

Consolidated Financial Statements and Independent Auditor's Report

of Orion Engineered Carbons S.A. , Luxembourg,
as at December 31, 2018



**UNITED STATES
SECURITIES AND EXCHANGE COMMISSION**
Washington, D.C. 20549

FORM 20-F

- Registration statement pursuant to Section 12(b) or 12(g) of the Securities Exchange Act of 1934
- or
- Annual report pursuant to Section 13 or 15(d) of the Securities Exchange Act of 1934 for the fiscal year ended December 31, 2018
- or
- Transition report pursuant to Section 13 or 15(d) of the Securities Exchange Act of 1934
- or
- Shell company report pursuant to Section 13 or 15(d) of the Securities Exchange Act of 1934

Commission file number: 001- 36563

ORION ENGINEERED CARBONS S.A.

(Exact Name of Registrant as Specified in its Charter)

N/A

(Translation of Registrant's Name into English)

Grand Duchy of Luxembourg
(Jurisdiction of Incorporation or Organization)

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(Address of Principal Executive Office)

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(Name, Telephone, E-Mail and/or Facsimile number and Address of Company Contact Person)

Securities registered or to be registered pursuant to Section 12(b) of the Act:

Title of Each Class

Name of Each Exchange On Which Registered

Common Shares, no par value

New York Stock Exchange

Securities registered or to be registered pursuant to Section 12(g) of the Act:

None

Securities for which there is a reporting obligation pursuant to Section 15(d) of the Act:

None

Indicate the number of outstanding shares of each of the issuer's classes of capital or common stock as of the close of the period covered by the annual report.

59,518,498 common shares, no par value

Indicate by check mark if the registrant is a well-known seasoned issuer, as defined in Rule 405 of the Securities Act. Yes No

If this report is an annual or transition report, indicate by check mark if the registrant is not required to file reports pursuant to Section 13 or 15(d) of the Securities Exchange Act of 1934. Yes No

Note—checking the box above will not relieve any registrant required to file reports pursuant to Section 13 or 15(d) of the Securities Exchange Act of 1934 from their obligations under those Sections.

Indicate by check mark whether the registrant (1) has filed all reports required to be filed by Section 13 or 15(d) of the Securities Exchange Act of 1934 during the preceding 12 months (or for such shorter period that the registrant was required to file such reports), and (2) has been subject to such filing requirements for the past 90 days. Yes No

Indicate by check mark whether the registrant has submitted electronically every Interactive Data File required to be submitted and posted pursuant to Rule 405 of Regulation S-T (§232.405 of this chapter) during the preceding 12 months (or for such shorter period that the registrant was required to submit and post such files). Yes No

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, or an emerging growth company. See definition of "large accelerated filer," "accelerated filer," and "emerging growth company" in Rule 12b-2 of the Exchange Act (Check one):

Large accelerated filer Accelerated Filer Non-accelerated filer Emerging growth company

If an emerging growth company that prepares its financial statements in accordance with U.S. GAAP, indicate by check mark if the registrant has elected not to use the extended transition period for complying with any new or revised financial accounting standards[†] provided pursuant to Section 13(a) of the Exchange Act.

[†]The term "new or revised financial accounting standard" refers to any update issued by the Financial Accounting Standards Board to its Accounting Standard Codification after April 5, 2012.

Indicate by check mark which basis of accounting the registrant has used to prepare the financial statements included in this filing:

U.S. GAAP International Financial Reporting Standards as issued by the International Accounting Standards Board Other

If "Other" has been checked in response to the previous question indicate by check mark which financial statement item the registrant has elected to follow Item 17 Item 18

If this is an annual report, indicate by check mark whether the registrant is a shell company (as defined in Rule 12b-2 of the Exchange Act). Yes No

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CERTAIN DEFINED TERMS

In this annual report, unless otherwise specified or if the context so requires:

- References to the “Company” are exclusively to Orion Engineered Carbons S.A., a Luxembourg joint stock corporation (*société anonyme*);
- References in this report to “Orion,” the “Group,” “we,” “us” or “our” are to Orion Engineered Carbons S.A. and its consolidated subsidiaries;
- References in this report to “Kinove Holdings” are to Kinove Luxembourg Holdings 1 S.à r.l., a Luxembourg limited liability company (*société à responsabilité limitée*), our previous principal shareholder which was owned by investment funds managed by affiliates of Rhône Capital L.L.C., investment funds managed directly or indirectly by Triton Managers III Limited and TFF III Limited and Luxinva S.A., a wholly-owned subsidiary of the Abu Dhabi Investment Authority, a public institution wholly-owned by the Government of the Emirate of Abu Dhabi;
- References in this report to “Luxco Coinvest” are to Kinove Luxembourg Coinvestment S.C.A., a liquidated investment vehicle previously owned by members of the Company’s management;
- References to the “Acquisition” are to the acquisition of the carbon black business line from Evonik Industries AG, completed on July 29, 2011; and
- References to the “Credit Agreement” are to the Credit Agreement, dated as of July 25, 2014, among the Company, Orion Engineered Carbons Holdings GmbH, Orion Engineered Carbons Bondco GmbH, Orion Engineered Carbons GmbH, OEC Finance US LLC, the revolving borrowers named therein, the guarantors named on the signature page thereto, the lenders named therein, and Goldman Sachs Bank USA as administrative agent, as amended.

PRESENTATION OF CERTAIN FINANCIAL AND OTHER INFORMATION

The financial statements included in this report have been prepared in accordance with accounting principles generally accepted in the United States (“US-GAAP” or “GAAP”). The audited consolidated financial statements as at and for the three years ended December 31, 2018 included in this report mark the first time the Company is preparing and publishing US-GAAP financial statements. Previously, the Company prepared its financial statements in accordance with International Financial Reporting Standards as issued by the IASB (“IFRS”). Tables providing illustrative overview of differences and impact on our financial statements as identified during the GAAP conversion project are included elsewhere in this report.

In this report, references to “\$”, “USD” and “U.S. Dollars” are to the lawful currency of the United States of America, references to “Euro” and “€” are to the single currency adopted by participating member states of the European Union (the “EU”) relating to Economic and Monetary Union, references to “Korean Won” are to the lawful currency of the Republic of Korea, and reference to “RMB” are to the Chinese Renminbi which is the currency and legal tender in mainland of the People's Republic of China. For periods commencing on or after January 1, 2018 we have been reporting our results (including results or figures for comparative periods) in U.S. Dollars rather than in Euro.

Non-GAAP Financial Measures

In this report, we present certain financial measures that are not recognized by US-GAAP and that may not be permitted to appear on the face of US-GAAP-compliant financial statements or notes thereto.

The non-GAAP financial measures used in this report are Contribution Margin, Contribution Margin per Metric Ton (collectively, “Contribution Margins”), Adjusted EBITDA, Net Working Capital and Capital Expenditures. We define Contribution Margin as revenue less variable costs (such as raw materials, packaging, utilities and distribution costs). We define Contribution Margin per Metric Ton as Contribution Margin divided by volume measured in metric tons. We define Adjusted EBITDA as operating result (EBIT) before depreciation and amortization, adjusted for acquisition related expenses, restructuring expenses, consulting fees related to Group strategy, share of profit or loss of joint venture and certain other items. Adjusted EBITDA is defined similarly in the Credit Agreement. Adjusted EBITDA is used by our management to evaluate our operating performance and make decisions regarding allocation of capital because it excludes the effects of items that have less bearing on the performance of our underlying core business. We define Net Working Capital as inventories plus current trade receivables minus trade payables. We define Capital Expenditures as cash paid for the acquisition of intangible assets and property, plant and equipment as shown in the consolidated financial statements.

We also use Segment Adjusted EBITDA Margin, which we define as Adjusted EBITDA for the relevant segment divided by the revenue for that segment.

We use Adjusted EBITDA, Contribution Margins and Net Working Capital, as well as Adjusted EBITDA by segment and Segment Adjusted EBITDA Margin, as internal measures of performance to benchmark and compare performance among our own operations. We use these measures, together with other measures of performance under US-GAAP, to compare the relative performance of operations in planning, budgeting and reviewing the performance of our business. We believe these measures are useful measures of financial performance in addition to consolidated net income for the period, income from operations (EBIT) and other profitability measures under US-GAAP because they facilitate operating performance comparisons from period to period and company to company and, with respect to Contribution Margin, eliminate volatility in feedstock prices. By eliminating potential differences in results of operations between periods or companies caused by factors such as depreciation and amortization methods, historic cost and age of assets, financing and capital structures and taxation positions or regimes, we believe that Adjusted EBITDA can provide a useful additional basis for comparing the current performance of the underlying operations being evaluated. For these reasons, we believe EBITDA-based measures are often used by the investment community as a means of comparison of companies in our industry. By deducting variable costs (such as raw materials, packaging, utilities and distribution costs) from revenue, we believe that Contribution Margins can provide a useful basis for comparing the current performance of the underlying operations being evaluated by indicating the portion of revenue that is not consumed by these variable costs and therefore contributes to the coverage of all costs and profits.

Different companies and analysts may calculate measures based on EBITDA, contribution margins and working capital differently, so making comparisons among companies on this basis should be done carefully. Adjusted EBITDA, Contribution Margins and Net Working Capital are not measures of performance under US-GAAP and should not be considered in isolation or construed as substitutes for revenue, consolidated net income for the period, income from operations (EBIT), gross profit and other US-GAAP measures as an indicator of our operations in accordance with US-GAAP.

Reconciliation of Non-GAAP Financial Measures

The non-GAAP financial measures contained in this report are unaudited and have not been prepared in accordance with US-GAAP or the accounting standards of any other jurisdiction and may not be comparable to other similarly titled measures of other companies. For a reconciliation of these non-GAAP financial measures to the most directly comparable US-GAAP measures, see “*Item 5. Operating and Financial Review and Prospects — Reconciliation of non-GAAP Financial Measures*.”

INDUSTRY, RANKING AND OTHER DATA

Information included in this report relating to industries, industry size, share of industry sales, industry position, industry capacities, industry demand, growth rates, penetration rates, average prices and other industry data pertaining to our business consists of estimates based on data reports compiled by professional third-party organizations and analysts, on data from external sources, on our best knowledge of our sales and industries in which we operate and on our own calculations based on such information. In many cases we are required to rely on internally developed estimates because there is no readily available external information (whether from trade associations, government bodies or other organizations) to validate industry-related analysis and estimates. While we have compiled, extracted and reproduced industry data from external sources, including third-party, industry or general publications, we have not independently verified the data and cannot guarantee its accuracy or completeness. Similarly, while we believe our internal estimates to be reasonable, they have not been verified by any independent sources, and we cannot guarantee their accuracy. Forecasts and other forward-looking information with respect to industry and ranking are subject to the same qualifications and additional uncertainties regarding the other forward-looking statements in this report.

TRADEMARKS AND TRADE NAMES

We own or have rights to certain trademarks and trade names that we use in conjunction with the operations of our business. Each trademark, trade name or service mark of any other company appearing in this report belongs to its holder. Solely for convenience, trademarks and trade names referred to in this report may appear without the “®” or “™” symbols, but such references are not intended to indicate, in any way, that we will not assert, to the fullest extent possible under applicable law, our rights or the rights of the applicable licensor to these trademarks and trade names. We do not intend our use or display of other companies’ trade names, trademarks or service marks to imply a relationship with, or endorsement or sponsorship of us by, such other companies.

NOTE REGARDING FORWARD-LOOKING STATEMENTS

This report contains and refers to certain forward-looking statements with respect to our financial condition, results of operations and business. These statements constitute forward-looking statements within the meaning of Section 21E of the Securities Exchange Act of 1934, as amended (the “Exchange Act”). Forward-looking statements are statements of future expectations that are based on management’s current expectations and assumptions and involve known and unknown risks and uncertainties that could cause actual results, performance or events to differ materially from those expressed or implied in these statements. Forward-looking statements include, among others, statements concerning the potential exposure to market risks, statements expressing management’s expectations, beliefs, estimates, forecasts, projections and assumptions and statements that are not limited to statements of historical or present facts or conditions.

Forward-looking statements are typically identified by words such as “anticipate,” “believe,” “could,” “estimate,” “expect,” “intend,” “may,” “plan,” “objectives,” “outlook,” “probably,” “project,” “will,” “seek,” “target” and other words of similar meaning. These forward-looking statements include, without limitation, statements about the following matters:

- our strategies for (i) strengthening our position in specialty carbon blacks and rubber carbon blacks, (ii) increasing our rubber carbon black margins and (iii) strengthening the competitiveness of our operations;
- the installation of pollution control technology in our U.S. manufacturing facilities pursuant to the EPA consent decree described herein;
- the outcome of any in-progress, pending or possible litigation or regulatory proceedings; and
- our expectation that the markets we serve will continue to grow.

All these forward-looking statements are based on estimates and assumptions that, although believed to be reasonable, are inherently uncertain. Therefore, undue reliance should not be placed upon any forward-looking statements. There are important factors that could cause actual results to differ materially from those contemplated by such forward-looking statements. These factors include, among others:

- negative or uncertain worldwide economic conditions;
- volatility and cyclicity in the industries in which we operate;
- operational risks inherent in chemicals manufacturing, including disruptions as a result of severe weather conditions and natural disasters;
- our dependence on major customers;
- our ability to compete in the industries and markets in which we operate;
- our ability to develop new products and technologies successfully and the availability of substitutes for our products;
- our ability to implement our business strategies;

- volatility in the costs and availability of raw materials and energy;
- our ability to realize benefits from investments, joint ventures, acquisitions or alliances;
- our ability to realize benefits from planned plant capacity expansions and site development projects and the potential delays to such expansions and projects;
- information technology systems failures, network disruptions and breaches of data security;
- our relationships with our workforce, including negotiations with labor unions, strikes and work stoppages;
- our ability to recruit or retain key management and personnel;
- our exposure to political or country risks inherent in doing business in some countries;
- geopolitical events in the European Union, and in particular a “no-deal Brexit” which may impact the Euro;
- environmental, health and safety regulations, including nanomaterial and greenhouse gas emissions regulations, and the related costs of maintaining compliance and addressing liabilities;
- possible future investigations and enforcement actions by governmental or supranational agencies;
- our operations as a company in the chemical sector, including the related risks of leaks, fires and toxic releases;
- market and regulatory changes that may affect our ability to sell or otherwise benefit from co-generated energy;
- litigation or legal proceedings, including product liability and environmental claims;
- our ability to protect our intellectual property rights and know-how;
- our ability to generate the funds required to service our debt and finance our operations;
- fluctuations in foreign currency exchange and interest rates;
- the availability and efficiency of hedging;
- changes in international and local economic conditions, including with regard to the Euro, dislocations in credit and capital markets and inflation or deflation;
- potential impairments or write-offs of certain assets;
- required increases in our pension fund contributions;
- the adequacy of our insurance coverage;
- changes in our jurisdictional earnings mix or in the tax laws or accepted interpretations of tax laws in those jurisdictions;
- our indemnities to and from Evonik (as defined below);
- challenges to our decisions and assumptions in assessing and complying with our tax obligations;
- our status as a foreign private issuer; and
- potential difficulty in obtaining or enforcing judgments or bringing actions against us in the United States.

In light of these risks, our results could differ materially from the forward-looking statements contained in this report. For further information regarding factors that could affect our business and financial results and the related forward-looking statements, see “*Item 3. Key Information —D. Risk Factors.*”

PART I

Item 1. Identity of Directors, Senior Management and Advisers

Not applicable.

Item 2. Offer Statistics and Expected Timetable

Not applicable.

Item 3. Key Information

A. Selected Financial Data

The following tables set forth selected historical financial information for fiscal years 2018 , 2017 , 2016 , 2015 and 2014 and as of December 31, 2018 , 2017 , 2016 , 2015 and 2014 . The financial information for fiscal years 2018 , 2017 and 2016 and balance sheet information as of December 31, 2018 and 2017 has been derived from our audited consolidated financial statements included elsewhere in this report. The financial information for fiscal year 2015 and balance sheet information as of December 31, 2016 and 2015 has been derived from our unaudited consolidated financial statements not included in this report converted into US-Dollars and adjusted for impacts associated with our conversion from IFRS to US-GAAP. The financial information for fiscal year 2014 and balance sheet information as of December 31, 2014 has been derived from our unaudited consolidated financial statements converted into US-Dollars. The 2014 information provided is based on IFRS. This information should be read in conjunction with the consolidated financial statements included elsewhere in this report, the related notes and other financial information included herein, and financial information previously filed with or furnished to the Securities and Exchange Commission (the "SEC").

Consolidated Statements of Operations Data	Year Ended December 31,			
	2018	2017	2016	2015
	(In millions, except per share amounts)			
Net sales	\$ 1,578.2	\$ 1,328.3	\$ 1,139.3	\$ 1,234.5
Cost of sales	1,148.2	950.7	764.9	879.4
Gross profit	430.0	377.6	374.4	355.1
Selling, general and administrative expenses	231.9	207.5	202.5	188.8
Research and development costs	20.3	18.2	16.1	14.8
Other expenses, net	6.1	7.6	9.0	15.7
Restructuring income	40.3	—	—	—
Restructuring expenses	15.6	6.5	30.0	—
Income from operations	196.3	137.9	116.8	135.8
Interest and other financial expense, net	28.6	44.1	43.3	62.1
Reclassification of actuarial losses from AOCI	—	9.7	0.1	10.5
Income from operations before income taxes and equity in earnings of affiliated companies	167.7	84.0	73.4	63.2
Income tax expense	46.9	19.7	24.4	23.1
Equity in earnings of affiliated companies, net of tax	0.6	0.5	0.5	0.5
Net income	\$ 121.3	\$ 64.9	\$ 49.5	\$ 40.6
Earnings per share - basic	\$ 2.04	\$ 1.09	\$ 0.83	\$ 0.68
Earnings per share - diluted	\$ 1.99	\$ 1.07	\$ 0.82	\$ 0.68
Dividends per share	\$ 0.80	\$ 0.77	\$ 0.74	\$ 0.74

Income Statement Data (IFRS)

	2014
(In \$ millions, except per share amounts)	
Revenue	1,753.7
Cost of sales	(1,353.5)
Gross profit	400.2
Selling expenses	(132.4)
Research and development costs	(17.2)
General and administrative expenses	(72.4)
Other operating income	5.9
Other operating expenses	(44.7)
Restructuring expenses	—
Operating result (EBIT)	139.5
Finance income	51.9
Finance costs	(243.8)
Share of profit or loss of joint ventures	0.7
Financial result	(191.3)
Profit or (loss) before income taxes	(51.8)
Income taxes	(23.5)
Profit or (loss) for the period	(75.2)
Earnings Per Share - basic (\$ per share) ⁽¹⁾	\$ (1.49)
Earnings Per Share - diluted (\$ per share) ⁽¹⁾	\$ (1.49)
Dividends per share (\$ per share)	\$ 0.98

Statement of Cash Flows Data

	Year Ended December 31,			
	2018	2017	2016	2015
	(In millions)			
Net cash provided by operating activities	\$ 122.0	\$ 147.7	\$ 177.4	\$ 195.1
Net cash used in investing activities	(88.1)	(90.3)	(68.5)	(83.0)
Net cash used in financing activities	(43.8)	(68.5)	(101.8)	(112.3)

Statement of Cash Flows Data

	2014
Year Ended December 31,	IFRS figures
(In millions)	
Net cash provided by operating activities	\$ 172.8
Net cash used in investing activities	(84.0)
Net cash used in financing activities	(90.6)

Balance Sheet Data

	Year Ended December 31,			
	2018	2017	2016	2015
	(In millions)			
Cash and cash equivalents	\$ 57.0	\$ 72.3	\$ 77.9	\$ 71.1
Property, plant and equipment	483.5	462.1	409.9	420.1
Total assets	1,273.0	1,164.4	1,055.5	1,057.6
Total liabilities	1,114.1	1,069.1	1,000.8	1,004.9
Total stockholders' equity ⁽¹⁾	158.9	95.3	54.7	52.7

(1) Our share capital as of December 31, 2018 is denominated in Euro and was €60,035,579 (a USD-equivalent amount of \$68,740,737, respectively, applying a closing rate of 1,1450 US-Dollar per 1 Euro), represented by 60,035,579 common shares with no par value of which 517,081 common shares are held in treasury.

Balance Sheet Data

Year Ended December 31,

	2014
	IFRS figures
(In millions)	
Cash and cash equivalents	\$ 85.6
Property, plant and equipment	434.9
Total assets	1,241.0
Total liabilities	1,173.9
Total stockholders' equity	67.1

The following tables present a reconciliation of Adjusted EBITDA to net income:

	Year Ended December 31,			
	2018	2017	2016	2015
	(In millions)			
Net income	\$ 121.3	\$ 64.9	\$ 49.5	\$ 40.6
Add back income tax expense	46.9	19.7	24.4	23.1
Add back equity in earnings of affiliated companies, net of tax	(0.6)	(0.5)	(0.5)	(0.5)
Income from operations before income taxes and equity in earnings of affiliated companies	167.7	84.0	73.4	63.2
Add back interest and other financial expense, net	28.6	44.1	43.3	62.1
Reclassification of actuarial losses from AOCI	—	9.7	0.1	10.5
Income from operations	196.3	137.9	116.8	135.8
Add back depreciation, amortization and impairment of intangible assets and property, plant and equipment	98.2	98.4	97.1	80.9
EBITDA	294.5	236.2	214.0	216.7
Equity in earnings of affiliated companies, net of tax	0.6	0.5	0.5	0.5
Restructuring expenses/(income)	(24.6)	6.5	19.8	—
Consulting fees related to Group strategy	4.8	2.8	2.8	1.6
Long Term Incentive Plan	13.9	8.8	4.0	1.0
Other adjustments	5.0	2.1	5.7	11.7
Adjusted EBITDA	\$ 294.1	\$ 257.0	\$ 246.7	\$ 231.6

Year Ended December 31,	2014
	IFRS figures
(In millions)	
Loss for the period	\$ (75.2)
Add back income tax expense	23.5
Add back equity in earnings of affiliated companies, net of tax	(0.7)
Income from operations before income taxes and equity in earnings of affiliated companies	(52.4)
Add back interest and other financial expense, net	192.0
Earnings before income taxes and finance income/costs (operating result (EBIT))	139.5
Add back depreciation, amortization and impairment of intangible assets and property, plant and equipment	102.3
EBITDA	241.9
Equity in earnings of affiliated companies, net of tax	0.7
Restructuring expenses/(income)	5.4
Consulting fees related to Group strategy	6.1
Other adjustments	22.4
Adjusted EBITDA	\$ 276.4

For a comprehensive overview of identified differences related to the conversion to US-GAAP see “ *Item 5. Operating and Financial Review and Prospects—U.S. GAAP Reporting* ”.

B. Capitalization and Indebtedness

Not applicable.

C. Reasons for the Offer and Use of Proceeds

Not applicable.

D. Risk Factors

The following risks may have material adverse effects on our business, financial condition and results of operations. Additional risks and uncertainties of which we are not presently aware or that we currently deem immaterial could also materially affect our business operations and financial condition.

Risks Related to Our Business

Negative or uncertain worldwide economic conditions may result in business volatility and may adversely impact our business, financial condition, results of operations and cash flows.

Our operations and performance are materially affected by worldwide economic conditions. Because carbon black is used in a diverse group of end products, demand for carbon black has historically been related to real gross domestic product (“GDP”) and general global economic conditions. In particular, a large part of our sales has direct exposure to the cyclical automotive industry and, to a lesser extent, the construction industry. As a result, our business experiences a level of inherent cyclical. The nature of our business and our large fixed asset base make it difficult to rapidly adjust our fixed costs downward when demand for our products declines, which could materially affect our profitability. A global or regional economic downturn may reduce demand for our products, which would decrease our revenue and could have a material adverse effect on our business, financial condition, results of operations and cash flows. For example, our results of operations dropped sharply in the wake of the global financial and economic crisis in the second half of 2008 and 2009. In periods with significant market turmoil and tightened credit availability, we expect to experience difficulty in collecting accounts receivable, pricing pressure and reduced global business activity.

Structural changes in the industries in which we operate may result in business volatility and may adversely affect our business, financial condition, results of operations and cash flows.

Our business is influenced by structural changes in the industries in which we operate, such as the entry of new suppliers, product substitution, changing technologies, industry consolidation and the migration of customers to lower-cost countries. Some of our customers have shifted, and may continue to shift, manufacturing capacity from mature regions, such as North America and Europe, to emerging regions, such as Asia and South America. Although we have developed and implemented strategies to meet these changes in demand, we cannot be

certain that we will be able to successfully expand capacity in emerging regions. Our ability to expand in these regions depends in part on their economic and political conditions and on our ability to establish and finance operations, construct additional manufacturing capacity or form strategic business alliances including acquisitions and joint ventures. Over the last few years, for instance, our competitors in China have aggressively added capacity at a far greater rate than demand has increased, which has resulted in pressured margins in the region, particularly with respect to standard tire grades. In addition, we may not be successful in reducing capacity in mature regions commensurate with industry demand. Similarly, demand for our customers' products and our competitors' reactions to market conditions could affect our results. Our business is also sensitive to changes in industry capacity utilization. Prices tend to decrease when capacity utilization decreases, which could adversely affect our business, financial condition, results of operations and cash flows.

Our business is subject to operational risks, which could adversely affect our business, financial condition, results of operations and cash flows.

Our operations are subject to hazards inherent in chemicals manufacturing and the related use, storage, transportation and disposal of feedstocks, products and wastes, including but not limited to, fires and explosions, accidents, severe weather and natural disasters (including hurricanes, tornados, ice storms, droughts, floods and earthquakes), mechanical failures, unscheduled downtime at our production facilities, transportation interruptions, pipeline leaks and ruptures, quality problems, technical difficulties, energy grid shutdowns, discharges or releases of toxic or hazardous substances or gases, other environmental risks, and sabotage, terrorist attacks or other acts of violence as well as potential boycotts, general strikes, sanctions or blockades.

Such events could disrupt our supply of raw materials or otherwise affect production, transportation and delivery of our products or affect demand for our products. We could incur significant expenditures in connection with such operational risks. These may be caused both by external factors, such as natural disasters, war, acts of terrorism, strikes, official orders, technical interruptions or material defects and accidents or mistakes in internal procedures, such as fire, explosion or release of toxic or hazardous substances. In all of these cases, our property, third-party property or the environment may sustain damage, or there may be human exposure to hazardous substances, personal injuries or fatalities. Such events could result in material financial liabilities, civil or criminal law consequences, the temporary or permanent closure of the relevant production or administrative sites or power plant and a negative impact on our financial condition, results of operations and cash flows.

We are dependent on major customers for a significant portion of our sales, and a significant adverse change in a customer relationship could adversely affect our business, financial condition, results of operations and cash flows.

Customer concentration is driven by the consolidated nature of the industries we serve. In 2018, our top ten customers accounted for approximately 49% of our volume measured in thousand metric tons ("kmt"). The top five customers in each of our segments represented approximately 26% and approximately 52% of our Specialty Carbon Black and Rubber Carbon Black segment volumes measured in kmt for 2018, respectively. Our success in strengthening relationships and growing business with our largest customers and retaining their business over extended time periods could affect our future results. The loss of any of our major customers (including due to industry consolidation) or a reduction in volumes sold to them, could adversely affect our results of operations. Any deterioration in the financial condition of any of our customers or the industries they serve that impairs our customers' ability to make payments to us could increase our uncollectible receivables and could adversely affect our business, financial condition, results of operations and cash flows.

We may not be able to compete successfully in the industries and markets in which we operate.

The industries in which we operate are highly competitive and this competition could harm our business, financial condition, results of operations and cash flows. Competition is based on price, product innovation, product quality, distribution capability, and industry and customer knowledge. We face competition from global and regional suppliers, both in developed and in emerging regions. More recently, a significant percentage of tire demand is met by imports from, and a shift in production to, low-cost emerging regions. This has adversely affected utilization rates of carbon black producers in developed regions and resulted in plant closures. While we aim to operate at low cost and are focused on reducing our fixed and variable cost base across our production chain, there may be improvements in the cost competitiveness of other manufacturers relative to us or in the performance properties of substitutable products and raw materials, which could result in advantages for our competitors and adversely affect our business. Furthermore, some of our competitors may have greater financial and other resources and larger capitalization than we do. If we are unable to respond successfully to changing competitive conditions, the demand for our products could be adversely affected.

The markets in which we operate are highly competitive and this competition, and the challenges we face to gain share in those markets and new markets, could harm our business, financial condition, results of operations and cash flows.

We may not successfully develop new products and technologies that address our customers' changing requirements or competitive challenges, and our customers may substitute our products by using other products we do not offer.

The industries into which we sell our products are subject to periodic technological changes, ongoing product improvements, product substitution and changes in customer requirements. Increased competition from existing or newly developed products offered by our competitors or companies whose products offer a similar or better functionality to our products may negatively affect demand for our products. We work to identify, develop and market innovative products on a timely basis to meet our customers' changing requirements and competitive challenges. Should we not be able to substantially maintain or further develop our product portfolio, customers may elect to source comparable products from competitors, which could adversely affect our business, financial condition, results of operations and cash flows.

Although carbon black continues to offer opportunities for product and process innovation, we cannot be certain that the investments we make in our Innovation Group will result in proportional increases in revenue or profits. In addition, the timely commercialization of products that we are developing may be disrupted or delayed by manufacturing or other technical difficulties, industry acceptance or insufficient industry size to support a new product, competitors' new products, and difficulties in moving from the experimental stage to the production stage. These disruptions or delays could adversely affect our business, financial condition, results of operations and cash flows.

As a reinforcing agent in rubber, carbon black competes primarily with precipitated silica in combination with silane, which is not part of our product portfolio. Historically, silica has offered some performance benefits over carbon black in the area of rolling resistance. To date, silica-based tire applications have gained position in passenger car tire treads. Although substitution has not been significant due to carbon black's cost advantage, technological advances and changing customer requirements may lead to increased demand for silica-based tires, especially in developed regions. For example, Evonik announced in 2010 plans to significantly increase its capacity for precipitated silica to satisfy increasing demand and has since increased its global capacity for precipitated silica significantly. Increased substitution and competition from precipitated silica producers, including Evonik, could adversely affect our business, financial condition, results of operations and cash flows. If we should decide to include precipitated silica in combination with silane in our product portfolio in the future, we may be restricted in our ability to do so under our intellectual property sharing arrangements with Evonik.

Alternative materials, procedures or technologies may be developed, or existing ones may be improved, and may replace those currently offered in the carbon black industry. If such newly developed or improved products are being offered at lower prices, have preferable features or other advantages, in particular from a regulatory perspective, and we are not able to offer similar new or improved products, we may lose substantial business, which could have an adverse effect on our business, financial condition, results of operations and cash flows.

We may be unable to implement our business strategies in an effective manner.

Our future financial performance and success largely depend on our ability to maintain our current position and to implement our business strategies for growth successfully. We have undertaken, and will continue to undertake, various initiatives to realign our product portfolio away from standard specialty carbon black and rubber carbon black products to higher margin applications, and we continue to focus on cost reduction initiatives to optimize our asset base, improve operating efficiencies and generate cost savings. We cannot guarantee that we will successfully implement our business strategies or that implementing these strategies will sustain or improve and not harm our results of operations. In particular, we may not be able to increase or sustain our manufacturing efficiency or asset utilization, enhance our current portfolio of products or achieve other fixed or variable cost savings. In addition, the costs involved in implementing our strategies may be significantly higher than we currently anticipate. For example, our ability to complete capacity expansions as planned may be delayed or interrupted by the need to obtain environmental and other regulatory approvals, the availability of labor and materials, unforeseen hazards, such as weather conditions, adverse political or market developments, and other risks customarily associated with construction projects. Moreover, the cost of expanding capacity could have a negative impact on our financial results until capacity utilization is sufficient to absorb the incremental costs associated with the expansion. Further, labor or governmental restrictions could impede or delay our ability to reduce headcount.

Our business strategies are based on our assumptions about future demand for our products and the new products and applications we are developing, and on our continuing ability to produce our products profitably. Each of these factors depends on, among other things, our ability to realign our product portfolio, divest businesses or discontinue product lines on favorable terms and with minimal disruptions, finance our operations and product development activities, maintain high-quality and efficient manufacturing operations, relocate and close certain manufacturing facilities with minimal disruption to our operations, respond to competitive and regulatory changes, access quality raw materials in a cost-effective and timely manner, and retain and attract highly skilled technical, managerial, marketing and finance personnel. Any failure to develop, revise or implement our business strategies in a timely and effective manner may adversely affect our business, financial condition, results of operations and cash flows.

We are subject to volatility in the costs and availability of raw materials and energy, which could decrease our margins and adversely affect our business, financial condition, results of operations and cash flows.

Our manufacturing processes consume significant amounts of raw materials and energy, the costs of which are subject to fluctuations in worldwide supply and demand as well as other factors beyond our control. In 2018, raw materials accounted for 74% of our cost of sales. Approximately 83% of the cost of raw material used in the production of carbon black is related to petroleum-based or coal-based feedstock known as carbon black oil, with some limited use of other raw materials, such as nitrogen tetroxide, hydrogen and natural gas. We obtain a considerable portion of our raw materials and energy from selected key suppliers. Although we maintain raw material reserves, if any of these suppliers is unable to meet its obligations under supply agreements with us on a timely basis or at all, we may be forced to incur higher costs to obtain the necessary raw materials and energy elsewhere or, in certain limited cases, we may not be able to obtain carbon black oil or raw materials at all. Additionally, raw material sourcing and related infrastructure in certain jurisdictions where we operate may be subject to local regulations that may reduce, delay or halt the physical supply of raw materials. Our inability to source quality raw materials or energy in a timely fashion and pass through cost increases to our customers could have an adverse impact on our business, financial condition, results of operations and cash flows.

Most of our carbon black supply contracts contain provisions that adjust prices to account for changes in a relevant feedstock price index. While we have re-negotiated many of our customer contracts to reduce the time-lag after which we are able to pass through changes in carbon black oil prices to our customers, we are still exposed to oil price fluctuations and there can be no assurance that we will be able to

shift price risks to our customers. Success in offsetting increased raw material and energy costs with price increases is also influenced by competitive and economic conditions, as well as the speed and severity of such changes, and could vary significantly, depending on the segment served. Such increases may not be accepted by our customers, may not be fully reflected in the indices used in our pricing formulas, may not be sufficient to compensate for increased raw material and energy costs or may decrease demand for our products and our volume of sales. Rapid and significant oil or energy price fluctuations have had and are likely to continue to have significant and varying effects on our earnings and results of operations, partly because oil price changes affect our sales prices and our cost of raw materials and energy at different times and amounts, and partly due to other factors, such as differentials affecting the ultimate carbon black oil price paid by us (versus a particular reference price index), carbon black oil usage amounts and ongoing efficiency initiatives. Failure to fully offset the effects of fluctuating raw material or energy costs could have a material adverse effect on our business, financial condition, results of operations and cash flows. Further, volatility in costs and pricing could result in commercial disputes with suppliers and customers regarding the interpretations of complex contractual pricing arrangements, which could adversely affect our business.

Significant movements in the market price for crude oil tend to create volatility in our carbon black feedstock costs, which can affect both our Net Working Capital and operating results. Changes in raw material and energy prices have a direct impact on our Net Working Capital levels. In general, increases in the cost of raw materials lead to an increase in our Net Working Capital requirements, as our inventories and current trade receivables increase as a result of higher carbon black oil and other feedstock prices and related sales price levels, partially offset by an increase in trade payables. Due to the quantity of carbon black oil and finished goods that we typically keep in stock together with the levels of receivables and payables maintained, increases occur gradually over a two to three-month period but can vary depending on inventory levels and working capital levels generally. Conversely, decreases in the cost of raw materials lead to a decrease in our Net Working Capital requirements within a two to three-month period following the decrease in costs. Net Working Capital swings are particularly significant in an environment of high price volatility such as in the fourth quarter of 2014.

Any failure to realize benefits from investments, joint ventures, acquisitions or alliances could adversely affect our business, financial condition, results of operations and cash flows.

We have made, and may continue to make, investments and acquisitions and enter into joint ventures. The success of acquisitions of new technologies, companies and products, or arrangements with third parties is not always predictable and we may not achieve our anticipated objectives. Our investments may require high initial expenditures, and as in the case of Deutsche Gasrußwerke GmbH & Co. KG (the “German JV”), our collaboration with, among others, the tire manufacturers Continental, Pirelli and Goodyear, ongoing expenditures for modernization and expansion may be required. The German JV finances itself independently. However, any potential future lack of external financing sources may jeopardize the joint venture and may result in negative impacts on our own supply chain and business. Our investments can only be operated profitably if their utilization is warranted by corresponding demands. A build up of overcapacities that remain unused due to erroneous assessments of market development, could have a material adverse effect on our business, financial condition, results of operations and cash flows.

Plant capacity expansions and site development projects may be delayed or may not achieve the expected benefits.

Our ability to complete capacity expansions and consolidations as planned, including capacity conversions from rubber carbon black to specialty carbon black and vice versa, and other site development projects, including those associated with yield efficiency improvements, may be delayed, interrupted, or otherwise limited by the need to obtain environmental and other regulatory approvals, unexpected cost increases, availability of labor and materials, unforeseen hazards such as weather conditions, and other risks customarily associated with construction projects. In addition, lower oil prices may result in lower yield efficiency improvements. Moreover, the costs of these activities could have a negative impact on our results of operations, and in the case of capacity expansion projects, until capacity utilization at the particular facility is sufficient to absorb the incremental costs associated with the expansion. In addition, our ability to expand capacity in emerging countries depends in part on economic and political conditions in these regions and, in some cases, on our ability to establish operations, construct additional manufacturing capacity or form strategic business alliances.

The capital expenditures we might need to incur under the EPA consent decree remain uncertain; timing, locations, target levels and other factors could also affect our ability to meet target emission levels and target dates under the EPA consent decree.

On June 7, 2018, a consent decree (the “EPA CD”) between Orion Engineered Carbons LLC (for purposes of this risk factor, “Orion”) and the United States on behalf of U.S. Environmental Protection Agency (“EPA”), as well as the Louisiana Department of Environmental Quality became effective. The consent decree resolves and settles the EPA’s claims of noncompliance set forth in the notices and finding of violations from the EPA with respect to the Company’s U.S. facilities.

Under Orion’s EPA CD, Orion will install certain pollution control technology in order to further reduce SO₂, NO_x and particulate matter (“PM”) emissions at its four U.S. manufacturing facilities in Ivanhoe (Louisiana), Belpre (Ohio), Borger (Texas), and Orange (Texas) over approximately six years. The EPA CD also requires the continuous monitoring of emissions reductions that Orion will need to comply with over a number of years. Orion has commenced the installation works for its Ivanhoe facility, and expects to complete the installation in this facility over the next two years. Under the EPA CD, Orion can choose either its Belpre or Borger facilities as the next site for installation of pollution control equipment with comparable effectiveness. We expect the capital expenditures for installation of pollution control equipment in the remaining Orion facilities to decrease due to economies of scale and synergies from prior installations. We also expect that the third and fourth plants will require significantly less costly pollution control equipment given the requirements of the EPA CD. We estimate the installations of monitoring and pollution control equipment at all four Orion plants in the U.S. will require capital expenditures of up to \$190

million . However, the actual total capital expenditures we might need to incur in order to fulfill the requirements of the EPA CD remain uncertain. The EPA CD allows some flexibility for Orion to choose among different technology solutions for reducing emissions and the locations where these solutions are implemented. The solutions Orion ultimately chooses to implement may differ in scope and operation from those it currently anticipates (including those discussed in the next paragraph) and factors, such as timing, locations, target levels, changing cost estimates and local regulations, could cause actual capital expenditures to significantly exceed current expectations or affect Orion’s ability to meet the agreed target emission levels or target dates for installing required equipment as anticipated or at all. Orion also agreed to and paid a civil penalty of \$800,000 and agreed to perform environmental mitigation projects totaling \$550,000 . Noncompliance with applicable emissions limits could lead to further penalty payments to the EPA.

We may be subject to information technology systems failures, network disruptions, cybersecurity attacks and breaches of data security.

We rely on information technology systems to manage and operate our business, process transactions, and summarize our operating results. Our information technology systems are an important element for effectively operating our business. Information technology systems failures, particularly in connection with running SAP, including risks associated with upgrading our systems, network disruptions and breaches of data security, could disrupt our operations by impeding our processing of transactions, our ability to protect customer or company information and our financial reporting, and lead to increased costs. It is possible that future technological developments could adversely affect the functionality of our computer systems and require further action and substantial funds to prevent or repair computer malfunctions. Our information technology systems, including our back-up systems, are subject to damage or interruption from power outages, computer and telecommunications failures, computer viruses, cybercrimes, internal or external security breaches, catastrophic events such as fires, earthquakes, floods, tornados, hurricanes, acts of war or terrorism, and usage errors by our employees or third party providers. Although we have taken steps to address these concerns by implementing sophisticated network security, back-up systems and internal control measures, there can be no assurance that a system failure or data security breach will not have a material adverse effect on our business, financial condition, results of operations and cash flows. If our information technology systems are damaged or cease to function properly, we may have to make a significant investment to fix or replace them, and we may suffer loss of critical data and interruptions or delays in our operations. Any material disruption in our information technology systems, or delays or difficulties in implementing or integrating new systems or enhancing current systems, could have an adverse effect on our business, financial condition or results of operations.

We also faces global cybersecurity threats, which may range from uncoordinated individual attempts to sophisticated and targeted measures, known as advanced persistent threats, directed at us. Cybersecurity attacks and security breaches may include, but are not limited to, attempts to access information, computer viruses, denial of service and other electronic security breaches.

We believe that we face a heightened threat of cybersecurity attacks due to the industries we serve, the locations of our operations and our technological innovations. We have experienced cybersecurity attacks in the past, and may experience them in the future, potentially with more frequency or sophistication. Based on information known to date, past attacks have not had a material impact on our financial condition or results of operations. However, due to the evolving nature of cybersecurity threats, the scope and impact of any future incident cannot be predicted.

We employ a number of measures to protect and defend against cybersecurity attacks, including firewalls, intrusion detection systems, anti-virus software and frequent backups. Additionally, we conduct regular periodic training of our employees regarding the protection of sensitive information which includes training intended to prevent the success of “phishing” attacks. While we continually work to safeguard our systems and mitigate potential risks, there is no assurance that such actions will be sufficient to prevent cybersecurity attacks or security breaches that manipulate or improperly use our systems or networks, compromise confidential or otherwise protected information, destroy or corrupt data, or otherwise disrupt our operations. The occurrence of such events could negatively impact our reputation and our competitive position and could result in litigation with third parties, regulatory action, loss of business, potential liability and increased remediation costs, any of which could have a material adverse effect on our financial condition and results of operations. In addition, such attacks or breaches could require significant management attention and resources, and result in the diminution of the value of the Company’s investment in research and development.

Our enterprise risk management program and disclosure controls and procedures address cybersecurity and include elements intended to ensure that there is an analysis of potential disclosure obligations arising from cybersecurity attacks and security breaches. We also maintain compliance programs to address the potential applicability of restrictions against trading while in possession of material, nonpublic information generally and in connection with a cybersecurity attack or security breach. However, a breakdown in existing controls and procedures around the Company’s cybersecurity environment may prevent us from detecting, reporting or responding to cybersecurity incidents in a timely manner and could have a material adverse effect on our financial condition or the market price of our securities.

In addition to supporting our operations, we use our systems to collect and store confidential and sensitive data, including information about our business, our customers and our employees. As our technology continues to evolve, we anticipate that we will collect and store even more data in the future, and that our systems will increasingly use remote communication features that are sensitive to both willful and unintentional security breaches. Much of our value is derived from our confidential business information, including customer data, proprietary technology and trade secrets. To the extent the confidentiality of such information is compromised, we may lose our competitive advantage, and our business, financial condition, results of operations and cash flows may suffer. We also collect, retain and use personal information, including data we gather from customers for product development and marketing purposes, and data we obtain from employees. In the event of a breach in security that allows third parties access to this personal information, we are subject to a variety of laws on a global basis that require us to provide notification to the data owners, and that subject us to lawsuits, fines and other means of regulatory enforcement. Our

reputation could suffer in the event of such a data breach, which could cause customers to purchase from our competitors. Ultimately, any compromise of our data security could have a material adverse effect on our business, financial condition, results of operations and cash flows.

If we are unable to successfully negotiate with the representatives of our employees, including labor unions and works councils, we may experience strikes and work stoppages.

We are party to collective bargaining agreements and social plans with our employees' labor unions. In particular, 72.68% of our employees are covered by collective bargaining agreements, of which 8.27% will expire within one year. We also are required to consult with our employee representatives, such as works councils, on certain matters such as restructuring, acquisitions and divestitures. Although we believe that our relations with our employees are good, there can be no assurance that new agreements will be reached or consultations will be completed without union or works council actions or on terms satisfactory to us. Current and future negotiations and consultations with employee representatives could have a material adverse effect on our business. In addition, a material work stoppage or union dispute could adversely affect our business, financial condition, results of operations and cash flows.

We may not be able to recruit or retain key management and personnel.

Our success is dependent on the management and leadership skills of our key management and personnel. The loss of any member of our key management team and personnel or an inability to attract, retain, develop and maintain additional personnel could prevent us from implementing our business strategy. In addition, our future growth and success also depend on our ability to attract, train, retain and motivate skilled managerial, sales, administration, research and development ("R&D"), operating and technical personnel. The loss of one or more member of our key management or operating personnel, or the failure to attract, retain and develop additional key personnel, could have a material adverse effect on our business, financial condition, results of operations and cash flows.

We are exposed to political or country risk inherent in doing business in some countries.

We operate a global network of production plants, located in Europe, North America, South Korea, China, South Africa and Brazil. Accordingly, our business is subject to risks related to the different legal, political, social and regulatory requirements and economic conditions of many jurisdictions. Risks inherent in international operations include the following: changes in the rate of economic growth, unsettled political or economic conditions, expropriation or other governmental actions; social unrest, war, terrorist activities or other armed conflict; national and regional labor strikes, confiscatory taxation or other adverse tax policies, deprivation of contract rights, trade regulations affecting production, pricing and marketing of products; reduced protection of intellectual property rights; restrictions on the repatriation of income or capital, exchange controls, inflation, deflation, currency fluctuations and devaluation, the effect of global environmental, health and safety issues on economic conditions, market opportunities and operating restrictions, changes in foreign laws and tax rates, changes in trade sanctions that result in losing access to customers and suppliers in those countries, costs associated with compliance with anti-bribery and anti-corruption laws, nationalization of private enterprises by foreign governments, and changes in financial policy and availability of credit or financing sources. These factors could adversely affect our business, financial condition, results of operations and cash flows.

Legal and Regulatory Risks

Our operations are subject to environmental, health and safety regulations. We have been and may in the future be subject to investigations by regulatory authorities in respect of alleged violations and may incur significant costs to maintain compliance with, and to address liabilities under, these laws and regulations.

We are subject to extensive domestic, foreign, federal, state and local laws and regulations governing environmental protection and occupational health and safety, all of which may be subject to change in the future. The production and processing of carbon black and other chemicals we produce involve the handling, transportation, manufacture, use and disposal of substances or components that may pose environmental risks or be considered toxic, hazardous or carcinogenic under these laws. We are also required to obtain permits or other approvals from various regulatory authorities for our operations, which may be required for matters including air emissions; wastewater and storm water discharges; storage, handling and disposal of hazardous substances; and operation, maintenance and closure of landfills. If we violate or otherwise fail to comply with these laws, regulations or permits or other approvals, or fail to receive the timely renewal of and due application for required permits, we may have to limit production, we may incur fines or other sanctions, be required to undertake significant capital expenditures to achieve compliance, or be subject to other obligations by one or more regulatory authorities.

If environmental harm to soil, groundwater, surface water or natural resources is found to have occurred as a result of our current or historical operations, we may be required to incur significant remediation costs at our current or former production facilities or at third-party sites. Many of our facilities have a long history of operation, which may contribute to our environmental compliance and remediation costs due to past spills, chemical storage, wastewater treatment and waste disposal practices and other activities. For instance, many of our facilities have onsite landfills that have been in use for a number of years, and we may incur significant costs when these landfills reach capacity in order to close them in accordance with applicable laws and regulations and to address contamination of soil and groundwater at, under or migrating from the facilities, including costs to address impacts to natural resources. Under certain laws and regulations, the obligations to investigate and remediate contamination at a facility or site may be imposed on current and former owners or operators, or on persons who may have sent waste to that facility or site for disposal. Liability under such laws and regulations may be without regard to fault or to the legality of the activities giving rise to the contamination. As a result, we may incur liabilities for wastes, including hazardous wastes, generated by our operations and disposed of onsite or at offsite locations, even if we were not responsible for the disposal. Further, we may also incur

additional closure and cleanup costs in connection with the closure of plants, including costs relating to decommissioning of equipment, asbestos removal and closure of features such as storage tanks, wastewater treatment systems, ponds and landfills.

Environmental and safety regulations are subject to frequent change, as are the priorities of those who enforce them, and we could incur substantial costs to comply with future laws and regulations. The trend in environmental regulation is imposing increasingly stringent restrictions on activities that may affect the environment. Any new or amended environmental laws and regulations may result in costly measures for matters subject to regulation, including but not limited to more stringent limits or control requirements for our air emissions; new or increased compliance obligations relating to greenhouse gas (“GHG”) emissions; stricter requirements for noise, waste handling, storage, transport, disposal, wastewater and storm water discharges; and more stringent cleanup and remediation standards, which, in each case, could have a material adverse effect on our operations and financial condition.

Certain national and international health organizations have classified carbon black as a possible or suspect human carcinogen. To the extent that, in the future, (i) these organizations re-classify carbon black as a known or confirmed carcinogen, (ii) other organizations or government authorities in other jurisdictions classify carbon black or any of our other finished products, raw materials or intermediates as suspected or known carcinogens or (iii) there is discovery of adverse health effects attributable to the production or use of carbon black or any of our other finished products, raw materials or intermediates, we could be required to incur significantly higher costs to comply with environmental, health and safety laws, or to comply with restrictions on sales of our products, and our reputation and business could be adversely affected. In addition, chemicals that are currently classified as harmless may be classified as dangerous in the future, and our products may have characteristics that are not recognized today but may be found in the future to impair human health or to be carcinogenic. See “*Item 4. Information on the Company —B. Business Overview —Environmental, Health and Safety Matters .*”

Developing regulation of carbon black as a nano-scale material could require us to comply with costly new requirements.

Carbon black consists of aggregates or agglomerates of primary particles that are nano-scale. The EPA and other governmental agencies are currently developing a regulatory approach under which they will collect further data on nano-scale materials, including carbon black, under the Toxic Substances Control Act. The EPA has proposed rules that would require manufacturers of nano-scale materials to submit additional manufacturing information, exposure and release information and available health and safety data. Based on a review of the Rule and the Working Guidance issued by the EPA, it is the determination of the International Carbon Black Association (ICBA) that carbon black is not subject to reporting under the TSCA 8(a) Reporting Rule. However, the EPA and other nations’ environmental regulatory authorities, including the European Commission, are also conducting extensive environmental health and safety testing of nano-scale materials. If carbon black is found to be harmful to humans and/or to the environment, it could be subject to more stringent regulatory control, which could require us to incur significantly higher costs to comply with new environmental, health and safety laws and could adversely affect our reputation and business. See “*Item 4. Information on the Company —B. Business Overview—Environmental, Health and Safety Matters .*”

In connection with such regulation, the European Commission is in the process of defining “nano-material. According to its recommendation of October 18, 2011 (2011/696/EU) carbon black is defined as a nano-material. In a similar approach, the International Organization for Standardization (“ISO”) developed the ISO TC 229 “Nanotechnologies,” which considers carbon black a “nano-structured material.” The industry is not yet generally affected by these definitions. However, certain regulations regarding cosmetics applications or articles which are intended for food contact have already been implemented, and other regulations are being discussed which may affect the use of carbon black in the future. This development may significantly affect our business in a manner we cannot predict, including by increasing the costs of doing business.

Regulations requiring a reduction of greenhouse gas emissions could adversely affect our business, financial condition, results of operations and cash flows.

Significant volumes of carbon dioxide (“CO₂”), a GHG, are emitted in carbon black manufacturing processes. Over the past few decades, concerns about the relationship between GHGs and global climate change have resulted in increased levels of scrutiny from regulators and the public alike, and have led to proposed and enacted regulations on both national and supranational levels, to monitor, regulate and control emissions of CO₂ and other GHGs.

In December 2005, the European Commission published a directive that includes carbon black manufacturing in the combustion sector and in Phase II of the Emissions Trading Scheme for GHGs for the period from 2008 to 2012. The European Commission has developed allowable emission credits for Phase III of the Emissions Trading Scheme (the “ETS”), which apply for the period 2013 to 2020. The ETS is anticipated to become progressively more stringent over time, which could have an impact on our costs of compliance under the ETS. The European Union member states (“EU Member States”) have included carbon black facilities in their national allocation plans, and we have taken actions to comply with applicable CO₂ emission requirements. Certain industry sectors in the European Union, including the carbon black industry, currently receive a certain share of their emission allowances for free. This list of industry sectors is reviewed by the European Commission every five years, with the latest review in October 2014. Although the carbon black industry retained its placement in the 2014 review, we cannot predict the outcome of a future review by the European Commission. On January 24, 2017 the European Commission issued a decision with recalculated correction factors for CO₂ emission certificates from 2013 to 2020. Currently, it is not clear whether the German Emissions Trading Authority (DEHSt) will apply the new factors to allocations granted in the past. Additionally, there can be no assurance that we will be able to purchase emissions credits if our carbon black operations generate more CO₂ than our allocations permit or that the cost of such credits will not be excessive.

In addition, effective January 2015, South Korea commenced a GHG emissions trading scheme (“South Korean ETS”), with the goal of achieving a 37% reduction in GHG emissions relative to the projected business-as-usual case by 2030. Participation is mandatory for South Korean legal entities that emit over 125,000 tons of CO₂ equivalent (“tCO₂e”) annually and for workplaces that discharge over 25,000 tCO₂e annually. The design concept of the South Korean ETS is similar to the European ETS. The South Korean ETS covers industries (including the petrochemical sector), electric power producers, the transportation sector and commercial properties, among others, including our South Korean operating entity. The emissions allowance allocated to our South Korean operating entity in 2015 was set at 88% (“Allocation Rate”) of the projected emissions when operating at full capacity. The Allocation Rate was reduced to 84% in 2016 and 82% in 2017. We initially sought administrative relief by appealing to South Korea’s Environment Ministry—subsequently succeeded by the Ministry of Trade, Industry and Energy (“Ministry”)—under Article 38 of the GHG Emissions Allowance and Trading Act to effectively seek an increase in the allowance. When this appeal failed to deliver the desired outcome, we filed a legal action with the Seoul Administrative Court (“Trial Court”) against the Ministry in February, 2015 to seek judicial relief. On February 2, 2017, the Trial Court rendered a verdict in favor of the Ministry. We filed an appeal to the appellate court in February 2017, but the Trial Court’s decision was affirmed on July 11, 2017. We appealed the appellate court’s decision with the South Korean Supreme Court. On November 29, 2018, the Supreme Court issued its decision, upholding the appellate court’s ruling. As a result, we were unable to secure additional, free CO₂ allocations. We have purchased adequate amount of carbon credits to cover the expected deficits for the first three year carbon trading period (2015-17). Further, the South Korean government’s auditing agent discovered that our process gas contained less GHG than previously assessed, which resulted in positive corrections to the CO₂ emissions from our South Korean facility. As a result of these additional credits and reductions in the emissions level, we had 78,775 units of excess CO₂ credit after settling the balance for the first three-year trading period. These excess CO₂ credits can be used during the second three-year carbon trading period (2018-20), which started in January 2018. However, there can be no assurance that our emission credits will cover the full requirements for the second trading period and our process gas GHG emission levels remain on expected level as product mix, feedstock quality and technologies may adversely impact the required CO₂ credits.

In June 2016 the Republic of South Africa issued a draft regulation pertaining to “Carbon Offsets.” Our business operation in South Africa is subject to the newly developed GHG-related law Carbon Tax Bill. The Carbon Tax Bill proposal has gone through multiple consultative processes, the last version was issued on December 5, 2018 and is planned to be discussed and voted by the South African Parliament in 2019. The carbon black process is listed on Table 3 of this bill and a process emission factor was determined for a ton of carbon black produced using furnace black technology. The required tax payment would become due annually by June 30 of each year for the preceding calendar year. Taking into consideration our expected production levels in Port Elizabeth, the bill likely will have a significant financial impact on our business performance in South Africa.

The international community continues to negotiate a binding treaty that would require reductions in GHG emissions by developed countries. In addition, a number of further measures addressing GHG emissions may be implemented, such as a successor international agreement, if any, to the Kyoto Protocol and the European Union’s proposal to consider raising its commitment to reduce carbon emissions by 2020 from a 20% to a 40% reduction by 2030 (compared to 1990 emission levels). The United Nations Conference on Climate Change in December 2015 led to the creation of the Paris Agreement and encourages countries to continuously review and improve their GHG emission reduction goals. While signing the Paris Agreement does not legally bind countries to reduce GHG emissions, countries that participate may respond by enacting legislation or regulations in order to progress in lowering GHG emissions. In the United States, Congress has from time to time considered legislation to reduce emissions of GHGs, but no comprehensive legislation has been enacted to date, and significant uncertainty currently exists as to how any such GHG legislation or regulations would impact large stationary sources, such as our facilities in Belpre (Ohio), Borger (Texas), Orange (Texas) and Ivanhoe (Louisiana), and what costs or operational changes these regulations may require in the future. The current administration has withdrawn from the Paris Agreement. There are currently no efforts within the US Congress or the EPA to proceed with additional GHG regulations on a national level. However, almost one-half of the U.S. states have taken legal measures to reduce emissions of GHGs, primarily through the development of GHG emission inventories and/or regional or state GHG cap-and-trade programs. There are also ongoing discussions and regulatory initiatives in other countries, including in Brazil where we have facilities, regarding GHG emission reduction programs, but those programs have not yet been defined. There is no assurance that, in the future, the current level of regulation will continue in the jurisdictions where we operate.

Compliance with current or future GHG regulations governing our operations, including those discussed above, may result in significantly increased capital expenditures for measures such as the installation of more environmentally efficient technology or the purchase of allowances to emit carbon dioxide or other GHGs. While their potential effect on our manufacturing operations or financial results cannot be estimated, it could be substantial. There is no way to predict the form that future regulations may take or to estimate any costs that we may be required to incur with respect to these or any other future requirements. In addition to the increased expenditures outlined above, such requirements could also adversely affect our energy supply, or the costs (and types) of raw materials we use, and ultimately may directly or indirectly restrict our operations or reduce demand for our products. The realization of any or all of these consequences could have a material adverse effect on our business, financial condition, results of operations and cash flows. See “*Item 4. Information on the Company*—B. *Business Overview—Environmental, Health and Safety Matters.*”

As a company in the chemical sector, our operations have the potential to cause environmental and other damage as well as personal injury.

The operation of a chemical manufacturing business as well as the sale and distribution of chemical products involve safety, health and environmental risks. For example, the production and processing of carbon black and other chemicals involves the storage, handling, transportation, manufacture or use of certain substances or components that may be considered toxic or hazardous. Our manufacturing processes and the storage and transportation of chemical products entail risks such as leaks, fires, explosions, toxic releases or mechanical failures. If

operational risks materialize, they could result in injury or loss of life, damage to the environment or damage to property. In addition, the occurrence of material operating problems at our facilities due to any of these hazards may result in loss of production, which, in turn, may make it difficult for us to meet customer needs. Accordingly, these hazards and their consequences could have a material adverse effect on our business, financial condition, results of operations and cash flows, both during and after the period of operational difficulties, and could harm our reputation.

The European Union REACH legislation or similar legislation in other countries may affect our ability to manufacture and sell certain products.

In December 2006, the European Union signed the REACH (Registration, Evaluation, Authorisation and Restriction of Chemicals) legislation. This legislation requires chemical manufacturers and importers in the European Union to demonstrate the safety of the chemical substances contained in their products through a substance registration process. We have registered under REACH, which is a functional prerequisite to the continued sale of our products in the European Union markets. REACH presents a risk to the continued sale of our products in the European Union should our existing classification registration no longer apply as a result of changes in the interpretation of REACH by the authorities, changes in our product mix or purity, or if the European Union seeks to ban or materially restrict the production or importation of the chemical substances used in our products. In March 2016, the European Chemical Agency (ECHA) announced a carbon black substance evaluation, and carbon black was included in the Community Rolling Action Plan (CoRAP). CoRAP listed substances have been prioritized for substance evaluation. The reasons for including carbon black in CoRAP are carbon black being suspected of posing a risk to human health (carcinogenic, suspected reproduction toxicant), exposure of workers, exposure of sensitive populations and a high (aggregated) tonnage and use potential. The start of this evaluation, which will be conducted by ANSES (the French Agency for Food, Environmental and Occupational Health & Safety), which was initially scheduled for 2019, is now proposed to be delayed to 2021 as per the latest draft from October 2018. It is highly likely that the draft CoRAP will be adopted without changes in March 2019. The outcome of the evaluation will be of significant importance for the carbon black industry.

Additionally, other organizations and countries, including South Korea and China, have adopted or may in the future adopt comparable or even more restrictive regulations than REACH, which could affect our ability to manufacture and sell certain products in the future.

In certain jurisdictions, carbon black has been added to lists of hazardous products that are subject to labeling and other requirements. Compliance with these requirements is required to sell our products in these jurisdictions, and noncompliance may result in material fines or penalties. Changes in the classification of carbon black on these lists or to the applicable regulations could result in more stringent or new requirements and adversely affect our compliance costs. See “*Item 4. Information on the Company —B. Business Overview—Environmental, Health and Safety Matters .*”

Market and regulatory changes may affect our ability to sell or otherwise benefit from co-generated energy, which may adversely affect our business, results of operations and cash flows.

Currently, eight of our manufacturing sites have some form of co-generation transforming combustible exhaust gas, the main by-product of the carbon black production process, into electricity, steam or hot water. Some of this co-generated energy is self-consumed and the excess may be sold to third parties. Our ability to benefit from co-generation, and in particular our ability to sell it to third parties, may be limited due to general market conditions or regulatory changes, which may adversely affect our business, results of operations and cash flows.

For example, in December 2013, the European Commission opened an in-depth investigation procedure regarding certain exemptions from an energy surcharge granted under the German Renewable Energies Act (Erneuerbare-Energien-Gesetz or “EEG”). Under the EEG, energy intensive industries are exempted to a large extent from the energy surcharge that aims to balance above-market payments for green energy. Another exemption exists for the consumption of self-generated electricity. The German legislature amended the national regulations of the EEG in August 2014. Under new regulations, the exemption regarding self-consumption (*Eigenverbrauch*) of self-produced electricity is grandfathered for power plants that were installed before August 1, 2014. Our German production facilities are exempted from the energy surcharge under the current law to the extent that we consume our self-produced energy. However, a potential loss of this benefit due to a future change in legislation or a change in the setup of any of our plants may adversely affect our business, results of operations and cash flows.

Litigation or legal proceedings could expose us to significant liabilities and thus adversely affect our business, financial condition, results of operations and cash flows.

We become, from time to time, involved in various claims and lawsuits arising in the ordinary course of our business. Also, certain asbestos related claims have been filed with respect to time periods when Evonik and other preceding owners were in control of our business. Some of those claims are subject to a limited indemnity from Evonik under the agreements related to the Acquisition. Some matters involve claims for large amounts of damages as well as other relief. Additional claims by (former) employees based on alleged past exposure to asbestos have been received by the Company and may be received in the future.

The outcome of legal proceedings is extremely difficult to predict and we offer no assurances in this regard. Adverse rulings, judgments or settlements in pending or future litigation, including employment-related litigation, contract litigation, product liability claims, personal injury claims, claims based on alleged exposure to asbestos, chemicals or to carbon black, environmental permitting disputes or in connection with environmental remediation activities, could have an adverse effect on our business, financial condition, results of operations and cash flows.

Because many of our products provide critical performance attributes to our customers' applications and products, the sale of these products involves a risk of product liability claims against us, including claims arising in connection with the use of, or exposure to, our products. Our products have widespread end-uses in a variety of consumer industries. A successful product liability claim, or series of claims, arising out of these various uses that results in liabilities in excess of our insurance coverage or for which we are not indemnified or have not otherwise provided, could have a material adverse effect on our business, financial condition, results of operations and cash flows. In particular, we could be required to increase our debt or divert resources from other investments in our business in order to discharge any such liabilities.

We may not be able to protect our intellectual property rights successfully and we are still subject to restrictions and risks associated with our intellectual property sharing arrangements with Evonik.

Our intellectual property rights are important to our success and competitive position. We own various patents and other intellectual property rights, and have licenses to use intellectual property rights covering some of our products as well as certain processes and product uses. We often choose not to seek to patent a production method or product in order to avoid disclosure of business specific know-how. In addition to patents, a significant part of our intellectual property are our trade secrets, general know-how and experience regarding manufacturing technology, plant operation and quality management, which third parties, including our competitors, may develop independently without violating our trade secret rights. We make careful assessments with respect to production process improvements and decide whether to apply for patents or retain and protect them as trade secrets. In some of the countries in which we operate or sell products, such as China, the laws protecting patent holders are significantly weaker than in the United States, the European Union and certain other developed countries. When we file a patent application, it is usually filed for all countries with active competition, where we have existing customers. Nonetheless, because the laws and enforcement mechanisms in some countries may not be as effective as in others, and because our intellectual property rights may, if asserted, ultimately be found to be invalid or unenforceable, we may not be able to protect all of our intellectual property rights successfully. Insufficient protection of intellectual property may limit our ability to make use of technological advantages or result in a reduction of future profits. This may cause competitive restrictions with an adverse effect on our business, financial condition, results of operations and cash flows.

Irrespective of our intellectual property rights, we may be subject to claims that our products, processes or product uses infringe or misappropriate the intellectual property rights of others. These claims, even if without merit, could be expensive and time consuming to litigate. If we were to lose such proceedings, we could be subject to injunctions, obliged to pay damages or enter into licensing agreements requiring royalty payments and use restrictions, all of which could adversely affect our business, financial condition, results of operations and cash flows. In addition, licensing agreements may not be available to us, and, if available, may not be available to us on acceptable terms.

In connection with the separation of our business from Evonik as part of the Acquisition, Evonik assigned to us intellectual property that was exclusively used in its carbon black business as well as certain intellectual property rights that are still in use in its retained business. Evonik retained ownership of certain intellectual property that is not material to us. Evonik has granted us a non-exclusive license to use such retained intellectual property in the field of carbon black. In addition, we have granted back to Evonik licenses relating to some of our intellectual property rights to use such intellectual property in all fields outside the field of carbon black, which licenses are exclusive, subject to certain exceptions in areas adjacent to carbon black. Accordingly, we may be restricted in leveraging the intellectual property that we use on the basis of a license from Evonik or the intellectual property that is subject to the grant-back licenses to expand our business into fields outside of carbon black.

Risks Related to Indebtedness, Currency Exposure and Other Financial Matters

Our significant leverage may make it difficult for us to service our debt and operate our businesses.

Although we have repaid \$156.8 million of our \$815 million debt since the refinancing in July 2014, we are highly leveraged with significant debt service obligations and expect to continue to have high leverage for the foreseeable future. We may also incur more debt in the future. This may have important negative consequences for our business and investors, including requiring that a substantial portion of the cash flows from our operations be dedicated to debt service obligations; reducing the availability of cash flows to fund internal growth through working capital, capital expenditures, other general corporate purposes and payments of dividends; increasing our vulnerability to economic downturns in our industry; exposing us to interest rate increases on our existing indebtedness and indebtedness that we may incur in the future; placing us at a competitive disadvantage compared to our competitors that have less debt in relation to cash flows; limiting our flexibility in planning for or reacting to changes in our business and our industry; restricting us from pursuing strategic acquisitions or exploiting certain business opportunities; and limiting, among other things, our ability to borrow additional funds or raise equity capital in the future and increasing the costs of such additional financings.

If our future cash flows from operations and other capital resources are insufficient to pay our obligations as they mature or to fund our liquidity needs, we may be forced to reduce or delay our business activities and capital expenditures, sell assets, obtain additional debt or equity financing or restructure or refinance all or a portion of our debt on or before maturity. In the worst case scenario, an actual or impending inability to pay debts as they become due and payable could result in our insolvency.

Restrictive covenants in our debt instruments may limit our ability to operate our business. Our failure to comply with these covenants, including as a result of events beyond our control, could result in an event of default that may adversely affect our business, financial condition, results of operations and cash flows.

Our current debt instruments impose significant operating and financial restrictions on us. These restrictions include limitations on our ability to, among other things, merge or consolidate with other companies; sell, lease, transfer or dispose of assets; pay dividends, redeem share capital or redeem or reduce subordinated indebtedness; and make acquisitions or investments.

Our debt instruments contain covenants that may adversely affect our ability to finance our future operations and capital needs and to pursue available business opportunities. Our ability to comply with these provisions may be affected by changes in economic or business conditions or other events beyond our control. In addition, our debt instruments contain cross-default provisions such that a default under one particular financing arrangement could automatically trigger defaults under other financing arrangements and cause such indebtedness to become due and payable, together with accrued and unpaid interest. As a result, any default under an indebtedness to which we are party could result in a substantial loss to us and could adversely affect our business, financial condition, results of operations and cash flows.

A deterioration in our financial position or a downgrade of our ratings by a credit rating agency could increase our borrowing costs and our business relationships could be adversely affected.

A deterioration of our financial position or a downgrade of our credit ratings for any reason could increase our borrowing costs and have an adverse effect on our business relationships with customers, suppliers and hedging counterparties. We may enter into various forms of hedging arrangements against currency, interest rate or oil price fluctuations. Financial strength and credit ratings are important to the availability and pricing of these hedging activities. As a result, any downgrade of our credit ratings may make it more costly for us to engage in these activities, and changes to our level of indebtedness may make it more difficult or costly for us to engage in these activities in the future.

In addition, a downgrade could adversely affect our existing financing, limit access to the capital or credit markets, or otherwise adversely affect the availability of other new financing on favorable terms, if at all, result in more restrictive covenants in agreements governing the terms of any future indebtedness that we incur, increase our borrowing costs, or otherwise adversely affect our business, financial condition, results of operations and cash flows.

Fluctuations in foreign currency exchange and interest rates could adversely affect our business, financial condition, results of operations and cash flows.

We are exposed to market risks relating to fluctuations in foreign currency exchange and interest rates. Our results of operations may be affected by both the transaction effects and the translation effects of foreign currency exchange rate fluctuations. We are exposed to currency fluctuation when we convert currencies that we may receive for our products into currencies required to pay our debt, or into currencies in which we purchase raw materials, meet our fixed costs or pay for services, which could result in a gain or loss depending on fluctuations in exchange rates. Fluctuations in currency exchange rates could require us to reduce our prices to remain competitive in foreign markets. In each case, the relevant income or expense is reported in the relevant local currency and translated into U.S. Dollar at the applicable currency exchange rate for inclusion in our consolidated financial statements. Therefore, our financial results in any given period are materially affected by fluctuations in the value of the U.S. Dollar relative to other currencies, in particular the Euro and the Korean Won. Generally, a depreciation of Euro against the U.S. Dollar has a negative impact on (by increasing) our Net Working Capital, because a large part of our raw material are purchased by and held at entities using the Euro. In addition, 56.7% of our outstanding debt obligations are denominated, pay interest in and must be repaid in Euro (and certain of our future debt obligations may be denominated in Euro), and therefore expose us to additional exchange rate risks. An appreciation of the Euro would make our financing under Euro-denominated instruments more expensive. Significant changes in the value of the U.S. Dollar relative to the other currencies could have a material adverse effect on our business, financial condition, results of operations and cash flows. In addition, we are exposed to adverse changes in interest rates. We manage our foreign exchange risk through normal operating and financing activities and, when deemed appropriate, through the selective use of derivative transactions, the effectiveness of which is dependent, in part, upon the counterparties to these contracts honoring their financial obligations to us. We cannot be certain that we will be successful in reducing the risks inherent in exposures to foreign currency and interest rate fluctuations, and our financial results could be adversely affected.

From time to time, it may be necessary for us to enter into hedging arrangements to reduce the impact of price and exchange rate volatility. Unavailability or inefficiency of hedging could adversely affect our business, financial condition, results of operations and cash flows.

In the past, we have entered into certain hedging arrangements to reduce the impact of raw material and energy price volatility as well as interest rate and currency exchange rate fluctuations. Since 2011, we began the discontinuation of our raw material hedging policy to protect us against the time-lag exposure between contract oil price adjustments. Generally, we incorporate flexible pricing formulas into our feedstock and sales contracts in an effort to offset price volatility. Based on volumes in kmt in 2018, approximately 29% of our contracts were non-indexed (approximately 20% in our Rubber Carbon Black segment and approximately 60% in our Specialty Carbon Black segment). Approximately 71% of our contracts are formally based on index price adjustments. In regions where pricing formulas are less prevalent we stipulate regular raw material cost adjustments in our customer agreements. A one-month price adjustment mechanism typically results in a two-month delay in reflecting oil price changes in our customer pricing, while the quarterly price adjustment mechanism typically results in a four-month delay. There is no assurance that such formulas in our contracts will fully protect against price volatility, particularly in periods of rapid and significant oil price fluctuations. Starting in 2016, we have entered from time to time into limited short-term commodity derivatives

for a specific carbon black oil grade. It may be necessary for us to enter into hedging arrangements in the future to reduce the impact of raw material or energy price volatility or currency and exchange rate fluctuation, which may or may not be effective. The use of derivative hedging instruments is generally dependent on the availability of adequate credit lines with appropriate financial institutions. As a result, we could be unable to use derivative financial instruments in the future, to the extent necessary or on commercially reasonable terms, and any hedging strategy we employ could therefore be adversely affected. The effectiveness of our derivative hedging instruments will also depend on the relevant hedging counterparties honoring their financial obligations. Any failure by a hedging counterparty to perform its obligations could adversely affect our business, financial condition, results of operations and cash flows.

Geopolitical events in the EU, and in particular a “no-deal Brexit,” may impact the Euro and as a result, our business, financial condition, results of operations and cash flows.

On June 23, 2016, a referendum was held in the United Kingdom (the “U.K.”) in which a majority voted to exit the EU, known as “Brexit”. The U.K. government served notice to the European Council on March 29, 2017 of its desire to withdraw in accordance with Article 50 of the Treaty on European Union, and there has been no approval by the U.K. parliament of any withdrawal agreement between the EU and the U.K. Failing such approval or the implementation of an agreed extension to the U.K.’s planned departure date, it is currently expected that the U.K. will leave the EU on March 29, 2019 under a “no-deal Brexit,” leaving considerable uncertainty as to the ongoing terms of the U.K.’s relationship with the EU, including the terms of trade between the U.K. and the EU, and a likely negative impact on all parties. The Brexit vote has given rise to calls for the governments of other European Union member states to consider withdrawal. These developments, or the perception that any of them could occur, have caused and may continue to cause significant volatility in global financial markets as well as adversely affect the exchange rate of the Euro with respect to the U.S. Dollar, which as described under “- *Fluctuations in foreign currency exchange and interest rates could adversely affect our business, financial condition, results of operations and cash flows*” above, could have an adverse effect on us.

Political, social and economic uncertainty and changes arising from Brexit, including a “no-deal Brexit” if it occurs, may have a negative impact not only on the economy of the U.K. but also on the economies non-U.K. EU and EEA countries and the overall stability of the Euro. Should the Euro dissolve entirely, the legal and contractual consequences for holders of Euro-denominated obligations and for parties subject to other contractual provisions referencing the Euro would be determined by laws in effect at such time. These potential developments, or market perceptions concerning these and related issues, could have adverse consequences for us with respect to our outstanding Euro-denominated debt obligations and, as we have a substantial amount of debt denominated in Euro, could adversely affect our business, financial condition, results of operations and cash flows.

Dislocations in credit and capital markets may make it more difficult for us and our suppliers and customers to borrow money or raise capital.

The economic weakness in many regions worldwide has affected, and may continue to affect, us in several ways. Dislocations in the credit markets may result in less credit being made available by banks and other lending institutions. As a result, we may not be able to obtain financing for our business and acquisitions or to pursue other business plans or make necessary investments, which could have a material adverse effect on our business, financial condition, results of operations and cash flows.

Furthermore, a number of our customers and suppliers rely on access to credit to adequately fund their operations, which may also be limited due to dislocations in the credit markets. The inability of our customers to obtain credit facilities or capital market financing may adversely affect our business by reducing our sales and increasing our exposure to bad debt, while the inability of our suppliers to access adequate financing may adversely affect our business by increasing prices for raw materials, energy and transportation.

In addition, payments received from customers that later enter into insolvency or comparable proceedings under applicable laws may be subject to clawback risks.

Inflation or deflation could adversely affect our business, financial condition, results of operations and cash flows.

Inflation in certain countries where we operate may adversely affect our business by increasing the cost of raw materials, energy, labor and transportation. Current or future efforts by governments to stimulate the economy may increase the risk of significant inflation. In the event of an increase in inflation, we may seek to increase the sales prices of our products in order to maintain satisfactory margins; however such increases may not be accepted by our customers, may not be sufficient to compensate for the negative impact of inflation or may decrease demand for our products and our volume of sales. If we are not able to fully offset the effects of increased inflation, it could have a material adverse effect on our business, financial condition, results of operations and cash flows.

Alternatively, a significant period of deflation could cause a decrease in overall spending and borrowing levels. This could lead to a further deterioration in economic conditions. Deflation also may delay consumption of our customers’ products resulting in lower demand for our products.

We may be required to impair or write off certain assets if our assumptions about future sales and profitability prove incorrect.

In analyzing the value of our inventory, property, plant and equipment, investments and intangible assets, we have made assumptions about future sales (prices and volume), costs and cash generation. These assumptions are based on management’s best estimates and, if the actual results differ significantly from these assumptions, we may not be able to realize the value of the assets recorded, which could lead to

an impairment or write-off of certain of these assets and that could have a material adverse effect on our business, financial condition and results of operations.

We may be required to increase our pension fund contributions.

We have made pension commitments to our existing and some of our former employees. These commitments are partially covered by pension schemes, pension and benevolent funds and insurance policies some of which are maintained by previous employers. The amount of obligations is based on certain actuarial assumptions, including discount factors, life expectancy, pension trends and future salary development as well as expected interest rates applicable to the plan assets. Actual results deviating from these assumptions could result in a considerable increase of our pension commitments and liabilities and higher allocations to the pension reserves in future years, which could have a material adverse effect on our business, financial condition, results of operations and cash flows. For a more detailed description of our defined benefit plans see our consolidated financial statements and the related notes included in “ *Item 18. Financial Statements* ” of this report.

Our insurance coverage may not be adequate to cover all the risks we may face and it may be difficult to obtain replacement insurance on acceptable terms or at all.

Our plants, equipment and other assets are insured for property damage and business interruption risks, and our business as a whole is insured for public and products liability risks as well as certain bad debt losses in Europe under insurance policies with reputable insurance companies. We believe these insurance policies are generally in accordance with customary industry practices, including deductibles and coverage limits. However, we cannot be fully insured against all potential hazards incident to our business, including losses resulting from war risks or terrorist acts, or all potential losses, including damage to our reputation. Chemical-related assets may be at greater risk of future terrorist attacks than other possible targets in the United States or elsewhere. A direct attack on our assets or assets used by us could have a material adverse effect on our business, financial condition, results of operations and cash flows. Insurance that provides adequate coverage against terrorist attacks has become increasingly expensive and difficult to obtain. If we were to incur a significant liability for which we were not fully insured, it could have a material adverse effect on our business, financial condition, results of operations and cash flows.

Although we attempt to keep insurance premiums low, as a result of market conditions, premiums and deductibles for certain insurance policies can increase substantially and, in some instances, certain insurance may become unavailable at a reasonable cost or available only for certain risks. We can provide no assurances that we would be able to obtain replacement insurance on acceptable terms or at all.

Significant changes in our jurisdictional earnings mix or in the tax laws of those jurisdictions, as well as changes in their interpretation, could adversely affect our business, financial condition, results of operations and cash flows.

Our future tax rates may be adversely affected by a number of factors, including the enactment of new tax legislation such as the U.S. tax reform, other changes in tax laws or the interpretation of such tax laws, changes in the estimated realization of our net deferred tax assets (arising, among other things, from tax loss carry forwards and the Acquisition), the jurisdictions in which profits are determined to be earned and taxed, adjustments to estimated taxes upon finalization of various tax returns, increases in expenses that are not deductible for tax purposes, including write-offs of acquired in process R&D and impairment of goodwill in connection with acquisitions, changes in available tax credits and additional tax or interest payments resulting from tax audits with various tax authorities. Losses for which no tax benefits can be recorded could materially impact our tax rate and its volatility from period to period. Any significant change in our jurisdictional earnings mix or in the tax laws in those jurisdictions, as well as changes in their interpretation, could increase our tax rates and adversely affect our financial results in those periods.

Our agreements with Evonik in connection with the Acquisition require us to indemnify Evonik with respect to certain aspects of our business and require Evonik to indemnify us for certain retained liabilities. We cannot offer assurance that we will be able to enforce claims under these indemnities as we expect.

In connection with the Acquisition, we agreed to indemnify Evonik with respect to future liabilities related to our business and Evonik agreed to indemnify us, subject to certain limitations, for certain liabilities that it agreed to retain. Our potential exposure for such liabilities could be significant and the scope and terms of these indemnities may be less favorable than the potential terms of a similar agreement with an unaffiliated third party. There can be no assurance that we will be able to enforce our claims under the indemnity from Evonik. Even if we ultimately succeed in recovering from Evonik any amounts for which we are held liable, we may be temporarily required to bear these losses ourselves. In addition, our ability to enforce claims under our indemnity from Evonik is dependent on Evonik’s creditworthiness at the time we seek to enforce these claims, and there can be no assurance as to what Evonik’s financial condition will be in the future.

In particular, the agreement with Evonik provides for a partial indemnity from Evonik against various exposures, including, but not limited to, capital investments, fines and costs arising in connection with Clean Air Act violations that occurred prior to July 29, 2011. Almost all of the allegations made by the EPA with regard to Company’s U.S. facilities relate to alleged violations before July 29, 2011. The indemnity provides for a recovery from Evonik of a share of the costs (including fines), expenses (including reasonable attorney’s fees, but excluding costs for maintenance and control in the ordinary course of business and any internal cost of monitoring the remedy), liabilities, damages and losses suffered and is subject to various contractual provisions including provisions set forth in the Share Purchase Agreement with Evonik, such as a de minimis clause, a basket, overall caps (which apply to all covered exposures and all covered environmental exposures, in the aggregate), damage mitigation and cooperating requirements, as well as a statute of limitations provision. Due to the cost-sharing and cap provisions in Evonik’s indemnity, we expect that substantial costs we will incur in the EPA enforcement initiative and its respective settlement could exceed the scope of the indemnity in the tens of millions of Euros. In addition, Evonik has signaled that it may likely defend itself against

claims under the indemnity; while we intend to enforce our rights vigorously, there is no assurance that we will be able to recover costs or expenditures incurred under the indemnity as we expect or at all.

We could experience a material adverse effect on our financial condition if the tax authorities were to successfully challenge decisions and assumptions we have made in assessing and complying with our tax obligations.

We make, and have in the past made, numerous decisions and assumptions in assessing and complying with our tax obligations, including in respect of the tax treatment of the separation of our business from Evonik, the Acquisition, assumptions regarding the tax deductibility of certain interest expenses under German tax regulations, the upholding and recognition of our German tax group and the applicability of the regulations to our business as a group headquartered by a Luxembourg company. Many of the tax laws that apply to us, including tax laws that apply to the separation of our business from Evonik and the Acquisition, are complex and often require judgments to be made when the law is unclear or the facts are uncertain. While we believe the decisions we have made and the assumptions and practices we have applied are reasonable and accurate, we cannot guarantee that these decisions, assumptions and practices will not be questioned or rejected by the tax authorities. In particular, we are subject to tax audits for the period in which the Acquisition occurred by tax authorities in multiple jurisdictions worldwide, and in many cases these audits have not yet begun or have not been completed and could give rise to issues of this kind. If these tax authorities were to successfully challenge such decisions or assumptions, we could be required to pay additional amounts to such authorities to satisfy our tax obligations, which could have a material adverse effect on our business, financial condition, results of operations and cash flows. In particular, the German tax authorities are conducting their first audit of Orion Engineered Carbons GmbH following the Acquisition. Currently, we are unable to assess when this audit will be completed or the possible outcome of this audit. While currently we do not believe this audit will have a material adverse impact on our financial position, it could raise one or more issues of the kind referenced above.

Risks Related to Ownership of our Common Shares

Exchange rate fluctuations may reduce the amount of U.S. Dollars shareholders receive in respect of any dividends or other distributions we may pay in the future in connection with our common shares.

Under Luxembourg law, the determination of whether we have sufficient distributable profits to pay dividends is made on the basis of our unconsolidated annual financial statements prepared under the Luxembourg Company Law in accordance with accounting principles generally accepted in Luxembourg and in Euros. Exchange rate fluctuations may affect the amount in Euro that we are able to distribute, and the amount in U.S. Dollars that our shareholders receive upon the payment of cash dividends or other distributions if we declare and pay in Euro, if any. Such fluctuations could adversely affect the value of our common shares, and, in turn, the U.S. Dollar proceeds that holders receive from the sale of our common shares.

Failure to maintain effective internal controls in accordance with Section 404 of Sarbanes-Oxley could have a material adverse effect on our business and share price.

As a public company, we are required to document and test our internal control over financial reporting in order to satisfy the requirements of Section 404 of the Sarbanes-Oxley Act of 2002 (“Sarbanes-Oxley”), which requires, an annual report on management’s assessment of the effectiveness of our internal control over financial reporting and a report by our independent registered public accounting firm that addresses the effectiveness of internal control over financial reporting. During this process, we may identify deficiencies that we may not be able to remediate in a timely manner to meet our deadline for compliance with Section 404 or that constitute a material weakness,

which could require a restatement or other revision of our financial statements. Testing and maintaining internal control could divert our management's attention from other matters that are important to the operation of our business, increase our legal and financial compliance costs and make some management activities more difficult, time consuming and costly. We may not be able to conclude on an ongoing basis that we have effective internal control over financial reporting in accordance with Section 404 or our independent registered public accounting firm may not issue an unqualified report on the effectiveness of our internal control over financial reporting. In such an event, we could not be certain that our financial statements will be accurate and investors could lose confidence in our reported financial information, which would likely have a negative effect on the trading price of our common shares. In addition, if we do not maintain effective internal controls, we may not be able to accurately report our financial information on a timely basis, which could harm the trading price of our common shares, impair our ability to raise additional capital, or jeopardize our stock exchange listing.

If securities or industry analysts do not or not continue to publish research or reports about our business, or if they adversely change their recommendations regarding our common shares, the market price and trading volume of our common shares could decline.

The trading market for our common shares will be influenced by research or reports that industry or securities analysts publish about our business. If one or more analysts who cover us downgrade our common shares, the market price for our common shares would likely decline. If one or more of these analysts cease to cover us or fail to regularly publish reports on us, we could lose visibility in the financial markets, which, in turn, could cause the market price or trading volume for our common shares to decline.

Our exemption as a foreign private issuer from certain rules under the U.S. securities laws may result in less information about us being available to investors than for U.S. companies.

As a foreign private issuer (as such term is defined in Rule 405 under the Securities Act of 1933), we are exempt from certain rules under the U.S. securities laws and are permitted to file less information with the SEC than U.S. companies. As long as we maintain our status as a foreign private issuer, we are exempt from certain rules under the Exchange Act, that impose certain disclosure obligations and procedural requirements for proxy solicitations under Section 14 of the Exchange Act. In addition, our officers, directors and principal shareholders are exempt from the reporting and "short-swing" profit recovery provisions of Section 16 of the Exchange Act and the rules under the Exchange Act with respect to their purchases and sales of our common shares. Moreover, we are not required to file periodic reports and financial statements with the SEC (such as quarterly reports on Form 10-Q or current reports on Form 8-K) as frequently or as promptly as companies that are not foreign private issuers whose securities are registered under the Exchange Act. In addition, we are not required to comply with Regulation FD, which restricts the selective disclosure of material information. As a result, there may be less publicly available information about us than is regularly published by or about U.S. issuers and our shareholders may not have access to information they deem important, which may result in our common shares being less attractive to investors. In addition, while we voluntarily comply with the governance requirements of the NYSE, as a foreign private issuer we are not required to comply with most of these requirements, including those relating to the independence of the members of our Board of Directors and its committees, and we could decide in the future not to comply with them.

We expect to lose our foreign private issuer status, which could result in significant additional costs and expenses.

We expect that we will cease to qualify as a foreign private issuer as of the next determination date, which is the last business day in June 2019. The regulatory and compliance costs to us under U.S. securities laws as a U.S. domestic issuer may be significantly higher than costs we incur as a foreign private issuer, which could have a material adverse effect on our business and financial results.

The rights of our shareholders may differ from the rights they would have as shareholders of a U.S. corporation, which could adversely affect trading in our common shares and our ability to conduct equity financings.

Our corporate affairs are governed by our Articles of Association and the laws of Luxembourg, including the Luxembourg Company Law (*loi du 10 août 1915 concernant les sociétés commerciales, telle quelle a été modifiée*). The rights of our shareholders and the responsibilities of our directors and officers under Luxembourg law are different from those applicable to a corporation incorporated in the United States. Luxembourg laws may not be as extensive as those in effect in the United States, and Luxembourg law and regulations in respect of corporate governance matters might not be as protective of minority shareholders as state corporation laws in the United States. As a result, our shareholders may have more difficulty in protecting their interests in connection with actions taken by our directors and officers than they would as shareholders of a corporation incorporated in the United States.

We are organized under the laws of the Grand Duchy of Luxembourg and it may be difficult to obtain or enforce judgments or bring original actions against us or the members of our Board of Directors in the United States.

We are organized under the laws of the Grand Duchy of Luxembourg and the majority of our assets are located outside the United States. Furthermore, some of the members of our Board of Directors and officers reside outside the United States and a substantial portion of their assets are located outside the United States. Investors may not be able to effect service of process within the United States upon us or these persons or to enforce judgments obtained against us or these persons in U.S. courts, including judgments in actions predicated upon the civil liability provisions of the U.S. federal securities laws. Likewise, it may also be difficult for an investor to enforce in U.S. courts judgments obtained against us or these persons in courts located in jurisdictions outside the United States, including judgments predicated upon the civil liability provisions of the U.S. federal securities laws. Awards of punitive damages in actions brought in the United States or elsewhere are generally not enforceable in Luxembourg.

As there is no treaty in force on the reciprocal recognition and enforcement of judgments in civil and commercial matters between the United States and the Grand Duchy of Luxembourg, courts in Luxembourg will not automatically recognize and enforce a final judgment rendered by a U.S. court. The enforceability in Luxembourg courts of judgments rendered by U.S. courts will be subject, prior to any enforcement in Luxembourg, to the procedure and the conditions set forth in the Luxembourg procedural code, which conditions may include the following as of the date of this report (which may change):

- the judgment of the U.S. court is final and enforceable (*exécutoire*) in the United States;
- the U.S. court had jurisdiction over the subject matter leading to the judgment (that is, its jurisdiction was in compliance both with Luxembourg private international law rules and with the applicable domestic U.S. federal or state jurisdictional rules);
- the U.S. court applied to the dispute the substantive law that would have been applied by Luxembourg courts (based on recent case law and legal doctrine, it is not certain that this condition would still be required for enforcement (*exequatur*) to be granted by a Luxembourg court);
- the judgment was granted following proceedings where the counterparty had the opportunity to appear and, if it appeared, to present a defense, and the decision of the foreign court must not have been obtained by fraud, but in compliance with the rights of the defendant;
- the U.S. court acted in accordance with its own procedural laws; and
- the decisions and the considerations of the U.S. court must not be contrary to Luxembourg international public policy rules or have been given in proceedings of a tax or criminal nature or rendered subsequent to an evasion of Luxembourg law (*fraude à la loi*). Awards of damages made under civil liability provisions of the U.S. federal securities laws, or other laws, which are classified by Luxembourg courts as being of a penal or punitive nature (for example, fines or punitive damages), might not be recognized by Luxembourg courts. Ordinarily, an award of monetary damages would not be considered as a penalty, but if the monetary damages include punitive damages, such punitive damages may be considered a penalty.

In addition, actions brought in a Luxembourg court against us or the members of our Board of Directors and our officers to enforce liabilities based on U.S. federal securities laws may be subject to certain restrictions. In particular, Luxembourg courts generally do not award punitive damages. Litigation in Luxembourg is also subject to rules of procedure that differ from the U.S. rules, including with respect to the taking and admissibility of evidence, the conduct of the proceedings and the allocation of costs. Proceedings in Luxembourg would have to be conducted in the French or German language, and all documents submitted to the court would, in principle, have to be translated into French or German. For these reasons, it may be difficult for a U.S. investor to bring an original action in a Luxembourg court predicated upon the civil liability provisions of the U.S. federal securities laws against us, the members of our Board of Directors or our officers. In addition, even if a judgment is obtained against our company, the non-U.S. members of our Board of Directors or our officers based on the civil liability provisions of the U.S. federal securities laws, a U.S. investor may not be able to enforce it in U.S. or Luxembourg courts.

Under our Articles of Association, we may indemnify our directors for and hold them harmless against all claims, actions, suits or proceedings brought against them, subject to limited exceptions. The right to indemnification does not exist in the case of gross negligence, fraud or wrongful misconduct. The rights and obligations among or between us and any of our current or former directors and officers are generally governed by the laws of the Grand Duchy of Luxembourg and are subject to the jurisdiction of the Luxembourg courts, unless such rights or obligations do not relate to or arise out of such persons' capacities listed above. Although there is doubt as to whether U.S. courts would enforce this indemnification provision in an action brought in the United States under U.S. federal or state securities laws, this provision could make judgments obtained outside Luxembourg more difficult to enforce against our assets in Luxembourg or in jurisdictions that would apply Luxembourg law.

Luxembourg and European insolvency and bankruptcy laws are substantially different from U.S. insolvency laws and may offer our shareholders less protection than they would have under U.S. insolvency and bankruptcy laws.

As a joint stock corporation organized under the laws of Luxembourg with its registered office in Luxembourg, we are subject to Luxembourg insolvency and bankruptcy laws in the event any insolvency proceedings are initiated against us including, among other things, Council Regulation (EC) No. 1346/2000 of May 29, 2000 on insolvency proceedings. Should courts in another European country determine that the insolvency and bankruptcy laws of that country apply to us in accordance with and subject to such EU regulations, the courts in that country could have jurisdiction over the insolvency proceedings initiated against us. Insolvency and bankruptcy laws in Luxembourg or the relevant other European country, if any, may offer our shareholders less protection than they would have under U.S. insolvency and bankruptcy laws and make it more difficult for them to recover the amount they could expect to recover in a liquidation under U.S. insolvency and bankruptcy laws.

Item 4. Information on the Company

A. History and Development of the Company

The Company

Orion Engineered Carbons S.A. is a Luxembourg joint stock corporation (*société anonyme* or S.A.), incorporated on July 28, 2014 as a Luxembourg limited liability company (*société à responsabilité limitée*) under the name Orion Engineered Carbons S.à r.l., and before that under the name Kinove Luxembourg Holdings 2 S.à r.l.. The Company's registered office is located at 6, Route de Trèves, L-2633 Senningerberg (Municipality of Niederanven), Grand Duchy of Luxembourg. Our principal executive offices are located in Houston, Texas, U.S., and our telephone number is (281) 318-2959. Our website address is www.orioncarbons.com. The SEC maintains website (www.sec.gov) that contains reports and other information regarding issuers that file electronically with the SEC. The information contained on, or that can be accessed through these websites is not part of, and is not incorporated into, this report.

Historically, our business operated as a business line of Evonik. Effective July 29, 2011, private investors indirectly acquired from Evonik the entities operating its carbon black business.

On July 30, 2014, the Company completed the initial public offering of 19.5 million of its common shares at a price to the public of \$18.00 per share (the "IPO"). The common shares were sold by Kinove Holdings, the former majority shareholder in the Company. The Company did not receive any proceeds from the sale of common shares in the IPO, although Kinove Holdings made a contribution to the subscribed capital and the reserves of the Company of approximately \$286 million (€12 million, based on the exchange rate at the time) as part of the refinancing that occurred substantially simultaneously with the IPO. During 2017, Kinove Holdings sold all its remaining common shares in four registered public offerings. The Company did not receive any proceeds from the sale of common shares in those offerings. Currently, we operate on a fully stand-alone basis with all our shares held by public investors except for 517,081 shares held by us in treasury.

In 2015, we completed the acquisition of Qingdao Evonik Chemical Co., Ltd. now operating as OECQ. OECQ has an annual production capacity of 75 kmt, mainly designated for rubber carbon black products. By the end of 2016 we ceased production at our Ambès (France) plant. This plant accounted for a production capacity of 40 kmt in standard rubber carbon black products. In June 2018, we finalized the production network consolidation of our two South Korea plants and ceased production at our Bupyeong plant. This plant accounted for a production capacity of 55 kmt. In October 2018, we completed the acquisition of the acetylene carbon black manufacturer Société du Noir d'Acétylène de l'Aubette, SAS ("SN2A") from LyondellBasell Industries Holdings B.V. and its French affiliate. SN2A was founded in 1987 and is headquartered at Berre l'Etang, near Marseille, France and has an annual production capacity of 5 kmt of ultra-pure premium Specialty Carbon Black.

B. Business Overview

Overview

We are a leading global producer of carbon black. Carbon black is a form of carbon used to improve certain properties of materials into which it is added. It is used as a pigment and as a performance additive in coatings, polymers, printing and special applications (specialty carbon black) and in the reinforcement of rubber in tires and mechanical rubber goods (rubber carbon black).

We operate a diversified carbon black business with more than 280 specialty carbon black grades and approximately 80 rubber carbon black grades. Our product portfolio is one of the broadest in the industry and is divided into the following segments:

- *Specialty Carbon Black.* We are one of the largest global producers of specialty carbon black with an estimated share of global industry sales of approximately 25% in 2018 measured by volume in kmt. Our estimated share of global industry specialty carbon black sales remained relatively stable in the past three years (26% in 2017 and 26% in 2016). We believe that our share of global industry sales measured by revenue is higher, since our product portfolio is weighted towards higher priced premium grades. We manufacture specialty carbon black at multiple sites for a broad range of specialized applications. Specialty carbon black imparts specific characteristics, such as high-quality pigmentation, UV light protection, viscosity control and electrical conductivity.
- *Rubber Carbon Black .* We are one of the largest global producers of rubber carbon black. We have a global supply network and an estimated share of global industry sales of approximately 7% in 2018 measured by volume in kmt.

We have over 80 years of experience and enjoy a long-standing reputation for technical capability in the carbon black industry and its served applications. We provide consistent product quality, reliability, technical expertise and innovation, built upon continually improving processes and know-how through our advanced Innovation Group and through supply chain execution.

Our Innovation Group works closely with our clients to develop innovative products and applications, while strengthening customer relationships and improving communication. Long-term R&D alliances and sophisticated technical interfaces with customers allow us to develop solutions to meet specific customer requirements. As a result, we have been able to generate attractive margins for our specialized carbon black products. Additionally, our Innovation Group works closely with our operations group to improve process economics with new process equipment designs, operating techniques and raw material selection.

We operate a modern global supply chain network currently comprising 13 wholly owned production facilities in Europe, North and South America, Asia and South Africa and three sales companies , as well as one jointly-owned production plant in Germany.

Products and Applications

We have a diversified carbon black production platform across the Specialty Carbon Black and Rubber Carbon Black operating segments. In 2018 we offered more than 280 specialty carbon black grades and approximately 80 rubber carbon black grades under a number of well-recognized brand names and trademarks. Our product portfolio is one of the broadest in the industry. Our product and geographic diversity exposes us to a wide variety of applications and industries, which in turn lowers our dependency on individual customers or regions. Our overall product portfolio benefits from higher margin specialty and technical grade rubber carbon black products and stable margin rubber carbon black products.

We continuously strive to meet our customers' changing demands and adjust our products accordingly, as well as to enhance our product portfolio with innovations. In our Specialty Carbon Black segment, we launched several new post-treated specialty carbon black grades for coatings and printing applications, as well as several new conductive carbon black grades for polymers, printing and new markets, such as for battery electrodes. In our Rubber Carbon Black segment, we developed two product families: PUREX[®] for mechanical rubber goods ("MRG") applications, which complies with high cleanliness requirements, and ECORAX[®] for tires, which is characterized by improved tire properties of wear and fuel consumption.

Specialty Carbon Black

Overview

We are one of the largest global producers of specialty carbon black with an estimated share of global industry sales of approximately 25% in 2018 measured by volume in kmt. We believe that our share of global industry sales measured by revenue is higher, since our product

portfolio is weighted towards higher priced premium grades. We manufacture specialty carbon black at multiple sites for a broad range of specialized applications. Specialty carbon black imparts specific characteristics, such as high-quality pigmentation, UV light protection, viscosity control and electrical conductivity.

In 2018, our Specialty Carbon Black segment generated \$ 545.4 million in revenues, 262.4 kmt in volume, \$ 149.3 million in Segment Adjusted EBITDA and Segment Adjusted EBITDA Margin of 27.4%. The Specialty Carbon Black segment has a relatively balanced product mix divided into four sectors: Coatings, Polymers, Printing and Special Applications. In 2018, Polymer applications accounted for about 70% of our volume measured in kmt, Printing accounted for nearly 14%, while Coatings, Special Applications and cross-sector sales to distributors represented the remainder. Our mix of specialty carbon black products is more balanced when measured in terms of Adjusted EBITDA.

Our Specialty Carbon Black segment generates higher margins per metric ton than our Rubber Carbon Black segment, with the highest margin per metric ton in Coatings. We believe the key driver of attractive margins in specialty carbon black is innovation supported by our Innovation Group, which works in close coordination with our customers and technical marketing support. We provide assistance to our customers through the whole value chain, including product formulation, technical support, product handling, packaging, logistics, supply chain management and final application.

We are recognized by our customers as a leading innovator and manufacturer of customized products fitting specific application needs. Our specialty carbon black customer base is relatively diverse, with the top five customers accounting for approximately 26% of the Specialty Carbon Black segment volume in 2018. We have been supplying most of our blue-chip customers for a period of over 30 years.

Coatings

Product and Application Portfolio

We have a broad Coatings product portfolio, which includes products used for pigmentation in pure black coatings (for example, in automotive basecoats), for conductivity and for tinting in all other coatings, as well as for paints and for light tinting in transparent coatings (for example, for metallic effects and wood glazing). The variety of our manufacturing processes allows the creation of specialty carbon black with different morphological and chemical properties, thereby giving some of our products unique characteristics. Coatings-related specialty carbon black products are manufactured in Cologne (Germany), Yeosu (South Korea) and Belpre (Ohio), as well as at the German JV in Dortmund (Germany).

The following table provides examples of our Coatings applications.

Coatings	Automotive	General Industrial	Architectural & Decorative
Applications	Automotive original equipment manufacturing Automotive refinish Automotive parts	Wood, coil and plastic coatings Protective and marine Aerospace Packaging	Architectural Decorative
Attributes	Pigmentation, high jetness and blue undertone, conductivity	High-performance tinting Conductivity	Tinting
Brands	PRINTEX ® NEROX ® LAMP BLACK COLOUR BLACK SPECIAL BLACK	PRINTEX ® NEROX ® LAMP BLACK COLOUR BLACK SPECIAL BLACK	PRINTEX ® NEROX ® LAMP BLACK COLOUR BLACK SPECIAL BLACK

Customers

We believe that the global Coatings industry consists of a few key suppliers that account for approximately half of the global Coatings capacity. However, the mid-size players are driving innovation for formulations, specific product customization and quality. We believe we have demonstrated the ability and have the application technology platform to play a substantial role in this process and to meet demanding customer requirements. The customized nature of Coatings products leads to attractive margins in the industry.

We supply many of the Coatings industry's blue chip and mid-size customers and have longstanding relationships with several major global customers. We have been serving several of the key industry players, including AkzoNobel, Axalta, Nippon Paint and PPG, for over 30 years. The Coatings market is relatively fragmented, although our top five customers account for approximately 38% of Coatings volume in 2018.

Polymers

Product and Application Portfolio

Polymers are the largest end-use market for specialty carbon blacks. Our Polymer portfolio is one of the broadest in the industry and, supported by an application technology platform, enables us to cover most of the product demand spectrum. Our Polymer applications products are manufactured in Cologne (Germany), Malmö (Sweden), Yeosu (South Korea), Belpre (Ohio), Borger (Texas) and Paulinia (Brazil), as well as at the German JV in Dortmund (Germany).

Our Polymers portfolio is tailored to meet specific industry and customer needs. For example, potable water pipes made of polyethylene, agricultural films, cables and other articles exposed to UV radiation (sunlight) need to be protected against polymer degradation and subsequent deterioration of mechanical strength. We offer tailor-made products that not only provide efficient UV protection but also provide additional benefits, such as good processing properties and easy handling. Products offered also meet special performance criteria, including food-contact compliance and spin-fiber quality.

In addition to UV protection, our portfolio includes products from standard- to high-performance grades designed and modified to provide electrical conductivity, antistatic and reinforcing properties to many different polymer articles, including high-voltage cables, films, boxes and high pressure pipes.

Our portfolio offering targeted at fiber products and technology represents a niche growth area and provides a combination of a broad range of jetness with good filterability. Certain of our polymer products have a bluish undertone, which makes these grades especially attractive for high-performance fibers in textiles, with luxury touch and feel. Ultra clean products provide good process stability during the small and thin fiber manufacturing processes.

The following table provides examples of our polymers applications.

Polymers	Pipe	Wire & Cable	Films	Blow & Injection Molding	Fiber	Thermal Insulation	Other
Applications	Pressure pipes (water, gas) Irrigation Sewage pipes Conductive pipes/hoses	Power cables (LV to HV) Jacketing	Agricultural Packaging Geomembrane Foil Laminations	Packaging Housing Container Automotive	Textile Industrial Non-Woven	Construction	Thermosets TPE profiles Plastics
Attributes	Dispersibility UV protection Conductivity	Dispersibility UV protection Conductivity	Dispersibility UV protection Coloring	Dispersibility UV protection Conductivity	Dispersibility Coloring	IR absorption	Thixotrophy Dispersibility Coloring Reinforcing UV protection
Brands	PRINTEX ® AROSPERSE HIBLACK ®	PRINTEX ® HIBLACK ®	PRINTEX ® AROSPERSE HIBLACK ®	PRINTEX ® AROSPERSE HIBLACK ®	PRINTEX ® AROSPERSE COLOUR BLACK	LAMP BLACK AROSPERSE	PRINTEX ® AROSPERSE HIBLACK ® LAMP BLACK

Customers

Due to the diverse nature of Polymer applications (construction, general industrial, engineering, automotive and packaging), the customer base for Polymers tends to be wide-ranging from regional and international master batch producers to global integrated petrochemical and polyolefin producers. We supply many of the plastics industry's blue-chip customers and supply leading customers in each region. We have been serving certain of our key customers, including Ampacet, Borealis, MDI and Schulman, for over 30 years. Our top five customers accounted for approximately 33% of Polymers volume in 2018 .

Printing

Product and Application Portfolio

We have a broad Printing product portfolio with a large number of grades for different printing technologies and applications. We apply different process technologies to offer highly specialized products that meet specific requirements, including compliance with food-contact regulations and specially formulated products with different coloristic properties (such as undertone, optical density and gloss), rheological effects and dispersibility functions. Specialty carbon black products for the Printing industry are mainly manufactured in Cologne (Germany), Yeosu (South Korea), Belpre (Ohio) and Paulinia (Brazil), as well as at the German JV in Dortmund (Germany).

We focus on Printing products with the highest potential for specialty applications, such as packaging and specialty niches. Consequently, relatively low-end newspaper and other print media applications represented only a small portion of our overall specialty carbon black sales in 2018 . Margins in specialty Printing applications are relatively high, as their producers must meet and balance numerous technical properties. These properties include ease of dispersion, processing, handling, formulation requirements, final product performance hold-out, rub resistance and, most importantly, coloristic properties, such as optical density, gloss, light-fastness and color tone. Our specialty carbon black product portfolio supports printing ink manufactures in achieving these attributes.

Packaging inks require special rheology, dispersion and wetting behavior properties. For example, UV curing inks on nonporous substrates require special surface chemistry for wetting, flow, color and stability. We are recognized by our customers for our low structure, surface after-treated, post-oxidized Printing carbon black products.

The following table provides examples of our printing applications.

Printing Applications	Packaging			Print Media			
	High-end Packaging	Packaging	Display Advertising	Publication (magazines)	Special Applications	Books, Posters, Brochures	Newspaper
Applications	Liquid inks UV curing Sheetfed Screen	Liquid inks	Heatset Sheetfed Screen	Heatset Sheetfed Publication gravure	Screen Water-based gravure UV curing	Sheetfed UV curing	Water-based flexo Coldset
Attributes	Coloring Gloss Food contact regulations Wettability	Coloring	Coloring Gloss Moderate flow Wettability	Coloring Gloss Good flow Low abrasion	Coloring Gloss Moderate flow Wettability	Coloring Gloss Moderate flow Wettability	Coloring
Brands	NEROX ® PRINTEX ® SPECIAL BLACK	PRINTEX ® HIBLACK ®	NEROX ® HIBLACK ® PRINTEX ® SPECIAL BLACK	PRINTEX ® HIBLACK ®	PRINTEX ® SPECIAL BLACK	PRINTEX ® SPECIAL BLACK	PRINTEX ® HIBLACK ®

Customers

The global Printing industry has been undergoing consolidation over the past few years. Currently, the industry is dominated by a few key players. Sourcing decisions are largely based on specialty carbon black product attributes. For low-end applications, decisions are made based primarily on price. For high-end applications, the required degree of product and technology know-how makes purchasing decisions less price sensitive. We play an important role in helping our customers develop customized Printing solutions and are recognized by customers as a preferred strategic and technical partner. We have been serving certain of our key customers, including major positions at CRT Graphics, Flint Group, Siegwerk, Sun/DIC and Toyo Ink, for over 30 years. Due to the relatively consolidated nature of the Printing industry, our top five Printing customers accounted for approximately 70% of Printing volume in 2018 .

Special Applications

The Special Applications product category comprises applications not included into our Coatings, Polymers and Printing portfolios, such as, silicones, non-woven textile, building materials, battery electrodes metallurgical, agrochemicals and carbon brushes. Our top five customers accounted for approximately 32% of Special Applications volume in 2018 .

Distribution

We sell most of our specialty carbon black products directly to our customers and only a smaller part of our sales is made via external channel partners and distributors. External channel partners and distributors generally sell our products to smaller customers, who do not negotiate with us directly. These sales are made across all our specialty carbon black applications, including Coatings, Polymers, Printing and Special Applications.

Competition

We are one of the largest global producers of specialty carbon black with an estimated share of global industry sales of approximately 25% measured by volume in kmt in 2018 . We believe that our share of global industry sales measured by revenue is significantly higher, since our product portfolio is weighted towards the higher priced premium segment of the specialty carbon black market. Cabot and Birla are the

other two large global producers of specialty carbon black with shares of global industry sales of approximately 22% and 14%, respectively, in 2018 based on volume (*Source: Orion internal study*). All top three producers of specialty carbon black use their R&D and applications technology platforms to tailor products to customer needs and to introduce their products into new application niches.

Rubber Carbon Black

Overview

We are one of the largest global producers of rubber carbon black with an estimated global industry sales share of approximately 7% in 2018 measured by volume in kmt. Rubber carbon black sales are largely regional, since transportation costs are high relative to sales price. Accordingly, we believe that in most of our key regions, our estimated rubber carbon black share of industry sales is higher than our global share based on volumes. For example, we estimate that in 2018 we held higher rubber carbon black shares of industry sales relative to our 7% global share in the European Union (18%), North America (15%), South Korea (42%), South Africa (78%) and Brazil (19%) . In 2018 , our largest rubber carbon black customer accounted for approximately 20% and the second largest for approximately 10% of our consolidated revenue with no other customer exceeding 10% of our consolidated revenue.

In 2018 , our Rubber Carbon Black segment generated \$ 1,032.8 million in revenues, 822.3 kmt in volume, \$ 144.9 million in Segment Adjusted EBITDA and Segment Adjusted EBITDA Margin of 14% . Rubber carbon black is primarily used for reinforcement of rubber compounds and to adjust specific performances of rubber articles. Based on the application of rubber carbon black, we have divided the Rubber Carbon Black segment into two categories: Tires and Mechanical Rubber Goods (MRG). Relative to our competitors, we believe that we have higher sales revenue from mechanical rubber goods due to higher margins on such products.

We hold leading positions in the major rubber carbon black industries and have access to emerging regions through our production sites and sales offices in Asia, South America, Eastern Europe, South Africa and China.

Tires

Product and Application Portfolio

We offer a broad Tire product portfolio which includes high reinforcing grades and semi-reinforcing grades. Fine particle reinforcing grade carbon blacks are used mostly in the tread of tires. Other reinforcing grade carbon blacks are also used in different components of the tire carcass. In addition to standardized grades, we produce advanced grades tailored to meet specific customer performance requirements, such as ECORAX ® grades designed to lower rolling resistance and HP grades for truck tires and high- and ultra-high-performance passenger car tires. Semi-reinforcing grade carbon blacks are used in several components of the tire carcass like sidewall and bead area. We cover the full portfolio of standard semi-reinforcing grade carbon blacks and have a portfolio of special semi-reinforcing grade carbon blacks, which fulfill special customer requirements using special production technology. These special semi-reinforcing grade carbon blacks are part of our ECORAX ® product family and are already growing in the regions.

Customers

Given the highly consolidated nature of the tire industry, our top ten customers represented slightly more than 85% of our tires volume in 2018 . A significant portion of our Tire products are sold to top-tier tire manufacturers. We have longstanding relationships with most of these customers and have the capacity to serve them in major global regions. We have been serving certain of our key customers for over 20 years.

We believe that our customers value the quality, consistency and reliability of our operations and are generally reluctant to switch suppliers without due cause. In addition, because automotive tires have safety implications, tire manufacturers are often required to go through lab and extensive plant approval processes before they change their supplier of carbon black. Furthermore, our extensive pan-European, North American and pan-Asian supply chain network ensures that we are in close proximity to our core customers.

Mechanical Rubber Goods

Product and Application Portfolio

We produce a wide range of mechanical rubber goods products for a variety of end-uses, including automotive production, construction, manufacturing of wires and cables, as well as certain food and medical applications. Our MRG products can be divided into four main groups: (i) standardized ASTM furnace grades, (ii) specialized ASTM furnace grades, (iii) specialized non-ASTM furnace grades and rubber carbon blacks from special production processes lampblack (Durex O) and (iv) thermal black (N990) and gas black (CK3). In the field of special ASTM and non-ASTM blacks we offer an extensive portfolio of “PUREX ® ” grades. These grades are mainly used in automotive rubber parts like window sealings and hoses. These grades have an exceptionally high purity, high consistency and can be dispersed well in rubber compounds. The grades of the PUREX ® family aiming at the adjustment of special requirements like smooth surface, special surface appearance of sealing systems, electrical resistance and other specific requirements. The trend towards light weight construction of cars and the resulting use of aluminum require more attention to electrical resistivity of MRG parts.

The following table presents examples of our mechanical rubber goods applications.

Mechanical Rubber Goods	Transportation Construction and Others		Automotive		Conductive & Isolation		Food & Medical
	Applications	Conveyor belts Construction profiles Mechanical rubber goods	Extruded and other profiles	Damping elements Hoses Transmission belts	Molded goods with high resistance	Seals rubber-to-metal bonding Unvulcanized sheets and adhesives	Electrically conductive and antistatic rubber goods
Attributes	Tensile strength Tear and abrasion resistance Reinforcement	Filler loadings Compression Smooth surfaces Processibility Consistency	Processibility Injection molding and calendaring	Low hysteresis Reinforcement Processing	Scorch safety Tensile strength	Electrical conductivity or antistatic behavior	Dispersion Filler loadings
Brands	CORAX ®	PUREX ® DUREX ® CORAX ® N990	CORAX ® PUREX ® DUREX ®	PUREX ®	CK 3	PRINTEX ® CORAX ® PUREX ®	PUREX ® CORAX ® N990

Customers

We serve customers across the whole value chain and MRG applications, including compounders, parts and component manufacturers and automotive system suppliers. The mechanical rubber goods industry is fragmented in nature and supports a large number of suppliers. The industry, however, is undergoing a consolidation process. Our top ten global customers accounted for approximately 50% of our mechanical rubber goods volume in 2018. We have a diversified geographic presence with significant exposure to the European, North and South American and Asian MRG markets. We supply various blue-chip customers and have longstanding relationships with several of them. We have been serving certain key customers for over 20 years.

Competition

We are one of the largest global producers of rubber carbon black in the world with an estimated share of global industry sales of 7% in 2018 measured by volume in kmt. Cabot, Birla and Black Cat were the three largest global producers of rubber carbon black in 2018 with estimated shares of global industry sales of approximately 13%, 13% and 8%, respectively, based on our best estimates. Following the recent take over of the U.S. based carbon black producer Sid Richardson by Japanese producer Tokai Carbon, we estimate that Tokai Carbon has a comparable market share to ours (7%).

Rubber carbon black sales are largely regional, since transportation costs are high relative to sales price. As a result, the global rubber carbon black industry is more fragmented compared to the specialty carbon black industry. The smaller regional suppliers participate mainly in standard tire and mechanical rubber goods applications and are less prevalent in more specialized products for the higher-end tire and mechanical rubber goods applications.

Procurement and Raw Materials

In 2018, raw materials accounted for 74% of our cost of sales. Approximately 83% of the cost of raw material used in the production of carbon black is related to petroleum-based or coal-based feedstock known as carbon black oil, with some limited use of other raw materials, such as nitrogen tetroxide, hydrogen and natural gas. Carbon black oil comes from three main sources: (i) fluid catalytic cracking bottoms, a by-product of fuel producing refineries, (ii) steam cracker tar, a by-product of ethylene producing crackers, and (iii) certain coal tar products.

The efficient procurement of carbon black oil is an important factor in achieving optimal production costs and profitability. We employ a dedicated global carbon black oil procurement group which is fully integrated within our value chain and management team. Our carbon black oil procurement strategy entails global sourcing of carbon black oil, using proprietary optimization tools to maximize value.

We maintain close relationships with our suppliers, which include global and national oil companies, as well as independent refiners and blenders across different regions. We purchase carbon black oil from more than 30 different suppliers to limit our dependence on certain individual key suppliers. Since the carbon black industry utilizes only a low share of total heavy fuel oil supply worldwide, we believe that the risk of raw material shortage is low. In regions where the number of suppliers is low, we have back-up plans to import carbon black oil from other regions in the event of a local carbon black oil shortage.

Approximately 50% of our carbon black oil supply is covered by short- and long-term contracts with a wide variety of suppliers.

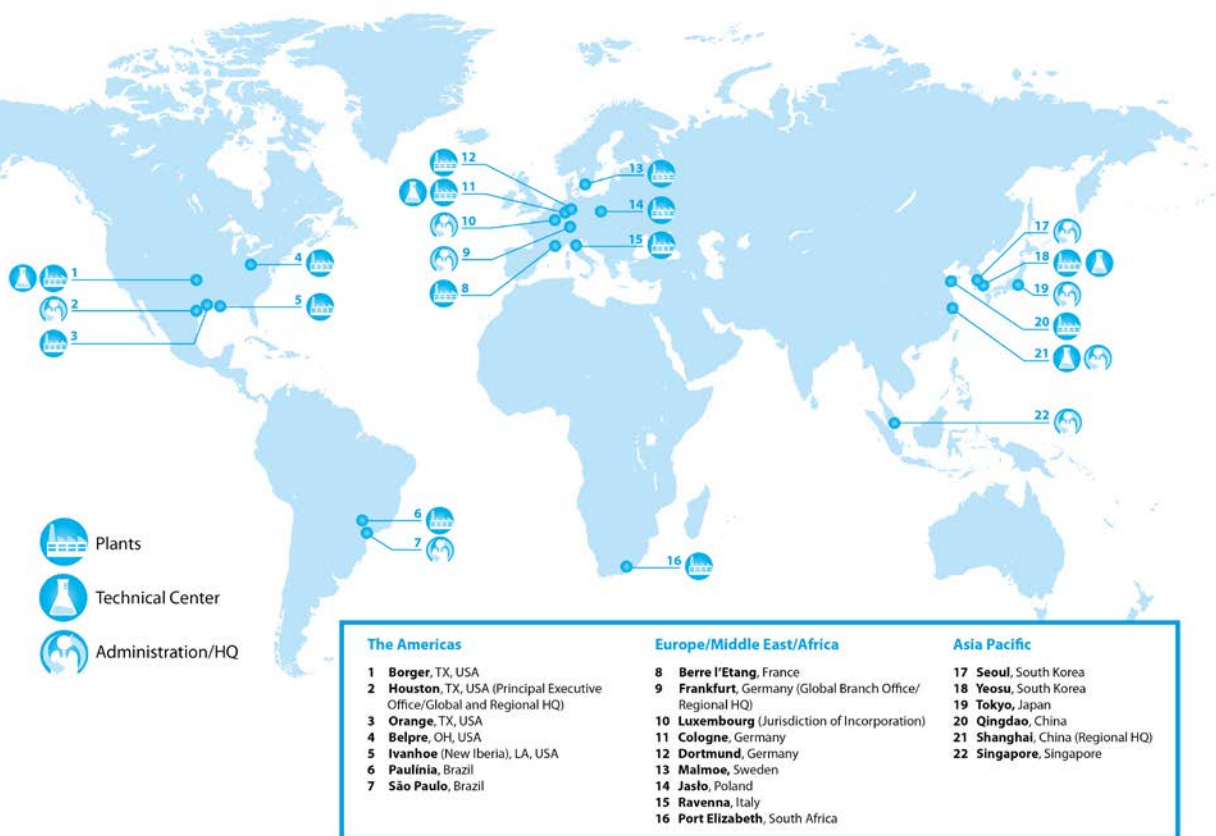
The pricing of carbon black oil is typically indexed to the price of fuel oil and is generally benchmarked against Thomson Reuters indices of mainly three regions, namely the U.S. Gulf Coast, Amsterdam / Rotterdam / Antwerp and Singapore. While the majority of our purchases are based on underlying fuel oil indices, the ultimate carbon black oil price also depends on carbon black oil specific quality characteristics, differentials (premiums or discounts), freight costs and region specific supply and demand as well as regulatory factors. Carbon black oil procurement is an important factor in achieving best-in-class production costs.

Locations and Production

Production Facilities

We currently operate a global platform of 13 wholly owned production facilities in Europe, North and South America, Asia and South Africa and 3 sales companies, as well as one jointly-owned production plant in Germany. Our Ambès (France) plant ceased production as of December 31, 2016 and in June 2018 our plant in Bupyeong (Korea) ceased production. Our worldwide state-of-the-art manufacturing facilities allow us to produce consistent, high-quality products for our customers in each operating region. All of our production plants are ISO 9001 (Quality Management) and ISO 14001 (Environmental Management) certified. Our global production capacity totaled approximately 1,275 kmt in 2018, of which 420 kmt was in Europe, 375 kmt was in North America, 245 kmt in South Korea, 95 kmt was in Brazil, 75 kmt was in China, 65 kmt was in South Africa, and the capacity of the German JV proportionate to our shareholding. We estimate that our average plant utilization rate was 91% in 2018.

The following map provides an overview of the geographical footprint of our production network as of December 31, 2018.



Principal Production Facilities

In Germany, we operate one wholly-owned production plant located in Cologne and our German JV owns one production plant located in Dortmund. Our Cologne production site occupies a total area of approximately 380,000 square meters (“sqm”) and has a total annual production capacity of approximately 142 kmt, of which 98 kmt are currently designated for specialty carbon black products and 44 kmt are designated for rubber carbon black products. The plant utilizes the furnace, gas and lamp black production processes, and is equipped with co-generation facilities. Our global technical innovation center is also located at our Cologne facility. Kommanditgesellschaft Deutsche Gasrußwerke GmbH & Co., our joint venture with tire manufacturers is located in Dortmund and has a total annual production capacity of approximately 128 kmt, of which 8 kmt are currently designated for specialty carbon black products and 120 kmt are designated for rubber carbon black products. The plant utilizes the furnace and the gas black production processes. Our shareholding in the German JV amounts to 54.0% (with 50% voting rights). Continental holds 33.7%, Pirelli 7.0%, Goodyear 3.3% and Vorwerk 1.6%. The German JV specialty production capacity is fully attributable to us, and the rubber production capacity is split between us and our German JV partners. We account for our holdings in the German JV using the equity method.

In other European countries, we have one wholly-owned production plant in each of France, Italy, Sweden and Poland. Our Ravenna (Italy) production site occupies a total area of approximately 125,000 sqm and has a total annual production capacity of approximately 75 kmt, of which 5 kmt are currently designated for specialty carbon black products and 70 kmt are designated for rubber carbon black products. The plant utilizes the furnace black production process, and is equipped with co-generation facilities. Our Malmö (Sweden) production site occupies a total area of approximately 46,000 sqm and has a total annual production capacity of approximately 45 kmt. The plant has two production lines, one designated for specialty carbon black and one for rubber carbon black. The plant utilizes the furnace black production process, and is equipped with co-generation facilities. Our Jaslo (Poland) production site occupies a total area of approximately 100,000 sqm and has a total annual production capacity of approximately 40 kmt currently designated for rubber carbon black products. The plant utilizes the furnace black production process, and is equipped with co-generation facilities. In October 2018 we completed the acquisition of the acetylene carbon black manufacturer SN2A (France) occupying a total area of approximately 25,000 sqm. The plant has an annual production capacity of 5 kmt ultra-pure premium Specialty Carbon Black.

In the United States we have four wholly-owned production plants. Our Ivanhoe (Louisiana) production site occupies a total area of approximately 376,000 sqm and has a total annual production capacity of approximately 122 kmt currently designated for rubber carbon black products. The plant utilizes the furnace black production process. Our Borger (Texas) production site occupies a total area of approximately 688,000 sqm and has a total annual production capacity of approximately 105 kmt. In 2014 we converted one of the rubber carbon black production lines at the Borger production site into a specialty carbon black production line. The plant utilizes the furnace and the thermal black production processes, and is equipped with co-generation facilities. Our Orange (Texas) production site occupies a total area of approximately 77,000 sqm and has a total annual production capacity of approximately 74 kmt currently designated for rubber carbon black products. The plant utilizes the furnace black production process, and is equipped with co-generation facilities. Our Belpre (Ohio) production site occupies a total area of approximately 202,500 sqm and has a total annual production capacity of approximately 74 kmt. The plant has four production lines, only one of which is designated for rubber carbon black products with the remaining ones for specialty carbon black. The production site utilizes the furnace black production process. For our U.S. production sites we have recently settled with the EPA to implement install certain pollution control technology that could potentially affect their utilization. See “*Item 4. Information on the Company—B. Business Overview—Environmental, Health and Safety Matters - Environmental—Environmental Proceedings.*”

In South Korea, we have completed our production network consolidation in 2018 of our two wholly-owned production plants. Our Bupyeong site ceased production and had a total annual production capacity of approximately 55 kmt. Our Yeosu production site occupies a total area of approximately 154,000 sqm and has a total annual production capacity of approximately 190 kmt. The plant has ten production lines, three of which are currently designated for specialty carbon black products. The production site utilizes the furnace black production process. In addition, one of our technical centers as well as the country headquarter is located in Seoul.

In China, we have one wholly-owned production plan with a total annual production capacity of approximately 75 kmt mainly designated for rubber carbon black products. The plant is equipped with three production lines and its main manufacturing focus is on high-end mechanical rubber goods applications.

In other regions, we have one wholly-owned production plant in each of Brazil and South Africa. Our Paulinia (Brazil) production site occupies a total area of approximately 97,000 sqm and has a total annual production capacity of approximately 95 kmt currently designated for rubber carbon black products. The plant utilizes the furnace black production process. Our Port Elizabeth (South Africa) production site occupies a total area of approximately 127,000 sqm and has a total annual production capacity of approximately 65 kmt currently designated for rubber carbon black products. The plant has three production lines, which utilize the furnace black production process.

In addition we are in the process of improving our plants in the U.S. as a result of the EPA consent decree. See “*Item 3. Key Information—D. Risk Factors—Risks related to our business—The Capital Expenditures we might need to incur in connection with the settlement of our enforcement case with the EPA remain uncertain, and the actual resources may be higher than we expect.*”

Characteristics of Production Network

Production Know-how

With exception of our acquired plant in France, we produce rubber carbon black at all, and specialty carbon blacks at many of, our production sites. We have the production know-how to manufacture a wide range of specialty carbon blacks and rubber carbon blacks worldwide. We believe we are currently the only supplier with core production competencies across all leading production processes (furnace black, gas black, lamp black and thermal black). This provides us flexibility to offer a wide range of specialty carbon black and rubber carbon black products that are best suited to customers' needs.

Flexible Specialty Carbon Black and Rubber Carbon Black Production Platform

Our existing flexible production platform allows us to convert production lines from tire carbon blacks to mechanical rubber goods and specialty carbon blacks to meet changing industry dynamics with often only minor investment. For example, we have migrated production lines from rubber carbon blacks to specialty carbon blacks at our Malmö (Sweden), Belpre (Ohio) and Borger (Texas) plants. Our flexible production platform also enables us to shift additional production capacity to higher margin carbon black products, at the same time reducing or discontinuing less profitable product lines. We have made investments in strategic sites to increase the flexibility of our production platform. We have upgraded our rubber carbon black production lines for mechanical rubber goods in South Korea and Italy and added an additional rubber carbon black production line in South Korea and further increased the flexibility in South Korea through the completion of our strategic realignment of our Rubber Carbon Black segment.

Over the last ten years, we have undertaken selective gradual capacity realignment initiatives aimed at meeting changing industry dynamics and increasing profitability. Although such capacity realignments entailed additional Capital Expenditures, they have contributed to improving our profitability profile. We have successfully moved our specialty carbon black and rubber carbon black product portfolios up the value chain and increased our global higher margin product capacity, which resulted in cession of production at our Sines (Portugal) facility in December 2013. As an initial step of a global rubber footprint initiative, our French subsidiary ceased carbon black production at our Ambès (France) facility as of December 31, 2016 and we completed the consolidation of our two production facilities in South Korea in June 2018.

Through the acquisition of SN2A, we have now added acetylene black to our product portfolio. Acetylene black is an ultra-pure premium Specialty Carbon Black distinguished by its high electrical and thermal conductivity. Lithium-ion batteries and high-end electrical cables are key applications for this material.

Location of Production Network

Our production sites are strategically located throughout the world in close proximity to key customer sites. This is particularly important for our rubber carbon black business, which is largely regional. Since specialty carbon black's freight costs represent a smaller component of the final cost (relative to rubber carbon black), it is commercially viable to ship specialty carbon blacks across geographic regions from our key production sites in Germany, South Korea, China and the United States. The regional spread of our production network also offers access to high-growth regions globally.

Flexibility of Asset Base

We have implemented a flexible and intelligent production and supply chain network under the concept of operating all regional production sites as one large virtual plant. This allows us to shift production of specialty carbon black and rubber carbon black among different plants in order to optimize costs and plant utilization. In most cases, more than one plant is approved by our customers for specific products, which not only increases production flexibility but also ensures a higher supply security for customers.

Cost Improvements

We have implemented various initiatives to realize cost improvements throughout our production network, including:

- *Energy saving and efficiency improvements* . We have implemented and will continue to implement production and energy efficiency initiatives by exploiting alternative feedstock sources, while optimizing our feedstock and energy purchasing and pricing methods. Our new reactor designs, higher temperature air pre-heating equipment and state-of-the-art energy recovery equipment are being installed throughout our production network.
- *Co-generation* . The main by-product of the carbon black production process is a combustible exhaust gas that can be used for the generation of electricity, steam and hot water, a process which is known as co-generation. In recent years, we have increased our co-generation capabilities, and currently eight of our manufacturing sites have some form of co-generation, with analyses underway to expand co-generation to more locations.
- *Productivity improvements* . We have realized certain savings relating to the implementation of high performance work teams and other productivity improvement initiatives. We link our employee bonus levels to the achievement of predetermined objectives, including individual, team and company-wide targets.

- *Global strategic rubber footprint initiative* . We initiated an in depth review of our global rubber engagement in 2016 to shift production and capacities from lower margin standard grades towards higher specialized technical grade rubber products providing higher margins. This strategic realignment of our Rubber segment is an essential transition that requires complementary actions. Accordingly, we ceased production in our Ambès (France) at the end of 2016. This facility had a capacity of approximately 50 kmt per year utilized in production of unviable standard grades. In 2018, we consolidated our two Korean plants at the Yeosu facility and closed our Bupyeong plant. In 2018, we also acquired SN2A, which produces ultra-pure premium specialty carbon black. We continue to evaluate further steps with respect to our rubber carbon black facilities.

Innovation

We enjoy a long-standing reputation within the industry for carbon black product and process technology, applications knowledge, and innovation. Carbon black products are highly versatile and meet specific performance requirements across many industries. This creates significant opportunities for product and process innovation. The final properties of the carbon black product depend on the mixture of raw materials used and to a large extent on the configuration and operating conditions of the specific reactor and the further processing of the initial product in beading, drying and after-treatment steps. Minimal changes to just one of the many process parameters can result in completely different carbon black products with different properties and potential end uses. Accordingly, further product innovations are a key competitive factor in the industry, even after decades of R&D in this field.

We maintain multiple product applications and process development centers in Europe, Asia and the Americas. Our Innovation Group is divided into applications technology and process development teams. The applications technology team works closely with our major clients to develop innovative products and expand the applications range for carbon black products. Additional benefits of these efforts are the further strengthening of customer relationships and improved communications. Success in applications development deepens our understanding of customer and industry requirements gained through these interactions. The process development team works closely with our manufacturing and procurement teams to enhance company competitiveness. This team focuses on efforts that lead to improved production processes, improved product quality and improved cost structure.

Our leading competence center is located in Cologne (Germany) to support and enhance our global Innovation Group activities. This center includes carbon black technologists, applications technology laboratories and process development staff, co-located with our pilot process development facilities. Staffing in our Cologne technical center includes physicists, chemists and engineers who can effectively and efficiently collaborate to create and analyze various carbon black properties with a goal to develop new products to meet customer requirements. Common processes and information technology tools further enhance coordination and communication with our regional technical centers located in South Korea, China and the United States. Overall, a total of more than 100 FTEs were employed in the Innovation Group in 2018 .

Applications Technology

Our goal is to remain at the forefront of the industry in terms of product development by having dedicated applications technology facilities. Success relies on close collaboration with customers, often through long-term R&D alliances, which create superior technical interfaces. These interactions enable us to develop tailored solutions and meet unique customer requirements.

The applications technology team employs approximately 75% of our Innovation Group FTEs globally. The applications technology team can be subdivided into (i) specialty carbon black, with the majority of employees in Cologne (Germany) and some employees in the United States and Asia, and (ii) rubber carbon black, with most employees in Cologne (Germany).

Our applications technology teams bring together a deep knowledge of carbon black technology with an understanding of the key applications practiced by our customers. This team has access to extensive laboratory and testing facilities using similar formulations, processing and test methods employed by our customers. Customer collaborations often include cooperative testing with customers' staff in our facilities. Applications technology provides a key customer and market interface and translates specific customer needs into carbon black product attributes. Product attributes are used to design and select relevant product prototypes and make specific product recommendations. This team has all the needed capabilities to develop and evaluate new products.

Applications technology plays a supporting role in the process of new product launch by providing technical data and presentations, training and support and establishment and monitoring of quality targets. This team works closely with customers to provide support during the qualification cycle, which can be long and may last over one year. This close cooperation decreases the likelihood of customer switching suppliers once a product has been approved.

Product quality test methods and applications testing are defined within the applications technology team. Methods are developed centrally and deployed worldwide to relevant production and applications laboratories to assure consistency in measurements and reporting.

Spending on innovation, including both applications technology and process development, amounted to \$20.3 million in 2018 , \$18.2 million in 2017 and \$16.1 million in 2016 and was mostly directed towards the development of new specialty carbon black products, new applications for carbon black products and the improvement of process efficiencies as well as reduction of emission levels.

Process Development

We believe our process development capabilities represent a key competitive advantage. Product customization relies upon extensive process capabilities. Unique products and products that are difficult to replicate add value to customers' end-products. Our customers have come to rely upon a continuous improvement in product quality and performance. Process development also enables improvements in manufacturing costs and efficiencies.

Our process development department employs approximately 25% of our Innovation Group FTEs globally, most of whom are located in Cologne (Germany). Our efforts include three main areas: (i) process development focused on improving efficiency and optimization of raw materials use, (ii) specialty carbon black product development and (iii) rubber carbon black product development. Professional staff in this group includes chemists, chemical engineers and process engineers with an understanding of critical process parameters to control carbon black manufacturing. This group also includes physicists and theoreticians who carry out computer modeling of carbon black production processes.

Pilot Plants

Process development operates special "pilot plants" which we believe are significant enablers for development efforts and provide us with a competitive advantage. These pilot plants are small scale production facilities used for real-world trials of new carbon black grades, feedstocks and production processes. We operate two pilot plants at the Cologne site in Germany, with the main pilot plant being a 25% scale semi-commercial sized furnace reactor line based on the standard configuration of a full production furnace line. This unit is constructed with a modular reactor set-up which provides flexibility to carry out experimental process developments. The plant is also used for the small-scale production and sale of carbon black grades that are in their initial stage of commercialization. This enables market introduction of specialty products. We also have a smaller gas black pilot plant in Cologne (Germany), which further enhances our flexibility in conducting gas black product research.

Mini-Plants and Simulations Centers

In addition to the semi-commercial pilot plants, we operate a family of "mini-plants" in Cologne (Germany). The mini-plants include a smaller furnace reactor for basic studies as well as various facilities for chemical after-treatment, granulation and drying to tailor new products to specific customer requirements, especially in the specialty carbon black area. Experiments in the pilot plants for product and process development rely on world-class expertise in process simulation. Process simulation is used to predict the outcome from planned experiments thereby limiting costly experiments, accelerating our development cycle and increasing our likelihood of success at full-scale production.

Product and Process Innovation

Product and process efforts are focused on technical targets that have specific, quantified value-creation opportunities. Global portfolio management, R&D and project management processes assure that efforts are prioritized, aligned and tracked. Intellectual property creation is also a key outcome from innovation efforts.

This approach has yielded several recent successes. For example, our Specialty Carbon Black segment developed a clean and highly dispersible carbon black for use in high-voltage power cables in response to industry requirements for increased efficiency. Our Rubber Carbon Black segment developed a carbon black with unique particle characteristics that increase wear resistance, thereby extending the life of truck tires. These product successes rely on our proprietary production processes. In addition, process improvements have been successfully deployed, creating improved efficiencies and lower costs and is under continued further deployment.

Marketing, Sales and Customer Contracts

We have an integrated sales and marketing process that combines key management, regional sales and technical marketing and applications support. This allows us to focus on customer solutions tailored to particular industries or regions. The Sales and Marketing departments employed approximately 244 FTEs globally at the end of 2018 .

Sales

Our Sales department is organized into two main groups: Key Account Management and Regional Sales. The Key Account Management team deals with the largest customers (approximately 70 key accounts) and has dedicated sales people by global account. The Regional sales team covers all other customers (approximately 960 customers, of which approximately 420 are located in Europe, the Middle East and Africa, approximately 270 in the Americas and approximately 270 in Asia-Pacific). The field sales force operates along geographical regions and, where necessary, is combined across our Specialty Carbon Black and Rubber Carbon Black segments. In addition to selling carbon black directly, we work with third-party distributors serving our markets with all required smaller volume lots.

Marketing

Marketing is organized between our two operating segments: Specialty Carbon Black and Rubber Carbon Black. The Marketing teams support the expansion of our business and its substantial and sustainable profit development. They design and implement short and mid-term marketing strategies, as well as monitor relevant market trends, gather market intelligence and identify niches for new product launches. In addition, Marketing teams are in charge of strategic and operational price setting.

Flexible Contracts

Most of our long-term contracts contain formula-driven price adjustment mechanisms for changes in raw material and/or energy costs. We sell carbon black under the following two main categories of contracts based on price adjustment mechanisms:

- *Contracts with feedstock adjustments (indexed contracts).* This category includes contracts with monthly or, in some cases, quarterly automatic feedstock and/or energy costs adjustments, which cover approximately 80% of volumes in our Rubber Carbon Black segment and selected large customers volumes close to 100 kmt in our Specialty Carbon Black segment in 2018 . Considering as well those volumes subject to regular raw material cost adjustment ("de facto formula") the cover rate would increase to 88% in our Rubber Carbon Black segment and to approximately 110 kmt in our Specialty Carbon Black segment in 2017.
- *Non-indexed contracts.* This category includes short-term contracts (usually shorter than three months) where sales prices of our carbon black products are not linked to carbon black oil market prices.

Many of our indexed contracts allow for monthly price adjustments, while a small portion (by volume sold) allows for quarterly price adjustments. The one-month oil price adjustment mechanism typically results in a two-month delay in reflecting oil price changes in our customers pricing, while the three-month price adjustment mechanism typically results in a four-month delay. We believe that these contracts have enabled us generally to maintain our Segment Adjusted EBITDA Margins, however, rapid and significant oil or energy price fluctuations have had and are likely to continue to have significant and varying effects on our earnings and results of operations, partly because oil price changes affect our sales prices and our cost of raw materials and energy at different times and amounts, and partly due to other factors, such as differentials affecting the ultimate carbon black oil prices paid by us (versus a particular reference price index), actual carbon black oil usage amounts and our ongoing efficiency initiatives. See “ *Item 5. Operating and Financial Review and Prospects —Key Factors Affecting Our Results of Operations—Raw Material and Energy Costs .*” Sales prices under non-indexed contracts (covering approximately 20% of the volumes in the Rubber Carbon Black segment and volumes close to 100 kmt in the Specialty Carbon Black segment in 2018) are reviewed on a regular basis, with one to three month intervals to reflect raw material and energy price fluctuations as well as overall market conditions. We believe that the current competitive environment usually allows us to implement price adjustments in a reasonably timely manner when oil prices are relatively stable. In any event, our reliance on indexing and short-term contracts will not fully protect us from significant price fluctuations, in part as a portion of our contracts are not indexed or short-term, and those that remain subject to lag-time effects. As of 2016 we entered into a commodity hedge to address the exposure resulting from the supply of a specific carbon black oil type for our Korean production. See “ *Item 3. Key Information —D. Risk Factors—Risks Related to Our Business—We are subject to volatility in the costs and availability of raw materials and energy, which could decrease our margins and adversely affect our business, financial condition, results of operations and cash flows .*” In addition, specific contract price adjustment details also affect the pass through of these costs.

Outbound Logistics and Distribution

Our outbound logistics and distribution function has critical importance given the high cost involved in the transportation of carbon black, in particular rubber carbon black. Each of our plants has different logistics demands based on the products manufactured and the region’s export requirements. Unlike rubber carbon blacks, which are mostly sold regionally, specialty carbon blacks are sold globally, since freight costs typically represent a smaller component of the final price. Europe and North America, which export high volumes of specialty carbon black, have complex and demanding logistics requirements. Other regions, such as South Africa, South Korea and Brazil, are relatively self-contained with the vast majority of production sold within the respective countries.

The primary method of the carbon black transportation to customers is by truck and rail. The majority of the regions use primarily trucks, with the exception of the United States, where rail transport accounts for approximately half of transportation modes. We lease our trucks and the majority of rail cars and have a variety of third-party agreements with railroad and trucking companies for the management of vehicles.

Carbon black is packaged and sold in bulk (on average 20 metric ton packages for trucks and 50 metric ton packages for rail), flexible intermediate bulk containers (on average 0.5-1.0 metric ton packages) and small bags (on average 10-20 kg packages). We choose a packaging method based on cost considerations and client preferences. We estimate that 49% of our volume in 2018 was delivered in bulk, 41% in intermediate bulk containers and 10% in bags.

Intellectual Property

We consider intellectual property development and management as a source of strategic competitive advantage. We maintain patents and trademarks on a number of our products and processes. However, we often do not patent a production method or product to avoid disclosure of business specific know-how. We proactively make careful assessments with respect to production process improvements and decide whether to apply for patents or retain and protect these improvements as trade secrets. When we file a patent application, it is usually filed in the relevant countries with active competition and markets for our products. In addition to patents, a significant part of our intellectual property is our trade secrets, general know-how and experience regarding the manufacturing technology, plant operation and quality management.

We rely on intellectual property laws, confidentiality procedures and contractual provisions to protect our intellectual property rights. We regard our patents, trade secrets and other intellectual property as valuable assets and take action when we deem it necessary to protect them. We proactively monitor competing patents and patent applications to ensure that we do not infringe the rights of other industry participants and/or challenge patent applications that may be without merit and would inhibit our ability to utilize our technology.

In connection with the separation of our business from Evonik, Evonik assigned to us its intellectual property that was exclusively used in its carbon black business, as well as certain intellectual property rights that are still in use in its retained business. Evonik retained ownership of certain intellectual property that is not material to us. Evonik has granted us a non-exclusive license to use such retained intellectual property in the field of carbon black. In addition, we have granted back to Evonik licenses relating to some of our intellectual property rights to use such intellectual property in all fields outside of carbon black, which licenses are exclusive, subject to certain exceptions in areas adjacent to carbon black. Accordingly, we may be restricted in leveraging our intellectual property that we use on the basis of a license from Evonik or the intellectual property that is subject to the grant-back license to expand our business into fields outside of carbon black. For additional information, see “ *Item 3. Key Information —D. Risk Factors—Legal and Regulatory Risks—We may not be able to protect our intellectual property rights successfully and we are still subject to restrictions and risks associated with our intellectual property sharing arrangements with Evonik.*”

Environmental, Health and Safety Matters

Protection of humans and the environment, fair treatment of our partners and a clear alignment to the needs of customers are the essential components of our activities. Therefore, we strive not only to comply with all applicable laws and voluntary obligations, but strive to continuously improve our performance and management systems. Our integrated global management system with established standards and processes is based on the principles of the Responsible Care, ISO 9001 Quality Management System, ISO 14001 Environmental Management Systems, and OSHAS 18001 Safety Management Systems. All our operating sites are third-party certified by ISO 14001 and ISO 9001. The global management system outlines our processes and procedures practiced in relation to environmental protection, occupational and process safety, health protection and quality management including sustainable compliance, social accountability and product stewardship.

Our operations involve the use, processing, handling, storage and transportation of materials that are subject to numerous supranational, national and local environmental and safety laws and regulations. Our production facilities require operating permits that are subject to renewal or modification. We could incur significant costs, including fines, penalties and other sanctions, third-party claims and environmental cleanup costs, as a result of violations of or liabilities under environmental, health and safety laws and regulations or operational permits required thereunder. We believe that our operations are currently in substantial compliance with all applicable environmental, health and safety laws and regulations. Although our management systems and practices are designed to ensure compliance with laws and regulations, future developments and increasingly stringent regulation could require us to make additional unforeseen environmental, health and safety expenditures. See as well risks described in “ *Item 3. Key Information—D. Risk Factors—Legal and Regulatory Risks—Our operations are subject to environmental, health and safety regulations. We have been and may in the future be subject to investigations by regulatory authorities in respect of alleged violations and may incur significant costs to maintain compliance with, and to address liabilities under, these laws and regulations*”.

Environmental

Air Quality

One of the main environmental challenges of a carbon black plant is the management of exhaust gas from production processes. This exhaust gas contains a number of regulated pollutants, including carbon monoxide and sulfur compounds. The most common method for controlling these gases is through combustion, which produces useable energy as a by-product. Currently, eight manufacturing sites have the capability to beneficially utilize these gases through some form of energy co-generation, such as the sale or reuse of steam, gas or electricity. In addition, we are evaluating initiatives to build additional co-generation facilities.

The primary air pollutants of concern include sulfur dioxide (SO₂), nitrogen oxides (NO_x) and particulates. In order to maintain compliance with emission requirements, we utilize various desulfurization and de-NO_x processes in some of our plants. We control the particulate matter by using our state-of-the-art bag filter technology.

With regard to air quality we are subject to emission control provisions at the national as well as at the EU level. The EU Directive No. 2010/75/EU on industrial emissions (“IED Directive”) entered into force on January 6, 2011. It provides for regulation on the prevention and control of pollution from industrial activities and includes rules aiming to reduce emissions into air, water, and land and to prevent the generation of waste. Starting January 2013, the EU member states had to comply with emissions limits for certain industries. Moreover, the IED Directive amended the former EU Directive 2008/1/EC on integrated pollution prevention and control (“IPPC Directive”) by defining best available techniques as binding industry standards. The Best Available Techniques Reference (BREF Notes) document applied to the carbon black industry was developed and implemented in August 2007 and it is subject its revision beginning in 2020 by the European Commission.

Germany, for example, implemented the IED Directive by amendments to certain German statutes (among other things, the Federal Emissions Control Act (*Bundes-Immissionsschutzgesetz*), the Federal Water Act (*Wasserhaushaltsgesetz*) and the Act on Recycling (*Kreislaufwirtschaftsgesetz*). With respect to new emissions thresholds and new binding industry standards, permits need to comply with these standards and will, in general, not be grandfathered.

Besides the IED Directive and its implementation, European jurisdictions in which we operate may provide for further regulations regarding emission reduction and safety technology standards that apply to our facilities (for example, the German Emissions Control Act). Therefore, under such regulations we would have to modernize our facilities regularly to meet the required standards.

In the United States, we are subject to emissions limitations under the federal Clean Air Act (“CAA”) and analogous state and local laws and regulations, which regulate the emission of air pollutants from our facilities and impose significant monitoring, record keeping and reporting requirements. In addition, these laws and regulations require us to obtain pre-approval for the construction or modification of facilities expected to produce or significantly increase air emissions and to obtain and comply with air permits that include stringent conditions on air emissions and operations. In certain cases, we may need to incur capital and operating expenditures for specific equipment or technologies to control emissions. All our U.S. facilities are required to obtain federal “Title V” permits, which are required for stationary sources classified as “major” on the basis of their emissions. Obtaining permits and approvals required for the construction, modification and operation of our facilities, or the appeal of such permits and approvals once they are issued, has the potential to delay the development of our projects. We have incurred, and expect to continue to incur, substantial administrative and capital expenditures to maintain compliance with CAA requirements that have been promulgated or may be promulgated or revised in the future.

Pursuant to the CAA, the EPA has developed industry-specific National Emission Standards for Hazardous Air Pollutants (“NESHAPs”) for stationary sources classified as “major” on the basis of their hazardous air pollutant emissions. Our U.S. facilities are subject to NESHAPs applicable to carbon black facilities, as well as NESHAPs applicable to industrial boilers. The NESHAPs establish emissions reduction requirements and require use of control technology requirements that meet a minimum standard and which may entail a combination of technology, processes, and techniques. These requirements are imposed through our Title V permits, and require specific monitoring, recordkeeping and reporting requirements. See “—*Environmental Proceedings*” for information regarding our compliance with the CAA.

In China a reduction of NO_x emission limits for a boiler from 300 parts per million (“ppm”) to 200 ppm and dust from 30 micro gram per cubic meter (“mg/m³”) to 20 mg/m³ was required following a change in Chinas Air Pollution Prevention law in October 2017. In addition Chinese government reduced SO₂ limits for the boiler from 200 ppm to 50 ppm effective from 2018.

Further reduction of NO_x emissions from 200 to 100 ppm and dust from 20mg/m³ to 10mg/m³ will become effective in 2019. With effect from calendar year 2020 SO₂ emission limits for a dryer will be reduced from 200 ppm to 50 ppm.

In Korea the Clean Air Conservation Act changed, leading to reduced air emission limits for SO₂ from 400 ppm to 200 ppm, NO_x from 250 ppm to 150 ppm and dust from 50ppm to 30 ppm. These changes will become effective in calendar year 2020. These regulation changes may require additional capital and operating expenditures for specific equipment or technologies to control emissions.

Greenhouse Gas Regulation and Emissions Trading

Our facilities also emit significant volumes of CO₂. In the European Union, all our production facilities are subject to the European Emission Trading Scheme (“ETS”) for CO₂ emissions. The ETS was set up in 2003 by the Directive 2003/87/EC in order to considerably reduce the output of GHGs. The directive has been implemented into German law as the Greenhouse Gas Emissions Trading Act (*Treibhausgas-Emissionshandelsgesetz*). Industrial sites to which the ETS applies receive a certain number of allowances to emit GHGs and must surrender one allowance for each metric ton of GHG emitted. For the third trading period that commenced in 2013, the ETS has been revised such that the EU-wide quantity of emission allowances allocated each year have been significantly reduced as compared to the average annual total quantity of allowances issued in the EU between 2008 and 2012 and no free-of-charge allocation for any electricity producing entity exists anymore.

The ETS affects carbon black manufacturers in the European Union. Carbon black production is currently listed on the carbon leakage list, which allows receiving the major share of needed emission allowances free of charge. This list was reviewed by the European Commission and Carbon Black remained on the Carbon Leakage List for the ETS Phase IV (2021-2030). See “ *Item 3. Key Information —D. Risk Factors—Legal and Regulatory Risks—Regulations requiring a reduction of greenhouse gas emissions could adversely affect our business, financial condition, results of operations and cash flows.* ” The preparation for the ETS Phase IV (2021-2030) started in 2017 by the European Commission, the European Council and the European Parliament in cooperation, Council and Parliament announced during 2018 the implementation timetable with regard to ETS Phase IV. As part of International Carbon Black Association's (“ICBA”) joint activity towards ETS, OEC completed the 2018's emission data collection. This data collection shall contribute to help developing an industrial benchmark of emission data. Data shall provide a basis for expected discussions and exchanges between environmental agencies across the EU to complete the emission allocation process for ETS Phase IV.

In the U.S., comprehensive climate change legislation has not yet been adopted. After determining that emissions of carbon dioxide, methane, and certain other gases endanger public health and the environment in December 2009, the EPA has regulated GHG emissions under various provisions of the Clean Air Act. The EPA adopted rules that require reporting of GHG emissions by owners and operators of facilities in certain source categories or that exceed certain GHG emissions thresholds, and our facilities are subject to this rule. Further, EPA issued the GHG “Tailoring Rule” in May 2010, to address GHG permitting requirements pursuant to its determination that GHG emissions triggered permitting requirements for stationary sources starting in January 2011, and has since continued efforts to regulate GHG emissions.

Apart from the EPA's efforts, Congress has from time to time considered legislation to reduce emissions of GHGs, but no legislation has been enacted to date. At the state level, approximately one-half of the states have already taken legal measures to reduce emissions of GHGs, primarily through the planned development of GHG emission inventories and/or regional GHG cap-and-trade programs. There is no assurance that the current level of regulation will continue at the federal or state level in the future, or that future changes would not materially affect our operations or require material capital expenditures. The adoption of legislation or regulations that require reporting of GHGs, establish permitting thresholds based on GHG emissions or otherwise limit or impose compliance obligations for emissions of GHGs from our equipment

and operations could require us to incur costs to obtain and comply with permits, reduce emissions of GHGs associated with our operations or purchase carbon offsets or allowances.

The design concept of the South Korean ETS is similar to the European ETS. Each participant receives an allocation of allowed emissions. If the emissions exceed the allocated allowance, then the participant is required to offset such excess emissions through various legally authorized means, such as purchasing certified credits, applying authorized offset credits and borrowing (the use of proceeding year's allocation). A failure to offset excessive emissions will result in a monetary penalty, equaling three times the market price for the carbon credit traded at the Korean exchange. However, the maximum penalty is set at 100,000 Korean Won (approximately \$90 applying an exchange rate of 1,112.85 Korean Won per U.S. Dollar as of December 31, 2018). As of end-January, the market price for carbon credit is around 28,000 Korean Won (approximately, \$25.20). The combined carbon deficit over the first three year period (from 2015 to 2017) was 276,864 tCO₂e. We purchased emission rights in an amount of 2.3 billion Korean Won (approximately \$2.1 million) to address this deficit and we are taking steps to mitigate our exposure for future periods through various means, including improvements in the feedstock-to-carbon black conversion ratio, energy optimization to reduce the use of energy at our two sites and pricing the cost of GHG offsets in our offers to our customers. We are also considering taking bid positions in the Korean Exchange to acquire carbon credits at reasonable prices.

Although the South African Carbon Offsets Law was intended to be in effect from January 1, 2017, it is still in draft form. The Carbon Tax Bill proposal has gone through multiple consultative processes, the last version came out on December 5, 2018 and is scheduled to be discussed and voted by the Parliament in 2019. The carbon black process is listed on Table 3 of this bill and a process emission factor was determined for a ton of carbon black produced using furnace black technology. The current amount of tax is determined to be 120 ZAR per ton of CO₂ emitted into the atmosphere. Our facility in Port Elizabeth is currently in contact with the relevant authority to minimize the impact, however, the final outcome of that negotiation is not known at this time.

There are also ongoing discussions and regulatory initiatives in other countries in which we have facilities, including Brazil, regarding GHG emission reduction programs, but those programs have not yet been defined.

Water Quality

Our plants are net consumers of water. Most of our plants recycle a substantial amount of the water used in the manufacturing process, which is used as "quench water" in the cooling process. Water discharge from most plants consists primarily of storm-water during and after heavy rain, as well as limited wastewater from ancillary operations such as boiler blowdown and equipment washing; these discharges only take place under permitted conditions. For those plants that discharge water, the treatment generally is a settling pond system. Some facilities operate more advanced wastewater treatment systems, such as filtration and aeration systems incorporating chlorination or ozonation, depending on local requirements.

At the EU level, the European Directive No. 2000/60/EC, also known as the Water Framework Directive ("WFD"), aimed to achieve a good qualitative and quantitative status of all water bodies by 2015. Its main goals include expanding the scope of water protection to all waters, including surface waters and groundwater, water management based on river basins, a "combined approach" of emission limit values and quality standards and streamlining legislation. A lot of effort has been put into the preparation and drafting of the River Basin Management Plans by 2009. The Plans should have identified all actions to be taken in the river basin district to deliver the objectives of the WFD. An interim Commission's Assessment with respect to the status of water conditions in the EU, and activities influencing it, is attesting best water qualities ever since. However, the assessment shows that a more determined effort is needed to ensure achievement of WFD objectives in the enacted 6-year cycles ending in 2021 and 2027.

Moreover, the use of water for the manufacturing process may require permits or licenses as, for example, under the German Federal Water Act or German local laws. Permits may also be required for the discharge of wastewater into the public sewer system. Such permit or license may be revoked without compensation under certain circumstances.

In the United States, our facilities are subject to the federal Clean Water Act ("CWA"), and analogous state laws and regulations that impose restrictions on the discharge of pollutants into waters of the United States. Any such discharge of pollutants must be in accordance with the terms of the permit issued by EPA or the analogous state agency. In addition, the CWA and implementing state laws and regulations require individual permits or coverage under general permits for discharges of storm water runoff from certain types of facilities. Federal and state regulatory agencies can impose administrative, civil and criminal penalties for non-compliance with discharge permits or other requirements of the CWA and analogous state laws and regulations. These permits generally have a term of five years. Our facilities are subject to CWA permitting requirements, and must obtain and comply with National Pollutant Discharge Elimination System permits, which establish standards for, and require monitoring of, our discharges. We are subject to categorical pretreatment standards for the Carbon Black Manufacturing Point Source category, which, among other requirements, prohibits discharges of process wastewater pollutants to navigable water.

Contamination

As we handle chemicals that could cause water or soil contamination, we may be subject to remediation obligations under national law. Additionally, third parties may be able to file claims for personal injury and property damage allegedly caused by the release of hazardous substances or other pollutants into the environment.

In particular, the German Federal Act on Soil Protection (*Bundes-Bodenschutzgesetz*) requires the prevention of soil contamination by taking adequate precautions. In case of discovery of any contamination or past pollution (*Altlasten*) the owner, the current controlling person of the property, the polluter, its universal successor (*Gesamtrechtsnachfolger*) or the previous owner (if such owner transferred title to the real property after March 1, 1999 and knew or should have known of the contamination or past pollution) may be held responsible for remediation measures. Responsibility may be placed on either or several of the persons even in the absence of any fault or negligence. The competent authorities may also take remediation measures themselves and require the responsible party to bear the costs of such remediation. If several parties are responsible, they are jointly or severally liable and each party has the legal claim to reimbursement against the other parties. Such reimbursement may be contractually modified or waived among the parties.

In case of contamination of ground or surface water, the responsibility for remediation measures results from the Federal Act on Soil Protection in conjunction with the Federal Water Act and local water protection laws.

In the United States, our facilities are subject to the Comprehensive Environmental Response, Compensation, and Liability Act (“CERCLA”), the Resource Conservation and Recovery Act (“RCRA”) and similar state laws. CERCLA establishes liability for parties, including current and former site owners and operators, generators, and transporters, in connection with releases of hazardous substances. Under CERCLA, we may be subject to liability without regard to fault or the lawfulness of the disposal or other activity. Our operations involve the storage, handling, transportation and disposal of hazardous substances within the meaning of CERCLA. As a result, we may be jointly and severally liable under CERCLA for all or part of the costs required to clean up sites at which hazardous substances have been released into the environment. Under CERCLA and similar state laws, we could be required to remove previously disposed substances and wastes, remediate contaminated property and groundwater, conduct natural resource damage assessments and pay compensation and penalties. RCRA is the principal federal statute regulating the generation, treatment, storage and disposal of hazardous and other wastes. RCRA and state hazardous waste regulations impose detailed operating, inspection, training and response standards and requirements for permitting, closure, remediation, financial responsibility, record keeping and reporting. Our sites have areas currently and formerly used as landfills for wastes generated by our operations. These landfills may be subject to regulation under RCRA, and certain of our facilities have been investigated and remediated under RCRA. These laws and regulations may also expose us to liability for acts that were in compliance with applicable laws at the time we performed those acts. We could incur significant costs in connection with investigation and remediation activities or claims asserted at current or former facilities or third-party sites.

Non-hazardous and Hazardous Waste

In some jurisdictions in which we operate we are subject to provisions regarding waste management and the handling and storage of hazardous substances. Those provisions may require documentation on the disposal of waste or compliance with certain safety standards (for example, as set forth in Council Directive 96/82/EC on the control of major-accident hazards involving dangerous substances, known as Seveso II Directive). The directive was implemented into German law by the 12th Ordinance under the German Emissions Control Act.

We generate hazardous waste in the form of spent solvents at our plant labs. In addition, coal tar fractions, a common raw material at some plants, are considered hazardous waste if spilled or otherwise require disposal, as are certain refractories that contain hexavalent chromium, which are generated infrequently. Certain facilities have on-site landfills permitted for the current disposal of non-hazardous solid waste.

Energy Surcharge

The German Renewable Energies Act grants above-market payments to the producers of energy generated from renewable sources. To balance these payments, an energy surcharge is imposed on the consumers of energy. Certain exemptions regarding that surcharge are provided in the EEG, in particular for energy intensive industries and self-consumption of self-produced energy. The European Commission opened an in-depth investigation procedure in December 2013 to examine whether the reductions granted under the EEG comply with EU state aid rules. Currently, the European Commission and the German government are working out an agreement regarding future benefits in that respect. Accordingly, the German legislator is amending the national regulations and setting up a new regime regarding energy intensive industries. It is expected that the exemption from the energy surcharge regarding electricity generated for the Company’s own consumption will be grandfathered. However, there is no assurance that we can maintain the exemption status permanently.

Environmental Proceedings

During 2008 and 2009, the U.S. Environmental Protection Agency (“EPA”) contacted all U.S. carbon black producers as part of an industry-wide EPA initiative, requesting extensive and comprehensive information under Section 114 of the U.S. Clean Air Act. The EPA used that information to determine, for each facility, that either: (i) the facility has been in compliance with the Clean Air Act; (ii) violations have occurred and enforcement litigation may be undertaken; or (iii) violations have occurred and a settlement of an enforcement case is appropriate. In response to information requests received by the Company’s U.S. facilities, the Company furnished information to the EPA on each of its U.S. facilities. EPA subsequently sent notices under Section 113(a) of the Clean Air Act in 2010 alleging violations of Prevention of Significant Deterioration (“PSD”) and Title V permitting requirements under the Clean Air Act at the Company’s Belpre (Ohio) facility. In October 2012, the Company received a corresponding notice and finding of violation (an “NOV”) alleging the failure to obtain PSD and Title V permits reflecting Best Available Control Technology (“BACT”) at several units of the Company’s Ivanhoe (Louisiana) facility, and in January 2013 the Company also received an NOV issued by the EPA for its facility in Borger (Texas) alleging the failure to obtain PSD and Title V permits reflecting BACT during the years 1996 to 2008. A comparable NOV for the Company’s U.S. facility in Orange (Texas) was issued by the EPA in February 2013; and EPA issued an additional NOV in March 2016 alleging more recent non-PSD air emissions violations primarily at the dryers and the incinerator of the Orange facility.

In 2013, Orion began discussions with the EPA and the U.S. Department of Justice (“DOJ”) about a potential settlement to resolve the NOV’s received, which ultimately led to a consent decree executed between Orion Engineered Carbons LLC (for purpose of this note Q. “Orion”) and the United States (on behalf of the EPA), as well as the Louisiana Department of Environmental Quality. The consent decree (the “EPA CD”) became effective on June 7, 2018. The consent decree resolves and settles the EPA’s claims of noncompliance set forth in the NOV’s and in a respective complaint filed in court against Orion by the United States immediately prior to the filing of the consent decree.

All five U.S. carbon black producers have settled with the U.S. government. Orion was one of the two last carbon black companies to sign a consent decree.

Under Orion’s EPA CD, Orion will install certain pollution control technology in order to further reduce SO₂, NO_x and particulate matter (“PM”) emissions at its four U.S. manufacturing facilities in Ivanhoe (Louisiana), Belpre (Ohio), Borger (Texas), and Orange (Texas) over approximately six years. The EPA CD also requires the continuous monitoring of emissions reductions that Orion will need to comply with over a number of years. Orion has commenced the installation works for its Ivanhoe facility, and expects to complete the installation in this facility over the next two years. Under the EPA CD, Orion can choose either its Belpre or Borger facilities as the next site for installation of pollution control equipment with comparable effectiveness. We expect the capital expenditures for installation of pollution control equipment in the remaining Orion facilities to decrease due to economies of scale and synergies from prior installations. We also expect that the third and fourth plants will require significantly less costly pollution control equipment given the requirements of the EPA CD. We estimate the installations of monitoring and pollution control equipment at all four Orion plants in the U.S. will require capital expenditures of up to \$190 million. However, the actual total capital expenditures we might need to incur in order to fulfill the requirements of the EPA CD remain uncertain. The EPA CD allows some flexibility for Orion to choose among different technology solutions for reducing emissions and the locations where these solutions are implemented. The solutions Orion ultimately chooses to implement may differ in scope and operation from those it currently anticipates (including those discussed in the next paragraph) and factors, such as timing, locations, target levels, changing cost estimates and local regulations, could cause actual capital expenditures to significantly exceed current expectations or affect Orion’s ability to meet the agreed target emission levels or target dates for installing required equipment as anticipated or at all. Orion also agreed to and paid a civil penalty of \$800,000 and agreed to perform environmental mitigation projects totaling \$550,000. Noncompliance with applicable emissions limits could lead to further penalty payments to the EPA.

As part of Orion’s compliance plan under the EPA CD, in April 2018 Orion signed a contract with Haldor Topsoe group to install its SNOXTM emissions control technology to remove SO₂, NO_x and dust particles from tail gases at Orion’s Ivanhoe, Louisiana Carbon Black production plant. The SNOXTM technology has not been used previously in the carbon black industry.

Orion’s Share Purchase Agreement with Evonik in connection with the Acquisition provides for a partial indemnity from Evonik against various exposures, including, but not limited to, capital investments, fines and costs arising in connection with Clean Air Act violations that occurred prior to July 29, 2011. Except for certain less relevant allegations contained in the second NOV received for the Company’s facility in Orange (Texas) in March 2016, all of the other allegations made by the EPA with regard to all four of the Company’s U.S. facilities - as discussed above - relate to alleged violations before July 29, 2011. The indemnity provides for a recovery from Evonik of a share of the costs (including fines), expenses (including reasonable attorney’s fees, but excluding costs for maintenance and control in the ordinary course of business and any internal cost of monitoring the remedy), liabilities, damages and losses suffered and is subject to various contractual provisions including provisions set forth in the Share Purchase Agreement with Evonik, such as a de minimis clause, a basket, overall caps (which apply to all covered exposures and all covered environmental exposures, in the aggregate), damage mitigation and cooperation requirements, as well as a statute of limitations provision. Due to the cost-sharing and cap provisions in Evonik’s indemnity, the Company expects that substantial costs it has already incurred and will incur in this EPA enforcement initiative and the EPA CD likely will exceed the scope of the indemnity in the tens of millions of US dollars. In addition, Evonik has signaled that it may likely defend itself against claims under the indemnity. While the Company intends to enforce its rights vigorously, there is no assurance that the Company will be able to recover costs or expenditures incurred under the indemnity as it expects or at all. See *“Item 3. Key Information -D. Risk-Factors-Risks Related to Indebtedness, Currency Exposure and Other Financial Matters-Our agreements with Evonik in connection with the Acquisition require us to indemnify Evonik with respect to certain aspects of our business and require Evonik to indemnify us for certain retained liabilities. We cannot offer assurance that we will be able to enforce claims under these indemnities as we expect.”*

Chemical Regulations

Some jurisdictions we operate in have established regimes to regulate or control chemical products to ensure the safe manufacture, use and disposal of chemicals.

In the European Union, the Regulation on Registration, Evaluation, Authorisation of Chemicals (“REACH”) was signed in December 2006, came into effect on June 1, 2007 and requires chemical manufacturers and importers in the European Union to register all chemicals manufactured in, or imported into the European Union in quantities of more than one ton annually. Registration has to be made at the European Chemicals Agency (“ECHA”). The registration process requires capital and resource commitments to compile and file comprehensive chemical dossiers regarding the use and attributes of each chemical substance manufactured or imported by us and requires us to perform chemical safety assessments. Moreover, the use of certain “highly hazardous chemicals” must be authorized by ECHA. Furthermore, REACH Regulation contains rules on bringing substances to the market that have been identified as substances of very high concern (“SVHC”). If identified as SVHC, manufactured substances will be listed on the “candidate list” and potentially prioritized for or inclusion into Annex XIV to the REACH Regulation which may mean a full ban or requirement for authorization to be granted by the European Commission at its discretion. Carbon black oils used as raw materials in the carbon black production are considered intermediates under REACH. Use of intermediates is exempted from authorization under REACH.

Registration of certain chemicals with ECHA has been compulsory since June 1, 2008. For pre-registered substances, three registration deadlines are applicable, depending on the tonnage of the substance. Substances manufactured or imported into the EU exceeding 1,000 mt/y and specific SVHC in lower volumes had to be registered before December 1, 2010. The second period regarding substances in quantities of 100 to 1,000 mt/y ended on May 31, 2013. The last deadline for substances of more than 1 mt/y was May 31, 2018.

Further national provisions exist that apply to our business. For example, under German law, the Chemicals Act (*Chemikaliengesetz*) and related ordinances impose particular obligations on producers, processors, and handlers of chemical agents. We have to comply with safety obligations in this respect, particularly regarding the handling and storage of hazardous substances.

In the United States, we are subject to federal and state requirements relating to our business and products. In particular, we are subject to the California Safe Water and Toxic Enforcement Act, known as Proposition 65. Among other requirements, Proposition 65 imposes labeling and record keeping requirements. Non-compliance may result in significant penalties or fines, and future amendments to Proposition 65 could result in increased labeling or other compliance obligations applicable to our products.

In South Korea the so called Chemical Control Act was enacted. According to the act coal based feedstock oils such as CCT, CTD, SPO containing more than 0.001% quinolone are treated as hazardous chemicals requiring production sites to be duly licensed to use these coal based feedstock from 2019. We may incur capital and operational expenses to meet the relevant requirements to become duly licensed.

We are a member of the International Carbon Black Association (the “ICBA”), which currently consists of representatives from carbon black manufacturers in Canada, Europe, the United States, South America, Asia and Africa. The ICBA seeks to address common environmental, health and safety issues, undertakes research on health implications of carbon black, and serves as the leading advocate for the industry in the regulatory and public-interest arenas. The ICBA funds research on international environmental, health, product safety and workplace safety matters and is currently in the process of founding a regional subgroup covering Asia.

We are also a member of the European consortium for carbon black (“*cb4reach Consortium*”) which has pre-registered and registered carbon black with ECHA as required by the REACH Regulation. Besides the Company, the following companies are members of the cb4reach Consortium: Cabot Corporation, Cancarb Limited, Birla Carbon, Continental Carbon Company, Tokai Carbon, and Imerys S.A.

Health and Safety

The health and safety of our employees and customers is one of our highest priorities. We maintain very good performance in occupational injury and illness rates. New employees and contractors working on site are given environmental, health and safety training and we keep track of environmental, health and safety matters. Employees are required to report and log incidents including near misses into the electronic environmental, health and safety (“EHS”) management system. Our sites are required to implement and report EHS leading and lagging indicators for EHS performance. Plant managers are required to track and monitor these leading and lagging indicators and take action as appropriate. Leading and lagging indicator data and incidents are reviewed by senior management on a monthly basis. A strategic safety team provides for development, implementation and auditing of safety activities and promotes safety accountability by our personnel.

Carbon black is produced under controlled conditions and has high purity levels. It therefore differs from other combustion products that may contain high concentrations of hazardous compounds. Due to its high purity, certain carbon black grades are permitted for use in cosmetics or in products in contact with food.

The International Agency for Research on Cancer (“IARC”) classifies carbon black as a Group 2B substance (known animal carcinogen, possible human carcinogen). We have communicated IARC’s classification of carbon black to our customers and employees in accordance with applicable regulatory requirements. The Permanent Senate Commission for the Investigation of Health Hazards of Chemical Compounds in the Work Area (the “MAK Commission”) of the German Research Foundation (*Deutsche Forschungsgemeinschaft*), which uses a different rating system, classifies carbon black as a suspect carcinogen (Category 3B). Other national and international health organizations have not

rated carbon black. Any risk reclassification of our raw materials, intermediates or finished product could result in increased operating costs or affect product lines or sales.

The Community Rolling Action Plan (“CoRAP”) indicates substances for evaluation by the European Member States. The evaluation aims to clarify the initial concern that manufacturing and/or use of these substances could pose a risk to human health or the environment. With ECHA’s update of the CoRAP list in March 2016 Carbon black was included in CoRAP for substance evaluation in 2018 and was shifted by one year to start in 2019. As per most recent ECHA update from October 2018 the substance evaluation is proposed to be further delayed to 2021. The substance evaluation for carbon black was proposed by France. The initial reasons of concern raised by the French Agency for Food, Environmental and Occupational Health & Safety (“ANSES”) relate to carbon black being a carcinogenic substance and a suspected reproduction toxicant. Orion is working as a member of the cb4reach Consortium and ICBA to address the reasons for nomination. The conclusion of the evaluation may have significant business impact should ANSES conclude that carbon black poses a risk to human health. A potential outcome could be a harmonized classification and labeling of carbon black for carcinogenicity and toxicity to reproduction. These developments may significantly affect our business, including increasing costs of doing business.

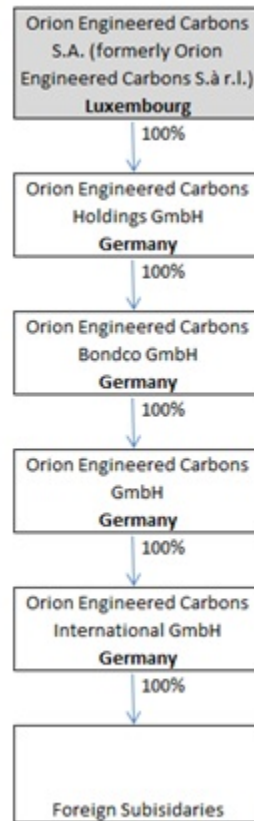
According to the recommendation of October 18, 2011 (2011/696/EU), carbon black is defined as a nano-material in Europe. In a similar approach the ISO developed the ISO TC 229 “Nanotechnologies,” which considers carbon black as a “nano-structured material.” Other countries (such as, US, Canada, France, Belgium, Sweden, Switzerland, etc.) have implemented or are considering implementing notification schemes related to nano materials. The notification of carbon black under the different notification schemes requires capital and resource commitments to compile and file dossiers. Furthermore, more and more specific requirements for substances regarded as nanomaterials are emerging with Europe. For example, Germany is planning to introduce a more stringent Occupational Exposure Limit for nanomaterials. These developments may significantly affect our business, including increasing costs of doing business.

Further Regulatory Matters

We are subject to further governmental regulation from national, European Union and other international regulatory authorities concerning, among other things: product safety, export and import control regulations and other customs regulations, data protection and our competitive and marketplace conduct. We believe that we are in compliance in all material respects with these regulations. We cannot guarantee, however, that any future changes in the requirements or mode of enforcement of these laws and regulations will not have a material adverse effect on our business, financial condition, results of operations or cash flows.

C. Organizational Structure

Below is a simplified diagram of the Company's corporate structure as of December 31, 2018 .



Subsidiaries

For a list of our subsidiaries see “*Exhibit 8.1 List of Subsidiaries of Orion Engineered Carbons S.A.*”

D. Property, Plants and Equipment

See “—B. Business Overview—Production—Production Facilities .”

Item 4A. Unresolved Staff Comments

Not applicable.

Item 5. Operating and Financial Review and Prospects

The following discussion and analysis summarizes the significant factors affecting our results of operations and financial condition during the years ended December 31, 2018 , 2017 and 2016 and should be read in conjunction with the information included under Item 4. Information on the Company and *Item 18. Financial Statements* included elsewhere in this Annual Report. We prepare our financial statements in accordance with accounting principles generally accepted in the United States and in US Dollars.

Overview

In 2018 , we generated revenue of \$ 1,578.2 million on a volume of 1,084.7 kmt, a net income of \$ 121.3 million, and Adjusted EBITDA of \$ 294.1 million. Adjusted EBITDA for our Specialty Carbon Black segment was \$ 149.3 million, and the Segment Adjusted EBITDA Margin was 27.4% . This segment accounted for 34.6% of our total revenue, 50.7% of total Adjusted EBITDA and 24.0% of our total volume in kmt in 2018 . Adjusted EBITDA for our Rubber Carbon Black segment was \$ 144.9 million, and Segment Adjusted EBITDA Margin was 14% . This segment accounted for 65.4% of our total revenue, 49.3% of total Adjusted EBITDA and 76.0% of our total volume in kmt in 2018 .

Key Factors Affecting Our Results of Operations

We believe that certain factors have had, and will continue to have, a material effect on our results of operations and financial condition. As many of these factors are beyond our control and certain of these factors have historically been volatile, past performance will not necessarily be indicative of future performance and it is difficult to predict future performance with any degree of certainty. In addition, important factors that could cause our actual results of operations or financial conditions to differ materially from those expressed or implied below, include, but are not limited to, factors indicated under “ *Item 3. Key Information –D. Risk Factors* ”, “ *Note Regarding Forward-Looking Statements* ” and “ *Item 5. Operating and Financial Review and Prospects-Key Factors Affecting Our Results of Operations* ” of this report.

General Economic Conditions, Cyclicalities and Seasonality

Our results of operations are affected by worldwide economic conditions. Because carbon black is used in a diverse group of end products, demand for carbon black has historically been related to real GDP and general global economic conditions. In particular, a large part of our sales has direct exposure to the cyclical automotive industry and, to a lesser extent, the construction industry. As a result, our results of operations experience a level of inherent cyclicalities. The nature of our business and our large fixed asset base make it difficult to rapidly adjust our fixed costs downward when demand for our products declines, which materially affects our results of operations. For example, we experienced a decrease in volume of approximately 15% in 2009, in the wake of the global financial and economic crisis, followed by a recovery in volume of 14.8% in 2010. As a result, our results of operations dropped sharply in the second half of 2008 and 2009, and recovered again in 2010. Our overall results improved thereafter in line with the global economic recovery and recovery in underlying industries, which varied by region.

Our business is generally not seasonal in nature, although we may experience some regional seasonal declines during holiday periods and our results of operations are generally weaker in the last three months of the year.

Drivers of Demand

Besides general global economic conditions, certain specific drivers of demand for carbon black differ among our operating segments. Specialty carbon black has a wide variety of end-uses and demand is largely driven by the development of the coatings, polymers and printing industries. Demand for specialty carbon black in the coatings and polymers industries is mainly influenced by the levels of industrialization, infrastructure, construction and car ownership. Demand for specialty carbon black in the printing industry is mainly influenced by developments in print media and packaging materials. Demand for rubber carbon black is largely driven by the development of the tire and mechanical rubber goods industries. Demand for rubber carbon black in tires is mainly influenced by the number of replacement and original equipment tires produced, which in turn is driven by (i) vehicle trends, including the number of vehicles produced and registered, and the number of miles driven, (ii) demand for high-performance tires, (iii) demand for larger vehicles, such as trucks and buses and (iv) changes in regulatory requirements. Demand for rubber carbon black in mechanical rubber goods is mainly influenced by vehicle trends, construction activity and general industrial production.

Demand in the developed West European and North American regions is mainly driven by demographic changes, customers’ high-quality requirements, stringent tire regulation standards and relatively stable tire replacement demand. Demand in emerging markets, such as China, Southeastern Asia, South America and Eastern Europe, is mainly driven by the growing middle class, rapid industrialization, new infrastructure spending and increasing car ownership trends. The growth in vehicle production in turn drives demand for both original equipment tire manufacturing and replacement tires in developing regions.

Asset Utilization

Margins in the carbon black industry, and the chemical industry generally, are strongly influenced by industry capacity. As demand for products approaches available supply, utilization rates rise, and prices and margins typically increase over time. Historically, this relationship has been highly cyclical, due to fluctuations in supply resulting from the timing of new investments in capacity and general economic conditions affecting the relative strength or weakness of demand. Generally, capacity is more likely to be added in periods when current or expected future demand is strong and margins are, or are expected to be, high. Investments in new capacity can result, and in the past frequently have resulted, in over-capacity, which typically leads to a reduction of margins. For example, some of our customers have shifted, and may continue to shift, manufacturing capacity from mature regions, such as North America and Europe, to emerging regions, such as Asia and South America. Consequently, competitors in China have recently (particularly regarding production of standard tire grades), added capacity at far greater proportion than demand has risen, which resulted in pressured margins in the region. In response, producers typically reduce capacity utilization or limit further capacity additions, eventually causing the industry to be relatively undersupplied. In recent years, a systematic reduction in capacity in North America and Europe, together with increased manufacturing efficiencies, has enabled us to largely preserve margins and increase our utilization rates.

Although utilization levels can differ significantly by plant, these levels tend to be driven more by variations in demand from specific customers served by each plant rather than by general trends in the region where the plant is located. We estimate our average plant utilization rate to have been at approximately 91% in 2018, approximately 90% in 2017 and approximately 87% in 2016. We have made recent investments in strategic sites to increase the flexibility of our production platform and closed production facilities in Europe and South Korea in order to consolidate capacities in the European and Asian regions. Both actions allow us to opportunistically upgrade and expand our capacity to produce higher margin products, as demand allows, and positions us better to shift additional production capacity to specialty carbon black products and rubber carbon black for higher-end mechanical rubber goods. We intend to achieve further growth in production volume, as customer demand allows, by improving utilization rates, improving the availability of our assets by minimizing planned and unplanned facility downtime and improving the capacity of our assets through systematic supply chain planning and improved operating technologies. Unplanned outages

can impact our operating results. Similarly, planned or unplanned outages of our competitors can positively affect our operating results by decreasing the product supply in the industry.

Efficiency Initiatives

Our results of operations are affected by our energy consumption, manufacturing costs and efficiency improvements. We have implemented and will continue to implement production and energy efficiency initiatives by exploiting alternative feedstock sources with a strong focus on feedstock yields, as well as on feedstock prices. As further discussed below under “– *Raw Material and Energy Costs*,” the benefits arising from these feedstock-related efficiency initiatives are reduced as oil prices fall.

We have developed new energy efficient reactor designs and state-of-the-art energy recovery equipment that have already been installed in many of our production sites. In recent years, we have increased our co-generation capabilities and currently eight of our manufacturing sites have some form of co-generation, transforming combustible exhaust gas, the main by-product of the carbon black production process, into electricity, steam or hot water. We are analyzing available energy recovery options for our production sites currently not equipped with co-generation facilities and plan to expand co-generation capacity of our plants in the future, if economically viable.

Raw Material and Energy Costs

Our results of operations are affected, directly and indirectly, by fluctuations in raw material and energy prices. Our manufacturing processes consume significant amounts of raw materials and energy, the costs of which are subject to fluctuations in worldwide supply and demand, in addition to other factors beyond our control. In 2018, raw materials accounted for 74% of our cost of sales. Approximately 83% of the cost of raw material used in the production of carbon black is related to petroleum-based or coal-based feedstock known as carbon black oil, with some limited use of other raw materials, such as nitrogen tetroxide, hydrogen and natural gas. The pricing of carbon black oil is typically indexed to the price of fuel oil and is generally benchmarked against Thomson Reuters indices of mainly three regions, namely the U.S. Gulf Coast, Amsterdam / Rotterdam / Antwerp and Singapore. While the majority of our purchases are based on underlying fuel oil indices, the ultimate carbon black oil price also depends on carbon black oil specific quality characteristics, differentials (premiums or discounts), freight costs and region specific supply and demand as well as regulatory factors. Carbon black oil procurement is an important factor in achieving best-in-class production costs. Approximately 50% of our carbon black oil supply is covered by short- and long-term contracts with a wide variety of suppliers.

A significant portion of our volume is sold based on formula-driven price adjustment mechanisms for changes in costs of raw materials, that is, approximately 80% in the Rubber Carbon Black segment and volumes of approximately 100 kmt in the Specialty Carbon Black segment, based on volumes in 2018. Most of our indexed contracts allow for monthly price adjustments, while a relatively small portion allows for quarterly price adjustments. The one-month oil price adjustment mechanism typically results in a two-month delay in reflecting oil price changes in our customers pricing, while the three-month price adjustment mechanism typically results in a four-month delay. Sales prices under our non-indexed contracts (approximately 20% in the Rubber Carbon Black segment and volumes of approximately 100 kmt in the Specialty Carbon Black segment based on volume in kmt in 2018) are reviewed regularly with a view to reflecting raw material and energy price fluctuations as overall market conditions allow. We believe that the current competitive environment generally allows us to implement price adjustments in a reasonably timely manner, although, as discussed below, the timing of price adjustments and other contract terms relating to price adjustments may have unpredictable and varying effects on our profitability. In addition, there can be no guarantee that we will be able to timely adjust prices under our non-indexed contracts in the future, see “*Item 3. Key Information — D. Risk Factors — Risks Related to Our Business — We are subject to volatility in the costs and availability of raw materials and energy, which could decrease our margins and adversely affect our business, financial condition, results of operations and cash flows.*”

Costs for raw materials and energy have fluctuated significantly and may continue to fluctuate in the future. For example, Brent crude oil prices continuously increased from \$76 per barrel in May 2010 to a peak of \$127 per barrel in April 2011, and then declined to approximately \$30 at end of December 2015. At end of December 2018 the price decreased again to \$54 per barrel after an increase to \$67 at end of December 2017. We believe that our contracts have enabled us generally to maintain our Segment Adjusted EBITDA Margins since the Acquisition, however, rapid and significant oil or energy price fluctuations have had and are likely to continue to have significant and varying effects on our earnings and results of operations, partly because oil price changes affect our sales prices and our cost of raw materials and energy at different times and amounts, and partly due to other factors, such as differentials affecting the ultimate carbon black oil price paid by us (versus a particular reference price index), actual carbon black oil usage amounts and our ongoing efficiency initiatives. As a result of the significant decline in oil prices in particular in 2014, we have seen one or more of these factors come into play at different times and adversely affect our profitability, and this is likely to be seen again in future periods of a declining oil pricing environment. It is also possible that in this environment, other factors come into play and interact adversely with our longer-term formula-based customer pricing arrangements. It is difficult to predict the impact of these factors going forward. In general, our customer pricing arrangements, and in particular the price adjustment formulas, are designed to protect us against rising or higher oil prices, and while we may seek to adjust them to accommodate the current environment, they may be difficult to change quickly, and if changed, may not be as protective if and when oil prices begin to rise.

Foreign Currency Exchange Rate Fluctuations

Our results of operations and Net Working Capital are affected by foreign currency exchange rate fluctuations. Our exposure to foreign currencies comes from three main sources: (i) currency translation, when we translate results of our subsidiaries denominated in local functional currencies into U.S. Dollar, (ii) commercial transactions, such as when we contract purchases of our feedstock, which are mostly in U.S. Dollars, at non-U.S.-Dollar entities and (iii) financing transactions, as a large portion of our financial obligations are denominated in U.S. Dollars, some of which are hedged. In 2018, 40%, 25% and 18% of our revenues were generated by our subsidiaries whose functional currency is the Euro, the U.S. Dollar and the Korean Won, respectively, with the remainder in other currencies. Fluctuations in currency exchange rates could require us to reduce our prices to remain competitive in foreign regions. In each case, the relevant income or expense is reported in the respective local currency and translated into U.S. Dollar at the applicable currency exchange rate for inclusion in our consolidated financial information. Therefore, our financial results in any given period are materially affected by fluctuations in the value of the U.S. Dollar relative to other currencies, in particular the Euro and the Korean Won. Our foreign currency transaction exposure is partially offset by costs and expenses incurred by our subsidiaries in their local functional currencies.

The pricing of carbon black oil, our main raw material, is linked to the price of heavy fuel oil and is generally benchmarked against Platts indices of three regions: the U.S. Gulf Coast, Rotterdam and Singapore. Most of our carbon black oil purchase contracts are denominated in U.S. Dollars. Generally, an appreciation of the U.S. Dollar has a negative impact on our results of operations and Net Working Capital, because our raw material purchases in U.S. Dollars may not be fully offset by our ability to pass-through changes in raw material costs to customers and by the translation effect of our results of operations outside the United States.

We manage our foreign currency exchange exposure through the use of derivative instruments to economically hedge on balance sheet foreign currency denominated receivables and payables. In May 2018, we entered into a \$235 million cross-currency swap to hedge interest rate risk and foreign currency exposure related to the U.S. Dollar-denominated Term Loan entered into by our German entity. In conjunction therewith we discontinued the use of the U.S. Dollar-denominated portion of our Term loan to hedge our U.S. operations. See “*Note J. Derivatives*”. We use customary products to manage other foreign exchange risk, including forward exchange contracts and currency options. We do not generally use foreign exchange hedging for expected exposure, as our expected exposure from sales is largely offset by our expected exposure from purchases.

Current and Future Environmental Regulations

Our operations are subject to extensive environmental laws and regulations, which require us to invest significant financial and technical resources to maintain compliance with applicable requirements. If environmental harm is found to have occurred as a result of our current or historical operations, we may incur significant remediation costs at current or former production facilities or third-party sites and may have to pay fines and damages. Many of our facilities have a long history of operation and have never been the subject of comprehensive environmental investigations. As a result, our environmental compliance and remediation costs could increase. Future closure and decommissioning at any one of these facilities, or of process units at these facilities, could result in significant remediation costs. For instance, many of our facilities have onsite landfills, storage tanks, wastewater treatment systems, ponds and other units that have been in use for a number of years, and we may incur significant costs when closing these units in accordance with applicable laws and regulations and when addressing related contamination of soil and groundwater. For more information about information requests made by the EPA to, and alleged violations of the U.S. Clean Air Act by, certain of our facilities located in the United States, see “*Item 4. Information on the Company —B. Business Overview—Environmental, Health and Safety Matters—Environmental—Environmental Proceedings.*”

Changes to environmental regulations or laws that may affect previously unregulated aspects of our business may also require us to incur significant compliance costs. New regulations requiring further reductions of GHG and other emissions are being considered in Europe, the United States, China, Brazil and South Korea. Our carbon black operations may generate more CO₂ than is permitted under current or future allocation schemes for GHG emissions, requiring us either to purchase emission credits or to modify our production processes to reduce emissions. Additionally, nano-scale materials, including carbon black, are under increased and ongoing scrutiny in multiple jurisdictions, including the European Union, and are likely to be subject to stricter regulation in the future, which may require us to incur significant costs in order to comply with new laws and requirements. Further, carbon black has been classified by certain national and international health organizations as a possible or suspected human carcinogen. A negative reclassification of carbon black by these organizations, or similar classifications of carbon black or other finished products, raw materials or intermediates by other organizations or governmental authorities could adversely affect our compliance costs, operations, sales and reputation.

Environmental considerations can also affect the industries in which we operate, including our position with respect to our competitors. For example, new tire labeling regulatory requirements globally (particularly in Europe) are expected to reduce the threat of low-cost tire imports significantly and to favorably affect demand in developed regions.

In connection with the Acquisition, Evonik agreed, subject to certain deductibles, caps, exclusions and procedural requirements, to indemnify us for certain historical environmental liabilities. See “*Item 3. Key Information —D. Risk Factors—Risks Related to Indebtedness, Currency Exposure and Other Financial Matters—Our Agreements with Evonik in connection with the Acquisition require us to indemnify Evonik with respect to certain aspects of our business and require Evonik to indemnify us for certain retained liabilities. We cannot offer assurance that we will be able to enforce claims under these indemnities as we expect.*”

Critical Accounting Policies

The preparation of our financial statements requires management to make estimates and judgments that affect the reported amounts of assets, liabilities, revenues, and expenses and related disclosure of contingent assets and liabilities. We consider an accounting estimate to be critical to the financial statements if (i) the estimate is complex in nature or requires a high degree of judgment and (ii) different estimates and assumptions were used, the results could have a material impact on the consolidated financial statements. We evaluate our estimates and application of our policies on an ongoing basis. We base our estimates on historical experience, current conditions and on various other assumptions that we believe are reasonable under the circumstances, the results of which form the basis for making judgments about the carrying values of assets and liabilities that are not readily apparent from other sources. Actual results may differ from these estimates under different assumptions or conditions. The policies that we believe are critical to the preparation of the consolidated financial statements are the following:

- Revenue and expense recognition;
- Goodwill;
- valuation of intangibles acquired in a business combination
- Inventories;
- Pension provisions;
- Deferred taxes, current income taxes;
- Derivative financial instruments;
- Hedge accounting; and
- Contingent liabilities and other financial obligations.

These critical accounting policies and other significant accounting policies are discussed in note Note A. Significant Accounting Policies to our audited consolidated financial statements included elsewhere in this report. See also note Note K. Employee Benefit Plans to our audited consolidated financial statements for information about sensitivities of inputs used with respect to pension provisions. See also note Note F. Business Combination, Goodwill and Intangible Assets to our audited consolidated financial statements with respect to goodwill. In particular, with regard to the assessment of the value in use of the reporting unit to which goodwill is allocated, management believes that no reasonably possible change in any of the key assumptions would cause the carrying value of the reporting units to materially exceed their recoverable amounts.

Effective from January 1, 2018 ASC 606 with respect to revenue recognition became effective. The adoption of this standard did not result in a material difference in our revenue recognition.

Effective from January 1, 2019 ASC 842 with respect to treatment and recognition of lease agreements became effective. We have not early adopted this standard. Based on the lease portfolio as of December 31, 2018, the Company anticipates recording additional lease assets and liabilities of approximately \$32 million on its consolidated balance sheet from 2019 onwards, with no material adoption impacts to its consolidated statements of operations. One asset currently recored under build-to-suit accounting and its associated liability of \$29 million will be derecognized upon adoption the standard and accounted for upon commencement of the lease. For our current lease obligation see also note Note Q . Commitments and Contingencies .

Certain of the significant accounting policies include the use of estimates, but do not meet the definition of critical because they generally do not require estimates or judgments that are as difficult or subjective to measure. However, these policies are important to an understanding of the consolidated financial statements.

U.S. Dollar Reporting

We are reporting our results in U.S. dollars rather than euros for periods commencing on or after January 1, 2018, including results and financial information for comparison. U.S. dollar reporting could result in greater volatility of our reported net income, EPS and Adjusted EBITDA, because substantial portions of our revenues and costs are denominated in non-dollar currencies.

U.S. GAAP Reporting

We prepared our audited financial statements included in this report in accordance with generally accepted accounting principles in the United States. The audited consolidated financial statements as at and for the three years ended December 31, 2018 included elsewhere in this report mark the first time the Company is preparing and publishing US-GAAP financial statements. Previously, the Company prepared its financial statements in accordance with IFRS. The tables below provide an illustrative and indicative overview of the differences between IFRS and GAAP reporting and impact on our financial statement. The differences between IFRS and GAAP related to (i) actuarial gains and losses, recognition of those gains and losses through other comprehensive income and the recycling in subsequent periods through profit and loss, (ii) recognition and amortization of transaction costs associated with financial debt and upon such debt modifications, (iii) impairments and (iv) current and deferred taxes. The Company does not consider the differences, individually or in the aggregate, to be material nor having a material impact on the Company's future financial performance or financial positions.

314,912 shares of common treasury stock									
Additional paid-in capital	63.5	—	—	—	—	—	—	—	63.5
Retained earnings	56.9	(7.9)	(7.5)	0.3	(10.4)	8.1	(17.5)		39.4
Accumulated other comprehensive income/(loss)	(40.2)	6.9	7.1	0.1	6.9	(0.4)	20.6		(19.6)
<i>thereof recycling of actuarial gains/losses</i>		9.7	10.5	0.1	9.7	—	30.0		
<i>tax effect on recycling of actuarial gains/losses</i>		(2.9)	(3.1)	—	(3.1)	—	(9.1)		
<i>net impact of recycling on AOCI/retained earnings</i>		6.9	7.4	0.1	6.6	—	20.9		
Total stockholders' equity	155.8	(1.1)	(0.3)	0.4	(3.5)	7.7	3.1		158.9
Total liabilities and stockholders' equity	\$ 1,274.4	\$ 0.5	\$ 0.5	\$ 1.9	\$ (0.5)	\$ (3.8)	\$ (1.4)		\$ 1,273.0

Illustrative Consolidated Statements of Operations (in \$ millions)	US-GAAP conversion effects				indicative 2018 IFRS values	2018 conversion effects	2018 US-GAAP values
	opening balance adjust-ment	fiscal year 2015	fiscal year 2016	fiscal year 2017			
Net sales	\$ —	\$ —	\$ —	\$ —	\$ 1,578.2	\$ —	\$ 1,578.2
Cost of sales	—	—	—	—	1,148.2	—	1,148.2
Gross profit	—	—	—	—	430.0	—	430.0
Selling, general and administrative expenses	—	—	—	—	231.9	—	231.9
Research and development costs	—	—	—	—	20.3	—	20.3
Other expenses, net	—	—	—	—	6.1	—	6.1
Restructuring expenses/(income), net	—	—	(1.3)	1.3	(24.6)	—	(24.6)
Income from operations	—	—	(1.3)	1.3	196.3	—	196.3
Interest and other financial expense, net	—	—	2.0	2.8	28.1	0.5	28.6
Recycling of actuarial gains/losses	9.7	10.5	0.1	9.7	—	—	—
Income from continuing operations before income taxes and equity in earnings of affiliated companies	9.7	10.5	0.8	13.7	168.2	0.5	167.7
Income tax expenses	(1.8)	(3.1)	(1.1)	(3.3)	47.0	(0.1)	46.9
Equity in earnings of affiliated companies, net of tax	—	—	—	—	0.6	—	0.6
Net income	\$ 7.9	\$ 7.5	\$ (0.3)	\$ 10.4	\$ 121.8	\$ 0.5	\$ 121.3

Interest expenses in previous and current years are partly related to different capitalization and amortization rules for transaction costs associated with long-term financial debt and the treatment of such transaction costs on debt modifications. In particular treatment of capitalized transaction costs upon debt modification is different under GAAP. In addition there is a difference between debt modification versus debt extinguishment and the related consequences in terms of recognition and timing of amortization of such capitalized transaction costs. The recycling of actuarial gains and losses solely relates to pensions recorded through (accumulated) other comprehensive income under IFRS. Income tax effects are in particular related to the above mentioned conversion impacts.

Reconciliation of Non-GAAP Financial Measures

We focus on Contribution Margin and Adjusted EBITDA as measures of our operating performance. Contribution Margin and Adjusted EBITDA presented in this Management Discussion and Analysis have not been prepared in accordance with US-GAAP or the accounting standards of any other jurisdiction. Other companies may use similar non-GAAP financial measures that are calculated differently from the way we calculate these measures. Accordingly, our Contribution Margin and Adjusted EBITDA may not be comparable to similar measures used by other companies and should not be considered in isolation, or construed as substitutes for, revenue, consolidated net income for the period, income from operations (EBIT), gross profit and other GAAP measures as indicators of our results of operations in accordance with US-GAAP.

Contribution Margin and Contribution Margin per Metric Ton (Non-GAAP Financial Measures)

We calculate Contribution Margin by subtracting variable costs (such as raw materials, packaging, utilities and distribution costs) from our revenue. We believe that Contribution Margin is useful because we see this measure as indicating the portion of revenue that is not consumed by such variable costs and therefore contributes to the coverage of all other costs and profits. The following table reconciles Contribution Margin and Contribution Margin per Metric Ton to revenue:

	Year Ended December 31,		
	2018	2017	2016
		unaudited	
	(in millions, unless otherwise indicated)		
Revenue (1)	\$ 1,578.2	\$ 1,328.3	\$ 1,139.3
Variable costs (2)	(1,000.6)	(803.8)	(620.0)
Contribution margin	\$ 577.6	\$ 524.5	\$ 519.3

Volume (in kmt)		1,084.7		1,087.4		1,127.9
Contribution margin per metric ton	\$	532.6	\$	482.4	\$	460.5

(1) Separate line item in audited Financial Statements.

(2) Includes costs such as raw materials, packaging, utilities and distribution.

Adjusted EBITDA (Non-GAAP Financial Measure)

We define Adjusted EBITDA as income from operations (EBIT) before depreciation and amortization, adjusted for acquisition related expenses, restructuring expenses, consulting fees related to Group strategy, share of profit or loss of joint venture and certain other items. Adjusted EBITDA is defined similarly in our Credit Agreements. Adjusted EBITDA is used by our management to evaluate our operating performance and make decisions regarding allocation of capital because it excludes the effects of items that have less bearing on the performance of our underlying core business.

Our use of Adjusted EBITDA has limitations as an analytical tool, and should not be considered in isolation or as a substitute for analysis of our financial results as reported under US-GAAP. Some of these limitations are: (a) although Adjusted EBITDA excludes the impact of depreciation and amortization, the assets being depreciated and amortized may have to be replaced in the future and thus the cost of replacing assets or acquiring new assets, which will affect our operating results over time, is not reflected; (b) Adjusted EBITDA does not reflect interest or certain other costs that we will continue to incur over time and will adversely affect our profit or loss, which is the ultimate measure of our financial performance and (c) other companies, including companies in our industry, may calculate Adjusted EBITDA or similarly titled measures differently. Because of these and other limitations, Adjusted EBITDA should be considered alongside our other US-GAAP-based financial performance measures, such as revenue, consolidated net income for the period or income from operations (EBIT). The following table presents a reconciliation of Adjusted EBITDA to consolidated net income for each of the periods indicated:

	Year Ended December 31,		
	2018	2017	2016
	(in \$ million)		
Net income	\$ 121.3	\$ 64.9	\$ 49.5
Add back income tax expense	46.9	19.7	24.4
Add back equity in earnings of affiliated companies, net of tax	(0.6)	(0.5)	(0.5)
Income from operations before income taxes and equity in earnings of affiliated companies	167.7	84.0	73.4
Add back interest and other financial expense, net	28.6	44.1	43.3
Reclassification of actuarial losses from AOCI	—	9.7	0.1
Income from operations	196.3	137.9	116.8
Add back depreciation, amortization and impairment of intangible assets and property, plant and equipment	98.2	98.4	97.1
EBITDA	294.5	236.2	214.0
Equity in earnings of affiliated companies, net of tax	0.6	0.5	0.5
Restructuring (income) / expenses ⁽¹⁾	(24.6)	6.5	19.8
Consulting fees related to Group strategy ⁽²⁾	4.8	2.8	2.8
Long term incentive plan	13.9	8.8	4.0
Other Adjustments ⁽³⁾	5.0	2.1	5.7
Adjusted EBITDA	\$ 294.1	\$ 257.0	\$ 246.7
<i>Thereof Adjusted EBITDA Specialty Carbon Black</i>	<i>\$ 149.3</i>	<i>\$ 145.5</i>	<i>\$ 151.5</i>
<i>Thereof Adjusted EBITDA Rubber Carbon Black</i>	<i>\$ 144.9</i>	<i>\$ 111.5</i>	<i>\$ 95.2</i>

(1) Restructuring income for the period ended December 31, 2018 are related to our strategic realignment of our worldwide Rubber footprint, and in particular reflects the gain recognized in connection with the land sale in South Korea exceeding the associated cessation costs. Restructuring expenses for the period ended December 31, 2017 and 2016 relate to the worldwide Rubber footprint initiative. In the period ended December 31, 2016 expenses are in particular associated with expenses related to our decision to cease production by December 31, 2016 of the plant in Ambès, France. These expenses comprise personnel related costs of \$6.8 million and demolishing, site remediation and securing as well as accrued other expenses for the cessation of \$12.9 million.

(2) Consulting fees related to the Orion strategy include external consulting for establishing and executing Group strategies relating to Rubber footprint realignment, conversion to US dollar and US GAAP, as well as costs relating to our assessment of feasibility for inclusion in certain US indice

(3) Other adjustments (from items with less bearing on the underlying performance of the Company's core business) in the period ended December 31, 2018 primarily relate to costs related in particular to license fees required for certain innovative technologies to meet the EPA requirements of \$1.2 million and other EPA related costs of \$1.4 million. Other adjustments in the period ended December 31, 2017 primarily relate to costs associated with our EPA enforcement action of \$2.4 million, costs to remediate damages incurred by hurricane Harvey of \$1.4 million and costs associate with the secondary offering of

our shares, offset by \$1.4 million of reimbursements of reassessed real estate transfer taxes. Other adjustments for the period ended December 31, 2016 primarily relate to cost of \$4.6 million associated with our EPA enforcement action (including accrued expenses for penalties and mitigation projects).

A. Operating Results

2018 Compared to 2017

The table below presents our historical results derived from our consolidated financial statements for the periods indicated.

Statement of operations data	Year Ended December 31,	
	2018	2017
	(In millions)	
Net sales	\$ 1,578.2	\$ 1,328.3
Cost of sales	1,148.2	950.7
Gross profit	430.0	377.6
Selling, general and administrative expenses	231.9	207.5
Research and development costs	20.3	18.2
Other expenses, net	6.1	7.6
Restructuring income	40.3	—
Restructuring expenses	15.6	6.5
Income from operations	196.3	137.9
Interest and other financial expense, net	28.6	44.1
Reclassification of actuarial losses from AOCI	—	9.7
Income from operations before income taxes and equity in earnings of affiliated companies	167.7	84.0
Income tax expense	46.9	19.7
Equity in earnings of affiliated companies, net of tax	0.6	0.5
Net income	\$ 121.3	\$ 64.9

Net sales

Revenue increased overall by \$ 249.9 million, or 18.8% , from \$ 1,328.3 million (\$ 478.9 million in our Specialty Carbon Black segment and \$ 849.4 million in our Rubber Carbon Black segment) in 2017 to \$ 1,578.2 million (\$ 545.4 million in our Specialty Carbon Black segment and \$ 1,032.8 million in our Rubber Carbon Black segment) in 2018 .

This revenue increase was primarily due to contractually indexed sales price increases in our Rubber Carbon Black segment resulting from the pass through of higher feedstock costs to customers with agreements that link price to the cost of feedstock and certain base price increases product mix, and foreign exchange translation effects, offset partly by lower volumes.

Volume decreased by 2.7 kmt, or 0.3% , from 1,087.4 kmt (261.4 kmt in our Specialty Carbon Black segment and 826.0 kmt in our Rubber Carbon Black segment) in 2017 to 1,084.7 kmt (262.4 kmt in our Specialty Carbon Black segment and 822.3 kmt in our Rubber Carbon Black segment) in 2018 . This decrease largely reflected reduced Rubber volumes in South Korea due to the close of the plant in Seoul and both slowing demand and significant destocking of inventories in China. The decrease in volume contributed a decrease of revenue of 0.2%, or \$3.0 million. Volume in our Specialty Carbon Black segment increased and contributed an increase in revenue of 0.1%, or \$1.6 million, while decreased volumes in our Rubber Carbon Black segment decreased revenue by 0.3%, or \$4.6 million in 2018 compared to 2017 . The volume related decrease of revenue was offset mainly by positive impacts on revenue in 2018 compared to 2017 resulting from oil price changes of 11.2%, or \$148.2 million, and increases of certain base prices of 3.3%, or \$44.2 million. Foreign exchange translation effects had a positive impact of \$24.6 million on our revenues. This volume decrease was primarily due to lower volumes following the closure of one of our plants in South Korea as well as softening demand in China.

Cost of sales and Gross profit

Cost of sales increased by \$ 197.5 million, or 20.8% , from \$ 950.7 million (\$ 289.5 million in our Specialty Carbon Black segment and \$ 661.2 million in our Rubber Carbon Black segment) in 2017 to \$ 1,148.2 million (\$ 346.0 million in our Specialty Carbon Black segment and \$ 802.2 million in our Rubber Carbon Black segment) in 2018 . The 0.3% decrease in volume in 2018 compared to 2017 resulted in a decrease of cost of sales of 0.3%, or \$2.5 million (0.1%, or \$0.8 million, increase in our Specialty Carbon Black segment and 0.3%, or \$3.2 million, decrease in our Rubber Carbon Black segment) in 2018 compared to 2017 . This volume-related decrease of cost of sales as well as a decrease associated with non-formula customers' feedstock costs was offset by higher oil prices of 13.5%, or \$128.5 million and unfavorable product mix effects of \$2.5 million, while other impacts were not material.

Revenues of our Specialty Carbon Black segment increased by 13.9% in 2018 compared to 2017 . The cost of sales in this segment increased by 19.6% . This increase in cost of sales reflects the effects of the increase in carbon black oil prices and timing impacts associated with higher oil prices and higher regional feedstock mix costs.

Higher overall revenue as a result of the above mentioned impacts was sufficient to offset the increased cost of sales. Gross profit increased by \$ 52.4 million, or 13.9% , from \$ 377.6 million (\$ 189.4 million in our Specialty Carbon Black segment and \$ 188.2 million in our Rubber Carbon Black segment) in 2017 to \$ 430.0 million (\$ 199.4 million in our Specialty Carbon Black segment and \$ 230.6 million in our Rubber Carbon Black segment) in 2018 for reasons described above.

Selling, general and administrative expenses

Selling, general and administrative expenses increased by \$24.4 million , or 11.8% , from \$207.5 million in 2017 to \$231.9 million in 2018 , despite a decrease in volume from 1,087.4 kmt in 2017 to 1,084.7 kmt in 2018 , mainly as a result of significant increases in freight costs, long-term incentive plan costs, foreign exchange impacts and consulting fees among other smaller items.

Research and development costs

R&D expenses increased by \$ 2.2 million, from \$ 18.2 million in 2017 to \$ 20.3 million in 2018 . This increase is primarily related to the timing of expenditures for individual development of programs, as well as research on installation of equipment to reduce emission levels in connection with the recent EPA consent decree.

Other expenses, net

Other expenses, net which comprises other operating income and other operating expenses amounted to \$ 6.1 million in 2018 and \$ 7.6 million in 2017 .

In 2018 , other operating income amounted to \$ 5.0 million and included, among other things, \$ 1.7 million income from the reversal of provisions. Other operating expenses in 2018 amounted to \$11.1 million, comprising primarily \$ 4.8 million consulting fees related to group strategy and license fees required for certain innovative technologies to meet the EPA requirements of \$1.2 million and other EPA related costs of \$1.9 million.

In 2017 , other operating income amounted to \$5.0 million and included, among other things, \$1.5 million of income from the reversal of provisions and \$1.4 million of reimbursement of real estate transfer taxes. Other operating expenses in 2017 amounted to \$12.6 million, comprising primarily \$2.8 million consulting fees related to group strategy, \$2.4 million expenses related to the EPA enforcement action, \$1.4 million costs to remediate damages incurred by hurricane Harvey as well as cost associated with our secondary public offerings.

Restructuring expenses/(income), net

Restructuring expenses/(income), net, comprise restructuring income of \$40.3 million and restructuring expenses of \$15.6 million. As part of the strategic repositioning of the Rubber business footprint, we consolidated our two production network in South Korea, ceased production at our Seoul plant and sold the land. Proceeds from the land sale exceeded the associated closing and remediation cost and we recorded a restructuring gain of \$ 24.6 million in 2018 , following associated Rubber footprint restructuring expenses of \$6.5 million in 2017 .

Income from operations

Income from operations increased by \$58.4 million, or 42.4% , from \$ 137.9 million in 2017 to \$ 196.3 million in 2018 mainly as a result of increased Gross Profit and positive one-time proceeds from our land sale in South Korea, offset by increased selling, general and administrative expenses.

Interest and other financial expense, net

Interest and other financial expense, net comprises interest and other financial income and interest and other financial expenses. Interest and other financial expense, net amounted to \$ 28.6 million in 2018 compared to \$ 44.1 million in 2017 .

Interest and other financial expense, net in 2018 includes, among others, \$ 20.6 million of regular interest expenses, \$ 2.5 million of amortization of capitalized transaction costs and \$ 1.3 million net expenses of foreign currency revaluation effects.

Interest and other financial expense, net in 2017 includes, \$ 22.8 million of regular interest expenses, \$ 6.9 million of amortization of capitalized transaction costs and \$ 6.3 million net expenses of foreign currency revaluation effects.

Income from operations before income taxes and equity in earnings of affiliated companies

Income from operations before income taxes and equity in earnings of affiliated companies increased by \$83.6 million , or 99.5% , from \$84.0 million in 2017 to \$167.7 million in 2018 , mainly driven by the increase in gross profit and one-time effects related to the land sale in South Korea.

Income tax expense

Income taxes amounted to \$ 46.9 million in 2018 compared to \$ 19.7 million in 2017 , as a result of increased income before taxes.

In 2018 , the effective tax rate of 27.9% deviated from the expected group rate of 32.0% in particular due to the one-time effect associated to low taxation on land sale proceeds in South Korea as well as reduced U.S. corporate income taxes. For details regarding this deviation see Note P. Income Taxes to the audited consolidated financial statements.

In 2017 , the effective tax rate of 23.3% deviated from the expected group rate of 32.0% in particular due to the one-time effect associated with the U.S. tax reform providing a one-time gain from reduction in deferred tax liabilities of \$8.8 million. For details regarding this deviation see Note P. Income Taxes to the audited consolidated financial statements.

Equity in earnings of affiliated companies, net of tax

Equity in earnings of affiliated companies represents the equity income from our German JV, which was comparable in 2018 and 2017 .

Net income

Our net income in 2018 amounted to \$ 121.3 million , an improvement of \$ 56.5 million , reflecting all the factors described above.

Contribution Margin and Contribution Margin per Metric Ton (Non-GAAP Financial Measures)

Contribution Margin increased by \$ 53.1 million , or 10.1% , from \$ 524.5 million in 2017 to \$ 577.6 million in 2018 , primarily due to changes in oil price impacts, base price increases and our product mix. Contribution Margin per Metric Ton increased by 10.4% , from \$ 482.4 per Metric Ton in 2017 to \$ 532.6 per Metric Ton in 2018 , reflecting higher proportional Specialty Carbon Black profits in 2018 compared to 2017 .

Adjusted EBITDA (Non-GAAP Financial Measure)

Adjusted EBITDA increased by \$ 37.2 million, or 14.5% , from \$ 257.0 million in 2017 to \$ 294.1 million in 2018 .

2017 Compared to 2016

The table below presents our historical results derived from our consolidated financial statements for the periods indicated.

Statement of operations data	Year Ended December 31,	
	2017	2016
	(In millions)	
Net sales	\$ 1,328.3	\$ 1,139.3
Cost of sales	950.7	764.9
Gross profit	377.6	374.4
Selling, general and administrative expenses	207.5	202.5
Research and development costs	18.2	16.1
Other expenses, net	7.6	9.0
Restructuring income	—	—
Restructuring expenses	6.5	30.0
Income from operations	137.9	116.8
Interest and other financial expense, net	44.1	43.3
Reclassification of actuarial losses from AOCI	9.7	0.1
Income from operations before income taxes and equity in earnings of affiliated companies	84.0	73.4
Income tax expense	19.7	24.4
Equity in earnings of affiliated companies, net of tax	0.5	0.5
Net income	\$ 64.9	\$ 49.5

Net sales

Revenue increased overall by \$ 189.0 million, or 16.6% , from \$ 1,139.3 million (\$ 427.0 million in our Specialty Carbon Black segment and \$ 712.3 million in our Rubber Carbon Black segment) in 2016 to \$ 1,328.3 million (\$ 478.9 million in our Specialty Carbon Black segment and \$ 849.4 million in our Rubber Carbon Black segment) in 2017 .

This revenue increase was primarily due to contractually indexed sales price increases in our Rubber Carbon Black segment resulting from the pass through of higher feedstock costs to customers with agreements that link price to the cost of feedstock and certain base price increases, offset partly by impacts resulting from a different product mix, by lower volumes and foreign exchange rate translation impacts.

Volume decreased by 40.5 kmt, or 3.6% , from 1,127.9 kmt (241.8 kmt in our Specialty Carbon Black segment and 886.1 kmt in our Rubber Carbon Black segment) in 2016 to 1,087.4 kmt (261.4 kmt in our Specialty Carbon Black segment and 826.0 kmt in our Rubber Carbon Black segment) in 2017 . This decrease is mainly a result of a decrease in volumes sold of Rubber Carbon Black products in all regions except South America and China and as a result of the closure of our Rubber standard grade production capacity in France and the U.S. and the ongoing conversion of capacity in South Korea. The decrease in our Rubber Carbon Black products was partly offset by increased volumes for Specialty Carbon Black products increased in all regions. The decrease in volume contributed a decrease of revenue of 1.1%, or \$12.2 million (Volume in our Specialty Carbon Black segment increased and contributed an increase in revenue of 8.2%, or \$34.8 million, while decreased volumes in our Rubber Carbon Black segment decreased revenue by 6.6%, or \$47.0 million) in 2017 compared to 2016 . The volume related decrease of revenue as well as negative impacts from our product mix of \$13.5 million was offset mainly by positive impacts on revenue in 2017 compared to 2016 resulting from oil price changes of 14.9%, or \$169.3 million, and increases of certain base prices of 2.0%, or \$23.1 million. Foreign exchange translation effects had a positive impact of \$22.3 million on our revenues.

Cost of sales and Gross profit

Cost of sales increased by \$ 185.8 million, or 24.3% , from \$ 764.9 million (\$ 230.4 million in our Specialty Carbon Black segment and \$ 534.4 million in our Rubber Carbon Black segment) in 2016 to \$ 950.7 million (\$ 289.5 million in our Specialty Carbon Black segment and \$ 661.2 million in our Rubber Carbon Black segment) in 2017 . The 3.6% decrease in volume in 2017 compared to 2016 resulted in a decrease of cost of sales of 2.6%, or \$15.9 million (8.2%, or \$13.6 million, increase in our Specialty Carbon Black segment and 6.5%, or \$29.6 million, decrease in our Rubber Carbon Black segment) in 2017 compared to 2016 . This volume-related decrease of cost of sales as well as a decrease

associated with a change in our product mix was offset by higher oil prices of 30.2%, or \$187.0 million and unfavorable foreign exchange translation effects of \$11.5 million, with other impacts on cost of sales almost netting out each other.

Revenues of our Specialty Carbon Black segment increased by 12.2% in 2017 compared to 2016 . The cost of sales in this segment increased by 25.6%. This increase in cost of sales reflects the timing impact of price increases for non-indexed customers during rising carbon black oil prices as well higher depreciation charges. The percentage increase in cost of sales of our Rubber Carbon Black segment (23.7%) was higher than the percentage increase in revenue (19.3%) of that segment. This increase in cost of sales reflects the effects of the increase in carbon black oil prices and timing impacts associated with higher oil prices, higher regional feedstock mix costs as well as higher depreciation charges in part due to hurricane Harvey impairments and accelerated depreciation at our Bupyeong, South Korea plant. These negative impacts were partly offset by lower cost of sales due to lower volumes in the Rubber segment.

Higher overall revenue as a result of the above mentioned impacts was sufficient to offset the increased cost of sales. Gross profit increased by \$ 3.2 million, or 0.8% , from \$ 374.4 million (\$ 196.6 million in our Specialty Carbon Black segment and \$ 177.8 million in our Rubber Carbon Black segment) in 2016 to \$ 377.6 million (\$ 189.4 million in our Specialty Carbon Black segment and \$ 188.2 million in our Rubber Carbon Black segment) in 2017 for reasons described above.

Selling, general and administrative expenses

Selling, general and administrative expenses increased by \$ 5.0 million, or 2.5% , from \$ 202.5 million in 2016 to \$ 207.5 million in 2017 , despite a decrease in volume from 1,127.9 kmt in 2016 to 1,087.4 kmt in 2017 in part due to salary increases.

Research and development costs

R&D expenses increased by \$ 2.1 million, from \$ 16.1 million in 2016 to \$ 18.2 million in 2017 . This increase is primarily related to the timing of expenditures for individual development of programs, as well as research on installation of equipment to reduce emission levels in connection with the recent EPA consent decree.

Other expenses, net

Other expenses, net which comprises Other operating income and Other operating expenses amounted to \$ 7.6 million in 2017 and \$ 9.0 million in 2016 .

In 2017 , other operating income amounted to \$5.0 million and included, among other things, \$1.5 million of income from the reversal of provisions and \$1.4 million of reimbursement of real estate transfer taxes. Other operating expenses in 2017 amounted to \$12.6 million, comprising primarily \$2.8 million consulting fees related to group strategy, \$2.4 million expenses related to the EPA enforcement action, \$1.4 million costs to remediate damages incurred by hurricane Harvey as well as cost associated with our secondary public offerings.

In 2016, other operating income amounted to \$6.3 million and included, among other things, \$1.3 million of income from the reversal of provisions. Other operating expenses in 2016 amounted to \$15.3 million, comprising primarily \$4.6 million of expenses related to the EPA enforcement action (including accrued expenses for penalties and mitigation projects), \$2.8 million related to group strategy consulting fees, \$1.1 million related to loss on disposal of assets and \$0.9 million of currency translation effects.

Restructuring expenses/(income), net

As part of the strategic repositioning of the Rubber business footprint, we concluded consultations with local works council at our Ambès (France) plant to implement a restructuring and down staffing with a cessation of production at the site at the end of 2016. Expenses relating to this restructuring activity totaled \$ 30.0 million in 2016 comprising cash costs of \$ 17.8 million and non-cash items of \$ 12.2 million (of which \$ 10.3 million related to impairments of fixed assets). Further activities in repositioning the Rubber footprint resulted in expenses of \$6.5 million in 2017 mainly due to our efforts to consolidate our two Korean production sites. For details regarding restructuring expenses see Note M. to the audited consolidated financial statements.

Income from operations

Income from operations increased by \$ 21.1 million, or 18.0% , from \$ 116.8 million in 2016 to \$ 137.9 million in 2017 , mainly driven by our restructuring expenses relating to the strategic repositioning of the Rubber business footprint.

Interest and other financial expense, net

Interest and other financial expense, net comprises interest and other financial income and interest and other financial expenses. Interest and other financial expense, net amounted to \$ 44.1 million in 2017 compared to \$ 43.3 million in 2016 .

Interest and other financial expense, net in 2017 includes, \$ 22.8 million of regular interest expenses, \$ 6.9 million of amortization of capitalized transaction costs and \$ 6.3 million net expenses of foreign currency revaluation effects.

Interest and other financial expense, net in 2016 includes, among others, \$ 33.0 million regular interest expenses, \$ 6.1 million of amortization of capitalized transaction costs, interest expenses related to pension obligations of \$1.7 million and a net income of foreign currency exchange rate revaluation effects of \$ 1.6 million .

Income from operations before income taxes and equity in earnings of affiliated companies

Our profit before taxes in 2017 was \$ 84.0 million, reflecting an improvement of \$ 10.6 million from a profit before taxes of \$ 73.4 million in 2016 , despite the effects of expenses related to the strategic repositioning of the Rubber business footprint.

Income tax expense

Income taxes amounted to \$ 19.7 million in 2017 compared to \$ 24.4 million in 2016 . While the profit before taxes increased significantly our income taxes were reduced by a one-time effect of \$8.8 million from the re-measurement of our net deferred tax liabilities in the United States following the Tax Cuts and Jobs Act reform enacted as of December 22, 2017.

In 2017 , the effective tax rate of 23.3% deviated from the expected group rate of 32.0% in particular due to the one-time effect associated with the U.S. tax reform. For details regarding this deviation see Note P. Income Taxes to the audited consolidated financial statements.

In 2016 , the effective tax rate of 33.0% deviated from the expected group rate of 32.0%. For details regarding this deviation see Note P. Income Taxes to the audited consolidated financial statements.

Equity in earnings of affiliated companies, net of tax

Equity in earnings of affiliated companies represents the equity income from our German JV, which was comparable in 2017 and 2016 .

Net income

Our profit for the period in 2017 amounted to \$ 64.9 million, an improvement of \$ 15.4 million compared to 2016 , reflecting all the factors described above.

Contribution Margin and Contribution Margin per Metric Ton (Non-GAAP Financial Measures)

Contribution Margin increased by \$ 5.2 million, or 1.0% , from \$ 519.3 million in 2016 to \$ 524.5 million in 2017 , primarily due to increased volumes, some benefit from sales price changes and the effect of the consolidation of OECQ. As a result, Contribution Margin per Metric Ton increased by 4.8% , from \$ 460.5 per Metric Ton in 2016 to \$ 482.4 per Metric Ton in 2017 .

Adjusted EBITDA (Non-GAAP Financial Measure)

Adjusted EBITDA increased by \$ 10.3 million, or 4.2% , from \$ 246.7 million in 2016 to \$ 257.0 million in 2017 .

Segment Discussion

Our business operations are divided into two operating segments: the Specialty Carbon Black segment and the Rubber Carbon Black segment. We use segment revenue, segment gross profit, segment volume, Segment Adjusted EBITDA and Segment Adjusted EBITDA Margin as measures of segment performance and profitability.

The table below presents our segment results derived from our audited consolidated financial statements for 2018, 2017 and 2016.

	Year Ended December 31,		
	2018	2017	2016
	(In millions, unless otherwise indicated)		
Specialty Carbon Black			
Revenue	\$ 545.4	\$ 478.9	\$ 427.0
Cost of sales	346.0	289.5	230.4
Gross profit	\$ 199.4	\$ 189.4	\$ 196.6
Volume (kmt) ⁽¹⁾	262.4	261.4	241.8
Adjusted EBITDA	\$ 149.3	\$ 145.5	\$ 151.5
Adjusted EBITDA Margin (%) ⁽²⁾	27.4	30.4	35.5
Rubber Carbon Black			
Revenue	\$ 1,032.8	\$ 849.4	\$ 712.3
Cost of sales	802.2	661.2	534.4
Gross profit	\$ 230.6	\$ 188.2	\$ 177.8
Volume (kmt) ⁽¹⁾	822.3	826.0	886.1
Adjusted EBITDA	\$ 144.9	\$ 111.5	\$ 95.2
Adjusted EBITDA Margin (%) ⁽²⁾	14.0	13.1	13.4

(1) Unaudited.

(2) Defined as Adjusted EBITDA divided by revenue.

Specialty Carbon Black

2018 Compared to 2017

Revenue of the Specialty Carbon Black segment increased by \$ 66.5 million, or 13.9% , from \$ 478.9 million in 2017 to \$ 545.4 million in 2018 , primarily due to price increases for non-formula customers, pass through of higher feedstock costs and base price increases and foreign exchange rate translation effects.

Volume of the Specialty Carbon Black segment increased by 1.0 kmt, or 0.4% , from 261.4 kmt in 2017 to 262.4 kmt in 2018 , as a result of increased volumes in particular in China somewhat offset by lower volumes primarily in the United States.

Gross profit of the Specialty Carbon Black segment increased by \$ 10.0 million, or 5.2% , from \$ 189.4 million in 2017 to \$ 199.4 million in 2018 , mainly as a result of foreign exchange rate translation effects and increased cogeneration income.

Adjusted EBITDA of the Specialty Carbon Black segment increased by \$ 3.8 million, or 2.6% , from \$ 145.5 million in 2017 to \$ 149.3 million in 2018 , as a result of increase in gross profit offset by increased salary expenses and unfavorable foreign exchange rate translation impacts.

2017 Compared to 2016

Revenue of the Specialty Carbon Black segment increased by \$ 51.9 million, or 12.2% , from \$ 427.0 million in 2016 to \$ 478.9 million in 2017 , primarily due to increased volumes, pass through of higher feedstock costs and base price increases, offset by impacts from changes in our product mix.

Volume of the Specialty Carbon Black segment increased by 19.5 kmt, or 8.1% , from 241.8 kmt in 2016 to 261.4 kmt in 2017 , as a result of increased volumes in all regions, in particular from our European and North American facilities.

Gross profit of the Specialty Carbon Black segment decreased by \$ 7.2 million, or 3.6% , from \$ 196.6 million in 2016 to \$ 189.4 million in 2017 , mainly due to a lag in recovering higher feedstock costs as well as higher depreciation charges more than offsetting the increase in revenue from increased volumes.

Adjusted EBITDA of the Specialty Carbon Black segment decreased by \$ 6.0 million, or 4.0% , from \$ 151.5 million in 2016 to \$ 145.5 million in 2017 , as a result of decrease in gross profit (excluding the impact of increased depreciation on gross profit).

Rubber Carbon Black

2018 Compared to 2017

Revenue of the Rubber Carbon Black segment increased by \$ 183.4 million, or 21.6% , from \$ 849.4 million in 2017 to \$ 1,032.8 million in 2018 , primarily due to an increase in contractually indexed sales prices resulting from the pass through of higher feedstock costs, favorable product mix effects and certain base price increases in the 2018 agreements, offset by lower volumes.

Volume of the Rubber Carbon Black segment decreased by 3.7 kmt, or 0.5% , from 826.0 kmt in 2017 to 822.3 kmt in 2018 mainly due to conversion of capacity to Specialty Carbon Black or technical rubber grades as well as ceased production in one of our plants in South Korea.

Gross profit of the Rubber Carbon Black segment increased by \$ 42.4 million, or 22.6% , from \$ 188.2 million in 2017 to \$ 230.6 million in 2018 , with favorable effects resulting from oil price changes, base price increases and a favorable product mix somewhat offset by unfavorable feedstock differentials and weakening in some efficiency programs.

Adjusted EBITDA of the Rubber Carbon Black segment increased by \$ 33.4 million, or 30.0% , from \$ 111.5 million in 2017 to \$ 144.9 million in 2018 , due to development of gross profit, offset by increased salaries and other costs.

2017 Compared to 2016

Revenue of the Rubber Carbon Black segment increased by \$ 137.1 million, or 19.3% , from \$ 712.3 million in 2016 to \$ 849.4 million in 2017 , primarily due to an increase in contractually indexed sales prices resulting from the pass through of lower feedstock costs and certain base price increases in the 2017 agreements, offset primarily by impacts associated with decreased volumes.

Volume of the Rubber Carbon Black segment decreased by 60.1 kmt, or 6.8% , from 886.1 kmt in 2016 to 826.0 kmt in 2017 mainly due to weaker demand in in all regions except for South America and China and as a result of the closure of our Rubber standard grade capacity in France and the ongoing conversion of capacity in South Korea.

Gross profit of the Rubber Carbon Black segment increased by \$ 10.4 million, or 5.8% , from \$ 177.8 million in 2016 to \$ 188.2 million in 2017 , with favorable effects resulting from cost reductions mainly related to the closure of our Ambès, France, plant by end of 2016 as well as the impact of base price increases on our revenues.

Adjusted EBITDA of the Rubber Carbon Black segment increased by \$ 16.3 million, or 17.1% , from \$ 95.2 million in 2016 to \$ 111.5 million in 2017 , due to development of gross profit and the impact of cost savings from effects related to our Rubber footprint restructuring efforts initiated in 2016 on sales, marketing and general administrative expenses.

B. Liquidity and Capital Resources

Historical Cash Flows

The tables below present our historical cash flows derived from our audited consolidated financial statements for 2018, 2017 and 2016.

	Year Ended December 31,		
	2018	2017	2016
	(In millions)		
Net cash provided by operating activities	\$ 122.0	\$ 147.7	\$ 177.4
Net cash used in investing activities	(88.1)	(90.3)	(68.5)
Net cash used in financing activities	(43.8)	(68.5)	(101.8)
Cash, cash equivalents and restricted cash at the end of the period	61.6	75.2	80.5
Less restricted cash at the end of the period	4.6	2.9	2.6
Cash and cash equivalents at the end of the period	57.0	72.3	77.9

2018

Net cash provided by operating activities in 2018 amounted to \$ 122.0 million and consisted of a consolidated profit for the period of \$ 121.3 million, adjustments primarily for depreciation of \$ 98.2 million and cash outflows from Net Working Capital of \$ 65.6 million.

Net cash used in investing activities in 2018 amounted to \$ 88.1 million. It comprises proceeds from our land sale in Korea and \$36.6 million were used in the acquisition of the SN2A and the remaining amount for capital expenditure projects mainly related to preservation and overhaul projects as well as expenditures associated with our efforts to consolidate our to productions plants in South Korea.

Net cash used in financing activities in 2018 amounted to \$ 43.8 million. \$ 26.4 million were used for repayments of current borrowing as well as \$ 8.3 million regular debt repayment and \$ 4.9 million used for share repurchases. In addition \$ 47.7 million were used for dividend payments. Cash inflow of \$ 49.0 million are related to local bank loan facilities.

2017

Net cash provided by operating activities in 2017 amounted to \$ 147.7 million and consisted of a consolidated profit for the period of \$ 64.9 million, adjustments primarily for depreciation of \$ 98.4 million, cash outflows from changes in operating assets and liabilities of \$ 21.6 million including changes in Net Working Capital of \$ 24.0 million.

Net cash used in investing activities in 2017 amounted to \$ 90.3 million for capital expenditure projects mainly related to preservation and overhaul projects as well as expenditures associated with our efforts to consolidate our production plants in South Korea.

Net cash used in financing activities in 2017 amounted to \$ 68.5 million. \$ 28.9 million were used for repayments of borrowing, of which \$20.7 million were paid as voluntary redemption of our Term Loan. In addition \$ 45.7 million were used for dividend payments. Cash inflow of \$ 11.7 million are related to a local bank loan facility.

2016

Net cash provided by operating activities in 2016 amounted to \$ 177.4 million and consisted of a consolidated profit for the period of \$ 49.5 million, adjustments primarily for depreciation of \$ 88.1 million impairment of assets in closed french factory of \$ 9.0 million cash outflows from changes in operating assets and liabilities of \$ 13.1 million including changes in Net Working Capital of \$ 6.9 million.

Net cash used in investing activities in 2016 amounted to \$ 68.5 million for capital expenditure projects mainly related to preservation and overhaul projects offset by the receipt of cash indemnifications of \$2.4 million in connection with the acquisition of OECQ (cash outflows related to OECQ in 2015 were \$ 31.0 million of cash paid less acquired cash of \$ 5.2 million).

Cash outflows from financing activities in 2016 amounted to \$ 101.8 million. \$ 51.8 million were used for repayments of borrowing, of which \$43.8 million were paid as voluntary redemption of our Term Loan. In addition, \$ 44.1 million were used for dividend payments as well as \$ 3.8 million for share repurchases.

Sources of Liquidity

Our principal sources of liquidity are the net cash generated from our operating activities, as well as available cash balances, amounts available under our multicurrency, senior secured Revolving Credit Facility providing a line of credit of up to €175 million (USD equivalent: \$ 200.4 million) and to a certain extent our subsidiaries facilities with local financial institutions. We cannot guarantee that our cash position and cash generated from operations will be adequate to support the further growth of our business. Our ability to generate cash from operations depends on our future operating performance, which in turn is dependent on general economic, financial, competitive, market, regulatory and other conditions and factors, many of which are beyond our control. See “*Item 3. Key Information –D. Risk Factors.*” In addition, there are some statutory restrictions on the ability of our subsidiaries to transfer funds to us (e.g., legislation on permitted dividend payments or currency transfers), although we believe that we have structured our treasury operations to minimize the impact of such statutory restrictions on our operations. We intend to use cash from operating activities, as well as cash balances, to finance our capital needs. Based on our current operating performance and liquidity, we believe that cash provided by our operating activities and available cash balances will be sufficient to cover our Net Working Capital requirements, Capital Expenditures, interest payments and scheduled debt repayments in the next year.

Net Working Capital (Non-GAAP Financial Measure)

We define Net Working Capital as the total of inventories and current trade receivables, less trade payables. Net Working Capital is a non-GAAP financial measure, and other companies may use a similarly titled financial measure that is calculated differently from the way we calculate Net Working Capital. The following tables set forth the principal components of our Net Working Capital as of the dates indicated.

	Year Ended December 31,		
	2018	2017	2016
	(In millions)		
Inventories	\$ 183.6	\$ 159.3	\$ 120.5
Trade receivables	262.8	234.3	200.8
Trade payables	163.6	169.6	129.6
Net working capital	\$ 282.9	\$ 224.0	\$ 191.8

Our Net Working Capital position can vary significantly from month to month, mainly due to fluctuations in oil prices and receipts of carbon black oil shipments. In general, increases in the cost of raw materials lead to an increase in our Net Working Capital requirements, as our inventories and trade receivables increase as a result of higher carbon black oil prices and related sales levels. These increases are partially offset by related increases in trade payables. Due to the quantity of carbon black oil that we typically keep in stock, such increases in Net Working Capital occur gradually over a period of two to three months. Conversely, decreases in the cost of raw materials lead to a decrease in our Net Working Capital requirements over the same period of time. Based on 2018 Net Working Capital requirements, we estimate that a \$10 per barrel movement in the Brent crude oil price correlates to a movement in our Net Working Capital of approximately \$23 to \$26 million within about a two to three month period. In times of relatively stable oil prices, the effects on our Net Working Capital levels are less significant and Net Working Capital swings increase in an environment of high price volatility.

Our Net Working Capital increased from \$ 224.0 million as of December 31, 2017 to \$ 282.9 million as of December 31, 2018 primarily due to the impact from higher feedstock cost related to increased oil-prices seen in the last quarter of 2018.

Capital Expenditures (Non-GAAP Financial Measure)

We define Capital Expenditures as cash paid for the acquisition of intangible assets and property, plant and equipment as shown in the consolidated financial statements.

Our Capital Expenditures amounted to \$70.9 million in 2016, \$90.3 million in 2017 and \$116.2 million in 2018. We plan to finance our Capital Expenditures with cash generated by our operating activities. With the exception of required expenditures in association with our recent settlement with the EPA we currently do not have any material commitments to make Capital Expenditures, and do not plan to make Capital Expenditures, outside the ordinary course of our business. See note Q. Commitments and Contingencies for further details regarding the EPA settlement.

Capital Expenditures in 2018 amounted to \$116.2 million and were mainly composed of preservation and overhaul projects as well as expenditures associated with our efforts to consolidate our production plants in South Korea and commencing investments required to address the EPA requirements in the United States.

Capital Expenditures in 2017 amounted to \$90.3 million and were mainly composed of preservation and overhaul projects.

Capital Expenditures in 2016 amounted to \$70.9 million and were mainly composed of preservation and overhaul projects.

C. Research and Development, Patents and Licenses, etc.

Spending on innovation, including both applications technology and process development, amounted to \$20.3 million in 2018, \$18.2 million in 2017 and \$16.1 million in 2016 and was mostly directed towards the development of new specialty carbon black products, new applications for carbon black products and the improvement of process efficiencies, and to a lesser extent towards research on installation of equipment to reduce emission levels in connection with the recent EPA consent decree. For further information see “*Item 4. Information on the Company—B. Business Overview—Innovation.*”

D. Trend Information

See “*Item 4. Information on the Company—B. Business Overview.*”

E. Off-Balance Sheet Arrangements

As of December 31, 2018, we did not have any off-balance sheet arrangements.

F. Contractual Obligations

The following table sets forth our contractual obligations as of December 31, 2018 :

	Less than 1 year	1-3 years	4-5 years	More than 5 years	Total
	In million				
Long-term debt obligations (1)	\$ 30.0	\$ 36.7	\$ 38.7	\$ 631.2	\$ 778.9
Revolving credit facility (2)	—	—	—	—	—
Term loan (3)	8.1	16.2	16.2	618.0	658.5
Interest expense on long-term debt (4)	21.9	20.5	22.5	13.2	120.4
Purchase commitments (5)	157.3	173.4	60.3	—	391.0
Operating leases	9.2	14.0	10.5	12.5	46.3
Total contractual obligations (6)	\$ 196.5	\$ 224.2	\$ 109.5	\$ 643.7	\$ 1,216.2

(1) Sets forth obligations to repay principal and interest under our long-term debt obligations.

(2) Represents the obligation under the Revolving Credit Facility. As of December 31, 2018, there were no cash amounts drawn under our Revolving Credit Facility of €175.0 million (USD equivalent: \$ 200.4 million).

(3) Represents the Term Loans and includes the outstanding principal amounts of \$284.8 million (U.S. Dollar term loan) and \$373.3 million (EUR term loan) which has been translated at an exchange rate at the reporting date of \$1.145 per €1.00. The borrowing costs on the principal of the Euro-denominated Term Loan have been translated applying the same exchange rate.

(4) Represents interest expenses related to indebtedness from our Term Loans, assuming future interest based on a forward rate assumption.

(5) Represents purchase commitments under long-term supply agreements for the supply of raw materials, mainly oil and gas.

(6) This amount does not reflect the Company's obligations under its existing pension arrangements, which as of December 31, 2018 amounted to \$20.6 million (see Note K. Employee Benefit Plans with regard to pension provisions and post-retirement benefits included in the audited financial statements).

The level of performance bonds, guarantees and letters of credit required for carbon black oil purchasing could increase as a result of increasing oil prices or other factors (such as our ownership structure). As at December 31, 2018 Orion Engineered Carbons GmbH has four guarantees issued by Euler Hermes S.A. with a total volume of \$15,222k (in prior year four guarantees by Euler Hermes S.A. of \$21,093k); one guarantee insurance issued by Deutsche Bank AG with a volume of \$2,900k (in prior year one guarantee issued by HSBC AG with a volume of \$2,399k). In addition, there is one cash collateral provided by Norcarb Engineered Carbons AB of \$33k (in prior year one cash collateral of \$30k). None of these guarantees reduce the possible utilization limit of the current RCF.

Item 6. Directors, Senior Management and Employees

A. Directors and Senior Management

Board of Directors

The Company is managed by a board of directors (*conseil d'administration*) (the “Board of Directors”), composed of eight members appointed for terms of up to six years in accordance with Luxembourg Company Law. The general meeting of shareholders may, without prior notice (*ad nutum*) remove a director with or without cause by a simple majority of the votes validly cast. A vacancy in the office of a director because of death, legal incapacity, bankruptcy, resignation or otherwise may be filled on a temporary basis by the remaining directors until the next general meeting of shareholders.

The Board of Directors is vested with the broadest powers to take any actions necessary or useful to fulfill the Company’s corporate purpose, with the exception of actions reserved by law or by the Articles of Association (*statuts*) to the general meeting of shareholders. Reserved matters include, in particular, all decisions affecting the Articles of Association, such as capital increases, capital reductions, mergers and a change of the legal form of the Company. At least half of the directors are required to be present or represented at a meeting for the Board of Directors to validly act and deliberate. Resolutions of the Board of Directors are adopted with the approval of a majority of the directors present or represented at a meeting of the Board of Directors. Meetings of the Board of Directors are convened and held in accordance with the rules of procedure of the Board of Directors and the Articles of Association.

In accordance with article 60 of the Luxembourg Company Law, the Company’s daily management and representation in connection with such daily management may be delegated to two or several members of the Board of Directors or to any other person (whether or not a shareholder), acting alone or jointly with others. The appointment, revocation and powers of such persons shall be determined by a resolution of the Board of Directors. The Company may also grant special powers by notarized proxy or private instrument. According to the Articles of Association, the Company will be bound to third parties in all circumstances by (i) the joint signature of any two directors or (ii) the sole signature of any person to whom such signatory power has been granted by the Board of Directors. With respect to matters that constitute daily management of the Company, the Company will be bound to third parties by the joint signatures of (i) two class A daily managers, (ii) one class A daily manager and one class B daily manager or (iii) any other person(s) to whom such power in relation to the daily management of the Company has been delegated in accordance with the Articles of Association.

Directors

Our Board of Directors consists of the following eight members.

<u>Name</u>	<u>Age</u>	<u>Years in Office</u>	<u>Title</u>
Dan F. Smith	72	3	Chairman of the Board
Corning F. Painter	56	Since Sept. 4, 2018	Director and Chief Executive Officer
Jack L. Clem	66	Since Sept. 4, 2018	Director
Marc Jean Pierre Faber	60	1	Director
Paul Huck	69	3	Director
Kerry A. Galvin	68	Since Aug. 2, 2018	Director
Didier Miraton	60	3	Director
Hans-Dietrich Winkhaus	82	3	Director

The current term for Messrs. Smith, Faber, Huck, Miraton and Winkhaus expires on July 28, 2020. The term for Ms. Galvin and Messrs. Painter and Clem expires at the general meeting of shareholders that will be held to approve the Company’s annual accounts for the financial year ending December 31, 2019.

The following is a brief summary of the business experience of the directors.

Dan F. Smith . Mr. Smith serves as chairman of the board of Kraton Corp., He is also a director of Nexeo Solutions, Inc. and, since May 2017, TPG Pace Energy Holdings Corp. During the past five years, Mr. Smith served on the board of directors of Cooper Industries plc. He began his career with ARCO (Atlantic Richfield Company) in 1968 as an engineer. He was elected president of Lyondell Chemical Company in August 1994, chief executive officer in December 1996 and chairman of the board of directors in May 2007. Mr. Smith retired in December 2007 as chairman, president and chief executive officer of Lyondell Chemical Company following the acquisition of Lyondell by Basell. Mr. Smith also serves as a member of the College of Engineering Advisory Council at Lamar University. Mr. Smith is a graduate of Lamar University with a B.S. degree in chemical engineering.

Corning F. Painter. Mr. Painter began his career at Air Products in 1984 as part of the company's career development program. He rose through the ranks, progressing through a variety of commercial and operations positions in the U.S. and overseas, and was rapidly promoted several times over the last several years, holding leadership positions in operations, supply chain, corporate strategy and technology. He held the position of Executive Vice President, Industrial Gases until he left Air Products at the end of June, 2018 to become Orion Engineered Carbons group's new Chief Executive Officer starting from September 2018.

Jack L. Clem. Mr. Clem has been the Chief Executive Officer (CEO) of Orion Engineered Carbons Group between July 2011 and September 2018 and manager of the Company since May 2014 and had been the head of Evonik Degussa GmbH's global Carbon Black business since August 2009. He joined Degussa in 2001 and shortly after was named CEO of their joint venture in Carbon Black with a U.S.-based private equity firm. He has over 35 years of experience in the performance and specialty minerals and chemicals industry. Prior to joining Degussa, he held various senior management positions in North America and Europe at J.M. Huber Corporation and started his career in engineering and plant management at Occidental Chemical Corporation.

Marc Jean Pierre Faber . Mr. Faber has been a daily manager of the Company since 2014. Mr. Faber holds various directorship positions, amongst others at AXA Real Estate Investments Corporation. Between 2003 and 2010, Mr. Faber served as chief executive officer of BIP Investment Partners S.A. Previously, he was the Chief Financial Officer of Cerametal Sarl, Luxembourg between 2001 and 2002, after various other functions within that company since 1991. Mr. Faber holds an MBA from INSEAD (Fontainebleau, France) and a civil engineer degree from the University of Liege, Belgium.

Paul Huck . Mr. Huck previously served for nine years as the chief financial officer and senior vice president of Air Products and Chemicals, Inc., a global \$10 billion industrial gas and chemical company. Prior to this he served for ten years at Air Products and Chemicals as a vice president and corporate controller. He served as a director of NewPage Corporation and as a member of NewPage's audit committee from 2012 until its sale in 2015. He also is a director of AdvanSix Inc. since 2016. In addition, he serves on the boards of numerous charities. Mr. Huck holds a B.S. in mathematics from the United States Naval Academy and an MBA from the Johnson Graduate School of Management at Cornell University.

Kerry A. Galvin . Ms. Galvin has been practicing law for 30 years, including 26 years as in-house counsel. She spent 18 years at Lyondell Chemical Co., a publicly traded chemical company in the Fortune 200, including the last eight years as General Counsel. Later she became General Counsel at Axiom Energy Services LP, a privately held oil field services company, serving for more than five years until her retirement. She has been a board member of the American Corporate Counsel Association, the Alumni Association of The University of Michigan and The Georgetown University Board of Regents. Ms. Galvin earned a B.S. in Foreign Service from Georgetown University and a J.D. from the University of Michigan.

Didier Miraton . Mr. Miraton is currently an adviser to several senior executives and a professor in the MBA program at the *Collège des Ingénieurs* (CDI) in Paris. He was the chief executive officer of Almérys SAS, a French information technology company operating in the health insurance data sphere, until late 2015. He is the former chief executive officer of the *Laboratoires Pierre Fabre* , a leading French pharmaceutical company. He also served as a managing partner of the *Compagnie Generale des Etablissements Michelin SCA* from May 11, 2007 to June 30, 2011. During his time at Michelin, Mr. Miraton also acted as president of Michelin's worldwide Research & Technology group and was a member of the Michelin Group Executive Council. Mr. Miraton has been an independent director of *Vilmorin Clause & Cie SA* since November 2007. He holds a civil engineering degree from the *École Nationale des Ponts-et-Chaussées* .

Hans-Dietrich Winkhaus . Mr. Winkhaus previously served as chief executive officer of Henkel KGaA. He served also as Chairman of the Board of Deutsche Telekom AG and Schwarz Pharma AG. He was a board member at BMW AG, Lufthansa AG, ERGO AG and Degussa AG. He is an independent member of the supervisory board of Galeria Kaufhof since 2018. Mr. Winkhaus studied Business Administration at and received a Ph.D. from Ludwig Maximilian University, Munich.

Senior Management

The following table sets forth certain information concerning our senior management:

Name	Age	Title
Corning F. Painter	56	Chief Executive Officer
Charles Herlinger	63	Chief Financial Officer
Erik Thiry	48	Senior Vice President–Business Line Rubber Carbon Black and Business Development
Claudine Mollenkopf	51	Senior Vice President–Business Line Specialty Carbon Black
Lixing Min	58	Senior Vice President and General Manager–Asia Pacific Region
David Deters	53	Senior Vice President–Innovation
Mark Peters	60	Senior Vice President and General Manager–Americas
Christian Eggert	45	General Counsel Global and Head of Group Legal
Jeffrey Malenky	63	Senior Vice President–Global Human Resources
Michael Reers	50	Senior Vice President and Group Controller
André Schulze Isfort	44	Chief Accounting Officer, Head of Consolidation & Reporting

Corning F. Painter. Mr. Painter began his career at Air Products in 1984 as part of the company’s career development program. He rose through the ranks, progressing through a variety of commercial and operations positions in the U.S. and overseas, and was rapidly promoted several times over the last several years, holding leadership positions in operations, supply chain, corporate strategy and technology. He held the position of Executive Vice President, Industrial Gases until he left Air Products at the end of June, 2018 to become Orion Engineered Carbons group’s new Chief Executive Officer starting from September 2018.

Charles Herlinger. Mr. Herlinger has been the Chief Financial Officer of Orion since July 2011. He has considerable experience from previous public and private chief financial officer positions. Most recently, he was chief financial officer of the Almatix Group, a leading worldwide manufacturer of specialty alumina-based chemical products. Prior to that, he served as chief financial officer of Cable & Wireless plc., a London Stock Exchange listed public company. Mr. Herlinger started his career as audit manager with KPMG and spent over 15 years with Siemens. Mr. Herlinger holds a bachelor’s degree in business administration and qualified both as a certified public accountant in the United States and a chartered accountant in the United Kingdom.

Erik Thiry. Mr. Thiry has been the Senior Vice President–Business Line Rubber Carbon Black since September 2015 and prior to that served as Senior Vice President–Business Development. He has been a member of the executive management team since May 2012. He has over 15 years of experience in management consulting, including the chemical industry, at a global consulting firm. Mr. Thiry holds a master’s degree in business management and mechanical engineering from the University of Kaiserslautern, Germany.

Claudine Mollenkopf. Dr. Mollenkopf has been our Senior Vice President–Business Line Specialty Carbon Black since August 2011 and prior to that served the business as vice president of mechanical rubber goods. Dr. Mollenkopf joined Evonik in 1996. She has over 20 years of experience in the chemicals industry, including various positions at Evonik, such as head of aerosil and silanes sales Europe. Ms. Mollenkopf holds a doctorate and engineering degree (EHICS) in chemistry from the University Louis Pasteur, France.

Lixing Min. Dr. Min has been our Senior Vice President and General Manager–Asia-Pacific Region since April 1, 2013. He has over 23 years of experience in the chemical industry, including positions of general management of the Asia-Pacific region for both American- and German-based chemical companies. Dr. Min holds a bachelor’s degree in chemistry from Fudan University in China and master’s and doctoral degrees in chemistry from the University of Rochester.

David Deters. David Deters has been the Senior Vice President–Innovation and a member of the executive management team since August 2015. He has over 30 years of global experience within coatings, printing inks and specialty chemical sectors. Prior to joining Orion, he held executive management positions at Hempel as GVP R&D and Marine Marketing and King Industries as VPGM Specialty Chemicals. He worked for 20 years at DuPont holding various Technical Director and Global Product Management positions throughout the world. Mr. Deters holds a Bachelor of Science Degree in Engineering from Michigan State University.

Mark Peters. Mark Peters has been Senior Vice President and General Manager–Americas since July 2015. He has over 29 years of experience in the chemical industry, including roles in manufacturing and business development. Mr. Peters holds a Bachelor of Science Degree in Chemical Engineering from Mississippi State University.

Christian Eggert. Dr. Eggert has been the General Counsel and Head of Group Legal since August 2012, also serving as the Chief Compliance Officer. Prior to Orion, he worked as a lawyer in private practice for more than nine years, and with two major international law firms (one as a partner) while specializing in mergers & acquisitions, restructurings and corporate law. Dr. Eggert holds a law degree from the University of Münster, a doctorate degree from the University of Jena and a master's degree (LL.M) in comparative law from the University of Miami School of Law. He is admitted to practice law in Germany, is a member of the American Bar Association and an elected fellow of the American Bar Foundation.

Jeffrey Malenky. Mr. Malenky has been Senior Vice President–Global Human Resources since July 29, 2011. Mr. Malenky joined Evonik in 1996 and has over 30 years of experience in human resources, including a position as vice president human resources at Evonik in the United States. Mr. Malenky holds a bachelor's degree in liberal arts from St. Vincent College, *juris doctor* and master's degrees in business administration from the University of Pittsburgh. Mr. Malenky is admitted to the practice of law in the Commonwealth of Pennsylvania.

Michael Reers. Mr. Reers has been Senior Vice President and Group Controller since September 1, 2012. He has over 19 years of broad experience in different industries and served in several financial positions such as chief financial officer, controller or head of corporate accounting/controlling. Before joining Orion, he was responsible for all finance aspects in Europe and Asia at BELFOR in Duisburg/Germany and prior to that served in different financial positions at Danaher Corporation, a U.S. public listed company. Mr. Reers holds a master's degree in business administration from the University of Münster.

André Schulze Isfort. André Schulze Isfort has been Head of Consolidation & Reporting since August 15, 2011, also serving as Chief Accounting Officer. He has almost 10 years of experience in the chemical industry including as head of a restructuring project and as head of internal audit. Prior to joining the industry he worked for five years at Deloitte. Mr. Schulze Isfort holds a master's degree in business administration from the University of Applied Science of Münster.

B. Compensation

Executive Compensation

For 2018, our current executive officers named in the table above under “*Senior Management*,” received total aggregate compensation of \$11.5 million, which included base salary, annual cash bonus, other benefits, and amounts set aside or accrued to provide pension, retirement or similar benefits of \$1.0 million, and \$11.2 million accrued expenses related to the share-based payment program. In determining the foregoing aggregate amounts, compensation paid to certain of our executive officers in currencies other than the US-Dollar were converted using the average conversion rate over 2018 from the applicable currency to the US-Dollar.

C. Board Practices

See “—A. *Directors and Senior Management*.”

Audit Committee

Ms. Galvin and Messrs. Huck and Winkhaus serve on our Audit Committee, chaired by Mr. Huck. All members of our Audit Committee qualify as independent under the listing rules of the NYSE and SEC Rule 10A-3 under the Exchange Act. Each independent member of our Audit Committee is financially literate, and Mr. Huck is an “audit committee financial expert” as defined in Item 407 of SEC Regulation S-K. Our Audit Committee's responsibilities include:

- reviewing and making recommendations to the Board of Directors with regard to the appointment and approval of the compensation of our independent auditors;
- overseeing the work of our independent auditors and resolving any disagreements between management and our independent auditors regarding financial reporting;
- pre-approving audit and permissible non-audit services to be provided by our independent auditors;
- reviewing and approving the annual audit plan;
- reviewing and discussing our annual and quarterly financial statements and related disclosures with management and our independent auditors, as well as accounting policies and practices used by us;
- coordinating the oversight and reviewing the adequacy of our internal control over financial reporting;
- establishing policies and procedures for the receipt and retention of accounting-related complaints and concerns;
- reviewing guidelines and policies regarding the Company's exposure to risk; and
- reviewing quarterly earnings releases.

Compensation Committee

Messrs. Smith, Huck and Miraton serve on our Compensation Committee, chaired by Mr. Smith. All members of our Compensation Committee qualify as independent under the listing rules of the NYSE. Our Compensation Committee's responsibilities include:

- annually reviewing and approving corporate goals and objectives relevant to the compensation of our chief executive officer;
- evaluating the performance of our chief executive officer in light of such corporate goals and objectives and determining the compensation of our chief executive officer;
- reviewing the performance and approving the compensation of our other executive officers;
- making recommendations to the Board of Directors with respect to incentive-compensation plans and equity-based plans that are subject to approval by the Board of Directors and overseeing the activities of the individuals and committees responsible for administering these plans; and
- reviewing and approving any new equity compensation plan or any material change to an existing plan where shareholder approval has not been obtained.

Nominating and Governance Committee

Messrs. Smith and Huck serve on our Nominating and Governance Committee, chaired by Mr. Huck. All members of our Nominating and Governance Committee qualify as independent under the listing rules of the NYSE. Our Nominating and Governance Committee's responsibilities include:

- identifying individuals qualified to become members of our Board of Directors and its committees;
- recommending potential nominees for election to the Board of Directors;
- identifying directors qualified to fill vacancies on any committee of the Board of Directors;
- developing, recommending and reviewing our corporate governance guidelines and other policies;
- reviewing proposed waivers and amendments of the code of conduct;
- overseeing the process of evaluating the performance of our Board of Directors; and
- advising our Board of Directors on corporate governance matters.

None of our directors is party to service contracts with the Company or any of its subsidiaries that would provide for benefits upon termination of employment.

D. Employees

As of December 31, 2018, we had 1,437 employees and approximately 366 contractors in our wholly-owned entities including 26 employees joining Orion upon the acquisition of the plant in France end of October 2018.

The table below shows our number of employees and contractors by activity as well as per country as of the end of the periods indicated. This data does not include employees and contractors employed by, or performing services for, joint ventures.

	As of December 31,		
	2018	2017	2016
<u>By Activity</u>			
Production	1,181	1,191	1,198
Sales and marketing	282	268	279
General and administration	240	218	228
Research and development	100	97	91
Total	1,803	1,774	1,796
Contractors	366	333	336
Internal employees	1,437	1,441	1,460
<u>By Country</u>			
Germany	562	541	514
The rest of Europe/Middle East	233	202	206
North America	337	297	319
South Korea	254	305	309
China	209	223	260
South Africa	131	127	110
Brazil	62	65	63
The rest of Asia-Pacific	15	14	15
Total	1,803	1,774	1,796
Contractors	366	333	336
Internal employees	1,437	1,441	1,460

Labor Relations

We actively manage our labor relations and place high importance on transparent dialogue, which we believe has resulted in constructive union relations. There have been no significant strikes or labor disruptions at any site since 2004.

In 2017, 35 of the former employees in our closed facility in Ambès, France filed claims with the labor court of Bordeaux contesting the termination of their employment and seeking damages. The court held several hearings on the claims in 2018. While we intend to continue to oppose these claims, our results of operations reflect accruals made by us to satisfy these claims should the former employees prevail.

Our employees in Germany and certain other countries are represented by workers' councils in accordance with local law and practices, which provide workers' councils with participation and information rights. Membership of trade unions varies in accordance with the business area, local practice and country in which we operate. We have entered into collective bargaining agreements with trade unions either directly or as members of employer organizations. In particular, 72.68% of our employees are covered by such bargaining agreements, of which 8.27% will expire within one year. These agreements typically govern, among other things, terms and conditions of employment and reflect the prevailing practices in each country. We believe we have stable relations with our employees and voluntary turnover has been low in recent years.

E. Share Ownership

To our knowledge, the total number of common shares of the Company owned by our directors and executive officers as of March 7, 2019 was 462,320, which represents less than 1% of our issued and outstanding shares. Our directors, collectively (7 persons, excluding the Chief Executive Officer) beneficially owned 152,582 shares and our executive officers, collectively (11 persons) beneficially owned 309,738 shares.

Equity Plans

2014 Omnibus Incentive Compensation Plan

Types of Awards. The 2014 Plan provides for the grant of stock options (both stock options intended to be incentive stock options under Sections 421 or 422 of the Internal Revenue Code of 1986, as amended and non-qualified stock options), stock appreciation rights,

restricted stock awards, restricted stock units, dividend equivalent rights, performance-based stock awards and other stock-based awards (collectively, “stock awards”) based on our common shares, as well as the grant of cash awards.

Eligibility and Administration . Current employees or consultants of Orion or, solely with respect to their final year of service, former employees, will be eligible for awards under the 2014 Plan. The 2014 Plan generally is administered by our Compensation Committee (or its delegates). The Compensation Committee (or its delegates) determines the persons who will receive awards under the 2014 Plan, the time when awards will be granted, the terms of such awards and the number of common shares, if any, which will be subject to the awards. The Board of Directors, in its sole discretion, also may grant awards or administer the 2014 Plan.

Authorized Shares . If any award that is granted under the 2014 Plan is forfeited, expires or is settled for cash, then the shares covered by such forfeited, expired or settled award will again become available to be delivered pursuant to awards granted under the 2014 Plan. In the event that tax withholding obligations from an award granted under the 2014 Plan (other than a stock option or stock appreciation right) are satisfied by the withholding or tendering of common shares, the shares so withheld or tendered will be added back to the shares available for issuance under the 2014 Plan. In the case of an acquisition, any common shares issued in connection with awards that are assumed, converted or substituted as a result of our acquisition of another company will not count against the number of shares that may be issued under the 2014 Plan.

Adjustments . In connection with stock splits, extraordinary dividends, stock dividends, recapitalizations and certain other events affecting our common shares, the Compensation Committee (or its delegates) will make adjustments as it deems appropriate in the number of shares available for issuance under the 2014 Plan, the number and kind of shares covered by outstanding grants, the kind of shares that may be issued under the 2014 Plan and the exercise price of all outstanding stock awards, if applicable.

Amendment and Termination . The 2014 Plan has a term of ten years. The Board of Directors may from time to time suspend, discontinue, revise or amend the 2014 Plan. Unless otherwise determined by the Board, shareholder approval of any suspension, discontinuance, revision or amendment will be obtained only to the extent necessary to comply with any applicable laws, regulations or rules of a securities exchange or self-regulatory agency.

In 2015, the company established a Long Term Incentive Plan (“LTIP”) under the 2014 Plan, which is an equity settled share-based payment in the form of performance share units (“PSU”) for a defined group of executive managers. See note *Note L. – “Stock-Based Compensation”* to the consolidated financial statements.

2014 Non-Employee Director Compensation Plan

The terms of the 2014 Director Plan are substantially similar to those of the 2014 Plan, except for the following key differences: (1) only non-employee directors are permitted to participate in the 2014 Director Plan; (2) incentive stock options may not be granted to non-employee directors; (3) cash-based awards may include retainers or meeting-based fees; and (4) award grants will be limited by the aggregate amount of non-employee director compensation approved by the general meeting of the shareholders on an annual basis in accordance with Luxembourg law.

Item 7. Major Shareholders and Related Party Transactions

A. Major Shareholders

As of March 6, 2019, we had 59,518,498 common shares outstanding and 517,081 common shares that have been repurchased by us pursuant to share repurchase plans in 2016 and 2018. The following table sets forth information relating to the ownership of our common shares by shareholders known to us to beneficially own more than 5% of our common shares outstanding:

Shareholder	Number of Common Shares Beneficially owned	Percentage of Outstanding Common Shares
Wellington Management Group LLP ⁽¹⁾	6,780,920	11.39%
FMR LLC ⁽²⁾	5,790,464	9.73%
Renaissance Technologies LLC ⁽³⁾	4,019,196	6.75%
Victory Capital Management Inc. ⁽⁴⁾	3,755,222	6.31%
AllianceBernstein L.P. ⁽⁵⁾	3,084,398	5.18%

- (1) As reported in a Schedule 13G/A filed on February 12, 2019 by (i) Wellington Management Group LLP, a holding company organized in Massachusetts (“WMG”), (ii) Wellington Group Holdings LLP, a holding company organized in Delaware (“WGH”), (iii) Wellington Investment Advisors Holdings LLP, a holding company organized in Delaware (“WIAH”), and (iv) Wellington Management Company LLP, an investment adviser organized in Delaware (“WMC”). According to the Schedule 13G/A, the common shares are owned of record by clients of one more investment advisers directly or indirectly owned by WMG and those clients have the right to receive, or the power to direct the receipt of, dividends from, or the proceeds from the sale of, the common shares. According to the Schedule 13G/A, no such client is known to have such right or power with respect to more than 5% of the common shares. According to the Schedule 13G/A, WIAH is owned by WGH and WGH is owned by WMG, and the address of the principal office of each such entity is c/o Wellington Management Group Company LLP, 280 Congress Street, Boston MA 02210.

- (2) As reported in a Schedule 13G filed on February 13, 2019 by (i) FMR LLC, a holding company organized in Delaware (“FMR”) and (ii) Abigail P. Johnson, a Director, the Chairman and Chief Executive Officer of FMR. According to the Schedule 13G, members of the Johnson family, including Abigail P. Johnson, are the predominant owners, directly or through trusts, of 49% of the voting power of FMR and may be deemed to form a controlling group with respect to FMR. Neither FMR nor Abigail P. Johnson has the sole power to vote or direct the voting of the shares owned directly by the various investment companies registered under the Investment Company Act of 1940 (“Fidelity Funds”) advised by Fidelity Management & Research Company (“FMR Co”), a wholly owned subsidiary of FMR, which power resides with the Fidelity Funds’ Boards of Trustees. FMR Co carries out the voting of the shares under written guidelines established by the Fidelity Funds’ Boards of Trustees. According to the Schedule 13G, the principal business address of FMR and Abigail P. Johnson is 245 Summer Street, Boston MA 02210.
- (3) As reported on February 12, 2019 by (i) Renaissance Technologies LLC, an investment adviser organized in Delaware (“RTC”) and (ii) Renaissance Technologies Holdings Corporation, a holding company organized in Delaware (“RTHC”). According to the Schedule 13G certain funds and accounts managed by RTC have the right to receive dividends and proceeds from the sale of the common shares. According to the Schedule 13G, RTHC the majority owner of RTC, and the address of the principal office of each such entity is 800 Third Avenue, New York NY 10022.
- (4) As reported in a Schedule 13G/A A filed by Victory Capital Management Inc. (“Victory”) on February 1, 2019. Pursuant to the Schedule 13GA, Victory is a registered investment adviser, organized in New York. According to the Schedule 13G/A, the clients of Victory, including investment companies registered under the Investment Company Act of 1940 and separately managed accounts, have the right to receive or the power to direct the receipt of dividends from the sale of the common shares and no client has the right to receive or the power to direct the receipt of dividends from, or the proceeds from the sale of, more than 5% of the common shares. According to the Schedule 13G, the address of the principal office of Victory is 4900 Tiedeman Rd. 4th Floor, Brooklyn OH 44144.
- (5) As reported in a Schedule 13G filed by AllianceBernstein L.P. (“Alliance Bernstein L.P.”) on February 13, 2019. Pursuant to the Schedule 13G, AllianceBernstein L.P. is an investment adviser organized in Delaware. According to the Schedule 13G, the common shares were acquired solely for investment purposes on behalf of client discretionary investment advisory accounts and the address of the principal office of AllianceBernstein. L.P. is 1345 Avenue of the Americas, New York NY 10105.

Each common share carries one vote . As of March 7, 2019, there were eight holders of record of our common shares (including the Company as holder of repurchased common shares), two of which have a U.S. mailing address. One of these two holders is CEDE & Co., a nominee company for The Depository Trust Company (a registered clearing agency with the SEC), which held approximately 99.88% of our outstanding common shares as of such date. The beneficial owners of the common shares held by CEDE & Co. may include persons who reside outside the United States.

B. Related Party Transactions

In the normal course of business Orion from time to time receives services from, or sells products to, other related unconsolidated parties, in transactions that are either not material or approved in accordance with our Related Party Transaction Approval Policy. In addition, Orion purchased carbon black products for retail from the DGW KG associate for an aggregate amount of \$93,536k in 2018 (\$79,270k and \$77,670k for 2017 and 2016 , respectively). Payables to DGW amount to \$18,615k at year end (Prior year: \$19,611k). Sales and service provided to DGW amounted to \$6,464k in 2018 (\$2,627k and \$2,574k in 2017 and 2016 , respectively). Receivables at December 31, 2018 and 2017 amounted to \$651k , and \$537k respectively.

Remuneration paid to corporate management and other members of management amounted to \$22.7 million in 2018 and except for contributions into pension scheme benefits and portions of share-based payments comprised short-term benefits. For additional information regarding compensation, including social security costs, pension expenses and other personnel see note *Note S. – “ Related Parties ”* to the consolidated financial statements.

Related Party Transaction Approval Policy

Our Board of Directors has implemented a written related party transaction approval policy pursuant to which an independent committee, which may be a standing or ad hoc committee of our Board of Directors, reviews and approves or takes such other action as it may deem appropriate with respect to the following transactions:

- a transaction in which we are a participant and which involves an amount exceeding \$120,000 and in which any of our directors, officers or 5% shareholders, or any other “related person” as defined in Item 404 of SEC Regulation S-K (“Item 404”), has or will have a direct or indirect material interest; and
- any other transaction that meets the related party disclosure requirements of the SEC as set forth in Item 404.

This policy sets forth factors to be considered by an independent committee in determining whether to approve any such transaction, including the nature of our involvement in the transaction, whether we have demonstrable business reasons to enter into the transaction, whether the transaction would impair the independence of a director and whether the proposed transaction involves any potential reputational or other risk issues.

To simplify the administration of the approval process under this policy, an independent committee may, where appropriate, establish guidelines for certain types of related party transactions or designate certain types of such transactions that will be deemed pre-approved. This policy also provides that the following transactions are deemed pre-approved:

- decisions on compensation or benefits or the hiring or retention of our directors or executive officers, if approved by the applicable committee of the Board of Directors;
- the indemnification and advancement of expenses pursuant to our articles of association or an indemnification agreement; and
- transactions where the related person's interest or benefit arises solely from such person's ownership of our securities and holders of such securities receive the same benefit on a pro rata basis.

If our Board of Directors appoints an ad hoc independent committee to review and take action with regard to any one or more related party transactions, the committee will be comprised of at least three independent directors. If at the applicable time our Board of Directors has designated an independent director as its "lead director," he or she will be a member and the chairperson of the independent committee. A director on any committee considering a related party transaction who has an interest in the transaction will not participate in the consideration of that transaction unless requested by the chairperson of the committee.

C. Interest of Experts and Counsel

Not applicable.

Item 8. Financial Information

A. Consolidated Statements and Other Financial Information

See "Item 18. Financial Statements" and our audited consolidated financial statement beginning on page F-1.

Legal Proceedings

We become involved from time to time in various claims and lawsuits arising in the ordinary course of our business, such as employment related claims and asbestos litigation, against some of which we have limited indemnification from Evonik under the agreements relating to the Acquisition. Some matters involve claims for large amounts of damages as well as other relief. With respect to our settlement of the EPA's enforcement initiative under Sections 114 and 113a of the Clean Air Act see "Item 4. Information on the Company —B. Business Overview—Environmental, Health and Safety Matters—Environmental—Environmental Proceedings ." We believe, based on currently available information, that the results of the proceedings referenced above, in the aggregate, will not have a material adverse effect on our financial condition, but may be material to our operating results and cash flow for any particular period when the relevant costs are incurred. We note that the outcome of legal proceedings is inherently uncertain, and we offer no assurances as to the outcome of any of these matters or their effect on the Company.

Dividend Policy

In accordance with the Luxembourg Company Law, the general meeting of shareholders has the power to make a resolution on the payment of dividends upon the recommendation of the Board of Directors. In deciding whether to recommend any future dividend, the Board of Directors would take into account any legal or contractual limitation, our actual and anticipated future earnings, cash flows, debt service and capital requirements, our business plans and such other matters as the Board of Directors believes appropriate, in its discretion. Generally, any dividend approved by a general meeting of shareholders would be paid out shortly after the meeting.

Our ability to pay dividends depends on the existence of legally distributable amounts, which include available profit, distributable reserves and share premium, as determined in accordance with the Luxembourg Company Law and on the basis of the Company's unconsolidated balance sheet. In order to determine the distributable amounts, the financial profit or loss for the relevant financial period must be adjusted by the profit/loss carried forward from the previous financial years as well as any withdrawals or contributions made to the distributable reserves and share premium. Certain reserves must be established by law (e.g., the Company's legal reserve, equal to 10% of the Company's share capital or, in the case of a buy back of its own shares by the Company, a reserve equal to the value of the shares bought back) and deducted when calculating the amount available for distribution. Because the Company is a holding company, it does not generate any distributable profits of its own and is dependent on the transfer of distributable profits by its operating subsidiaries.

During the fiscal year 2018 , our board of directors declared dividends of \$0.80 per common share, equivalent to a total distribution of \$47.7 million . The dividends were paid in quarterly installments at \$0.20 per share. Luxembourg withholding tax at a rate of 15% was deducted from the dividends, subject to certain exemptions and reductions in certain circumstances.

B. Significant Changes

Except as otherwise disclosed in this report, there has been no undisclosed significant change since the date of the annual financial statements.

Item 9. The Offer and Listing

A. Offer and Listing Details

The Company's common shares are listed on the New York Stock Exchange, or NYSE, under the symbol "OEC." Trading on the NYSE began on July 25, 2014. As of March 7, 2019, a total of 60,035,579 common shares were registered in the Company's shareholder register, of which 517,081 common shares have been repurchased by the company pursuant to a share repurchase plans in 2016 and 2018.

B. Plan of Distribution

Not applicable.

C. Markets

See "—A. Offer and Listing Details."

D. Selling Shareholders

Not applicable.

E. Dilution

Not applicable.

F. Expenses of the Issue

Not applicable.

Item 10. Additional Information

A. Share Capital

Not applicable.

B. Memorandum and Articles of Association

Information relating to our Articles of Association is incorporated by reference to the Registration Statement on Form F-1 (File No. 333-196593), as filed with the SEC on July 21, 2014. and last updated as filed with the SEC on April 16, 2018.

On April 16, 2018, an Extraordinary General Meeting of Shareholders approved amendments to our Articles of Association intended to give effect to certain amendments to the Luxembourg Company Law, as amended (*1 oi du 10 août 1915 concernant les sociétés commerciales, telle quelle a été modifiée*), which entered into force on August 23, 2016 and required the adoption of amendments to our Articles of Association by August 23, 2018. The amendments were technical in nature and allow for more flexibility in the management of the Company. A redlined version of the articles of association was filed as Exhibit 99.3 to Form 6-K furnished to the SEC on March 16, 2018.

C. Material Contracts

Credit Agreement

We are party to the Credit Agreement with, among others, Goldman Sachs Bank USA, as administrative agent, Goldman Sachs Bank USA and UBS Securities LLC, as joint global coordinators and joint bookrunners, Barclays Capital, J.P. Morgan Limited, J.P. Morgan Chase Bank, N.A., and Morgan Stanley Bank, N.A. as joint bookrunners and DZ Bank AG, Fifth Third Bank, HSBC Bank N.A. and Mediobanca S.p.A as mandated lead arrangers. The borrowers under the Credit Agreement are Orion Engineered Carbons GmbH and a U.S. subsidiary, which are indirect subsidiaries of the Company. The Credit Agreement was most recently amended on November 7, 2017.

The Credit Agreement consists of (i) senior secured term loans in the principal amount of \$658.2 million as of December 31, 2018, having a final maturity in 2024 and bearing interest at an annual rate of LIBOR/EURIBOR (minimum 0.00%) plus 2.50%, subject to downward adjustment based on Orion's leverage ratio as set forth in the Credit Agreement and (ii) a multicurrency, senior secured revolving line of credit of up to €175 million-equivalent, having a final maturity in 2021 and bearing interest at an annual rate of LIBOR/EURIBOR plus 2.50% to 3.00%, depending on the leverage ratio. We are required to pay a commitment fee equal to 35% of the applicable interest rate then in effect to the lenders under the New Revolving Credit Facility in respect of the unutilized commitments thereunder. For more details see note *H.—Debt and other obligations*.

We are required to prepay the Term Loans, subject to certain exceptions, with the net cash proceeds (that are not reinvested) from all non-ordinary course asset sales or other dispositions or any incurrence of debt by the borrowers, certain parent companies (including the Company), and their respective restricted subsidiaries. In addition, if our first lien net leverage ratios exceed specified levels, we will be required to prepay the Term Loans, subject to certain exception, with up to 50% of our annual excess cash flow. Currently, our first lien net leverage ratio does not exceed the specified levels. We also have the ability to voluntarily repay outstanding loans at any time without premium or penalty, subject to certain exceptions.

The obligations under the Credit Agreement are unconditionally guaranteed by certain parent companies of the borrowers, including the Company, and, subject to certain exceptions, each of the borrowers' existing and future material wholly-owned subsidiaries. In addition,

the Credit Agreement is collateralized by first priority or equivalent security interests, subject to certain exceptions and qualifications, in (i) all the capital stock of, or other equity interests in, the borrowers and each of the borrowers' and guarantors' material direct or indirect wholly-owned restricted subsidiaries, and (ii) certain tangible and intangible assets of the borrowers and the guarantors.

The Credit Agreement contains a number of significant affirmative and negative covenants and events of default. Such covenants, among other things, restrict, subject to certain exceptions, the ability of the borrowers, certain parent companies (including the Company), and their respective restricted subsidiaries to incur additional indebtedness and make guarantees; create liens on assets; enter into sale and leaseback transactions; engage in mergers or consolidations; sell assets; make fundamental changes; pay dividends and distributions or repurchase our capital stock; make investments, loans and advances, including acquisitions; engage in certain transactions with affiliates; make changes in the nature of their business; and make prepayments of junior debt or permitted subordinated unsecured debt. The borrowers, certain parent companies (including the Company), and their respective restricted subsidiaries are also required to maintain a maximum first lien net leverage ratio if borrowings under the New Revolving Credit Facility exceed a certain threshold.

D. Exchange Controls

None.

E. Taxation

This section describes the material Luxembourg tax and material United States federal income tax consequences of owning common shares. Insofar as it relates to United States federal income tax consequences, this section applies only to U.S. holders (as defined below) who hold common shares as capital assets for tax purposes and does not apply to members of special classes of holders subject to special rules, including:

- a dealer in securities,
- a trader in securities that elects to use a mark-to-market method of accounting for securities holdings,
- a tax-exempt organization,
- a life insurance company,
- a person liable for alternative minimum tax,
- a person that actually or constructively owns 10% or more of the combined voting power of our voting stock or of the total value of our stock,
- a person that holds common shares as part of a straddle or a hedging or conversion transaction,
- a person that purchases or sells common shares as part of a wash sale for tax purposes, or
- a person whose functional currency is not the U.S. Dollar.

This section is based on the laws of Luxembourg, and the Internal Revenue Code of 1986, as amended, its legislative history, existing and proposed regulations, published rulings and court decisions, all as currently in effect, as well as on the Convention Between the Government of the Grand Duchy of Luxembourg and the Government of the United States of America for the Avoidance of Double Taxation and the Prevention of Fiscal Evasion with Respect to Taxes on Income and Capital (the "Treaty"). These laws are subject to change, possibly on a retroactive basis.

If an entity treated as a partnership for United States federal income tax purposes holds the common shares, the United States federal income tax treatment of a partner will generally depend on the status of the partner and the tax treatment of the partnership. A partner in a partnership holding the common shares should consult its tax advisor with regard to the United States federal income tax treatment of an investment in the common shares.

A U.S. holder is a beneficial owner of common shares that is, for United States federal income tax purposes:

- a citizen or resident of the United States,
- a domestic corporation,
- an estate whose income is subject to United States federal income tax regardless of its source, or
- a trust if a United States court can exercise primary supervision over the trust's administration and one or more United States persons are authorized to control all substantial decisions of the trust, or a trust that has elected to be treated as a domestic trust for United States federal income tax purposes.

Investors should consult their own tax advisors regarding the United States federal, state and local and the Luxembourg and other tax consequences of owning and disposing of common shares in their particular circumstances. In particular, investors should confirm their eligibility for Treaty benefits with their advisors and should discuss any possible consequences of failing to qualify for such benefits.

This discussion addresses only United States federal income taxation and Luxembourg income taxation, net worth taxation and inheritance taxation.

Luxembourg Taxation of Common Shares

The following information is of a general nature only and is based on the laws in force in Luxembourg as of the date of this report. It does not purport to be a comprehensive description of all the tax considerations that might be relevant to an investment decision. It is included herein solely for preliminary information purposes. It is not intended to be, nor should it be construed to be, legal or tax advice. It is a description of the essential material Luxembourg tax consequences with respect to any offerings of our common stock and may not include tax considerations that arise from rules of general application or that are generally assumed to be known to shareholders. This summary is based on the laws in force in Luxembourg on the date of this report and is subject to any change in law that may take effect after such date. Prospective shareholders should consult their professional advisors with respect to particular circumstances, the effects of state, local or foreign laws to which they may be subject, and as to their tax position. Please be aware that the residence concept used under the respective headings applies for Luxembourg income tax assessment purposes only. Any reference in the present section to a tax, duty, levy impost or other charge or withholding of a similar nature refers to Luxembourg tax law and/or concepts only. Also, please note that a reference to Luxembourg income tax encompasses corporate income tax (*impôt sur le revenu des collectivités*), municipal business tax (*impôt commercial communal*), a solidarity surcharge (*contribution au fonds pour l'emploi*), as well as personal income tax (*impôt sur le revenu*) generally. Corporate taxpayers may further be subject to net wealth tax (*impôt sur la fortune*) as well as other duties, levies or taxes. Corporate income tax, municipal business tax as well as the solidarity surcharge invariably apply to most corporate taxpayers resident in Luxembourg for tax purposes. Individual taxpayers are generally subject to personal income tax and the solidarity surcharge. Under certain circumstances, where an individual taxpayer acts in the course of the management of a professional or business undertaking, municipal business tax may apply as well.

Taxation of the Company

Income Tax

Profits of the Company are as a general rule subject to corporate income tax (*impôt sur le revenu des collectivités* – “CIT”) and municipal business tax (*impôt commercial communal* – “MBT”). The tax profit as determined for CIT purposes is applicable, with minor adjustments, for MBT purposes. CIT is levied at an effective rate of 20.33% in 2017 and 19.26% as from 2018 (inclusive of the 7% surcharge for the employment fund). MBT is levied at a variable rate according to the municipality in which a company is located and amounts to 6.75% (in Luxembourg-city). The maximum aggregate CIT and MBT rate consequently amounts to 27.08 in 2017 and 26.01% as from 2018 (in Luxembourg-city).

As a general rule, dividends, liquidation proceeds and capital gains received or realized by the Company are regarded as ordinary business income and are consequently included in the taxable base for CIT and MBT purposes. In case of dividends, a tax credit may be available for Luxembourg or foreign withholding tax retained by the distributing entity. The same is valid for liquidation proceeds. Capital gains are taxable only upon realization. No special lower taxation rates apply to capital gains.

Dividends, liquidation proceeds and capital gains may however be tax exempt if the conditions of the participation exemption regime, as described below, are satisfied. If these conditions are not met, under current Luxembourg tax laws, 50% of the gross amount of dividends (excluding liquidation proceeds) received from (i) a Luxembourg resident fully-taxable company limited by share capital, or (ii) a company limited by share capital resident in a State with which the Grand Duchy of Luxembourg has concluded a double tax treaty and liable to a tax corresponding to Luxembourg CIT, or (iii) a company resident in a EU Member State and covered by Article 2 of the amended Council Directive 2011/96/EU of November 30, 2016 (the “Parent-Subsidiary Directive”) are exempt from income tax.

Under the participation exemption regime, dividends derived by the Company from its shareholdings may be exempt from income tax if at the time the dividend is made available, (i) the distributing entity is a qualified subsidiary (“Qualified Subsidiary”) i.e., a Luxembourg resident fully-taxable company limited by share capital (*société de capitaux*), a company covered by Article 2 of the Parent-Subsidiary Directive or a non-resident company limited by share capital (*société de capitaux*) liable in its country of residence to a tax corresponding to Luxembourg CIT and (ii) the Company has held or commits itself to hold for an uninterrupted period of at least 12 months a direct participation of at least 10% of the share capital of the distributing entity or a direct participation of an acquisition price of at least €1.2 million-equivalent (“Qualified Shareholding”). According to the administrative practice of the Luxembourg tax administration, a foreign tax is generally considered comparable to Luxembourg CIT if it is levied at a rate of at least 9.5% in 2017 and 9.0% as from 2018 on a taxable base that is similar to the basis used for Luxembourg CIT purposes. Liquidation proceeds are assimilated to dividends received and may be exempt under the same conditions. Participations held through a tax transparent entity are considered as being direct participations proportionally to the percentage held in the net assets of the transparent entity.

Under the participation exemption regime, capital gains realized by the Company on its shareholdings in eligible entities (as defined above) may be exempt from income tax if the above mentioned conditions are met, except that, if the 10% threshold condition is not met, the

acquisition price must be of at least €6 million-equivalent for capital gains purposes. Taxable gains are determined as being the difference between the price for which shares have been disposed of and the lower of their cost or book value.

Tax treaties signed by Luxembourg can further broaden the scope of the participation exemption regime.

Net Worth Tax

The Company is subject to Luxembourg net worth tax on its net assets as determined for net worth tax purposes. Net worth tax is levied at the rate of 0.5% on net assets not exceeding €500 million-equivalent and at the rate of 0.05% on the portion of the net assets exceeding €500 million-equivalent. Net worth is referred to as the unitary value (*valeur unitaire*), as generally determined on January 1 of each year. The unitary value is in principle calculated as the difference between (i) assets estimated at their fair market value (*valeur estimée de réalisation*), and (ii) liabilities *vis-à-vis* third parties

Under the participation exemption regime, a Qualified Shareholding held in a Qualified Subsidiary by the Company is exempt from net worth tax.

As from January 1, 2016, a minimum net wealth tax (“MNWT”) is levied on companies having their statutory seat or central administration in Luxembourg. For entities for which the sum of fixed financial assets, receivables against related companies, transferable securities and cash at bank exceeds 90% of their total gross assets and €50,000 equivalent, the MNWT is set at €4,815 equivalent. For all other companies having their statutory seat or central administration in Luxembourg which do not fall within the scope of the €4,815 equivalent MNWT, the MNWT ranges from €35 to €2,100 equivalent, depending on the company’s total gross assets.

Other taxes

The incorporation of the Company through a contribution in cash to its share capital as well as further share capital increase or any other amendment to the articles of incorporation of the Company are subject to a fixed registration duty of €75 equivalent.

Withholding Tax

Dividends paid by the Company to its shareholders are generally subject to a 15% withholding tax in Luxembourg. A corresponding tax credit may be granted to the shareholders in the countries of their residence based on their local applicable legislation.

Where a withholding needs to be applied, the rate of the withholding tax may be reduced pursuant to the double tax treaty existing between Luxembourg and the country of residence of the relevant holder, subject to the fulfillment of the conditions set forth therein. If the Company and a U.S. relevant holder are eligible for the benefits of the Treaty, the rate of withholding on distributions generally is 15%, or 5% if the U.S. relevant holder is a qualified resident company as defined in Article 24 of the Treaty that owns at least 10% of the Company's voting stock.

A withholding tax exemption applies under the participation exemption regime if cumulatively (i) the shareholder is an eligible parent (“Eligible Parent”) and (ii) at the time the income is made available, the shareholder has held or commits itself to hold for an uninterrupted period of at least 12 months a Qualified Shareholding. Holding a participation through a tax transparent entity is deemed to be a direct participation in the proportion of the net assets held in this entity. An Eligible Parent includes (a) a company covered by Article 2 of the Parent-Subsidiary Directive or a Luxembourg permanent establishment thereof, (b) a company resident in a State having a double tax treaty with Luxembourg and liable to a tax corresponding to Luxembourg CIT or a Luxembourg permanent establishment thereof, (c) a company limited by share capital (*société de capitaux*) or a cooperative society (*société coopérative*) resident in a Member State of the European Economic Area other than an EU Member State and liable to a tax corresponding to Luxembourg CIT or a Luxembourg permanent establishment thereof or (d) a Swiss company limited by share capital (*société de capitaux*) which is subject to corporate income tax in Switzerland without benefiting from an exemption.

No withholding tax is levied on capital gains and liquidation proceeds.

Non-Luxembourg holders of the shares who have neither a permanent establishment, nor a permanent representative in Luxembourg to which or whom the shares would be attributable are not liable for any Luxembourg tax on dividends paid on the shares, other than a potential withholding tax as described above.

The responsibility for the withholding of withholding tax will be borne by the Company.

Taxation of the Shareholders

Tax Residency of the Shareholders

A shareholder will not become resident, nor be deemed to be resident, in Luxembourg by reason only of the holding and/or disposal of the common shares or the execution, performance or enforcement of his/her rights thereunder.

Income Tax

For the purposes of this paragraph, a disposal may include a sale, an exchange, a contribution, a redemption and any other kind of alienation of the participation.

Luxembourg Resident Shareholders

Luxembourg Resident Individuals

Dividends and other payments derived from the common shares held by resident individual shareholders, who act in the course of the management of either their private wealth or their professional/business activity, are subject to income tax at the ordinary progressive rates. Under current Luxembourg tax laws, 50% of the gross amount of dividends received by resident individuals from the Company may, however, be exempt from income tax.

Capital gains realized on the disposal of the common shares by resident individual shareholders, who act in the course of the management of their private wealth, are not subject to income tax, unless said capital gains qualify either as speculative gains or as gains on a substantial participation. Capital gains are deemed to be speculative if the common shares are disposed of within 6 months after their acquisition or if their disposal precedes their acquisition. Speculative gains are subject to income tax as miscellaneous income at ordinary rates. A participation is deemed to be substantial where a resident individual shareholder holds or has held, either alone or together with his/her spouse or partner and/or minor children, directly or indirectly at any time within the 5 years preceding the disposal, more than 10% of the share capital of the company whose common shares are being disposed of. A shareholder is also deemed to alienate a substantial participation if he acquired free of charge, within the 5 years preceding the transfer, a participation that was constituting a substantial participation in the hands of the alienator (or the alienators in case of successive transfers free of charge within the same 5-year period). Capital gains realized on a substantial participation more than 6 months after the acquisition thereof are taxed according to the half-global rate method (i.e., the average rate applicable to the total income is calculated according to progressive income tax rates and half of the average rate is applied to the capital gains realized on the substantial participation).

Capital gains realized on the disposal of the common shares by resident individual shareholders, who act in the course of their professional/business activity, are subject to income tax at ordinary rates. Taxable gains are determined as being the difference between the price for which the common shares have been disposed of and the lower of their cost or book value.

Luxembourg Resident Companies

Dividends and other payments derived from the common shares held by Luxembourg resident fully taxable companies are subject to income taxes, unless the conditions of the participation exemption regime, as described below, are satisfied. If the conditions of the participation exemption regime are not met, 50% of the dividends distributed by the Company to a Luxembourg fully taxable resident company are nevertheless exempt from income tax.

Under the participation exemption regime, dividends derived from the common shares may be exempt from income tax at the level of the shareholder if cumulatively (i) the shareholder is a Luxembourg fully taxable resident company (“Qualified Parent”) and (ii) at the time the dividend is put at the shareholder’s disposal, the shareholder has held or commits itself to hold for an uninterrupted period of at least 12 months a Qualified Shareholding. Liquidation proceeds are assimilated to dividends and may be exempt under the same conditions.

Capital gains realized by a Luxembourg fully taxable resident company on the disposal of the common shares are subject to income tax at ordinary rates, unless the conditions of the participation exemption regime, as described below, are satisfied. Under the participation exemption regime, capital gains realized on the common shares may be exempt from income tax at the level of the shareholder if cumulatively (i) the shareholder is a Qualified Parent and (ii) at the time the capital gain is realized, the shareholder has held or commits itself to hold for an uninterrupted period of at least 12 months common shares representing either (a) a direct participation of at least 10% in the share capital of the Company or (b) a direct participation in the Company of an acquisition price of at least €6 million-equivalent. Taxable gains are determined as being the difference between the price for which the common shares have been disposed of and the lower of their cost or book value.

For the purposes of the participation exemption regime, common shares held through a tax transparent entity are considered as being a direct participation proportionally to the percentage held in the net assets of the transparent entity.

Luxembourg Resident Companies Benefiting from a Special Tax Regime

A shareholder which is a Luxembourg resident company benefiting from a special tax regime, such as (i) an undertaking for collective investment (“UCI”) governed by the amended law of December 17, 2010, (ii) a specialized investment fund (“SIF”) governed by the amended law of February 13, 2007, (iii) a family wealth management company governed by the amended law of May 11, 2007, or (iv) a reserved alternative investment fund (“RAIF”) treated as a SIF for Luxembourg tax purposes and governed by the law of July 23, 2016 is exempt from income tax in Luxembourg. Dividends and capital gains derived from the common shares are thus not subject to Luxembourg income tax in their hands.

Luxembourg Non-Resident Shareholders

Non-resident shareholders, who have neither a permanent establishment nor a permanent representative in Luxembourg to which or whom the common shares are attributable, are not liable to any Luxembourg income tax, whether they receive payments of dividends or realize capital gains on the disposal of the common shares, except capital gains realized on a substantial participation before the acquisition or within the first 6 months of the acquisition thereof, that are subject to income tax in Luxembourg at ordinary rates (subject to the provisions of any relevant double tax treaty), or capital gains realized by a shareholder who has been a former Luxembourg resident for more than fifteen years and has become a non-resident, at the time of transfer, less than five years ago. A participation is deemed to be substantial where a shareholder holds or has held, either alone or, in case of an individual shareholder, together with his/her spouse or partner and/or minor children, directly or indirectly at any time within the 5 years preceding the disposal, more than 10% of the share capital of the company whose common shares are being disposed of. A shareholder is also deemed to alienate a substantial participation if he acquired free of charge, within the 5 years preceding the transfer, a participation that was constituting a substantial participation in the hands of the alienator (or the alienators in case of successive transfers free of charge within the same 5-year period).

If the Company and a U.S. relevant holder are eligible for the benefits of the Treaty, such U.S. relevant holder generally should not be subject to Luxembourg tax on the gain from the disposal of such common shares unless such gain is attributable to a permanent establishment of such U.S. relevant holder in Luxembourg.

Non-resident shareholders having a permanent establishment or a permanent representative in Luxembourg to which or whom the common shares are attributable, must include any income received, as well as any gain realized on the disposal of the common shares, in their taxable income for Luxembourg tax assessment purposes, unless the conditions of the participation exemption regime, as described below, are satisfied. If the conditions of the participation exemption regime are not fulfilled, 50% of the gross amount of dividends received by a Luxembourg permanent establishment or permanent representative are, however, exempt from income tax. Taxable gains are determined as being the difference between the price for which the common shares have been disposed of and the lower of their cost or book value.

Under the participation exemption regime, dividends derived from the common shares may be exempt from income tax if cumulatively (i) the common shares are attributable to a qualified permanent establishment (“Qualified Permanent Establishment”) and (ii) at the time the dividend is put at the disposal of the Qualified Permanent Establishment, it has held or commits itself to hold a Qualified Shareholding in the Company. A Qualified Permanent Establishment means (a) a Luxembourg permanent establishment of a company covered by Article 2 of the Parent-Subsidiary Directive, (b) a Luxembourg permanent establishment of a company limited by share capital (*société de capitaux*) resident in a State having a double tax treaty with Luxembourg and (c) a Luxembourg permanent establishment of a company limited by share capital (*société de capitaux*) or a cooperative society (*société coopérative*) resident in a Member State of the European Economic Area other than an EU Member State. Liquidation proceeds are assimilated to a received dividend and may be exempt under the same conditions. Common shares held through a tax transparent entity are considered as being a direct participation proportionally to the percentage held in the net assets of the transparent entity.

Under the participation exemption regime, capital gains realized on the common shares may be exempt from income tax if cumulatively (i) the common shares are attributable to a Qualified Permanent Establishment and (ii) at the time the capital gain is realized, the Qualified Permanent Establishment has held or committed itself to hold for an uninterrupted period of at least 12 months common shares representing either (a) a direct participation in the share capital of the Company of at least 10% or (b) a direct participation in the Company of an acquisition price of at least €6 million.

Net Worth Tax

Luxembourg Shareholders

Luxembourg resident shareholders, as well as non-resident shareholders who have a permanent establishment or a permanent representative in Luxembourg to which or whom the common shares are attributable, are subject to Luxembourg net wealth tax on such common shares, except if the shareholder is (i) a resident or non-resident individual taxpayer, (ii) an UCI governed by the amended law of December 17, 2010, (iii) a securitization company governed by the amended law of March 22, 2004 on securitization, (iv) a company governed by the amended law of June 15, 2004 on venture capital vehicles, (v) a SIF governed by the amended law of February 13, 2007, (vi) a family wealth management company governed by the amended law of May 11, 2007, (vii) a professional pension institution governed by the amended law of July 13, 2005, or (viii) a RAIF governed by the law of July 23, 2016. However, (i) a securitization company governed by the amended law of March 22, 2004 on securitization, (ii) a company governed by the amended law of June 15, 2004 on venture capital vehicles, (iii) a professional pension institution governed by the amended law of July 13, 2005 and (iv) a RAIF treated as a venture capital vehicle for Luxembourg tax purposes and governed by the law of July 23, 2016 remain subject to MNWT.

Under the participation exemption regime, a Qualified Shareholding held in a Qualified Subsidiary by a Qualified Parent or attributable to a Qualified Permanent Establishment may be exempt from Luxembourg net worth tax.

Non-Luxembourg Shareholders

Luxembourg net wealth tax will not be levied on a non-Luxembourg shareholder with respect to the common shares held unless the common shares are attributable to an enterprise or part thereof which is carried on through a permanent establishment or a permanent representative in Luxembourg.

Other Taxes

Under current Luxembourg tax laws, no registration tax or similar tax is in principle payable to shareholders upon the acquisition, holding or disposal of the shares. However, a fixed registration duty of €12 equivalent may be due upon registration of the shares in Luxembourg in the case of a registration of the shares on a voluntary basis.

No inheritance tax is levied on the transfer of the common shares upon death of a shareholder in cases where the deceased was not a resident of Luxembourg for inheritance tax purposes.

Gift tax may be due on a gift or donation of the shares, if the gift is recorded in a Luxembourg notarial deed or otherwise registered in Luxembourg.

The disposal of the shares is not subject to a Luxembourg registration tax or stamp duty, unless recorded in a Luxembourg notarial deed or otherwise registered in Luxembourg.

U.S. Taxation of Common Shares

Dividends

Under the United States federal income tax laws, and subject to the passive foreign investment company (“PFIC”) rules discussed below, the gross amount of any distribution the Company pays out of its current or accumulated earnings and profits (as determined for United States federal income tax purposes) is subject to United States federal income taxation as a dividend for U.S. holders. For noncorporate U.S. holders, dividends that constitute qualified dividend income will be taxable at the preferential rates applicable to long-term capital gains provided that such holders hold the common shares for more than 60 days during the 121-day period beginning 60 days before the ex-dividend date and meet other holding period requirements. Dividends the Company pays with respect to the common shares generally will be qualified dividend income provided that, in the year that the dividend is received, the common shares are readily tradable on an established securities market in the United States. The common shares should generally be treated as readily tradable on an established securities market in the United States so long as they are listed on the NYSE.

U.S. holders must include any Luxembourg tax withheld from the dividend payment in this gross amount even if not in fact received. The dividend is taxable when received, actually or constructively. The dividend will not be eligible for the dividends-received deduction generally allowed to United States corporations in respect of dividends received from other United States corporations. Distributions in excess of current and accumulated earnings and profits, as determined for United States federal income tax purposes, will be treated as a non-taxable return of capital to the extent of a U.S. holder’s basis in the common shares and thereafter as capital gain. However, we do not expect to calculate earnings and profits in accordance with United States federal income tax principles. Accordingly, holders should expect that any distribution will be treated as a dividend.

Subject to certain limitations, the Luxembourg tax withheld in accordance with the Treaty and paid over to Luxembourg will be creditable or deductible against a U.S. holder’s United States federal income tax liability. Special rules apply in determining the foreign tax credit limitation with respect to dividends that are subject to the preferential tax rates.

Dividends will generally be income from sources outside the United States and will, depending on the holder’s circumstances, generally be “passive” income for purposes of computing the foreign tax credit allowable to such holder.

U.S. holders should consult their own tax advisors regarding the utilization of Luxembourg withholding taxes.

Capital Gains

Subject to the PFIC rules discussed below, U.S. holders that sell or otherwise dispose of their common shares will recognize capital gain or loss for United States federal income tax purposes equal to the difference between the U.S. Dollar value of the amount realized and the U.S. holder’s tax basis, determined in U.S. Dollars, in their common shares. Capital gain of a noncorporate U.S. holder is generally taxed at preferential rates where the property is held for more than one year. The deductibility of capital losses is subject to limitations. The gain or loss will generally be income or loss from sources within the United States for foreign tax credit limitation purposes.

PFIC Rules

The Company believes that it currently is not, and the Company does not expect to become, a PFIC. Therefore, the common shares should not be treated as stock of a PFIC for United States federal income tax purposes, but this conclusion is a factual determination that is made annually and thus may be subject to change. In general, a non-U.S. corporation will be classified as a PFIC for any taxable year if at least (i) 75% of its gross income is classified as passive income or (ii) 50% of its assets (determined on the basis of a quarterly average) produce or are held for the production of passive income. If the Company were to be treated as a PFIC, gain realized on the sale or other disposition of the common shares would in general not be treated as capital gain. Instead, unless a U.S. holder elects to be taxed annually on a mark-to-market basis with respect to its common shares, such holder would be treated as if it had realized such gain and certain “excess distributions” ratably over its holding period for the common shares and would be taxed at the highest tax rate in effect for each such year to which the gain was allocated, together with an interest charge in respect of the tax attributable to each such year. With certain exceptions, common shares will be treated as stock in a PFIC if the Company were a PFIC at any time during the U.S. holder’s holding period in the common shares.

Dividends received from the Company will not be eligible for the special tax rates applicable to qualified dividend income if the Company is treated as a PFIC with respect to holders either in the taxable year of the distribution or the preceding taxable year, but instead will be taxable at rates applicable to ordinary income.

F. Dividends and Paying Agents

Not applicable.

G. Statement by Experts

Not applicable.

H. Documents on Display

We are subject to the reporting requirements of the Exchange Act, as applied to foreign private issuers. We furnish or file quarterly financial information to the SEC on Form 6-K and file annual reports on Form 20-F within the time period required by the SEC, which is currently four months from the end of the fiscal year on December 31. Any documents filed or furnished by the Company may be read or copied at the SEC's public reference room at 100 F Street, N.E., Room 1580, Washington, D.C. 20549. Please call the SEC at 1-800-SEC-0330 for further information on the public reference room. The SEC also maintains a website at <http://www.sec.gov> which contains reports and other information regarding registrants that file electronically with the SEC.

Whenever a reference is made in this report to a contract or other document, please be aware that such reference is not necessarily complete and reference should be made to the exhibits that are a part of this report for a copy of the contract or other document.

I. Subsidiary Information

Not applicable.

Item 11. Quantitative and Qualitative Disclosures About Market Risk

Our activities expose us to a variety of market risks. Our primary market risk exposures relate to foreign exchange, interest rate and commodity risks. To manage these risks and our exposure to the unpredictability of financial markets, we seek to minimize potential adverse effects on our financial performance and capital. Where appropriate, we use derivative financial instruments solely for the purpose of hedging the currency, interest and commodity risks arising from our operations and sources of finance. For this purpose, a systematic financial and risk management system has been established. We do not enter into derivative financial instruments for speculative purposes.

The following discussion and analysis only addresses our market risk and does not address other financial risks that we face in the normal course of business, including credit risk and liquidity risk.

Interest Rate Risk

Interest rate risk management aims to protect consolidated net income from negative effects from market interest rate fluctuations. Orion would be exposed to interest rate risk which might arise from incurring new liabilities at this time due to higher interest rates. Since the new Term Loans are variable interest rate instruments, we are exposed to the market risk arising from changes in the yield curve. Appropriate hedging instruments are in place to mitigate the exposure arising from increasing interest rates.

The table below shows the sensitivity of the interest expense to changes in the interest rate, after the impact of hedge accounting. It shows the change resulting from a hypothetical fluctuation in the three-month LIBOR of 50 basis points (0.50%) as of December 31, 2018 assuming that all other variables remain unchanged. For example changes in USD/EUR currency rate would have an impact on our interest exposure and vice versa. Changes in interest rates would also have a related impact on our foreign currency (USD) exposure. The sensitivity analysis assumes that the hypothetical interest rate was valid and that the New Revolving Credit Facilities was utilized in the full amount over the course of the entire year. The effect of this hypothetical change in the interest rate of the variable rate loan on our consolidated income from operations before taxes and equity in earnings of affiliated companies ("income before taxes" in this section) for the year ended December 31, 2018 is as follows:

	December 31, 2018	
	Increase by 0.50%	Decrease by 0.50%
	In thousands	
Increase (decrease) in the interest expense	\$ (8,924)	\$ (1,831)
Increase (decrease) in income before taxes	8,924	1,831
Increase (decrease) in equity (cash flow hedge reserve)	3,306	(2,813)
Increase (decrease) in total comprehensive income before taxes	12,230	(982)

Currency Risk

Our functional currency of our main lending Group entity, OEC GmbH, is Euro. Currency risks primarily stem from future cash flows related to interest payments and the U.S. Dollar-denominated Term Loan. In addition to currency risks from operating activities, these interest and principal repayments mainly represent the risk in connection with exchange rate fluctuations.

The table below shows the sensitivity with regard to the effect of a change in the Euro/U.S. Dollar exchange rate using the outstanding amount and the interest for the U.S. Dollar-denominated Term Loan. A fluctuation of the Euro/U.S. Dollar exchange rate of 10% as of December 31, 2018 with other conditions remaining unchanged, would have the following effect on our income from operations before taxes and equity in earnings from affiliated companies or capital:

	December 31, 2018	
	Value of the U.S. Dollar in relation to the Euro ⁽¹⁾	
	Increase by 10%	Decrease by 10%
	In thousands	
FX gain / (FX loss) in finance result	\$ 1,804	\$ (2,205)
Increase (decrease) in income before taxes	1,804	(2,205)
Increase (decrease) in equity (reserve for hedges of a net investment in foreign operation)	—	—
Increase (decrease) in total comprehensive income before taxes	25,895	(31,649)

⁽¹⁾ U.S. Dollar/Euro exchange rate as of December 31, 2018 : 1.1450.

Commodity Risk

Commodity risk results from changes in market prices for raw materials, mainly carbon black oil. Raw materials are primarily purchased to meet our production requirements. Factors of importance to our risk position are the availability and price of raw materials, energy, starting products and intermediates. In particular, our raw material prices depend on exchange rates and the price of crude oil. Pricing and procurement risks are reduced through worldwide procurement and optimized processes to ensure immediate sourcing of additional raw material requirements. Costs for raw materials and energy have fluctuated significantly in past years and may continue to fluctuate in the future. For example, Brent crude oil prices continuously increased from \$76 per barrel in May 2010, to a peak of \$127 per barrel in April 2011, and then declined to \$110 per barrel by the end of December 2013, dropped sharply to \$60 in December 2014 and further declined to \$30 per barrel by end of December 2015. At December 31, 2018 the price per barrel was at \$54 per barrel. We endeavor to reduce purchasing risks on the procurement markets through worldwide purchasing activities and optimized processes for the purchase of additional raw materials. Raw materials are purchased exclusively to cover our own requirements.

A significant portion of our volume is sold based on formula-driven price adjustment mechanisms for changes in costs of raw materials (volumes of 80% in the Rubber Carbon Black segment and volumes of approximately 90 kmt in the Specialty Carbon Black segment in 2018). Most of our indexed contracts allow for monthly price adjustments, while a relatively small portion allows for quarterly price adjustments. The one-month oil price adjustment mechanism typically results in a two-month delay in reflecting oil price changes in our customer pricing, while the three-month price adjustment mechanism typically results in a four-month delay. We believe that our contracts have enabled us to generally maintain our Segment Adjusted EBITDA Margins since the Acquisition. We discontinued our raw material hedging strategy in 2011 and all our raw material hedging arrangements elapsed by the end of 2013. Beginning in 2016 we entered into limited short term commodity derivatives for a specific carbon black oil grade. We also have short-term non-indexed contracts covering approximately 20% of volumes in the Rubber Carbon Black segment and volumes exceeding 90 kmt in the Specialty Carbon Black segment in 2018 . Sales prices under non-indexed contracts are reviewed on a quarterly basis to reflect raw material and market fluctuation.

Item 12. Description of Securities Other Than Equity Securities

A. Debt Securities

Not applicable.

B. Warrants and Rights

Not applicable.

C. Other Securities

Not applicable.

D. American Depositary Shares

Not applicable.

Item 13. Defaults, Dividend Arrearages and Delinquencies

None.

Item 14. Material Modifications to the Rights of Security Holders and Use of Proceeds

None.

Item 15. Controls and Procedures**Disclosure Controls and Procedures**

An evaluation was carried out, under the supervision and with the participation of management, including the Chief Executive Officer (“CEO”) and Chief Financial Officer (“CFO”), of the effectiveness of the design and operation of our disclosure controls and procedures as defined in Rule 13a-15(e) and 15d-15(e) of the Securities Exchange Act as of December 31, 2018. Based on that evaluation, the CEO and the CFO have concluded that as of December 31, 2018, our disclosure controls and procedures were effective in ensuring that material information that is required to be disclosed in our reports filed under the Exchange Act is recorded, processed, summarized and reported within the time periods specified in the SEC’s rules and forms, and that such information is accumulated and communicated to our management, including our CEO and CFO, as appropriate, to allow timely decisions regarding required disclosure.

In designing and evaluating our disclosure controls and procedures, management, including the CEO and the CFO, recognized that any controls and procedures, no matter how well designed and operated, can provide only reasonable assurance of achieving the desired control objectives, and management necessarily was required to apply its judgment in evaluating the cost-benefit relationship of possible controls and procedures. Because of the inherent limitations in all control systems, no evaluation of controls can provide absolute assurance that all control issues and instances of fraud, if any, within the Company have been detected.

Management’s Annual Report on Internal Control over Financial Reporting

Management is responsible for establishing and maintaining adequate internal control over financial reporting (as such term is defined in Rules 13a-15(f) and 15d-15(f) under the Exchange Act). The Company’s internal control over financial reporting was designed to provide reasonable assurance regarding the reliability of financial reporting and the preparation and fair presentation of the Company’s financial statements for external purposes in accordance with US-GAAP.

Because of its inherent limitations, internal control over financial reporting may not prevent or detect misstatements or omissions. In addition, projections of any evaluation of effectiveness to future periods are subject to the risk that controls may become inadequate because of changes in conditions, or that the degree of compliance with the policies or procedures may deteriorate.

Management conducted its assessment of the effectiveness of our internal control over financial reporting as of December 31, 2018 based on the framework in Internal Control-Integrated Framework (2013) issued by the Committee of Sponsoring Organizations of the Treadway Commission (COSO). Based on that assessment, management has concluded that, as of December 31, 2018, the Company’s internal control over financial reporting was effective.

SEC guidelines permit companies to exclude acquisitions from their assessment of internal control over financial reporting during the first year following an acquisition. Accordingly, management’s assessment did not include the internal controls of SN2A, which is included in the consolidated financial statements for the year ended December 31, 2018 and constituted \$52 million and \$37 million of total assets and net assets, respectively, as of December 31, 2018 and \$1.0 million and \$(0.5) million of revenues and net income, respectively for the year ended on December 31, 2018.

Attestation Report of the Independent Registered Public Accounting Firm

The Company’s independent registered public accounting firm, Ernst & Young GmbH Wirtschaftsprüfungsgesellschaft, has issued an attestation report on management’s internal control over financial reporting which is set forth in Item 18 of this form.

Changes in Control over Financial Reporting

During the period covered by this report, there were no changes in our internal control over financial reporting that have materially affected, or are reasonably likely to materially affect, our internal control over financial reporting, except for such changes made in connection with our conversion from IFRS to GAAP reporting.

Item 16A. Audit Committee Financial Expert

See “*Item 6. Directors, Senior Management and Employees —C. Board Practices—Audit Committee.*”

Item 16B. Code of Ethics

In accordance with NYSE listing requirements and SEC rules, the Company adopted code of business conduct and ethics that applies to all of its employees, the members of its Board of Directors and its officers.

The text of our code of ethics for senior financial officers and code of conduct for employees is posted on our web site at: <https://investor.orioncarbons.com/corporate-governance>.

Item 16C. Principal Accountant Fees and Services

The Audit Committee has adopted a pre-approval policy that requires the pre-approval of all services performed for us by our independent registered public accounting firm. Additionally, the Audit Committee has delegated to its Chairman full authority to approve any management request for pre-approval, provided the Chairman presents any approval given at its next scheduled meeting. All audit-related services, tax services and other services rendered by our independent registered public accounting firm or their affiliates were pre-approved by the Audit Committee and are compatible with maintaining the auditor's independence.

Ernst & Young GmbH Wirtschaftsprüfungsgesellschaft has served as our principal independent public auditor for the years 2018 and 2017 for which audited Consolidated Financial Statements appear in this report. Set forth below are the total fees billed (or expected to be billed), on a consolidated basis, by Ernst & Young GmbH Wirtschaftsprüfungsgesellschaft and affiliates for providing audit and other professional services in each of the last two years:

	2018	2017
	(In millions)	
Audit fees	\$ 3.5	\$ 2.4
Audit-related fees	—	—
Tax fees	0.5	0.3
All other fees	—	—
Total	\$ 4.0	\$ 2.7

Audit fees consist of fees and expenses billed for the annual audit and quarterly review of Orion's consolidated financial statements and the provision of comfort letters to Underwriters in connection with secondary offerings of our shares during 2017.

Tax fees include fees and expenses billed for tax compliance services, including assistance on the preparation of tax returns, requests to extend filing dates and assistance and representation in connection with tax audits, and for tax consultancy in connection with international tax issues and mergers and acquisitions deals.

Item 16D. Exemptions from the Listing Standards for Audit Committees

Not applicable.

Item 16E. Purchases of Equity Securities by the Issuer and Affiliated Purchasers

A total of 206,501 common shares have been repurchased by the Company pursuant to a share repurchase plan in 2018.

The following table sets forth the numbers and average prices of the shares repurchased during the fiscal year 2018:

Period	Total Number of Shares Purchased	Average Price Paid per Share in US-Dollar	total amount paid in US-Dollar	Maximum approximate Dollar Value of shares that may yet be purchased under Program
October 1, 2018 – October 31, 2018 ¹⁾	71,583	\$23.8745	\$1,709,008	\$38,290,992
November 1, 2018 – November 31, 2018	90,700	\$23.8716	\$2,165,154	\$36,125,838
December 31, 2018 – December 31, 2018	44,218	\$23.6936	\$1,047,684	\$35,078,154
Total	206,501	\$23.8345	\$4,921,846	\$35,078,154

Note:

- 1) A resolution approved at the meeting of our board of directors held on March 1, 2018, authorized the Company to acquire own shares, subject to certain limitations, up to an aggregate acquisition value not exceeding \$20 million and 15% of the shares outstanding during the period from March 1, 2018 until December 31, 2018. By resolution of our board of directors dated October 31, 2018, the aggregate total acquisition value of this repurchase program was extended by an additional \$20 million to a total of \$40 million.

Item 16F. Change in Registrant’s Certifying Accountant

None.

Item 16G. Corporate Governance

As a foreign private issuer with registered office in Luxembourg that is listed on the NYSE, we are generally entitled to follow the corporate governance practices applicable to Luxembourg issuers under the corporate and securities laws of the Grand Duchy of Luxembourg (“Luxembourg Law”). The following is a summary of any significant ways in which our corporate governance practices differ from those required to be followed by U.S. domestic companies under NYSE listing standards.

Rule 10A-3(b)(2) under the Exchange Act requires that a U.S. public company’s independent auditors be appointed by the company’s audit committee. As required under Luxembourg Law and our Articles of Association, our independent auditors are appointed by a general meeting of shareholders upon the recommendation of the Audit Committee.

Item 16H. Mine Safety Disclosure

Not applicable.

PART II

Item 17. Financial Statements

Not applicable

Item 18. Financial Statements

See page F-1 of this report.

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REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

To the Shareholders and the Board of Directors of Orion Engineered Carbons S.A.

Opinion on the Financial Statements

We have audited the accompanying consolidated balance sheets of Orion Engineered Carbons S.A. (the Company) as of December 31, 2018 and 2017, the related consolidated statements of operations, comprehensive income, changes in stockholders' equity and cash flows for each of the three years in the period ended December 31, 2018, and the related notes (collectively referred to as the "consolidated financial statements"). In our opinion, the consolidated financial statements present fairly, in all material respects, the financial position of the Company at December 31, 2018 and 2017, and the results of its operations and its cash flows for each of the three years in the period ended December 31, 2018, in conformity with U.S. generally accepted accounting principles.

We also have audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States) (PCAOB), the Company's internal control over financial reporting as of December 31, 2018, based on criteria established in Internal Control-Integrated Framework issued by the Committee of Sponsoring Organizations of the Treadway Commission (2013 framework) and our report dated March 7, 2019 expressed an unqualified opinion thereon.

Basis for Opinion

These financial statements are the responsibility of the Company's management. Our responsibility is to express an opinion on the Company's financial statements based on our audits. We are a public accounting firm registered with the PCAOB and are required to be independent with respect to the Company in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

We conducted our audits in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free of material misstatement, whether due to error or fraud. Our audits included performing procedures to assess the risks of material misstatement of the financial statements, whether due to error or fraud, and performing procedures that respond to those risks. Such procedures included examining, on a test basis, evidence regarding the amounts and disclosures in the financial statements. Our audits also included evaluating the accounting principles used and significant estimates made by management, as well as evaluating the overall presentation of the financial statements. We believe that our audits provide a reasonable basis for our opinion.

/s/Tobias Schlebusch /s/Titus Zwirner
Wirtschaftsprüfer Wirtschaftsprüfer
(German Public Auditor) (German Public Auditor)

Ernst & Young GmbH Wirtschaftsprüfungsgesellschaft
We have served as the Company's auditor since 2011
Cologne, Germany
March 7, 2019

REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

To the Shareholders and the Board of Directors of Orion Engineered Carbons S.A.

Opinion on Internal Control over Financial Reporting

We have audited Orion Engineered Carbons S.A.'s internal control over financial reporting as of December 31, 2018, based on criteria established in Internal Control-Integrated Framework issued by the Committee of Sponsoring Organizations of the Treadway Commission (2013 framework) (the COSO criteria). In our opinion, Orion Engineered Carbons S.A. (the Company) maintained, in all material respects, effective internal control over financial reporting as of December 31, 2018, based on the COSO criteria.

As indicated in the accompanying Management's Annual Report on Internal Control over Financial Reporting, management's assessment of and conclusion on the effectiveness of internal control over financial reporting did not include the internal controls of Société du Noir d'Acétylène de l'Aubette, SAS, which is included in the 2018 consolidated financial statements of the Company and constituted \$52 million and \$37 million of total and net assets, respectively, as of December 31, 2018 and \$1.0 million and \$(0.5) million of revenues and net income, respectively, for the year then ended. Our audit of internal control over financial reporting of the Company also did not include an evaluation of the internal control over financial reporting of Société du Noir d'Acétylène de l'Aubette, SAS.

We also have audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States) (PCAOB), the consolidated balance sheets of the Company as of December 31, 2018 and 2017, the related consolidated statements of operations, comprehensive income, changes in stockholders' equity and cash flows for each of the three years in the period ended December 31, 2018, and the related notes and our report dated March 7, 2019 expressed an unqualified opinion thereon.

Basis for Opinion

The Company's management is responsible for maintaining effective internal control over financial reporting and for its assessment of the effectiveness of internal control over financial reporting included in the accompanying Management's Annual Report on Internal Control over Financial Reporting. Our responsibility is to express an opinion on the Company's internal control over financial reporting based on our audit. We are a public accounting firm registered with the PCAOB and are required to be independent with respect to the Company in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

We conducted our audit in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether effective internal control over financial reporting was maintained in all material respects.

Our audit included obtaining an understanding of internal control over financial reporting, assessing the risk that a material weakness exists, testing and evaluating the design and operating effectiveness of internal control based on the assessed risk, and performing such other procedures as we considered necessary in the circumstances. We believe that our audit provides a reasonable basis for our opinion.

Definition and Limitations of Internal Control Over Financial Reporting

A company's internal control over financial reporting is a process designed to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles. A company's internal control over financial reporting includes those policies and procedures that (1) pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect the transactions and dispositions of the assets of the company; (2) provide reasonable assurance that transactions are recorded as necessary to permit preparation of financial statements in accordance with generally accepted accounting principles, and that receipts and expenditures of the company are being made only in accordance with authorizations of management and directors of the company; and (3) provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use, or disposition of the company's assets that could have a material effect on the financial statements.

Because of its inherent limitations, internal control over financial reporting may not prevent or detect misstatements. Also, projections of any evaluation of effectiveness to future periods are subject to the risk that controls may become inadequate because of changes in conditions, or that the degree of compliance with the policies or procedures may deteriorate.

/s/Tobias Schlebusch /s/Titus Zwirner
Wirtschaftsprüfer Wirtschaftsprüfer
(German Public Auditor) (German Public Auditor)

Ernst & Young GmbH Wirtschaftsprüfungsgesellschaft
Cologne, Germany
March 7, 2019

Consolidated statements of operations of Orion Engineered Carbons S.A.

	Years Ended December 31,		
	2018	2017	2016
	(In thousands, except per share amounts)		
Net sales	\$ 1,578,203	\$ 1,328,297	\$ 1,139,291
Cost of sales	1,148,232	950,701	764,856
Gross profit	429,971	377,596	374,435
Selling, general and administrative expenses	231,918	207,493	202,457
Research and development costs	20,320	18,159	16,069
Other expenses, net	6,061	7,581	9,047
Restructuring income	40,253	—	—
Restructuring expenses	15,620	6,492	30,048
Income from operations	196,305	137,871	116,814
Interest and other financial expense, net	28,642	44,135	43,300
Reclassification of actuarial losses from AOCI	—	9,687	104
Income from operations before income taxes and equity in earnings of affiliated companies	167,663	84,049	73,410
Income tax expense	46,944	19,736	24,363
Equity in earnings of affiliated companies, net of tax	591	547	462
Net income	\$ 121,310	\$ 64,860	\$ 49,509
Weighted-average shares outstanding (in thousands of shares):			
Basic	59,567	59,320	59,353
Diluted	61,049	60,674	60,154
Earnings per share (USD per share):			
Basic	\$ 2.04	\$ 1.09	\$ 0.83
Diluted	1.99	1.07	0.82
Dividends per share	\$ 0.80	\$ 0.77	\$ 0.74

The accompanying notes are an integral part of these consolidated financial statements.

Consolidated Statements of Comprehensive Income of Orion Engineered Carbons S.A.

	Years Ended December 31,		
	2018	2017	2016
	(In thousands)		
Net income	\$ 121,310	\$ 64,860	\$ 49,509
Other comprehensive income (loss), net of tax			
Foreign currency translation adjustments	(10,096)	(4,932)	6,168
Unrealized net gains/(losses) on hedges of a net investment in a foreign operation	(269)	14,569	(3,641)
Unrealized net gains/(losses) on cash flow hedges	(4,077)	(1,108)	793
Gains/(losses) on defined benefit plans	134	4,099	(6,853)
Other comprehensive income/(loss)	(14,308)	12,628	(3,533)
Comprehensive income	\$ 107,002	\$ 77,488	\$ 45,976

The accompanying notes are an integral part of these consolidated financial statements.

Consolidated Balance Sheets of Orion Engineered Carbons S.A.

	December 31	
	2018	2017
	(In thousands, except share amounts)	
Current assets		
Cash and cash equivalents	\$ 57,016	\$ 72,284
Accounts receivable, net of reserve for doubtful accounts of \$5,081 and \$5,221	262,821	234,273
Other current financial assets	12,573	3,890
Inventories	183,629	159,334
Income tax receivables	24,342	17,289
Prepaid expenses and other current assets	34,938	35,038
Total current assets	575,319	522,108
Property, plant and equipment - net	483,534	462,129
Goodwill	55,546	58,180
Intangible assets - net	95,245	70,722
Investment in equity method affiliates	5,332	5,585
Deferred income tax assets	52,395	38,195
Other financial assets	2,723	3,564
Other assets	2,928	3,883
Total non-current assets	697,703	642,258
Total assets	\$ 1,273,022	\$ 1,164,366
Current liabilities		
Accounts payable	\$ 163,585	\$ 169,624
Current portion of long term debt and other financial liabilities	41,020	6,022
Current portion of employee benefit plan obligation	855	763
Accrued liabilities	56,297	59,471
Income taxes payable	28,086	15,539
Other current liabilities	30,493	33,733
Total current liabilities	320,336	285,152
Long-term debt, net	643,748	681,144
Employee benefit plan obligation	60,377	64,627
Deferred income tax liabilities	45,504	20,470
Other liabilities	44,161	17,668
Commitments and contingencies	Note Q	—
Total non-current liabilities	793,790	783,909
Stockholders' equity		
Common stock		
Authorized: 89,452,626 and 89,452,626 shares with no par value		
Issued – 60,035,579 and 59,635,126 shares with no par value		
Outstanding – 59,518.498 and 59,320,214 shares	84,254	83,770
Less cost of 517,081 and 314,912 shares of common treasury stock	(8,683)	(3,773)
Additional paid-in capital	63,544	102,529
Retained earnings/(Accumulated deficit)	39,409	(81,901)
Accumulated other comprehensive income/(loss)	(19,628)	(5,320)
Total stockholders' equity	158,896	95,305

Total liabilities and stockholders' equity

\$ 1,273,022

\$ 1,164,366

The accompanying notes are an integral part of these consolidated financial statements.

Consolidated Statements of Cash Flows of Orion Engineered Carbons S.A.

	Years Ended December 31,		
	2018	2017	2016
	(In thousands)		
Cash flows from operating activities:			
Net income	\$ 121,310	\$ 64,860	\$ 49,509
Adjustments to reconcile net income to net cash provided by operating activities:			
Depreciation of property, plant and equipment and amortization of intangible assets	98,156	98,356	88,111
Impairment of property, plant and equipment and intangible assets	—	—	9,034
Amortization of debt issuance costs	2,220	4,171	4,035
Share-based incentive compensation	13,919	8,835	3,958
Deferred tax (benefit)/provision	(3,634)	(7,667)	3,807
Foreign currency transactions	2,782	(14,402)	3,729
Other operating non-cash expenses	1,165	15,163	2,159
Changes in operating assets and liabilities, net of effects of businesses acquired:			
(Increase)/decrease in trade receivables	(39,680)	(15,885)	(15,832)
(Increase)/decrease in inventories	(31,406)	(25,632)	(9,328)
Increase/(decrease) in trade payables	5,444	17,545	32,010
Increase/(decrease) in provisions	(4,427)	(12,317)	20,565
Increase/(decrease) in tax liabilities	4,843	(11,954)	636
Increase/(decrease) in other assets and liabilities that cannot be allocated to investing or financing activities	(48,707)	26,666	(14,957)
Net cash provided by operating activities	121,985	147,739	177,436
Cash flows from investing activities:			
Cash received from the disposal of intangible assets and property, plant and equipment	64,672	—	2,360
Cash paid for the acquisition of intangible assets and property, plant and equipment	(116,157)	(90,282)	(70,864)
Acquisition of businesses, net of cash and cash equivalents acquired	(36,571)	—	—
Net cash used in investing activities	(88,056)	(90,282)	(68,504)
Cash flows from financing activities:			
Proceeds from borrowings	—	11,890	—
Payments for debt issue costs	(741)	(5,327)	(2,106)
Repayments of long-term debt	(8,288)	(28,866)	(51,821)
Cash inflows related to current financial liabilities	48,963	11,652	—
Cash outflows related to current financial liabilities	(26,370)	(12,141)	—
Dividends paid to shareholders	(47,665)	(45,705)	(44,131)
Repurchase of common stock	(4,926)	—	(3,773)
Taxes paid for shares issued under net settlement feature	(4,741)	—	—
Net cash used in financing activities	(43,768)	(68,497)	(101,831)
Increase (decrease) in cash, cash equivalents and restricted cash	(9,839)	(11,040)	7,101
Cash, cash equivalents and restricted cash at the beginning of the period	75,213	80,480	73,709
Effect of exchange rate changes on cash	(3,770)	5,773	(329)
Cash, cash equivalents and restricted cash at the end of the period	61,604	75,213	80,480
Less restricted cash at the end of the period	4,588	2,929	2,574
Cash and cash equivalents at the end of the period	\$ 57,016	\$ 72,284	\$ 77,906
Cash paid for interest, net	\$ (24,367)	\$ (25,905)	\$ (41,779)
Cash paid for income taxes	\$ (60,228)	\$ (39,549)	\$ (19,652)
Supplemental disclosure of non-cash activity:			
Liabilities under build-to-suit lease	\$ 28,657	\$ —	\$ —

The accompanying notes are an integral part of these consolidated financial statements.

Consolidated Statements of Changes in Stockholders' Equity of Orion Engineered Carbons S.A.

(In thousands, except per share amounts)	Common stock		Treasury shares	Additional paid-in capital	Retained earnings	Accumulated other comprehensive loss	Total equity
	Number of common shares	Amount					
As at January 1, 2016	59,635,126	\$ 83,770	\$ —	\$ 179,572	\$ (196,270)	\$ (14,415)	\$ 52,657
Net income	—	—	—	—	49,509	—	49,509
Other comprehensive loss, net of tax	—	—	—	—	—	(3,533)	(3,533)
Distributions from additional paid-in capital	—	—	—	(44,131)	—	—	(44,131)
Share buyback	(314,912)	—	(3,773)	—	—	—	(3,773)
Share based compensation	—	—	—	3,958	—	—	3,958
As at December 31, 2016	59,320,214	83,770	(3,773)	139,399	(146,761)	(17,948)	54,687
Net income	—	—	—	—	64,860	—	64,860
Other comprehensive income, net of tax	—	—	—	—	—	12,628	12,628
Distributions from additional paid-in capital	—	—	—	(45,705)	—	—	(45,705)
Share based compensation	—	—	—	8,835	—	—	8,835
As at December 31, 2017	59,320,214	83,770	(3,773)	102,529	(81,901)	(5,320)	95,305
Net income	—	—	—	—	121,310	—	121,310
Other comprehensive loss, net of tax	—	—	—	—	—	(14,308)	(14,308)
Distributions from additional paid-in capital	—	—	—	(47,665)	—	—	(47,665)
Share buyback	(206,501)	—	(4,926)	—	—	—	(4,926)
Share based compensation	—	—	—	8,680	—	—	8,680
Issuance of stock under equity compensation plans	404,785	484	16	—	—	—	500
As at December 31, 2018	59,518,498	\$ 84,254	\$ (8,683)	\$ 63,544	\$ 39,409	\$ (19,628)	\$ 158,896

The accompanying notes are an integral part of these consolidated financial statements.

Note A. Significant Accounting Policies

Orion's audited consolidated financial information comprise Orion and its subsidiaries (the "Orion Group", or the "Group" or the "Company"). The Group's fiscal year comprises the period from January 1 to December 31, 2018 .

The Group's audited consolidated financial statements are prepared in US Dollars, the presentation currency of the Group. Except where stated otherwise, all figures are presented in thousands of US Dollars.

The consolidated financial statements have been prepared in conformity with accounting principles generally accepted in the United States of America ("U.S.").

Adoption of accounting standards

In May 2014, the FASB issued ASU 2014-09, *Revenue from Contracts with Customers (Topic 606) (ASU 2014-09)* . Subsequently, the FASB also issued ASU 2015-14, *Revenue from Contracts with Customers (Topic 606)* , which adjusted the effective date of ASU 2014-09; ASU 2016-08, *Revenue from Contracts with Customers (Topic 606): Principal versus Agent Considerations (Reporting Revenue Gross versus Net)* , which amends the principal-versus-agent implementation guidance and illustrations in ASU 2014-09; ASU 2016-10, *Revenue from Contracts with Customers (Topic 606): Identifying Performance Obligations and Licensing* , which clarifies identifying performance obligation and licensing implementation guidance and illustrations in ASU 2014-09; and ASU 2016-12, *Revenue from Contracts with Customers (Topic 606): Narrow-Scope Improvements and Practical Expedients* , which addresses implementation issues and is intended to reduce the cost and complexity of applying the new revenue standard in ASU 2014-09 (collectively, the "Revenue ASUs"). The Revenue ASUs provide an accounting standard for a single comprehensive model for use in accounting for revenue arising from contracts with customers and supersedes most current revenue recognition guidance. The guidance permits two methods of adoption: retrospectively to each prior reporting period presented (the full retrospective method), or retrospectively with the cumulative effect of initially applying the guidance recognized at the date of initial application (the modified retrospective method). Orion elected to apply the modified retrospective method. The new Revenue ASUs did not have a material impact on the Company's financial statements and were adopted on January 1, 2018.

In July 2015, the FASB issued Accounting Standard Update ("ASU") No. 2015-11, *Inventory (Topic 330)* . The amendment simplifies the subsequent measurement of inventory by replacing the lower of cost or market test with a lower of cost and net realizable value test. The guidance applies only to inventories for which cost is determined by methods other than last-in first-out (LIFO) and the retail inventory method (RIM). Entities that use LIFO or RIM will continue to use existing impairment models (e.g., entities using LIFO would apply the lower of cost or market test). The new standard is effective for fiscal years beginning after December 15, 2016, including interim periods within those years, and with early adoption permitted. Orion decided to early adopt the standard as of January 1, 2016 and the adoption did not have a material impact on the Company's financial statements.

In November 2015, the FASB issued ASU No. 2015-17, *Income Taxes (Topic 740): Balance Sheet Classification of Deferred Taxes* . The amendments in ASU 2015-17 eliminates the current requirement for organizations to present deferred tax liabilities and assets as current and non-current in a classified balance sheet. Instead, organizations will be required to classify all deferred tax assets and liabilities as non-current. This guidance is effective for fiscal years beginning after December 15, 2017, and interim periods within fiscal years beginning after December 15, 2018. Early adoption is permitted. The Company has decided to early adopt ASU 2015-17 as of January 1, 2016 and the adoption did not have a material impact on the Company's financial statements.

In January 2016, the FASB issued ASU No. 2016-01, *Financial Instruments Overall (Subtopic 825-10): Recognition and Measurement of Financial Assets and Financial Liabilities* . The amendments in ASU 2016-01 address certain aspects of recognition, measurement, presentation, and disclosure of financial instruments. This guidance is effective for fiscal years beginning after December 15, 2017, including interim periods within those fiscal years. The Company adopted the standard as of January 1, 2018 and the adoption did not have a material impact on the Company's financial statements.

In March 2016, the FASB issued ASU No. 2016-09, *Compensation - Stock Compensation (Topic 718): Improvements to Employee Share-Based Payment Accounting* , that amends the accounting standard for stock compensation by simplifying several aspects of the accounting for employee share-based payment transactions, including the related accounting for income taxes, forfeitures, and the withholding of shares to satisfy the employer's tax withholding requirements, as well as classification in the statements of cash flows. Management made the election to continue to account for forfeitures based on expected forfeitures. The new standard is effective for fiscal years beginning after December 15, 2016, including interim periods within those years, and with early adoption permitted. Orion early adopted the standard on January 1, 2016 and the adoption did not have a material impact on the Company's financial statements.

In August 2016, the FASB issued ASU No. 2016-15, *Statement of Cash Flows (Topic 230): Classification of Certain Cash Receipts and Cash Payments* . The amendment in ASU 2016-15 addresses the classification of eight specific cash flow issues and their presentation within the Statement of Cash Flows. This guidance is effective for fiscal years beginning after December 15, 2017, and interim periods within those fiscal years. Early adoption is permitted. The Company decided to early adopt ASU 2016-15 as of January 1, 2016 and the adoption did not have a material impact on the Company's financial statements.

In October 2016, the FASB issued ASU No. 2016-16, *Income Taxes (Topic 740): Intra-Entity Transfer of Assets Other Than Inventory* . The amendments in ASU 2016-16 eliminates the current requirement to account for an advanced tax on intra-entity transfers of assets. Instead, the Company is required to only recognize an advanced tax on intra-entity transfers of inventories. For all other transfers of assets, the Company recognizes income tax expenses and potential deferred taxes. This guidance is effective for fiscal years beginning after December 15, 2017.

Early adoption is permitted. The Company decided to early adopt ASU 2016-16 as of January 1, 2016. The adoption resulted in an effect of \$472 thousand recognized in retained earnings.

In November 2016, the FASB issued ASU No. 2016-18, *Statement of Cash Flows (Topic 230): Restricted Cash*. The amendments in ASU 2016-18 require that a statement of cash flows explain the change during the period in the total of cash, cash equivalents, and amounts generally described as restricted cash or restricted cash equivalents. Therefore, amounts generally described as restricted cash and restricted cash equivalents should be included with cash and cash equivalents when reconciling the beginning-of-period and end-of-period total amounts shown on the statement of cash flows. The guidance is effective for fiscal years beginning after December 15, 2017, and interim periods within those fiscal years. Early adoption is permitted. The Company decided to early adopt ASU 2016-18 as of January 1, 2016 and restricted cash is presented accordingly.

In January 2017, the FASB issued ASU No. 2017-01, *Business Combinations (Topic 805): Clarifying the Definition of a Business*. The amendments in ASU 2017-01 provide a screen to determine when an integrated set of activities is not deemed to be a business. The screen requires that when substantially all of the fair value of the gross assets acquired (or disposed of) is concentrated in a single identifiable asset or a group of similar identifiable assets, the set is not a business. This screen reduces the number of transactions that need to be further evaluated. This guidance is effective for fiscal years beginning after December 15, 2017. The Company adopted ASU 2017-01 as of January 1, 2018 and presented its business combination of fiscal year 2018 accordingly.

In January 2017, the FASB issued ASU No. 2017-04, *Intangibles - Goodwill and Other (Topic 350): Simplifying the Test for Goodwill Impairment*, that amends and simplifies the accounting standard for goodwill impairment. The new standard removes Step 2 of the goodwill impairment test, which requires a hypothetical purchase price allocation. A goodwill impairment will now be the amount by which a reporting unit's carrying value exceeds its fair value, limited to the total amount of goodwill allocated to that reporting unit. The new standard is effective for annual and any interim impairment tests for periods beginning after December 15, 2019, and early adoption is permitted for any impairment tests performed after January 1, 2017. The Company has decided to adopt ASU 2017-04 early as of January 1, 2018. The adoption had no impact on the Company's financial statements.

In May 2017, the FASB issued ASU No. 2017-09, *Compensation - Stock compensation (Topic 718)*. The amendments in this update provide guidance about which changes to the terms or conditions of a share-based payment award require an entity to apply modification accounting. This ASU will be effective for periods beginning after December 15, 2017. The Group adopted this update as of January 1, 2018. The adoption had no impact on the Company's financial statements.

In March 2017, the FASB issued ASU No. 2017-07, *Compensation - Retirement Benefits (Topic 715): Improving the Presentation of Net Periodic Pension Cost and Net Periodic Postretirement Benefit Cost*, that amends the requirements on the presentation of net periodic pension and post-retirement benefit cost. Before adoption, net benefit costs are reported as employee costs within operating income. The new standard requires the service cost component to be presented with other employee compensation costs. The other components will be reported separately outside of operations. The new standard is effective for fiscal years beginning after December 15, 2017, including interim periods within those years, and early adoption is permitted as of the beginning of any annual period for which an entity's financial statements (interim or annual) have not been issued. The Group adopted this update as of January 1, 2018. The impacts are presented in the statements of operations separately in particular as reclassification of actuarial losses from AOCI.

Principles of consolidation

The consolidated financial statements include all subsidiaries indirectly or directly controlled by Orion. Entities are consolidated from the date the Orion Group obtains control, which generally is the acquisition date, and are deconsolidated when control is lost.

Control is achieved when the Orion Group is exposed, or has the right, to variable returns from its involvement with the investee and has the ability to affect those returns through its power over the investee. The Orion Group re-assesses whether or not it controls an investee if facts and circumstances indicate that there are changes to one or more of these three elements of control.

The Orion Group consolidated financial statements are prepared in accordance with uniform accounting policies. Income and expenses, intercompany profits and losses, and receivables and liabilities between consolidated subsidiaries are eliminated.

Use of estimates

The preparation of consolidated financial statements in conformity with accounting principles generally accepted in the U.S. requires management to make certain estimates and assumptions that affect the reported amount of assets and liabilities and the disclosure of contingent assets and liabilities at the date of the consolidated financial statements and the reported amounts of revenue and expenses during the reported period. Actual results could differ from those estimates.

Foreign currency translation

Foreign currency transactions are measured at the exchange rate at the date of initial recognition. Any gains or losses resulting from the valuation of foreign currency monetary assets and liabilities using the currency exchange rates as at the reporting date are recognized in other expenses, net. Other operating income from currency translation amounted to \$331k in 2018, \$75k in 2017 and \$1k in 2016. Other operating expenses from currency translation amounted to \$74k in 2018, \$16k in 2017 and \$893k in 2016.

Currency exchange differences relating to financing activities are recognized in interest and other financial income and interest and other financial expense.

The assets and liabilities of foreign operations with functional currencies different from the presentation currency U.S. dollars are translated using closing rates as at the reporting date. Income and expense items are translated at average monthly exchange rates for the respective period. The translation of equity is performed using historical exchange rates. The overall foreign currency impact from translating the statement of financial position and income statement of all the foreign entities is recognized in accumulated other comprehensive income (loss) ("AOCI").

Revenue and income recognition

OEC recognizes revenue when or as it satisfies a performance obligation by transferring a good or a service to a customer. Revenue is only recognized when control is transferred to the customer. The amount of consideration we receive and revenue we recognize is based upon the terms stated in the sales contract, which may contain variable consideration such as discounts or rebates. We also give our customers a limited right to return product that has been damaged, does not satisfy their specifications, or other specific reasons. Payment terms on product sales to our customers typically range from 30 to 90 days. Although certain exceptions exist where standard payment terms are exceeded, these instances are infrequent and do not exceed one year.

Revenue is recognized according to the five-step model proscribed in ASC 606. Under the first step, the entity has to identify the contract entered with a customer granting the right to receive goods or service in exchange for consideration. The second step requires the identification of distinct performance obligations within a contract. The transaction price of the arrangement is defined in Step 3 of ASC 606. In addition to the contractual fixed price the entity has to take variable considerations into account. If the entity identified more than one separate performance obligation under step 2, it has to account for this contract as a multiple element arrangement resulting in an allocation of revenues to the obligations identified. If these conditions are satisfied, revenue from the sale of goods is recognized when control have been transferred to the buyer, either at a point in time, or over time.

The Group records a provision for warranty costs, based on historical trends of warranty costs incurred as a percentage of sales, which management has determined to be a reasonable estimate of the probable losses to be incurred for warranty claims in a period.

The Group derives substantial majority of revenues by selling carbon black to industrial customers for further processing. Revenue recognition and measurement is governed by the following principles. The amount of revenue, the transactions price, is contractually specified between the parties and is measured at the amount expected be received less value-added tax and any trade discounts and volume rebates granted. Discounts and volume rebates are accounted for as estimates of variable consideration and deducted from revenue.

With respect to the sale of goods, sales are recognized at the point in time control over the good transfers to the customer. The timing of the transfer of control varies depending on the individual terms of the sales agreement.

Shipping and handling costs incurred in connection with the satisfaction of performance obligations are accounted for as fulfillment activities rather than separate performance obligations.

Interest income is recognized using the effective interest method.

Cost of sales

Cost of Sales consists of the raw and packaging materials, direct manufacturing costs, depreciation, inspection costs, inbound freight cost and shipping, internal handling costs and other overhead expenses necessary to manufacture the products.

Selling and administrative expenses

Selling and administrative expenses consist of salaries and other compensation benefits of sales and office personnel, general office expenses and other expenses not directly related to manufacturing operations.

Research and development costs

Research and development costs include salaries, equipment and material expenditures, and contractor fees and are expensed as incurred.

Income taxes

Current income tax receivables and liabilities are measured at the amount expected to be recovered from or paid to the taxation authorities. They are calculated based on the tax rates and tax laws that are enacted on the reporting date.

Deferred tax assets and liabilities are determined based on the estimated future tax effects of differences between financial statement carrying amounts and the tax bases of existing assets and liabilities. Deferred tax assets are recognized to the extent that realization of those assets is considered to be more likely than not. They are measured using statutory tax rates that are expected to apply to taxable income in the jurisdictions and years when the asset is realized or the liability is settled, based on tax rates that are enacted at the reporting date. The effect on deferred tax assets and liabilities of a change in tax rates is recognized in income in the period that includes the enactment date.

A valuation allowance is established for deferred taxes when it is more likely than not that all or a portion of the deferred tax assets will not be realized.

Orion records benefits for uncertain tax positions based on the assessment of whether the position is more likely than not to be sustained by taxing authorities. If the threshold is not met, no tax benefit of the uncertain tax position is recognized. If the threshold is met, the tax benefit that is recognized is the largest amount that is greater than 50% likely of being realized upon ultimate settlement. The analysis

presumes the taxing authorities' full knowledge of the positions taken and all relevant facts, but does not consider the time value of money. The Company also accrues for interest and penalties on its uncertain tax positions and included such charges in its income tax provision in the Consolidated Statements of Operations.

Cash, cash equivalents and restricted cash

Cash and cash equivalents comprise bank balances, checks and cash on hand. They include all highly liquid investments with a maturity of three months or less at date of acquisition.

Restricted cash comprises cash which is not available for immediate use and may not be utilized for any purpose until a certain event or events take place. A designation for short-term or long-term restricted cash is made based on the expected time of release or distribution.

Cash, cash equivalents and restricted cash for December 31, 2018 and 2017 reconciles as follows:

	December 31	
	2018	2017
	(In thousands)	
Cash and cash equivalents	\$ 57,016	\$ 72,284
Restricted cash included in other assets and liabilities	4,588	2,929
Total cash, cash equivalents and restricted cash shown in the statement of cash flows	\$ 61,604	\$ 75,213

Restrictions result from mandatory and voluntary pledges to secure certain guarantee amounts.

Accounts and notes receivables

Trade receivables are recorded at the invoiced amount and generally do not bear interest. Orion monitors and evaluates collectibility of receivables on an ongoing basis and considers whether an allowance for doubtful accounts is necessary. Trade receivables in China may at certain times be settled with the receipt of bank issued non-interest bearing notes. These notes totaled RMB 38,962k (\$35k) and RMB 67,679k (\$63k) as of December 31, 2018 and 2017 , respectively, and are included in accounts receivable in the Company's Consolidated Balance Sheets. Orion periodically sells a portion of these bank notes and other customer receivables at a discount and such sales are accounted for as asset sales. The Company does not have any continuing involvement with these notes or other customer receivables after the sale. The difference between proceeds from the sale and the carrying value of these assets is recognized as a loss on the sale of receivables and is included in Other expenses, net in the accompanying Consolidated Statements of Operations.

Financial instruments

Orion's financial instruments consist primarily of cash and cash equivalents, trade receivables, loans, miscellaneous financial assets, term loan, local bank loans, trade payables and derivative instruments. The carrying values of Orion's financial instruments approximate fair value with the exception of variable rate long-term debt, which is recorded at amortized cost. The fair values of the Company's financial instruments are based on quoted market prices, if such prices are available. In situations where quoted market prices are not available, the Company relies on valuation models to derive fair value. Such valuation takes into account the ability of the financial counterparty to perform and the Company's own credit risk.

The Group uses derivative financial instruments primarily for purposes of hedging the exposures to fluctuations in foreign currency exchange rates, which exist as part of its ongoing business operations. Orion does not enter into derivative contracts for speculative purposes, nor does it hold or issue any derivative contracts for trading purposes. All derivatives are recognized on the Consolidated Balance Sheets at fair value. Where the Group has a legal right to offset derivative settlements under a master netting agreement with a counterparty, derivatives with that counterparty are presented on a net basis. The changes in the fair value of derivatives are recorded in either earnings or AOCI, depending on whether or not the instrument is designated as part of a hedge transaction and, if designated as part of a hedge transaction, the type of hedge transaction. The gains or losses on derivative instruments reported in AOCI are reclassified to earnings in the period in which earnings are affected by the underlying hedged item. The ineffective portion of all hedges is recognized in earnings during the period in which the ineffectiveness occurs.

In accordance with Orion's risk management strategy, the Company may enter into certain derivative instruments that may not be designated as hedges for hedge accounting purposes. Although these derivatives are not designated as hedges, the Company believes that such instruments are closely correlated with the underlying exposure, thus managing the associated risk. The Company records in earnings the gains or losses from changes in the fair value of derivative instruments that are not designated as hedges. Cash movements associated with these instruments are presented in the Consolidated Statements of Cash Flows as Cash Flows from Operating Activities because the derivatives are designed to mitigate risk to the Company's cash flow from operations. The cash flows related to the principal amount of outstanding debt instruments are presented in the Cash Flows from Financing Activities section of the Consolidated Statements of Cash Flows.

Concentrations of credit risk

Credit risk is the risk of an unexpected loss if a customer or third party to a financial instrument fails to meet its contractual obligations. Financial instruments that potentially subject the Company to a concentration of credit risk consist primarily of cash and cash equivalents, accounts receivable, derivative instruments and undrawn amounts under the Revolving Credit Facility.

Cash and Cash Equivalents

Cash and cash equivalents are defined as cash on hand, demand deposits with financial institutions, and short-term liquid investments with an initial maturity date of less than three months. Our cash in demand deposit accounts may exceed federally insured limits and could be negatively impacted if the underlying financial institutions fail or are subject to other adverse conditions in the financial markets. Credit risk is mitigated as we place the cash mainly with our defined core banks which are major financial institutions enjoying investment grade long-term credit ratings. To date, we have experienced no loss or diminished access to cash in our demand deposit accounts.

Accounts receivable

Our trade accounts receivable are subject to concentrations of credit risk with customers primarily in our Rubber Carbon Black segment. During 2018, sales to our ten largest customers within our Rubber Carbon Black segment accounted for approximately 64.0% of total consolidated segment revenues. Sales to our ten largest customers within our Specialty Carbon Black segment accounted for approximately 39.4% of total consolidated segment revenues (alternatively, our top ten customers of the Group represent 49% of total Group sales volume). A default in payment, a material reduction in purchases from these or any other large customers, or the loss of a large customer or customer groups could have a material adverse impact on our financial condition, results of operations and liquidity. In addition, trade receivables are subject to concentrations of credit risk with customers of specific industries which can be affected by a downturn in the economy. We estimate the receivables for which we do not expect full collection based on historical collection rates and ongoing evaluations of the creditworthiness of our customers. An allowance is recorded in our consolidated financial statements for these estimated amounts. The concentration of customer credit risks is mitigated by the size and diversity of the customer base as well as its geographic dispersion. Moreover we have a professional credit management system in place. A comprehensive internal limit system is used to analyze and monitor customer credit risk on an ongoing basis. Export orders are subjected to an additional political risk (country risk) analysis, producing an overall risk made up of political and economic risks. Deliveries to customers based in countries with high risk are generally covered by letters of credit or a credit insurance. As part of the credit analysis, maximum limits are set for each customer. To this end, the Company uses ratings of international rating agencies and its own internal credit checks.

Derivative instruments

By using derivative instruments, Orion is subject to credit risk. If a counterparty fails to fulfill its performance obligations under a derivative contract, Orion's credit risk will equal the fair value of the derivative. Generally, when the fair value of a derivative contract is positive, the counterparty owes Orion, thus creating a payment risk for Orion. The Company minimizes counterparty credit (or repayment) risk by entering into transactions with major financial institutions enjoying investment grade long-term credit ratings. No significant concentration of credit risk existed as of December 31, 2018.

Undrawn amounts under the Revolving Credit Facility

The Group has a €175m syndicated Revolving Credit Facility, originally dated July 25, 2024, in place to cover short-term Working Capital requirements. The Revolving Credit Facility syndicate is comprised of ten national and international banks. Currently a major part of the Revolving Credit Facility is still undrawn. If a Revolving Credit Facility lender fails to fulfill its performance obligations (especially with respect to making funds available) under the credit agreement, Orion's credit risk comprises a potential cash shortage/refinancing risk amounting to the respective bank's commitment amount. With regard to the allocation of the total Revolving Credit Facility amount of €175m to the ten major financial institutions (highest single commitment is €24m), all with investment grade long-term credit ratings, there is no significant concentration of credit risk as of December 31, 2018.

Inventories

Inventories are stated at the lower of cost or net realizable value ("NRV"). The cost of inventories (raw materials, consumables and supplies) that have a similar nature or use is assigned by using the weighted average cost method. Amounts are removed from inventory using the average cost.

Inventory is reviewed for both potential obsolescence and potential declines in net realizable value periodically. In this review, assumptions are made about the future demand for, and market value of, the inventory and based on these assumptions the amount of any obsolete, slow moving, or overvalued inventory is estimated. Orion writes down the value of these inventories by an amount equal to the difference between the cost of the inventory and its estimated net realizable value.

Investments

The Company has an investment in DGW (Kommanditgesellschaft Deutsche Gasrußwerke GmbH & Co) and DGW GmbH (Kommanditgesellschaft Deutsche Gasrußwerke GmbH & Co) that is determined to not be a Variable Interest Entity and is accounted for using the equity method. The equity method is used to account for investments in affiliates in which the Group has the ability to exert significant influence over the affiliates' operating and financial policies.

Intangible assets and goodwill

The Group records tangible and intangible assets acquired and liabilities assumed in business combinations under the acquisition method of accounting. Amounts paid for an acquisition are allocated to the assets acquired and liabilities assumed based on their fair values at the date of acquisition. The determination of the fair value of intangible assets requires the use of significant judgment with regard to assumptions used in the valuation model. The Company estimates the fair value of identifiable acquisition-related intangible assets principally based on projections of cash flows that will arise from these assets. The projected cash flows are discounted to determine the fair value of the assets at the dates of acquisition. Acquisition-related costs are expensed as incurred and included in other expenses, net.

When the Group acquires a business, it assesses the financial assets and liabilities assumed for appropriate classification and designation in accordance with the contractual terms, economic circumstances and pertinent conditions as at the acquisition date. This includes the separation of embedded derivatives in host contracts by the acquiree.

Any contingent consideration to be transferred by the acquirer is recognized at fair value at the acquisition date.

Goodwill is comprised of the purchase price of business acquisitions in excess of the fair value assigned to the net tangible and identifiable intangible assets acquired (being the excess of the aggregate of i) the consideration transferred, ii) the amount recognized for non-controlling interest and iii) any previous interest held over the net assets acquired, over the fair value of the identifiable assets acquired and liabilities assumed).

At the date of acquisition the goodwill is allocated to those reporting units that are expected to benefit from the synergies of the combination even if no other assets or liabilities of the acquiree are assigned to that reporting unit.

Intangible assets acquired separately are recognized initially at cost. The cost of intangible assets acquired in a business combination is their fair value at the date of acquisition.

Intangible assets with finite useful lives, which are comprised of trademarks, customer relationships and developed technologies, are amortized over their estimated useful lives and, if events or changes in circumstances indicate that the carrying amount of an asset may not be recoverable, tested for impairment, see below in this note under "Impairment test". Intangible assets with indefinite useful lives are not amortized, but are tested for impairment at least once a year. The useful lives of intangible assets are also re-assessed once a year.

Technology and patents (including capitalized development costs), trademarks and other intangible assets are amortized straight line over a useful life of 15 years. Other intangible assets are amortized straight line over a useful life of 3 to 10 years.

Customer relationships acquired in business combinations in 2011 from Evonik and in 2018 SN2A are amortized over their useful life. The useful life is estimated on the basis of contractual arrangements and historical values and is approximately 8 and 15 years, respectively. The amortization amount is based on the economic life and the probability of continuing the customer relationship in the form of a churn rate.

Impairment of Long-lived Assets and other intangible assets with finite useful lives

The Group assesses long-lived assets such as property, plant and equipment and other intangible assets with finite useful lives for impairment whenever events or changes in circumstances indicate that the carrying amount of an asset, an asset group or reporting units ("RU's") may not be recoverable.

Long-lived assets to be held and used are assessed for possible impairment by comparing their carrying values with their associated undiscounted, future net cash flows. Events that can trigger assessments for possible impairments include significant decreases in the market value of an asset, significant change in the extent or manner of use of or a physical change in an asset, and a more-likely-than-not expectation that a long-lived asset or asset group will be sold or otherwise disposed of significantly sooner than the end of its previously estimated useful life.

To test for impairment of assets, Orion generally uses a probability-weighted estimate of the future undiscounted net cash flows of the related assets over their remaining lives to determine if the value of the asset is recoverable. Long-lived assets are grouped with other assets and liabilities at the lowest level for which independent identifiable cash flows are determinable.

An asset impairment is recognized when the carrying value of the asset is not recoverable based on the analysis described above, in which case the asset is written down to its fair value. Any write-downs are treated as permanent reductions in the carrying amount of the assets.

If the asset does not have a readily determinable market value, a discounted cash flow model may be used to determine the fair value of the asset. In circumstances when an asset does not have separate identifiable cash flows, an impairment charge is recorded when the Company no longer intends to use the asset. An impairment loss may not be reversed if the fair value of the impaired asset or asset group increases subsequently.

Impairment of goodwill

Goodwill represents the excess of the purchase price over the net amount of identifiable assets acquired and liabilities assumed in a business combination measured at fair value. Goodwill is not amortized, but instead tested for impairment annually in the fourth quarter based on September 30 actual results, as well as whenever there are events or changes in circumstances (triggering events) which suggest that the carrying amount exceeds the fair value.

Impairment of goodwill is tested at the reporting unit level. A reporting unit is an operating segment or one level below an operating segment (referred to as a component). A component of an operating segment is required to be identified as a reporting unit if the component is a business for which discrete financial information is available and segment management regularly reviews its operating results. At the date of the annual impairment test Orion had two reporting units to which the goodwill was allocated. Goodwill impairment test was performed at the level of the two reporting units, RU's, "Rubber" and "Specialty" representing the two operating segments. These two reporting units were defined as Orion has the possibility to switch capacities as well as products between its various locations.

Goodwill impairment is recorded only after performing a qualitative impairment test indicates a potential impairment. If the carrying amount of the reporting units to which the goodwill is allocated exceeds the reporting unit's fair value an impairment loss is recorded. An impairment loss is the excess of the reporting units carrying amount over its fair value.

Property, plant and equipment

Property, plant and equipment are recorded at cost less accumulated depreciation. Depreciation of property, plant and equipment is calculated using the straight-line method over the expected useful lives of the related assets. The depreciable lives for Buildings, Plant and machinery and Furniture, fixtures and office equipment are between 5 and 50 years, 3 and 25 years, and 3 and 25 years, respectively. The cost and accumulated depreciation for property, plant and equipment sold, retired, or otherwise disposed of are removed from the Consolidated Balance Sheets and resulting gains or losses are included in other expenses, net in the Consolidated Statements of Operations.

Expenditures for repairs and maintenance are charged to expenses as incurred. Expenditures for major renewals and betterments, which significantly extend the useful lives of the existing property, plant and equipment, are capitalized and depreciated.

Leases

A lease is an agreement whereby the lessor conveys to the lessee in return for a payment or series of payments the right to use an asset for an agreed period of time. Leases are either capital leases or operating leases. The Group mainly acts as a lessee in operating leases.

Operating leases are all leases that do not qualify as capital leases (leases where, in accordance with the contractual terms, the lessee substantially bears all the risks and rewards of ownership of the asset). Those leases are not capitalized, but lease payments are presented as expense in the Group's Statements of Operations. Capital leases are recorded as assets by discounting the minimum future lease payments while this discounted minimum obligation is recorded as the associated lease liability. If conditions are met certain lease assets are recorded as asset-under-construction during the construction phase ("build-to-suit accounting").

Asset retirement obligations

Orion estimates incremental costs for special handling, removal and disposal of materials that may or will give rise to conditional asset retirement obligations ("ARO") and then discounts the expected costs back to the current year using a credit adjusted risk free rate. Orion recognizes ARO liabilities and costs when the timing and/or settlement can be reasonably estimated. The ARO reserves were \$2,414k and \$2,300k at December 31, 2018 and 2017, respectively, and are included in *Accrued liabilities (current)* and *Other Liabilities (non-current)* on the Consolidated Balance Sheets.

Pension provisions

Pension provisions are measured in accordance with the projected unit credit method (Topic ASC 715). The Company recognizes the total actuarial gains or losses recorded in accumulated other comprehensive income exceeding 10% of the defined benefit obligation in the following year through profit and loss separately from its income from operations.

Defined contribution obligations arise from commitments and state pension schemes (statutory pension insurance). The Group accounts for its contributions to a defined contribution plan on an accrual basis. An asset or liability may result from advance payments or payments due, respectively, to a defined contribution fund.

Stock-based compensation

Orion recognizes stock-based compensation cost measured at the grant date based on the fair value of the award, and recognizes these costs as expense over the service period, which generally represents the vesting period, includes an estimate of the awards that will be forfeited and also includes an estimate of awards that expect to vest based on the anticipated achievement of performance conditions. Fair value of awards is determined by using a Monte-Carlo simulation.

Awards can be classified as either equity- or liability-settled dependent on the Company's obligation to the counterparty and the intended settlement method. The overarching principle focuses on whether an equity relationship is created through the award. Orion classified its awards as equity settled.

When the terms of an equity-settled award are modified, the minimum expense recognized is the expense had the terms not been modified, if those original terms of the award are met. An additional expense is recognized for any modification that increases the total fair value of the share-based compensation transaction, or is otherwise beneficial to the employee as measured at the date of modification. Any modifications are accounted for as a new award, which might result in a lower amount of compensation cost than the grant date fair value of the original award or a greater amount of compensation costs than the sum of the grant date fair value of the original award plus the incremental fair value.

Environmental provisions

Environmental provisions are distinct obligations that arise from the improper operation of an asset and obligations from the normal operation of an asset (asset retirement). Environmental obligations are recognized when there is a legal obligation to restore a site, the damage has already occurred, it is likely that restorations will be incurred and the costs can be reasonably estimated. Changes in environmental legislation are not taken into account until they are enacted. When a single liability amount cannot be reasonably estimated, but a range can be reasonably estimated, the amount that reflects the best estimate is accrued within that range or as for other provisions the low end of the range if no estimate within the range is better. Environmental provisions are usually recognized immediately in profit or loss.

Restructuring expenses

A restructuring is a program that is planned and controlled by management and materially changes either the scope of a business or the manner in which the business is conducted.

Orion accounts for a provision for restructuring costs when there is a formal plan and the details of the restructuring have been communicated to those affected by the plan. Costs are allocated to the following cost types; termination benefits, costs to terminate a contract and costs to close or consolidate facilities or to relocate employees. The different cost types contain separate recognition criteria.

A provision for costs associated with an exit or disposal activity shall be measured initially and recored at its fair value in the period in which the liability is incurred.

Note B. Recent Accounting Pronouncements

In February 2016, the FASB issued ASU 2016-02, *Leases (Topic 842)*. Under the amendments in ASU 2016-02, lessees will be required to recognize (i) a lease liability, which is a lessee's obligation to make lease payments arising from a lease, measured on a discounted basis; and (ii) a right-of-use asset, which is an asset that represents the lessee's right to use, or control the use of, a specified asset for the lease term for all leases (with the exception of short-term leases) at the commencement date. This guidance is effective for fiscal years beginning after December 15, 2018 including interim periods within those fiscal years. Early adoption is permitted. The Company will adopt ASU 2016-02 as of January 1, 2019 using the optional transition method that allows for a cumulative-effect adjustment in the period of adoption and will not restate prior periods. Orion plans to elect the practical expedients upon transition that will retain the lease classification and initial direct costs for any leases that exist prior to adoption of the standard. While the Company is currently finally evaluating the impact of adopting ASU 2016-02, based on the lease portfolio as of December 31, 2018, the Company anticipates recording additional lease assets and liabilities of approximately \$ 32 million on its consolidated balance from 2019 onwards, with no material adoption impacts to its consolidated statements of operations. The ultimate impact of adopting ASU 2016-02 will be recognized in the Company's interim consolidated financial statements as of and for the period January 1, 2019. One asset currently recorded under build-to-suit accounting and its associated liability of \$29 million will be de-recognized upon adoption of the standard and accounted for upon commencement of the lease.

In June 2016, the FASB issued ASU No. 2016-13, *Financial Instruments - Credit Losses*. The new guidance requires the Company to measure all expected credit losses for financial instruments held at the reporting date based on historical experience, current conditions and reasonable and supportable forecasts. The new standard is effective for fiscal years beginning after December 15, 2019, including interim periods within those years, and early adoption is permitted for fiscal years beginning after December 15, 2018. The Company is currently evaluating the potential impact the adoption of this standard will have on its financial statements.

In August 2017, the FASB issued ASU No. 2017-12, *Derivatives and Hedging (Topic 815): Targeted Improvements to Accounting for Hedging Activities*, that amends the hedge accounting recognition and presentation requirements under hedge accounting. The new standard will make more financial and non-financial hedging strategies eligible for hedge accounting, amends the presentation and disclosure requirements, and simplifies how companies assess effectiveness. The new standard is effective for fiscal years beginning after December 15, 2018, including interim periods within those years, and early adoption is permitted. The Company is currently evaluating the potential impact the adoption of this standard will have on its financial statements and whether additional hedging strategies would be available for the Company upon effectiveness.

In February 2018, the FASB issued ASU No. 2018-02, *Income Statement - Reporting Comprehensive Income (Topic 220): Reclassification of Certain Tax Effects from Accumulated Other Comprehensive Income*, which allows for the elimination of the stranded income tax effects resulting from the enactment of the Tax Cuts and Jobs Act through a reclassification from accumulated other comprehensive income to retained earnings. The standard is effective for fiscal years beginning after December 15, 2018. Early adoption is permitted. The adoption of this guidance is not expected to have a significant impact on the Company's financial statements.

In August 2018, the FASB issued ASU No. 2018-13, *Fair Value Measurement (Topic 820): Disclosure Framework - Changes to the Disclosure Requirements for Fair Value Measurement*, that modifies the disclosure requirements for fair value measurements made in accordance with Topic 820, Fair Value Measurement, based on the concepts in the Concepts Statement, including the consideration of costs and benefits. The new guidance removes requirements to disclose the amount of and reason for transfers between Level 1 and Level 2 of the fair value hierarchy, the policy for timing of transfers between levels and the valuation processes for Level 3 fair value measurements. The new standard is effective for fiscal years, and interim periods within those fiscal years, beginning after December 15, 2019. The Company is currently evaluating the potential impact the adoption of this standard will have on its financial statements.

In August 2018, the FASB issued ASU No. 2018-14, *Compensation - Retirement Benefits - Defined Benefit Plans - General (Subtopic 715-20): Disclosure Framework - Changes to the Disclosure Requirements for Defined Benefit Plans*. The guidance changes the disclosure requirements for employers that sponsor defined benefit pension and/or other postretirement benefit plans. It eliminates requirements for certain disclosures that are no longer considered cost beneficial and requires new ones that the FASB considers pertinent. The guidance is effective for financial statements issued for fiscal years ending after December 15, 2020 for public business entities and fiscal years ending after December 15, 2021 for all other entities. Early adoption is permitted. Entities will apply the amendments retrospectively. The Company is currently evaluating the potential impact the adoption of this standard will have on its financial statements.

Note C. Inventories

Inventories, net of obsolete, unmarketable and slow moving reserves is as follows:

	December 31	
	2018	2017
	(In thousands)	
Raw materials, consumables and supplies, net	\$ 73,460	\$ 64,147
Work in process	1,246	11
Finished goods, net	108,923	95,176
Total	\$ 183,629	\$ 159,334

Orion periodically reviews inventories for both obsolescence and loss in value. In this review, Orion makes assumptions about the future demand for and the future market value of the inventory and, based on these assumptions, estimates the amount of obsolete, unmarketable or slow moving inventory. The inventory reserve for obsolete, unmarketable and slow moving assets as of December 31, 2018 and December 31, 2017 amounted to \$1,639k and \$1,717k , respectively.

In the periods ended December 31, 2018 , 2017 and 2016 \$1,916k , \$2,714k and \$4,382k , respectively, were recognized as an expense for damaged and lost inventories.

As of December 31, 2018 and 2017 , reserves to adjust inventories net realizable value in the amount of \$2,422k and \$2,049k , respectively, were recognized on raw materials, consumables and supplies and on finished goods.

Note D. Property, Plant and Equipment

Property, plant and equipment consists of the following:

	December 31	
	2018	2017
	(In thousands)	
Land	\$ 26,108	\$ 50,498
Land rights and buildings	92,495	99,126
Plant and machinery	673,919	640,056
Other equipment, furniture and fixtures	28,460	26,655
Prepayments and construction in progress	98,096	46,512
Total property, plant and equipment	919,078	862,847
Less: accumulated depreciation	435,544	400,718
Net property, plant and equipment	\$ 483,534	\$ 462,129

Depreciation expense was \$78,199k , \$76,988k and \$75,205k for fiscal 2018 , 2017 and 2016 , respectively.

Note E. Prepaid and other assets

	December 31					
	2018			2017		
	Total	Thereof current	Thereof non-current	Total	Thereof current	Thereof non-current
	(In thousands)					
Miscellaneous other receivables	\$ 34,052	\$ 33,750	\$ 302	\$ 33,876	\$ 33,632	\$ 244
Prepaid expenses	3,814	1,188	2,626	5,045	1,406	3,639
Total	\$ 37,866	\$ 34,938	\$ 2,928	\$ 38,921	\$ 35,038	\$ 3,883

Miscellaneous other receivables in the financial year are mainly related to VAT (\$15,653k and \$17,710k as at December 31, 2018 and 2017 , respectively), advance payments (\$5,305k and \$5,457k as at December 31, 2018 and 2017 , respectively), down payments (\$4,259k and \$4,134k as at December 31, 2018 and 2017 , respectively), refundable eco-taxes prepaid (\$5,859k and \$3,696k as at December 31, 2018 and 2017 , respectively) and guarantee deposits (\$1,667k and \$1,661k as at December 31, 2018 and 2017 , respectively).

Prepaid expenses mainly include other unamortized transaction costs of \$2,393k and \$1,499k as at December 31, 2018 and 2017 , respectively (of which \$1,763k and \$919k , respectively, is non-current) incurred in connection with the revolving credit facility that has not been drawn by the respective reporting dates.

Note F. Business Combination, Goodwill and Intangible Assets

Business Combination

On October 31, 2018, the acquisition for 100% of shares of the acetylene carbon black manufacturer Société du Noir d'Acétylène de l'Aubette, SAS ("SN2A") from LyondellBasell Industries Holdings B.V. was completed. The acquisition was accounted for as a business combination. The acquisition had an aggregate purchase price of \$36.8 million . This acquisition is expected to strengthen the Company's position in the specialty carbon black market by adding acetylene carbon black to its product portfolio.

The allocation of the purchase price set forth below is presented on preliminary assumptions and is based on estimates of the fair value of assets acquired and liabilities assumed:

	(in thousands)	
Assets		
Cash	\$	213
Other current assets		176
Accounts receivables		1,578
Inventories		924
Property, plant and equipment		5,770
Intangible assets		44,276
Total assets acquired	\$	52,937
Liabilities		
Current liabilities	\$	2,488
Deferred tax liabilities		13,665
Total liabilities assumed		16,153
Cash consideration paid	\$	36,784

As part of the purchase price allocation, the Company determined separately identifiable intangible assets of \$44.3 million, primarily related to the unique production technology, the long term feedstock supply contract and customer relationships, having a weighted-average useful life of fifteen years. The Company estimated the fair values of the identifiable acquisition-related intangible assets based on projections of cash flows that will arise from those assets. The projected cash flows were discounted to determine the fair value of the assets at the date of acquisition. The determination of the fair value of the intangible assets acquired required the use of significant judgment with regard to (i) assumptions in the discounted cash flow model used and (ii) determination of the useful lives of the production technology and customer relationships.

The Purchase Price allocation ("PPA") is considered preliminary and its assessments are made in consideration of the measurement period. ASC 805 provides for a "measurement period" of a reasonable time not to exceed one year. Any future modifications within the measurement period in course of finalizing the PPA will be accounted through consolidated statements of operations.

The purchase price equalled the fair value of the tangible net assets and intangible assets acquired and no goodwill was recorded.

The business combination did not materially impact our consolidated statement of operations for the periods presented. The operating result of the business is included in the Company's Specialty Carbon Black segment. Since the date of acquisition, SN2A revenues have totaled approximately \$1.2 million through December 31, 2018.

The Company incurred immaterial acquisition costs of less than \$0.2 million associated with the transaction, which are included in other operating expenses in the Consolidated Statements of Operations.

Goodwill

Orion had goodwill balances of \$55,546k and \$58,180k at December 31, 2018 and December 31, 2017, respectively. The carrying amount of goodwill attributable to each reportable segment for period ended December 31, 2018 is as follows:

	Rubber	Specialty	Total
	(In thousands)		
Balance at January 1, 2017	\$ 29,037	\$ 22,099	\$ 51,136
Foreign currency impact	4,000	3,044	7,044
Balance at December 31, 2017	33,037	25,143	58,180
Foreign currency impact	(1,487)	(1,147)	(2,634)
Balance at December 31, 2018	\$ 31,550	\$ 23,996	\$ 55,546

Qualitative impairment testing performed during the fiscal year for the Rubber and Specialty reporting units did not indicate a goodwill impairment.

Intangible Assets

The following table provides information regarding Orion's intangible assets:

	December 31					
	2018			2017		
	Gross Carrying Value	Accumulated Amortization	Net Intangible Assets	Gross Carrying Value	Accumulated Amortization	Net Intangible Assets
	(In thousands)					
Developed technology and patents	\$ 82,007	\$ 34,348	\$ 47,660	\$ 67,509	\$ 28,681	\$ 38,828
Customer relationships	78,263	66,262	12,001	77,201	58,781	18,420
Trademarks	19,694	9,782	9,912	20,628	8,827	11,801
Long-term contracts	22,396	113	22,283	—	—	—
Other intangible assets	50,621	47,232	3,389	48,862	47,189	1,673
Total intangible assets	\$ 252,981	\$ 157,737	\$ 95,245	\$ 214,200	\$ 143,478	\$ 70,722

Intangible assets are amortized over their estimated useful lives, which range from 3 to 15 years. The weighted average amortization period for all intangible assets at December 31, 2018 and 2017 was 10.8 and 8.6 years, respectively. Amortization expense for the years ended December 31, 2018, 2017 and 2016 was \$ 19,957k, \$ 21,368k and \$ 21,940k, respectively, and is included in Cost of sales and Selling, general and administrative expenses in the Consolidated Statements of Operations.

The estimated aggregate amortization expense for intangible assets for the fiscal years ending December 31, 2019 to 2023 and thereafter are as follows:

Year	(In thousands)
2019	\$ 16,370
2020	11,414
2021	10,823
2022	10,453
2023	10,133
Thereafter	36,052
Total aggregated amortization	\$ 95,245

Note G. Accruals and Other Liabilities

Current accrued liabilities consist of the following:

	December 31	
	2018	2017
	(In thousands)	
Accrued employee compensation	\$ 28,693	\$ 28,549
Accrued liabilities for sales and procurement	3,580	3,384
Accrued liabilities for restructuring	8,658	8,717
Other accrued liabilities	15,366	18,821
Total	\$ 56,297	\$ 59,471

Other current liabilities consist of the following:

	December 31	
	2018	2017
	(In thousands)	
Employee related liabilities	\$ 3,037	\$ 3,003
Liabilities for withholding tax	1,941	10,627
Liabilities for VAT	1,915	1,850
Liabilities for outstanding invoices	8,637	5,036
Other current liabilities	14,963	13,217
Total	\$ 30,493	\$ 33,733

Other long-term liabilities consist of the following:

	December 31	
	2018	2017
	(In thousands)	
Employee related liabilities	\$ 7,008	\$ 9,594
Liabilities for asset retirement obligation	2,414	2,300
Environmental protection liabilities	1,353	1,450
Liabilities from build-to-suit lease agreement	28,657	—
Other non-current liabilities	4,729	4,324
Total	\$ 44,161	\$ 17,668

Liabilities for ARO's were settled in an amount of \$167k for the year ended December 31, 2017 . In 2018 no ARO liabilities were settled.

Note H. Debt and Other Obligations

The company had the following debt arrangements in place as of December 31, 2018 and 2017 :

	December 31	
	2018	2017
(In thousands)		
Current		
Term loan	\$ 8,149	\$ 7,479
Deferred debt issuance costs - term loan ⁽¹⁾	(1,472)	(1,475)
Other short-term debt and obligations	34,343	18
Current portion of long term debt and other financial liabilities	41,020	6,022
Non-current		
Term loan	650,014	676,755
Deferred debt issuance costs - term loan ⁽¹⁾	(6,266)	(8,105)
Other long-term debt and obligations	—	12,494
Long-term debt, net	643,748	681,144
Total	\$ 684,768	\$ 687,166

(1) According to ASU 2015-03, adopted on January 1, 2016, the Company presents debt issuance costs related to a recognized liability as a direct deduction from the carrying amount of that liability.

(a) Term Loan

On July 25, 2014, Orion entered into a refinancing of its indebtedness. Orion entered into its current USD-equivalent \$895m credit facility term loan (term loan liability denominated in USD: \$358m , term loan liability denominated in EUR: €399m) with an original maturity date of July 25, 2021 (the “Term Loans”). Interest was calculated based on 3-M-EURIBOR (for EUR denominated loan), or 3-M-USD-LIBOR (for USD denominated loan) plus a 3.75% - 4.00% margin (depending on leverage ratio). For both EURIBOR and USD-LIBOR a floor of 1.0% applied. At least 1% of the principal amount is required to be repaid per annum; Orion may make additional voluntary repayments. On December 30, 2015, a voluntary repayment of €25.0 million and \$27.0 million was made. Further debt repayments of €20.0 million and \$22.0 million were made on January 29, 2016 and July 15, 2016 as well as €11.0 million and \$9.0 million were made on January 23, 2017.

On May 8, 2018 Orion signed an amendment to the credit agreement to reprice its EUR- and USD-denominated outstanding term loans. The repricing on the US dollar tranche reflects a 50 basis point reduction on margin from 2.50% to 2.00% , whereas on the euro tranche there is a 25 basis point reduction on margin from 2.50% to 2.25% . This repricing has reduced Orion's annual interest payments by approximately \$2.4 million . Other provisions of the credit agreement remained unchanged. In conjunction with the amendment of the credit agreement. On May 11, 2018 Orion entered into a \$235,000k cross currency swap to virtually convert its US dollar liabilities into EUR as part of a new hedging approach. This swap transaction impacts both principal and interest payments associated with debt service and will result in a further annual interest payments savings of approximately \$4.7 million over and above the interest savings achieved by the amendment itself. The swap became effective on May 15, 2018 and will expire on July 25, 2024, in line with maturity of the term loan.

Transaction costs incurred directly in connection with the incurrence of the Euro and U.S. Dollar denominated term loans, thereby reducing their carrying amount, are amortized as finance costs over the term of the loans. Transaction costs incurred in connection with the modifications of the term loan in 2016, 2017 and 2018 were directly expensed as incurred as the modified terms were not substantially different. In connection with the repricing described above further transaction costs of \$741k in 2018 and \$3,455k equivalent in 2017 and \$2,096k equivalent in 2016 were incurred and directly expensed. In 2018 , an amount of \$1,441k equivalent related to capitalized transaction costs was amortized and recognized as finance costs in this regard (prior year: \$3,052k equivalent). In addition in prior year 2017 an amount of \$414k was directly expensed as finance costs due to the voluntary redemption (current year \$0).

On September 30, 2016 the Company signed an amendment to the credit agreement, dated as of July 25, to reprice its EUR- and USD- denominated outstanding term loans. The repricing resulted in a 100 basis point reduction to interest, from the previous annual interest rate of 4.75% (3.75% margin plus floor of 1.00%) to an annual interest rate of 3.75% (3.00% margin plus floor of 0.75%). Other provisions of this credit agreement remained unchanged.

On May 5, 2017, the Company signed another amendment to the credit agreement, dated as of July 25, 2014 to reprice its EUR- and USD-denominated outstanding term loans. The repricing resulted in a 100 basis point reduction to interest for the EUR denominated loan, from the previous annual interest rate of currently 3.75% (3.00% margin plus 3-M-EURIBOR (minimum floor of 0.75%) to an annual interest rate of currently 2.75% (2.75% margin plus 3-M-EURIBOR (minimum floor of 0.00%)), and in a 50 basis points reduction to interest for the USD denominated loan, from the previous annual interest rate of 3.00% margin plus 3-M-USD-LIBOR (minimum floor of 0.75%) to an annual interest rate of 2.50% margin plus 3-M-USD-LIBOR (minimum floor of 0.00%). Other provisions of this credit agreement remained unchanged.

On November 7, 2017, the company signed an additional amendment to the credit agreement, dated as of July 25, 2014 to reprice its EUR denominated outstanding term loan, and to extend the term of the Term Loans. The repricing resulted in a 25 basis points reduction to interest for the EUR denominated loan, from the previous annual interest rate of currently 2.75% margin plus 3-M-EURIBOR (minimum floor of 0.00%) to an annual interest rate of currently 2.50% margin plus 3-M-EURIBOR (minimum floor of 0.00%). The term extension resulted in a new maturity date of July 25, 2024 (previously July 25, 2021). Other provisions of this credit agreement remained unchanged. This modification resulted in all third party costs to be directly expensed as incurred.

A portion of the USD-denominated term loan was designated as a hedge of the net investment in a foreign operation to reduce the Company's foreign currency exposure. Since January 1, 2015 the Company had designated \$180 million of the total USD-denominated term loan held by a Germany based subsidiary as the hedging instrument to hedge the change in net assets of a US subsidiary, which is held by a Germany based subsidiary, to manage foreign currency risk. Due to the new hedging approach and the new cross currency swap as described above, hedge accounting for the net investment hedge was discontinued on May 15, 2018. An unrealized loss of \$2.2 million remains within other comprehensive income until it is recycled through profit and loss upon divestment of the hedged item.

The carrying value as at December 31, 2018 includes the nominal amount of the Term Loans plus accrued unpaid interest less deferred debt issuance costs - term loan of \$7,738k (December 31, 2017 : \$9,580k).

(b) Revolving credit facility

To generally safeguard the Company's liquidity, the Company has entered into a revolving credit facility ("RCF").

As part of the refinancing, on July 25, 2014 the then-existing revolving facility was replaced by a €115m multicurrency revolving credit facility with an original maturity date July 25, 2019. Interest is calculated based on EURIBOR (for EUR drawings), and USD-LIBOR (for USD drawings) plus 2.5% - 3.0% margin (depending on leverage ratio). The RCF has not been drawn on the respective reporting dates. Transaction costs in the amount of \$ 3,341k originally incurred in connection with the RCF are also recorded as deferred expenses and are amortized as finance costs on a straight-line basis over the term of the facility (until July 25, 2019).

The amendment to the Credit Agreement entered into on May 5, 2017 (i) reduces the commitment fee paid on the unused commitments from 40% of the Applicable Rate (as defined in the Credit Agreement) to 35% of the Applicable Rate, (ii) extends the maturity date for the revolving credit facility to April 25, 2021 and (iii) increases the aggregate amount of revolving credit commitments to €175 million . All other terms of the Credit Agreement remained unchanged.

Additional Transaction costs in conjunction with the RCF in the amount of \$2,313k incurred in connection with the Amendment to the Credit Agreement are also recorded as deferred expenses and are amortized as finance costs on a straight-line basis over the term of the facility (until April 25, 2021).

During 2018 , transaction costs of \$779k were amortized (prior year: \$705k). Unamortized transaction costs that were incurred in conjunction with the RCF in July 2014 and the Amendment on May 30, 2017, amount to \$2,394k as at December 31, 2018 and \$3,299k as at December 31, 2017 .

(c) Local bank loans

On August 10, 2017, OEC Co. Ltd. in Korea has closed a term loan facility with Hana Bank with an amount of KRW 24 billion (about \$21 million) and a term of three years to finance the consolidation of our two plants in Korea. The loan is collateralized by real estate and machinery of our plant in Bupyong. As of December 31, 2017 the loan was drawn with an amount of \$12,512k .

On May 11, 2018 the local South Korean entity fully repaid the local term loan facility with KEB Hana Bank in the amount of KRW 13.3 billion (equivalent to \$ 12.3 million), using proceeds from the South Korean land sale. As of December 31, 2018 the balance is \$0 (prior year: \$12,512k).

Future Years Payment Schedule

The following table shows the residual terms of our Term Loan and its impact on our cash flows based on the agreed maturity date, the repayment schedule, and the total interest amounts. Implied three months EUR forward interest rates and implied USD forward interest rates as applicable on December 31, 2018 were used to calculate the repayment amounts.

	Interest	Scheduled Repayment		Total
	(In millions)			
2019	\$ 21.9	\$ 8.1		\$ 30.0
2020	20.9	8.1		29.0
2021	20.5	8.1		28.6
2022	21.4	8.1		29.5
2023	22.5	8.1		30.6
2024	13.2	617.7		630.9
Total	\$ 120.4	\$ 658.2		\$ 778.6

Note I. Financial Instruments and Fair Value Measurement

The Group measures financial instruments, such as derivatives, at fair value at each balance sheet date. Fair value is the price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date. The fair value of an asset or a liability is measured using the assumptions that market participants would use when pricing the asset or liability, assuming that market participants act in their economic best interest. The Group uses valuation techniques that are appropriate in the circumstances and for which sufficient data are available to measure fair value, maximizing the use of relevant observable inputs and minimizing the use of unobservable inputs.

All assets and liabilities for which fair value is measured or disclosed in the financial statements are categorized within the following fair value hierarchy based on the lowest level input that is significant to the fair value measurement as a whole:

Level 1 — Unadjusted quoted market prices in active markets for identical assets or liabilities that the entity can access at the measurement date.

Level 2 — Inputs other than quoted prices within Level 1 that are observable for the asset or liability, either directly (i.e., as prices) or indirectly (i.e., derived from prices). E.g., quoted prices for similar items in active markets, quoted prices for identical or similar items in markets that are not active, inputs other than quoted prices that are observable such as interest rate and yield curves, and market-corroborated inputs.

Level 3 — Unobservable inputs for the asset or liability.

For financial assets and liabilities that are recognized in the financial statements on a recurring basis, the Group determines whether transfers have occurred between levels in the hierarchy by re-assessing categorization at the end of each reporting period.

There was no transfer of financial assets or liabilities measured at fair value between Level 1 and Level 2, or transfers into or out of Level 3, during fiscal years 2018 or 2017 .

For the years ended December 31, 2018 and 2017, the Company's defined benefit pension plan assets were all Level 2 assets. See *Note K. - "Employee Benefit Plans"* herein for additional information.

The following table shows the fair value measurement at both year-ends December 31, 2018 and 2017 . All measurements are based on observable inputs such as interest rates and are classified as Level 2 within the fair value hierarchy:

	Fair Value Hierarchy	December 31	
		2018	2017
(In thousands)			
Receivables from hedges/ derivatives		\$ 9,949	\$ 3,554
Prepaid expenses and other current assets	Level 2	9,777	907
Other financial assets (non-current)	Level 2	172	2,647
Liabilities from derivatives		\$ 7,032	\$ 5,193
Other current liabilities	Level 2	2,302	929
Other liabilities (non-current)	Level 2	4,730	4,264
Term loan	Level 2	\$ 658,163	\$ 684,234
Local bank loans	Level 2	\$ 28,618	\$ 12,512

Note J. Accounting for Derivative Instruments and Hedging Activities

Cash flow hedge

The Group has designated, as of November 28, 2014 the entire interest rate caps entered in 2014 and denominated in Euro with an initial nominal amount of €375m against the Term Loan tranches denominated in Euro with an initial nominal amount of €399m , as well as the entire interest rate caps entered in 2014 and denominated in USD with an initial nominal amount of \$350 million against Term Loan tranches denominated in USD with an initial nominal amount of \$358 million with respect to quarterly interest payments exceeding a 3-months-EURIBOR rate of 1.0% and a 3-months-USD-LIBOR rate of 2.5% respectively. On November 14, 2017 the Group acquired floored forward interest rate swaps to hedge interest rate risk on current €denominated term loan financing. On May 15, 2018 the Group entered into a \$235 million Cross-Currency Swaps to hedge interest rate risk on current USD-denominated term loan financing which replaced the USD denominated Caps terminated on May 14, 2018.

The Group has designated the €denominated interest rate caps, the €denominated interest rate swap at closing in November 2017 and the Cross-Currency Swaps at closing in May 2018 in the same manner. The Group has performed a hedge effectiveness test based on the critical terms match method (prospectively) and the dollar offset test (retrospectively), both on designation date and as of December 31, 2018, which confirmed hedge effectiveness.

Net Investment Hedge

To reduce the Group's foreign currency exposure a portion of the U.S. Dollar denominated Term Loan was designated as a hedge of net investment in a foreign operation. Since January 1, 2015 the Company had designated \$180 million of the total USD denominated term loan held by a Germany-based subsidiary as the hedging instrument to hedge the change in net assets of a US subsidiary, which is held by a Germany-based subsidiary, to manage foreign currency risk. Due to the new hedging approach and the new cross currency swap as described above, hedge accounting for the net investment hedge was discontinued on May 15, 2018. An unrealized loss of \$2.2 million remains within other comprehensive income until it is recycled through profit and loss upon divestment of the hedged item.

Changes in fair value of the effective portion of the hedging instrument's gains or losses are reported as foreign currency translation gains or losses in AOCI while changes in the ineffective portion are reported in earnings. Effectiveness is assessed based on the hypothetical derivative method. There was no ineffectiveness in either of the years ended December 31, 2018 or 2017. The gains or losses on derivative instruments reported in AOCI are reclassified to earnings in the period in which earnings are affected by the underlying item, such as a disposal or substantial liquidations of the entities being hedged.

Due to the new hedging approach and the new cross currency swap described above, hedge accounting for the net investment hedge was discontinued on May 15, 2018. Thus in 2018, with the change of the reporting currency, Orion decided to de-designate the net investment hedge. Foreign currency risk exposure is reduced by using a cross-currency-swap, designated as a cash flow hedge. Cumulative gains and losses recognized in AOCI from the net investment hedge will continue to be recorded in AOCI until disposal of the U.S. business.

Thus, an unrealized loss of \$2.2 million remains within other comprehensive income until it is recycled through profit and loss upon divestment of the hedged item.

Note K. Employee Benefit Plans

Provisions for pensions are established to cover benefit plans for retirement, disability and surviving dependents' pensions. The benefit obligations vary depending on the legal, tax and economic circumstances in the various countries in which the Group companies operate. Generally, the level of benefit depends on the length of service and the remuneration.

In both 2018 and 2017, Germany accounted for approximately 90.1% of provisions for projected benefit pension obligations. There are also defined contribution pension plans in Germany and the United States for which our Group companies make regular contributions to off-balance sheet pension funds managed by third party insurance companies.

In South Korea, the company's pension plan provides, at the option of employees for either projected benefit or defined contribution benefits. Plan assets relating to this plan reduce the pension provision disclosed.

Obligations and Funded Status

The following provides information about projected benefit obligations, plan assets, the funded status and weighted-average assumptions of the defined benefit pension plan:

Change in Projected Benefit Obligation

	December 31	
	2018	2017
	(In thousands)	
Present value of projected benefit obligation at the beginning of the year	\$ 72,864	\$ 64,700
Actuarial (gain)/ loss	(198)	(747)
Service cost	604	772
Interest cost	1,758	1,723
Benefits paid	(925)	(2,414)
Other	126	145
Curtailments, settlements, special and contractual termination benefits	(2,154)	—
Currency translation	(4,452)	8,685
Present value of projected benefit obligation at the end of the year	\$ 67,623	\$ 72,864

Based on the weighted Macaulay method the projected benefit obligation has a duration of 21.2 (prior year: 21.9 years).

Change in Plan Assets

	December 31	
	2018	2017
	(In thousands)	
Fair value of plan assets at the beginning of the year	\$ 7,474	\$ 7,003
Actual return on plan assets	(79)	180
Employer contributions	609	1,003
Actuarial gain/(loss)	—	(77)
Benefits paid	—	(1,512)
Settlement	(1,467)	—
Other adjustments	174	—
Currency translation	(320)	877
Fair value of plan assets at the end of the year	\$ 6,391	\$ 7,474

The plan assets are held by Orion Engineered Carbons Co. Ltd. Korea, Bupyeong-gu, South Korea, and relate to qualifying insurance policies. These insurance policies do not have a quoted market price. The actual return on plan assets amounted to \$(79)k and \$103k for the years ended December 31, 2018 and 2017, respectively.

Net Funded Status

	December 31	
	2018	2017
	(In thousands)	
Projected benefit obligation	\$ 67,623	\$ 72,864
Fair value of plan assets	6,391	7,474
Net funded status	\$ 61,232	\$ 65,390

Amount Recognized in the Consolidated Balance Sheets

	December 31	
	2018	2017
	(In thousands)	
Non-current assets	\$ —	\$ —
Current liabilities	855	763
Non-current liabilities	60,377	64,627
Net liability recognized - pension plans	\$ 61,232	\$ 65,390

Pension Assumptions and Strategy

The assumptions in the table below were used in the actuarial valuation of the underlying the obligations:

Assumptions	December 31	
	2018	2017
Discount rate	1.9%	1.9%
Expected long-term rate of return on plan assets	2.0%	2.0%
Rate of compensation/salary increase	3.0%	3.0%
Future pension increase	1.5%	1.5%
Mortality	Heubeck 2018G	Heubeck 2005G

A 0.5% increase or decrease in the discount rate or in the future pension increase would have impacted the projected benefit obligation as follows:

Sensitivities	As at December 31, 2018			
	Discount rate		Future pension increase	
	0.5% decrease	0.5% increase	0.5% decrease	0.5% increase
	(In thousands)			
Impact on projected benefit obligation	\$ 5,913	\$ (5,148)	\$ (7,584)	\$ 8,379

Net Periodic Pension Cost (Benefit)

	Years Ended December 31,		
	2018	2017	2016
	(In thousands)		
Service cost	\$ 604	\$ 772	\$ 788
Interest cost	1,758	1,723	1,706
Expected return on plan assets	(174)	(180)	(151)
Past service cost/(income) and other adjustments	253	145	(2,087)
Net periodic pension cost	\$ 2,441	\$ 2,460	\$ 256

Effective at the end of 2013, all defined benefit plans in Germany were modified to close access to new participants and freeze benefits accrued under these plans at December 31, 2013 levels. Interest expense on the frozen obligation relating to these plans will continue to accrue. In addition, one program during the year ended December 31, 2016 ceased due to the closure of our Ambès (France) plant.

There is no expected pension contribution in 2019 .

The Group paid \$14,049k , \$12,770k and \$12,750k for the years ended December 31, 2018 , 2017 and 2016 , respectively, for state defined contribution pension schemes (statutory pension insurance) in Germany and other countries. This amount is also recognized as personnel expenses (social security costs).

Estimated Future Benefit Payments

The Company expects that the following benefit payments will be made to plan participants in the years from 2019 to 2028:

Benefit payments	(In thousands)	
2019	\$	1,213
2020		1,401
2021		1,531
2022		1,801
2023		1,964
2024 - 2028		12,640

The Company does not anticipate making funding contributions to the Pension Plan in 2018 .

Amounts Recognized in Accumulated Other Comprehensive (Income)/Loss

Amounts recognized in AOCI at December 31, 2018 and 2017 related to the Company's defined benefit pension plan were as follows:

Accumulated Other Comprehensive (Income) / Loss	December 31	
	2018	2017
	(In thousands)	
Net actuarial (gain) loss	\$ 198	\$ 670
Net prior service cost	—	—
Balance in accumulated other comprehensive (income) / loss	\$ 198	\$ 670

The estimated amounts that will be amortized from accumulated other comprehensive loss into net periodic benefit cost in 2019 :

	2019	
	(In thousands)	
Net actuarial (gain) loss	\$	—
Prior service cost (credit)		—
Net amount recognized	\$	—

Plan Assets

The fair value (all Level 2) of Orion's pension plan assets at December 31, 2018 and 2017 , by asset category, is as follows:

	December 31	
	2018	2017
	(In thousands)	
Equity securities	\$ —	\$ —
Debt securities	—	—
Other securities	6,391	7,474
Total pension plan assets	\$ 6,391	\$ 7,474

Note L. Stock-Based Compensation

On an annual basis since 2015, the Group has implemented a long-term incentive plan ("LTIP") which grants awards to employees and officers selected by the Compensation Committee of the Board of Directors (the "Compensation Committee"). PSU awards are earned based on achievement against one or more performance metrics established by the Compensation Committee in respect of a specified performance period. Earned PSUs range from zero to a specified maximum percentage of a participant's target award based on the performance of applicable performance metrics, and are subject to vesting terms based on continued employment.

The first performance period ran from January 1, 2015 through December 31, 2017, with PSUs earned based on achievement of EBITDA metrics established by the Compensation Committee and total shareholder return relative to a peer group. Once earned and vested, PSUs were settled in one share of Company common stock per vested PSU (or, at the Company's election, cash equal to the fair market value thereof). There is no exercise price. The first vesting period ran through March 31, 2018 (the "2015 Plan"). All PSUs are granted under, and

are subject to the terms and conditions of, the Company's 2014 Omnibus Incentive Compensation Plan, and do not increase the number of shares previously reserved for issuance under that plan. On August 2, 2016 the Compensation Committee established a consecutive LTIP (the "2016 Plan") having consistent terms as compared to the 2015 Plan. On July 31, 2017 the Compensation Committee established another consecutive LTIP (the "2017 Plan") having consistent terms as compared to the 2015 and 2016 Plan. On July 12, 2018 the Compensation Committee established a consecutive LTIP (the "2018 Plan") having consistent terms as compared to the 2015, 2016 and 2017 Plan. In April 2018 the Compensation Committee establish a stock compensation plan for the Board of directors under the existing Omnibus Incentive Compensation Plan.

The following table provides detail as to expenses recorded within operating income with respect to the LTIP:

	Years Ended December 31,		
	2018	2017	2016
	(In thousands)		
Expense arising from equity-settled share-based payment transactions (2015 Plan)	\$ 777	\$ 2,736	\$ 2,370
Expense arising from equity-settled share-based payment transactions (2016 Plan)	4,566	4,053	1,588
Expense arising from equity-settled share-based payment transactions (2017 Plan)	5,052	2,046	—
Expense arising from equity-settled share-based 2018 incentive	563	—	—
Expense arising from equity-settled share-based payment transactions (2018 Plan)	2,961	—	—
Total expenses	\$ 13,919	\$ 8,835	\$ 3,958

The following table illustrates the number of, and movements in, PSUs during the year:

	2018	2017	2016
	Number of PSUs		
Outstanding at January 1,	1,610,894	1,145,238	463,830
Granted during the period	450,977	474,660	690,279
Forfeited during the period	(19,759)	(9,004)	(8,871)
Exercised/vested during the period	(447,122)	—	—
Outstanding at December 31,	1,594,990	1,610,894	1,145,238
Expected to vest at December 31,	1,556,011	1,433,440	984,901

The closing price of the Company's shares and therefore the intrinsic value of one PSU outstanding was \$25.28 as of December 31, 2018 , \$25.60 as of December 31, 2017 and \$18.85 as of December 31, 2016 . Total intrinsic value amounted to \$40.3 million as of December 31,2018, \$41.2 million as of December 31,2017 and \$21.6 million as of December 31,2016.

The following table lists the inputs to the valuation model used for calculating the grant date fair values under the 2018 , 2017 and 2016 Plans:

	2015 Plan	2016 Plan	2017 Plan	2018 Plan
Expected term (in years)	3	3	3	3
Dividend yield (%)	2.14%	2.23%	1.88%	1.94%
Expected volatility OEC (%)	25.16%	32.07%	33.77%	30.22%
Expected volatility peer group (%)	13.90%	18.12%	17.30%	20.09%
Correlation	0.5234	0.4952	0.4574	0.3659
Risk-free interest rate (%)	0.90%	0.76%	1.45%	1.46%
Model used	Monte Carlo	Monte Carlo	Monte Carlo	Monte Carlo
Weighted average fair value of PSUs granted	\$17.41	\$17.21	\$24.89	\$39.24

In April 2018, 447,122 PSUs were exercised for the 2015 Plan. The expected term of share awards represents the weighted average period the share awards are expected to remain outstanding. The remaining contractual terms of share units outstanding is April 2019 for the 2016 Plan and April 2020 for the 2017 Plan and April 2021 for the 2018 Plan.

The Company used a combination of historical and implied volatility of its traded shares, or blended volatility, in deriving the expected volatility assumption. The risk-free interest rate assumption is based upon observed interest rates appropriate for the term of stock options. The dividend yield assumption is based on the Company's history.

Stock-based compensation expense is comprised of the following line items:

	Years Ended December 31,		
	2018	2017	2016
	(In thousands)		
Cost of sales	\$ 55	\$ 73	\$ 29
Selling expenses	2,711	1,637	676
General and administrative expenses	10,394	6,658	3,066
Research and development costs	759	467	187
Stock-based compensation expense	\$ 13,919	\$ 8,835	\$ 3,958

The assumption for estimating expected forfeitures is based on previous experience and based on 3% leavers rate per year. Actual forfeitures are in addition recorded as they occur.

Note M. Restructuring Expenses

Details of all restructuring activities and the related reserves for December 31, 2018 , 2017 and 2016 were as follows:

	Personnel expenses	Demolition and Removal costs	Ground remediation costs	Other	Total
	(In thousands)				
Provision at January 1, 2016	\$ —	\$ —	\$ —	\$ —	\$ —
Charges	6,864	5,191	4,036	3,667	19,758
Cost charged against liabilities (assets)	—	—	—	(1,980)	(1,980)
Cash paid	—	—	—	—	—
Foreign currency translation adjustment	(411)	(311)	(241)	(140)	(1,103)
Provision at December 31, 2016	6,453	4,880	3,795	1,547	16,675
Charges	2,975	1,440	—	2,076	6,492
Cost charged against liabilities (assets)	—	(153)	—	(114)	(267)
Cash paid	(9,295)	(3,849)	—	(2,474)	(15,618)
Foreign currency translation adjustment	513	505	522	(105)	1,435
Provision at December 31, 2017	646	2,824	4,317	930	8,717
Charges	7,586	1,978	2,919	3,137	15,620
Cost charged against liabilities (assets)	(324)	(14)	(833)	(8)	(1,180)
Cash paid	(5,825)	(2,182)	(3,259)	(3,202)	(14,468)
Foreign currency translation adjustment	252	(64)	(206)	(13)	(32)
Provision at December 31, 2018	\$ 2,334	\$ 2,541	\$ 2,939	\$ 844	\$ 8,658

Orion's reserves for restructuring are reflected in accrued liabilities on the Consolidated Balance Sheets.

The expenses relate to the Group's effort to restructure its Rubber segment. As a first step the Company's German operating subsidiary terminated with effect as of December 31, 2016, the Contract Manufacturing Agreement then in place between the Company's German operating subsidiary and the Company's French subsidiary, Orion Engineered Carbons SAS ("OEC SAS"), which has a plant in Ambès with a maximum capacity of mostly standard rubber grades of 50 kmt per year. Consequently, the management of OEC SAS concluded consultations with the local Works Council at this facility to implement a restructuring and down staffing with a cessation of production at the site by the end of 2016. Impairment charges of \$10,290k related to the property, plant and equipment of OEC SAS were calculated based on an estimated recoverable amount of zero and are fully charged to the Rubber Carbon Black segment.

The restructuring of the South Korean footprint concluded in the second quarter of 2018 resulting in cessation of production at the Bupyeong plant and the sale of the land to a third party. Restructuring income of \$40,253k reflects the proceeds of the land sale less the remaining book value of the land. Restructuring expenses comprise required costs for land restoration of \$7,218k and cost to consolidate the two South Korean production sites into one remaining site, including in particular personnel related termination costs of \$4,363k incurred in fiscal year 2018.

In the periods ending December 31, 2018 , 2017 and 2016 restructuring income, net amounted to \$24,633k as compared to restructuring expenses, net of \$6,492k and \$30,048k .

Note N. Accumulated Other Comprehensive Income (Loss)

Changes in each component of AOCI, net of tax, are as follows for fiscal 2018 , 2017 and 2016 :

	Currency Translation Adjustments	Hedging Activities Adjustments	Pension and Other Postretirement Benefit Liability Adjustment	Total
	(In thousands)			
Balance at January 1, 2016	\$ (1,790)	\$ (12,414)	\$ (211)	\$ (14,415)
Other comprehensive income (loss) before reclassifications	4,473	(4,857)	(11,704)	(12,088)
Income tax effects before reclassifications	1,695	1,630	3,783	7,108
Amounts reclassified from AOCI	—	—	104	104
Income tax effects on reclassifications	—	—	(34)	(34)
Currency translation AOCI	—	379	998	1,377
Balance at December 31, 2016	4,378	(15,262)	(7,064)	(17,948)
Other comprehensive income (loss) before reclassifications	(4,077)	20,970	670	17,563
Income tax effects before reclassifications	(855)	(7,216)	(217)	(8,288)
Amounts reclassified from AOCI	—	—	9,687	9,687
Income tax effects on reclassifications	—	—	(3,131)	(3,131)
Currency translation AOCI	—	(293)	(2,910)	(3,203)
Balance December 31, 2017	(554)	(1,801)	(2,965)	(5,320)
Other comprehensive income (loss) before reclassifications	(8,918)	(6,349)	198	(15,069)
Income tax effects before reclassifications	(1,178)	1,719	(64)	477
Currency translation AOCI	—	284	—	284
Balance December 31, 2018	\$ (10,650)	\$ (6,147)	\$ (2,831)	\$ (19,628)

The amounts reclassified out of AOCI and into the Consolidated Statement of Operations for the fiscal years ended December 31, 2018 , 2017 and 2016 are as follows:

	Years Ended December 31,		
	2018	2017	2016
	(In thousands)		
Amortization of actuarial losses (gains) (not included in operating income)	\$ —	\$ 9,687	\$ 104
Total before tax	—	9,687	104
Tax impact	—	(3,131)	(34)
Total after tax	\$ —	\$ 6,556	\$ 70

Note O. Earnings Per Share

Basic EPS is calculated by dividing the profit for the year attributable to ordinary equity holders of the parent by the weighted average number of ordinary shares outstanding during the year.

Diluted EPS is calculated by dividing the profit for the year (numerator) attributable to ordinary equity holders of the parent by the weighted average number of ordinary shares outstanding during the year plus the weighted average number of ordinary shares arising from exercising all dilutive ordinary shares (denominator).

The following table reflects the income and share data used in the basic and diluted EPS computations:

	2018	2017	2016
Net income for the period- attributable to ordinary equity holders of the parent (in USD k)	\$ 121,310	\$ 64,860	\$ 49,509
Weighted average number of ordinary shares (in thousands of shares)	59,567	59,320	59,353
Basic EPS	\$ 2.04	\$ 1.09	\$ 0.83
Dilutive effect of share based payments (in thousands of shares)	1,482	1,354	801
Weighted average number of diluted ordinary shares (in thousands of shares)	61,049	60,674	60,154
Diluted EPS	\$ 1.99	\$ 1.07	\$ 0.82

For 2017 the weighted average number of shares equals the outstanding number of shares. In 2016 and 2018 repurchases of treasury shares were taken into account on a daily basis. In 2018 new shares were generated and transferred for settlement of stock based compensation ("2015 Plan"), which was also included in the weighted number of shares. The dilutive effect of the share-based payment transaction is the weighted number of shares considering the grant date, forfeitures and executions during the respective fiscal years. The effect is determined by using the treasury stock method.

Note P. Income Taxes

Tax provisions (benefit) for income taxes consisted of the following:

	Years Ended December 31,		
	2018	2017	2016
	(In thousands)		
<i>Current</i>			
Domestic (1)	\$ 9,166	\$ 12,775	\$ 2,135
Foreign	41,412	14,628	18,421
Total	50,578	27,403	20,556
<i>Deferred</i>			
Domestic (1)	\$ 6,164	\$ 5,853	\$ 6,300
Foreign	(9,798)	(13,520)	(2,493)
Total	(3,634)	(7,667)	3,807
Provision (benefit) for income taxes	\$ 46,944	\$ 19,736	\$ 24,363

(1) Domestic refers to Germany.

Income before income taxes for fiscal years 2018 , 2017 and 2016 is as follows:

	Years Ended December 31,		
	2018	2017	2016
	(In thousands)		
Domestic (1)	\$ 115,594	\$ 121,061	\$ 52,426
Foreign	52,660	(36,465)	21,446
Income before income taxes	\$ 168,254	\$ 84,596	\$ 73,872

(1) Domestic refers to Germany.

A corporate income tax rate of 15% was used to calculate the current and deferred taxes for the German entities. A solidarity surcharge of 0.825% (calculated as 5.5% on the corporate income tax rate) and a trade tax rate of 16.18% , for the years ended December 31, 2018 , 2017 and 2016 respectively were also taken into account in the calculation. As a result, the overall tax rate for the German entities was 32.00% , for the years ended December 31, 2018 , 2017 and 2016 respectively. The current and deferred taxes for the non-German entities were calculated using their respective country-specific tax rates.

The following tax reconciliation shows the difference between the expected income taxes using the German overall tax rate of 32.00% and the effective income taxes in the income statement, for the years ended December 31, 2018 , 2017 and 2016 , respectively. The German tax rate is applied due to the fact that the primary operating entity is located in Germany and this entity holds all non-German operations.

	Years Ended December 31,		
	2018	2017	2016
	(In thousands)		
Income before income taxes	\$ 168,254	\$ 84,596	\$ 73,872
Expected income tax thereon	53,841	27,071	23,639
Tax rate differential	(6,695)	(2,249)	(5,201)
Change in valuation allowance on deferred tax assets and for losses without recognition of deferred taxes	(204)	(3,689)	1,740
Change in the tax rate and tax laws	(802)	(9,543)	(75)
Income taxes for prior years	876	561	32
Tax on non-deductible interest expenses	1,096	1,522	1,711
Taxes on other non-deductible expenses, and non-deductible taxes	(893)	6,216	5,144
Effects of changes in permanent differences	96	(879)	151
Tax effect on tax-free income	(532)	(1,033)	(1,263)
Other tax effects	161	1,759	(1,515)
Effective income taxes as reported	\$ 46,944	\$ 19,736	\$ 24,363
Effective tax rate	27.90%	23.33%	32.98%

Change in the tax rate and tax laws in an amount of \$8,820k are related to the effect of the U.S. tax reform enacted in December 2017 reducing the corporate income tax rate from 35% to 21% in the USA. As a result the net deferred tax liabilities for the US entities are now based on the new tax rate of 21%.

Other non-deductible expenses, and non-deductible taxes include taxes for Brazil (treated as a disregarded entity for U.S. tax purposes) which are non-creditable in the U.S. for the years ended December 31, 2017 \$1,361k and 2018 \$1,620k in connection with the reduced corporate income tax rate from 35% to 21% in the USA (U.S. tax reform enacted in December 2017).

Tax rate differential for the year ended December 31, 2018 are mainly driven by a benefit \$6,311k from taxable income resulting from a land sale done in Korea during 2018.

Income tax expense recognized in the consolidated statements of operations were \$46,944k in 2018 , \$19,736k in 2017 and \$24,363k in 2016 . Tax expenses/(benefit) recognized directly into the equity were \$265k in 2018 , \$(8,467)k in 2017 and \$6,483k in 2016 .

Significant components of deferred income taxes were as follows:

	December 31	
	2018	2017
	(In thousands)	
Assets		
Intangible assets	\$ 842	\$ 1,204
Property, plant and equipment	8,963	10,078
Financial assets	7,044	8,764
Inventories	4,131	2,633
Receivables, other assets	1,207	2,941
Liabilities		
Provisions	18,825	20,275
Liabilities	31,093	28,185
Other		
Loss carryforwards	43,753	54,918
Interest Carry forwards	9,041	8,162
Tax credits	1,022	—
Other	2,750	—
Total deferred tax assets (gross)	128,671	137,160
Valuation allowance	(40,905)	(54,596)
Total deferred tax assets (net)	\$ 87,766	\$ 82,564

	December 31	
	2018	2017
	(In thousands)	
Assets		
Intangible assets	\$ 12,973	\$ 740
Property, plant and equipment	30,628	32,784
Financial assets	6,719	6,629
Receivables, other assets	12,157	13,578
Liabilities		
Other	8,005	2,238
Provisions	6,441	6,808
Liabilities	3,953	2,062
Total deferred tax liabilities	\$ 80,876	\$ 64,839

The following table illustrates the gross and net deferred tax positions after the application of jurisdictional netting.

	December 31	
	2018	2017
	(In thousands)	
Deferred tax assets		
Gross deferred tax assets	\$ 87,766	\$ 82,564
Net deferred tax assets	52,395	38,195
Deferred tax liabilities		
Gross deferred tax liabilities	80,876	64,839
Net deferred tax liabilities	45,504	20,470
Net deferred tax asset / (liability) positions	\$ 6,891	\$ 17,725

Management assesses the recoverability of deferred tax assets. The assessment depends on future taxable profits being generated during the periods in which tax measurement differences reverse and tax loss carryforwards can be claimed. Orion expects that sufficient taxable income will be available to recover deferred tax assets due to the tax group in place.

As of December 31, 2018 and 2017, certain loss carryforwards were subject to restrictions with respect to the offsetting of losses. No deferred tax assets were recorded on these loss carryforwards if it is not likely that they will be used by future taxable income.

The following tax loss and interest carryforwards were recognized as at December 31, 2018 and 2017 (gross amounts):

	December 31	
	2018	2017
	(In thousands)	
Corporate income tax loss carryforwards	\$ 71,904	\$ 114,551
Trade tax loss carryforwards	—	—
Total	\$ 71,904	\$ 114,551

The change between the recognized tax loss and interest carryforwards as at December 31, 2018 compared to 2017 is mainly driven by the high taxable income of our German Tax Group.

No deferred tax assets were recognized for the following items (gross amounts):

	December 31	
	2018	2017
	(In thousands)	
Deductible temporary differences	\$ 40,905	\$ 34,019
Corporate income tax loss carryforwards	105,287	125,198
Trade tax loss carryforwards	—	256
Interest carryforwards for tax purposes	28,562	24,628
Total	\$ 174,754	\$ 184,101

The following table provides detail surrounding the expiration dates of the gross amount of tax loss carryforwards and tax credits:

	Net operating loss carryforwards	Tax Credits
	(In thousands)	
2019 to 2025	\$ 758	\$ —
2026 and thereafter	21,325	1,001
Indefinite carry-forwards	155,108	21
Total	\$ 177,191	\$ 1,022

As of December 31, 2018, the company's net operating loss carryforwards primarily relate to net operating losses which are due to expire at various dates, but not later than 2036.

No deferred taxes were recognized on a taxable temporary difference of \$11,815k (prior year: \$17,837k) in connection with subsidiaries.

Deferred tax liabilities amounting \$1,804k (2017: \$2,238k; 2016: \$1,719k) were recognized for subsidiaries for which a dividend distribution is expected in the near future.

Deferred tax liabilities in the USA were reduced by \$8,820k, deferred tax assets were reduced by \$429k mainly reflecting the changes following the U.S. tax reform and the future corporate tax rate of 21% for the year ended December 31, 2017.

We are not aware about events which would cause temporary differences, for which a deferred tax liability has not been recognized.

Tax uncertainties

A reconciliation of the beginning and ending amount of unrecognized tax benefits for fiscal years 2018 , 2017 and 2016 is as follows:

	2018	2017	2016
	(In thousands)		
Balance at beginning of the year	\$ 13,155	\$ 10,660	\$ 12,103
Additions based on tax positions related to the current year	4	1,590	165
Additions for tax positions of prior year	2,982	1,663	1,012
Reductions of tax positions of prior year	(1,370)	(759)	(2,619)
Reductions related to settlements	—	—	—
Reductions from lapse of statute of limitations	—	—	—
Balance at end of the year	\$ 14,771	\$ 13,155	\$ 10,660

We recognize interest related to unrecognized tax benefits and penalties as income tax expense. Related to the unrecognized tax benefits (noted above), we accrued penalties of \$0.0m and interest of \$0.5m during 2018 and in total \$3.4m as of December 31, 2018 . We recognized no liabilities for penalties and accrued interest of \$0.9m during 2017 , in total we accrued \$2.9m as of December 31, 2017 . We had recognized no liabilities for penalties and accrued interest of \$1.2m during 2016 . We accrued penalties and interest in total \$2.0m as of December 31, 2016 .

Orion and certain subsidiaries are under audit in a number of jurisdictions, and in particular in Germany for the initial three years of incorporation (fiscal years 2011-2013). It cannot be excluded that a further change in the unrecognized tax benefits may occur within the next twelve months related to the settlement of one or more of these audits or the lapse of applicable statutes of limitations; however, an estimated range of the impact on the unrecognized tax benefits cannot be quantified at this time.

Note Q . Commitments and Contingencies

Operating Lease Commitments

Orion leases certain vehicles, IT-Hardware, office buildings/space, warehouse and logistics, machinery and equipment under cancelable and non-cancelable operating leases, most of which expire within ten years and may be renewed by Orion. Contractual minimum lease payments are recognized on a straight-line basis over the minimum lease term. Operating lease expenses under such arrangements for fiscal years 2018 , 2017 and 2016 totaled \$4,214k , \$2,969k and \$4,136k , respectively.

As at December 31, 2018 commitments and contingencies break down as follows:

The nominal amounts of obligations from future minimum lease payments for assets leased under operating lease agreements have the following maturity:

Maturity	December 31, 2018
	(In thousands)
2019	\$ 9,222
2020	7,519
2021	6,508
2022	5,873
2023	4,597
2024 and thereafter	12,549
Total	\$ 46,268

Other Long-Term Commitments

To safeguard the supply of raw materials, contractual purchase commitments under long-term supply agreements for raw materials, primarily oil and gas, are in place with the following maturities:

Maturity	December 31, 2018
	(In thousands)
2019	\$ 157,311
2020 to 2023	233,706
2024 and thereafter	—
Total	\$ 391,017

Environmental Matters

EPA Action

During 2008 and 2009, the U.S. Environmental Protection Agency (“EPA”) contacted all U.S. carbon black producers as part of an industry-wide EPA initiative, requesting extensive and comprehensive information under Section 114 of the U.S. Clean Air Act. The EPA used that information to determine, for each facility, that either: (i) the facility has been in compliance with the Clean Air Act; (ii) violations have occurred and enforcement litigation may be undertaken; or (iii) violations have occurred and a settlement of an enforcement case is appropriate. In response to information requests received by the Company’s U.S. facilities, the Company furnished information to the EPA on each of its U.S. facilities. EPA subsequently sent notices under Section 113(a) of the Clean Air Act in 2010 alleging violations of Prevention of Significant Deterioration (“PSD”) and Title V permitting requirements under the Clean Air Act at the Company’s Belpre (Ohio) facility. In October 2012, the Company received a corresponding notice and finding of violation (an “NOV”) alleging the failure to obtain PSD and Title V permits reflecting Best Available Control Technology (“BACT”) at several units of the Company’s Ivanhoe (Louisiana) facility, and in January 2013 the Company also received an NOV issued by the EPA for its facility in Borger (Texas) alleging the failure to obtain PSD and Title V permits reflecting BACT during the years 1996 to 2008. A comparable NOV for the Company’s U.S. facility in Orange (Texas) was issued by the EPA in February 2013; and EPA issued an additional NOV in March 2016 alleging more recent non-PSD air emissions violations primarily at the dryers and the incinerator of the Orange facility.

In 2013, Orion began discussions with the EPA and the U.S. Department of Justice (“DOJ”) about a potential settlement to resolve the NOV’s received, which ultimately led to a consent decree executed between Orion Engineered Carbons LLC (for purpose of this note Q. “Orion”) and the United States (on behalf of the EPA), as well as the Louisiana Department of Environmental Quality. The consent decree (the “EPA CD”) became effective on June 7, 2018. The consent decree resolves and settles the EPA’s claims of noncompliance set forth in the NOV’s and in a respective complaint filed in court against Orion by the United States immediately prior to the filing of the consent decree.

All five U.S. carbon black producers have settled with the U.S. government. Orion was one of the two last carbon black companies to sign a consent decree.

Under Orion’s EPA CD, Orion will install certain pollution control technology in order to further reduce SO₂, NO_x and particulate matter (“PM”) emissions at its four U.S. manufacturing facilities in Ivanhoe (Louisiana), Belpre (Ohio), Borger (Texas), and Orange (Texas) over approximately six years. The EPA CD also requires the continuous monitoring of emissions reductions that Orion will need to comply with over a number of years. Orion has commenced the installation works for its Ivanhoe facility, and expects to complete the installation in this facility over the next two years. Under the EPA CD, Orion can choose either its Belpre or Borger facilities as the next site for installation of pollution control equipment with comparable effectiveness. We expect the capital expenditures for installation of pollution control equipment in the remaining Orion facilities to decrease due to economies of scale and synergies from prior installations. We also expect that the third and fourth plants will require significantly less costly pollution control equipment given the requirements of the EPA CD. We estimate the installations of monitoring and pollution control equipment at all four Orion plants in the U.S. will require capital expenditures of up to \$190 million. However, the actual total capital expenditures we might need to incur in order to fulfill the requirements of the EPA CD remain uncertain. The EPA CD allows some flexibility for Orion to choose among different technology solutions for reducing emissions and the locations where these solutions are implemented. The solutions Orion ultimately chooses to implement may differ in scope and operation from those it currently anticipates (including those discussed in the next paragraph) and factors, such as timing, locations, target levels, changing cost estimates and local regulations, could cause actual capital expenditures to significantly exceed current expectations or affect Orion’s ability to meet the agreed target emission levels or target dates for installing required equipment as anticipated or at all. Orion also agreed to and paid a civil penalty of \$800,000 and agreed to perform environmental mitigation projects totaling \$550,000. Noncompliance with applicable emissions limits could lead to further penalty payments to the EPA.

As part of Orion’s compliance plan under the EPA CD, in April 2018 Orion signed a contract with Haldor Topsoe group to install its SNOXTM emissions control technology to remove SO₂, NO_x and dust particles from tail gases at Orion’s Ivanhoe, Louisiana Carbon Black production plant. The SNOXTM technology has not been used previously in the carbon black industry.

Orion's Share Purchase Agreement with Evonik in connection with the Acquisition provides for a partial indemnity from Evonik against various exposures, including, but not limited to, capital investments, fines and costs arising in connection with Clean Air Act violations that occurred prior to July 29, 2011. Except for certain less relevant allegations contained in the second NOV received for the Company's facility in Orange (Texas) in March 2016, all of the other allegations made by the EPA with regard to all four of the Company's U.S. facilities - as discussed above - relate to alleged violations before July 29, 2011. The indemnity provides for a recovery from Evonik of a share of the costs (including fines), expenses (including reasonable attorney's fees, but excluding costs for maintenance and control in the ordinary course of business and any internal cost of monitoring the remedy), liabilities, damages and losses suffered and is subject to various contractual provisions including provisions set forth in the Share Purchase Agreement with Evonik, such as a de minimis clause, a basket, overall caps (which apply to all covered exposures and all covered environmental exposures, in the aggregate), damage mitigation and cooperation requirements, as well as a statute of limitations provision. Due to the cost-sharing and cap provisions in Evonik's indemnity, the Company expects that substantial costs it has already incurred and will incur in this EPA enforcement initiative and the EPA CD likely will exceed the scope of the indemnity in the tens of millions of US dollars. In addition, Evonik has signaled that it may likely defend itself against claims under the indemnity. While the Company intends to enforce its rights vigorously, there is no assurance that the Company will be able to recover costs or expenditures incurred under the indemnity as it expects or at all.

Pledges and guarantees

The pledge serves as collateral for claims arising under the finance documents, including the credit agreement dated July 25, 2014 as amended from time to time. The current principal amounts of the outstanding term loans under the Credit Agreement are \$284.8 million (U.S. Dollar Term Loan), and \$ 373.3 million (Euro Term Loan).

As at December 31, 2018 Orion Engineered Carbons GmbH has four guarantees issued by Euler Hermes S.A. with a total volume of \$15,222k (in prior year four guarantees by Euler Hermes S.A. of \$21,093k); one guarantee insurance issued by Deutsche Bank AG with a volume of \$2,900k (in prior year one guarantee issued by HSBC AG with a volume of \$2,399k). In addition, there is one cash collateral provided by Norcarb Engineered Carbons AB of \$33k (in prior year one cash collateral of \$30k). None of these guarantees reduce the possible utilization limit of the current RCF.

Note R. Financial Information by Segment & Geographic Area

Segment information

The Group's business is organized by its two carbon black product types. For corporate management purposes and all periods presented the Group had "Rubber" and "Specialty" as reportable operating segments. Rubber carbon black is used in the reinforcement of rubber in tires and mechanical rubber goods, Specialties are used as pigments and performance additives in coatings, polymers, printing and special applications.

The following table shows the relative size of the revenue recognized in each of the Company's reportable segment:

	2018	2017	2016
Rubber	65%	64%	63%
Specialty	35%	36%	37%

The senior management team, which is composed of the CEO, CFO and certain other senior management members is the chief operating decision maker ("CODM"). The senior management team monitors the operating segments' results separately in order to facilitate decisions regarding the allocation of resources and determine the segments' performance. Orion uses Adjusted EBITDA as the segments' performance measure. The CODM does not review reportable segment asset or liability information for purposes of assessing performance or allocating resources.

Adjustment items are not allocated to the individual segments as they are managed on a group basis.

Segment reconciliation for the years ended December 31, 2018 , 2017 and 2016 :

	Rubber	Specialties	Corporate and other	Total segments
	(In thousands)			
2018				
Revenues from external customers	\$ 1,032,818	\$ 545,385	\$ —	\$ 1,578,203
Equity in earnings of affiliated companies	591	—	—	591
Income from operations before income taxes and finance costs	87,169	108,226	910	196,305
Depreciation amortization and impairment of intangible assets and property, plant and equipment	57,127	41,029	—	98,156
Adjusted EBITDA	144,887	149,255	—	294,142
Assets	685,243	436,337	151,442	1,273,022
Total expenditures for additions to long-lived assets	67,885	43,171	—	111,057
2017				
Revenues from external customers	\$ 849,410	\$ 478,887	\$ —	\$ 1,328,297
Equity in earnings of affiliated companies	547	—	—	547
Income from operations before income taxes and finance costs	50,540	107,535	(20,204)	137,871
Depreciation amortization and impairment of intangible assets and property, plant and equipment	60,403	37,953	—	98,356
Adjusted EBITDA	111,490	145,488	—	256,978
Assets	610,782	357,492	196,092	1,164,366
Total expenditures for additions to long-lived assets	52,584	46,397	—	98,981
2016				
Revenues from external customers	\$ 712,271	\$ 427,020	\$ —	\$ 1,139,291
Equity in earnings of affiliated companies	462	—	—	462
Income from operations before income taxes and finance costs	29,833	119,282	(32,301)	116,814
Depreciation amortization and impairment of intangible assets and property, plant and equipment	64,933	32,212	—	97,145
Adjusted EBITDA	95,228	151,494	—	246,722
Assets	520,262	320,710	214,556	1,055,528
Total expenditures for additions to long-lived assets	47,393	18,903	—	66,296

The sales information noted above relates to external customers only. 'Corporate and other' includes income and expense that cannot be directly allocated to the business segments or are managed on corporate level and includes finance income and expenses, taxes and items with less bearing on the underlying core business. Income from operations before income taxes and finance costs of the segment 'Corporate and other' comprises the following:

	2018	2017	2016
	(In thousands)		
Restructuring expenses/(income)	(24,633)	6,492	19,758
Consulting fees related to Group strategy	4,804	2,807	2,837
Long Term Incentive Plan	13,919	8,835	3,958
Other non-operating	5,000	2,070	5,748
Expenses/(income) from operations before income taxes and finance costs	\$ (910)	\$ 20,204	\$ 32,301

Finance costs (interest and other financial expense, net, and actuarial gains and losses reclassified to the statement of operations) for the years ended December 31, 2018 , 2017 and 2016 are \$28,642k , \$53,822k and \$43,404k , respectively.

Geographic information

Revenues	Years Ended December 31,		
	2018	2017	2016
	(In thousands)		
Germany	\$ 628,709	\$ 524,065	\$ 440,988
United States	401,935	330,424	302,103
South Korea	279,016	246,551	220,753
Brazil	95,611	80,143	60,994
China	75,638	64,645	45,318
South Africa	56,373	46,844	36,853
Other	24,293	23,129	23,540
Rest of Europe ⁽¹⁾	16,628	12,496	8,742
Total	\$ 1,578,203	\$ 1,328,297	\$ 1,139,291

⁽¹⁾ Only a holding company is located in Luxembourg, accordingly no revenue is generated in the country of domicile.

Revenue generated for the year ended December 31, 2018 from the largest customer in the “Rubber” segment amounted to \$201,690k . Revenue from the largest customer in the “Rubber” segment for the year ended December 31, 2017 was \$144,382k and for the year ended December 31, 2016 revenue from the largest customer in the “Rubber” segment was \$92,781k , respectively. There is each another customer with more than, or equal to 10% of revenue for the periods 2018 and 2016, respectively.

Long-lived tangible assets ⁽¹⁾	December 31	
	2018	2017
	(In thousands)	
Germany	\$ 104,823	\$ 81,193
Sweden	26,351	18,559
Italy	29,586	24,822
Poland	12,964	14,001
Rest of Europe ⁽²⁾	5,815	65
Subtotal Europe	179,539	138,640
United States	139,929	133,463
South Korea	115,036	137,237
South Africa	16,894	18,562
Brazil	21,395	24,765
China	10,719	9,434
Other	22	28
Total	\$ 483,534	\$ 462,129

⁽¹⁾ Long-lived assets include property, plant and equipment, net.

⁽²⁾ Only a holding company is located in Luxembourg, accordingly no revenue is generated in the country of domicile.

Note S. Related Parties

As of December 31, 2018 related parties include one associate of Orion that is accounted for using the equity method, namely "Deutsche Gaßrußwerke" (DGW) and one principal owner of more than 10%.

Until December 8, 2017 Kinove Holdings and a co-investor as former majority shareholders of Orion Engineered Carbons S.A. and the shareholders of Kinove Holdings were related parties. In a series of secondary public offerings in 2017 Kinove Holdings and the co-investor sold their entire shareholdings in Orion Engineered Carbons S.A. to public shareholders. Therefore Kinove Holdings, the co-investor and the shareholders of Kinove Holdings are unrelated to Orion as of December 9, 2017.

Related parties include key management personnel having authority and responsibility for planning, directing and monitoring the activities of the Group directly or indirectly and their close family members.

Since the beginning of 2012, certain members of the administrative board, corporate management and senior management (the co-invested managers) have acquired shares on the basis of a co-investment program (CIP) of Kinove Luxembourg Coinvest S.C.A. which held 10% of the shares in Orion Engineered Carbons S.A which were fully sold in connection with the series of secondary public offerings in 2017 to public shareholders. The CIP qualified as an equity settled share-based payment plan because the terms and conditions under which the participating managers acquired the shares include defined lock-up periods and neither Orion Engineered Carbons S.A. nor any other group entity had an obligation to settle the share-based payment. No expenses were recognized in profit or loss as consideration for the services received by the co-invested managers.

In the normal course of business Orion from time to time receives services from, or sells products to, related unconsolidated parties, in transactions that are either not material or approved in accordance with our Related Party Transaction Approval Policy.

	December 31		
	2018	2017	
	(In thousands)		
Trade receivables from DGW KG	\$ 651	\$	537
Trade payables to DGW KG	\$ 18,615	\$	19,611

	Years Ended December 31,		
	2018	2017	2016
	(In thousands)		
Purchased carbon black products from DGW KG	\$ 93,536	\$ 79,270	\$ 77,670
Sales and services provided to DGW KG	\$ 6,464	\$ 2,627	\$ 2,574

Note T. Subsequent Events

The Company has evaluated events from December 31, 2018 through the date the financial statements were issued. There were no subsequent events that need disclosure.

Item 19. Exhibits

Exhibit No.	Description
1.1	<u>Articles of Association of Orion Engineered Carbons S.A. (incorporated by reference to Exhibit 99.1 to the Current Report on Form 6-K furnished on April 16, 2018 (File No. 001-36563))</u>
2.1	<u>Form of Specimen of Common Share Certificate (incorporated by reference to Exhibit 4.1 to Amendment No. 2 to the Registration Statement on Form F-1 filed on July 14, 2014 (File No. 333-196593))</u>
4.1	<u>Orion Engineered Carbons S.A. 2014 Omnibus Incentive Compensation Plan (incorporated by reference to Exhibit 4.2 to Registration Statement on Form S-8 filed on August 5, 2014 (File No. 333-197879))</u>
4.2	<u>Orion Engineered Carbons S.A. 2014 Non-Employee Director Plan (incorporated by reference to Exhibit 4.3 to Registration Statement on Form S-8 filed on August 5, 2014 (File No. 333-197879))</u>
4.3	<u>Credit Agreement, dated as of July 25, 2014, among the Company, Orion Engineered Carbons Holdings GmbH, Orion Engineered Carbons Bondco GmbH, Orion Engineered Carbons GmbH, OEC Finance US LLC, the revolving borrowers named therein, the guarantors named on the signature page thereto, the lenders named therein, and Goldman Sachs Bank USA as administrative agent (incorporated by reference to Exhibit 99.1 to the Current Report on Form 6-K furnished on July 31, 2014 (File No. 001-36563))</u>
4.4	<u>Fourth Amendment, dated as of May 31, 2017, to the Credit Agreement, by and among Orion Engineered Carbons S.A., Orion Engineered Carbons Holdings GmbH, Orion Engineered Carbons BondCo GmbH, Orion Engineered Carbons GmbH, OEC Finance US LLC, the Revolving Borrowers named therein, the Guarantors party thereto, the Lenders party thereto, Goldman Sachs Bank USA, in its capacity as administrative agent for the Lenders, and UniCredit Bank AG, as arranger with respect to the Amendment (incorporated by reference to Exhibit 99.1 to the Current Report on Form 6-K furnished on July 25, 2017 (File No. 001-36563))</u>
8.1	<u>List of Subsidiaries of Orion Engineered Carbons S.A.</u>
12.1	<u>Rule 13a-14(a)/15d-14(a) Certification of the Chief Executive Officer</u>
12.2	<u>Rule 13a-14(a)/15d-14(a) Certification of the Chief Financial Officer</u>
13.1	<u>Section 1350 Certification of Chief Executive Officer</u>
13.2	<u>Section 1350 Certification of Chief Financial Officer</u>
15.1	<u>Consent of Ernst & Young GmbH Wirtschaftsprüfungsgesellschaft</u>
101.INS	XBRL Instance Document
101.SCH	XBRL Taxonomy Extension Schema Document
101.CAL	XBRL Taxonomy Extension Calculation Linkbase Document
101.DEF	XBRL Taxonomy Extension Definition Linkbase Document
101.LAB	XBRL Taxonomy Extension Label Linkbase Document
101.PRE	XBRL Taxonomy Extension Presentation Linkbase Document

SIGNATURES

The registrant hereby certifies that it meets all the requirements for filing on Form 20-F and that it has duly caused and authorized the undersigned to sign this annual report on its behalf.

March 7, 2018

ORION ENGINEERED CARBONS S.A.

By /s/ Charles Herlinger

Name: Charles Herlinger

Title: Chief Financial Officer

List of Subsidiaries

The following entities are included in the Group consolidated financial statements as subsidiaries or joint ventures at December 31, 2018 .

	As at Dec 31, 2018
	Shareholding
Orion Engineered Carbons S.A., Luxembourg	
Controlled entities	
Orion Engineered Carbons LLC USA, Kingwood, USA (Principal Executive Office)	100%
Orion Engineered Carbons Holdings GmbH, Frankfurt am Main, Germany	100%
Orion Engineered Carbons Bondco GmbH, Frankfurt am Main, Germany	100%
Orion Engineered Carbons International GmbH, Frankfurt am Main, Germany	100%
Kinove Italian Bidco S.r.l., Ravenna, Italy	100%
Orion Engineered Carbons France Holdco SAS, Paris, France*	100%
Blackstar Engineered Carbons Portugal Holdco, Unipessoal, Lda., Sines, Portugal*	100%
Orion Engineered Carbons USA Holdco, LLC, Kingwood, USA	100%
Orion Engineered Carbons Korea Co. Ltd., Bupyeong-gu, South Korea	100%
Norcarb Engineered Carbons Sweden HoldCo AB, Malmö, Sweden	100%
Orion Engineered Carbons S.r.l. Italy, Ravenna, Italy	100%
Orion Engineered Carbons S.A.S. France, Ambès, France*	100%
Carbogal Engineered Carbons S.A. Portugal, Sines, Portugal*	100%
Orion Engineered Carbons France SAS; Berre-l'Etang; France	100%
Orion Engineered Carbons Co. Ltd., Bupyeong-gu, South Korea	100%
Orion Engineered Carbons sp. z o.o. Poland, Jaslo, Poland	100%
Norcarb Engineered Carbons AB Sweden, Malmö, Sweden	100%
Orion Engineered Carbons Ltda. Brazil, São Paulo, Brazil	100%
Orion Engineered Carbons Proprietary Limited South Africa, Port Elizabeth, South Africa	100%
Orion Engineered Carbons GmbH, Frankfurt am Main, Germany	100%
Orion Engineered Carbons KK Japan, Tokyo, Japan	100%
Orion Engineered Carbons Pte. Ltd., Singapore, Singapore	100%
Orion Engineered Carbons Trading Co. Ltd., Shanghai, China	100%
Orion Engineered Carbons Material Technology (Shanghai) Co., Ltd., Shanghai, China	100%
Orion Engineered Carbons Qingdao Co., Ltd., China	100%
CB International Services Company GmbH, Frankfurt am Main, Germany	100%
Associated entities	
Kommanditgesellschaft Deutsche Gasrusswerke GmbH & Co., Dortmund, Germany	54%
Deutsche Gasrusswerke Gesellschaft mit beschränkter Haftung, Dortmund, Germany	50%

* in liquidation

Although Orion holds 54% of shares as at December 31, 2018 and 2017 in Kommanditgesellschaft Deutsche Gasrusswerke GmbH & Co., Dortmund, Germany (“DGW KG”), the terms and conditions of DGW KG's articles of association and other bylaws impede Orion from controlling DGW KG. Therefore DGW KG is recognized as a joint venture applying the equity method.

CERTIFICATION

I, Corning Painter, certify that:

1. I have reviewed this annual report on Form 20-F of Orion Engineered Carbons S.A.;
2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;
3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the company as of, and for, the periods presented in this report;
4. The company's other certifying officer and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the company and have:
 - (a) Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the company, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;
 - (b) Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;
 - (c) Evaluated the effectiveness of the company's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and
 - (d) Disclosed in this report any change in the company's internal control over financial reporting that occurred during the period covered by the annual report that has materially affected, or is reasonably likely to materially affect, the company's internal control over financial reporting; and
5. The company's other certifying officer and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the company's auditors and the audit committee of the company's board of directors (or persons performing the equivalent functions):
 - (a) All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the company's ability to record, process, summarize and report financial information; and
 - (b) Any fraud, whether or not material, that involves management or other employees who have a significant role in the company's internal control over financial reporting.

Date: March 7, 2019

By: /s/ Corning Painter

Corning Painter
Chief Executive Officer

CERTIFICATION

I, Charles Herlinger, certify that:

1. I have reviewed this annual report on Form 20-F of Orion Engineered Carbons S.A.;
2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;
3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the company as of, and for, the periods presented in this report;
4. The company's other certifying officer and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the company and have:
 - (a) Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the company, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;
 - (b) Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;
 - (c) Evaluated the effectiveness of the company's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and
 - (d) Disclosed in this report any change in the company's internal control over financial reporting that occurred during the period covered by the annual report that has materially affected, or is reasonably likely to materially affect, the company's internal control over financial reporting; and
5. The company's other certifying officer and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the company's auditors and the audit committee of the company's board of directors (or persons performing the equivalent functions):
 - (a) All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the company's ability to record, process, summarize and report financial information; and
 - (b) Any fraud, whether or not material, that involves management or other employees who have a significant role in the company's internal control over financial reporting.

Date: March 7, 2019

By: /s/ Charles Herlinger _____

Charles Herlinger
Chief Financial Officer

CERTIFICATION

Pursuant to 18 U.S.C. §1350, the undersigned officer of Orion Engineered Carbons S.A. (the “Company”) hereby certifies that, to the officer’s knowledge, the Company’s Annual Report on Form 20-F for the year ended December 31, 2018 (the “Report”) fully complies with the requirements of Section 13(a) or 15(d), as applicable, of the Securities Exchange Act of 1934 and that the information contained in the Report fairly presents, in all material respects, the financial condition and results of operations of the Company.

Date: March 7, 2019

By: /s/ Corning Painter _____

Corning Painter
Chief Executive Officer

CERTIFICATION

Pursuant to 18 U.S.C. §1350, the undersigned officer of Orion Engineered Carbons S.A. (the “Company”) hereby certifies that, to the officer’s knowledge, the Company’s Annual Report on Form 20-F for the year ended December 31, 2017 (the “Report”) fully complies with the requirements of Section 13(a) or 15(d), as applicable, of the Securities Exchange Act of 1934 and that the information contained in the Report fairly presents, in all material respects, the financial condition and results of operations of the Company.

Date: March 7, 2019

By: /s/ Charles Herlinger _____

Charles Herlinger
Chief Financial Officer

CONSENT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

We consent to the incorporation by reference in the following Registration Statements:

- (1) Registration Statement (Form F-3/A No. 333-209963) of Orion Engineered Carbons S.A., and
- (2) Registration Statement (Form S-8 No. 333-197879) pertaining to the 2014 Omnibus Incentive Compensation Plan and the 2014 Non-Employee Director Plan of Orion Engineered Carbons S.A;

of our reports dated March 7, 2019, with respect to the consolidated financial statements of Orion Engineered Carbons S.A. and the effectiveness of internal control over financial reporting of Orion Engineered Carbons S.A. included in this Annual Report (Form 20-F) of Orion Engineered Carbons S.A. for the year ended December 31, 2018.

/s/Tobias Schlebusch /s/Titus Zwirner
Wirtschaftsprüfer Wirtschaftsprüfer
(German Public Auditor) (German Public Auditor)

Ernst & Young GmbH Wirtschaftsprüfungsgesellschaft
Cologne, Germany
March 7, 2019