

KRONOS WORLDWIDE INC  
Form 10-K  
March 10, 2017

UNITED STATES

SECURITIES AND EXCHANGE COMMISSION

Washington, D.C. 20549

FORM 10-K

Annual Report Pursuant to Section 13 or 15(d) of the Securities and Exchange Act of 1934:  
For the fiscal year ended December 31, 2016

Commission file number 1-31763

KRONOS WORLDWIDE, INC.

(Exact name of Registrant as specified in its charter)

DELAWARE  
(State or other jurisdiction  
of incorporation or organization)

76-0294959  
(IRS Employer  
Identification No.)

5430 LBJ Freeway, Suite 1700

Dallas, Texas 75240-2697

(Address of principal executive offices)

Registrant's telephone number, including area code: (972) 233-1700

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

Title of each class	Name of each exchange on which registered
Common stock (\$.01 par value)	New York Stock Exchange

No securities are registered pursuant to Section 12(g) of the Act.

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 the Registrant is not required to file reports pursuant to Section 13 or Section 15(d) of the Act. Yes No

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 and (2) has been subject to such filing requirements for the past 90 days. Yes No

Whether the Registrant has submitted electronically and posted on its corporate Website, if any, every Interactive Data File required to be submitted and posted pursuant to Rule 405 of Regulation S-T during the preceding 12 months (or for such shorter period that the Registrant was required to submit and post such files). Yes No

If disclosure of delinquent filers pursuant to Item 405 of Regulation S-K is not contained herein, and will not be contained, to the best of Registrant's knowledge, in definitive proxy or information statements incorporated by reference in Part III of this Form 10-K or any amendment to this Form 10-K. Yes No

Whether the Registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer or a smaller reporting company (as defined in Rule 12b-2 of the Act).

Large accelerated filer Accelerated filer Non-accelerated filer Smaller reporting company

Whether the Registrant is a shell company (as defined in Rule 12b-2 of the Act). Yes No

The aggregate market value of the 22.5 million shares of voting stock held by nonaffiliates of Kronos Worldwide, Inc. as of June 30, 2016 (the last business day of the Registrant's most recently-completed second fiscal quarter) approximated \$118.4 million.

As of February 28, 2017, 115,894,098 shares of the Registrant's common stock were outstanding.

Documents incorporated by reference

The information required by Part III is incorporated by reference from the Registrant's definitive proxy statement to be filed with the Commission pursuant to Regulation 14A not later than 120 days after the end of the fiscal year covered by this report.

## Forward-Looking Information

This Annual Report on Form 10-K contains forward-looking statements within the meaning of the Private Securities Litigation Reform Act of 1995, as amended. Statements in this Annual Report that are not historical facts are forward-looking in nature and represent management's beliefs and assumptions based on currently available information. In some cases, you can identify forward-looking statements by the use of words such as "believes," "intends," "may," "should," "could," "anticipates," "expects" or comparable terminology, or by discussions of strategies or trends. Although we believe that the expectations reflected in such forward-looking statements are reasonable, we do not know if these expectations will be correct. Such statements by their nature involve substantial risks and uncertainties that could significantly impact expected results. Actual future results could differ materially from those predicted. The factors that could cause actual future results to differ materially from those described herein are the risks and uncertainties discussed in this Annual Report and those described from time to time in our other filings with the SEC include, but are not limited to, the following:

- Future supply and demand for our products
- The extent of the dependence of certain of our businesses on certain market sectors
- The cyclicity of our business
- Customer and producer inventory levels
- Unexpected or earlier-than-expected industry capacity expansion
- Changes in raw material and other operating costs (such as energy and ore costs)
- Changes in the availability of raw materials (such as ore)
- General global economic and political conditions (such as changes in the level of gross domestic product in various regions of the world and the impact of such changes on demand for TiO<sub>2</sub>)
- Competitive products and substitute products
- Customer and competitor strategies
- Potential consolidation of our competitors
- Potential consolidation of our customers
- The impact of pricing and production decisions
- Competitive technology positions
- Potential difficulties in upgrading or implementing new accounting and manufacturing software systems
- The introduction of trade barriers
- Possible disruption of our business, or increases in our cost of doing business, resulting from terrorist activities or global conflicts
- Fluctuations in currency exchange rates (such as changes in the exchange rate between the U.S. dollar and each of the euro, the Norwegian krone and the Canadian dollar), or possible disruptions to our business resulting from potential instability resulting from uncertainties associated with the euro or other currencies
- Operating interruptions (including, but not limited to, labor disputes, leaks, natural disasters, fires, explosions, unscheduled or unplanned downtime, transportation interruptions and cyber attacks)
- Our ability to renew or refinance credit facilities
- Our ability to maintain sufficient liquidity
- The ultimate outcome of income tax audits, tax settlement initiatives or other tax matters

• Our ability to utilize income tax attributes, the benefits of which may not have been recognized under the more-likely-than-not recognition criteria

• Environmental matters (such as those requiring compliance with emission and discharge standards for existing and new facilities)

• Government laws and regulations and possible changes therein

• The ultimate resolution of pending litigation

• Possible future litigation.

Should one or more of these risks materialize (or the consequences of such a development worsen), or should the underlying assumptions prove incorrect, actual results could differ materially from those forecasted or expected. We disclaim any intention or obligation to update or revise any forward-looking statements whether as a result of changes in information, future events or otherwise.

## PART I

### ITEM 1. BUSINESS

#### General

Kronos Worldwide, Inc. (NYSE: KRO) (Kronos), a Delaware corporation, is a leading global producer and marketer of value-added titanium dioxide pigments, or  $\text{TiO}_2$ , a base industrial product used in a wide range of applications. We, along with our distributors and agents, sell and provide technical services for our products to approximately 4,000 customers in 100 countries with the majority of sales in Europe and North America. We believe we have developed considerable expertise and efficiency in the manufacture, sale, shipment and service of our products in domestic and international markets.

$\text{TiO}_2$  is a white inorganic pigment used in a wide range of products for its exceptional durability and its ability to impart whiteness, brightness and opacity.  $\text{TiO}_2$  is a critical component of everyday applications, such as coatings, plastics and paper, as well as many specialty products such as inks, food and cosmetics.  $\text{TiO}_2$  is widely considered to be superior to alternative white pigments in large part due to its hiding power (or opacity), which is the ability to cover or mask other materials effectively and efficiently.  $\text{TiO}_2$  is designed, marketed and sold based on specific end-use applications.

$\text{TiO}_2$  is the largest commercially used whitening pigment because it has a high refractive rating, giving it more hiding power than any other commercially produced white pigment. In addition,  $\text{TiO}_2$  has excellent resistance to interaction with other chemicals, good thermal stability and resistance to ultraviolet degradation. Although there are other white pigments on the market, we believe there are no effective substitutes for  $\text{TiO}_2$  because no other white pigment has the physical properties for achieving comparable opacity and brightness or can be incorporated in as cost-effective a manner. Pigment extenders such as kaolin clays, calcium carbonate and polymeric opacifiers are used together with  $\text{TiO}_2$  in a number of end-use markets. However, these products are not able to duplicate the opacity performance characteristics of  $\text{TiO}_2$  and we believe these products are unlikely to have a significant impact on the use of  $\text{TiO}_2$ .

$\text{TiO}_2$  is considered a “quality-of-life” product. Demand for  $\text{TiO}_2$  has generally been driven by worldwide gross domestic product and has generally increased with rising standards of living in various regions of the world. According to industry estimates,  $\text{TiO}_2$  consumption has grown at a compound annual growth rate of approximately 3% since 1990. Per capita consumption of  $\text{TiO}_2$  in Western Europe and the United States far exceeds that in other areas of the world, and these regions are expected to continue to be the largest consumers of  $\text{TiO}_2$  on a per capita basis. We believe that Western Europe and North America currently account for approximately 20% and 17% of global  $\text{TiO}_2$  consumption, respectively. Markets for  $\text{TiO}_2$  are generally increasing in South America, Eastern Europe, the Asia Pacific region and China and we believe these are significant markets where we expect continued growth as economies in these regions continue to develop and quality-of-life products, including  $\text{TiO}_2$ , experience greater demand.

At December 31, 2016, approximately 50% of our common stock was owned by Valhi, Inc. (NYSE: VHI) and approximately 30% was owned by a wholly-owned subsidiary of NL Industries, Inc. (NYSE: NL). Valhi also owns approximately 83% of NL Industries’ outstanding common stock. A wholly-owned subsidiary of Contran Corporation held approximately 93% of Valhi’s outstanding common stock. As discussed in Note 1 to our Consolidated Financial Statements, Lisa K. Simmons and Serena Simmons Connelly may be deemed to control Contran, Valhi, NL and us.

## Products and end-use markets

Including our predecessors, we have produced and marketed TiO<sub>2</sub> in North America and Europe, our primary markets, for over 100 years. We believe that we are the largest producer of TiO<sub>2</sub> in Europe with approximately one-half of our sales volumes attributable to markets in Europe. The table below shows our market share for our significant markets, Europe and North America, for the last three years.

	2014	2015	2016
Europe	18%	18%	17%
North America	17%	15%	16%

We believe we are the leading seller of TiO<sub>2</sub> in several countries, including Germany, with an estimated 9% share of worldwide TiO<sub>2</sub> sales volume in 2016. Overall, we are one of the top five producers of TiO<sub>2</sub> in the world.

We offer our customers a broad portfolio of products that include over 40 different TiO<sub>2</sub> pigment grades under the Kronos® trademark, which provide a variety of performance properties to meet customers' specific requirements. Our major customers include domestic and international paint, plastics, decorative laminate and paper manufacturers. We ship TiO<sub>2</sub> to our customers in either a powder or slurry form via rail, truck and/or ocean carrier. Sales of our core TiO<sub>2</sub> pigments represented approximately 93% of our net sales in 2016. We and our agents and distributors primarily sell our products in three major end-use markets: coatings, plastics and paper.

The following tables show our approximate TiO<sub>2</sub> sales volume by geographic region and end use for the year ended December 31, 2016:

Sales volumes percentages	Sales volumes percentages	
	by geographic region	by end-use
Europe	51%	Coatings 56%
North America	29%	Plastics 31%
Asia Pacific	10%	Other 7%
Rest of World	10%	Paper 6%

Some of the principal applications for our products include the following:

**TiO<sub>2</sub> for coatings** - Our TiO<sub>2</sub> is used to provide opacity, durability, tinting strength and brightness in industrial coatings, as well as coatings for commercial and residential interiors and exteriors, automobiles, aircraft, machines, appliances, traffic paint and other special purpose coatings. The amount of TiO<sub>2</sub> used in coatings varies widely depending on the opacity, color and quality desired. In general, the higher the opacity requirement of the coating, the greater the TiO<sub>2</sub> content.

**TiO<sub>2</sub> for plastics** - We produce TiO<sub>2</sub> pigments that improve the optical and physical properties in plastics, including whiteness and opacity. TiO<sub>2</sub> is used to provide opacity in items such as containers and packaging materials, and vinyl

products such as windows, door profiles and siding.  $\text{TiO}_2$  also generally provides hiding power, neutral undertone, brightness and surface durability for housewares, appliances, toys, computer cases and food packages.  $\text{TiO}_2$ 's high brightness along with its opacity, is used in some engineering plastics to help mask their undesirable natural color.  $\text{TiO}_2$  is also used in masterbatch, which is a concentrate of  $\text{TiO}_2$  and other additives and is one of the largest uses for  $\text{TiO}_2$  in the plastics end-use market. In masterbatch, the  $\text{TiO}_2$  is dispersed at high concentrations into a plastic resin and is then used by manufacturers of plastic containers, bottles, packaging and agricultural films.

$\text{TiO}_2$  for paper - Our  $\text{TiO}_2$  is used in the production of several types of paper, including laminate (decorative) paper, filled paper and coated paper to provide whiteness, brightness, opacity and color stability. Although we sell our  $\text{TiO}_2$  to all segments of the paper end-use market, our primary focus is on the  $\text{TiO}_2$  grades used in paper laminates, where several layers of paper are laminated together using melamine resin under high temperature and pressure. The top layer of paper contains  $\text{TiO}_2$  and plastic resin and is the layer that is printed with decorative patterns. Paper laminates are used to replace materials such as wood and tile for such applications as

counter tops, furniture and wallboard.  $\text{TiO}_2$  is beneficial in these applications because it assists in preventing the material from fading or changing color after prolonged exposure to sunlight and other weathering agents.

$\text{TiO}_2$  for other applications - We produce  $\text{TiO}_2$  to improve the opacity and hiding power of printing inks.  $\text{TiO}_2$  allows inks to achieve very high print quality while not interfering with the technical requirements of printing machinery, including low abrasion, high printing speed and high temperatures. Our  $\text{TiO}_2$  is also used in textile applications where  $\text{TiO}_2$  functions as an opacifying and delustering agent. In man-made fibers such as rayon and polyester,  $\text{TiO}_2$  corrects an otherwise undesirable glossy and translucent appearance. Without the presence of  $\text{TiO}_2$ , these materials would be unsuitable for use in many textile applications.

We produce high purity sulfate process anatase  $\text{TiO}_2$  used to provide opacity, whiteness and brightness in a variety of cosmetic and personal care products, such as skin cream, lipstick, eye shadow and toothpaste. Our  $\text{TiO}_2$  is also found in food products, such as candy and confectionaries, and in pet foods where it is used to obtain uniformity of color and appearance. In pharmaceuticals, our  $\text{TiO}_2$  is used commonly as a colorant in pill and capsule coatings as well as in liquid medicines to provide uniformity of color and appearance. Kronos® purified anatase grades meet the applicable requirements of the CTF (Cosmetics, Toiletries and Fragrances Association), USP and BP (United States Pharmacopoeia and British Pharmacopoeia) and the FDA (United States Food and Drug Administration).

Our  $\text{TiO}_2$  business is enhanced by the following three complementary businesses, which comprised approximately 7% of our net sales in 2016:

- We own and operate two ilmenite mines in Norway pursuant to a governmental concession with an unlimited term. Ilmenite is a raw material used directly as a feedstock by some sulfate-process  $\text{TiO}_2$  plants. We also sell ilmenite ore to third parties, some of whom are our competitors, and we sell an ilmenite-based specialty product to the oil and gas industry. The mines have estimated ilmenite reserves that are expected to last at least 50 years.
- We manufacture and sell iron-based chemicals, which are co-products and processed co-products of the sulfate and chloride process  $\text{TiO}_2$  pigment production. These co-product chemicals are marketed through our Ecochem division and are primarily used as treatment and conditioning agents for industrial effluents and municipal wastewater as well as in the manufacture of iron pigments, cement and agricultural products.
- We manufacture and sell titanium oxychloride and titanyl sulfate, which are side-stream specialty products from the production of  $\text{TiO}_2$ . Titanium oxychloride is used in specialty applications in the formulation of pearlescent pigments, production of electroceramic capacitors for cell phones and other electronic devices. Titanyl sulfate productions are used in pearlescent pigments, natural gas pipe and other specialty applications.

Manufacturing, operations and properties

We produce  $\text{TiO}_2$  in two crystalline forms: rutile and anatase. Rutile  $\text{TiO}_2$  is manufactured using both a chloride production process and a sulfate production process, whereas anatase  $\text{TiO}_2$  is only produced using a sulfate production process. Manufacturers of many end-use applications can use either form, especially during periods of tight supply for  $\text{TiO}_2$ . The chloride process is the preferred form for use in coatings and plastics, the two largest end-use markets. Due to environmental factors and customer considerations, the proportion of  $\text{TiO}_2$  industry sales represented by chloride process pigments has increased relative to sulfate process pigments, and in 2016, chloride process production facilities represented approximately 50% of industry capacity. The sulfate process is preferred for use in selected paper products, ceramics, rubber tires, man-made fibers, food products and cosmetics. Once an intermediate  $\text{TiO}_2$  pigment has been produced by either the chloride or sulfate process, it is “finished” into products with specific performance characteristics for particular end-use applications through proprietary processes involving various chemical surface treatments and intensive micronizing (milling).

• Chloride process - The chloride process is a continuous process in which chlorine is used to extract rutile  $\text{TiO}_2$ . The chloride process produces less waste than the sulfate process because much of the chlorine is recycled and feedstock



bearing higher titanium content is used. The chloride process also

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has lower energy requirements and is less labor-intensive than the sulfate process, although the chloride process requires a higher-skilled labor force. The chloride process produces an intermediate base pigment with a wide range of properties.

**Sulfate process** - The sulfate process is a batch process in which sulfuric acid is used to extract the TiO<sub>2</sub> from ilmenite or titanium slag. After separation from the impurities in the ore (mainly iron), the TiO<sub>2</sub> is precipitated and calcined to form an intermediate base pigment ready for sale or can be upgraded through finishing treatments. We produced 546,000 metric tons of TiO<sub>2</sub> in 2016, up from the 528,000 metric tons we produced in 2015. Our production amounts include our share of the output produced by our TiO<sub>2</sub> manufacturing joint venture discussed below in “TiQ Manufacturing Joint Venture.” Our average production capacity utilization rates were approximately 92%, 95% and 98% of capacity in 2014, 2015 and 2016, respectively. Our production utilization rates in 2014 were impacted by the previously-reported lockout at our Canadian production facility that began in June 2013. We operated our Canadian plant at approximately 15% of the plant’s capacity with non-union management employees during the lockout. The restart of production at the facility did not begin until February 2014. Our production rates in 2014 and in the first quarter of 2015 were also impacted by the implementation of certain productivity-enhancing improvement projects at other facilities, as well as necessary improvements to ensure continued compliance with our permit regulations, which resulted in longer-than-normal maintenance shutdowns in some instances.

We operate four TiO<sub>2</sub> plants in Europe (one in each of Leverkusen, Germany; Nordenham, Germany; Langerbrugge, Belgium; and Fredrikstad, Norway). In North America, we have a TiO<sub>2</sub> plant in Varennes, Quebec, Canada and, through the manufacturing joint venture described below in “TiQ Manufacturing Joint Venture,” a 50% interest in a TiO<sub>2</sub> plant in Lake Charles, Louisiana.

Our production capacity in 2016 was 555,000 metric tons, approximately three-fourths of which was from the chloride production process.

The following table presents the division of our expected 2017 manufacturing capacity by plant location and type of manufacturing process:

Facility	Description	% of capacity by TiO <sub>2</sub> manufacturing process	
		Chloride	Sulfate
Leverkusen, Germany (1)	TiO <sub>2</sub> production, chloride and sulfate process, co-products	40 %	22 %
Nordenham, Germany	TiO <sub>2</sub> production, sulfate process, co-products	-	40
Langerbrugge, Belgium	TiO <sub>2</sub> production, chloride process, co-products, titanium chemicals products	21	-
Fredrikstad, Norway (2)	TiO <sub>2</sub> production, sulfate process, co-products	-	24
Varennes, Canada	TiO <sub>2</sub> production, chloride and sulfate process, slurry facility, titanium chemicals products	21	14
Lake Charles, LA, US (3)	TiO <sub>2</sub> production, chloride process	18	-
<b>Total</b>		<b>100 %</b>	<b>100 %</b>

(1) The Leverkusen facility is located within an extensive manufacturing complex owned by Bayer AG. We own the Leverkusen facility, which represents about one-third of our current TiO<sub>2</sub> production capacity, but we lease the

land under the facility from Bayer under a long-term agreement which expires in 2050. Lease payments are periodically negotiated with Bayer for periods of at least two years at a time. A majority-owned subsidiary of Bayer provides some raw materials including chlorine, auxiliary and operating materials, utilities and services necessary to operate the Leverkusen facility under separate supplies and services agreements.

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(2) The Fredrikstad plant is located on public land and is leased until 2063.

(3) We operate the Lake Charles facility in a joint venture with Huntsman P&A Investments LLC (HPA) (formerly Tioxide Americas LLC), a subsidiary of Huntsman Corporation and the amount indicated in the table above represents the share of TiO<sub>2</sub> produced by the joint venture to which we are entitled. See Note 5 to our Consolidated Financial Statements and “TiQ Manufacturing Joint Venture.”

We own the land underlying all of our principal production facilities unless otherwise indicated in the table above.

Our production capacity has increased by approximately 9% over the past ten years due to debottlenecking programs, with only moderate capital expenditures. We believe that our annual attainable production capacity for 2017 is approximately 555,000 metric tons, and we currently expect our production capacity rate will be at near-capacity levels in 2017.

We also operate two ilmenite mines in Norway pursuant to a governmental concession with an unlimited term. In addition, we operate a rutile slurry manufacturing plant in Lake Charles, Louisiana, which converts dry pigment manufactured for us at the Lake Charles TiO<sub>2</sub> facility into a slurry form that is then shipped to customers.

We have various corporate and administrative offices located in the U.S., Germany, Norway, Canada and Belgium and various sales offices located in North America, Belgium, France and the United Kingdom.

#### TiO<sub>2</sub> Manufacturing Joint Venture

Kronos Louisiana, Inc., one of our subsidiaries, and HPA each own a 50% interest in a manufacturing joint venture, Louisiana Pigment Company, L.P., or LPC. LPC owns and operates a chloride-process TiO<sub>2</sub> plant located in Lake Charles, Louisiana. We and Huntsman share production from the plant equally pursuant to separate offtake agreements, unless we and Huntsman otherwise agree (such as in 2015, when we purchased approximately 52% of the production from the plant).

A supervisory committee directs the business and affairs of the joint venture, including production and output decisions. This committee is composed of four members, two of whom we appoint and two of whom Huntsman appoints. Two general managers manage the operations of the joint venture acting under the direction of the supervisory committee. We appoint one general manager and Huntsman appoints the other.

The joint venture is not consolidated in our financial statements, because we do not control it. We account for our interest in the joint venture by the equity method. The joint venture operates on a break-even basis and therefore we do not have any equity in earnings of the joint venture. We are required to purchase one half of the TiO<sub>2</sub> produced by the joint venture. All costs and capital expenditures are shared equally with Huntsman with the exception of feedstock (purchased natural rutile ore or slag) and packaging costs for the pigment grades produced. Our share of net costs is reported as cost of sales as the TiO<sub>2</sub> is sold. See Notes 5 and 16 to our Consolidated Financial Statements.

#### Raw materials

The primary raw materials used in chloride process TiO<sub>2</sub> are titanium-containing feedstock (purchased natural rutile ore or slag), chlorine and coke. Chlorine is available from a number of suppliers, while petroleum coke is available from a limited number of suppliers. Titanium-containing feedstock suitable for use in the chloride process is available from a limited but increasing number of suppliers principally in Australia, South Africa, Canada, India and the United States. We purchase chloride process grade slag from Rio Tinto Iron and Titanium Limited under a long-term supply contract that expires at the end of 2018, subject to two-year renewal periods if both parties agree. We also purchase upgraded slag from Rio Tinto Iron and Titanium Limited under a long-term supply contract that expires at the end of 2019. We purchase natural rutile ore under contracts primarily from Iluka Resources, Limited and Sierra Rutile

Limited, and rutile ore under contracts with Sibelco Australia, all of which expire in 2017. In the past we have been, and we expect that we will continue to be, successful in obtaining short-term and long-term extensions to these and other existing supply contracts prior to their expiration. We expect the

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raw materials purchased under these contracts, and contracts that we may enter into, will meet our chloride process feedstock requirements over the next several years.

The primary raw materials used in sulfate process  $\text{TiO}_2$  are titanium-containing feedstock, primarily ilmenite or purchased sulfate grade slag and sulfuric acid. Sulfuric acid is available from a number of suppliers. Titanium-containing feedstock suitable for use in the sulfate process is available from a limited number of suppliers principally in Norway, Canada, Australia, India and South Africa. As one of the few vertically-integrated producers of sulfate process  $\text{TiO}_2$ , we operate two rock ilmenite mines in Norway, which provided all of the feedstock for our European sulfate process  $\text{TiO}_2$  plants in 2016. We expect ilmenite production from our mines to meet our European sulfate process feedstock requirements for the foreseeable future. For our Canadian sulfate process plant, we purchase sulfate grade slag primarily from Rio Tinto Fer et Titane Inc. under a supply contract that renews annually, subject to termination upon twelve months written notice. We expect the raw materials purchased under these contracts, and contracts that we may enter into, to meet our sulfate process feedstock requirements over the next several years.

Many of our raw material contracts contain fixed quantities we are required to purchase, or specify a range of quantities within which we are required to purchase. The pricing under these agreements is generally negotiated quarterly.

The following table summarizes our raw materials purchased or mined in 2016.

Production process/raw material	Raw materials procured or mined (In thousands of metric tons)
Chloride process plants -	
Purchased slag or rutile ore	477
Sulfate process plants:	
Ilmenite ore mined and used internally	335
Purchased slag	26

#### Sales and marketing

Our marketing strategy is aimed at developing and maintaining strong customer relationships with new and existing accounts. Because  $\text{TiO}_2$  represents a significant raw material cost for our customers, the purchasing decisions are often made by our customers' senior management. We work to maintain close relationships with the key decision makers, through in-depth and frequent in-person meetings. We endeavor to extend these commercial and technical relationships to multiple levels within our customers' organization using our direct sales force and technical service group to accomplish this objective. We believe this has helped build customer loyalty to Kronos and strengthened our competitive position. Close cooperation and strong customer relationships enable us to stay closely attuned to trends in our customers' businesses. Where appropriate, we work in conjunction with our customers to solve formulation or application problems by modifying specific product properties or developing new pigment grades. We also focus our sales and marketing efforts on those geographic and end-use market segments where we believe we can realize higher selling prices. This focus includes continuously reviewing and optimizing our customer and product portfolios.

Our marketing strategy is also aimed at working directly with customers to monitor the success of our products in their end-use applications, evaluate the need for improvements in product and process technology and identify opportunities to develop new product solutions for our customers. Our marketing staff closely coordinates with our sales force and technical specialists to ensure that the needs of our customers are met, and to help develop and commercialize new grades where appropriate.

We sell a majority of our products through our direct sales force operating from five sales offices in Europe and two sales offices in North America. We also utilize sales agents and distributors who are authorized to sell our products in specific geographic areas. In Europe, our sales efforts are conducted primarily through our direct sales

force and our sales agents. Our agents do not sell any TiO<sub>2</sub> products other than Kronos® brand products. In North America, our sales are made primarily through our direct sales force and supported by a network of distributors. In addition to our direct sales force and sales agents, many of our sales agents also act as distributors to service our smaller customers in all regions. We offer customer and technical service to the customers who purchase our products through distributors as well as to our larger customers serviced by our direct sales force.

We sell to a diverse customer base with only one customer representing 10% or more of our sales in 2016 (Behr Process Corporation – 10%). Our largest ten customers accounted for approximately 33% of sales in 2016.

Neither our business as a whole nor any of our principal product groups is seasonal to any significant extent. However, TiO<sub>2</sub> sales are generally higher in the second and third quarters of the year, due in part to the increase in paint production in the spring to meet demand during the spring and summer painting seasons. With certain exceptions, we have historically operated our production facilities at near full capacity rates throughout the entire year, which among other things helps to minimize our per-unit production costs. As a result, we normally will build inventories during the first and fourth quarters of each year, in order to maximize our product availability during the higher demand periods normally experienced in the second and third quarters.

#### Competition

The TiO<sub>2</sub> industry is highly competitive. We compete primarily on the basis of price, product quality, technical service and the availability of high performance pigment grades. Since TiO<sub>2</sub> is not a traded commodity, its pricing is largely a product of negotiation between suppliers and their respective customers. Although certain TiO<sub>2</sub> grades are considered specialty pigments, the majority of our grades and substantially all of our production are considered commodity pigments with price and availability being the most significant competitive factors along with quality and customer service. During 2016, we had an estimated 9% share of worldwide TiO<sub>2</sub> sales volume, and based on sales volumes, we believe we are the leading seller of TiO<sub>2</sub> in several countries, including Germany.

Our principal competitors are The Chemours Company, or Chemours (which was spun-off from E.I. du Pont de Nemours & Co. into a separate publicly-traded company in 2015); Millennium Inorganic Chemicals, Inc. (a subsidiary of National Titanium Dioxide Company Ltd.), or Cristal; Huntsman Corporation; and Tronox Incorporated. The top five TiO<sub>2</sub> producers (i.e. we and our four principal competitors) account for approximately 58% of the world's production capacity. Huntsman completed its purchase of the TiO<sub>2</sub> business of Sachtleben Chemie GmbH in 2014, and has also announced its intent to exit the TiO<sub>2</sub> business (which, based on the latest public statements by Huntsman, is expected to occur during 2017). In 2015, Huntsman announced it was reducing its TiO<sub>2</sub> capacity by approximately 100,000 metric tons at one of its European sulfate process facilities. In August 2015, Chemours announced it was closing its plant in Delaware and shut down a production line at its facility in Tennessee, reducing its overall capacity by approximately 150,000 metric tons. In 2016, Huntsman announced it was closing its sulfate process facility in South Africa, reducing its overall capacity by 25,000 metric tons.

The following chart shows our estimate of worldwide production capacity in 2016:

Worldwide production capacity - 2016	
Chemours	18 %
Huntsman	11 %
Cristal	13 %



Kronos	9 %
Tronox	7 %
Other	42 %

Chemours has over one-half of total North American TiO<sub>2</sub> production capacity and is our principal North American competitor. In February 2017, Tronox announced a definitive agreement to acquire the TiO<sub>2</sub> assets of Cristal. Tronox expects the acquisition, if it is completed, to occur by the end of 2017.

Over the past ten years, we and our competitors increased industry capacity through debottlenecking projects, which in part compensated for the shut-down of various TiO<sub>2</sub> plants in France, the United States, the

United Kingdom and China. Chemours added a new 200,000 metric ton capacity line at its plant in Mexico which commenced production in the second quarter of 2016. Although overall industry demand is expected to remain strong in 2017 as a result of improving worldwide economic conditions, we do not expect any other significant efforts will be undertaken by us or our principal competitors to further increase capacity for the foreseeable future, other than through debottlenecking projects. If actual developments differ from our expectations, the TiO<sub>2</sub> industry's performance and that of our own could be unfavorably affected.

The TiO<sub>2</sub> industry is characterized by high barriers to entry consisting of high capital costs, proprietary technology and significant lead times (typically three to five years in our experience) required to construct new facilities or to expand existing capacity. We believe it is unlikely any new TiO<sub>2</sub> plants will be constructed in Europe or North America in the foreseeable future.

#### Research and development

We employ scientists, chemists, process engineers and technicians who are engaged in research and development, process technology and quality assurance activities in Leverkusen, Germany. These individuals have the responsibility for improving our chloride and sulfate production processes, improving product quality and strengthening our competitive position by developing new applications. Our expenditures for these activities were approximately \$19 million in 2014, \$16 million in 2015 and \$13 million in 2016. We expect to spend approximately \$15 million on research and development in 2017.

We continually seek to improve the quality of our grades and have been successful at developing new grades for existing and new applications to meet the needs of our customers and increase product life cycles. Since the beginning of 2012, we have added four new grades for pigments and other applications.

#### Patents, trademarks, trade secrets and other intellectual property rights

We have a comprehensive intellectual property protection strategy that includes obtaining, maintaining and enforcing our patents, primarily in the United States, Canada and Europe. We also protect our trademark and trade secret rights and have entered into license agreements with third parties concerning various intellectual property matters. We have also from time to time been involved in disputes over intellectual property.

Patents - We have obtained patents and have numerous patent applications pending that cover our products and the technology used in the manufacture of our products. Our patent strategy is important to us and our continuing business activities. In addition to maintaining our patent portfolio, we seek patent protection for our technical developments, principally in the United States, Canada and Europe. U.S. Patents are generally in effect for 20 years from the date of filing. Our U.S. patent portfolio includes patents having remaining terms ranging from less than one year to 20 years.

Trademarks and trade secrets - Our trademarks, including Kronos®, are covered by issued and/or pending registrations, including in Canada and the United States. We protect the trademarks that we use in connection with the products we manufacture and sell and have developed goodwill in connection with our long-term use of our trademarks. We conduct research activities in secret and we protect the confidentiality of our trade secrets through reasonable measures, including confidentiality agreements and security procedures, including data security. We rely upon unpatented proprietary knowledge and continuing technological innovation and other trade secrets to develop and maintain our competitive position. Our proprietary chloride production process is an important part of our technology and our business could be harmed if we fail to maintain confidentiality of our trade secrets used in this technology.



## Employees

As of December 31, 2016, we employed the following number of people:

Europe	1,850
Canada	365
United States (1)	45
Total	2,260

(1) Excludes employees of our Louisiana joint venture.

Certain employees at each of our production facilities are organized by labor unions. In Europe, our union employees are covered by master collective bargaining agreements for the chemical industry that are generally renewed annually. In Canada, our union employees are covered by a collective bargaining agreement that expires in June 2018. At December 31, 2016, approximately 87% of our worldwide workforce is organized under collective bargaining agreements. It is possible that there could be future work stoppages or other labor disruptions that could materially and adversely affect our business, results of operations, financial position or liquidity.

## Regulatory and environmental matters

Our operations and properties are governed by various environmental laws and regulations, which are complex, change frequently and have tended to become stricter over time. These environmental laws govern, among other things, the generation, storage, handling, use and transportation of hazardous materials; the emission and discharge of hazardous materials into the ground, air or water; and the health and safety of our employees. Certain of our operations are, or have been, engaged in the generation, storage, handling, manufacture or use of substances or compounds that may be considered toxic or hazardous within the meaning of applicable environmental laws and regulations. As with other companies engaged in similar businesses, certain of our past and current operations and products have the potential to cause environmental or other damage. We have implemented and continue to implement various policies and programs in an effort to minimize these risks. Our policy is to comply with applicable environmental laws and regulations at all our facilities and to strive to improve our environmental performance. It is possible that future developments, such as stricter requirements in environmental laws and enforcement policies, could adversely affect our operations, including production, handling, use, storage, transportation, sale or disposal of hazardous or toxic substances or require us to make capital and other expenditures to comply, and could adversely affect our consolidated financial position and results of operations or liquidity.

Our U.S. manufacturing operations are governed by federal, state and local environmental and worker health and safety laws and regulations. These include the Resource Conservation and Recovery Act, or RCRA, the Occupational Safety and Health Act, the Clean Air Act, the Clean Water Act, the Safe Drinking Water Act, the Toxic Substances Control Act and the Comprehensive Environmental Response, Compensation and Liability Act, as amended by the Superfund Amendments and Reauthorization Act, or CERCLA, as well as the state counterparts of these statutes. Some of these laws hold current or previous owners or operators of real property liable for the costs of cleaning up contamination, even if these owners or operators did not know of, and were not responsible for, such contamination. These laws also assess liability on any person who arranges for the disposal or treatment of hazardous substances, regardless of whether the affected site is owned or operated by such person. Although we have not incurred and do not currently anticipate any material liabilities in connection with such environmental laws, we may

be required to make expenditures for environmental remediation in the future.

While the laws regulating operations of industrial facilities in Europe vary from country to country, a common regulatory framework is provided by the European Union, or the EU. Germany and Belgium are members of the EU and follow its initiatives. Norway is not a member but generally patterns its environmental regulatory actions after the EU.

At our sulfate plant facilities in Germany, we recycle spent sulfuric acid either through contracts with third parties or at our own facilities. In addition, at our German locations we have a contract with a third-party to treat certain sulfate-process effluents. At our Norwegian plant, we ship spent acid to a third party location where it is

used as a neutralization agent. These contracts may be terminated by either party after giving three or four years advance notice, depending on the contract.

From time to time, our facilities may be subject to environmental regulatory enforcement under U.S. and non-U.S. statutes. Typically we establish compliance programs to resolve these matters. Occasionally, we may pay penalties. To date such penalties have not involved amounts having a material adverse effect on our consolidated financial position, results of operations or liquidity. We believe that all of our facilities are in substantial compliance with applicable environmental laws.

Our capital expenditures related to ongoing environmental compliance, protection and improvement programs, including capital expenditures which are primarily focused on increased operating efficiency but also result in improved environmental protection such as lower emissions from our manufacturing facilities, were \$11.7 million in 2016 and are currently expected to be approximately \$14 million in 2017.

#### Website and other available information

Our fiscal year ends December 31. Our annual reports on Form 10-K, quarterly reports on Form 10-Q, current reports on Form 8-K and any amendments to those reports are available on our website at [kronostio2.com](http://kronostio2.com). These reports are available on the website, without charge, as soon as is reasonably practicable after we file or furnish them electronically with the Securities and Exchange Commission, or SEC. Additional information regarding us, including our Audit Committee charter, Code of Business Conduct and Ethics and our Corporate Governance Guidelines, can also be found at this website. Information contained on our website is not part of this report. We will also provide free copies of such documents upon written request. Such requests should be directed to the Corporate Secretary at our address on the cover page of this Form 10-K.

The public may read and copy any materials we file with the SEC at the SEC's Public Reference Room at 100 F Street, N.E., Washington, D.C. 20549. The public may obtain information about the operation of the Public Reference Room by calling the SEC at 1-800-SEC-0330. We are an electronic filer and the SEC maintains an internet website that contains reports, proxy and information statements and other information regarding issuers that file electronically with the SEC at [www.sec.gov](http://www.sec.gov).

#### ITEM 1A. RISK FACTORS

Below are certain risk factors associated with our business. See also certain risk factors discussed in Item 7- "Management's Discussion and Analysis of Financial Condition and Results of Operations – Critical Accounting Policies and Estimates." In addition to the potential effect of these risk factors, any risk factor which could result in reduced earnings or operating losses, or reduced liquidity, could in turn adversely affect our ability to service our liabilities or pay dividends on our common stock or adversely affect the quoted market prices for our securities.

Demand for, and prices of, certain of our products are influenced by changing market conditions for our products, which may result in reduced earnings or in operating losses.

In 2016, 93% of our revenues are attributable to sales of TiO<sub>2</sub>. Pricing within the global TiO<sub>2</sub> industry over the long term is cyclical and changes in economic conditions, especially in Western industrialized nations, can significantly impact our earnings and operating cash flows. Historically, the markets for many of our products have experienced alternating periods of increasing and decreasing demand. Relative changes in the selling prices for our products are

one of the main factors that affect the level of our profitability. In periods of increasing demand, our selling prices and profit margins generally will tend to increase, while in periods of decreasing demand our selling prices and profit margins generally tend to decrease. In addition, pricing may affect customer inventory levels as customers may from time to time accelerate purchases of  $\text{TiO}_2$  in advance of anticipated price increases or defer purchases of  $\text{TiO}_2$  in advance of anticipated price decreases. Our ability to further increase capacity without additional investment in greenfield or brownfield capacity increases may be limited and as a result, our profitability may become even more dependent upon the selling prices of our products.

The TiO<sub>2</sub> industry is concentrated and highly competitive and we face price pressures in the markets in which we operate, which may result in reduced earnings or operating losses.

The global market in which we operate our business is concentrated with the top five TiO<sub>2</sub> producers accounting for over 50% of the world's production capacity and is highly competitive. Competition is based on a number of factors, such as price, product quality and service. Some of our competitors may be able to drive down prices for our products if their costs are lower than our costs. In addition, some of our competitors' financial, technological and other resources may be greater than our resources and such competitors may be better able to withstand changes in market conditions. Our competitors may be able to respond more quickly than we can to new or emerging technologies and changes in customer requirements. Further, consolidation of our competitors or customers may result in reduced demand for our products or make it more difficult for us to compete with our competitors. The occurrence of any of these events could result in reduced earnings or operating losses.

Higher costs or limited availability of our raw materials may reduce our earnings and decrease our liquidity. In addition, many of our raw material contracts contain fixed quantities we are required to purchase.

The number of sources for and availability of certain raw materials is specific to the particular geographical region in which a facility is located. For example, titanium-containing feedstocks suitable for use in our TiO<sub>2</sub> facilities are available from a limited number of suppliers around the world. Political and economic instability in the countries from which we purchase our raw material supplies could adversely affect their availability. If our worldwide vendors were unable to meet their contractual obligations and we were unable to obtain necessary raw materials, we could incur higher costs for raw materials or may be required to reduce production levels. We experienced significantly higher ore costs in 2012 which carried over into 2013. We have seen moderation in the purchase cost of third-party feedstock ore since 2013. We may also experience higher operating costs such as energy costs, which could affect our profitability. We may not always be able to increase our selling prices to offset the impact of any higher costs or reduced production levels, which could reduce our earnings and decrease our liquidity.

We have long-term supply contracts that provide for our TiO<sub>2</sub> feedstock requirements that currently expire through 2019. While we believe we will be able to renew these contracts, there can be no assurance we will be successful in renewing them or in obtaining long-term extensions to them prior to expiration. Our current agreements (including those entered into through February 2017) require us to purchase certain minimum quantities of feedstock with minimum purchase commitments aggregating approximately \$605 million in years subsequent to December 31, 2016. In addition, we have other long-term supply and service contracts that provide for various raw materials and services. These agreements require us to purchase certain minimum quantities or services with minimum purchase commitments aggregating approximately \$158 million at December 31, 2016. Our commitments under these contracts could adversely affect our financial results if we significantly reduce our production and were unable to modify the contractual commitments.

Our leverage may impair our financial condition or limit our ability to operate our businesses.

As of December 31, 2016, our total consolidated debt was approximately \$339.0 million, which relates primarily to a term loan entered into in February 2014. Our level of debt could have important consequences to our stockholders and creditors, including:

- making it more difficult for us to satisfy our obligations with respect to our liabilities;
- increasing our vulnerability to adverse general economic and industry conditions;
- requiring that a portion of our cash flows from operations be used for the payment of interest on our debt, which reduces our ability to use our cash flow to fund working capital, capital expenditures, dividends on our common stock, acquisitions or general corporate requirements;



limiting the ability of our subsidiaries to pay dividends to us;

limiting our ability to obtain additional financing to fund future working capital, capital expenditures, acquisitions or general corporate requirements;

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limiting our flexibility in planning for, or reacting to, changes in our business and the industry in which we operate; and

placing us at a competitive disadvantage relative to other less leveraged competitors.

In addition to our indebtedness, at December 31, 2016 we are party to various lease and other agreements (including feedstock ore purchase contracts and other long-term supply and service contracts, as discussed above) pursuant to which, along with our indebtedness, we are committed to pay approximately \$433 million in 2017. Our ability to make payments on and refinance our debt and to fund planned capital expenditures depends on our future ability to generate cash flow. To some extent, this is subject to general economic, financial, competitive, legislative, regulatory and other factors that are beyond our control. In addition, our ability to borrow funds under our revolving credit facilities in the future will, in some instances, depend in part on our ability to maintain specified financial ratios and satisfy certain financial covenants contained in the applicable credit agreement.

Our business may not generate cash flows from operating activities sufficient to enable us to pay our debts when they become due and to fund our other liquidity needs. As a result, we may need to refinance all or a portion of our debt before maturity. We may not be able to refinance any of our debt in a timely manner on favorable terms, if at all, in the current credit markets. Any inability to generate sufficient cash flows or to refinance our debt on favorable terms could have a material adverse effect on our financial condition.

Global climate change legislation could negatively impact our financial results or limit our ability to operate our businesses.

We operate production facilities in several countries. In many of the countries in which we operate, legislation has been passed, or proposed legislation is being considered, to limit greenhouse gases through various means, including emissions permits and/or energy taxes. In several of our production facilities, we consume large amounts of energy, primarily electricity and natural gas. To date, the permit system in effect in the various countries in which we operate has not had a material adverse effect on our financial results. However, if further greenhouse gas legislation were to be enacted in one or more countries, it could negatively impact our future results from operations through increased costs of production, particularly as it relates to our energy requirements or our need to obtain emissions permits. If such increased costs of production were to materialize, we may be unable to pass price increases onto our customers to compensate for increased production costs, which may decrease our liquidity, operating income and results of operations.

#### ITEM 1B. UNRESOLVED STAFF COMMENTS

None

#### ITEM 2. PROPERTIES

Information on our properties is incorporated by reference to Item 1: Manufacturing, Operations and Properties above. Our corporate headquarters is located in Dallas, Texas. See Note 17 to our Consolidated Financial Statements for information on our leases.

#### ITEM 3. LEGAL PROCEEDINGS

We are involved in various environmental, contractual, intellectual property, product liability and other claims and disputes incidental to our business. Information called for by this Item is incorporated by reference to Note 17 to our Consolidated Financial Statements.

#### ITEM 4. MINE SAFETY DISCLOSURES

Not applicable



## PART II

## ITEM 5. MARKET FOR COMMON EQUITY AND RELATED STOCKHOLDER MATTERS

Our common stock is listed and traded on the New York Stock Exchange (symbol: KRO). As of February 28, 2017, there were approximately 2,100 holders of record of our common stock. The following table sets forth the high and low closing per share sales price for our common stock for the periods indicated according to Bloomberg and dividends paid during such periods. On February 28, 2017 the closing price of our common stock was \$13.86.

	High	Low	Cash dividends paid
<b>Year ended December 31, 2015</b>			
First Quarter	\$13.07	\$11.12	\$ .15
Second Quarter	13.63	10.96	.15
Third Quarter	10.90	5.84	.15
Fourth Quarter	8.35	5.13	.15
<b>Year ended December 31, 2016</b>			
First Quarter	\$6.58	\$4.00	\$ .15
Second Quarter	6.87	5.08	.15
Third Quarter	9.01	4.82	.15
Fourth Quarter	12.48	7.32	.15
January 1, 2017 through February 28, 2017	\$15.52	\$12.09	\$ -

In February 2017, our board of directors declared a first quarter 2017 regular quarterly dividend of \$.15 per share, payable on March 16, 2017 to stockholders of record as of March 7, 2017. The declaration and payment of future dividends is discretionary, and the amount, if any, will be dependent upon our results of operations, financial condition, cash requirements for our business, the current long-term outlook for our business and other factors deemed relevant by our board. There are currently no restrictions on our ability to pay dividends, although provisions in certain credit agreements to which we are a party could in the future limit or restrict our ability to pay dividends.

In December 2010, our board of directors authorized the repurchase of up to 2.0 million shares of our common stock in open market transactions, including block purchases, or in privately-negotiated transactions at unspecified prices and over an unspecified period of time. We have 1,951,000 shares available for repurchase under the plan at December 31, 2016. See Note 15 to our Consolidated Financial Statements.

## Performance graph

Set forth below is a table and line graph comparing the yearly change in our cumulative total stockholder return on our common stock against the cumulative total return of the S&P Composite 500 Stock Index and the S&P 500 Diversified Chemicals Index. The graph shows the value at December 31 of each year, assuming an original investment of \$100 at December 31, 2011 and reinvestment of cash dividends and other distributions to stockholders.

	2011	2012	2013	2014	2015	2016
Kronos common stock	\$100	\$112	\$113	\$81	\$38	\$87
S&P 500 Composite Stock Index	100	116	154	175	177	198
S&P 500 Diversified Chemicals Index	100	121	173	187	194	221

The information contained in the performance graph shall not be deemed “soliciting material” or “filed” with the SEC, or subject to the liabilities of Section 18 of the Securities Exchange Act, except to the extent we specifically request that the material be treated as soliciting material or specifically incorporate this performance graph by reference into a document filed under the Securities Act or the Securities Exchange Act.

## Equity compensation plan information

We have an equity compensation plan, which was approved by our stockholders, pursuant to which an aggregate of 200,000 shares of our common stock can be awarded to members of our board of directors. At December 31, 2016, 163,500 shares are available for award under this plan. See Note 15 to our Consolidated Financial Statements.

## ITEM 6. SELECTED FINANCIAL DATA

The following selected financial data should be read in conjunction with our Consolidated Financial Statements and Item 7 - "Management's Discussion and Analysis of Financial Condition and Results of Operations."

	Years ended December 31,				
	2012	2013	2014	2015	2016
	(In millions, except per share data and TiO <sub>2</sub> operating statistics)				
<b>STATEMENTS OF OPERATIONS DATA:</b>					
Net sales	\$1,976.3	\$1,732.4	\$1,651.9	\$1,348.8	\$1,364.3
Gross margin	560.4	112.2	349.7	192.3	257.0
Income (loss) from operations	359.6	(132.6 )	149.7	(1.1 )	81.1
Net income (loss)	218.5	(102.0 )	99.2	(173.6 )	43.3
Net income (loss) per share	1.89	(.88 )	.86	(1.50 )	.37
Cash dividends per share	.60	.60	.60	.60	.60
<b>BALANCE SHEET DATA (at year end):</b>					
Total assets	\$2,013.6	\$1,610.0	\$1,633.1	\$1,242.7	\$1,179.6
Notes payable and long-term debt					
including current maturities	396.2	183.5	343.6	341.0	339.0
Common stockholders' equity	1,062.1	935.1	781.1	461.9	395.0
<b>STATEMENTS OF CASH FLOW DATA:</b>					
Net cash provided by (used in):					
Operating activities (1)	\$83.1	\$130.4	\$87.7	\$52.1	\$89.6
Investing activities (1)	152.4	(67.7 )	(61.2 )	(47.1 )	(53.0 )
Financing activities (1)	(34.3 )	(292.3 )	89.6	(72.1 )	(73.3 )
<b>TiO<sub>2</sub> OPERATING STATISTICS:</b>					
Sales volume (2)	470	498	496	525	559
Production volume (2)	469	474	511	528	546
Production capacity at beginning of year (2)	550	550	555	555	555
Production rate as a percentage of capacity	85	% 86	% 92	% 95	% 98

(1) Prior period amounts have been reclassified to reflect the change in the statement of cash flow classification of amounts paid in respect of the early redemption of certain indebtedness. As a result, net cash provided by operating activities for the year ended December 31, 2012 increased by \$6.2 million, and net cash used by financing activities increased by \$6.2 million, as compared to previously reported amounts. In addition, prior period amounts have been reclassified to reflect the change in the statement of cash flow presentation with respect to restricted cash. As a result, net cash provided by investing activities for the year ended December 31, 2012 increased by \$2.6 million, and net cash used in investing activities for the years ended December 31, 2013, 2014 and 2015 increased (decreased) by \$(.5) million, \$7.2 million and \$.3 million, respectively, in each case as compared to previously reported amounts. See Note 19 to our Consolidated Financial Statements.

(2)Metric tons in thousands

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ITEM 7. MANAGEMENT'S DISCUSSION AND ANALYSIS OF FINANCIAL CONDITION AND RESULTS OF OPERATIONS  
RESULTS OF OPERATIONS

Business overview

We are a leading global producer and marketer of value-added TiO<sub>2</sub>. TiO<sub>2</sub> is used for a variety of manufacturing applications, including plastics, paints, paper and other industrial products. During 2016, approximately one-half of our sales volumes were sold into European markets. We believe we are the largest producer of TiO<sub>2</sub> in Europe with an estimated 17% share of European TiO<sub>2</sub> sales volumes in 2016. In addition, we estimate we have a 16% share of North American TiO<sub>2</sub> sales volumes in 2016. Our production facilities are located throughout Europe and North America.

We consider TiO<sub>2</sub> to be a "quality of life" product, with demand affected by gross domestic product, or GDP, and overall economic conditions in our markets located in various regions of the world. Over the long-term, we expect demand for TiO<sub>2</sub> will grow by 2% to 3% per year, consistent with our expectations for the long-term growth in GDP. However, even if we and our competitors maintain consistent shares of the worldwide market, demand for TiO<sub>2</sub> in any interim or annual period may not change in the same proportion as the change in GDP, in part due to relative changes in the TiO<sub>2</sub> inventory levels of our customers. We believe that our customers' inventory levels are influenced in part by their expectation for future changes in market TiO<sub>2</sub> selling prices as well as their expectation for future availability of product. Although certain of our TiO<sub>2</sub> grades are considered specialty pigments, the majority of our grades and substantially all of our production are considered commodity pigment products with price and availability being the most significant competitive factors along with quality and customer service.

The factors having the most impact on our reported operating results are:

- TiO<sub>2</sub> selling prices,
- Our TiO<sub>2</sub> sales and production volumes,
- Manufacturing costs, particularly raw materials such as third-party feedstock ore, maintenance and energy-related expenses, and
- Currency exchange rates (particularly the exchange rate for the U.S. dollar relative to the euro, the Norwegian krone and the Canadian dollar).

Our key performance indicators are our TiO<sub>2</sub> average selling prices, our level of TiO<sub>2</sub> sales and production volumes and the cost of our third-party feedstock ore. TiO<sub>2</sub> selling prices generally follow industry trends and the selling prices will increase or decrease generally as a result of competitive market pressures.

In addition, our effective income tax rate in both 2015 and 2016 was impacted by certain favorable and unfavorable developments discussed below.

Executive summary

We reported net income of \$43.3 million, or \$.37 per share for 2016 compared to a net loss of \$173.6 million, or \$1.50 per share for 2015. We reported net income in 2016 as compared to a net loss in 2015 due to higher income from operations in 2016, as well as an aggregate \$159.0 million non-cash deferred income tax asset valuation allowance related to our German and Belgian operations recognized in 2015, and an aggregate \$12.0 million pre-tax other-than-temporary impairment (OTTI) charge on our investment in a marketable equity security recognized in 2015. Our income from operations improved in 2016 primarily due to the net impact of higher sales and production volumes and lower average selling prices in 2016, a \$21.7 million charge associated with the implementation of certain workforce reductions in 2015, lower raw materials and other production costs in 2016 (including cost savings



resulting from workforce reductions implemented in 2015), the recognition of an insurance settlement gain totaling \$4.3 million in 2016 from two separate business interruption claims and the net effect of changes in currency exchange rates. Of such \$21.7 million charge related to the workforce reductions,

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\$10.8 million was classified as part of cost of sales and \$10.9 million was classified in selling, general and administrative expense.

We reported a net loss of \$173.6 million, or \$1.50 per share for 2015 compared to net income of \$99.2 million, or \$.86 per share for 2014. We reported a net loss in 2015 primarily due to lower income from operations, the recognition of an aggregate \$159.0 million non-cash deferred income tax asset valuation allowance related to our German and Belgian operations, the recognition of an aggregate \$12.0 million pre-tax OTTI charge on our investment in a marketable equity security, and a \$21.7 million charge associated with the implementation of certain workforce reductions. Comparability of our results was also impacted by lower average selling prices in 2015, partially offset by the favorable effects of higher sales volumes, lower manufacturing and other production costs (primarily raw materials) and the net effect of changes in currency exchange rates.

Our net income in 2016 includes:

- a pre-tax insurance settlement gain of \$4.3 million (\$3.2 million, or \$.03 per share, net of income tax expense) recognized in the first, second and fourth quarters,
- the recognition of a net \$3.4 million (\$.03 per share) current income tax benefit related to the execution and finalization of an Advance Pricing Agreement between the U.S. and Canada,
- the recognition of an aggregate \$2.2 million (\$.02 per share) non-cash tax benefit as the result of a net decrease in our deferred income tax asset valuation allowance related to our German and Belgian operations, recognized in the second, third and fourth quarters, and
- the recognition of a \$2.4 million (\$.02 per share) non-cash income tax expense related to an increase in our reserve for uncertain tax positions, mostly recognized in the fourth quarter.

Our net loss in 2015 includes:

- the recognition of an aggregate non-cash deferred income tax asset valuation allowance related to our German and Belgian operations of \$159.0 million (\$1.37 per share), mostly recognized in the second quarter,
- the third quarter recognition of an aggregate pre-tax OTTI loss on our investment in a marketable equity security of \$12.0 million (\$7.8 million, or \$.07 per share, net of income tax benefit), and
  - a pre-tax charge of \$21.7 million (\$18.5 million, or \$.16 per share, net of income tax benefit) related to workforce reduction costs, mostly recognized in the second quarter.

Our net income in 2014 includes an aggregate non-cash income tax benefit of \$5.1 million (\$.04 per share) related to a net reduction in our reserve for uncertain tax positions (mostly recognized in the second quarter).

#### Critical accounting policies and estimates

The accompanying “Management’s Discussion and Analysis of Financial Condition and Results of Operations” is based upon our Consolidated Financial Statements, which we have prepared in accordance with accounting principles generally accepted in the United States of America, or GAAP. The preparation of these financial statements requires us to make estimates and judgments that affect the reported amounts of assets and liabilities and disclosure of contingent assets and liabilities at the date of the financial statements and the reported amount of revenues and expenses during the reported period. On an ongoing basis we evaluate our estimates, including those related to the recoverability of long-lived assets, pension and other postretirement benefit obligations and the underlying actuarial assumptions related thereto, the realization of deferred income tax assets and accruals for litigation, income tax and other contingencies. We base our estimates on historical experience and on various other assumptions which we believe to be reasonable under the circumstances, the results of which form the basis for making judgments about the reported amounts of assets, liabilities, revenues and expenses. Actual results may differ significantly from previously-estimated amounts under different assumptions or conditions.



The following critical accounting policies affect our more significant judgments and estimates used in the preparation of our Consolidated Financial Statements:

**Long-lived assets** - We recognize an impairment charge associated with our long-lived assets, including property and equipment, whenever we determine that recovery of such long-lived asset is not probable. Such determination is made in accordance with the applicable GAAP requirements of Accounting Standard Codification, or ASC, Topic 360-10-35 Property, Plant and Equipment and is based upon, among other things, estimates of the amount of future net cash flows to be generated by the long-lived asset and estimates of the current fair value of the asset. Significant judgment is required in estimating such cash flows. Adverse changes in such estimates of future net cash flows or estimates of fair value could result in an inability to recover the carrying value of the long-lived asset, thereby possibly requiring an impairment charge to be recognized in the future. We do not assess our property and equipment for impairment unless certain impairment indicators specified in ASC Topic 360-10-35 are present. We did not evaluate any long-lived assets for impairment during 2016 because no such impairment indicators were present.

**Benefit plans** - We maintain various defined benefit pension plans and postretirement benefits other than pensions, or OPEB, plans. The amounts recognized as defined benefit pension and OPEB expenses and the reported amounts of pension asset and accrued pension and OPEB costs are actuarially determined based on several assumptions, including discount rates, expected rates of return on plan assets, expected health care trend rates and expected mortality. Variances from these actuarially assumed rates will result in increases or decreases, as applicable, in the recognized pension and OPEB obligations, pension and OPEB expenses and funding requirements. These assumptions are more fully described below under “Defined Benefit Pension Plans” and “OPEB Plans.”

**Income taxes** - We recognize deferred taxes for future tax effects of temporary differences between financial and income tax reporting. Deferred income tax assets and liabilities for each tax-paying jurisdiction in which we operate are netted and presented as either a noncurrent deferred income tax asset or liability, as applicable. We record a valuation allowance to reduce our deferred income tax assets to the amount that is believed to be realized under the more-likely-than-not recognition criteria. While we have considered future taxable income and ongoing prudent and feasible tax planning strategies in assessing the need for a valuation allowance, it is possible that we may change our estimate of the amount of the deferred income tax assets that would more-likely-than-not be realized in the future, resulting in an adjustment to the deferred income tax asset valuation allowance that would either increase or decrease, as applicable, reported net income in the period such change in estimate was made.

For example, at December 31, 2016 we have substantial net operating loss (NOL) carryforwards in Germany (the equivalent of \$638 million for German corporate purposes and \$71 million for German trade tax purposes) and in Belgium (the equivalent of \$93 million for Belgian corporate tax purposes), all of which have an indefinite carryforward period. As a result, we have net deferred income tax assets with respect to these two jurisdictions, primarily related to these NOL carryforwards. The German corporate tax is similar to the U.S. federal income tax, and the German trade tax is similar to the U.S. state income tax. As more fully described below under “Comparison of 2016 to 2015 Results of Operations – Income tax expense,” at December 31, 2016 we have a deferred income tax asset valuation allowance recognized with respect to such net deferred income tax assets of our Belgian and German operations.

We record a reserve for uncertain tax positions where we believe it is more-likely-than-not our tax positions will not prevail with the applicable tax authorities. It is possible that in the future we may change our assessment regarding the probability that our tax positions will prevail that would require an adjustment to the amount of our reserve for uncertain tax positions that could either increase or decrease, as applicable, reported net income in the period the change in assessment was made.

In addition, we evaluate at the end of each reporting period as to whether or not some or all of the undistributed earnings of our non-U.S. subsidiaries are permanently reinvested (as that term is defined in GAAP). While we may have concluded in the past that some of such undistributed earnings are permanently reinvested, facts and circumstances can change in the future and it is possible that a change in facts and circumstances, such as a change in the expectation regarding the capital needs of our non-U.S. subsidiaries or a change in tax law, could result in a conclusion that some or all of such undistributed earnings are no longer permanently reinvested. In such an event, we would be required to recognize a deferred income tax liability in an amount equal to the estimated incremental U.S. income tax and withholding tax liability that would be generated if all of such previously-considered permanently reinvested undistributed earnings were to be distributed to the U.S.

Contingencies - We record accruals for legal and other contingencies when estimated future expenditures associated with such contingencies and commitments become probable and the amounts can be reasonably estimated. However, new information may become available or circumstances (such as applicable laws and regulations) may change, thereby resulting in an increase or decrease in the amount required to be accrued for such matters (and therefore a decrease or increase in reported net income in the period of such change).

Results from operations is impacted by certain of these and other significant judgments and estimates, such as allowance for doubtful accounts, reserves for obsolete or unmarketable inventories, impairment of equity method investments and long-lived assets, defined benefit pension plans and loss accruals. In addition, net income is impacted by the significant judgments and estimates for deferred income tax asset valuation allowances and loss accruals.

#### Comparison of 2016 to 2015 Results of Operations

	Year ended December 31,				
	2015	2016			
	(Dollars in millions)				
Net sales	\$1,348.8	100 %	\$1,364.3	100 %	
Cost of sales	1,156.5	86	1,107.3	81	
Gross margin	192.3	14	257.0	19	
Other operating income and expense, net	193.4	14	175.9	13	
Income (loss) from operations	\$(1.1 )	-	\$81.1	6	%
					%
					Change
TiO <sub>2</sub> operating statistics:					
Sales volumes*	525		559	7	%
Production volumes*	528		546	3	%
Percentage change in net sales:					
TiO <sub>2</sub> product pricing				(3 )	%
TiO <sub>2</sub> sales volumes				7	
TiO <sub>2</sub> product mix/other				(2 )	
Changes in currency exchange rates				(1 )	
Total				1	%

\* Thousands of metric tons

Industry conditions and 2016 overview – Due to competitive pressures, our average selling prices decreased throughout 2015 and, to a much lesser extent, into the first quarter of 2016. Our average selling prices at the beginning of 2016 were 17% lower as compared to the beginning of 2015. In the second quarter of 2016, our average selling prices began to rise due to the successful implementation of previously-announced price increases and average selling prices continued to rise through the remainder of 2016. Our average selling prices at the end of

2016 were 10% higher than at the end of 2015, with higher prices in all major markets, most notably in export markets. We experienced higher sales volumes in North American, European and export markets in 2016 as compared to 2015, partially offset by lower sales volumes in the Latin American market in 2016 as compared to 2015.

The following table shows our capacity utilization rates during 2015 and 2016.

	2015	2016
First Quarter	93 %	97 %
Second Quarter	100 %	95 %
Third Quarter	95 %	100 %
Fourth Quarter	92 %	100 %
Overall	95 %	98 %

Our production rates in the first and fourth quarters of 2015 were impacted by the implementation of certain productivity-enhancing improvement projects at certain facilities, as well as necessary improvements to ensure continued compliance with our permit regulations, which resulted in longer-than-normal maintenance shutdowns in some instances.

We continued to experience moderation in the cost of TiO<sub>2</sub> feedstock ore procured from third parties in 2015 and 2016. Our cost of sales per metric ton of TiO<sub>2</sub> sold declined throughout 2015 and 2016 due to the moderation in the cost of TiO<sub>2</sub> feedstock and the cost savings achieved from the 2015 implementation of a restructuring plan discussed below. Consequently, our cost of sales per metric ton of TiO<sub>2</sub> sold in 2016 was slightly lower than our cost of sales per metric ton of TiO<sub>2</sub> sold in 2015 (excluding the effect of changes in currency exchange rates).

In the second quarter of 2015, we initiated a restructuring plan designed to improve our long-term cost structure. A portion of such expected cost savings are planned to occur through workforce reductions. During the second, third and fourth quarters of 2015, we implemented certain voluntary and involuntary workforce reductions at certain of our facilities impacting approximately 160 individuals. We recognized an aggregate \$21.7 million charge in 2015 (substantially all of which was recognized in the second quarter) for such workforce reductions we had implemented through December 31, 2015, \$10.8 million of which is classified as part of cost of sales and \$10.9 million of which is classified in selling, general and administrative expense. The charge associated with the workforce reductions implemented in the third and fourth quarters of 2015, which impacted approximately 50 individuals, was not material due to the applicable law affecting such individuals, which generally provides for a short notice period (if any) and the payment of a nominal amount of severance (if any). See Note 13 to our Consolidated Financial Statements.

Net sales - Our net sales increased 1% or \$15.5 million in 2016 compared to 2015, primarily due to the net effect of a 7% increase in sales volumes (which increased net sales by approximately \$94 million) and a 3% decrease in average TiO<sub>2</sub> selling prices (which decreased net sales by approximately \$40 million). TiO<sub>2</sub> selling prices will increase or decrease generally as a result of competitive market pressures, changes in the relative level of supply and demand as well as changes in raw material and other manufacturing costs.

Our sales volumes increased primarily due to higher sales in North American, European and export markets partially offset by lower sales in the Latin American market. Our sales volumes in 2016 set a new overall record for a full-year period. We estimate that changes in currency exchange rates decreased our net sales by approximately \$9 million, or 1%, as compared to 2015.

Cost of sales - Cost of sales decreased \$49.2 million or 4% in 2016 compared to 2015 due to the net impact of lower raw materials and other production costs of approximately \$76 million (primarily caused by the lower third-party feedstock ore costs, as discussed above), approximately \$4.6 million in savings resulting from workforce reductions implemented in 2015, a 3% increase in TiO<sub>2</sub> production volumes and currency fluctuations (primarily the euro). In addition, cost of sales in 2015 includes approximately \$10.8 million of severance costs related to the workforce reduction plan discussed above.



Our cost of sales as a percentage of net sales decreased to 81% in 2016 compared to 86% in 2015, as the favorable effects of lower raw materials and other production costs, efficiencies related to higher production volumes, and the impact of the \$10.8 million workforce reduction charge classified in cost of sales in 2015 and associated cost savings from such workforce reduction realized in 2016 more than offset the unfavorable impact of lower average selling prices, as discussed above.

Other operating income and expense, net - Other operating income and expense, net in 2016 was \$175.9 million, a decrease of \$17.5 million compared to 2015. Other operating income and expense, net in 2015 included \$10.9 million of severance costs related to workforce reductions classified in selling, general and administrative expense. Other operating income and expense, net in 2016 includes the favorable impact of approximately \$5.6 million in cost savings realized from the workforce reductions implemented in 2015 along with income aggregating \$4.3 million related to insurance settlement gains from two separate business interruption claims.

Gross margin and income (loss) from operations - Income from operations increased by \$82.2 million, from a loss from operations of \$1.1 million in 2015 to income from operations of \$81.1 million in 2016. Income (loss) from operations as a percentage of net sales increased to 6% in 2016 from less than 1% in 2015. This increase was driven by the increase in gross margin, which increased to 19% in 2016 compared to 14% in 2015, as well as the impact of the \$10.9 million 2015 workforce reduction charge classified in selling, general and administrative expense and the associated cost savings from such workforce reductions realized in 2016 of \$5.6 million, and the income aggregating \$4.3 million related to insurance settlement gains from two separate business interruption claims. As discussed and quantified above, our gross margin increased primarily due to the net effect of lower selling prices, lower raw material and other production costs (including 2015 workforce reduction charges of \$10.8 million classified as cost of sales and the associated \$4.6 million of cost savings from such workforce reduction realized in 2016), higher sales volumes and higher production volumes. We estimate that changes in currency exchange rates increased income from operations by approximately \$14 million in 2016 as compared to 2015.

Selling, general and administrative expenses were approximately 13% of net sales in 2016 and 2015.

Other non-operating income (expense) – We recognized a \$12.0 million pre-tax impairment charge in the third quarter of 2015 due to other-than-temporary impairment on our investment in a marketable equity security available for sale. See Note 6 to our Consolidated Financial Statements.

Interest expense increased \$2.0 million from \$18.5 million in 2015 to \$20.5 million in 2016 primarily due to the interest rate swap contract which was effective September 30, 2015 and higher average debt levels in 2016. See Note 8 to our Consolidated Financial Statements.

Income tax expense – We recognized income tax expense of \$17.9 million in 2016 compared to income tax expense of \$142.8 million in 2015. As discussed below, our income tax expense in 2015 includes an aggregate non-cash deferred income tax expense of \$159.0 million related to the recognition of a deferred income tax asset valuation for our German and Belgian operations (mostly recognized in the second quarter), while our income tax expense in 2016 includes an aggregate \$2.2 million non-cash tax benefit as the result of a net decrease in such deferred income tax valuation allowance. Our earnings are subject to income tax in various U.S. and non-U.S. jurisdictions, and the income tax rates applicable to our pre-tax earnings (losses) of our non-U.S. operations is generally lower than the income tax rates applicable to our U.S. operations. Our income tax expense in 2016 includes a \$3.4 million current income tax benefit related to the execution and finalization of an Advance Pricing Agreement between the U.S. and Canada. Excluding the effect of any increase or decrease in our deferred income tax asset valuation allowance, we would generally expect our overall effective tax rate to be lower than the U.S. federal statutory rate of 35% primarily

because of our non-U.S. operations. Our effective income tax rate in 2015, excluding the impact of the deferred income tax asset valuation allowances we recognized, was higher than the U.S. federal statutory tax rate of 35%, primarily due to a current U.S. income tax benefit attributable to current year losses of one of our non-U.S. subsidiaries. Our effective income tax rate in 2016, excluding the impact of the deferred income tax asset valuation allowances we recognized and the change to prior year tax as discussed above, was higher than the U.S. federal statutory rate of 35% primarily due to a fourth quarter increase in our reserve for uncertain tax positions. Excluding the impact of the deferred income tax asset valuation allowance we recognized and the change to prior year tax, we expect our effective income tax rate to be lower than the U.S. federal statutory

rate of 35% primarily because of our non-U.S. operations. See Note 14 to our Consolidated Financial Statements for a tabular reconciliation of our statutory income tax provision to our actual tax provision.

We have substantial net operating loss (NOL) carryforwards in Germany (the equivalent of \$638 million for German corporate purposes and \$71 million for German trade tax purposes, respectively, at December 31, 2016) and in Belgium (the equivalent of \$93 million for Belgian corporate tax purposes at December 31, 2016), all of which have an indefinite carryforward period. As a result, we have net deferred income tax assets with respect to these two jurisdictions, primarily related to these NOL carryforwards. The German corporate tax is similar to the U.S. federal income tax, and the German trade tax is similar to the U.S. state income tax. Prior to June 30, 2015, and using all available evidence, we had concluded no deferred income tax asset valuation allowance was required to be recognized with respect to these net deferred income tax assets under the more-likely-than-not recognition criteria, primarily because (i) the carryforwards have an indefinite carryforward period, (ii) we utilized a portion of such carryforwards during the most recent three-year period, and (iii) we expected to utilize the remainder of the carryforwards over the long term. We had also previously indicated that facts and circumstances could change, which might in the future result in the recognition of a valuation allowance against some or all of such deferred income tax assets. However, as of June 30, 2015, and given our operating results during the second quarter of 2015 and our expectations at that time for our operating results for the remainder of 2015, which had been driven in large part by the trend in our average TiO<sub>2</sub> selling prices over such periods as well as the \$21.1 million pre-tax charge recognized in the second quarter of 2015 in connection with the implementation of certain workforce reductions, we did not have sufficient positive evidence to overcome the significant negative evidence of having cumulative losses in the most recent twelve consecutive quarters in both our German and Belgian jurisdictions at June 30, 2015 (even considering that the carryforward period of our German and Belgian NOL carryforwards is indefinite, one piece of positive evidence). Accordingly, at June 30, 2015, we concluded that we were required to recognize a non-cash deferred income tax asset valuation allowance under the more-likely-than-not recognition criteria with respect to our German and Belgian net deferred income tax assets at such date. We recognized an additional non-cash deferred income tax asset valuation allowance during the second half of 2015 due to losses recognized by our German and Belgian operations during such period. Such valuation allowance aggregated \$168.9 million at December 31, 2015. During 2016, we recognized an aggregate \$2.2 million non-cash tax benefit as the result of a net decrease in such deferred income tax valuation allowance, as the impact of utilizing a portion of our German NOLs during such period more than offset the impact of additional losses recognized by our Belgian operations during such period. We continue to believe we will ultimately realize the full benefit of these German and Belgian NOL carryforwards, in part because of their indefinite carryforward period. However, our ability to reverse all or a portion of either the German or Belgian valuation allowance in the future is dependent on the presence of sufficient positive evidence, such as the existence of cumulative profits in the most recent twelve consecutive quarters, and the ability to demonstrate future profitability for a sustainable period. Until such time as we are able to reverse either valuation allowance in full, to the extent we generate additional losses in Germany or Belgium in the intervening periods, our effective income tax rate would be impacted by the existence of such valuation allowance, because such losses would effectively be recognized without any associated net income tax benefit, as such losses would result in a further increase in the deferred income tax asset valuation allowance. Alternatively, until such time as we are able to reverse either valuation allowance in full, to the extent we generate income in Germany or Belgium in the intervening periods, our effective income tax rate would also be impacted by the existence of such valuation allowance, because such income may be recognized without any associated net income tax expense, subject to certain NOL usage limitations, as we would reverse a portion of the valuation allowance to offset the income tax expense attributable to such income. In addition, any change in tax law related to the indefinite carryforward period of either of these NOLs could adversely impact our ability to reverse either valuation allowance in full. Our Belgian operations continue to have cumulative losses in the most recent twelve consecutive quarters at December 31, 2016. Although the results of our German operations improved during 2016, indicating a change in the negative trend in earnings that existed at December 31, 2015, and we utilized a portion of our German NOLs during 2016, and we have cumulative income with respect to our German operations for the most recent twelve consecutive quarters at December 31, 2016, the sustainability of such positive trend in earnings

has not yet been demonstrated at December 31, 2016, and accordingly we do not currently have sufficient positive evidence under the more-likely-than-not recognition criteria to support reversal of the entire valuation allowance related to our German operations at such date. Consistent with our expectation regarding our consolidated results of operations in 2017 (as discussed below under the “Outlook” subsection), we currently believe it is likely our German and Belgian operations will report improved operating results in 2017 as compared to 2016. Whether the operating results of either or both of our German and Belgian operations would improve to such an extent in 2017 that reversal of the respective valuation

allowance in full would be supported by the presence of sufficient positive evidence is presently not ascertainable. However, if the positive trend in our German operating results continue during 2017 and continue to reflect cumulative income in the most recent twelve consecutive quarters such that the sustainability of such positive trend in earnings would then be demonstrated, it is possible our net deferred income tax asset with respect to our German operations could meet the more-likely-than-not recognition criteria sometime during 2017, at which time we would reverse the deferred income tax asset valuation allowance related to our German operations, resulting in the recognition of a material non-cash income tax benefit. Reversal of the deferred income tax asset valuation allowance with respect to our Belgian operations would not occur until such time as the expected positive trend in the operating results of our Belgian operations had generated cumulative income in a twelve consecutive quarter period, and sustainability of such positive trend in earnings could be demonstrated.

#### Comparison of 2015 to 2014 Results of Operations

	Year ended December 31,				
	2014	2015			
	(Dollars in millions)				
Net sales	\$1,651.9	100 %	\$1,348.8	100 %	
Cost of sales	1,302.2	79	1,156.5	86	
Gross margin	349.7	21	192.3	14	
Other operating income and expense, net	200.0	12	193.4	14	
Income (loss) from operations	\$149.7	9	\$(1.1)	-	%
					%
					Change
TiO <sub>2</sub> operating statistics:					
Sales volumes*	496		525	6	%
Production volumes*	511		528	3	%
Percentage change in net sales:					
TiO <sub>2</sub> product pricing				(14)	)%
TiO <sub>2</sub> sales volumes				6	
TiO <sub>2</sub> product mix/other				(2)	)
Changes in currency exchange rates				(8)	)
Total				(18)	)%

\* Thousands of metric tons

Net sales - Our net sales decreased 18% or \$303.1 million in 2015 compared to 2014, primarily due to the net effect of a 14% decrease in average TiO<sub>2</sub> selling prices (which decreased net sales by approximately \$231 million) and a 6% increase in sales volumes (which increased net sales by approximately \$99 million). TiO<sub>2</sub> selling prices will increase or decrease generally as a result of competitive market pressures, changes in the relative level of supply and demand as well as changes in raw material and other manufacturing costs.

Our sales volumes increased primarily due to higher sales in certain European and export markets, partially offset by lower sales in North American markets. We estimate that changes in currency exchange rates decreased our net sales by approximately \$138 million, or 8%, as compared to 2014.

Cost of sales - Cost of sales decreased \$145.7 million or 11% in 2015 compared to 2014 due to the net impact of lower raw materials and other production costs of approximately \$26 million (primarily caused by the lower third-party feedstock ore costs, as discussed above), a 3% increase in TiO<sub>2</sub> production volumes and currency fluctuations (primarily the euro). In addition, cost of sales in 2015 includes approximately \$10.8 million of severance costs related to the workforce reduction plan discussed above.

Our cost of sales as a percentage of net sales increased to 86% in 2015 compared to 79% in 2014, as the unfavorable impact of lower average selling prices and the workforce reduction charge more than offset the favorable effects of lower raw material costs and efficiencies related to higher production volumes, as discussed above.

Gross margin and income (loss) from operations - Income from operations decreased by \$150.8 million, from income of \$149.7 million in 2014 to a loss from operations of \$1.1 million in 2015. Income (loss) from operations as a percentage of net sales decreased to less than 1% in 2015 from 9% in 2014. This decrease was driven by the decline in gross margin, which decreased to 14% in 2015 compared to 21% in 2014, as well as the negative impact of the workforce reduction charge classified as part of other operating expense (\$10.9 million). As discussed and quantified above, our gross margin decreased primarily due to the net effect of lower selling prices, workforce reduction costs classified as part of cost of sales (\$10.8 million), lower manufacturing costs (primarily raw materials), higher production volumes, and higher sales volumes. We estimate that changes in currency exchange rates increased income from operations by approximately \$40 million in 2015 as compared to 2014.

Selling, general and administrative expenses were approximately 13% and 12% of net sales for 2015 and 2014, respectively. As discussed above, the relative increase in 2015 is primarily due to the workforce reduction charge classified as part of selling, general and administrative expense (\$10.9 million).

Other non-operating income (expense) – We recognized a \$12.0 million pre-tax impairment charge in the third quarter of 2015 due to other-than-temporary impairment on our investment in a marketable equity security available for sale. See Note 6 to our Consolidated Financial Statements.

Interest expense increased \$1.5 million from \$17.0 million in 2014 to \$18.5 million in 2015 primarily due to higher average debt levels mostly offset by lower average interest rates in 2015. See Note 8 to our Consolidated Financial Statements.

Income tax expense - We recognized income tax expense of \$142.8 million in 2015 compared to income tax expense of \$34.5 million in 2014. As discussed above, our income tax expense in 2015 includes an aggregate non-cash deferred income tax expense of \$159.0 million related to the recognition of a deferred income tax asset valuation allowance for our German and Belgian operations (mostly recognized in the second quarter). We continue to believe we will ultimately realize the full benefit of our German and Belgian NOL carryforwards, in part because of their indefinite carryforward period. However, our ability to reverse all or a portion of such valuation allowance in the future is dependent on the presence of sufficient positive evidence, such as the existence of cumulative profits in the most recent twelve consecutive quarters, and the ability to demonstrate future profitability for a sustainable period. Until such time as we are able to reverse the valuation allowance in full, to the extent we generate additional losses in Germany or Belgium in the intervening periods, our effective income tax rate would be impacted by the existence of such valuation allowance, because such losses would effectively be recognized without any associated net income tax benefit, as such losses would result in a further increase in the deferred income tax asset valuation allowance. Alternatively, until such time as we are able to reverse the valuation allowance in full, to the extent we generate income in Germany or Belgium in the intervening periods, our effective income tax rate would also be impacted by the existence of such valuation allowance, because such income would effectively be recognized without any associated net income tax expense, as we would reverse a portion of the valuation allowance to offset the income tax expense attributable to such income. In addition, any change in tax law related to the indefinite carryforward period of these NOLs could adversely impact our ability to reverse the valuation allowance in full.

In 2014, our income tax expense was favorably impacted by an aggregate non-cash income tax benefit of \$5.1 million related to a net reduction in our reserve for uncertain tax positions. Our earnings are subject to income tax in various U.S. and non-U.S. jurisdictions, and the income tax rates applicable to our pre-tax earnings (losses) of our non-U.S. operations are generally lower than the income tax rates applicable to our U.S. operations. Excluding the impact of

the net reduction in our reserve for uncertain tax positions in 2014, our effective tax rate in such period was lower than the U.S. federal statutory tax rate of 35% primarily due to our non-U.S. earnings. Our effective income tax rate in 2015, excluding the impact of the deferred income tax asset valuation allowance, was higher than the U.S. federal statutory tax rate of 35%, primarily due to a current U.S. income tax benefit attributable to current year losses of one of our non-U.S. subsidiaries. See Note 14 to our Consolidated Financial Statements for a tabular reconciliation of our statutory income tax provision to our actual tax provision.



## Effects of currency exchange rates

We have substantial operations and assets located outside the United States (primarily in Germany, Belgium, Norway and Canada). The majority of our sales from non-U.S. operations are denominated in currencies other than the U.S. dollar, principally the euro, other major European currencies and the Canadian dollar. A portion of our sales generated from our non-U.S. operations is denominated in the U.S. dollar (and consequently our non-U.S. operations will generally hold U.S. dollars from time to time). Certain raw materials used worldwide, primarily titanium-containing feedstocks, are purchased primarily in U.S. dollars, while labor and other production costs are purchased primarily in local currencies. Consequently, the translated U.S. dollar value of our non-U.S. sales and operating results are subject to currency exchange rate fluctuations which may favorably or unfavorably impact reported earnings and may affect the comparability of period-to-period operating results. In addition to the impact of the translation of sales and expenses over time, our non-U.S. operations also generate currency transaction gains and losses which primarily relate to (i) the difference between the currency exchange rates in effect when non-local currency sales or operating costs (primarily U.S. dollar denominated) are initially accrued and when such amounts are settled with the non-local currency, (ii) changes in currency exchange rates during time periods when our non-U.S. operations are holding non-local currency (primarily U.S. dollars), and (iii) relative changes in the aggregate fair value of currency forward contracts held from time to time. As discussed in Note 18 to our Consolidated Financial Statements, we periodically use currency forward contracts to manage a portion of our currency exchange risk, and relative changes in the aggregate fair value of any currency forward contracts we hold from time to time serves in part to mitigate the currency transaction gains or losses we would otherwise recognize from the first two items described above.

Overall, we estimate that fluctuations in currency exchange rates had the following effects on our sales and income from operations for the periods indicated.

## Impact of changes in currency exchange rates - 2016 vs. 2015

	Transaction gains/(losses) recognized			Translation gain/loss-	Total
	2015	2016	Change	impact of rate changes	impact 2016 vs. 2015
(In millions)					
<b>Impact on:</b>					
Net sales	\$ -	\$ -	\$ -	\$ (9 )	\$ (9 )
Income from operations	-	6	6	8	14

The \$9 million reduction in net sales (translation loss) was caused primarily by a strengthening of the U.S. dollar relative to the euro, as our euro-denominated sales were translated into fewer U.S. dollars in 2016 as compared to 2015. The strengthening of the U.S. dollar relative to the Canadian dollar and the Norwegian krone in 2016 did not have a significant effect on the reported amount of our net sales, as a substantial portion of the sales generated by our Canadian and Norwegian operations are denominated in the U.S. dollar.

The \$14 million increase in income from operations was comprised of the following:

• Approximately \$6 million from net currency transaction gains primarily caused by a strengthening of the U.S. dollar relative to the euro, Norwegian krone and Canadian dollar, as U.S. dollar-denominated receivables and U.S. dollar currency held by our non-U.S. operations became equivalent to a greater amount of local currency in 2016 as compared to 2015, and

• Approximately \$8 million from net currency translation gains caused primarily by a strengthening of the U.S. dollar relative to the Canadian dollar and the Norwegian krone, as their local currency-denominated operating costs were translated into fewer U.S. dollars in 2016 as compared to 2015, (and such translation, as it related to the U.S. dollar relative to the euro, had a negative effect on income from operations in 2016 as compared to 2015, as the negative impact of the stronger U.S. dollar on euro-denominated sales more than offset the favorable effect of euro-denominated operating costs being translated into fewer U.S. dollars in 2016 compared to 2015).

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## Impact of changes in currency exchange rates - 2015 vs. 2014

	Transaction			Translation	Total
	2014	2015	Change	gain/loss-	currency
Impact on:				impact of	impact
				rate	2015 vs.
				changes	2014
	(In				
	millions)				
Net sales	\$ -	\$ -	\$ -	\$ (138 )	\$ (138 )
Income from operations	4	-	(4 )	44	40

The \$138 million reduction in net sales (translation loss) was caused primarily by a strengthening of the U.S. dollar relative to the euro, as our euro-denominated sales were translated into fewer U.S. dollars in 2015 as compared to 2014. The strengthening of the U.S. dollar relative to the Canadian dollar and the Norwegian krone in 2015 did not have a significant effect on the reported amount of our net sales, as a substantial portion of the sales generated by our Canadian and Norwegian operations are denominated in the U.S. dollar.

The \$40 million increase in income from operations comprised the following net effects:

- A reduction in the amount of net currency transaction gains during the two periods of approximately \$4 million. Such net currency transaction gains (losses) result primarily from U.S. dollar-denominated receivables and U.S. dollar currency held by our non-U.S. operations, which are translated into the applicable local currency at each balance sheet date. During 2014, a relative strengthening of the U.S. dollar relative to the euro and the Norwegian krone gave rise to a net \$4 million currency transaction gain, whereas we recognized a nominal currency transaction loss during 2015, and
- Approximately \$44 million from net currency translation gains caused primarily by a strengthening of the U.S. dollar relative to the Canadian dollar and the Norwegian krone, as their local currency-denominated operating costs were translated into fewer U.S. dollars in 2015 as compared to 2014. Overall, the strengthening of the U.S. dollar relative to the euro in 2015 did not have a significant impact on our income from operations, as the reduction in net sales caused by such strengthening was substantially offset by the effect of our euro-denominated operating costs being translated into fewer U.S. dollars.

#### Outlook

During 2016 we operated our production facilities at 98% of practical capacity compared to 95% in 2015. We expect our production volumes to be slightly higher in 2017 as compared to 2016, as our production rates in 2017 will be positively impacted by the implementation of certain productivity-enhancing improvement projects at certain facilities. Assuming economic conditions do not deteriorate in the various regions of the world, we expect our 2017 sales volumes to be comparable to 2016 sales volumes. We will continue to monitor current and anticipated near-term customer demand levels and align our production and inventories accordingly.

We continued to experience moderation in the cost of TiO<sub>2</sub> feedstock ore procured from third parties in both 2015 and 2016. Our cost of sales per metric ton of TiO<sub>2</sub> sold declined throughout 2015 and 2016 due to the moderation in the

cost of TiO<sub>2</sub> feedstock and the cost savings achieved from the 2015 implementation of a restructuring plan discussed below. Consequently, our cost of sales per metric ton of TiO<sub>2</sub> sold in 2016 was slightly lower than our cost of sales per metric ton of TiO<sub>2</sub> sold in 2015 (excluding the effect of changes in currency exchange rates). We expect our cost of sales per metric ton of TiO<sub>2</sub> sold in 2017 will range from being comparable to slightly higher than our per-metric ton cost in 2016.

We started 2016 with selling prices 17% lower than the beginning of 2015, and prices declined by an additional 1% in the first quarter of 2016. In the second quarter of 2016, our average selling prices began to rise due to the implementation of previously-announced price increases and average selling prices continued to rise for the remainder of 2016. Our average selling prices at the end of 2016 were 10% higher than at the end of 2015, and were

also higher as compared to our overall average selling prices for the full year of 2016. Industry data indicates that overall TiO<sub>2</sub> inventory held by producers has declined significantly during 2016. In addition, we believe most customers hold very low inventories of TiO<sub>2</sub> with many operating on a just-in-time basis. With the strong sales volumes experienced in 2016, we continue to see evidence of strengthening demand for our TiO<sub>2</sub> products in certain of our primary markets. We and our major competitors have announced price increases, which we began implementing in the second quarter of 2016, as contracts have allowed. The extent to which we will be able to achieve any additional price increases in the near term will depend on market conditions.

We initiated a restructuring plan in 2015 designed to improve our long-term cost structure. As part of such plan, we implemented certain voluntary and involuntary workforce reductions during 2015 at certain of our facilities impacting approximately 160 individuals. Such workforce reductions are expected to result in approximately \$19 million of annual cost savings. Since the majority of workforce reductions had been implemented by July 1, 2015, the full year 2016 did not reflect this annual cost savings, as a portion of such annual cost savings were achieved in the second half of 2015 affecting year over year comparisons. These workforce reductions are not expected to negatively impact our ability to operate our production facilities at their practical capacity rates, as evidenced by the production levels we achieved in 2016. In addition to the workforce reductions implemented in 2015, we are also in the process of implementing other cost reduction initiatives throughout the organization, including the implementation of continued process productivity improvements.

Overall, we expect income from operations in 2017 will be higher as compared to 2016, principally as a result of expected higher average selling prices in 2017 as compared to 2016 and to a lesser extent from the favorable effects of anticipated higher production volumes in 2017. In addition, and as discussed above, if the positive trend in our German operating results experienced during 2016 continues during 2017, and we continue to reflect cumulative income in the most recent twelve consecutive quarters for our German operations such that the sustainability of such positive trend in earnings would then be demonstrated, it is possible our net deferred income tax asset with respect to our German operations could meet the more-likely-than-not recognition criteria sometime during 2017, at which time we would reverse the deferred income tax asset valuation allowance related to our German operations, resulting in the recognition of a material non-cash income tax benefit.

Due to the constraints of high capital costs and extended lead time associated with adding significant new TiO<sub>2</sub> production capacity, especially for premium grades of TiO<sub>2</sub> products produced from the chloride process, we believe increased and sustained profit margins will be necessary to financially justify major expansions of TiO<sub>2</sub> production capacity required to meet expected future growth in demand. As a result of customer decisions over the last year, some industry projects to increase TiO<sub>2</sub> production capacity have been cancelled or deferred indefinitely, and announcements have been made regarding the closure of certain facilities. Given the lead time required for production capacity expansions, a shortage of TiO<sub>2</sub> products could occur if economic conditions improve and global demand levels for TiO<sub>2</sub> increase sufficiently.

Our expectations for our future operating results are based upon a number of factors beyond our control, including worldwide growth of gross domestic product, competition in the marketplace, continued operation of competitors, unexpected or earlier-than-expected capacity additions or reductions and technological advances. If actual developments differ from our expectations, our results of operations could be unfavorably affected.

## LIQUIDITY AND CAPITAL RESOURCES

### Consolidated cash flows

#### Operating activities

Trends in cash flows as a result of our operating activities (excluding the impact of significant asset dispositions and relative changes in assets and liabilities) are generally similar to trends in our earnings. In addition to the impact of the operating, investing and financing cash flows discussed below, changes in the amount of cash, cash equivalents and restricted cash we report from year to year can be impacted by changes in currency exchange rates, since a portion of our cash, cash equivalents and restricted cash is held by our non-U.S. subsidiaries. For example, during 2016, relative changes in currency exchange rates resulted in a \$5.3 million decrease in the reported amount of our cash, cash equivalents and restricted cash compared to an \$8.5 million decrease in 2015 and a \$10.0 million decrease in 2014.

Cash provided by operating activities was \$89.6 million in 2016 compared to \$52.1 million in 2015. This \$37.5 million increase in the amount of cash provided was primarily due to the net effects of the following:

- higher income from operations in 2016 of \$82.2 million,
- a higher amount of net cash used associated with relative changes in our inventories, receivables, payables and accruals in 2016 of \$34.0 million as compared to 2015,
- lower net distributions from our TiO<sub>2</sub> manufacturing joint venture in 2016 of \$2.9 million, primarily due to the timing of the joint venture's working capital needs, and
- higher cash paid for income taxes in 2016 of \$5.2 million due to increased profits.

Cash provided by operating activities was \$52.1 million in 2015 compared to \$87.7 million in 2014. This \$35.6 million decrease was primarily due to the net effects of the following:

- lower income from operations in 2015 of \$150.8 million,
- lower cash used in 2015 of \$122.6 million associated with relative changes in our inventories, receivables, prepaids, payables and accruals,
- lower net cash paid for income taxes in 2015 of \$16.1 million due to decreased profits,
- lower net distributions from our TiO<sub>2</sub> joint venture in 2015 of \$4.1 million, primarily due to the timing of the joint venture's working capital needs, and
- higher cash paid for interest in 2015 of \$1.9 million, primarily due to higher average debt levels mostly offset by lower average interest rates on borrowings.

Changes in working capital are affected by accounts receivable and inventory changes. As shown below:

• Our average days sales outstanding, or DSO, was slightly lower from December 31, 2015 to December 31, 2016, primarily as a result of relative changes in the timing of collections, and

• Our average days sales in inventory, or DSI, decreased from December 31, 2015 to December 31, 2016, due to lower inventory volumes and lower inventory raw material costs.

For comparative purposes, we have provided prior year numbers below. Our DSO's will generally average around 65 days throughout the year.

	December 31,	December 31,	December 31,
	2014	2015	2016

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Days sales outstanding	61 days	66 days	65 days
Days sales in inventory	76 days	80 days	71 days

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### Investing activities

Our capital expenditures were \$61.2 million in 2014, \$47.1 million in 2015 and \$53.0 million in 2016. Capital expenditures are primarily incurred to maintain and improve the cost effectiveness of our manufacturing facilities. In addition, approximately \$18.1 million (\$13.4 million in 2016) of our capital expenditures during the past two years relates to the implementation of a new accounting and manufacturing software system. Our capital expenditures during the past three years include an aggregate of approximately \$30.9 million (including \$11.7 million in 2016) for our ongoing environmental protection and compliance programs.

### Financing activities

During 2016, we:

paid quarterly dividends to stockholders aggregating \$.60 per share (\$69.5 million),  
borrowed \$266.2 million under our revolving North American credit facility and subsequently repaid \$266.2 million,  
and

- repaid \$3.5 million on our term loan.

During 2015, we paid quarterly dividends aggregating \$.60 per share (\$69.5 million).

During 2014, we:

borrowed \$348.3 million on our new term loan and subsequently repaid \$2.6 million,  
repaid \$170.0 million under our note payable with Contran,

- borrowed \$81.0 million on our revolving North American credit facility and subsequently repaid \$92.1 million,

borrowed \$1.1 million from a Canadian economic development agency, and  
paid quarterly dividends to stockholders aggregating \$.60 per share (\$69.5 million).

In February 2017, our board of directors declared a first quarter 2017 regular quarterly dividend of \$.15 per share, payable March 16, 2017 to stockholders of record as of March 7, 2017.

### Outstanding debt obligations and borrowing availability

At December 31, 2016, our consolidated debt comprised:

\$340.4 million aggregate borrowing under our term loan (\$335.9 million carrying amount, net of unamortized original issue discount and debt issuance costs) due in February 2020, and

approximately \$3.1 million of other indebtedness.

Our North American and European revolvers and our term loan contain a number of covenants and restrictions which, among other things, restrict our ability to incur additional debt, incur liens, pay dividends or merge or consolidate with, or sell or transfer substantially all of our assets to, another entity, and contains other provisions and restrictive covenants customary in lending transactions of this type. Certain of our credit agreements contain provisions which could result in the acceleration of indebtedness prior to their stated maturity for reasons other than defaults for failure to comply with typical financial or payment covenants. For example, certain credit agreements allow the lender to accelerate the maturity of the indebtedness upon a change of control (as defined in the agreement) of the borrower. In addition, certain credit agreements could result in the acceleration of all or a portion of the indebtedness following a sale of assets outside the ordinary course of business. Our European revolving credit facility also requires the maintenance of certain financial ratios, and one of such requirements is based on the ratio of net debt to the last twelve months EBITDA of the borrowers. The terms of all of our debt instruments (including revolving lines of credit for



which we have no outstanding borrowings at December 31, 2016) are discussed in Note 8 to our Consolidated Financial Statements. We are in compliance with all of our debt

covenants at December 31, 2016. We believe that we will be able to continue to comply with the financial covenants contained in our credit facilities through their maturity.

In addition to the outstanding indebtedness indicated above, at December 31, 2016 we had \$74.8 million available for borrowing under our North American revolving credit facility, and we could borrow all such available amount without violating any of the facility's covenants. At December 31, 2016, based upon the last twelve months EBITDA and the net debt to EBITDA financial test for our European revolving credit facility, our borrowing availability under such facility is approximately 47% of the credit facility, or €55.8 million (\$58.5 million). In January 2017, we extended the maturity date of our North American revolving credit facility to the earlier of (i) January 2022 or (ii) 90 days prior to the maturity date of our existing term loan indebtedness (or 90 days prior to the maturity date of any indebtedness incurred in a permitted refinancing of such existing term loan indebtedness). Our European revolving credit facility matures in September 2017, and we believe we will be able to obtain an extension of this credit facility in the normal course of business on or prior to its maturity date.

Our assets consist primarily of investments in operating subsidiaries, and our ability to service parent-level obligations, including our term loan, depends in part upon the distribution of earnings of our subsidiaries, whether in the form of dividends, advances or payments on account of intercompany obligations or otherwise. Our term loan is collateralized, by, among other things, a first priority lien on (i) 100% of the common stock of certain of our U.S. wholly-owned subsidiaries, (ii) 65% of the common stock or other ownership interest of our Canadian subsidiary (Kronos Canada, Inc.) and certain first-tier European subsidiaries (Kronos Titan GmbH and Kronos Denmark ApS) and (iii) a \$395.7 million unsecured promissory note issued by our wholly-owned subsidiary, Kronos International, Inc. (KII). The term loan is also collateralized by a second priority lien on our U.S. assets which collateralize our North American revolving credit facility. Our North American revolving credit facility is collateralized by, among other things, a first priority lien on the borrower's trade receivables and inventories. Our European revolving credit facility is collateralized by, among other things, the accounts receivable and inventories of the borrowers plus a limited pledge of all the other assets of the Belgian borrower. See Note 8 to our Consolidated Financial Statements.

## Liquidity

Our primary source of liquidity on an ongoing basis is cash flows from operating activities which is generally used to (i) fund capital expenditures, (ii) repay any short-term indebtedness incurred for working capital purposes and (iii) provide for the payment of dividends. From time-to-time we will incur indebtedness, generally to (i) fund short-term working capital needs, (ii) refinance existing indebtedness or (iii) fund major capital expenditures or the acquisition of other assets outside the ordinary course of business. We will also from time-to-time sell assets outside the ordinary course of business and use the proceeds to (i) repay existing indebtedness, (ii) make investments in marketable and other securities, (iii) fund major capital expenditures or the acquisition of other assets outside the ordinary course of business or (iv) pay dividends.

The TiO<sub>2</sub> industry is cyclical, and changes in industry economic conditions significantly impact earnings and operating cash flows. Changes in TiO<sub>2</sub> pricing, production volumes and customer demand, among other things, could significantly affect our liquidity.

We routinely evaluate our liquidity requirements, alternative uses of capital, capital needs and availability of resources in view of, among other things, our dividend policy, our debt service, our capital expenditure requirements and estimated future operating cash flows. As a result of this process, we have in the past and may in the future seek to reduce, refinance, repurchase or restructure indebtedness, raise additional capital, repurchase shares of our common stock, modify our dividend policy, restructure ownership interests, sell interests in our subsidiaries or other assets, or take a combination of these steps or other steps to manage our liquidity and capital resources. Such activities have in the past and may in the future involve related companies. In the normal course of our business, we may investigate,

evaluate, discuss and engage in acquisition, joint venture, strategic relationship and other business combination opportunities in the TiO<sub>2</sub> industry. In the event of any future acquisition or joint venture opportunity, we may consider using then-available liquidity, issuing our equity securities or incurring additional indebtedness.

Based upon our expectation for the TiO<sub>2</sub> industry and anticipated demands on cash resources, we expect to have sufficient liquidity to meet our short term obligations (defined as the twelve-month period ending

December 31, 2017) and our long-term obligations (defined as the five-year period ending December 31, 2021, our time period for long-term budgeting). If actual developments differ from our expectations, our liquidity could be adversely affected.

Cash, cash equivalents, restricted cash and marketable securities

At December 31, 2016 we had:

	Held by		Total
	U.S. entities	Non-U.S. entities	
	(In millions)		
Cash and cash equivalents	\$11.4	\$39.3	\$50.7
Restricted cash	-	1.6	1.6
Noncurrent marketable securities	6.0	-	6.0

Stock repurchase program

At December 31, 2016, we have 1,951,000 shares available for repurchase under a stock repurchase program authorized by our board of directors. See Note 15 to our Consolidated Financial Statements.

Capital expenditures

We intend to spend approximately \$65 million primarily to maintain and improve our existing facilities during 2017, including approximately \$14 million in the area of environmental compliance, protection and improvement, and \$13 million related to the implementation of a new accounting and manufacturing system. Our capital expenditures in the area of environmental compliance, protection and improvement include expenditures which are primarily focused on increased operating efficiency but also result in improved environmental protection, such as lower emissions from our manufacturing plants. Capital spending for 2017 is expected to be funded through cash on hand or borrowing under existing credit facilities.

Off-balance sheet financing

Other than operating lease commitments disclosed in Note 17 to our Consolidated Financial Statements, we are not party to any material off-balance sheet financing arrangements.

Related party transactions

We are party to certain transactions with related parties. See Note 16 to our Consolidated Financial Statements. It is our policy to engage in transactions with related parties on terms, in our opinion, no less favorable to us than could be obtained from unrelated parties.

Commitments and contingencies

See Notes 14 and 17 to our Consolidated Financial Statements for a description of certain income tax examinations currently underway, certain legal proceedings and other commitments.

Recent accounting pronouncements

See Note 19 to our Consolidated Financial Statements.

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## Debt and other contractual commitments

As more fully described in the Notes to the Consolidated Financial Statements, we are a party to various debt, lease and other agreements which contractually and unconditionally commit us to pay certain amounts in the future. See Notes 8, 16, 17 and 18 to our Consolidated Financial Statements. The timing and amount shown for our commitments in the table below are based upon the contractual payment amount and the contractual payment date for such commitments. The following table summarizes such contractual commitments of ours and our consolidated subsidiaries as of December 31, 2016.

Contractual commitment	Payment due date				Total
	2017	2018/ 2019	2020/ 2021	2022 and after	
(In millions)					
<b>Indebtedness:</b>					
Principal (1)	\$3.6	\$8.3	\$331.2	\$ .7	\$343.8
Interest payments (2)	17.2	34.0	2.2	-	53.4
Operating leases	10.8	11.3	7.6	23.3	53.0
<b>Long-term supply contracts for the purchase</b>					
of TiO <sub>2</sub> feedstock (3)	326.5	278.9	-	-	605.4
Long-term service and other supply contracts (4)	49.9	73.0	22.9	12.2	158.0
Fixed asset acquisitions	17.1	-	-	-	17.1
Estimated tax obligations (5)	8.3	-	-	-	8.3
	\$433.4	\$405.5	\$363.9	\$36.2	\$1,239.0

- (1) At December 31, 2016, a significant portion of the amount shown for indebtedness relates to our term loan (\$340.4 million at December 31, 2016 which includes \$4.5 million unamortized original issue discount and debt issuance costs). The timing and amount shown for principal payments on our term loan is based on the mandatory contractual principal repayment schedule, and assumes no voluntary prepayments. See Item 7A - "Quantitative and Qualitative Disclosures About Market Risk" and Note 8 to the Consolidated Financial Statements.
- (2) The amounts shown for interest payments relate to outstanding variable-rate indebtedness, and reflect the net impact of the associated interest rate swap. Interest payments assume that variable-rate indebtedness remains outstanding until maturity.
- (3) Our contracts for the purchase of TiO<sub>2</sub> feedstock contain fixed quantities that we are required to purchase, or specify a range of quantities within which we are required to purchase based on our feedstock requirements. The pricing under these agreements is generally negotiated quarterly or semi-annually. The timing and amount shown for our commitments related to the supply contracts for TiO<sub>2</sub> feedstock are based upon our current estimate of the quantity of material that will be purchased in each time period shown, the payment that would be due based upon such estimated purchased quantity and an estimate of the prices for the various suppliers which is primarily based on first half 2017 pricing. The actual amount of material purchased and the actual amount that would be payable by us, may vary from such estimated amounts. Our obligation for the purchase of TiO<sub>2</sub> feedstock is more fully described in Note 17 to our Consolidated Financial Statements and above in "Business - raw materials." The amounts shown in the table above include the feedstock ore requirements from contracts we entered into through February 2017.
- (4) The amounts shown for the long-term service and other supply contracts primarily pertain to agreements we have entered into with various providers of products or services which help to run our plant facilities (electricity, natural gas, etc.), utilizing December 31, 2016 exchange rates. See Note 17 to our Consolidated Financial Statements.
- (5)

The amount shown for estimated tax obligations is the consolidated amount of income taxes payable at December 31, 2016 (including our reserve for uncertain tax positions classified as a current liability at such date), which are assumed to be paid during 2017.

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The above table does not reflect:

•Any amounts we might pay to fund our defined benefit pension plans and OPEB plans, as the timing and amount of any such future fundings are unknown and dependent on, among other things, the future performance of defined benefit pension plan assets, interest rate assumptions and actual future retiree medical costs. We expect to be required to contribute an aggregate of approximately \$15 million to our defined benefit pension plans and OPEB plans during 2017. Such defined benefit pension plans and OPEB plans are discussed below in greater detail. See Note 10 to our Consolidated Financial Statements.

•Any amounts we might pay to settle any of our uncertain tax positions classified as a noncurrent liability, as the timing and amount of any such future settlements are unknown and dependent on, among other things, the timing of tax audits. See Note 14 to our Consolidated Financial Statements; and

•Any amounts we might pay to acquire TiO<sub>2</sub> from our TiO<sub>2</sub> manufacturing joint venture, as the timing and amount of such purchases are unknown and dependent on, among other things, the amount of TiO<sub>2</sub> produced by the joint venture in the future and the joint venture's future cost of producing such TiO<sub>2</sub>. However, the table does include amounts related to our share of the joint venture's ore requirements necessary to produce TiO<sub>2</sub> for us. See Item 1, "Business" and Note 5 to our Consolidated Financial Statements.

We occasionally enter into raw material supply arrangements to mitigate the short-term impact of future increases in raw material costs. While these arrangements do not necessarily commit us to a minimum volume of purchase, they generally provide for stated unit prices based upon achievement of specified volume purchase levels. This allows us to stabilize raw material purchase prices to a certain extent, provided the specified minimum monthly purchase quantities are met.

#### Defined benefit pension plans

We maintain various defined benefit pension plans in the U.S., Europe and Canada. See Note 10 to our Consolidated Financial Statements.

Under defined benefit pension plan accounting, defined benefit pension plan expense, pension assets and accrued pension costs are each recognized based on certain actuarial assumptions. These assumptions are principally the assumed discount rate, the assumed long-term rate of return on plan assets and the assumed increase in future compensation levels. We recognize the full funded status of our defined benefit pension plans as either an asset (for overfunded plans) or a liability (for underfunded plans) in our Consolidated Balance Sheet.

We recognized consolidated defined benefit pension plan expense of \$21.8 million in 2014, \$23.4 million in 2015 and \$22.0 million in 2016. Certain non-U.S. employees are covered by plans in their respective countries, principally in Germany, Canada and Norway. Participation in the defined benefit pension plan in Germany was closed to new participants effective in 2005. German employees hired beginning in 2005 participate in a new plan in which the retirement benefit is based upon the amount of employee and employer contributions to the plan, but for which in accordance with German law the employer guarantees a minimum rate of return on invested assets and a guaranteed indexed lifetime benefit payment after retirement based on the participant's account balance at the time of retirement. In accordance with GAAP, the new pension plan is accounted for as a defined benefit plan, principally because of such guaranteed minimum rate of return and guaranteed lifetime benefit payment. Participation in the defined benefit plan in Canada with respect to hourly and salaried workers was closed to new participants in December 2013 and 2014, respectively, and existing hourly and salaried plan participants will no longer accrue additional defined pension benefits after December 2013 and 2014, respectively. Our U.S. plan was closed to new participants in 1996, and existing participants no longer accrued any additional benefits after that date. The amount of funding requirements for these defined benefit pension plans is generally based upon applicable regulations (such as ERISA in the U.S.) and will generally differ from pension expense for financial reporting purposes. We made contributions to all of our plans which aggregated \$20.1 million in 2014, \$17.2 million in 2015 and \$15.5 million in 2016.





The discount rates we use for determining defined benefit pension expense and the related pension obligations are based on current interest rates earned on long-term bonds that receive one of the two highest ratings given by recognized rating agencies in the applicable country where the defined benefit pension benefits are being paid. In addition, we receive third-party advice about appropriate discount rates and these advisors may in some cases use their own market indices. We adjust these discount rates as of each December 31 valuation date to reflect then-current interest rates on such long-term bonds. We use these discount rates to determine the actuarial present value of the pension obligations as of December 31 of that year. We also use these discount rates to determine the interest component of defined benefit pension expense for the following year.

At December 31, 2016, approximately 69%, 17%, 8% and 3% of the projected benefit obligations related to our plans in Germany, Canada, Norway and the U.S., respectively. We use several different discount rate assumptions in determining our consolidated defined benefit pension plan obligation and expense. This is because we maintain defined benefit pension plans in several different countries in Europe and North America and the interest rate environment differs from country to country.

We used the following discount rates for our defined benefit pension plans:

	Discount rates used for:		
	Obligations	Obligations	Obligations
	at December 31, 2014	at December 31, 2015	at December 31, 2016
	and expense in 2015	and expense in 2016	and expense in 2017
Germany	2.3%	2.3%	1.8%
Canada	3.8%	3.9%	3.7%
Norway	2.3%	2.8%	2.5%
U.S.	3.8%	4.1%	3.9%

The assumed long-term rate of return on plan assets represents the estimated average rate of earnings expected to be earned on the funds invested or to be invested in the plans' assets provided to fund the benefit payments inherent in the projected benefit obligations. Unlike the discount rate, which is adjusted each year based on changes in current long-term interest rates, the assumed long-term rate of return on plan assets will not necessarily change based upon the actual short-term performance of the plan assets in any given year. Defined benefit pension expense each year is based upon the assumed long-term rate of return on plan assets for each plan, the actual fair value of the plan assets as of the beginning of the year and an estimate of the amount of contributions to and distributions from the plan during the year. Differences between the expected return on plan assets for a given year and the actual return are deferred and amortized over future periods based either upon the expected average remaining service life of the active plan participants (for plans for which benefits are still being earned by active employees) or the average remaining life expectancy of the inactive participants (for plans for which benefits are not still being earned by active employees).

At December 31, 2016, approximately 56%, 25%, 13% and 4% of the plan assets related to our plans in Germany, Canada, Norway and the U.S., respectively. We use several different long-term rates of return on plan asset assumptions in determining our consolidated defined benefit pension plan expense. This is because the plan assets in different countries are invested in a different mix of investments and the long-term rates of return for different investments differ from country to country.

In determining the expected long-term rate of return on plan asset assumptions, we consider the long-term asset mix (e.g. equity vs. fixed income) for the assets for each of our plans and the expected long-term rates of return for such

asset components. In addition, we receive third-party advice about appropriate long-term rates of return. All of the assets of our U.S. plan are invested in the Combined Master Retirement Trust (CMRT), a collective investment trust sponsored by Contran to permit the collective investment by certain master trusts which fund certain employee benefits sponsored by Contran and certain of its affiliates, including us. Such assumed asset mixes are discussed in Note 10 to our Consolidated Financial Statements.

Our pension plan weighted average asset allocations by asset category were as follows:

	December 31, 2016			
	Germany	Canada	Norway	CMRT
Equity securities and limited partnerships	20 %	37 %	12 %	58 %
Fixed income securities	71	63	59	36
Real estate	8	-	9	-
Other	1	-	20	6
Total	100%	100 %	100 %	100 %

	December 31, 2015			
	Germany	Canada	Norway	CMRT
Equity securities and limited partnerships	20 %	36 %	12 %	56 %
Fixed income securities	70	56	62	38
Real estate	9	-	9	-
Other	1	8	17	6
Total	100%	100 %	100 %	100 %

We regularly review our actual asset allocation for each non-US plan and will periodically rebalance the investments in each plan to more accurately reflect the targeted allocation when considered appropriate. The CMRT trustee and investment committee do not maintain a specific target asset allocation in order to achieve their objectives, but instead they periodically change the asset mix of the CMRT based upon, among other things, advice they receive from third-party advisors and their expectations regarding potential returns for various investment alternatives and what asset mix will generate the greatest overall return.

Our assumed long-term rates of return on plan assets for 2014, 2015 and 2016 were as follows:

	2014	2015	2016
Germany	4.3%	4.3%	3.5%
Canada	5.5%	5.8%	5.2%
Norway	3.8%	3.8%	3.3%
U.S.	7.5%	7.5%	7.5%

We currently expect to use the same long-term rate of return on plan asset assumptions in 2017 as we used in 2016 for purposes of determining the 2017 defined benefit pension plan expense.

To the extent that a plan's particular pension benefit formula calculates the pension benefit in whole or in part based upon future compensation levels, the projected benefit obligations and the pension expense will be based in part upon expected increases in future compensation levels. For all of our plans for which the benefit formula is so calculated, we generally base the assumed expected increase in future compensation levels upon average long-term inflation rates for the applicable country.

In addition to the actuarial assumptions discussed above, the amount of recognized defined benefit pension expense and the amount of net pension asset and net pension liability will vary based upon relative changes in currency exchange rates.



A reduction in the assumed discount rate generally results in an actuarial loss, as the actuarially-determined present value of estimated future benefit payments will increase. Conversely, an increase in the assumed discount rate generally results in an actuarial gain. In addition, an actual return on plan assets for a given year that is greater than the assumed return on plan assets results in an actuarial gain, while an actual return on plan assets that is less than the assumed return results in an actuarial loss. Other actual outcomes that differ from previous assumptions, such as individuals living longer or shorter than assumed in mortality tables, which are also used to determine the actuarially-determined present value of estimated future benefit payments, changes in such mortality table themselves or plan amendments, will also result in actuarial losses or gains. These amounts are recognized in other comprehensive income. In addition, any actuarial gains generated in future periods would reduce the negative amortization effect of any cumulative unrecognized actuarial losses, while any actuarial losses generated in future periods would reduce the favorable amortization effect of any cumulative unrecognized actuarial gains.

During 2016, all of our defined benefit pension plans generated a combined net actuarial loss of approximately \$38.0 million. This actuarial loss resulted primarily from the decrease in discount rates from December 31, 2015 to December 31, 2016, and an actual return on plan assets during 2016 less than the expected return.

Based on the actuarial assumptions described above and our current expectation for what actual average currency exchange rates will be during 2017, we expect our defined benefit pension expense will approximate \$27 million in 2017. In comparison, we expect to be required to contribute approximately \$15 million to such plans during 2017.

As noted above, defined benefit pension expense and the amounts recognized as accrued pension costs are based upon the actuarial assumptions discussed above. We believe all of the actuarial assumptions used are reasonable and appropriate. However, if we had lowered the assumed discount rate by 25 basis points for all plans as of December 31, 2016, our aggregate projected benefit obligations would have increased by approximately \$28.9 million at that date and our defined benefit pension expense would be expected to increase by approximately \$1.8 million during 2017. Similarly, if we lowered the assumed long-term rate of return on plan assets by 25 basis points for all of our plans, our defined benefit pension expense would be expected to increase by approximately \$1.0 million during 2017.

#### OPEB plans

Certain of our subsidiaries in the U.S. and Canada currently provide certain health care and life insurance benefits for eligible retired employees. Under other postretirement employee benefits (OPEB) accounting, OPEB expense and accrued OPEB costs are based on certain actuarial assumptions, principally the assumed discount rate and the assumed rate of increases in future health care costs. We recognize the full unfunded status of our OPEB plans as a liability. See Note 10 to the Consolidated Financial Statements for a discussion of the consolidated OPEB cost we recognized during the last three years, the amount of our accrued OPEB costs, and the associated actuarial assumptions utilized.

Based on such actuarial assumptions and our current expectation for what actual average currency exchange rates will be during 2017, we expect our consolidated OPEB expense will be nil in 2017. In comparison, we expect to be required to make approximately \$.4 million of contributions to such plans during 2017.

We believe that all of the actuarial assumptions used are reasonable and appropriate. However, if we had lowered the assumed discount rate by 25 basis points for all plans as of December 31, 2016, our aggregate projected benefit obligations would have increased approximately \$.2 million at that date and our OPEB cost during 2016 would not be materially impacted. Similarly, a one percent assumed change in health care trend rates for all plans would not materially impact our OPEB costs.



## Operations outside the United States

As discussed above, we have substantial operations located outside the United States for which the functional currency is not the U.S. dollar. As a result, the reported amount of our assets and liabilities related to our non-U.S. operations, and therefore our consolidated net assets, will fluctuate based upon changes in currency exchange rates. At December 31, 2016, we had substantial net assets denominated in the euro, Canadian dollar and Norwegian krone.

## ITEM 7A. QUANTITATIVE AND QUALITATIVE DISCLOSURES ABOUT MARKET RISK

### General

We are exposed to market risk from changes in interest rates, currency exchange rates, equity security and raw materials prices.

### Interest rates

At December 31, 2016, our variable-rate term loan comprised the majority of our aggregate indebtedness. The following table presents principal amounts and weighted average interest rates for our aggregate outstanding indebtedness at December 31, 2015 and 2016. See Note 8 to our Consolidated Financial Statements.

	Indebtedness		Year-end	Maturity
	Amount	Carrying Fair	interest	
	amount	value	rate	date
	(In millions)			
December 31, 2016				
Variable rate indebtedness – term loan	\$ 335.9	\$ 334.6	4.0	% 2020
December 31, 2015				
Variable rate indebtedness – term loan	\$ 338.0	\$ 309.5	4.0	% 2020

As part of our interest rate risk management strategy, in 2015 we entered into a pay-fixed/receive-variable interest rate swap contract to minimize our exposure to volatility in the benchmark LIBOR interest rate as it relates to our forecasted outstanding variable-rate indebtedness. As a result of this swap the amount of interest expense we will incur is fixed at the swap rate, consequently a change in LIBOR rate will not impact the amount of interest expense recognized. See Note 18 to our Consolidated Financial Statements for a discussion of this interest rate swap.

### Currency exchange rates

We are exposed to market risk arising from changes in currency exchange rates as a result of manufacturing and selling our products worldwide. Earnings are primarily affected by fluctuations in the value of the U.S. dollar relative to the euro, the Canadian dollar, the Norwegian krone and the United Kingdom pound sterling.



The majority of our sales from non-U.S. operations are denominated in currencies other than the U.S. dollar, principally the euro, other major European currencies and the Canadian dollar. A portion of our sales generated from our non-U.S. operations is denominated in the U.S. dollar (and consequently our non-U.S. operations will generally hold U.S. dollars from time to time). Certain raw materials used worldwide, primarily titanium-containing feedstocks, are purchased primarily in U.S. dollars, while labor and other production costs are purchased primarily in local currencies. Consequently, the translated U.S. dollar value of our non-U.S. sales and operating results are subject to currency exchange rate fluctuations which may favorably or unfavorably impact reported earnings. In addition to the impact of the translation of sales and expenses over time, our non-U.S. operations also generate currency transaction gains and losses which primarily relate to (i) the difference between the currency exchange rates in effect when non-local currency sales or operating costs (primarily U.S. dollar denominated) are initially accrued and when such amounts are settled with the non-local currency, (ii) changes in currency exchange

rates during time periods when our non-U.S. operations are holding non-local currency (primarily U.S. dollars), and (iii) relative changes in the aggregate fair value of currency forward contracts held from time to time.

We periodically use currency forward contracts to manage a very nominal portion of currency exchange rate risk associated with trade receivables denominated in a currency other than the holder's functional currency or similar exchange rate risk associated with future sales. We have not entered into these contracts for trading or speculative purposes in the past, nor do we currently anticipate entering into such contracts for trading or speculative purposes in the future. We are not party to any currency forward contracts at December 31, 2016. See Note 18 to our Consolidated Financial Statements.

#### Marketable security prices

We are exposed to market risk due to changes in prices of the marketable securities which we own. In this regard, during 2015, we recorded a \$12.0 million pre-tax impairment charge due to other-than-temporary impairment on our investment in a marketable security available for sale. See Note 6 to our Consolidated Financial Statements. The fair value of securities which includes investments in publicly-traded shares of related parties was \$2.4 million and \$6.0 million, respectively, at December 31, 2015 and December 31, 2016. The potential change in the aggregate fair value of these investments, assuming a 10% change in prices, would be approximately \$.2 million and \$.6 million, respectively, at December 31, 2015 and December 31, 2016.

#### Raw materials

We are exposed to market risk from changes in commodity prices relating to our raw materials. As discussed in Item 1 we generally enter into long-term supply agreements for certain of our raw material requirements. Many of our raw material contracts contain fixed quantities we are required to purchase, or specify a range of quantities within which we are required to purchase. Raw material pricing under these agreements is generally negotiated quarterly or semi-annually depending upon the suppliers. For certain raw material requirements we do not have long-term supply agreements either because we have assessed the risk of the unavailability of those raw materials and/or the risk of a significant change in the cost of those raw materials to be low, or because long-term supply agreements for those raw materials are generally not available.

#### Other

We believe there may be a certain amount of incompleteness in the sensitivity analyses presented above. For example, the hypothetical effect of changes in exchange rates discussed above ignores the potential effect on other variables which affect our results of operations and cash flows, such as demand for our products, sales volumes and selling prices and operating expenses. Accordingly, the amounts presented above are not necessarily an accurate reflection of the potential losses we would incur assuming the hypothetical changes in exchange rates were actually to occur.

The above discussion and estimated sensitivity analysis amounts include forward-looking statements of market risk which assume hypothetical changes in currency exchange rates. Actual future market conditions will likely differ materially from such assumptions. Accordingly, such forward-looking statements should not be considered to be projections by us of future events, gains or losses.

## ITEM 8. FINANCIAL STATEMENTS AND SUPPLEMENTARY DATA

The information called for by this Item is contained in a separate section of this Annual Report. See “Index of Financial Statements” (page F-1).

ITEM 9. CHANGES IN AND DISAGREEMENTS WITH ACCOUNTANTS ON ACCOUNTING AND  
FINANCIAL DISCLOSURE

None

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## ITEM 9A. CONTROLS AND PROCEDURES

### Evaluation of disclosure controls and procedures

We maintain disclosure controls and procedures which, as defined in Exchange Act Rule 13a-15(e), means controls and other procedures that are designed to ensure that information required to be disclosed in the reports that we file or submit to the SEC under the Securities Exchange Act of 1934, as amended (the Act), is recorded, processed, summarized and reported, within the time periods specified in the SEC's rules and forms. Disclosure controls and procedures include, without limitation, controls and procedures designed to ensure that information we are required to disclose in the reports we file or submit to the SEC under the Act is accumulated and communicated to our management, including our principal executive officer and our principal financial officer, or persons performing similar functions, as appropriate to allow timely decisions to be made regarding required disclosure. Each of Robert D. Graham, our Chairman of the Board, President and Chief Executive Officer and Gregory M. Swalwell, our Executive Vice President and Chief Financial Officer, have evaluated the design and effectiveness of our disclosure controls and procedures as of December 31, 2016. Based upon their evaluation, these executive officers have concluded that our disclosure controls and procedures are effective as of the date of such evaluation.

### Management's report on internal control over financial reporting

Our management is responsible for establishing and maintaining adequate internal control over financial reporting which, as defined by Exchange Act Rule 13a-15(f) means a process designed by, or under the supervision of, our principal executive and principal financial officers, or persons performing similar functions, and effected by the board of directors, management and other personnel, 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, and includes those policies and procedures that:

- Pertain to the maintenance of records that in reasonable detail accurately and fairly reflect the transactions and dispositions of our assets,
- Provide reasonable assurance that transactions are recorded as necessary to permit preparation of financial statements in accordance with GAAP, and that receipts and expenditures are being made only in accordance with authorizations of management and directors and
- Provide reasonable assurance regarding prevention or timely detection of an unauthorized acquisition, use or disposition of assets that could have a material effect on our Consolidated Financial Statements.

Our evaluation of the effectiveness of internal control over financial reporting is based upon the criteria established in Internal Control – Integrated Framework issued by the Committee of Sponsoring Organizations of the Treadway Commission in 2013 (commonly referred to as the “2013 COSO” framework). Based on our evaluation under that framework, we have concluded that our internal control over financial reporting was effective as of December 31, 2016.

PricewaterhouseCoopers LLP, the independent registered public accounting firm that has audited our consolidated financial statements included in this Annual Report, has audited the effectiveness of our internal control over financial reporting as of December 31, 2016, as stated in their report, which is included in this Annual Report on Form 10-K.

As permitted by the SEC, our assessment of internal control over financial reporting excludes (i) internal control over financial reporting of equity method investees and (ii) internal control over the preparation of any financial statement schedules which would be required by Article 12 of Regulation S-X. However, our assessment of internal control over financial reporting with respect to equity method investees did include controls over the recording of amounts related to our investment that are recorded in the consolidated financial statements, including controls over the

selection of accounting methods for our investments, the recognition of equity method earnings and losses and the determination, valuation and recording of our investment account balances.

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Changes in internal control over financial reporting

There has been no change to our internal control over financial reporting during the quarter ended December 31, 2016 that has materially affected, or is reasonably likely to materially affect, our internal control over financial reporting.

Certifications

Our chief executive officer is required to annually file a certification with the New York Stock Exchange, or NYSE, certifying our compliance with the corporate governance listing standards of the NYSE. During 2016, our chief executive officer filed such annual certification with the NYSE. The 2016 certification was unqualified.

Our chief executive officer and chief financial officer are also required to, among other things, file quarterly certifications with the SEC regarding the quality of our public disclosures, as required by Section 302 of the Sarbanes-Oxley Act of 2002. The certifications for the quarter ended December 31, 2016 have been filed as Exhibits 31.1 and 31.2 to this Annual Report on Form 10-K.

ITEM 9B. OTHER INFORMATION

Not applicable

PART III

ITEM 10. DIRECTORS, EXECUTIVE OFFICERS AND CORPORATE GOVERNANCE

The information required by this Item is incorporated by reference to our 2017 definitive proxy statement to be filed with the SEC pursuant to Regulation 14A within 120 days after the end of the fiscal year covered by this report.

ITEM 11. EXECUTIVE COMPENSATION

The information required by this Item is incorporated by reference to our 2017 proxy statement.

ITEM 12. SECURITY OWNERSHIP OF CERTAIN BENEFICIAL OWNERS AND MANAGEMENT AND RELATED STOCKHOLDER MATTERS

The information required by this Item is incorporated by reference to our 2017 proxy statement.

ITEM 13. CERTAIN RELATIONSHIPS AND RELATED TRANSACTIONS, AND DIRECTOR INDEPENDENCE

The information required by this Item is incorporated by reference to our 2017 proxy statement. See also Note 16 to our Consolidated Financial Statements.

ITEM 14. PRINCIPAL ACCOUNTING FEES AND SERVICES

The information required by the Item is incorporated by reference to our 2017 proxy statement.

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PART IV

ITEM 15. EXHIBITS AND FINANCIAL STATEMENT SCHEDULES

(a) and (c) Financial Statements

The Registrant

The consolidated financial statements of the Registrant listed on the accompanying Index of Financial Statements (see page F-1) are filed as part of this Annual Report.

50%-or-less owned persons

We are not required to provide any consolidated financial statements pursuant to Rule 3-09 of Regulation S-X.

(b) Exhibits

Included as exhibits are the items listed in the Exhibit Index. We will furnish a copy of any of the exhibits listed below upon payment of \$4.00 per exhibit to cover our costs to furnish the exhibits. Pursuant to Item 601(b)(4)(iii) of Regulation S-K, any instrument defining the rights of holders of long-term debt issues and other agreements related to indebtedness which do not exceed 10% of consolidated total assets as of December 31, 2016 will be furnished to the Commission upon request.

Item No.	Exhibit Index
3.1+	Restated First Amended and Restated Certificate of Incorporation of Kronos Worldwide, Inc., as amended on May 12, 2011 – incorporated by reference to Exhibit 3.1 of the Registrant’s Current Report on Form 8-K (File No. 001-31763) filed on May 12, 2011.
3.2	Amended and Restated Bylaws of Kronos Worldwide, Inc. as of October 25, 2007 – incorporated by reference to Exhibit 3.1 of the Registrant’s Current Report on Form 8-K (File No. 001-31763) filed with the U.S. Securities and Exchange Commission on October 31, 2007.
10.1	Amended and Restated Tax Agreement between Valhi, Inc. and Kronos Worldwide, Inc. dated as of December 1, 2012 – incorporated by reference to Exhibit 10.1 to the Registrant’s Annual Report on Form 10-K (File No. 001-31763) for the year ended December 31, 2012.



- 10.2 Intercorporate Services Agreement by and between Contran Corporation and Kronos Worldwide, Inc., effective as of January 1, 2004 – incorporated by reference to Exhibit 10.2 to the Quarterly Report on Form 10-Q of the Registrant (File No. 001-31763) for the quarter ended March 31, 2004.
- 10.3\* Kronos Worldwide, Inc. 2012 Director Stock Plan – incorporated by reference to Exhibit 4.4 of the Registration statement on Form S-8 of the Registrant (File No. 333-113425).
- 10.4 €80,000,000 Facility Agreement, dated June 25, 2002, among Kronos Titan GmbH & Co. OHG, Kronos Europe S.A./N.V., Kronos Titan A/S and Titania A/S, as borrowers, Kronos Titan GmbH & Co. OHG, Kronos Europe S.A./N.V. and Kronos Norge AS, as guarantors, Kronos Denmark ApS, as security provider, Deutsche Bank AG, as mandated lead arranger, Deutsche Bank Luxembourg S.A., as agent and security agent, and KBC Bank NV, as fronting bank, and the financial institutions listed in Schedule 1 thereto, as lenders – incorporated by reference to Exhibit 10.1 to the Quarterly Report on Form 10-Q of NL Industries, Inc. (File No. 001-00640) for the quarter ended June 30, 2002.
- 10.5 First Amendment Agreement, dated September 3, 2004, Relating to a Facility Agreement dated June 25, 2002 among Kronos Titan GmbH, Kronos Europe S.A./N.V., Kronos Titan AS and Titania A/S, as borrowers, Kronos Titan GmbH, Kronos Europe S.A./N.V. and Kronos Norge AS, as guarantors, Kronos Denmark ApS, as security provider, with Deutsche Bank Luxembourg S.A., acting as agent – incorporated by reference to Exhibit 10.1 of the Current Report on Form 8-K of the Registrant dated November 17, 2004 (File No. 333-119639).

- | Item No. | Exhibit Index  |
|----------|--|
| 10.6     | Second Amendment Agreement Relating to a Facility Agreement dated June 25, 2002 executed as of June 14, 2005 by and among Deutsche Bank AG, as mandated lead arranger, Deutsche Bank Luxembourg S.A. as agent, the participating lenders, Kronos Titan GmbH, Kronos Europe S.A./N.V, Kronos Titan AS, Kronos Norge AS, Titania AS and Kronos Denmark ApS – incorporated by reference to Exhibit 10.3 to the Annual Report on Form 10-K of Kronos International, Inc. (File No. 333-100047) for the year ended December 31, 2009.             |
| 10.7     | Third Amendment Agreement Relating to a Facility Agreement dated June 25, 2002 executed as of May 26, 2008 by and among Deutsche Bank AG, as mandated lead arranger, Deutsche Bank Luxembourg S.A., as agent, the participating lenders, Kronos Titan GmbH, Kronos Europe S.A./N.V, Kronos Titan AS, Kronos Norge AS, Titania AS and Kronos Denmark ApS – incorporated by reference to Exhibit 10.4 to the Annual Report on Form 10-K of Kronos International, Inc. (File No. 333-100047) for the year ended December 31, 2009.              |
| 10.8     | Fourth Amendment Agreement Relating to a Facility Agreement dated June 25, 2002 executed as of September 15, 2009 by and among Deutsche Bank AG, as mandated lead arranger, Deutsche Bank Luxembourg S.A., as agent, the participating lenders, Kronos Titan GmbH, Kronos Europe S.A./N.V., Kronos Titan AS, Kronos Norge AS, Titania AS and Kronos Denmark ApS – incorporated by reference to Exhibit 10.5 to the Annual Report on Form 10-K of Kronos International, Inc. (File No. 333-1000947) for the year ended December 31, 2009.     |
| 10.9     | Fifth Amendment Agreement Relating to a Facility Agreement dated June 25, 2002 executed as of October 28, 2010 by and among Deutsche Bank AG, as mandated lead arranger, Deutsche Bank Luxembourg S.A., as agent, the participating lenders, Kronos Titan GmbH, Kronos Europe S.A./N.V., Kronos Titan AS, Kronos Norge AS, Titania AS and Kronos Denmark ApS – incorporated by reference to Exhibit 10.1 to the Current Report on Form 8-K of Kronos International, Inc. dated October 28, 2010 (File No. 333-100047).                       |
| 10.10    | Sixth Amendment Agreement Relating to a Facility Agreement dated June 25, 2002 executed as of September 27, 2012 by and among Deutsche Bank AG, as mandated lead arranger, Deutsche Bank Luxembourg S.A., as agent, the participating lenders, Kronos Titan GmbH, Kronos Europe S.A./N.V, Kronos Titan AS, Titania AS, Kronos Norge AS, and Kronos Denmark ApS – incorporated by reference to Exhibit 10.1 to our Current Report on Form 8-K (File No. 001-31763) filed with the U.S. Securities and Exchange Commission on October 3, 2012. |
| 10.11    | Credit Agreement, dated June 18, 2012, by and among Kronos Worldwide, Inc., certain of Kronos’ subsidiaries and Wells Fargo Capital Finance, LLC – incorporated by reference to Exhibit 10.1 to the Current Report on Form 8-K (File No. 001-31763) dated January 30, 2017 and filed by the registrant on January 30, 2017.  |
| 10.12    |  |

Third Amendment to Credit Agreement, dated January 30, 2017, by and among Kronos Worldwide, Inc., certain of Kronos' subsidiaries and Wells Fargo Capital Finance, LLC – incorporated by reference to Exhibit 10.2 to the Current Report on Form 8-K (File No. 001-31763) dated January 30, 2017 and filed by the registrant on January 30, 2017.

10.13 Lease Contract, dated June 21, 1952, between Farbenfabriken Bayer Aktiengesellschaft and Titangesellschaft mit beschränkter Haftung (German language version and English translation thereof)- incorporated by reference to Exhibit 10.14 to the Annual Report on Form 10-K (File No. 001-00640)of NL Industries, Inc. for the year ended December 31, 1985.

10.14 Master Technology Exchange Agreement, dated as of October 18, 1993, among Kronos Worldwide, Inc. (f/k/a Kronos, Inc.), Kronos Louisiana, Inc., Kronos International, Inc., Tioxide Group Limited and Tioxide Group Services Limited – incorporated by reference to Exhibit 10.8 to the Quarterly Report on Form 10-Q (File No. 001-00640) of NL Industries, Inc. for the quarter ended September 30, 1993.

Item No.	Exhibit Index
10.15	Form of Assignment and Assumption Agreement, dated as of January 1, 1999, between Kronos Inc. (formerly known as Kronos (USA), Inc.) and Kronos International, Inc. – incorporated by reference to Exhibit 10.9 to Kronos International, Inc.’s Registration Statement on Form S-4 (File No. 333-100047).
10.16	Form of Cross License Agreement, effective as of January 1, 1999, between Kronos Inc. (formerly known as Kronos (USA), Inc.) and Kronos International, Inc. – incorporated by reference to Exhibit to Kronos International, Inc.’s Registration Statement on Form S-4 (File No. 333-100047).
10.17	Formation Agreement dated as of October 18, 1993 among Tioxide Americas Inc., Kronos Louisiana, Inc. and Louisiana Pigment Company, L.P. – incorporated by reference to Exhibit 10.2 to NL Industries, Inc.’s Quarterly Report on Form 10-Q (File No. 001-00640) for the quarter ended September 30, 1993.
10.18	Joint Venture Agreement dated as of October 18, 1993 between Tioxide Americas Inc. and Kronos Louisiana, Inc. – incorporated by reference to Exhibit 10.3 to NL Industries, Inc.’s Quarterly Report on Form 10-Q (File No. 001-00640) for the quarter ended September 30, 1993.
10.19	Kronos Offtake Agreement dated as of October 18, 1993 between Kronos Louisiana, Inc. and Louisiana Pigment Company, L.P. – incorporated by reference to Exhibit 10.4 to NL Industries, Inc.’s Quarterly Report on Form 10-Q (File No. 001-00640) for the quarter ended September 30, 1993.
10.20	Amendment No. 1 to Kronos Offtake Agreement dated as of December 20, 1995 between Kronos Louisiana, Inc. and Louisiana Pigment Company, L.P. – incorporated by reference to Exhibit 10.22 to NL Industries, Inc.’s Annual Report on Form 10-K (File No. 001-00640) for the year ended December 31, 1995.
10.21	Tioxide Americas Offtake Agreement dated as of October 18, 1993 between Tioxide Americas Inc. and Louisiana Pigment Company, L.P. – incorporated by reference to Exhibit 10.5 to NL Industries, Inc.’s Quarterly Report on Form 10-Q (File No. 001-00640) for the quarter ended September 30, 1993.
10.22	Amendment No. 1 to Tioxide Americas Offtake Agreement dated as of December 20, 1995 between Tioxide Americas Inc. and Louisiana Pigment Company, L.P. – incorporated by reference to Exhibit 10.24 to NL Industries, Inc.’s Annual Report on Form 10-K (File No. 001-00640) for the year ended December 31, 1995.
10.23	Parents’ Undertaking dated as of October 18, 1993 between ICI American Holdings Inc. and Kronos Worldwide, Inc. (f/k/a Kronos, Inc.) – incorporated by reference to Exhibit 10.9 to NL Industries, Inc.’s Quarterly Report on Form 10-Q (File No. 001-00640) for the quarter ended September 30, 1993.

- 10.24 Allocation Agreement dated as of October 18, 1993 between Tioxide Americas Inc., ICI American Holdings, Inc., Kronos Worldwide, Inc. (f/k/a Kronos, Inc.) and Kronos Louisiana, Inc. – incorporated by reference to Exhibit 10.10 to NL Industries, Inc.’s Quarterly Report on Form 10-Q (File No. 001-00640) for the quarter ended September 30, 1993.
- 10.25 First amended and Restated Agreement Regarding Shared Insurance among CompX International Inc., Contran Corporation, Keystone Consolidated Industries, Inc., Kronos Worldwide, Inc., NL Industries, Inc., and Valhi, Inc. dated October 15, 2015 – incorporated by reference to Exhibit 10.24 to the Registrant’s Annual Report on Form 10-K (File No. 001-31763) for the year ended December 31, 2015.
- 10.26\*\* Tenth Amended and Restated Unsecured Revolving Demand Promissory Note dated December 31, 2016 in the principal amount of \$60.0 million executed by Valhi, Inc. and payable to the order of Kronos Worldwide, Inc.
- 10.27 Restated and Amended Agreement by and between Richards Bay Titanium (Proprietary) Limited (acting through its sales agent Rio Tinto Iron & Titanium Limited) and Kronos (US), Inc. effective January 1, 2016 – incorporated by reference to Exhibit 10.26 to the Registrant’s Annual Report on Form 10-K (File No. 001-31763) for the year ended December 31, 2015.

Item No.	Exhibit Index
10.28	Credit Agreement, dated February 18, 2014, by and among Kronos Worldwide, Inc. and Deutsche Bank AG New York Branch – incorporated by reference to Exhibit 10.1 to the Current Report on Form 8-K (File No. 001-31763) dated February 18, 2014 and filed by the registrant on February 18, 2014.
10.29	First Amendment to Credit Agreement dated May 21, 2015 among the registrant, Deutsche Bank AG New York Branch, as Administrative Agent, and the lenders a party thereto – incorporated by reference to Exhibit 10.1 to the current report on Form 8-K (File No. 001-31763) dated May 21, 2015 and filed by the registrant on May 21, 2015.
10.30	Guaranty and Security Agreement, dated February 18, 2014, among Kronos Worldwide, Inc., Kronos Louisiana, Inc., Kronos (US), Inc., Kronos International, Inc. and Deutsche Bank AG New York Branch – incorporated by reference to Exhibit 10.2 to the Current Report on Form 8-K (File No. 001-31763) dated February 18, 2014 and filed by the registrant on February 18, 2014.
10.31	Intercreditor Agreement dated as of February 18, 2014, by and between Wells Fargo Capital Finance and Deutsche Bank AG New York Branch, and acknowledged by Kronos Worldwide, Inc., Kronos Louisiana, Inc. and Kronos (US), Inc. – incorporated by reference to Exhibit 10.3 to the Current Report on Form 8-K (File No. 001-31763) dated February 18, 2014 and filed by the registrant on February 18, 2014.
21.1**	Subsidiaries.
23.1**	Consent of PricewaterhouseCoopers LLP.
31.1**	Certification.
31.2**	Certification.
32.1**	Certification.
101.INS**	XBRL Instance Document
101.SCH**	XBRL Taxonomy Extension Schema
101.CAL**	XBRL Taxonomy Extension Calculation Linkbase

101.DEF\*\* XBRL Taxonomy Extension Definition Linkbase

101.LAB\*\* XBRL Taxonomy Extension Label Linkbase

101.PRE\*\* XBRL Taxonomy Extension Presentation Linkbase

+Exhibit 3.1 is restated for the purposes of the disclosure requirements of Item 601 of Regulation S-K promulgated by the U.S. Securities and Exchange Commission and does not represent a restated certificate of incorporation that has been filed with the Delaware Secretary of State.

\*Management contract, compensatory plan or arrangement

\*\*Filed herewith

SIGNATURES

Pursuant to the requirements of Section 13 or 15(d) of the Securities Exchange Act of 1934, the Registrant has duly caused this report to be signed on its behalf by the undersigned, thereunto duly authorized.

Kronos Worldwide, Inc.  
(Registrant)

By: /s/ Robert D. Graham  
Robert D. Graham, March 10, 2017  
(Chairman, President and Chief Executive Officer)

Pursuant to the requirements of the Securities Exchange Act of 1934, this report has been signed below by the following persons on behalf of the Registrant and in the capacities and on the dates indicated:

/s/ Robert D. Graham  
Robert D. Graham, March 10, 2017  
(Chairman, President and Chief Executive Officer)

/s/ C. H. Moore, Jr.  
C. H. Moore, Jr., March 10, 2017  
(Director)

/s/ Thomas P. Stafford  
Thomas P. Stafford, March 10, 2017  
(Director)

/s/ John E. Harper  
John E. Harper, March 10, 2017  
(Director)

/s/ C. Kern Wildenthal  
C. Kern Wildenthal, March 10, 2017  
(Director)

/s/ Keith R. Coogan  
Keith R. Coogan, March 10, 2017  
(Director)

/s/ Loretta J. Feehan  
Loretta J. Feehan, March 10, 2017  
(Director)

/s/ R. Gerald Turner  
R. Gerald Turner, March 10, 2017  
(Director)

/s/ Tim C. Hafer  
Tim C. Hafer, March 10, 2017  
  
(Vice President, Controller,  
Principal Accounting Officer)

/s/ Gregory M. Swalwell  
Gregory M. Swalwell, March 10, 2017  
(Executive Vice President and  
Chief Financial Officer, Principal Financial  
Officer)





KRONOS WORLDWIDE, INC.

Annual Report on Form 10-K

Items 8, 15(a) and 15(c)

Index of Financial Statements

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All financial statement schedules have been omitted either because they are not applicable or required, or the information that would be required to be included is disclosed in the Notes to the Consolidated Financial Statements.

REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

To the Stockholders and Board of Directors of Kronos Worldwide, Inc.:

In our opinion, the accompanying consolidated balance sheets and the related consolidated statements of operations, of comprehensive income (loss), of stockholders' equity and of cash flows present fairly, in all material respects, the financial position of Kronos Worldwide, Inc. and its subsidiaries at December 31, 2015 and 2016, and the results of their operations and their cash flows for each of the three years in the period ended December 31, 2016 in conformity with accounting principles generally accepted in the United States of America. Also in our opinion, the Company maintained, in all material respects, effective internal control over financial reporting as of December 31, 2016, based on criteria established in Internal Control – Integrated Framework (2013) issued by the Committee of Sponsoring Organizations of the Treadway Commission (COSO). The Company's management is responsible for these financial statements, for maintaining effective internal control over financial reporting and for its assessment of the effectiveness of internal control over financial reporting, included in Management's Report on Internal Control Over Financial Reporting appearing under Item 9A. Our responsibility is to express opinions on these financial statements and on the Company's internal control over financial reporting based on our integrated audits. We conducted our audits in accordance with the standards of the Public Company Accounting Oversight Board (United States). Those standards require that we plan and perform the audits to obtain reasonable assurance about whether the financial statements are free of material misstatement and whether effective internal control over financial reporting was maintained in all material respects. Our audits of the financial statements included examining, on a test basis, evidence supporting the amounts and disclosures in the financial statements, assessing the accounting principles used and significant estimates made by management, and evaluating the overall financial statement presentation. Our audit of internal control over financial reporting included obtaining an understanding of internal control over financial reporting, assessing the risk that a material weakness exists, and testing and evaluating the design and operating effectiveness of internal control based on the assessed risk. Our audits also included performing such other procedures as we considered necessary in the circumstances. We believe that our audits provide a reasonable basis for our opinions.

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 (i) pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect the transactions and dispositions of the assets of the company; (ii) 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 (iii) 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/ PricewaterhouseCoopers LLP

Dallas, Texas

March 10, 2017

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## KRONOS WORLDWIDE, INC. AND SUBSIDIARIES

## CONSOLIDATED BALANCE SHEETS

(In millions, except per share data)

ASSETS	December 31,	
	2015	2016
Current assets:		
Cash and cash equivalents	\$92.5	\$50.7
Restricted cash	1.8	1.6
Accounts and other receivables	218.3	241.1
Receivable from affiliate	2.5	3.5
Inventories, net	387.2	343.5
Prepaid expenses and other	8.5	10.0
<b>Total current assets</b>	<b>710.8</b>	<b>650.4</b>
Other assets:		
Investment in TiO <sub>2</sub> manufacturing joint venture	82.9	78.9
Marketable securities	2.4	6.0
Deferred income taxes	14.0	8.1
Other	3.1	2.2