

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<sup>®</sup> purified anatase grades meet the applicable requirements of the CTFAs (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

6

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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.

7

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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

8

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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;

14

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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

18

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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,

19

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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			Translation	Total
	2015	2016	Change	gain/loss-	
				impact of	impact
				rate	2016 vs.
				changes	2015
	(In				
	millions)				
Impact on:					
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).

28

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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

31

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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.

34

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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.

35

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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

41

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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.

42

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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.

43

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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

Financial Statements	Page
<u>Report of Independent Registered Public Accounting Firm</u>	F-2
<u>Consolidated Balance Sheets – December 31, 2015 and 2016</u>	F-3
<u>Consolidated Statements of Operations - Years ended December 31, 2014, 2015 and 2016</u>	F-5
<u>Consolidated Statements of Comprehensive Income (Loss) - Years ended December 31, 2014, 2015 and 2016</u>	F-6
<u>Consolidated Statements of Stockholders' Equity - Years ended December 31, 2014, 2015 and 2016</u>	F-7
<u>Consolidated Statements of Cash Flows - Years ended December 31, 2014, 2015 and 2016</u>	F-8
<u>Notes to Consolidated Financial Statements</u>	F-10

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

F-2

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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
<b>Total other assets</b>	<b>102.4</b>	<b>95.2</b>
Property and equipment:		
Land	37.8	37.3
Buildings	197.4	195.8
Equipment	941.6	947.4
Mining properties	102.6	108.1
Construction in progress	29.2	38.7
	1,308.6	1,327.3
Less accumulated depreciation and amortization	879.1	893.3
<b>Net property and equipment</b>	<b>429.5</b>	<b>434.0</b>
<b>Total assets</b>	<b>\$1,242.7</b>	<b>\$1,179.6</b>

## KRONOS WORLDWIDE, INC. AND SUBSIDIARIES

## CONSOLIDATED BALANCE SHEETS (CONTINUED)

(In millions, except per share data)

LIABILITIES AND STOCKHOLDERS' EQUITY	December 31,	
	2015	2016
<b>Current liabilities:</b>		
Current maturities of long-term debt	\$3.8	\$3.6
Accounts payable and accrued liabilities	172.7	158.8
Payables to affiliates	19.5	14.7
Income taxes	5.7	5.0
<b>Total current liabilities</b>	<b>201.7</b>	<b>182.1</b>
<b>Noncurrent liabilities:</b>		
Long-term debt	337.2	335.4
Accrued pension cost	202.7	227.3
Accrued postretirement benefits cost	6.7	6.9
Deferred income taxes	8.1	10.5
Other	24.4	22.4
<b>Total noncurrent liabilities</b>	<b>579.1</b>	<b>602.5</b>
<b>Stockholders' equity:</b>		
Common stock, \$.01 par value; 240.0 shares authorized;		
115.9 shares issued	1.2	1.2
Additional paid-in capital	1,398.7	1,398.8
Retained deficit	(526.0 )	(552.2 )
Accumulated other comprehensive loss	(412.0 )	(452.8 )
<b>Total stockholders' equity</b>	<b>461.9</b>	<b>395.0</b>
<b>Total liabilities and stockholders' equity</b>	<b>\$1,242.7</b>	<b>\$1,179.6</b>

Commitments and contingencies (Notes 14 and 17)

See accompanying notes to consolidated financial statements.



## KRONOS WORLDWIDE, INC. AND SUBSIDIARIES

## CONSOLIDATED STATEMENTS OF OPERATIONS

(In millions, except per share data)

	Years ended December 31,		
	2014	2015	2016
Net sales	\$1,651.9	\$1,348.8	\$1,364.3
Cost of sales	1,302.2	1,156.5	1,107.3
Gross margin	349.7	192.3	257.0
Selling, general and administrative expense	191.9	178.0	172.6
Other operating income (expense):			
Currency transaction gains (losses), net	4.0	(.1 )	5.5
Disposition of property and equipment	(.9 )	(.8 )	(.3 )
Other income (expense), net	(.7 )	(.9 )	4.2
Corporate expense	(10.5 )	(13.6 )	(12.7 )
Income (loss) from operations	149.7	(1.1 )	81.1
Other income (expense):			
Interest and dividend income	1.0	.8	.6
Securities transactions, net	-	(12.0 )	-
Interest expense	(17.0 )	(18.5 )	(20.5 )
Income (loss) before income taxes	133.7	(30.8 )	61.2
Income tax expense	34.5	142.8	17.9
Net income (loss)	\$99.2	\$(173.6 )	\$43.3
Net income (loss) per basic and diluted share	\$.86	\$(1.50 )	\$.37
Cash dividends per share	\$.60	\$.60	\$.60
Weighted average shares used in the calculation of net			
income (loss) per share	115.9	115.9	115.9

See accompanying notes to consolidated financial statements.

F-5

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## KRONOS WORLDWIDE, INC. AND SUBSIDIARIES

## CONSOLIDATED STATEMENTS OF COMPREHENSIVE INCOME (LOSS)

(In millions)

	Years ended December		
	31, 2014	2015	2016
Net income (loss)	\$99.2	\$(173.6)	\$43.3
Other comprehensive income (loss), net of tax:			
Currency translation	(103.0)	(92.2 )	(17.6)
Marketable securities	(13.7 )	2.3	2.4
Defined benefit pension plans	(66.0 )	16.2	(25.6)
Other postretirement benefit plans	(1.1 )	(.2 )	(.3 )
Interest rate swap	-	(2.3 )	.3
Total other comprehensive loss, net	(183.8)	(76.2 )	(40.8)
Comprehensive income (loss)	\$(84.6 )	\$(249.8)	\$2.5

See accompanying notes to consolidated financial statements.

## KRONOS WORLDWIDE, INC. AND SUBSIDIARIES

## CONSOLIDATED STATEMENTS OF STOCKHOLDERS' EQUITY

Years ended December 31, 2014, 2015 and 2016

(In millions)

	Common stock	Additional paid-in capital	Retained earnings (deficit)	Accumulated other comprehensive loss	Total
Balance at December 31, 2013	\$ 1.2	\$ 1,398.5	\$ (312.6 )	\$ (152.0 )	\$ 935.1
Net income	-	-	99.2	-	99.2
Other comprehensive loss, net of tax	-	-	-	(183.8 )	(183.8 )
Issuance of common stock	-	.1	-	-	.1
Dividends paid - \$.60 per share	-	-	(69.5 )	-	(69.5 )
Balance at December 31, 2014	1.2	1,398.6	(282.9 )	(335.8 )	781.1
Net loss	-	-	(173.6 )	-	(173.6)
Other comprehensive loss, net of tax	-	-	-	(76.2 )	(76.2 )
Issuance of common stock	-	.1	-	-	.1
Dividends paid - \$.60 per share	-	-	(69.5 )	-	(69.5 )
Balance at December 31, 2015	1.2	1,398.7	(526.0 )	(412.0 )	461.9
Net income	-	-	43.3	-	43.3
Other comprehensive income, net of tax	-	-	-	(40.8 )	(40.8 )
Issuance of common stock	-	.1	-	-	.1
Dividends paid - \$.60 per share	-	-	(69.5 )	-	(69.5 )
Balance at December 31, 2016	\$ 1.2	\$ 1,398.8	\$ (552.2 )	\$ (452.8 )	\$ 395.0

See accompanying notes to consolidated financial statements.

## KRONOS WORLDWIDE, INC. AND SUBSIDIARIES

## CONSOLIDATED STATEMENTS OF CASH FLOWS

(In millions)

	Years ended December 31,		
	2014	2015	2016
Cash flows from operating activities:			
Net income (loss)	\$99.2	\$(173.6)	\$43.3
Depreciation and amortization	49.2	42.1	40.5
Deferred income taxes	19.6	138.5	7.7
Securities transactions, net	-	12.0	-
Benefit plan expense greater than cash funding	.5	5.1	5.8
Distributions from TiO <sub>2</sub> manufacturing joint venture, net	10.6	6.5	3.6
Other, net	10.7	6.3	3.0
Change in assets and liabilities:			
Accounts and other receivables	(27.8 )	20.1	(37.4 )
Inventories	(52.3 )	(9.5 )	38.8
Prepaid expenses	(.4 )	(1.6 )	(1.5 )
Accounts payable and accrued liabilities	(21.1 )	(12.0 )	(12.9 )
Income taxes	6.3	(1.5 )	3.8
Accounts with affiliates	(4.1 )	19.2	(5.8 )
Other noncurrent assets	2.6	.3	.3
Other noncurrent liabilities	(5.3 )	.2	.4
Net cash provided by operating activities	87.7	52.1	89.6
Cash flows from investing activities -			
Capital expenditures	(61.2 )	(47.1 )	(53.0 )
Net cash used in investing activities	(61.2 )	(47.1 )	(53.0 )
Cash flows from financing activities:			
Indebtedness:			
Borrowings	430.4	1.3	266.2
Principal payments	(265.2)	(3.9 )	(270.0)
Deferred financing fees	(6.1 )	-	-
Dividends paid	(69.5 )	(69.5 )	(69.5 )
Net cash provided by (used in) financing activities	89.6	(72.1 )	(73.3 )

## KRONOS WORLDWIDE, INC. AND SUBSIDIARIES

## CONSOLIDATED STATEMENTS OF CASH FLOWS (CONTINUED)

(In millions)

	Years ended December 31,		
	2014	2015	2016
Cash, cash equivalents and restricted cash – net change from:			
Operating, investing and financing activities	\$116.1	\$(67.1)	\$(36.7)
Effect of exchange rate changes	(10.0)	(8.5)	(5.3)
Net change for the year	106.1	(75.6)	(42.0)
Balance at beginning of year	63.8	169.9	94.3
Balance at end of year	\$169.9	\$94.3	\$52.3
Supplemental disclosures:			
Cash paid for:			
Interest, net of amounts capitalized	\$14.7	\$16.6	\$18.4
Income taxes	17.5	1.4	6.6
Accrual for capital expenditures	7.0	6.8	8.0

See accompanying notes to consolidated financial statements.

KRONOS WORLDWIDE, INC. AND SUBSIDIARIES

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

December 31, 2016

Note 1 – Summary of significant accounting policies:

Organization and basis of presentation – At December 31, 2016, Valhi, Inc. (NYSE: VHI) held approximately 50% of our outstanding common stock and a wholly-owned subsidiary of NL Industries, Inc. (NYSE: NL) held approximately 30% of our common stock. Valhi owned approximately 83% of NL's outstanding common stock and a wholly-owned subsidiary of Contran Corporation held approximately 93% of Valhi's outstanding common stock. All of Contran's outstanding voting stock is held by a family trust established for the benefit of Lisa K. Simmons and Serena Simmons Connelly and their children, for which Ms. Simmons and Ms. Connelly are co-trustees, or is held directly by Ms. Simmons and Ms. Connelly or entities related to them. Consequently, Ms. Simmons and Ms. Connelly may be deemed to control Contran, Valhi, NL and us.

Unless otherwise indicated, references in this report to “we,” “us” or “our” refers to Kronos Worldwide, Inc. and its subsidiaries, taken as a whole.

Management's estimates – In preparing our financial statements in conformity with accounting principles generally accepted in the United States of America (GAAP) we are required to make estimates and assumptions 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 reporting period. Actual results may differ significantly from previously-estimated amounts under different assumptions or conditions.

Principles of consolidation – The consolidated financial statements include our accounts and those of our majority-owned subsidiaries. We have eliminated all material intercompany accounts and balances.

Translation of currencies – We translate the assets and liabilities of our subsidiaries whose functional currency is other than the U.S. dollar at year-end exchange rates, while we translate our revenues and expenses at average exchange rates prevailing during the year. We accumulate the resulting translation adjustments in stockholders' equity as part of accumulated other comprehensive income (loss), net of related deferred income taxes. We recognize currency transaction gains and losses in income currently.

Derivatives and hedging activities – We recognize derivatives as either assets or liabilities measured at fair value. We recognize the effect of changes in the fair value of derivatives either in net income or other comprehensive income (loss), depending on the intended use of the derivative. See Note 18.

Cash and cash equivalents – We classify bank time deposits and U.S. Treasury securities purchased under short-term agreements to resell with original maturities of three months or less as cash equivalents.

Restricted cash – We classify cash that has been segregated or is otherwise limited in use as restricted. Such restrictions or limitations relate to certain Norwegian payroll tax and unfunded employee benefit obligations. To the extent the restricted amount relates to a recognized liability, we classify such restricted amount as either a current or noncurrent asset to correspond with the classification of the liability. To the extent the restricted amount does not relate to a recognized liability, we classify restricted cash as a current asset. All of our restricted cash is classified as a

current asset and is separately presented on the face of the statement of financial position.

Marketable securities and securities transactions – We carry marketable securities at fair value. Accounting Standard Codification (ASC) Topic 820, Fair Value Measurements and Disclosures, establishes a consistent framework for measuring fair value and (with certain exceptions) this framework is generally applied to all financial statement items required to be measured at fair value. The standard requires fair value measurements to be classified and disclosed in one of the following three categories:

Level 1 – Unadjusted quoted prices in active markets that are accessible at the measurement date for identical, unrestricted assets or liabilities;

F-10

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Level 2 – Quoted prices in markets that are not active, or inputs which are observable, either directly or indirectly, for substantially the full term of the assets or liability; and

Level 3 – Prices or valuation techniques that require inputs that are both significant to the fair value measurement and unobservable.

We classify all of our marketable securities as available-for-sale and unrealized gains or losses on these securities are recognized through other comprehensive income, net of deferred income taxes, except for any decline in value we conclude is other than temporary, which is accounted for as a realized loss as a component of net income. We base realized gains and losses upon the specific identification of the securities sold.

We evaluate our investments whenever events or conditions occur to indicate that the fair value of such investments has declined below their carrying amounts. If the carrying amount for an investment declines below its historical cost basis, we evaluate all available positive and negative evidence including, but not limited to, the extent and duration of the impairment, business prospects for the investee and our intent and ability to hold the investment for a reasonable period of time sufficient for the recovery of fair value. If we determine the decline in fair value is other than temporary, the carrying amount of the investment is written down to fair value.

See Notes 6, 10 and 18.

Accounts receivable – We provide an allowance for doubtful accounts for known and estimated potential losses arising from sales to customers based on a periodic review of these accounts. See Note 3.

Inventories and cost of sales – We state inventories at the lower of cost or market, net of allowance for obsolete and slow-moving inventories. We generally base inventory costs for all inventory categories on average cost that approximates the first-in, first-out method. Inventories include the costs for raw materials, the cost to manufacture the raw materials into finished goods and overhead. Depending on the inventory’s stage of completion, our manufacturing costs can include the costs of packing and finishing, utilities, maintenance, depreciation, and salaries and benefits associated with our manufacturing process. We allocate fixed manufacturing overheads based on normal production capacity. Unallocated overhead costs resulting from periods with abnormally low production levels are charged to expense as incurred. As inventory is sold to third parties, we recognize the cost of sales in the same period that the sale occurs. We periodically review our inventory for estimated obsolescence or instances when inventory is no longer marketable for its intended use, and we record any write-down equal to the difference between the cost of inventory and its estimated net realizable value based on assumptions about alternative uses, market conditions and other factors. See Note 4.

Investment in TiO<sub>2</sub> manufacturing joint venture – We account for our investment in a 50%-owned manufacturing joint venture by the equity method. Distributions received from such investee are classified for statement of cash flow purposes using the “nature of distribution” approach under ASC Topic 320. See Note 5.

Property and equipment and depreciation – We state property and equipment at cost, including capitalized interest on borrowings during the actual construction period of major capital projects. Capitalized interest costs were \$2.9 million in 2014, \$1.1 million in 2015 and \$.9 million in 2016. We compute depreciation of property and equipment for financial reporting purposes (including mining equipment) principally by the straight-line method over the estimated useful lives of the assets as follows:

Asset	Useful lives
Buildings and improvements	10 to 40 years
Machinery and equipment	3 to 20 years

Mine development costs      units-of-production

We use accelerated depreciation methods for income tax purposes, as permitted. Upon the sale or retirement of an asset, we remove the related cost and accumulated depreciation from the accounts and recognize any gain or loss in income currently.

F-11

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We expense costs incurred for maintenance, repairs and minor renewals (including planned major maintenance) while we capitalize expenditures for major improvements.

We have a governmental concession with an unlimited term to operate our ilmenite mines in Norway. Mining properties consist of buildings and equipment used in our Norwegian ilmenite mining operations. While we own the land and ilmenite reserves associated with the mining operations, such land and reserves were acquired for nominal value and we have no material asset recognized for the land and reserves related to our mining operations.

We perform impairment tests when events or changes in circumstances indicate the carrying value may not be recoverable. We consider all relevant factors. We perform the impairment test by comparing the estimated future undiscounted cash flows (exclusive of interest expense) associated with the asset to the asset's net carrying value to determine if a write-down to fair value or discounted cash flow value is required.

Long-term debt – We state long-term debt net of any unamortized original issue premium, discount or deferred financing costs (other than deferred financing costs associated with revolving credit facilities, which are recognized as an asset). We classify amortization of all deferred financing costs and any premium or discount associated with the issuance of indebtedness as interest expense and compute such amortization by either the interest method or the straight-line method over the term of the applicable issue. See Note 8.

Employee benefit plans – Accounting and funding policies for our retirement plans are described in Note 10.

Income taxes – We, Valhi and our qualifying subsidiaries are members of Contran's consolidated U.S. federal income tax group (the Contran Tax Group) and we and certain of our qualifying subsidiaries also file consolidated income tax returns with Contran in various U.S. state jurisdictions. As a member of the Contran Tax Group, we are jointly and severally liable for the federal income tax liability of Contran and the other companies included in the Contran Tax Group for all periods in which we are included in the Contran Tax Group. See Note 17. As a member of the Contran Tax Group, we are a party to a tax sharing agreement which provides that we compute our provision for U.S. income taxes on a separate-company basis using the tax elections made by Contran. Pursuant to the tax sharing agreement, we make payments to or receive payments from Valhi in amounts we would have paid to or received from the U.S. Internal Revenue Service or the applicable state tax authority had we not been a member of the Contran Tax Group. We made net payments of income taxes to Valhi of \$8.2 million in 2014 and \$.8 million in 2016, and received net income tax refunds from Valhi of \$3.5 million in 2015.

We recognize deferred income tax assets and liabilities for the expected future tax consequences of temporary differences between the income tax and financial reporting carrying amounts of assets and liabilities, including investments in our subsidiaries and affiliates who are not members of the Contran Tax Group and undistributed earnings of non-U.S. subsidiaries which are not deemed to be permanently reinvested. The earnings of non-U.S. subsidiaries subject to permanent reinvestment plans aggregated \$660 million at December 31, 2016. It is not practical for us to determine the amount of the unrecognized deferred income tax liability related to such earnings due to the complexities associated with the U.S. taxation on earnings of non-U.S. subsidiaries repatriated to the U.S. 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 periodically evaluate our deferred tax assets in the various taxing jurisdictions in which we operate and adjust any related valuation allowance based on the estimate of the amount of such deferred tax assets that we believe does not meet the more-likely-than-not recognition criteria.

We record a reserve for uncertain tax positions for tax positions where we believe that it is more-likely-than-not our position will not prevail with the applicable tax authorities. The amount of the benefit associated with our uncertain tax positions that we recognize is limited to the largest amount for which we believe the likelihood of realization is

greater than 50%. We accrue penalties and interest on the difference between tax positions taken on our tax returns and the amount of benefit recognized for financial reporting purposes. We classify our reserves for uncertain tax positions in a separate current or noncurrent liability, depending on the nature of the tax position. See Note 14.

F-12

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Net sales – We record sales when products are shipped and title and other risks and rewards of ownership have passed to the customer. Shipping terms of products shipped are generally FOB shipping point, although in some instances shipping terms are FOB destination point (for which we do not recognize sales until the product is received by the customer) or other standard shipping terms. We state sales net of price, early payment and distributor discounts and volume rebates. We report any tax assessed by a governmental authority that we collect from our customers that is both imposed on and concurrent with our revenue-producing activities (such as sales, use, value added and excise taxes) on a net basis (meaning we do not recognize these taxes either in our revenues or in our costs and expenses).

Selling, general and administrative expense; shipping and handling costs – Selling, general and administrative expense includes costs related to marketing, sales, distribution, shipping and handling, research and development, legal, and administrative functions such as accounting, treasury and finance, and includes costs for salaries and benefits not associated with our manufacturing process, travel and entertainment, promotional materials and professional fees. We include shipping and handling costs in selling, general and administrative expense and these costs were \$95 million in 2014, \$87 million in 2015 and \$90 million in 2016. We expense research, development and certain sales technical support costs as incurred and these costs approximated \$19 million in 2014, \$16 million in 2015 and \$13 million in 2016. We expense advertising costs as incurred and these costs were not material in any year presented.

#### Note 2 – Geographic information:

Our operations are associated with the production and sale of titanium dioxide pigments (TiO<sub>2</sub>). TiO<sub>2</sub> is used to impart whiteness, brightness, opacity and durability to a wide variety of products, including paints, plastics, paper, fibers and ceramics. Additionally, TiO<sub>2</sub> is a critical component of everyday applications, such as coatings, plastics and paper, as well as many specialty products such as inks, foods and cosmetics. At December 31, 2015 and 2016 the net assets of non-U.S. subsidiaries included in consolidated net assets approximated \$123 million and \$62 million, respectively.

For geographic information, we attribute net sales to the place of manufacture (point of origin) and to the location of the customer (point of destination); we attribute property and equipment to their physical location.

	Years ended December 31,		
	2014	2015	2016
	(In millions)		
<b>Net sales – point of origin:</b>			
Germany	\$844.1	\$690.0	\$699.8
United States	783.1	657.8	664.2
Canada	252.3	216.9	257.7
Belgium	249.3	198.8	187.4
Norway	256.8	183.5	164.8
Eliminations	(733.7 )	(598.2 )	(609.6 )
<b>Total</b>	<b>\$1,651.9</b>	<b>\$1,348.8</b>	<b>\$1,364.3</b>
<b>Net sales – point of destination:</b>			
Europe	\$882.9	\$700.4	\$697.6
North America	544.3	421.4	413.2
Other	224.7	227.0	253.5
<b>Total</b>	<b>\$1,651.9</b>	<b>\$1,348.8</b>	<b>\$1,364.3</b>



	December 31,	
	2015	2016
	(In millions)	
<b>Identifiable assets – net property and equipment:</b>		
Germany	\$212.1	\$208.2
Belgium	80.1	78.6
Norway	69.5	73.3
Canada	53.8	59.3
Other	14.0	14.6
<b>Total</b>	<b>\$429.5</b>	<b>\$434.0</b>

## Note 3 – Accounts and other receivables:

	December 31,	
	2015	2016
	(In millions)	
Trade receivables	\$194.8	\$224.8
Recoverable VAT and other receivables	17.8	16.7
Refundable income taxes	6.8	.3
Allowance for doubtful accounts	(1.1 )	(.7 )
<b>Total</b>	<b>\$218.3</b>	<b>\$241.1</b>

## Note 4 – Inventories, net:

	December 31,	
	2015	2016
	(In millions)	
Raw materials	\$75.9	\$68.7
Work in process	21.1	22.3
Finished products	232.4	195.7
Supplies	57.8	56.8
<b>Total</b>	<b>\$387.2</b>	<b>\$343.5</b>

## Note 5 – Investment in TiQ manufacturing joint venture:

We own a 50% interest in Louisiana Pigment Company, L.P. (LPC). LPC is a manufacturing joint venture whose other 50%-owner is Huntsman P&A Investments LLC (HPA) (formerly Tioxide Americas LLC). HPA is a subsidiary of Huntsman Corporation. LPC owns and operates a chloride-process TiO<sub>2</sub> plant in Lake Charles, Louisiana.

We and HPA are both required to purchase one-half of the TiO<sub>2</sub> produced by LPC, unless we and HPA agree otherwise (such as in 2015, when we purchased approximately 52% of the production from the plant). LPC operates on a break-even basis and, accordingly, we report no equity in earnings of LPC. Each owner's acquisition transfer price for its share of the TiO<sub>2</sub> produced is equal to its share of the joint venture's production costs and interest expense, if any. Our share of net cost is reported as cost of sales as the related TiO<sub>2</sub> acquired from LPC is sold. We report

distributions we receive from LPC, which generally relate to excess cash generated by LPC from its non-cash production costs, and contributions we make to LPC, which generally relate to cash required by LPC when it builds working capital, as part of our cash flows from operating activities in our Consolidated Statements of Cash Flows. The components of our net distributions from LPC are shown in the table below.

F-14

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	Years ended December 31,		
	2014	2015	2016
	(In millions)		
Distributions from LPC	\$48.0	\$48.2	\$35.0
Contributions to LPC	(37.4)	(41.7)	(31.4)
Net distributions	\$10.6	\$6.5	\$3.6

Summary balance sheets of LPC are shown below:

	December 31,	
	2015	2016
	(In millions)	
<b>ASSETS</b>		
Current assets	\$96.2	\$94.5
Property and equipment, net	110.1	111.6
Total assets	\$206.3	\$206.1
<b>LIABILITIES AND PARTNERS' EQUITY</b>		
Other liabilities, primarily current	\$37.8	\$45.2
Partners' equity	168.5	160.9
Total liabilities and partners' equity	\$206.3	\$206.1

Summary income statements of LPC are shown below:

	Years ended December 31,		
	2014	2015	2016
	(In millions)		
<b>Revenues and other income:</b>			
Kronos	\$193.1	\$176.5	\$157.9
HPA	193.8	162.5	157.5
Total revenues and other income	386.9	339.0	315.4
<b>Cost and expenses:</b>			
Cost of sales	386.4	338.5	314.9
General and administrative	.5	.5	.5
Total costs and expenses	386.9	339.0	315.4
Net income	\$-	\$-	\$-

Note 6 – Marketable securities:

Our marketable securities consist of investments in the publicly-traded shares of related parties: Valhi, NL and CompX International Inc. NL owns the majority of CompX's outstanding common stock. All of our marketable securities are accounted for as available-for-sale securities, which are carried at fair value using quoted market prices in active markets for each marketable security and represent a Level 1 input within the fair value hierarchy. See Note 18. Because we have classified all of our marketable securities as available-for-sale, any unrealized gains or losses on the securities are recognized through other comprehensive income, net of deferred income taxes.



Marketable security	Fair value measurement level	MarkeCost Unrealized		
		value	basis	gain (loss)
(In millions)				
December 31, 2015:				
Valhi common stock	1	\$2.3	\$3.2	\$ (.9 )
NL and CompX common stocks	1	.1	.1	-
Total		\$2.4	\$3.3	\$ (.9 )
December 31, 2016:				
Valhi common stock	1	\$5.9	\$3.2	\$ 2.7
NL and CompX common stocks	1	.1	.1	-
Total		\$6.0	\$3.3	\$ 2.7

At December 31, 2015 and 2016, we held approximately 1.7 million shares of Valhi's common stock. We also held a nominal number of shares of CompX and NL common stocks. At December 31, 2015 and 2016, the quoted per share market price of Valhi's common stock was \$1.34 and \$3.46, respectively.

The Valhi, CompX and NL common stocks we own are subject to the restrictions on resale pursuant to certain provisions of the Securities and Exchange Commission (SEC) Rule 144. In addition, as a majority-owned subsidiary of Valhi we cannot vote our shares of Valhi common stock under Delaware General Corporation Law, but we do receive dividends from Valhi on these shares, when declared and paid.

Securities transactions in 2015 includes a third-quarter aggregate \$12.0 million pre-tax other than temporary impairment charge to write down the cost basis of our investment in the 1.7 million shares of Valhi's common stock to its aggregate market value at September 30, 2015.

Note 7 – Other noncurrent assets:

	December 31, 2015 2016	
	(In millions)	
Pension asset	\$ .4	\$ .6
Deferred financing costs, net	1.0	.4
Other	1.7	1.2
Total	\$3.1	\$2.2

Note 8 – Long-term debt:

	December 31, 2015 2016	
	(In millions)	
Term loan	\$338.0	\$335.9

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Other	3.0	3.1
Total debt	341.0	339.0
Less current maturities	3.8	3.6
Total long-term debt	\$337.2	\$335.4

F-16

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Term loan – In February 2014, we entered into a new \$350 million term loan. The term loan was issued at 99.5% of the principal amount, or an aggregate of \$348.3 million. We used \$170 million of the net proceeds of the term loan to prepay the outstanding principal balance of our note payable to Contran (along with accrued and unpaid interest through the prepayment date) and such note payable was cancelled. The remaining net proceeds of the term loan were available for our general corporate purposes. The term loan, as amended in May 2015:

- bears interest, at our option, at LIBOR (with LIBOR no less than 1.0%) plus 3.00%, or the base rate, as defined in the agreement, plus 2.00%;

- requires quarterly principal repayments of \$875,000 which commenced in June 2014, other mandatory principal repayments of formula-determined amounts under specified conditions with all remaining principal balance due in February 2020. Voluntary principal prepayments are permitted at any time;

- 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) to us;

- is also collateralized by a second priority lien on all of the U.S. assets which collateralize our North American revolving facility, as discussed below;

- contains 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 (however, there are no ongoing financial maintenance covenants); and

- contains customary default provisions, including a default under any of our other indebtedness in excess of \$50 million.

Prior to the May 2015 amendment to the term loan, the applicable margin on outstanding LIBOR-based borrowings was 3.75% and the applicable margin on outstanding base rate borrowings was 2.75%. All other terms of the term loan, including principal repayments, maturity and collateral remain unchanged. We accounted for such amendment to our term loan as a modification of the terms of the term loan. We paid a \$750,000 refinancing fee in connection with this amendment, which along with the existing unamortized deferred financing costs associated with the term loan are being amortized over the remaining term of the loan.

The average interest rate on the term loan borrowings was 4.0% as of and for the year ended December 31, 2016. The carrying value of the term loan at December 31, 2016 is stated net of unamortized original issue discount of \$.9 million and debt issuance costs of \$3.6 million (December 31, 2015 - \$1.2 million and \$4.7 million).

See Note 18 for a discussion of the interest rate swap we entered into in the third quarter of 2015 pursuant to our interest rate risk management strategy.

#### Revolving credit facilities

Revolving North American credit facility – In June 2012, we entered into a \$125 million revolving bank credit facility. As amended in January 2017, the facility matures the earlier of (i) January 30, 2022 or (ii) 90 days prior to the maturity date of our term loan (or the maturity date of any new term loan constituting a permitted refinancing of the existing term loan). Based on the February 2020 maturity date of our existing term loan, the maturity date of the North American credit facility is currently November 2019. Borrowings under the revolving credit facility are available for our general corporate purposes. Available borrowings on this facility are based on formula-determined amounts of eligible trade receivables and inventories, as defined in the agreement, of certain of our North American subsidiaries less any outstanding letters of credit up to \$15 million issued under the facility (with revolving borrowings by our Canadian subsidiary limited to \$25 million). Any amounts outstanding under the revolving credit

facility bear interest, at our option, at LIBOR plus a margin ranging from 1.5% to 2.0% or at the applicable base rate, as defined in the agreement, plus a margin ranging from .5% to 1.0%. The credit facility is collateralized by, among other things, a first priority lien on the borrowers' trade receivables and inventories. The facility contains a number of covenants and restrictions which, among other things, restricts the borrowers' ability to

F-17

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incur additional debt, incur liens, pay dividends or merge or consolidate with, or sell or transfer all or substantially all of their assets to, another entity, contains other provisions and restrictive covenants customary in lending transactions of this type and under certain conditions requires the maintenance of a specified financial covenant (fixed charge coverage ratio, as defined) to be at least 1.1 to 1.0. We had no borrowings or repayments under this facility during 2015. During 2016, we borrowed \$266.2 million and repaid \$266.2 million under this facility. At December 31, 2016 we had approximately \$74.8 million available for borrowing under this revolving facility.

Revolving European credit facility – Our operating subsidiaries in Germany, Belgium, Norway and Denmark have a €120 million secured revolving bank credit facility that matures in September 2017. We expect to extend the maturity date of this facility on or prior to its maturity date. We may denominate borrowings in euros, Norwegian kroner or U.S. dollars. Outstanding borrowings bear interest at LIBOR plus 1.90%. The facility is collateralized by the accounts receivable and inventories of the borrowers, plus a limited pledge of all of the other assets of the Belgian borrower. The facility contains certain restrictive covenants that, among other things, restrict the ability of the borrowers to incur debt, incur liens, pay dividends or merge or consolidate with, or sell or transfer all or substantially all of the assets to, another entity, and requires the maintenance of certain financial ratios. In addition, the credit facility contains customary cross-default provisions with respect to other debt and obligations of the borrowers, KII and its other subsidiaries.

We had no borrowings or repayments under this facility during 2015 and 2016 and at December 31, 2016, there were no outstanding borrowings under this facility. Our European revolving credit facility requires the maintenance of certain financial ratios, and one of such requirements is based on the ratio of net debt to last twelve months earnings before income tax, interest, depreciation and amortization expense (EBITDA) of the borrowers. Based upon the borrowers' last twelve months EBITDA as of December 31, 2016 and the net debt to EBITDA financial test, our borrowing availability at December 31, 2016 is approximately 47% of the credit facility, or €55.8 million (\$58.5 million).

Aggregate maturities and other – Aggregate maturities of debt at December 31, 2016 are presented in the table below.

Year ending December 31,	Amount (In millions)
2017	\$ 3.6
2018	4.1
2019	4.2
2020	330.6
2021	.7
2022 and thereafter	.3
Gross maturities	343.5
Less original issue discount and debt issuance costs	4.5
Total	\$ 339.0

We are in compliance with all of our debt covenants at December 31, 2016.

Note 9 – Accounts payable and accrued liabilities:

	December 31,	
	2015	2016
	(In millions)	
Accounts payable	\$96.1	\$84.9
Accrued sales discounts and rebates	18.9	20.9
Employee benefits	14.2	17.7
Reserve for uncertain tax positions	-	3.3
Interest rate swap contract	3.3	2.9
Accrued workforce reduction costs	5.3	1.2
Other	34.9	27.9
Total	\$172.7	\$158.8

See Note 18 for a discussion of the interest rate swap contract, and Note 13 for a discussion on accrued workforce reduction costs.

Note 10 – Employee benefit plans:

Defined contribution plans – We maintain various defined contribution pension plans with our contributions based on matching or other formulas. Defined contribution plan expense approximated \$2.6 million in 2014, \$2.7 million in 2015 and \$2.8 million in 2016.

Accounting for defined benefit and postretirement benefits other than pensions (OPEB) plans – We recognize an asset or liability for the over or under funded status of each of our individual defined benefit pension plans on our Consolidated Balance Sheets. Changes in the funded status of these plans are recognized either in net income (loss), to the extent they are reflected in periodic benefit cost, or through other comprehensive income (loss).

Defined benefit plans – We sponsor various defined benefit pension plans. Certain non-U.S. employees are covered by plans in their respective countries. Our U.S. plan was closed to new participants in 1996, and existing participants no longer accrued any additional benefits after that date. The benefits under our plans are based upon years of service and employee compensation. Our funding policy is to contribute annually the minimum amount required under ERISA (or equivalent non-U.S.) regulations plus additional amounts as we deem appropriate.

We expect to contribute the equivalent of approximately \$14.8 million to all of our defined benefit pension plans during 2017. Benefit payments to plan participants out of plan assets are expected to be the equivalent of:

Years ending December 31,	Amount (In millions)
2017	\$ 20.1
2018	20.4
2019	20.9
2020	22.1
2021	22.6
Next 5 years	124.4



The funded status of our non-U.S. defined benefit pension plans is presented in the table below.

	December 31,	
	2015	2016
	(In millions)	
<b>Change in projected benefit obligations (PBO):</b>		
Benefit obligations at beginning of the year	\$648.4	\$569.7
Service cost	11.2	9.9
Interest cost	14.6	14.7
Participant contributions	1.6	1.5
Actuarial losses (gains)	(8.7 )	33.7
Change in currency exchange rates	(76.4 )	(15.0 )
Benefits paid	(21.0 )	(20.4 )
Benefit obligations at end of the year	569.7	594.1
<b>Change in plan assets:</b>		
Fair value of plan assets at beginning of the year	414.8	372.0
Actual return on plan assets	10.6	10.0
Employer contributions	17.1	15.3
Participant contributions	1.6	1.5
Change in currency exchange rates	(51.1 )	(6.9 )
Benefits paid	(21.0 )	(20.4 )
Fair value of plan assets at end of year	372.0	371.5
Funded status	\$(197.7)	\$(222.6)
<b>Amounts recognized in the balance sheet:</b>		
Noncurrent pension asset	\$.4	\$.6
Noncurrent accrued pension costs	(198.1)	(223.2)
Total	\$(197.7)	\$(222.6)
<b>Accumulated other comprehensive loss:</b>		
Actuarial losses	\$230.6	\$257.5
Prior service cost	1.9	1.6
Total	\$232.5	\$259.1
Accumulated benefit obligations (ABO)	\$545.2	\$569.5

The components of our net periodic defined benefit pension cost for our non-U.S. defined benefit pension plans are presented in the table below. The amounts shown below for the amortization of prior service cost, net transition obligations and recognized actuarial losses for 2014, 2015 and 2016 were recognized as components of our accumulated other comprehensive income (loss) at December 31, 2013, 2014 and 2015, respectively, net of deferred income taxes.

	Years ended December 31,		
	2014	2015	2016
	(In millions)		
Net periodic pension cost:			
Service cost benefits	\$9.9	\$11.2	\$9.9
Interest cost on PBO	21.7	14.6	14.7
Expected return on plan assets	(20.0)	(16.6)	(14.4)
Settlement gain	(.3 )	-	-
Recognized actuarial losses	10.0	13.6	11.3
Amortization of prior service cost	.5	.4	.2
Amortization of net transition obligations	.1	-	-
Total	\$21.9	\$23.2	\$21.7

Information concerning certain of our non-U.S. defined benefit pension plans (for which the ABO exceeds the fair value of plan assets as of the indicated date) is presented in the table below.

	December 31,	
	2015	2016
	(In millions)	
Plans for which the ABO exceeds plan assets:		
PBO	\$518.1	\$541.5
ABO	498.7	521.8
Fair value of plan assets	321.6	319.5

The weighted-average rate assumptions used in determining the actuarial present value of benefit obligations for our non-U.S. defined benefit pension plans as of December 31, 2015 and 2016 are presented in the table below.

	December 31,	
Rate	2015	2016
Discount rate	2.6%	2.1%
Increase in future compensation levels	2.9%	2.6%

The weighted-average rate assumptions used in determining the net periodic pension cost for our non-U.S. defined benefit pension plans for 2014, 2015 and 2016 are presented in the table below.

	Years ended December 31,		
Rate	2014	2015	2016
Discount rate	3.8%	2.5%	2.6%

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Increase in future compensation levels	2.7%	2.6%	2.9%
Long-term return on plan assets	5.0%	4.6%	3.9%

Variances from actuarially assumed rates will result in increases or decreases in accumulated pension obligations, pension expense and funding requirements in future periods.

F-21

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The funded status of our U.S. defined benefit pension plan is presented in the table below.

	December 31,	
	2015	2016
	(In millions)	
Change in PBO:		
Benefit obligations at beginning of the year	\$19.8	\$18.6
Interest cost	.8	.8
Actuarial gains	(1.0)	(.6)
Benefits paid	(1.0)	(1.0)
Benefit obligations at end of the year	18.6	17.8
Change in plan assets:		
Fair value of plan assets at beginning of the year	15.5	13.9
Actual return (loss) on plan assets	(.7)	.5
Employer contributions	.1	.2
Benefits paid	(1.0)	(1.0)
Fair value of plan assets at end of year	13.9	13.6
Funded status	\$(4.7)	\$(4.2)
Amounts recognized in the balance sheet:		
Accrued pension costs:		
Current	\$(.1)	\$(.1)
Noncurrent	(4.6)	(4.1)
Total	\$(4.7)	\$(4.2)
Accumulated other comprehensive loss - actuarial losses	\$11.6	\$11.0
ABO	\$18.6	\$17.8

The components of our net periodic defined benefit pension cost for our U.S. defined benefit pension plan is presented in the table below. The amounts shown below for recognized actuarial losses for 2014, 2015 and 2016 were recognized as components of our accumulated other comprehensive income (loss) at December 31, 2013, 2014 and 2015 respectively, net of deferred income taxes.

	Years ended		
	December 31,		
	2014	2015	2016
	(In millions)		
Net periodic pension cost (income):			
Interest cost on PBO	\$ .8	\$ .8	\$ .8
Expected return on plan assets	(1.2)	(1.1)	(1.0)
Recognized actuarial losses	.3	.5	.5
Total	\$(.1)	\$.2	\$.3

The discount rate assumptions used in determining the actuarial present value of the benefit obligation for our U.S. defined benefit pension plan as of December 31, 2015 and 2016 are 4.1% and 3.9%, respectively. The impact of assumed increases in future compensation levels does not have an effect on the benefit obligation as the plan is frozen with regards to compensation.



The weighted-average rate assumptions used in determining the net periodic pension cost for our U.S. defined benefit pension plan for 2014, 2015 and 2016 are presented in the table below. The impact of assumed increases in future compensation levels also does not have an effect on the periodic pension cost as the plan is frozen with regards to compensation.

Rate	Years ended December 31,		
	2014	2015	2016
Discount rate	4.5%	3.8%	4.1%
Long-term return on plan assets	7.5%	7.5%	7.5%

Variances from actuarially assumed rates will result in increases or decreases in accumulated pension obligations, pension expense and funding requirements in future periods.

The amounts shown in the above tables for actuarial losses and prior service cost at December 31, 2015 and 2016 have not yet been recognized as components of our periodic defined benefit pension cost as of those dates. These amounts will be recognized as components of our periodic defined benefit cost in future years and are recognized, net of deferred income taxes, in our accumulated other comprehensive income (loss) at December 2015 and 2016. We expect approximately \$12.8 million and \$.2 million of the unrecognized actuarial losses and prior service costs, respectively, will be recognized as components of our consolidated net periodic defined benefit pension cost in 2017.

The table below details the changes in our consolidated other comprehensive income (loss) during 2014, 2015 and 2016.

	Years ended December 31,		
	2014	2015	2016
Changes in plan assets and benefit obligations			
recognized in other comprehensive income (loss):			
Current year:			
Net actuarial gain (loss)	\$(103.9)	\$2.7	\$(38.0)
Settlements	(.3)	-	-
Amortization of unrecognized:			
Net actuarial losses	10.3	14.1	11.8
Prior service cost	.5	.4	.2
Net transition obligations	.1	-	-
Total	\$(93.3)	\$17.2	\$(26.0)

At December 31, 2015 and 2016, substantially all of the assets attributable to our U.S. plan were invested in the Combined Master Retirement Trust (CMRT), a collective investment trust sponsored by Contran to permit the collective investment by certain master trusts that fund certain employee benefits plans sponsored by Contran and certain of its affiliates. For 2014, 2015 and 2016, the long-term rate of return assumption for plan assets invested in the CMRT was 7.5%, based on the long-term asset mix of the assets of the CMRT and the expected long-term rates of

return for such asset components as well as advice from Contran's actuaries.

The CMRT unit value is determined semi-monthly, and the plans have the ability to redeem all or any portion of their investment in the CMRT at any time based on the most recent semi-monthly valuation. However, the plans do not have the right to individual assets held by the CMRT and the CMRT has the sole discretion in determining how to meet any redemption request. For purposes of our plan asset disclosure, we consider the investment in the CMRT as a Level 2 input because (i) the CMRT value is established semi-monthly and the plans have the right to redeem their investment in the CMRT, in part or in whole, at any time based on the most recent value and (ii) observable inputs from Level 1 or Level 2 (or assets not subject to classification in the fair value hierarchy) were used to value approximately 91% and 92% of the assets of the CMRT at December 31, 2015 and 2016, respectively, as noted below. CMRT assets not subject to classification in the fair value hierarchy consist

F-23

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principally of certain investments measured at net asset value per share in accordance with ASC 820-10. The aggregate fair value of all of the CMRT assets, including funds of Contran and its other affiliates that also invest in the CMRT, and supplemental asset mix details of the CMRT are as follows:

	December 31,			
	2015		2016	
	(In millions)			
CMRT asset value	\$648.8		\$637.8	
CMRT assets comprised of:				
Assets not subject to fair value hierarchy	30	%	30	%
Assets subject to fair value hierarchy:				
Level 1	54		54	
Level 2	7		8	
Level 3	9		8	
	100	%	100	%
CMRT asset mix:				
Domestic equities, principally publicly traded	29	%	31	%
International equities, principally publicly traded	22		22	
Fixed income securities, principally publicly traded	38		36	
Privately managed limited partnerships	5		5	
Hedge funds	5		5	
Other, primarily cash	1		1	
	100	%	100	%

In determining the expected long-term rate of return on non-U.S. 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. Such assumed asset mixes are summarized below:

In Germany, the composition of our plan assets is established to satisfy the requirements of the German insurance commissioner. Our German pension plan assets represent an investment in a large collective investment fund established and maintained by Bayer AG in which several pension plans, including our German pension plan and Bayer's pension plans, have invested. Our plan assets represent a very nominal portion of the total collective investment fund maintained by Bayer. These plan assets are a Level 3 input because there is not an active market that approximates the value of our investment in the Bayer investment fund. We determine the fair value of the Bayer plan assets based on periodic reports we receive from the managers of the Bayer plan. These periodic reports are subject to audit by the German pension regulator.

In Canada, we currently have a plan asset target allocation of 35% to equity securities and 65% to fixed income securities. We expect the long-term rate of return for such investments to average approximately 125 basis points above the applicable equity or fixed income index. The Canadian assets are Level 1 inputs because they are traded in active markets.

In Norway, we currently have a plan asset target allocation of 11% to equity securities, 79% to fixed income securities, 7% to real estate and the remainder primarily to other investments and liquid investments such as money markets. The expected long-term rate of return for such investments is approximately 7%, 3%, 5% and 7%, respectively. The majority of Norwegian plan assets are Level 1 inputs because they are traded in active markets; however approximately 11% of our Norwegian plan assets are invested in real estate and other investments not actively traded and are therefore a Level 3 input.



•We also have plan assets in Belgium and the United Kingdom. The Belgian plan assets are invested in certain individualized fixed income insurance contracts for the benefit of each plan participant as required by the local regulators and are therefore a Level 3 input. The United Kingdom plan assets consist of marketable securities which are Level 1 inputs because they trade in active markets.

We regularly review our actual asset allocation for each plan, and will periodically rebalance the investments in each plan to more accurately reflect the targeted allocation and/or maximize the overall long-term return when considered appropriate.

The composition of our December 31, 2015 and 2016 pension plan assets by asset category and fair value level is shown in the table below.

	Fair Value Measurements at December 31, 2015			
	Total (In millions)	Quoted prices in active markets (Level 1)	Significant other observable inputs (Level 2)	Significant unobservable inputs (Level 3)
Germany	\$223.1	\$ -	\$ -	\$ 223.1
Canada:				
Local currency equities	9.6	9.6	-	-
Non local currency equities	23.3	23.3	-	-
Local currency fixed income	50.6	50.6	-	-
Global mutual fund	6.8	6.8	-	-
Cash and other	.5	.5	-	-
Norway:				
Local currency equities	2.0	2.0	-	-
Non local currency equities	3.6	3.6	-	-
Local currency fixed income	24.5	24.5	-	-
Non local currency fixed income	4.7	4.7	-	-
Real estate	4.2	-	-	4.2
Cash and other	7.9	6.7	-	1.2
U.S.				
CMRT	13.9	-	13.9	-
Other	11.2	3.5	-	7.7
Total	\$385.9	\$135.8	\$ 13.9	\$ 236.2

Fair Value Measurements at December 31, 2016				
	Total	Quoted prices in active markets (Level 1)	Significant other observable inputs (Level 2)	Significant unobservable inputs (Level 3)
	(In millions)			
Germany	\$217.0	\$ -	\$ -	\$ 217.0
Canada:				
Local currency equities	14.8	14.8	-	-
Non local currency equities	19.7	19.7	-	-
Local currency fixed income	59.5	59.5	-	-
Cash and other	.4	.4	-	-
Norway:				
Local currency equities	1.6	1.6	-	-
Non local currency equities	4.1	4.1	-	-
Local currency fixed income	23.2	23.2	-	-
Non local currency fixed income	5.4	5.4	-	-
Real estate	4.2	-	-	4.2
Cash and other	9.9	8.8	-	1.1
U.S.				
CMRT	13.7	-	13.7	-
Other	11.7	3.5	-	8.2
Total	\$385.2	\$141.0	\$ 13.7	\$ 230.5

A rollforward of the change in fair value of Level 3 assets follows.

	December 31,	
	2015	2016
	(In millions)	
Fair value at beginning of year	\$254.1	\$236.2
Gain on assets held at end of year	6.5	4.1
Gain on assets sold during the year	.3	-
Assets purchased	13.7	13.1
Assets sold	(12.4)	(13.4)
Currency exchange rate fluctuations	(26.0)	(9.5)
Fair value at end of year	\$236.2	\$230.5

Postretirement benefits other than pensions (OPEB) – We provide certain health care and life insurance benefits for eligible Canadian and U.S. retired employees. Certain of our Canadian employees may become eligible for such postretirement health care and life insurance benefits if they reach retirement age while working for us. In the U.S., employees who retired after 1998 are not entitled to any such benefits. The majority of all retirees are required to contribute a portion of the cost of their benefits and certain current and future retirees are eligible for reduced health care benefits at age 65. We have no OPEB plan assets, rather, we fund medical claims as they are paid. Contributions to our OPEB plans to cover benefit payments are expected to be the equivalent of:

Years ending December 31,	Amount (In millions)
2017	\$ .4
2018	.4
2019	.4
2020	.4
2021	.4
Next 5 years	2.2

The funded status of our OPEB plans is presented in the table below:

	December 31, 2015 2016 (In millions)	
<b>Change in accumulated OPEB obligations:</b>		
Obligations at beginning of the year	\$8.5	\$7.0
Service cost	.1	.1
Interest cost	.3	.3
Actuarial gains	(.2 )	(.1 )
Change in currency exchange rates	(1.3)	.2
Benefits paid from employer contributions	(.4 )	(.3 )
Obligations at end of the year	7.0	7.2
Fair value of plan assets	-	-
Funded status	\$(7.0)	\$(7.2)
<b>Amounts recognized in the balance sheet:</b>		
Current accrued OPEB costs	\$(.3 )	\$(.3 )
Noncurrent accrued OPEB costs	(6.7)	(6.9)
Total	\$(7.0)	\$(7.2)
<b>Accumulated other comprehensive income:</b>		
Net actuarial losses	\$3.1	\$2.9
Prior service credit	(6.2)	(5.5)
Total	\$(3.1)	\$(2.6)

The amounts shown in the table above for net actuarial losses and prior service credit at December 31, 2015 and 2016 have not yet been recognized as components of our periodic OPEB cost as of those dates. These amounts will be

recognized as components of our periodic OPEB cost in future years and are recognized, net of deferred income taxes, in our accumulated other comprehensive income (loss). We expect to recognize approximately \$.2 million of unrecognized actuarial losses and \$.6 million of prior service credit as components of our periodic OPEB cost in 2017.

F-27

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At December 31, 2016, the accumulated OPEB obligations for all OPEB plans comprised \$.5 million related to U.S. plans and \$6.7 million related to our Canadian plan (in 2015 the amounts were \$.6 million and \$6.4 million, respectively).

The components of our periodic OPEB costs are presented in the table below. The amounts shown below for amortization of prior service credit and recognized actuarial losses for 2014, 2015 and 2016 were recognized as components of our accumulated other comprehensive income (loss) at December 31, 2013, 2014 and 2015, respectively, net of deferred income taxes.

	Years ended December 31, 2014 2015 2016 (In millions)		
<b>Net periodic OPEB cost (benefit):</b>			
Service cost	\$ .1	\$ .1	\$ .1
Interest cost	.4	.3	.3
Amortization of prior service credit	(.9)	(.8)	(.8)
Recognized actuarial losses	.2	.3	.2
Total	\$(.2)	\$(.1)	\$(.2)

The table below details the changes in benefit obligations recognized in accumulated other comprehensive income (loss) during 2014, 2015 and 2016.

	Years ended December 31, 2014 2015 2016 (In millions)		
<b>Changes in benefit obligations recognized</b>			
<b>in other comprehensive income (loss):</b>			
<b>Current year:</b>			
Net actuarial gain (loss)	\$(.8)	\$.2	\$.1
<b>Amortization of unrecognized:</b>			
Net actuarial loss	.2	.3	.2
Prior service cost	(.9)	(.8)	(.8)
Total	\$(1.5)	\$(.3)	\$(.5)

A summary of our key actuarial assumptions used to determine the net benefit obligation as of December 31, 2015 and 2016 are presented in the table below. The weighted average discount rate was determined using the projected benefit obligation as of such dates. The impact of assumed increases in future compensation levels does not have a material effect on the actuarial present value of the benefit obligation as substantially all of such benefits relate solely to eligible retirees, for which compensation is not applicable.

	2015	2016
<b>Healthcare inflation:</b>		
Initial rate	7.0%	7.0%
Ultimate rate	5.0%	5.0%

Year of ultimate rate achievement	2021	2021
Weighted average discount rate	3.9%	3.5%

Assumed health care cost trend rates affect the amounts we report for health care plans. A one percent change in assumed health care trend rates would not have a material effect on the net periodic OPEB cost for 2016 or on the accumulated OPEB obligation at December 31, 2016.

F-28

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The weighted average discount rate used in determining the net periodic OPEB cost for 2016 was 3.9% (2015 – 3.7%; 2014 – 4.6%). Such weighted average rate was determined using the projected benefit obligation as of the beginning of each year. The impact of assumed increases in future compensation levels does not have a material effect on the net periodic OPEB cost as substantially all of such benefits relate solely to eligible retirees, for which compensation is not applicable. The impact of the assumed rate of return on plan assets also does not have a material effect on the net periodic OPEB cost as there were no plan assets as of December 31, 2015 or 2016.

Variances from actuarially-assumed rates will result in additional increases or decreases in accumulated OPEB obligations, net periodic OPEB cost and funding requirements in future periods.

Note 11 – Other noncurrent liabilities:

	December 31, 2015 2016 (In millions)	
Reserve for uncertain tax positions	\$11.8	\$7.3
Employee benefits	7.5	7.8
Interest rate swap contract	.2	.2
Other	4.9	7.1
Total	\$24.4	\$22.4

See Note 18 for a discussion on the interest rate swap contract.

Note 12 – Other operating income (expense), net:

Other operating income (expense), net in 2016 includes income of \$3.4 million, recognized in the first and second quarters, related to cash received from settlement of a business interruption insurance claim arising in 2014 and income of \$.9 million recognized in the fourth quarter of 2016 related to cash received from settlement of another business interruption insurance claim arising in 2015. No additional material amounts are expected to be received with respect to such insurance claims.

Note 13 – Restructuring costs:

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 is 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. A substantial portion of such workforce reductions were accomplished through voluntary programs, for which eligible workforce reduction costs are recognized at the time both the employee and employer are irrevocably committed to the terms of the separation. For involuntary programs, eligible costs are recognized when management approves the separation program, the affected employees are properly notified and the costs are estimable. To the extent there is a statutorily-mandated notice period and the affected employee is not required to provide services to us during such notice period, severance and all wages during such notice period are accrued at the time of separation. To the extent the affected employee is required to provide services to us during all or a portion of such notice period, the severance (and if applicable notice period wages for any period beyond the time the affected employee is required to provide future services to us) is accrued ratably over the period in which services will be provided. As of December 31, 2015 we had recognized an aggregate \$21.7 million charge for such workforce reductions we had implemented through that date (substantially all of which was recognized in the

second quarter of 2015), \$10.8 million of which is classified in cost of sales and \$10.9 million of which is classified in selling, general and administrative expense. For workforce reductions implemented through December 31, 2015, we do not expect to accrue any further material amounts associated with the affected individuals who are providing service to us past December 31, 2015. Substantially all of the accrued severance costs at December 31, 2016 are expected to be paid in the first quarter of 2017.

F-29

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The table below presents a summary of the activity in our accrued workforce reduction costs during 2015 and 2016:

	Years ended December 31, 2015 2016 (In millions)	
Balance at beginning of the year	\$-	\$5.6
Workforce reduction costs accrued	21.7	-
Workforce reduction costs paid	(15.9)	(4.1)
Currency translation adjustments, net	(.2 )	(.1 )
Balance at end of the year	\$5.6	\$1.4
Amounts recognized in the balance sheet:		
Current liability	\$5.3	\$1.2
Noncurrent liability	.3	.2
	\$5.6	\$1.4

Note 14 - Income taxes:

	Years ended December 31, 2014 2015 2016 (In millions)		
Pre-tax income (loss):			
U.S.	\$59.2	\$5.5	\$11.5
Non-U.S.	74.5	(36.3 )	49.7
Total	\$133.7	\$(30.8 )	\$61.2
Expected tax expense (benefit), at U.S. federal statutory income tax rate of 35%	\$46.8	\$(10.8 )	\$21.4
Non-U.S. tax rates	(4.2 )	.5	(4.3 )
Incremental net tax (benefit) on earnings and losses of non-U.S. companies	(3.7 )	(8.7 )	2.2
Valuation allowance	-	159.0	(2.2 )
U.S. - Canada APA	-	-	(3.4 )
Adjustment to the reserve for uncertain tax positions, net	(5.1 )	.7	2.4
Nondeductible expenses	1.9	2.1	1.5
U.S. state income taxes and other, net	(1.2 )	-	.3
Provision for income taxes	\$34.5	\$142.8	\$17.9
Components of income tax expense:			
Currently payable:			
U.S. federal and state	\$1.9	\$ .3	\$-
Non-U.S.	15.2	3.3	9.5

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	17.1	3.6	9.5
Deferred income taxes (benefit):			
U.S. federal and state	10.0	(6.4 )	4.3
Non-U.S.	7.4	145.6	4.1
	17.4	139.2	8.4
Provision for income taxes	\$34.5	\$142.8	\$17.9

F-30

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	Years ended December 31,		
	2014	2015	2016
	(In millions)		
Comprehensive provision for income taxes (benefit)			
allocable to:			
Net income	\$34.5	\$142.8	\$17.9
Other comprehensive income (loss):			
Currency translation	(16.9)	-	-
Marketable securities	(6.7 )	1.1	1.3
Pension plans	(30.1)	1.5	(.8 )
OPEB plans	(.4 )	(.1 )	(.2 )
Interest rate swap	-	(1.3 )	.2
Total	\$(19.6)	\$144.0	\$18.4

The amount shown in the above table of our income tax rate reconciliation for non-U.S. tax rates represents the result determined by multiplying the pre-tax earnings or losses of each of our non-U.S. subsidiaries by the difference between the applicable statutory income tax rate for each non-U.S. jurisdiction and the U.S. federal statutory tax rate of 35%. The amount shown on such table for incremental net tax expense (benefit) on earnings and losses on non-U.S. companies includes, as applicable, (i) current income taxes (including withholding taxes, if applicable), if any, associated with any current-year earnings of our non-U.S. subsidiaries to the extent such current-year earnings were distributed to us in the current year, (ii) deferred income taxes (or deferred income tax benefit) associated with the current-year change in the aggregate amount of undistributed earnings of our Canadian subsidiary, which earnings are not subject to a permanent reinvestment plan, in an amount representing the current-year change in the aggregate current income tax that would be generated (including withholding taxes, if applicable) when such aggregate undistributed earnings are distributed to us, and (iii) current U.S. income taxes (or current income tax benefit), including U.S. personal holding company tax, as applicable, attributable to current-year income (losses) of one of our non-U.S. subsidiaries, which subsidiary is treated as a dual resident for U.S. income tax purposes, to the extent the current-year income (losses) of such subsidiary is subject to U.S. income tax under the U.S. dual-resident provisions of the Internal Revenue Code.

The components of our net deferred income taxes at December 31, 2015 and 2016 are summarized in the following table.

	December 31,			
	2015		2016	
	Assets	Liabilities	Assets	Liabilities
	(In millions)			
Tax effect of temporary differences related to:				
Inventories	\$3.2	\$ (3.5 )	\$3.7	\$ (3.7 )
Property and equipment	-	(59.3 )	-	(58.1 )
Accrued OPEB costs	2.0	-	2.0	-
Accrued pension cost	39.4	-	48.3	-
Currency revaluation on intercompany debt	18.6	-	24.0	-
Other accrued liabilities and deductible differences	19.4	-	12.6	-

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Other taxable differences	-	(.5 )	-	(.4 )
Tax on unremitted earnings of non-U.S. subsidiaries	-	(1.9 )	-	(2.9 )
Tax loss and tax credit carryforwards	157.4	-	145.5	-
Valuation allowance	(168.9)	-	(173.4)	-
Adjusted gross deferred tax assets (liabilities)	71.1	(65.2 )	62.7	(65.1 )
Netting by tax jurisdiction	(57.1 )	57.1	(54.6 )	54.6
Net noncurrent deferred tax asset (liability)	\$ 14.0	\$ (8.1 )	\$ 8.1	\$ (10.5 )

F-31

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We have substantial net operating loss (NOL) carryforwards in Germany (the equivalent of \$638 million and \$71 million for German corporate and 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 recognized 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 expect 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, 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. Such valuation allowance aggregated \$150.3 million at June 30, 2015. We recognized an additional \$8.7 million non-cash deferred income tax asset valuation allowance under the more-likely-than-not recognition criteria during the third and fourth quarters of 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. In addition to the aggregate \$159.0 million increase and \$2.2 million decrease in the deferred income tax asset valuation allowance recognized as part of the provision for income taxes in 2015 and 2016, respectively, the deferred income tax asset valuation allowance also increased by an aggregate of \$9.8 million in 2015 and \$6.7 million in 2016 due to amounts recognized in other comprehensive income.

Tax authorities are examining certain of our U.S. and non-U.S. tax returns and have or may propose tax deficiencies, including penalties and interest. Because of the inherent uncertainties involved in settlement initiatives and court and tax proceedings, we cannot guarantee that these tax matters will be resolved in our favor, and therefore our potential exposure, if any, is also uncertain.

In 2011 and 2012 we received notices of re-assessment from the Canadian federal and provincial tax authorities related to the years 2002 through 2004. We objected to the re-assessments and believed the position was without merit. Accordingly, we appealed the re-assessments and in connection with such appeal we were required to post letters of credit aggregating Cdn. \$7.9 million. In 2014, the Appeals Division of the Canadian Revenue Authority ruled in our favor and reversed in their entirety such notices of re-assessment. As a result, we recognized a non-cash income tax benefit of \$3.0 million related to the release of a portion of our reserve for uncertain tax positions in 2014 related to the completion of this Canadian income tax audit. In addition, the related letters of credit have been cancelled.

Also during 2014, we recognized a non-cash income tax benefit of \$3.1 million related to the release of a portion of our reserve for uncertain tax positions in conjunction with the completion of an audit of our U.S. income tax return for 2009.

As a result of ongoing audits in certain jurisdictions, in 2008 we filed Advance Pricing Agreement Requests with the tax authorities in the U.S., Canada and Germany. These requests have been under review with the respective tax authorities since 2008 and prior to 2016, it was uncertain whether an agreement would be reached between the tax authorities and whether we would agree to execute and finalize such agreements. During 2016, Contran, as the ultimate parent of our U.S. Consolidated income tax group, executed and finalized an Advance Pricing Agreement with the U.S. Internal Revenue Service and our Canadian subsidiary executed and finalized an Advance Pricing Agreement with the Competent Authority for Canada (collectively, the “U.S.-Canada APA”) effective for tax years 2005 – 2015. Pursuant to the terms of the U.S.-Canada APA, the U.S. and Canadian tax authorities agreed to certain prior year changes to taxable income of our U.S. and Canadian subsidiaries. As a result of such agreed-upon changes, we recognized a \$3.4 million current U.S. income tax benefit in 2016. In addition, our Canadian subsidiary will incur a cash income tax payment of approximately CAD \$3 million (USD \$2.3 million) as a result of the U.S.-Canada APA, but such payment was fully offset by previously provided accruals (such USD \$2.3 million has not been paid as of December 31, 2016, and is classified as part of income taxes payable at such date). We currently expect the Advance Pricing Agreement between Canada and Germany (collectively, the “Canada-Germany APA”) to be executed and finalized within the next twelve months. We believe we have adequate accruals to cover any cash income tax payment which might result from the finalization of the Canada-Germany APA, and accordingly we do not expect the execution of such APA to have a material adverse effect on our consolidated financial position, results of operations or liquidity.

We believe we have adequate accruals for additional taxes and related interest expense which could ultimately result from tax examinations. We believe the ultimate disposition of tax examinations should not have a material adverse effect on our consolidated financial position, results of operations or liquidity.

We accrue interest and penalties on our uncertain tax positions as a component of our provision for income taxes. The amount of interest and penalties we accrued during 2014, 2015 and 2016 was not material, and at December 31, 2014, 2015 and 2016, we had \$2.8 million, \$2.3 million and \$2.5 million, respectively, accrued for interest and penalties for our uncertain tax positions.

The following table shows the changes in the amount of our uncertain tax positions (exclusive of the effect of interest and penalties discussed above) during 2014, 2015 and 2016:

	Years ended		
	December 31,		
	2014	2015	2016
	(In millions)		
Changes in unrecognized tax benefits:			
Unrecognized tax benefits at beginning of year	\$15.9	\$10.4	\$9.7
Net increase (decrease):			
Tax positions taken in prior periods	(5.4 )	(.3 )	(.1 )
Tax positions taken in current period	1.1	1.1	2.5
Lapse due to applicable statute of limitations	-	(.2 )	(.2 )
Settlements with taxing authorities	-	-	(2.3)
Change in currency exchange rates	(1.2 )	(1.3 )	.3
Unrecognized tax benefits at end of year	\$10.4	\$9.7	\$9.9

If our uncertain tax positions were recognized, a benefit of \$8.8 million, \$7.8 million and \$10.6 million would affect our effective income tax rates for 2014, 2015 and 2016 respectively. At December 31, 2016, we currently estimate that our unrecognized tax benefits may decrease by \$6.3 million excluding interest during the next twelve months related to certain adjustments to our prior year returns and the expiration of certain statutes of limitations.

F-33

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We and Contran file income tax returns in U.S. federal and various state and local jurisdictions. We also file income tax returns in various non-U.S. jurisdictions, principally in Germany, Canada, Belgium and Norway. Our U.S. income tax returns prior to 2013 are generally considered closed to examination by applicable tax authorities. Our non-U.S. income tax returns are generally considered closed to examination for years prior to 2012 for Germany, 2013 for Belgium, 2011 for Canada and 2007 for Norway.

Note 15 - Stockholders' equity:

Long-term incentive compensation plan – Prior to 2014, our board of directors adopted a new plan that would provide for the award of stock to our board of directors, and up to a maximum of 200,000 shares could be awarded. We awarded 8,000 shares in each of 2014 and 2015 and 13,500 shares in 2016 under this plan, and 163,500 shares are available for future award under this plan at December 31, 2016.

Stock repurchase program – Prior to 2014, 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 may repurchase our common stock from time to time as market conditions permit. The stock repurchase program does not include specific price targets or timetables and may be suspended at any time. Depending on market conditions, we may terminate the program prior to its completion. We would use cash on hand or other sources of liquidity to acquire the shares. Repurchased shares will be added to our treasury and cancelled. At December 31, 2016, 1,951,000 shares are available for repurchase under this authorization.

Accumulated other comprehensive loss - Changes in accumulated other comprehensive loss for 2014, 2015 and 2016 are presented in the table below.

	Years ended December 31,		
	2014	2015	2016
	(In millions)		
<b>Accumulated other comprehensive loss, net of tax:</b>			
<b>Currency translation:</b>			
Balance at beginning of year	\$(56.8 )	\$(159.8)	\$(252.0)
Other comprehensive loss	(103.0)	(92.2 )	(17.6 )
Balance at end of year	\$(159.8)	\$(252.0)	\$(269.6)
<b>Marketable securities:</b>			
Balance at beginning of year	\$10.8	\$(2.9 )	\$(.6 )
<b>Other comprehensive income (loss):</b>			
Unrealized gains (losses) arising during the year	(13.7 )	(6.5 )	2.4
<b>Less reclassification adjustment for amounts</b>			
included in realized loss	-	8.8	-
Balance at end of year	\$(2.9 )	\$(.6 )	\$1.8
<b>Defined benefit pension plans:</b>			
Balance at beginning of year	\$(109.4)	\$(175.4)	\$(159.2)
<b>Other comprehensive income (loss):</b>			
<b>Amortization of prior service cost and net</b>			
losses included in net periodic pension cost	7.2	10.0	8.5
Net actuarial gain (loss) arising during year	(73.2 )	6.2	(34.1 )
Balance at end of year	\$(175.4)	\$(159.2)	\$(184.8)
<b>OPEB plans:</b>			
Balance at beginning of year	\$3.4	\$2.3	\$2.1
<b>Other comprehensive (income) loss:</b>			
<b>Amortization of prior service credit and net</b>			
losses included in net periodic OPEB cost	(.5 )	(.4 )	(.4 )
Net actuarial gain (loss) arising during year	(.6 )	.2	.1
Balance at end of year	\$2.3	\$2.1	\$1.8
<b>Interest rate swap:</b>			
Balance at beginning of year	\$-	\$-	\$(2.3 )
<b>Other comprehensive loss:</b>			
Unrealized losses arising during the year	-	(2.9 )	(2.0 )
<b>Less reclassification adjustment</b>			
for amounts included in interest expense	-	.6	2.3
Balance at end of year	\$-	\$(2.3 )	\$(2.0 )
<b>Total accumulated other comprehensive loss:</b>			

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Balance at beginning of year	\$(152.0)	\$(335.8)	\$(412.0)
Other comprehensive loss	(183.8)	(76.2 )	(40.8 )
Balance at end of year	\$(335.8)	\$(412.0)	\$(452.8)

See Note 6 for further discussion of our marketable securities, Note 10 for amounts related to our defined benefit pension plans and OPEB plans and Note 18 for discussion of our interest rate swap contract.

F-35

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## Note 16 - Related party transactions:

We may be deemed to be controlled by Ms. Simmons and Ms. Connelly. See Note 1. Corporations that may be deemed to be controlled by or affiliated with such individuals sometimes engage in (a) intercorporate transactions such as guarantees, management and expense sharing arrangements, shared fee arrangements, joint ventures, partnerships, loans, options, advances of funds on open account, and sales, leases and exchanges of assets, including securities issued by both related and unrelated parties and (b) common investment and acquisition strategies, business combinations, reorganizations, recapitalizations, securities repurchases, and purchases and sales (and other acquisitions and dispositions) of subsidiaries, divisions or other business units, which transactions have involved both related and unrelated parties and have included transactions which resulted in the acquisition by one related party of a publicly-held noncontrolling interest in another related party. While no transactions of the type described above are planned or proposed with respect to us other than as set forth in these financial statements, we continuously consider, review and evaluate, and understand that Contran and related entities consider, review and evaluate such transactions. Depending upon the business, tax and other objectives then relevant, it is possible that we might be a party to one or more such transactions in the future.

Current receivables from and payables to affiliates are summarized in the table below.

	December 31, 2015 2016 (In millions)	
<b>Current receivable from affiliate:</b>		
Income taxes receivable from Valhi	\$-	\$ .7
Other	2.5	2.8
	\$2.5	\$3.5
<b>Current payables to affiliates:</b>		
LPC	\$19.4	\$14.7
Income taxes payable to Valhi	.1	-
Total	\$19.5	\$14.7

Amounts payable to LPC are generally for the purchase of TiO<sub>2</sub>, while amounts receivable from LPC are generally from the sale of TiO<sub>2</sub> feedstock. See Note 5. Purchases of TiO<sub>2</sub> from LPC were \$193.1 million in 2014, \$176.5 million in 2015 and \$157.9 million in 2016. Sales of feedstock to LPC were \$98.4 million in 2014, \$80.6 million in 2015 and \$68.8 million in 2016.

From time to time, we may have loans and advances outstanding between us and various related parties pursuant to term and demand notes. We generally enter into these loans and advances for cash management purposes. When we loan funds to related parties, we are generally able to earn a higher rate of return on the loan than we would earn if we invested the funds in other instruments, and when we borrow from related parties, we are generally able to pay a lower rate of interest than we would pay if we had incurred third-party indebtedness. While certain of these loans to affiliates may be of a lesser credit quality than cash equivalent instruments otherwise available to us, we believe we have considered the credit risks in the terms of the applicable loans. In this regard:

In November 2010, we entered into an unsecured revolving demand promissory note with Valhi whereby, as amended, we agreed to loan Valhi up to \$60 million. Our loan to Valhi bears interest at prime plus 1.00%, payable quarterly, with all principal due on demand, but in any event no earlier than December 31, 2018. The amount of our outstanding loans to Valhi at any time is at our discretion. As of December 31, 2015 and 2016, we had no

outstanding loans to Valhi under this promissory note; and

In February 2013, we entered into a promissory note with Contran in which we borrowed \$190 million on this note and subsequently repaid \$20 million during 2013. We prepaid and cancelled this note payable to Contran in February 2014 using a portion of the net proceeds of our new term loan. See Note 8.

F-36

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Interest income (including unused commitment fees) on our loan to Valhi was \$.5 million in each of 2014 and 2015 and \$.4 million in 2016. Interest expense on our loan from Contran was \$1.6 million in 2014.

Under the terms of various intercorporate services agreements (ISAs) entered into between us and various related parties, including Contran, employees of one company will provide certain management, tax planning, financial and administrative services to the other company on a fee basis. Such charges are based upon estimates of the time devoted by the employees of the provider of the services to the affairs of the recipient, and the compensation and associated expenses of such persons. Because of the large number of companies affiliated with Contran, we believe we benefit from cost savings and economies of scale gained by not having certain management, financial and administrative staffs duplicated at each entity, thus allowing certain individuals to provide services to multiple companies but only be compensated by one entity. The net ISA fee charged to us, approved by the independent members of our board of directors, is included in selling, general and administrative expense and corporate expense and was \$12.3 million in 2014, \$13.4 million in 2015 and \$15.2 million in 2016. This agreement is renewed annually and we expect to pay approximately \$15.7 million under the ISA during 2017.

Contran and certain of its subsidiaries and affiliates, including us, purchase certain of their insurance policies as a group, with the costs of the jointly-owned policies being apportioned among the participating companies. Tall Pines Insurance Company and EWI RE, Inc., each subsidiaries of Valhi, provide for or broker certain insurance policies for Contran and certain of its subsidiaries and affiliates, including ourselves. Tall Pines purchases reinsurance from third-party insurance carriers with an A.M. Best Company rating of generally at least A-(excellent) for substantially all of the risks it underwrites. Consistent with insurance industry practices, Tall Pines and EWI receive commissions from insurance and reinsurance underwriters and/or assess fees for the policies that they provide or broker. The aggregate premiums paid to Tall Pines and EWI by us and our joint venture were \$10.7 million in 2014, \$10.3 million in 2015 and \$9.2 million in 2016. These amounts principally represent payments for insurance premiums, which include premiums or fees paid to Tall Pines or fees paid to EWI. These amounts also include payments to insurers or reinsurers through EWI for the reimbursement of claims within our applicable deductible or retention ranges that such insurers or reinsurers paid to third parties on our behalf, as well as amounts for claims and risk management services and various other third-party fees and expenses incurred by the program. We expect these relationships with Tall Pines and EWI will continue in 2017.

With respect to certain of such jointly-owned policies, it is possible that unusually large losses incurred by one or more insureds during a given policy period could leave the other participating companies without adequate coverage under that policy for the balance of the policy period. As a result, and in the event that the available coverage under a particular policy would become exhausted by one or more claims, Contran and certain of its subsidiaries and affiliates, including us, have entered into a loss sharing agreement under which any uninsured loss arising because the available coverage had been exhausted by one or more claims will be shared ratably amongst those entities that had submitted claims under the relevant policy. We believe the benefits, in the form of reduced premiums and broader coverage associated with the group coverage for such policies, justifies the risk associated with the potential for any uninsured loss.

Contran and certain of its subsidiaries, including us, participate in a combined information technology data recovery program that Contran provides from a data recovery center that it established. Pursuant to the program, Contran and certain of its subsidiaries, including us, as a group share information technology data recovery services. The program apportions its costs among the participating companies. We paid Contran \$.1 million in each of 2014, 2015 and 2016 for such services. We expect that this relationship with Contran will continue in 2017.

Note 17 - Commitments and contingencies:

Environmental matters - Our operations are governed by various environmental laws and regulations. Certain of our operations are and have been engaged in the 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 maintain compliance with applicable environmental laws and regulations at all of our facilities and to strive to improve our environmental performance. From time to time, we may be subject to environmental regulatory enforcement under U.S. and non-

F-37

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U.S. statutes, the resolution of which typically involves the establishment of compliance programs. It is possible that future developments, such as stricter requirements of environmental laws and enforcement policies thereunder, could adversely affect our production, handling, use, storage, transportation, sale or disposal of such substances. We believe all of our manufacturing facilities are in substantial compliance with applicable environmental laws.

Litigation matters - We are involved in various environmental, contractual, product liability, patent (or intellectual property), employment and other claims and disputes incidental to our business. At least quarterly our management discusses and evaluates the status of any pending litigation to which we are a party. The factors considered in such evaluation include, among other things, the nature of such pending cases, the status of such pending cases, the advice of legal counsel and our experience in similar cases (if any). Based on such evaluation, we make a determination as to whether we believe (i) it is probable a loss has been incurred, and if so if the amount of such loss (or a range of loss) is reasonably estimable, or (ii) it is reasonably possible but not probable a loss has been incurred, and if so if the amount of such loss (or a range of loss) is reasonably estimable, or (iii) the probability a loss has been incurred is remote. We have not accrued any amounts for either of the two pending matters discussed below, as it is not reasonably possible we have incurred a loss in either case that would be material to our consolidated financial condition, results of operations or liquidity.

In March 2013, we were served with the complaint, Los Gatos Mercantile, Inc. d/b/a Los Gatos Ace Hardware, et al v. E.I. Du Pont de Nemours and Company, et al. (United States District Court, for the Northern District of California, Case No. 3:13-cv-01180-SI). The defendants include us, E.I. Du Pont de Nemours & Company, Huntsman International LLC and Millennium Inorganic Chemicals, Inc. As amended by plaintiffs' third amended complaint (Harrison, Jan, et al v. E.I. Du Pont de Nemours and Company, et al), plaintiffs seek to represent a class consisting of indirect purchasers of titanium dioxide in the states of Arizona, Arkansas, California, the District of Columbia, Florida, Iowa, Kansas, Massachusetts, Michigan, Minnesota, Mississippi, Missouri, Nebraska, New Hampshire, New Mexico, New York, North Carolina, Oregon and Tennessee that indirectly purchased titanium dioxide from one or more of the defendants on or after March 1, 2002. The complaint alleges that the defendants conspired and combined to fix, raise, maintain, and stabilize the price at which titanium dioxide was sold in the United States and engaged in other anticompetitive conduct. The case is now proceeding in the trial court. We believe the action is without merit, will deny all allegations of wrongdoing and liability and intend to defend against the action vigorously. Based on our quarterly status evaluation of this case, we have determined that it is not reasonably possible that a loss has been incurred in this case.

In September 2016, we were served with the complaint, Home Depot U.S.A., Inc. v. E.I. Dupont Nemours and Company, et al. (United States District Court, for the Northern District of California, Case No. 3:16-cv-04865). The defendants include us, E.I. Du Pont de Nemours & Company, Huntsman International LLC and Millennium Inorganic Chemicals, Inc. The plaintiff alleges that it indirectly purchased titanium dioxide from one or more of the defendants on or after March 1, 2002. The complaint alleges that the defendants conspired and combined to fix, raise, maintain, and stabilize the price at which titanium dioxide was sold in the United States and engaged in other anticompetitive conduct. The case is now proceeding in the trial court. We believe the action is without merit, will deny all allegations of wrongdoing and liability and intend to defend against the action vigorously. Based on our quarterly status evaluation of this case, we have determined that it is not reasonably possible that a loss has been incurred in this case.

Concentrations of credit risk - Sales of TiO<sub>2</sub> accounted for 90%, 92% and 93% of our sales in 2014, 2015 and 2016, respectively. The remaining sales result from the mining and sale of ilmenite ore (a raw material used in the sulfate pigment production process), and the manufacture and sale of iron-based water treatment chemicals and certain titanium chemical products (derived from co-products of the TiO<sub>2</sub> production processes). TiO<sub>2</sub> is generally sold to the paint, plastics and paper industries. Such markets are generally considered "quality-of-life" markets whose demand for TiO<sub>2</sub> is influenced by the relative economic well-being of the various geographic regions. We sell TiO<sub>2</sub> to over 4,000

customers, with the top ten customers approximating 35% of net sales in 2014, 34% in 2015 and 33% in 2016. In each of 2014, 2015 and 2016 one customer, Behr Process Corporation, accounted for approximately 10% of our net sales. The table below shows the approximate percentage of our TiO<sub>2</sub> sales by volume for our significant markets, Europe and North America, for the last three years.

F-38

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	2014	2015	2016
Europe	50 %	52 %	51 %
North America	33 %	29 %	29 %

Long-term contracts - We have long-term supply contracts that provide for certain of our TiO<sub>2</sub> feedstock requirements through 2019. The agreements require us to purchase certain minimum quantities of feedstock with minimum purchase commitments aggregating approximately \$605 million over the life of the contracts 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.

Operating leases - Our principal German operating subsidiary leases the land under its Leverkusen TiO<sub>2</sub> production facility pursuant to a lease with Bayer AG that expires in 2050. The Leverkusen facility itself, which we own and which represents approximately one-third of our current TiO<sub>2</sub> production capacity, is located within Bayer's extensive manufacturing complex. We periodically establish the amount of rent for the land lease associated with the Leverkusen facility by agreement with Bayer for periods of at least two years at a time. The lease agreement provides for no formula, index or other mechanism to determine changes in the rent for such land lease; rather, any change in the rent is subject solely to periodic negotiation between Bayer and us. We recognize any change in the rent based on such negotiations as part of lease expense starting from the time such change is agreed upon by both parties, as any such change in the rent is deemed "contingent rentals" under GAAP. Under the terms of various supply and services agreements, majority-owned subsidiaries of Bayer provide raw materials, including chlorine, auxiliary and operating materials, utilities and services necessary to operate the Leverkusen facility. These agreements, as amended, expire in 2017 through 2019. We expect to renew these agreements prior to expiration at similar terms and conditions.

We also lease various other manufacturing facilities and equipment. Some of the leases contain purchase and/or various term renewal options at fair market and fair rental values, respectively. In most cases we expect that, in the normal course of business, such leases will be renewed or replaced by other leases. Net rent expense approximated \$16 million in 2014 and \$14 million in each of 2015 and 2016. At December 31, 2016, future minimum payments under non-cancellable operating leases having an initial or remaining term of more than one year were as follows:

Years ending December 31,	Amount (In millions)
2017	\$ 10.8
2018	6.3
2019	5.0
2020	4.1
2021	3.5
2022 and thereafter	23.3
Total	\$ 53.0

Approximately \$16 million of the \$53.0 million aggregate future minimum rental commitments at December 31, 2016 relates to our Leverkusen facility lease discussed above. The minimum commitment amounts for such lease included in the table above for each year through the 2050 expiration of the lease are based upon the current annual rental rate as of December 31, 2016. As discussed above, any change in the rent is based solely on negotiations between Bayer and us, and any such change in the rent is deemed "contingent rentals" under GAAP which is excluded from the future minimum lease payments disclosed above.



Income taxes - We and Valhi are a party to a tax sharing agreement providing for the allocation of tax liabilities and tax payments as described in Note 1. Under applicable law, we, along with every other member of the Contran Tax Group, are each jointly and severally liable for the aggregate federal income tax liability of Contran and the other companies included in the Contran Tax Group for all periods in which we are included in the Contran Tax Group. Valhi has agreed, however, to indemnify us for any liability for income taxes of the Contran Tax Group in excess of our tax liability computed in accordance with the tax sharing agreement.

Note 18 - Financial instruments:

The following table summarizes the valuation of our financial instruments recorded on a fair value basis as of December 31, 2015 and 2016:

	Fair value measurements		
	Quoted prices in active markets	Significant other observable inputs	Significant unobservable inputs
	Total (Level 1) (In millions)	(Level 2)	(Level 3)
Asset (liability)			
December 31, 2015:			
Currency forward contracts	\$(1.2)	\$ (1.2 )	\$ -
Interest rate swap contract	(3.5)	-	(3.5 )
Noncurrent marketable securities			
(See Note 6)	2.4	2.4	-
December 31, 2016:			
Interest rate swap contract	\$(3.1)	\$ -	\$ (3.1 )
Noncurrent marketable securities			
(See Note 6)	6.0	6.0	-

Our earnings and cash flows are subject to fluctuations due to changes in currency exchange rates and interest rates. Our risk management policy allows for the use of derivative financial instruments to prudently manage exposure to currency exchange rates and interest rates. Derivatives that we use are primarily currency forward contracts and interest rate swaps. 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.

Currency forward contracts - Certain of our sales generated by our non-U.S. operations are denominated in U.S. dollars. 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. Derivatives used to hedge forecasted transactions and specific cash flows associated with financial assets and liabilities denominated in currencies other than the U.S. dollar and which meet the criteria for hedge accounting are designated as cash flow hedges. Consequently, the effective portion of gains and losses is deferred as a component of accumulated other comprehensive income and is recognized in earnings

at the time the hedged item affects earnings. Contracts that do not meet the criteria for hedge accounting are marked-to-market at each balance sheet date with any resulting gain or loss recognized in income currently as part of net currency transaction gains and losses. The fair value of the currency forward contracts is determined using Level 1 inputs based on the currency spot forward rates quoted by banks or currency dealers.

F-40

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At December 31, 2016, we had no currency forward contracts outstanding. The estimated value of such currency forward contracts at December 31, 2015 was a \$1.2 million net liability, which is recognized as part of accounts payable and accrued liabilities in our Consolidated Balance Sheet at such date. We did not use hedge accounting for any of our contracts to the extent we held such contracts during 2014, 2015 and 2016.

Interest rate swap contract - As part of our interest rate risk management strategy, in August 2015 we entered into a pay-fixed/receive-variable interest rate swap contract with Wells Fargo Bank, N.A. to minimize our exposure to volatility in LIBOR as it relates to our forecasted outstanding variable-rate indebtedness. Under this interest rate swap, we will pay a fixed rate of 2.016% per annum, payable quarterly, and receive a variable rate of three-month LIBOR (subject to a 1.00% floor), also payable quarterly, in each case based on the notional amount of the swap then outstanding. The effective date of the swap contract was September 30, 2015. The notional amount of the swap started at \$344.8 million and declines by \$875,000 each quarter beginning December 31, 2015, with a final maturity of the swap contract in February 2020. The notional amount of the swap as of December 31, 2016 was \$340.4 million. This swap contract has been designated as a cash flow hedge and qualified as an effective hedge at inception under ASC Topic 815. The effective portion of changes in fair value on this interest rate swap is recorded as a component of other comprehensive income, net of deferred income taxes. Commencing in the fourth quarter of 2015, as interest expense accrues on LIBOR-based variable rate debt, we classify the amount we pay under the pay-fixed leg of the swap and the amount we receive under the receive-variable leg of the swap as part of interest expense, with the net effect that the amount of interest expense we recognize on our LIBOR-based variable rate debt each quarter, as it relates to the notional amount of the swap outstanding each quarter, to be based on a fixed rate of 2.016% per annum in lieu of the level of LIBOR prevailing during the quarter. The amount of hedge ineffectiveness, if any, related to the swap will be recorded in earnings (also as part of interest expense). Since the inception of the swap through December 31, 2016, there have been no gains or losses recognized in earnings in the current period representing hedge ineffectiveness with respect to the interest rate swap.

During 2015 and 2016, the pretax unrealized loss arising during the year and recognized in other comprehensive income related to the interest rate swap contract was \$4.4 million and \$3.1 million, respectively. During 2015 and 2016, \$0.9 million and \$3.5 million, respectively, were reclassified from accumulated other comprehensive income into earnings (interest expense). During the next twelve months, the amount of the December 31, 2016 accumulated other comprehensive income balance that is expected to be reclassified to earnings is \$3.5 million pre-tax.

The fair value of the interest rate swap contract at December 31, 2016 was a \$3.1 million liability including \$2.9 million recognized as part of accounts payable and accrued liabilities and \$0.2 million recognized as part of other noncurrent liabilities in our Condensed Consolidated Balance Sheet (at December 31, 2015, we had a \$3.5 million liability of which \$3.3 million was recognized as part of accounts payable and accrued liabilities and \$0.2 million recognized as part of other noncurrent liabilities). See Notes 9 and 11. The fair value of the interest rate swap was estimated by a third party using inputs that are observable or that can be corroborated by observable market data such as interest rate yield curves, and therefore, is classified within Level 2 of the valuation hierarchy.

The following table presents the financial instruments that are not carried at fair value but which require fair value disclosure as of December 31, 2015 and 2016.

	December 31, 2015		December 31, 2016	
	Carrying	Fair	Carrying	Fair
	amount	value	amount	value
	(In millions)			
Cash, cash equivalents and restricted cash	\$94.3	\$94.3	\$52.3	\$52.3

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Variable rate term loan	338.0	309.5	335.9	334.6
Common stockholders' equity	461.9	653.6	395.0	1,383.8

F-41

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At December 31, 2016, the estimated market price of our term loan was \$983 per \$1,000 principal amount. The fair value of our term loan was based on quoted market prices; however, these quoted market prices represented Level 2 inputs because the markets in which the term loan trades were not active. The fair value of our common stockholders' equity is based upon quoted market prices at each balance sheet date, which represent Level 1 inputs. Due to their near-term maturities, the carrying amounts of accounts receivable and accounts payable are considered equivalent to fair value. See Notes 3 and 9.

Note 19 - Recent accounting pronouncements:

Adopted

In August 2016, the Financial Accounting Standards Board (FASB) issued Accounting Standards Update (ASU) No. 2016-15, Statement of Cash Flows (Topic 230): Classification of Certain Cash Receipts and Cash Payments. This standard provides guidance on eight specific cash flow issues including: debt prepayment or debt extinguishment costs, proceeds from the settlement of insurance claims, distributions from equity method investees and separately identifiable cash flows and application of the predominance principle. The new standard is effective for us beginning with the first quarter of 2018. We have elected to adopt this ASU with this Annual Report without any material effect on the presentation of cash flows in our previously issued Consolidated Financial Statements.

In November 2016, the FASB issued ASU No. 2016-18, Statement of Cash Flows (Topic 230): Restricted Cash. This standard provides guidance on the cash flow classification of changes in restricted cash and additional disclosure requirements regarding the nature of restrictions on cash. The new standard is effective for us beginning with the first quarter of 2018. We have elected to adopt this ASU retrospectively beginning with this Annual Report and accordingly we have presented all changes in cash, cash equivalents and restricted cash in the statement of cash flows and provided additional disclosure regarding the composition and classification of cash, cash equivalents and restricted cash in our Consolidated Balance Sheets and related Footnotes. As a result, net cash used in investing activities increased from \$54.0 million to \$61.2 million for the year ended December 31, 2014, and increased from \$46.8 million to \$47.1 million for the year ended December 31, 2015, and the negative effect of exchange rate changes on cash, cash equivalents and restricted cash increased from \$9.4 million to \$10.0 million for the year ended December 31, 2014, and increased from \$8.4 million to \$8.5 million for the year ended December 31, 2015.

Pending adoption

In May 2014, the FASB issued ASU No. 2014-09, Revenue from Contracts with Customers (Topic 606). This standard replaces existing revenue recognition guidance, which in many cases was tailored for specific industries, with a uniform accounting standard applicable to all industries and transactions. The new standard, as amended, is currently effective for us beginning with the first quarter of 2018. Entities may elect to adopt ASU No. 2014-09 retrospectively for all periods for all contracts and transactions which occurred during the period (with a few exceptions for practical expediency) or retrospectively with a cumulative effect recognized as of the date of adoption. ASU No. 2014-09 is a fundamental rewriting of existing GAAP with respect to revenue recognition, and we are still evaluating the effect the standard will have on our Consolidated Financial Statements. We currently expect to adopt the standard in the first quarter of 2018 using the modified retrospective approach to adoption. Our sales generally involve single performance obligations to ship goods pursuant to customer purchase orders without further underlying contracts, and as such we expect adoption of this standard will have a minimal effect on our revenues. We are in the process of evaluating the additional disclosure requirements.

In January 2016, the FASB issued ASU 2016-01, Financial Instruments-Overall (Subtopic 825-10): Recognition and Measurement of Financial Assets and Financial Liabilities, which addresses certain aspects related to the recognition, measurement, presentation and disclosure of financial instruments. The ASU requires equity investments (except for

those accounted for under the equity method of accounting or those that result in the consolidation of the investee) to generally be measured at fair value with changes in fair value recognized in net income. The amendment also requires a number of other changes, including among others: simplifying the impairment assessment for equity instruments without readily determinable fair values; eliminating the requirement for public business entities to disclose methods and assumptions used to determine fair value for financial instruments measured at amortized cost; requiring an exit price notion when measuring the fair value of financial instruments for disclosure purposes; and requiring separate presentation of financial assets and liabilities by measurement category and form of asset. The changes indicated above will be effective for us beginning in the first

F-42

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quarter of 2018, with prospective application required, and early adoption is not permitted. The most significant aspect of adopting this ASU will be the requirement to recognize changes in fair value of our available-for-sale marketable equity securities in net income (currently changes in fair value of such securities are recognized in other comprehensive income).

In February 2016, the FASB issued ASU 2016-02, Leases (Topic 842), which is a comprehensive rewriting of the lease accounting guidance which aims to increase comparability and transparency with regard to lease transactions. The primary change will be the recognition of lease assets for the right-of-use of the underlying asset and lease liabilities for the obligation to make payments by lessees on the balance sheet for leases currently classified as operating leases. The ASU also requires increased qualitative disclosure about leases in addition to quantitative disclosures currently required. Companies are required to use a modified retrospective approach to adoption with a practical expedient which will allow companies to continue to account for existing leases under the prior guidance unless a lease is modified, other than the requirement to recognize the right-of-use asset and lease liability for all operating leases. The changes indicated above will be effective for us beginning in the first quarter of 2019, with early adoption is permitted. We are in the process of assessing all of our current leases. We have not yet evaluated the effect this ASU will have on our Consolidated Financial Statements, but given the material amount of our future minimum payments under non-cancellable operating leases at December 31, 2016 discussed in Note 17, we expect to recognize a material right-of-use lease asset and lease liability upon adoption of the ASU.

Note 20 - Quarterly results of operations (unaudited):

	Quarter ended			
	March 31	June 30	September 30	December 31
	(In millions, except per share data)			
<b>Year ended December 31, 2015</b>				
Net sales	\$365.1	\$360.2	\$ 336.5	\$ 287.0
Gross margin	77.4	46.5	43.2	25.2
Net income (loss)	18.4	(159.8)	(11.8)	(20.4)
Basic and diluted income (loss) per share	\$.16	\$(1.38)	\$.10	\$.18
<b>Year ended December 31, 2016</b>				
Net sales	\$318.4	\$356.1	\$ 356.1	\$ 333.7
Gross margin	40.4	55.5	75.5	85.6
Net income (loss)	(3.8)	1.7	22.2	23.2
Basic and diluted income (loss) per share	\$(.03)	\$.01	\$.19	\$.20

We recognized the following amounts during 2015:

- pretax charges of \$21.1 million, \$.4 million and \$.2 million in the second, third and fourth quarters, respectively, in workforce reduction charges (see Note 13),
- a \$12.0 million non-cash pretax impairment charge in the third quarter due to other-than-temporary impairment on our investment in a marketable security held for sale (see Note 6), and
- non-cash deferred income tax expense of \$150.3 million, \$2.3 million and \$6.4 million in the second, third and fourth quarters, respectively, related to the recognition of a deferred income tax asset valuation allowance related to our German and Belgium operations (see Note 14).

We recognized the following amounts during 2016:

- pre-tax insurance settlement gains of \$2.0 million, \$1.4 million and \$.9 million in the first, second and fourth quarters, respectively, (see Note 12),

current income tax benefit of \$5.6 million in the third quarter, and current income tax expense of \$2.2 million in the fourth quarter, related to the execution and finalization of an Advance Pricing Agreement between the U.S. and Canada (see Note 14),

F-43

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non-cash deferred income tax expense (benefit) of \$2.9 million, \$(.8) million and \$(4.3) million in the second, third and fourth quarters, respectively, as the result of a net decrease in our deferred income tax asset valuation allowance related to our German and Belgian operations (see Note 14), and

non-cash income tax expense of \$2.4 million related to an increase in our reserve for uncertain tax positions, mostly in the fourth quarter.

The sum of the quarterly per share amounts may not equal the annual per share amounts due to relative changes in the weighted average number of shares used in the per share computations.