GRAFTECH INTERNATIONAL LTD
Form 10-K
February 27, 2017
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UNITED STATES SECURITIES AND EXCHANGE COMMISSION
Washington, D.C. 20549
FORM 10-K
(Mark One)
x ANNUAL REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934
for the fiscal year ended December 31, 2016
OR
¨ TRANSITION REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934
for the transition period from to
Commission file number: 1-13888

GRAFTECH INTERNATIONAL LTD.
(Exact name of registrant as specified in its charter)

Delaware	27-2496053
(State or other jurisdiction of incorporation or organization)	(I.R.S. Employer Identification Number)
Suite 300 - Park Center I 6100 Oak Tree Boulevard Independence, Ohio	44131 (Zip Code)

Registrant's telephone number, including area code: (216) 676-2000

Securities registered pursuant to Section 12(b) of the Act:
None

Securities registered pursuant to Section 12(g) of the Act:
None

Indicate by check mark if the registrant is a well-known seasoned issuer, as defined in Rule 405 of the Securities Act. Yes ¨ No x
Indicate by check mark if the registrant is not required to file reports pursuant to Section 13 or Section 15(d) of the Act. Yes x No ¨
Indicate by check mark whether the registrant: (1) has filed all reports required to be filed by Section 13 or 15(d) of the Securities Exchange Act of 1934 during the preceding 12 months (or for such shorter period that the registrant was required to file such reports), and (2) has been subject to such filing requirements for the past 90 days. Yes ¨ No x
Indicate by check mark whether the registrant has submitted electronically and posted on its corporate Web site, if any, every Interactive Data File required to be submitted and posted pursuant to Rule 405 of Regulation S-T (§232.405 of this chapter) during the preceding 12 months (or for such shorter period that the registrant was required to submit and post such files). Yes x No ¨
Indicate by check mark 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. x
Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer or a smaller reporting company. See definitions of "large accelerated filer," "accelerated filer", "non-accelerated filer" and "smaller reporting company" in Rule 12b-2 of the Exchange Act.
Large Accelerated Filer ¨ Accelerated Filer ¨ Non-Accelerated Filer ¨ Smaller reporting company ¨

Indicate by check mark whether the registrant is a shell company (as defined in Exchange Act Rule 12b-2).
Yes ¨ No x
None of the oustanding common stock of the registrant is held by a non-affiliate of the registrant and therefore the aggregate market value of common stock held by non-affiliates of the registrant is zero. On February 1, 2017, 100 shares of our common stock were outstanding.

(Explanatory Note: The registrant is a voluntary filer and not subject to the filing requirements of Section 13 or 15(d) of the Securities Exchange Act of 1934. Although not subject to these filing requirements, the registrant has filed all reports that would have been required to be filed by Section 13 or 15(d) of the Securities Exchange Act of 1934 during the preceding 12 months had the registrant been subject to such requirements.)

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PART I

Preliminary Notes

Important Terms. We use the following terms to identify various matters. These terms help to simplify the presentation of information in this Report.
"Brookfield" means BCP IV GrafTech Holdings LP, an affiliate of Brookfield Asset Management Inc., and the direct owner of GrafTech
"Common Stock" means GTI common stock, par value $.01 per share.
"Credit Agreement" refers to the credit agreement providing for our senior secured revolving and term credit facilities, dated as of April 23, 2014, as amended as of November 19, 2014, February 27, 2015, June 26, 2015, July 28, 2015 and April 27, 2016, as further amended, supplemented, restated or otherwise modified from time to time.
"GrafTech Finance" refers to GrafTech Finance Inc. only. GrafTech Finance is an indirect wholly-owned, special purpose finance subsidiary of GTI and the borrower under the Revolving Facility.
"GrafTech Global" refers to GrafTech Global Enterprises Inc. only. GrafTech Global is an indirect wholly-owned subsidiary of GTI and the direct or indirect holding company for many of our operating subsidiaries. GrafTech Global is a guarantor of the Revolving Facility.
"GTI" refers to GrafTech International Ltd. only. GTI is our U.S. parent company. GTI is a guarantor of the Revolving Facility.
"Indenture" refers to the indenture dated November 20, 2012, under which the Senior Notes were issued.
"MTM Adjustment" refers to our accounting policy regarding pension and other post-employment benefits plans ("OPEB") whereby we immediately recognize the change in the fair value of plan assets and net actuarial gains and losses annually in the fourth quarter of each year (referred to as "mark-to-market").
"Revolving Facility" refers to the senior secured revolving credit facility provided under the Credit Agreement, at the relevant time.
"Senior Notes" means our 6.375% senior notes due 2020 issued on November 20, 2012.
"Senior Subordinated Notes" means our senior subordinated promissory notes issued on November 30, 2010, in connection with the Seadrift Coke L.P. ("Seadrift") and C/G Electrodes LLC ("C/G") acquisitions, in an aggregate principal amount of $200 million. The Senior Subordinated Notes were non-interest bearing, due on November 30, 2015 and repaid in full in August 2015. Because the Senior Subordinated Notes are non-interest bearing, we were required to record them at each measurement date at their then present value (determined using an interest rate of 7.00%).
"Subsidiaries" refers to those companies that, at the relevant time, are or were majority owned or wholly-owned directly or indirectly by GTI or its predecessors to the extent that those predecessors' activities related to the graphite and carbon business.
"We," "GrafTech," "us" or "our" refers to GTI and its subsidiaries collectively or, if the context so requires, GTI, GrafTech Global, GrafTech Finance or GrafTech International Holdings Inc., individually.
Presentation of Financial, Market and Legal Data. References to cost in the context of our low cost advantages and strategies do not include the impact of special charges, expenses or credits, such as those related to investigations, lawsuits, claims, restructurings or impairments, or the impact of changes in accounting principles.
Unless otherwise noted, when we refer to "dollars", we mean U.S. dollars. Unless otherwise noted, all dollars are presented in thousands.
References to spot prices for graphite electrodes mean prices under individual purchase orders (not part of an annual or other extended purchase arrangement) for near term delivery for standard size graphite electrodes used in large electric arc steel melting furnaces (sometimes called "melters" or "melter applications") as distinct from, for example, a ladle furnace or a furnace producing non-ferrous metals.
Neither any statement made in this Report nor any charge taken by us relating to any legal proceedings constitutes an admission as to any wrongdoing.

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Unless otherwise noted, market and market share data in this Report are our own estimates. Market data relating to the steel, electronics, semiconductor, solar, thermal management, transportation, petrochemical and other metals industries, our general expectations concerning such industries and our market position and market share within such industries, both domestically and internationally, are derived from trade publications relating to those industries and other industry sources as well as assumptions made by us, based on such data and our knowledge of such industries. Market and market share data relating to the graphite and carbon industry as well as information relating to our competitors, our general expectations concerning such industry and our market position and market share within such industry, both domestically and internationally, are derived from the sources described above and public filings, press releases and other public documents of our competitors as well as assumptions made by us, based on such data and our knowledge of such industry. Such data are used to provide a gauge of our competitiveness against our competitors and are intended to describe things such as customer or potential customer bases, industries, or subsets of the industries in which we compete and intermediate or end use applications of the product or technology involved. Unless otherwise noted, references to "market share" are based on sales volumes for the relevant year. Similarly, product descriptions are used to help understand how we develop, produce, source, manage, market, sell, or account for products. Market data and product descriptions are not intended to define markets or products from an antitrust, trade regulation, trade remedy, or other regulatory purpose. Our estimates involve risks and uncertainties and are subject to change based on various factors, including those discussed under “Risk Factors-Risks Relating to Us” and “Risk Factors-Forward Looking Statements” in this Report. We cannot guarantee the accuracy or completeness of this market and market share data and have not independently verified it. None of the sources mentioned above has consented to the disclosure or use of data in this Report.

The GRAFTECH logo, GRAFCELL®, GRAFOAM®, GRAFIHX™, eGraf® and HOTPRESSED™ are our trademarks and trade names used in this report. This Report also contains trademarks and trade names belonging to other parties.

We make available, free of charge, on or through our web site, our annual reports on Form 10-K, our quarterly reports on Form 10-Q, our current reports on Form 8-K and amendments to those reports filed or furnished pursuant to Section 13(a) or 15(d) of the Exchange Act as soon as reasonably practicable after we electronically file them with, or furnish them to, the U.S. Securities and Exchange Commission (“SEC”). We maintain our website at http://www.graftech.com. The information contained on our web site is not part of this Report. The SEC maintains a website that contains reports, proxy and information statements, and other information regarding issuers that file electronically. Please see http://www.sec.gov for more information.

We have a code of ethics (which we call our Code of Conduct and Ethics) that applies to our principal executive officer, principal financial officer, principal accounting officers and controller, and persons performing similar functions, as well as our other employees, and which is intended to comply, at a minimum, with the Sarbanes-Oxley Act of 2002 and the SEC rules adopted thereunder. A copy of our Code of Conduct and Ethics is available on our web site. We intend to report timely on our website any disclosures concerning amendments or waivers of our Code of Conduct and Ethics that would otherwise require the filing of a Form 8-K with the SEC.

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Item 1. Business

Introduction

Our vision is to enable customer leadership, better and faster than our competition, through the creation, innovation and manufacture of graphite and carbon material science-based solutions. We have over 125 years of experience in the research and development of graphite and carbon-based solutions and our intellectual property portfolio is extensive. Our business was founded in 1886 by the National Carbon Company. We are a leading manufacturer of a broad range of high quality graphite electrodes, products essential to the production of electric arc furnace (“EAF”) steel and various other ferrous and nonferrous metals.

We currently manufacture our graphite electrodes in 4 manufacturing facilities strategically located in North America and Europe. We believe our Industrial Materials business has the largest manufacturing capacity and one of the lowest manufacturing cost structure of all of our major competitors and delivers the highest-level quality products. We currently have the operating capability, depending on product demand and mix, to manufacture approximately 195,000 metric tons of graphite electrodes. Beginning in 2013 and continuing through 2015, we announced and implemented rationalization plans designed to significantly improve our competitiveness, allow us to better serve customers and position our Industrial Materials business for success. As a result we have reduced our manufacturing facilities and reduced graphite electrode capacity. Additionally, we initiated changes to the Company’s operating and management structure in order to streamline, simplify and decentralize the organization, resulting in savings within our corporate functions. These strategic initiatives addressed three key areas: profitability, cash flow and future growth.

We hold approximately 201 issued and pending patent applications related to our Industrial Materials business.

On August 15, 2015, GrafTech became an indirect wholly owned subsidiary of Brookfield Asset Management Inc. through a tender offer to our shareholders and subsequent merger transaction. Brookfield Asset Management is an experienced operator of industrial, natural resource and other tangible asset businesses. This transaction has provided us with a stable equity partner with experience in cyclical capital intensive industries.

Industrial Materials Segment

Industrial Materials is our only reportable segment and it delivers high quality graphite electrodes and needle coke products. Graphite electrodes are key components of the conductive power systems used to produce steel and non-ferrous metals. Approximately 75% of our graphite electrodes sold are consumed in the EAF steel melting process, the steel making technology used by all “mini-mills,” typically at a rate of one graphite electrode every eight to ten operating hours. We believe that mini-mills constitute the higher long-term growth sector of the steel industry and that there is currently no commercially viable substitute for graphite electrodes in EAF steel making. The remaining approximately 25% of electrodes sold are primarily used in various other ferrous and non-ferrous melting applications, including steel refining (ladle furnace operations for both EAF and basic oxygen furnace steel production), fused materials, chemical processing, and alloy metals.

Additionally, through our Seadrift subsidiary, we are a producer of petroleum needle coke. Needle coke is the key raw material in the manufacture of the graphite electrodes used in melting operations. Petroleum needle coke, a crystalline form of carbon derived from decant oil, is used in the production of graphite electrodes. Our Needle coke production allows us to be the only vertically integrated graphite electrode manufacturer. We believe that Seadrift is the world's second largest petroleum-based needle coke producer and assuming normal annual maintenance, a product mix of only normal premium petroleum needle coke production and related by-products, the annual capacity is approximately 140,000 metric tons. Seadrift currently provides a substantial portion of our needle coke requirements.

Our Industrial Materials segment, which had net sales of $825 million in 2014, $533 million in 2015 and $438 million in 2016 manufactures and delivers high quality graphite electrodes and needle coke products, as well as provides customer technical services. We estimate that the worldwide sales for products serviced by our Industrial Materials segment was approximately $3.5 billion in 2015 and approximately $2.7 billion in 2016. The decline in worldwide sales is primarily the result of lower prices and volumes driven primarily by decreased EAF steel production. This decrease is caused by increased imports to the markets we serve and increased blast furnace steel production as iron ore prices have fallen.

Graphite Electrode Products. Graphite electrodes are consumed primarily in EAF steel production, the steel making technology used by all “mini-mills.” Graphite electrodes are also consumed in the refining of steel in ladle furnaces and in other smelting processes such as production of titanium dioxide.

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Electrodes act as conductors of electricity in the furnace, generating sufficient heat to melt scrap metal, iron ore or other raw materials used to produce steel or other metals. The electrodes are consumed in the course of that production.

Electric arc furnaces operate using either alternating electric current or direct electric current. The vast majority of electric arc furnaces use alternating current. Each of these alternating current furnaces typically uses nine electrodes (in three columns of three electrodes each) at one time. The other electric arc furnaces, which use direct current, typically use one column of three electrodes. The size of the electrodes varies depending on the size of the furnace, the size of the furnace's electric transformer and the planned productivity of the furnace. In a typical furnace using alternating current and operating at a typical number of production cycles per day, one of the nine electrodes is fully consumed (requiring the addition of a new electrode), on average, every eight to ten operating hours. The actual rate of consumption and addition of electrodes for a particular furnace depends primarily on the efficiency and productivity of the furnace. Therefore, demand for graphite electrodes is directly related to the amount and efficiency of EAF steel production.

EAF steel production requires significant heat (as high as 5,000° F) to melt the raw materials in the furnace, primarily scrap metal. Heat is generated as electricity (as much as 150,000 amps) passes through the electrodes and creates an electric arc between the electrodes and the raw materials.

Graphite electrodes are currently the only known commercially available products that have the high levels of electrical conductivity and the capability of sustaining the high levels of heat generated in an electric arc furnace producing steel. Therefore, graphite electrodes are essential to the production of steel in electric arc furnaces. We believe there is currently no commercially viable substitute for graphite electrodes in EAF steel making. We estimate that, on average, the cost of graphite electrodes represents about 1-2% of the total cost of producing steel in a typical electric arc furnace.

EAF steel production was estimated to be approximately 395 million metric tons in 2016, representing approximately 25% of the world's steel production. The World Steel Association's utilization rate for the total steel market was 70% in 2015 and 69% in 2016. EAF steel capacity utilization rates typically follow the trends of the overall steel industry, however recently blast furnace utilization has increased to the detriment of EAF production as iron ore and coal prices have fallen faster than the price of scrap steel.

Relationship Between Graphite Electrode Demand and EAF Steel Production. The improved efficiency of electric arc furnaces has resulted in a decrease in the average rate of consumption of graphite electrodes per metric ton of steel produced in electric arc furnaces (called "specific consumption"). We estimate that the average EAF melter specific consumption is approximately 1.7 kilograms of graphite electrodes per metric ton produced.

Over the long term, specific consumption will continue to decrease at a gradual pace, as the EAF steel makers investment cost (relative to the benefits) increases to achieve further efficiencies in specific consumption. Another contributing factor is the ongoing electrode quality improvements of graphite electrode manufacturers.

We further believe that the rate of decline in the future will be impacted by the addition of modern EAF steel making capacity which tends to have lower specific consumption than older electric arc furnaces. To the extent that this new capacity replaces old capacity, it has the effect of accelerating the reduction in industry wide specific consumption due to the efficiency of new electric arc furnaces relative to the old. However, to the extent that this new capacity increases industry wide EAF steel production capacity and that capacity is utilized, it creates additional demand for graphite electrodes.

Over the long term, graphite electrode demand is estimated to grow at an average annual net growth rate of approximately 1%-2%, based on the anticipated growth of EAF steel production (average historical growth rate of 1%-2%), partially offset by the decline in future specific consumption.

Production Capacity. We believe that the worldwide total graphite electrode manufacturing capacity was approximately 1.88 million metric tons for 2014, 1.85 million metric tons for 2015 and approximately 1.70 million metric tons for 2016. We believe that the worldwide graphite electrode industry manufacturing capacity utilization rate excluding China was approximately 68% for 2015 and 76% for 2016 and including China capacity utilization was approximately 64% in 2015 and 63% in 2016.. We routinely update our estimates as more information, which can vary, becomes available, as stated capacities in some cases are effective capacity adjusted for production yields and product mix.

We have the capability, depending on product demand and mix, to manufacture approximately 195,000 metric tons of graphite electrodes during 2016. This production capacity is down approximately 60,000 metric tons from previous years due to our rationalization initiatives. See Note 4 to the Financial Statements for a discussion on these rationalization activities. As a result of our acquisition of Seadrift in November 2010, our graphite electrode production is vertically integrated. Seadrift currently provides a substantial portion of our needle coke requirements.

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Petroleum Needle Coke and Coke Products. We produce petroleum needle coke. Petroleum needle coke, a crystalline form of carbon derived from decant oil, is used primarily in the production of graphite electrodes. We are one of three petroleum needle coke producers in the world, and this backward integration reduces our reliance on other suppliers. Needle coke is the key raw material in the manufacture of graphite electrodes which are consumed in EAF steel production. Graphite electrode producers combine petroleum or coal tar ("pitch") needle coke with binders and other ingredients to form graphite electrodes. Petroleum and pitch needle coke, relative to other varieties of coke, are distinguished by their needle-like structure and their quality, which is measured by the presence of impurities, principally sulfur, nitrogen and ash. The needle-like structure of petroleum and pitch needle coke creates expansion along the length of the electrode, rather than the width, which reduces the likelihood of fractures. Impurities reduce quality because they increase the coefficient of thermal expansion and electrical resistivity of the graphite electrode, which can lead to uneven expansion and a build-up of heat and cause the graphite electrode to oxidize rapidly and break. Petroleum and pitch needle coke are typically low in these impurities. In order to minimize fractures caused by disproportionate expansion over the width of an electrode, and minimize the effect of impurities, large-diameter graphite electrodes (18 inches to 32 inches) employed in high-intensity electric arc furnace applications are comprised almost exclusively of petroleum and pitch needle coke.

Engineered Solutions Business

We also produce other graphite products within our Engineered Solutions business, which includes advanced graphite materials, advanced energy technologies, refractory products and advanced composite materials. Advanced graphite materials are highly engineered synthetic graphite products used in many areas due to their unique properties and our ability to tailor them to specific solutions. These products are used in transportation, alternative energy, metallurgical, chemical, oil and gas exploration and various other industries. Advanced energy technologies products consist of electronic thermal management solutions, fuel cell components, and sealing materials. Refractory products are used in blast furnaces and submerged arc furnaces due to their high thermal conductivity and the ease with which they can be machined to large or complex shapes. Advanced composite materials are highly engineered carbon products that are woven into various shapes, primarily to support the aerospace and defense industries.

During the first quarter of 2016, we announced that we are exploring strategic options for our Engineered Solutions business to focus our efforts on our graphite electrode business. During the second quarter of 2016, our Engineered Solutions business qualified as held for sale status. All results have been excluded from continuing operations for both the current and prior years, unless otherwise noted. See Note 3 "Discontinued Operations and Assets Held for Sale" for significant components of the results of our Engineered Solutions segment.

During the fourth quarter of 2016, we sold our advanced composite materials business, which produced highly engineered carbon products that are woven into various shapes, primarily to support the aerospace and defense industries. We are continuing to negotiate with potential buyers for the remaining Engineered Solutions' businesses.

Business Strategies

We believe that, by growing our revenues, successfully implementing LEAN initiatives, and maximizing our cash flows, we will deliver enhanced financial performance. We believe this strategy will position us to capitalize on growth opportunities that may arise. We have transformed our operations, building competitive advantages to enable us to compete successfully, to realize enhanced performance as economic conditions improve and to exploit growth opportunities from our intellectual property portfolio. Our business strategies are designed to expand upon our competitive advantages by:

Leveraging Our Unique Global Manufacturing Network. We believe that our global manufacturing network, our backward integration and our research and development provides us with competitive advantages in product quality, product costs, timely and reliable delivery, and operational flexibility to adjust product mix to meet the diverse needs of a wide range of segments and customers.

We continue to leverage our network to seek to achieve significant increases in throughput generated from our existing assets, through productivity improvements, capital expenditures, and other efficiency initiatives. We believe we can further exploit our network by focusing our technical and customer service capabilities on:

- large global customers to whom we believe we are well positioned to offer products that meet their volume, product quality, product mix, delivery reliability and service needs at competitive prices; and

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customers in targeted segments where we have competitive advantages to meet identified customer needs due to the range and quality of our products, the utilization of our capacity, the value of our customer technical service and our low cost supplier advantage.

We sell our products in every major geographic region. Sales of our products to buyers outside the U.S. accounted for approximately 76% of net sales in 2014, approximately 80% of net sales in 2015 and 83% in 2016. No single customer or group of affiliated customers accounted for more than 10% of our total net sales in 2014, 2015 or 2016.

Driving Continuous Improvement with LEAN and Six Sigma. We believe a consistent focus on our customers and diligence towards aligning our processes to satisfy these customers is essential in today’s global market. We have undertaken a comprehensive launch of LEAN and Six Sigma with dedicated resources at all of our key manufacturing plants intended to create a common language and tool set centering around LEAN and Six Sigma.

Our focus on waste reduction using a team approach creates knowledge at all levels of the organization. Concentrating on creating flow within processes enables us to capitalize on lower inventories while still maintaining a high percentage of on-time-delivery. Our metric driven behavior and process of deploying corrective actions to anomalies drives us towards customer centric solutions. We believe we will be able to continue to leverage our stream-lined processes as a sustainable competitive advantage with shorter lead times, lower costs, higher quality products, and exceptional service.

Delivering Exceptional and Consistent Quality. We believe that our products are among the highest quality products available in our industry. We have been recognized as a preferred or certified supplier by many major steel companies and have received numerous technological innovation and other awards by industry groups, customers and others. Using our technological capabilities, we continually seek to improve the consistent overall quality of our products and services, including the performance characteristics of each product, the uniformity of the same product manufactured at different facilities and the expansion of the range of our products. We believe that improvements in overall quality create significant efficiencies and opportunities for us, provide us the opportunity to increase sales volumes and potential demand share, and create production efficiencies for our customers.

Providing Superior Technical Service. We believe that we are recognized as one of the industry leaders in providing value added technical services to customers for our major product lines. We have a large customer technical service organization, with supporting engineering and scientific groups with more than 90 engineers and specialists around the world dedicated to our Industrial Materials business, and we believe that we are recognized as one of the industry leaders in providing value added technical services to customers for our major product lines. A portion of these employees assist key steel and other metals customers in furnace applications, operations and upgrades to reduce energy consumption, improve raw material costs and increase output.

Maintaining Liquidity and Building Value. We believe that our business strategies and our rationalization and related activities support our goal of growing revenues and operating income and maximizing the cash generated from operations. Maintaining liquidity remains a priority for us. As of December 31, 2016, we had Senior Notes with a carrying value of $274 million which will mature in 2020 with a redemption value of $300 million. We had outstanding borrowings on our Credit Agreement totaling $90.7 million and cash and cash equivalents of $11.6 million. As of December 31, 2015, we had outstanding borrowings under our Credit Agreement of $98 million, $268 million of Senior Notes and cash and cash equivalents of $6.9 million.

We continually review our assets, product lines and businesses to seek out opportunities to maximize value, through re-deployment, merger, acquisition, divestiture or other means, which could include taking on more debt. We may at any time buy or sell assets, product lines or businesses.

Production Planning

We plan and source production of our products globally. We have evaluated virtually every aspect of our global supply chain, and we have redesigned and implemented changes to our global manufacturing, marketing and sales processes to leverage the strengths of our repositioned manufacturing network. Among other things, we have reduced manufacturing bottlenecks, improved product and service quality and delivery reliability, expanded our range of products, improved our global sourcing for our customers and have closed or plan to close high cost manufacturing locations when lower cost manufacturing locations can absorb or expand to meet needed production capacity.

We deploy synchronous work process improvements at most of our manufacturing facilities. We have also installed and continue to install and upgrade proprietary process technologies at our manufacturing facilities, and use statistical process controls in our manufacturing processes for all products, and employ LEAN processing improvement techniques.
Our global manufacturing network also helps us to minimize risks associated with dependence on any single economic region.
Manufacturing

Graphite Electrode Products. The manufacture of a graphite electrode takes, on average, about two months. We manufacture graphite electrodes ranging in size up to 30 inches in diameter and over 11 feet in length, and weighing as much as 5,900 pounds (2.6 metric tons). The manufacture of graphite electrodes includes six main processes: forming the electrode, baking the electrode, impregnating the electrode with a special pitch that improves the strength, rebaking the electrode, graphitizing the electrode using electric resistance furnaces, and machining.
We currently manufacture graphite electrodes in the United States, Mexico, France and Spain and we have an electrode machining center in Brazil. During 2016, we temporarily idled our U.S. facility to align with overall demand.
Petroleum Needle Coke and Coke Products. Petroleum needle coke is produced through a manufacturing process very similar to a refinery. The production process converts decant oil into petroleum needle coke shaped in a needle-like structure. We produce petroleum needle coke at one manufacturing facility in the U.S.
Quality Standards and Maintenance. Most of our global manufacturing facilities are certified and registered to ISO 9001-2008 international quality standards and some are certified to QS 9001-2008. Maintenance at our facilities is conducted on an ongoing basis.
Raw Materials and Suppliers. The primary raw materials for electrodes are engineered by-products and residues of the petroleum and coal industries. We use these raw materials because of their high carbon content. The primary raw materials for graphite electrodes are calcined needle coke and pitch. We purchase raw materials from a variety of sources and believe that the quality and cost of our raw materials on the whole is competitive with those available to our competitors. We obtained a substantial portion of our 2016 needle coke requirements internally and plan to do the same in 2017.
The primary raw material used by Seadrift to make petroleum needle coke is decant oil, a by-product of the gasoline refining process. Seadrift is not dependent on any single refinery for decant oil. While Seadrift has purchased a substantial majority of its raw material inventory from a limited number of suppliers in recent years, we believe that there is an abundant supply of suitable decant oil in the United States available from a variety of sources.
We purchase energy from a variety of sources. Electric power used in manufacturing processes is purchased from local suppliers under contracts with pricing based on rate schedules or price indices. Our electric costs can vary significantly depending on these rates and usage. Natural gas used in manufacturing processes is purchased from local suppliers primarily under annual volume contracts with pricing based on various natural gas price indices.
Distribution

We deploy various demand management and inventory management techniques to seek to ensure we can meet our customers’ delivery requirements while still maximizing the utilization of our production capacity. We can experience significant variation in our customers’ delivery requirements as their specific needs vary and change through the year. We generally seek to maintain appropriate inventory levels, taking into account these factors as well as the significant differences in manufacturing cycle times for graphite electrode products and our customers’ products.
Finished products are usually stored at our manufacturing facilities. Limited quantities of some finished products are also stored at local warehouses around the world to meet customer needs.
Sales and Customer Service
We believe our product quality, our global manufacturing network and our low cost structure allow us to deliver a broad range of product offerings across various segments. We differentiate and sell the value of our product offerings, depending on the segment or specific product application, primarily based on product quality and performance, delivery reliability, price, and customer technical service.

We price our products based on the value that we believe we deliver to our customers. Pricing may vary within any given industry, depending on the segment within that industry and the value of the offer to a specific customer. We believe that we can achieve increased competitiveness, customer demand, and profitability through our value

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added offerings to customers. In certain segments where the product is less differentiated, these value added offerings have less impact on our competitiveness.

We have a large customer technical service organization, with supporting application engineering and scientific groups and more than 90 engineers and specialists around the world dedicated to our Industrial Materials business. We believe that we are recognized as one of the industry leaders in providing value added technical services to customers for our major product lines.

We deploy these selling methods and our customer technical service to address the specific needs of all products. Our direct sales force currently operates from 6 sales offices located around the world.

We sell our Industrial Materials products primarily through our direct sales force, independent sales representatives and distributors, all of whom are trained and experienced with our products.

Historically, our graphite electrode customers generally seek to negotiate to secure the reliable supply of their anticipated volume requirements on an annual basis, sometimes called the “graphite electrode book building process”. These orders are subject to renegotiation or adjustment to meet changing conditions. The balance of our graphite electrode customers purchase their electrodes as needed at current market prices.

We have customer technical service personnel based around the world to assist customers to maximize their production and minimize their costs. A portion of our engineers and technicians provide technical service and advice to key steel and other metals customers. These services relate to furnace applications and operation, as well as furnace upgrades to reduce energy consumption, improve raw material costs and increase output.

Technology

We believe that we are an industry leader in graphite and carbon materials science and high temperature processing know-how and that we operate premier research, development and testing facilities for our industry. We have over 125 years of experience in the research and development of graphite and carbon technologies.

Research and Development. We conduct our research and development both independently and in conjunction with our strategic suppliers, customers and others. We opened a new dedicated innovation and technology center located near our corporate headquarters in Ohio in February 2015 which focuses on all products. This facility drives innovation to support new product development and commercialize the next generation technologies in carbon and graphite material science. The activities at this center are integrated with the efforts of our engineers at our manufacturing facilities who are focused on improving manufacturing processes.

Research and development expenses amounted to $9.7 million in 2014, $3.4 million in the period January 1 through August 14, 2015, $1.1 million in the period August 15 through December 31, 2015 and $2.4 million in 2016. We believe that our technological and manufacturing strengths and capabilities provide us with a significant growth opportunity as well as a competitive advantage.

Intellectual Property. We believe that our intellectual property, consisting primarily of patents and proprietary know-how, provides us with competitive advantages and is important to our growth opportunities. Our intellectual property portfolio is extensive, with approximately 201 carbon and graphite U.S. and foreign patents and published patent applications focused on our Industrial Materials business, which we believe is more than any of our major competitors (in the business segments in which we operate).

We own, and have obtained licenses to, various trade names and trademarks used in our businesses. For example, the trade name and trademark UCAR are owned by Union Carbide Corporation (which was acquired by Dow Chemical Company) and are licensed to us on a worldwide, exclusive and royalty-free basis until 2025. This particular license automatically renews for successive ten-year periods. It permits non-renewal by Union Carbide in 2025 or at the end of any renewal period upon five years’ notice of non-renewal.

We rely on patent, trademark, copyright and trade secret laws as well as appropriate agreements to protect our intellectual property. Among other things, we seek to protect our proprietary know-how and information, through the requirement that employees, consultants, strategic partners and others, who have access to such proprietary information and know-how, enter into confidentiality or restricted use agreements.

Competition

Competition in the Industrial Materials segment is intense and is based primarily on product differentiation and quality, delivery reliability, price, and customer service, depending on the segment or specific product application.

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In the most demanding product applications (that is, graphite electrodes that can operate in the largest, most productive and demanding EAF steel mills in the world), we compete primarily on product quality, delivery reliability, price and customer technical service. We believe these are prerequisite capabilities that not all producers of graphite electrodes possess or can demonstrate consistently. We primarily compete with higher quality graphite electrode producers, although this segment of the graphite electrode market has become increasingly competitive in recent years as more graphite electrode producers have improved the quality of their offerings and become qualified suppliers to some of the largest and most sophisticated EAF customers.

In other product applications, including ladle furnaces requiring less demanding performance and certain other ferrous and non-ferrous segments, we compete based on product differentiation, product quality and price. We believe our product quality, global manufacturing network, proximity to regional and local customers and the related lower cost structure allows us to deliver a broad range of product offerings across these various segments.

We believe that there are no current commercially viable substitutes for graphite electrodes in EAF steel production. We believe that there are certain cost and technology barriers to entry into our industry, including the need for extensive product and process know-how and other intellectual property and a high initial capital investment. It also requires high quality raw material sources and a developed energy supply infrastructure. However, competing manufacturers, particularly Chinese manufacturers, have been able to expand their sales and manufacturing geographically.

There are a number of international graphite electrode producers, including SGL Carbon A.G. (Germany), Tokai Carbon Co., Ltd. (Japan), Showa Denko Carbon K.K. (Japan), Graphite India Limited (India), HEG Limited (India), SEC Corporation Limited (Japan), Nippon Carbon Co., Ltd. (Japan), Energoprom Group (Russia), Fangda Carbon New Material Technology Co., Ltd. (China), Nantong Yangzi Carbon Co. Ltd (China), Kaifeng Carbon Co., Ltd. (China) and Sinosteel Jilin Carbon Co., Ltd (China), as well as a number of others. In October 2016, SGL Carbon A.G. agreed to sell its performance products business, which is comprised mainly of their graphite electrode product line to Showa Denko Carbon K.K.

All graphite electrode manufacturers, even those without multinational manufacturing operations, are capable of, and many in fact are, supplying their products globally and are experiencing increased competition from Indian, Russian and Chinese graphite electrode manufacturers. The Chinese government has strongly supported and invested heavily in industrial expansion in recent years and continues to do so. As a part of this expansion, Chinese production of graphite electrodes has increased and the quality of the electrodes produced in China has improved. The Chinese currency policies regarding the Renminbi may provide Chinese producers with a competitive advantage with respect to exports of graphite electrodes.

Coke represents a significant portion of the cost to produce a graphite electrode. Competition in the needle coke industry is based primarily on price, reliability and product specifications. Our Seadrift facility competes primarily on the specifications and price of its needle coke.

We believe there are currently approximately nine other firms producing needle coke. These competitors include Phillips 66 (U.S.), Petrocokes Japan Limited (Japan), Mitsubishi Chemical Company, Baosteel Group (China), C-Chem Co., Ltd. (Japan), Indian Oil Company Limited (India), JX Holdings Inc. (Japan), Petrochina International Jinzhou Co., Ltd. (China) and Anshan Kaitan Thermo-Energy New Materials Co., Ltd (China).

Environmental Matters

We are subject to a wide variety of federal, state, local and foreign environmental laws and regulations that govern our properties, neighboring properties, and our current and former operations worldwide. These laws and regulations relate to the presence, use, storage, handling, generation, treatment, emission, release, discharge and disposal of wastes and other substances, including the packaging, labeling and transportation of products that are defined as hazardous or toxic or otherwise believed to have potential to harm the environment or human health. These laws and regulations (and the enforcement thereof) are periodically changed and are becoming increasingly stringent. We have incurred substantial costs in the past, and will continue to incur additional costs in the future, to comply with these legal requirements.

The principal U.S. laws to which our properties and operations are subject include:

- the Clean Air Act, the Clean Water Act and the Resource Conservation and Recovery Act and similar state and local laws which regulate air emissions, water discharges and hazardous waste generation, treatment, storage, handling, transportation and disposal;

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- the Comprehensive Environmental Response, Compensation and Liability Act of 1980, as amended by the Superfund Amendments and Reauthorization Act of 1986, and the Small Business Liability Relief and Brownfields Revitalization Act of 2002, and similar state laws that provide for the reporting of, responses to and liability for, releases of hazardous substances into the environment; and
- the Toxic Substances Control Act and related laws that are designed to track and control chemicals that are produced or imported into the United States and assess the risk to health and to the environment of new products at early developmental stages.

Further, laws and regulations adopted or proposed in various states impose or may impose, as the case may be, environmental monitoring, reporting and/or remediation requirements if operations cease or property is transferred or sold.

We believe that we are currently in compliance in all material respects with the federal, state, local and foreign environmental laws and regulations to which we are subject. We have experienced some level of regulatory scrutiny at most of our current and former facilities and, in some cases, have been required to take corrective or remedial actions and incur related costs in the past, and may experience further regulatory scrutiny, and may be required to take further corrective or remedial actions and incur additional costs, in the future. Although it has not been the case in the past, these costs could have a material adverse effect on us in the future.

We have received and may in the future receive notices from the U.S. Environmental Protection Agency (“U.S. EPA”) or state environmental protection agencies, as well as claims from other parties, alleging that we are a potentially responsible party (“PRP”) under Superfund and similar state laws for past and future remediation costs at waste disposal sites and other contaminated properties. Although Superfund liability is joint and several, in general, final allocation of responsibility at sites where there are multiple PRPs is made based on each PRP's relative contribution of hazardous substances to the site. Based on information currently available to us, we believe that any potential liability we may have as a PRP will not have a material adverse effect on us.

As a result of amendments to the Clean Air Act enacted in 1990, certain of our U.S. facilities have been or will be required to comply with new reporting requirements and standards for air emissions that have been or may be adopted by the U.S. EPA and state environmental protection agencies pursuant to new and revised regulations that have been or could be promulgated, including the possible promulgation of future maximum achievable control technology standards that apply specifically to our manufacturing sector(s), or more generally to our operation(s) or equipment. Achieving compliance with the regulations that have been promulgated to date has resulted in the need for additional administrative and engineered controls, changes to certain manufacturing processes, and increased monitoring and reporting obligations. Similar foreign laws and regulations have been or may also be adopted to establish new standards for air emissions, which may also require additional controls on our manufacturing operations outside the U.S. Based on information currently available to us, we believe that compliance with these regulations will not have a material adverse effect on us.

As mentioned, our manufacturing operations located outside of the U.S. are also subject to their national and local laws and regulations related to environmental protection and product safety. Under the European Union's (“EU”) regulations concerning the Registration, Evaluation, Authorization and Restriction of Chemicals (commonly referred to as “REACH”), enacted in 2007, manufacturers within the EU and importers into the EU of certain chemical substances are required to register and evaluate the potential impacts of those substances on human health and the environment. Under REACH, the continued importation into the EU, manufacture and/or use of certain chemical substances may be restricted, and manufacturers and importers of certain chemicals will be required to undertake evaluations of those substances. The requirements of REACH are being phased in over a period of years, and compliance is requiring and will continue to require expenditures and resource commitments. Based on information currently available to us, we believe that compliance with these regulations will not have a material adverse effect on us.

International accords, foreign laws and regulations, and U.S. federal, state and local laws and regulations are increasingly being enacted to address concerns about the effects that carbon dioxide (“CO2”) emissions and other identified greenhouse gases (“GHG”) may have on the environment and climate worldwide. These effects are widely referred to as Climate Change. Some members of the international community have taken actions in the past to address Climate Change issues on a global basis. In 1997, an international Kyoto Protocol set binding GHG emission reduction targets for the participating industrialized countries. Participating members of the international community continue to meet at annual meetings of the United Nations Framework Convention on Climate Change ("UNFCC") to reach global agreements on Climate Change to replace the expired Kyoto Protocol.

The EU Emissions Trading Scheme ("EU ETS") enacted under the provisions of the 1997 Kyoto Protocol requires certain listed energy-intensive industries to participate in an international "cap and trade" system of GHG

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emission allowances. A third phase of the EU ETS started in January 2013 under Directive 2009/29/EC, which instituted a number of program changes. EU Member States brought into force the necessary laws, regulations and administrative provisions to comply with this EU Directive. Carbon and graphite manufacturing is still not a covered industry sector in the revised Annex 1 of this Directive. However, one of our European manufacturing operations was required to comply with these provisions under a more general fuel combustion category, because their combustion units met the applicability levels. The operations subject to these provisions was eligible to receive free carbon dioxide emission allowances under the member state allocation program.

In December 2015, the 21st Conference of Parties for the UNFCC concluded with more than 190 countries adopting the Paris Agreement, which then came into force and legally binding on the parties in November 2016, after the three criteria in Article 21 were satisfied. The Paris Agreement is a partly binding and partly voluntary agreement to cut global carbon emissions in an effort to limit the rise in global temperatures. The U.S. has pledged to achieve significant reductions in CO2 emissions by 2020. The U.S. may sign a future international Climate Change agreement and/or enact new national Climate Change legislation to reduce GHG emissions in accordance with established goals and deadlines. Such new legislation could impact our industry directly or indirectly, for example by higher energy costs. One or more of our U.S. facilities could be covered by such new legislation and we could incur additional compliance obligations and related expenses.

In 2009, a Final Mandatory Reporting of Greenhouse Gases Rule was issued by the U.S. EPA, which requires facilities with specified GHG sources that emit over the annual threshold quantities to monitor and report their GHG emissions annually. In addition, corporations that are large suppliers of petroleum products (including, by definition, importers and exporters that exceed the annual GHG threshold quantities) must also submit an annual activity report to the U.S. EPA. Some of our operations are covered under this Rule, and we believe that we have the necessary administrative systems in place to comply with the requirements. Under various other foreign and U.S. state regulations, we are currently required to report certain GHG emissions to the pertinent authorities. Furthermore, in December 2009, the U.S. EPA issued an “endangerment and cause or contribute finding” for GHG, under Section 202(a) of the Clean Air Act, allowing it to issue new rules that directly regulate GHG emissions under the existing federal New Source Review, Prevention of Significant Deterioration (PSD) and Title V Operating Permit programs. In May 2010, the U.S. EPA set GHG emissions thresholds to define when permits under these programs are required for new and existing industrial facilities. Under these programs, new or significantly modified facilities must also use best available control technologies to minimize GHG emissions. Therefore, we may incur future expenses to modify our air permits, implement additional administrative and engineered controls, invest in capital improvements, and/or make changes in certain manufacturing processes at our U.S. facilities to achieve compliance with these regulations or to expand our operations.

Based on information currently available to us, we believe that compliance with international accords, U.S. and foreign laws and regulations concerning Climate Change which have been promulgated, or that could be promulgated in the future, will not have a material adverse effect on us.

We have sold or closed a number of facilities that had operated solid waste management units on site. In most cases where we divested the properties, we have retained ownership of on-site landfills. When our landfills were or are to be sold, we obtained or seek to obtain financial assurance we believe to be adequate to protect us from any potential future liability associated with these landfills. When we have closed landfills, we believe that we have done so in material compliance with applicable laws and regulations. We continue to monitor these landfills and observe any reporting obligations we may have with respect to them pursuant to applicable laws and regulations. To date, the costs associated with the retained landfills have not been, and we do not anticipate that future costs will be, material to us.

Estimates of future costs for compliance with U.S. and foreign environmental protection laws and regulations, and for environmental liabilities, are necessarily imprecise due to numerous uncertainties, including the impact of potential new laws and regulations, the availability and application of new and diverse technologies, the extent of insurance coverage, the potential discovery of contaminated properties, or the identification of new hazardous substance disposal sites at which we may be a PRP and, in the case of sites subject to Superfund and similar state and foreign laws, the final determination of remedial requirements and the ultimate allocation of costs among the PRPs. Subject to the inherent imprecision in estimating such future costs, but taking into consideration our experience to date regarding environmental matters of a similar nature and facts currently known, we estimate that our costs and capital expenditures (in each case, before adjustment for inflation) for environmental protection regulatory compliance programs and for remedial response actions will not increase materially over the next several years.

Furthermore, we establish accruals for environmental liabilities when it is probable that a liability has been or will be incurred, and the amount of the liability can be reasonably estimated. We adjust the accrual as new remedial

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actions or other commitments are made, and when new information becomes available that changes the prior estimates previously made.

Insurance

We maintain insurance against civil liabilities relating to personal injuries to third parties, for loss of or damage to property, for business interruptions and for environmental matters, that provides coverage, subject to the applicable coverage limits, deductibles and retentions, and exclusions, that we believe are appropriate upon terms and conditions and for premiums that we consider fair and reasonable in the circumstances. We cannot assure you, however, that we will not incur losses beyond the limits of or outside the coverage of our insurance.

Employees

As of December 31, 2016, we had 1,244 employees in our Industrial Materials business and supporting corporate functions (excluding contractors), a decrease of 75 employees from December 31, 2015. A total of 425 employees were in Europe (including Russia), 593 were in Mexico and Brazil, 6 were in South Africa, 211 were in the U.S. and 9 were in the Asia Pacific region. As of December 31, 2016, 750 of our employees were hourly employees.

As of December 31, 2016, approximately 53% of our worldwide employees were covered by collective bargaining or similar agreements, which expire at various times in each of the next several years. As of December 31, 2016, approximately 536 employees, or 43% of our employees, were covered by agreements which expire, or are subject to renegotiation, at various times through December 31, 2017. We believe that, in general, our relationships with our unions are satisfactory and that we will be able to renew or extend our collective bargaining or similar agreements on reasonable terms as they expire. We cannot assure, however, that renewed or extended agreements will be reached without a work stoppage or strike or will be reached on terms satisfactory to us.

We have not had any material work stoppages or strikes during the past decade.

Item 1A. Risk Factors

An investment in our securities involves significant risks. You should carefully read all of the information included in this report and carefully consider, among other matters, the following risk factors, as well as any discussed under Item 7, “Management's Discussion and Analysis of Financial Conditions and Results of Operations.” If any of the conditions or events described in the following risk factors were to occur, our business, financial condition, results of operations or growth prospects could be affected materially and adversely. In that case, the market price of our securities could decline and you could lose part or all of your investment.

The risks described below are not the only ones facing us. Additional risks not presently known to us, or that we currently deem immaterial, individually or in the aggregate, may also impair our business operations.

RISKS RELATING TO US

A downturn in global economic conditions may materially adversely affect our business.

A global, regional or localized economic downturn may reduce customer demand or inhibit our ability to produce our products, negatively impacting our operating results. Our business and operating results have been and will continue to be sensitive to economic downturns (including credit market tightness which can impact our liquidity as well as that of our customers, suppliers and other business partners), declining consumer and business confidence, fluctuating commodity prices, volatile exchange rates and other challenges that can affect the economy. Our customers may experience deterioration of their businesses, cash flow shortages and difficulty obtaining financing, leading them to delay or cancel plans to purchase products, and they may not be able to fulfill their obligations in a timely fashion. Further, suppliers and other business partners may experience similar conditions, which could impact their ability to fulfill their obligations to us. Also, it could be difficult to find replacements for business partners without incurring significant delays or cost increases). Such events and other economic matters would negatively impact our revenues and results of operations.

As more fully described under “Management's Discussion and Analysis of Financial Condition and Results of Operations,” we are currently facing a challenging environment for our products, particularly our Industrial Materials products, as a result of global economic conditions.

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The International Monetary Fund reported GDP growth figures for 2016 at approximately 3.1 percent. We believe that worldwide the graphite electrode industry manufacturing capacity utilization rate excluding China was approximately 68% for 2015 and 76% for 2016 and including China capacity utilization was approximately 64% in 2015 and 63% in 2016.. These lower capacity utilization rates may continue to be driven by a challenging environment for our customers which would negatively impact demand for our Industrial Materials products and may adversely affect our revenue and results of operations for 2017.

We are dependent on the global steel industry.

We sell our Industrial Materials products, which accounted for 100% of our total net sales within continuing operations in 2016, primarily to the EAF steel production industry. Our customers, including major steel producers, are experiencing and may continue to experience downturns or financial distress that could adversely impact our ability to collect our accounts receivable or to collect them on a timely basis.

The steel industry has historically been highly cyclical and is affected significantly by general economic conditions. Significant customers for the steel industry include companies in the automotive, construction, appliance, machinery, equipment and transportation industries, all of which continue to be affected by the general economic downturn and the deterioration in financial markets, including severely restricted liquidity and credit availability.

We sell products used in the transportation, semiconductor, solar, petrochemical, electronics, and other industries which are susceptible to global and regional economic downturns

Many of our other products are sold primarily to the electronics, transportation, alternative energy, and oil and gas exploration industries. These are global basic industries, and they are experiencing various degrees of contraction, growth and consolidation. Customers in these industries are located in every major geographic region. As a result, our customers are affected by changes in global and regional economic conditions. This, in turn, affects overall demand and prices for our products sold to these industries. As a result of changes in economic conditions, demand and pricing for our products sold to these industries has fluctuated and in some cases declined significantly, which could have a material adverse effect on our results of operations.

Demand for our products sold to these industries may be adversely affected by improvements in our products as well as in the manufacturing operations of customers, which reduce the rate of consumption or use of our products.

Sales volumes and prices of our products sold to these industries are impacted by the supply/demand balance as well as overall changes in demand, excess capacity and growth of and consolidation within, the end markets for our products. In addition to the factors mentioned above, the supply/demand balance is affected by factors such as business cycles, rationalization, and increases in capacity and productivity initiatives within our industry and the end markets for our products, and certain of such factors are affected by decisions by us. Changes in the supply/demand balance could have a material adverse effect on our results of operations.

In addition, a continuation of the current difficult economic conditions may lead current or potential customers of our Engineered Solutions business to delay or reduce technology purchases or slow their adoption of new technologies. This may result in a continued reduction, or slower rate of recovery, of sales of our Engineered Solutions products and increased price competition, which could materially and adversely affect our financial position and results of operations.

Our indebtedness could limit our financial and operating activities, and adversely affect our ability to incur additional debt to fund future needs.

As of December 31, 2016, we had approximately $365.4 million of total indebtedness principal outstanding, This includes $274.1 million of Senior Notes ($300.0 million due upon maturity). The Company also has access to a $225 million Revolving Facility (subject to a $25 million minimum liquidity requirement). As of December 31, 2016, the Company had $61.2 million of borrowings and $12.3 million of letters of credit, for a total of $73.5 million drawn against the Revolving Facility.

. This substantial amount of indebtedness could:

- require us to dedicate a substantial portion of our cash flow to the payment of principal and interest, thereby reducing the funds available for operations and future business opportunities;

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- make it more difficult for us to satisfy our obligations with respect to the Senior Notes, including our repurchase obligations;
- limit our ability to borrow additional money if needed for other purposes, including working capital, capital expenditures, debt service requirements, acquisitions and general corporate or other purposes, on satisfactory terms or at all;
- limit our ability to adjust to changing economic, business and competitive conditions;
- place us at a competitive disadvantage with competitors who may have less indebtedness or greater access to financing;
- make us more vulnerable to an increase in interests rates, a downturn in our operating performance or a decline in general economic conditions; and
- make us more susceptible to changes in credit ratings, which could impact our ability to obtain financing in the future and increase the cost of such financing.

If compliance with our debt obligations under the Revolving Facility materially limits our financial or operating activities, or hinders our ability to adapt to changing industry conditions, we may lose market share, our revenue may decline and our operating results may be negatively affected.

The Credit Agreement governing the Revolving Facility and the indenture governing the Senior Notes includes covenants that could restrict or limit our financial and business operations.

The Credit Agreement and the Indenture contain a number of restrictive covenants that, subject to certain exceptions and qualifications, restrict or limit GTI's ability and the ability of GTI's subsidiaries to, among other things:

- incur, repay or refinance indebtedness;
- create liens on or sell our assets;
- engage in certain fundamental corporate changes or changes to our business activities;
- make investments or engage in mergers or acquisitions;
- engage in sale-leaseback transactions;
- pay dividends or repurchase stock;
- engage in certain affiliate transactions;
- enter into agreements or otherwise restrict GTI's subsidiaries from making distributions or paying dividends to the borrowers under the Revolving Facility; and
- repay intercompany indebtedness owed to GTI or make distributions or pay dividends to GTI.

The Credit Agreement also contains certain affirmative covenants and requires us to comply with financial coverage ratios regarding both our cash interest expense and our senior secured debt relative to our EBITDA (as defined in the Credit Agreement).

These covenants and restrictions could affect our ability to operate our business, and may limit our ability to react to market conditions or take advantage of potential business opportunities as they arise. Additionally, our ability to comply with these covenants may be affected by events beyond our control, including general economic and credit conditions and industry downturns.

If we fail to comply with the covenants in the Credit Agreement and are unable to obtain a waiver, or amendment, an event of default would result, and the lenders could, among other things, declare outstanding amounts due and payable, refuse to lend additional amounts to us, require deposit of cash collateral in respect of outstanding letters of credit, or refuse to waive any restrictive covenants in the Credit Agreement, including the restriction which prohibits dividends and distributions from GTI's subsidiaries to GTI to fund payment of indebtedness, including the Senior Notes, during a default or event of default. If we were unable to repay or pay the amounts due, the lenders could, among

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other things, proceed against the collateral granted to them to secure such indebtedness, which includes substantially all of the assets of GTI and its U.S. subsidiaries and certain assets of certain of GTI's foreign subsidiaries.

Our cash flows may not be sufficient to service our indebtedness, and if we are unable to satisfy our obligations under our indebtedness, we may be required to seek other financing alternatives, which may not be successful.

Our ability to make timely payments of principal and interest on our debt obligations, including the Senior Notes and our obligations under the Revolving Facility, depends on our ability to generate positive cash flows from operations, which is subject to general economic conditions, competitive pressures and certain financial, business and other factors beyond our control. If our cash flows and capital resources are insufficient to make these payments, we may be required to seek additional financing sources, reduce or delay capital expenditures, sell assets or operations or refinance our indebtedness. These actions could have a material adverse effect on our business, financial conditions and results of operations. In addition, we may not be able to take any of these actions, and, even if successful, these actions may not permit us to meet our scheduled debt service obligations. Our ability to restructure or refinance the debt under the Revolving Facility will depend on, among other things, the condition of the capital markets and our financial condition at such time. There can be no assurance that we will be able to restructure or refinance any of our indebtedness on commercially reasonable terms or at all. If we cannot make scheduled payments on our debt, we will be in default and the outstanding principal and interest on our debt could be declared to be due and payable, in which case we could be forced into bankruptcy or liquidation or required to substantially restructure or alter our business operations or debt obligations.

Borrowings under the Revolving Facility bear interest at a variable rate, which subjects us to interest rate risk, which could cause our debt service obligations to increase significantly.

All of our borrowings under the Revolving Facility are at variable rates of interest and expose us to interest rate risk. If interest rates increase, our debt service obligations on this variable rate indebtedness would increase even though the amount borrowed remained the same.

We may not be able to raise the funds necessary to finance a change of control repurchase under the Indenture governing the Senior Notes.

Upon the occurrence of a change of control repurchase event under the Indenture, holders of Senior Notes may require us to purchase their Senior Notes. However, it is possible that we would not have sufficient funds at that time to make the required purchase of Senior Notes. We cannot assure you that we will have sufficient financial resources, or will be able to arrange financing, to pay the repurchase price in cash with respect to any Senior Notes tendered by holders for repurchase upon a change of control. Our failure to repurchase the Senior Notes when required would result in an event of default under the Indenture which could, in turn, constitute a default under the terms of our other indebtedness, if any.

The Credit Agreement governing the Revolving Facility includes covenants that could restrict or limit our ability to repurchase the Senior Notes in a change of control repurchase event.

Upon the occurrence of a change of control repurchase event under the indenture governing the Senior Notes, holders of Senior Notes may require us to purchase their Senior Notes. The Credit Agreement contains a restrictive covenant on the repurchase or retirement of indebtedness, which could limit or restrict our ability to make the required repurchase of Senior Notes. If the repurchase of Senior Notes does violate covenants in the Credit Agreement and if we are unable to obtain a waiver or amendment, an event of default would occur if we repurchased the Senior Notes, and the lenders under the Credit Agreement could, among other things, declare outstanding amounts thereunder due and payable, refuse to lend additional amounts to us, and require a deposit of cash collateral in respect of outstanding letters of credit. If we were unable to repay or pay the amounts due, the lenders could, among things, proceed against the collateral granted to them to secure such indebtedness, which includes substantially all of the assets of GTI and GTI's U.S. subsidiaries and certain assets of certain of GTI's foreign subsidiaries.

A lowering or withdrawal of the ratings assigned to our debt securities by rating agencies may increase our future borrowing costs and reduce our access to capital.

Any rating assigned to our debt could be lowered or withdrawn entirely by a rating agency if, in that rating agency's judgment, future circumstances relating to the basis of the rating, such as adverse changes, so warrant. Any future lowering of our ratings likely would make it more difficult or more expensive for us to obtain additional debt financing. In January 2016, Moody's downgraded our Senior Notes from B1 to Caa1.

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Disruptions in the capital and credit markets, which may continue indefinitely or intensify, could adversely affect our results of operations, cash flows and financial condition, or those of our customers and suppliers.

Disruptions in the capital and credit markets may adversely impact our results of operations, cash flows and financial condition, or those of our customers and suppliers. Disruptions in the capital and credit markets as a result of uncertainty, changing or increased regulation, reduced alternatives or failures of significant financial institutions could adversely affect our access to liquidity needed to conduct or expand our businesses or conduct acquisitions or make other discretionary investments, as well as our ability to effectively hedge our currency or interest rate risks and exposures. Such disruptions may also adversely impact the capital needs of our customers and suppliers, which, in turn, could adversely affect our results of operations, cash flows and financial condition.

We are subject to risks associated with operations in multiple countries.

A substantial majority of our net sales are derived from sales outside the U.S., and a majority of our operations and our total property, plant and equipment and other long- lived assets are located outside the U.S. As a result, we are subject to risks associated with operating in multiple countries, including:

- currency devaluations and fluctuations in currency exchange rates, including impacts of transactions in various currencies, impact on translation of various currencies into dollars for U.S. reporting and financial covenant compliance purposes, and impacts on results of operations due to the fact that costs of our foreign subsidiaries are primarily incurred in local currencies while their products are primarily sold in dollars and euros;
- imposition of or increases in customs duties and other tariffs;
- imposition of or increases in currency exchange controls, including imposition of or increases in limitations on conversion of various currencies into dollars, euros, or other currencies, making of intercompany loans by subsidiaries or remittance of dividends, interest or principal payments or other payments by subsidiaries;
- imposition of or increases in revenue, income or earnings taxes and withholding and other taxes on remittances and other payments by subsidiaries;
- imposition of or increases in investment or trade restrictions by the U.S. or by non-U.S. governments or trade sanctions adopted by the U.S.;
- inability to definitively determine or satisfy legal requirements, inability to effectively enforce contract or legal rights and inability to obtain complete financial or other information under local legal, judicial, regulatory, disclosure and other systems; and
- nationalization or expropriation of assets, and other risks which could result from a change in government or government policy, or from other political, social or economic instability.

We cannot assure you that such risks will not have a material adverse effect on us or that we would be able to mitigate such material adverse effects in the future.

In addition to the factors noted above, our results of operations and financial condition are affected by inflation, deflation and stagflation in each country in which we have a manufacturing facility. We cannot assure you that future increases in our costs will not exceed the rate of inflation or the amounts, if any, by which we may be able to increase prices for our products.

Our ability to grow and compete effectively depends on protecting our intellectual property. Failure to protect our intellectual property could adversely affect us.

We believe that our intellectual property, consisting primarily of patents and proprietary know-how and information, is important to our growth. Failure to protect our intellectual property may result in the loss of the exclusive right to use our technologies. We rely on patent, trademark, copyright and trade secret laws and confidentiality and restricted use agreements to protect our intellectual property. Some of our intellectual property is not covered by any patent or patent application or any such agreement.

Patents are subject to complex factual and legal considerations. Accordingly, there can be uncertainty as to the validity, scope and enforceability of any particular patent. Therefore, we cannot assure you that:

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- any of the U.S. or foreign patents now or hereafter owned by us, or that third parties have licensed to us or may in the future license to us, will not be circumvented, challenged or invalidated;
- any of the U.S. or foreign patents that third parties have non-exclusively licensed to us, or may non-exclusively license to us in the future, will not be licensed to others; or
- any of the patents for which we have applied or may in the future apply will be issued at all or with the breadth of claim coverage sought by us.

Moreover, patents, even if valid, only provide protection for a specified limited duration.

We cannot assure you that agreements designed to protect our proprietary know-how and information will not be breached, that we will have adequate remedies for any such breach, or that our strategic alliance suppliers and customers, consultants, employees or others will not assert rights against us with respect to intellectual property arising out of our relationships with them.

In addition, effective patent, trademark and trade secret protection may be limited, unavailable or not applied for in the U.S. or in any of the foreign countries in which we operate.

Further, we cannot assure you that the use of our patented technology or proprietary know-how or information does not infringe the intellectual property rights of others.

Intellectual property protection does not protect against technological obsolescence due to developments by others or changes in customer needs.

The protection of our intellectual property rights may be achieved, in part, by prosecuting claims against others whom we believe have misappropriated our technology or have infringed upon our intellectual property rights, as well as by defending against misappropriation or infringement claims brought by others against us. Our involvement in litigation to protect or defend our rights in these areas could result in a significant expense to us, adversely affect the development of sales of the related products, and divert the efforts of our technical and management personnel, regardless of the outcome of such litigation.

If necessary, we may seek licenses to intellectual property of others. However, we can give no assurance to you that we will be able to obtain such licenses or that the terms of any such licenses will be acceptable to us. Our failure to obtain a license from a third party for its intellectual property that is necessary for us to make or sell any of our products could cause us to incur substantial liabilities and to suspend the manufacture or shipment of products or use of processes requiring the use of such intellectual property.

Our current and former manufacturing operations are subject to increasingly stringent health, safety and environmental requirements.

We use and generate hazardous substances in our manufacturing operations. In addition, both the properties on which we currently operate and those on which we have ceased operations are and have been used for industrial purposes. Further, our manufacturing operations involve risks of personal injury or death. We are subject to increasingly stringent environmental, health and safety laws and regulations relating to our current and former properties, neighboring properties, and our current raw materials, products, and operations. These laws and regulations provide for substantial fines and criminal sanctions for violations and sometimes require evaluation and registration or the installation of costly pollution control or safety equipment or costly changes in operations to limit pollution or decrease the likelihood of injuries. It is also possible that the impact of such regulations on our suppliers could affect the availability and cost of our raw materials. In addition, we may become subject to potential material liabilities for the investigation and cleanup of contaminated properties, for claims alleging personal injury or property damage resulting from exposure to or releases of hazardous substances, or for personal injury as a result of an unsafe workplace. Further, alleged noncompliance with or stricter enforcement of, or changes in interpretations of, existing laws and regulations, adoption of more stringent new laws and regulations, discovery of previously unknown contamination or imposition of new or increased requirements could require us to incur costs or become the basis of new or increased liabilities that could be material.

We may face risks related to greenhouse gas emission limitations and climate change.

There is growing scientific, political and public concern that emissions of greenhouse gases (“GHG”) are altering the atmosphere in ways that are affecting, and are expected to continue to affect, the global climate. Legislators,

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regulators and others, as well as many companies, are considering ways to reduce GHG emissions. GHG emissions are regulated in the European Union via an Emissions Trading Scheme (“ETS”), otherwise known as a “Cap and Trade” program. In the United States, environmental regulations issued in 2009 and 2010 require reporting of GHG emissions by defined industries, activities and suppliers, and regulate GHG as a pollutant covered under the New Source Review, Prevention of Significant Deterioration (“PSD”) and Title V Operating Permit programs of the Clean Air Act Amendments. It is possible that some form of regulation of GHG emissions will also be forthcoming in other countries in which we operate or market our products. Regulation of GHG emissions could impose additional costs, both direct and indirect, on our business, and on the businesses of our customers and suppliers, such as increased energy and insurance rates, higher taxes, new environmental compliance program expenses, including capital improvements, environmental monitoring, and the purchase of emission credits, and other administrative costs necessary to comply with current requirements and potential future requirements or limitations that may be imposed, as well as other unforeseen or unknown costs. To the extent that similar requirements and limitations are not imposed globally, such regulation may impact our ability to compete with companies located in countries that do not have such requirements or do not impose such limitations. The company may also realize a change in competitive position relative to industry peers, changes in prices received for products sold, and changes to profit or loss arising from increased or decreased demand for products produced by the company. The impact of any future GHG regulatory requirements on our global business will be dependent upon the design of the regulatory schemes that are ultimately adopted and, as a result, we are unable to predict their significance to our operations at this point in time.

The potential physical impacts of climate change on the Company's operations are uncertain and will likely be particular to the geographic circumstances. These physical impacts may include changes in rainfall and storm patterns, shortages of water or other natural resources, changing sea levels, and changing global average temperatures. For instance, our Seadrift facility in Texas and our Calais facility in France, are located in geographic areas less than 50 feet above sea level. As a result, any future rising sea levels could have an adverse impact on their operations and on their suppliers. Due to these uncertainties, any future physical effects of climate change may or may not adversely affect the operations at each of our production facilities, the availability of raw materials, the transportation of our products, the overall costs of conducting our business, and our financial performance.

We face certain litigation and legal proceedings risks that could harm our business.

We are involved in various product liability, occupational, environmental, and other legal claims, demands, lawsuits and other proceedings arising out of or incidental to the conduct of our business. The results of these proceedings are difficult to predict. Moreover, many of these proceedings do not specify the relief or amount of damages sought. Therefore, as to a number of the proceedings, we are unable to estimate the possible range of liability that might be incurred should these proceedings be resolved against us. Certain of these matters involve types of claims that, if resolved against us, could give rise to substantial liability, which could have a material adverse effect on our financial position, liquidity and results of operations.

We are dependent on supplies of raw materials and energy. Our results of operations could deteriorate if that supply increases in cost or is substantially disrupted for an extended period.

We purchase raw materials and energy from a variety of sources. In many cases, we purchase them under short term contracts or on the spot market, in each case at fluctuating prices. The availability and price of raw materials and energy may be subject to curtailment or change due to:

- limitations which may be imposed under new legislation or regulation;
- supplier's allocations to meet demand of other purchasers during periods of shortage (or, in the case of energy suppliers, extended cold weather);
- interruptions or cessations in production by suppliers, and
- market and other events and conditions.

Petroleum and coal products, including decant oil, petroleum coke and pitch, our principal raw materials, and energy, particularly natural gas, have been subject to significant price fluctuations.

We have in the past entered into, and may continue in the future to enter into, derivative contracts and short duration fixed rate purchase contracts to effectively fix a portion of our exposure to certain products.

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A substantial increase in raw material or energy prices which cannot be mitigated or passed on to customers or a continued interruption in supply, particularly in the supply of decant oil, petroleum coke or energy, would have a material adverse effect on us.
Seadrift could be impacted by a reduction in the availability of low sulfur decant oil or an increase in the pricing of petroleum needle coke feedstocks.
Seadrift uses low sulfur decant oil in the manufacture of petroleum needle coke. There is no assurance that Seadrift will always be able to obtain an adequate quantity of suitable feedstocks or that capital would be available to install equipment to allow for utilization of higher sulfur decant oil, which is more readily available in the United States, in the event that suppliers of lower sulfur decant oil were to become more limited in the future. Seadrift purchases approximately 1.5 million barrels of low sulfur decant oil annually. The prices paid by Seadrift for such feedstocks are governed by the market for heavy fuel oils, which prices can fluctuate widely for various reasons including, among other things, worldwide oil shortages and cold winter weather. Seadrift's petroleum needle coke is used in the manufacture of graphite electrodes, the price of which is subject to rigorous industry competition thus restricting Seadrift's ability to pass through raw material price increases.
We may divest or acquire businesses.
We may divest or acquire businesses to rationalize or expand our businesses and enhance our cash flows. No assurance can be given that we will be successful in any of such activities or as to the impact thereof on us financial or otherwise.
We have significant goodwill on our balance sheet that is sensitive to changes in the market, which could result in impairment charges.
Our annual impairment test of goodwill was performed in the fourth quarter. The estimated fair values of our reporting units were based on discounted cash flow models derived from internal earnings forecasts and assumptions. The assumptions and estimates used in these valuations incorporated the current and expected economic environment. Our graphite electrode reporting unit's fair value exceeds its carrying value (see Note 5 "Goodwill and Other Intangible Assets" to the Financial Statements). A further deterioration in the global economic environment or in any of the input assumptions in our calculation could adversely affect the fair value of our reporting units and result in further impairment of some or all of the goodwill on the balance sheet. See Item 7 "Management's Discussion and Analysis of Financial Conditions and Results of Operations-Critical Accounting Policies" for further information regarding goodwill.

Our results of operations could deteriorate if our manufacturing operations were substantially disrupted for an extended period.
Our manufacturing operations are subject to disruption due to extreme weather conditions, floods, hurricanes and tropical storms and similar events, major industrial accidents, cybersecurity attacks, strikes and lockouts, adoption of new laws or regulations, changes in interpretations of existing laws or regulations or changes in governmental enforcement policies, civil disruption, riots, terrorist attacks, war, and other events. We cannot assure you that no such events will occur. If such an event occurs, it could have a material adverse effect on us.
We have non-dollar-denominated intercompany loans and have had in the past, and may in the future have, foreign currency financial instruments and interest rate swaps and caps. The related gains and losses have in the past been, and may in the future be, significant.
As part of our cash management, we have non-dollar denominated intercompany loans between our subsidiaries. These loans are deemed to be temporary and, as a result, remeasurement gains and losses on these loans are recorded as currency gains / losses in other income (expense), net, on the Consolidated Statements of Income.
Additionally, we have in the past entered into, and may in the future enter into, interest rate swaps and caps to attempt to manage interest rate expense. We have also in the past entered into, and may in the future enter into, foreign currency financial instruments to attempt to hedge global currency exposures. We may purchase or sell these financial instruments, and open and close hedges or other positions, at any time. Changes in currency exchange rates or interest rates have in the past resulted, and may in the future result, in significant gains or losses with respect thereto. These instruments are marked-to-market monthly and gains and losses thereon are recorded in Other Comprehensive Income

in the Consolidated Balance Sheets.

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There may be volatility in our results of operations between quarters.

Sales of our products fluctuate from quarter to quarter due to such factors as changes in economic conditions, changes in competitive conditions, scheduled plant shutdowns by customers, national vacation practices, changes in customer production schedules in response to seasonal changes in energy costs, weather conditions, strikes and work stoppages at customer plants and changes in customer order patterns including those in response to the announcement of price increases or price adjustments. We have experienced, and expect to continue to experience, volatility with respect to demand for and prices of our industrial material products, specifically graphite electrodes, both globally and regionally. We have also experienced volatility with respect to prices of raw materials and energy, and we expect to experience volatility in such prices in the future. Accordingly, results of operations for any quarter are not necessarily indicative of the results of operations for a full year.

The graphite and carbon industry is highly competitive. Our market share, net sales or net income could decline due to vigorous price and other competition.

Competition in the graphite and carbon products industry (other than, generally, with respect to new products) is based primarily on price, product differentiation and quality, delivery reliability, and customer service. Electrodes, in particular, are subject to rigorous price competition. In such a competitive market, changes in market conditions, including customer demand and technological development, could adversely affect our competitiveness, sales and/or profitability.

Competition with respect to new products is, and is expected to be, generally based primarily on product innovation, price, performance and cost effectiveness as well as customer service.

Competition could prevent implementation of price increases, require price reductions or require increased spending on research and development, marketing and sales that could adversely affect us.

RISKS RELATING TO OUR SECURITIES

GTI is a holding company and all of its operations are conducted through its subsidiaries.

GTI is a holding company and derives substantially all of its cash flow from its subsidiaries. Since GTI's operations are conducted through its subsidiaries, its cash flow and its consequent ability to service its indebtedness, including the Senior Notes, is dependent upon the earnings of its subsidiaries and the distribution of those earnings to GTI or upon the payments of funds by those subsidiaries to GTI or the repayment of intercompany indebtedness owed to GTI. GTI's subsidiaries are separate and distinct legal entities with trade payables and other liabilities. In addition to any statutory restrictions, the payment of dividends and the making of distributions and the making of loans and advances to GTI by its subsidiaries are subject to contractual restrictions provided in the Revolving Facility. In addition, any right GTI may have to receive assets of any of its subsidiaries upon their liquidation or reorganization (and the consequent right of the holders of the Senior Notes to participate in those assets) is effectively subordinated to the claims of such subsidiary's creditors, including trade creditors.

The Senior Notes are structurally subordinated to all of the existing and future liabilities, including trade payables, of GTI's subsidiaries that are not, or do not become, guarantors of the Senior Notes.

The Senior Notes are not guaranteed by all of GTI's subsidiaries or any of GTI's foreign subsidiaries. The Senior Notes are therefore structurally subordinated to all of the existing and future liabilities, including trade payables, of any non-guarantor subsidiary such that, in the event of an insolvency, liquidation, reorganization, dissolution or other winding up of any such subsidiary, all of such subsidiary's creditors (including trade creditors and preferred stockholders, if any) would be entitled to payment in full out of such subsidiary's assets before the holders of the Senior Notes would be entitled to any payment.

As of December 31, 2016, GTI's subsidiaries that are not guarantors of the Senior Notes had total liabilities, including trade payables (but excluding intercompany liabilities), of approximately $137.5 million or 24% of our total liabilities, and total assets (excluding intercompany receivables) of approximately $719.7 million, or 65% of our total assets. In addition, for the year ended December 31, 2016, our subsidiaries that are not guarantors of the Senior Notes generated approximately $350.9 million, or 80%, of our consolidated revenues and approximately $77.5 million of our consolidated operating loss of $92.1 million.

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Under certain circumstances, subsidiary guarantees may be released.

Those subsidiaries that provide guarantees of the Senior Notes will be released from such guarantees upon the occurrence of certain events, including the following:

- the unconditional release or discharge of any guarantee or indebtedness that resulted in the creation of the guarantee of the Senior Notes by such subsidiary guarantor;
- the sale or other disposition, including by way of merger or consolidation or the sale of its capital stock following which such subsidiary guarantor is no longer a subsidiary of the Company; or
- GTI's exercise of its legal defeasance option or its covenant defeasance option as described in the indenture applicable to the Senior Notes.

If any such subsidiary guarantee is released, no holder of the Senior Notes will have a claim as a creditor against any such subsidiary and the indebtedness and other liabilities, including trade payables and preferred stock, if any, of such subsidiary will be effectively senior to the claim or any holders of the Senior Notes.

We may incur substantially more debt ranking senior or equal in right of payment with the Senior Notes, including secured debt, which would increase the risks described herein.

The agreements relating to our debt, including the Credit Agreement, limit but do not prohibit our ability to incur additional debt, and the amount of debt that we could incur could be substantial. Accordingly, we could incur significant additional debt in the future, including additional debt under the Revolving Facility. Much of this additional debt could constitute secured debt, to which the Senior Notes would be effectively subordinated to the extent of the value of the collateral securing such debt (the collateral securing the Revolving Facility consists of substantially all of the assets of GTI and its U.S. subsidiaries and certain assets of certain of GTI's foreign subsidiaries). In addition, if we form or acquire any subsidiaries in the future, those subsidiaries also could incur debt, which debt would be effectively senior to the Senior Notes if those subsidiaries are not required to guarantee the Senior Notes. If new debt is added to our current debt levels, the related risks that we now face could intensify.

In addition, certain types of liabilities are not considered “Indebtedness” under the Credit Agreement, and the Credit Agreement does not impose any limitation on the amount of liabilities incurred by the subsidiaries, if any, that might be designated as “unrestricted subsidiaries.”

The ability of holders of Senior Notes to require us to repurchase Senior Notes as a result of a disposition of “substantially all” of our assets may be uncertain.

The definition of change of control in the indenture governing the Senior Notes includes a phrase relating to the sale of “all or substantially all” of our assets. Although there is a limited body of case law interpreting the phrase “substantially all,” there is no precise established definition of such phrase under applicable law. Accordingly, the ability of a holder of Senior Notes to require us to repurchase its Senior Notes as a result of a sale or other disposition of less than all of our assets to another person or group may be uncertain.

If we default on our obligations to pay our other indebtedness, we may not be able to make payments on the Senior Notes.

Any default under the agreements governing our indebtedness, including a default under the Revolving Facility, that is not waived by the required lenders, and the remedies sought by the holders of such indebtedness, could prevent us from paying principal, premium, if any, and interest on the Senior Notes and substantially decrease the market value of the Senior Notes. If we are unable to generate sufficient cash flow and are otherwise unable to obtain funds necessary to meet required payments of principal, premium, if any, and interest on our indebtedness, or if we otherwise fail to comply with the various covenants, including financial and operating covenants in the instruments governing our indebtedness (including covenants in the Credit Agreement and the indenture that governs the Senior Notes), we could be in default under the terms of the agreements governing such indebtedness, including the Credit Agreement and the indenture governing the Senior Notes. In the event of such default:

- the holders of such indebtedness may be able to cause all of our available cash flow to be used to pay such indebtedness and, in any event, could elect to declare all the funds borrowed thereunder to be due and payable, together with accrued and unpaid interest;

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- the lenders under the Revolving Facility could elect to terminate their commitments thereunder, cease making further loans and institute foreclosure proceedings against our assets; and
- we could be forced into bankruptcy or liquidation.

Upon any such bankruptcy filing, we would be stayed from making any ongoing payments on the Senior Notes, and the holders of the Senior Notes would not be entitled to receive post-petition interest or applicable fees, costs or charges, or any "adequate protection" under Title 11 of the United States Code (the "Bankruptcy Code"). Furthermore, if a bankruptcy case were to be commenced under the Bankruptcy Code, we could be subject to claims, with respect to any payments made within 90 days prior to commencement of such a case, that we were insolvent at the time any such payments were made and that all or a portion of such payments, which could include repayments of amounts due under the Senior Notes, might be deemed to constitute a preference, under the Bankruptcy Code, and that such payments should be voided by the bankruptcy court and recovered from the recipients for the benefit of the entire bankruptcy estate. Also, in the event that we were to become a debtor in a bankruptcy case seeking reorganization or other relief under the Bankruptcy Code, a delay and/or substantial reduction in payment under the Senior Notes may otherwise occur. If our operating performance declines, we may in the future need to obtain waivers from the required lenders under the Revolving Facility to avoid being in default. If we breach our covenants under the Credit Agreement and seek a waiver, we may not be able to obtain a waiver from the required lenders. If this occurs, we would be in default under the Revolving Facility, the lenders could exercise their rights, as described above, and we could be forced into bankruptcy or liquidation.

Federal and state statutes could allow a court to void the Senior Notes or any of our subsidiaries' guarantees of the Senior Notes under fraudulent transfer laws and require noteholders to return payments received by us or the subsidiary guarantors to us or the subsidiary guarantors or to fund for the benefit of their respective creditors or subordinate the Senior Notes or the guarantees to other claims of us or the subsidiary guarantors.

Under the federal bankruptcy laws and comparable provisions of state fraudulent transfer laws, the Senior Notes or any of the guarantees thereof could be voided, or claims with respect to the Senior Notes or any of the guarantees could be subordinated to all other debts of GTI or the subsidiary guarantors. In addition, a bankruptcy court could void (i.e., cancel) any payments by GTI or the subsidiary guarantors pursuant to their guarantees and require those payments to be returned to GTI or the subsidiary guarantors or to a fund for the benefit of us or their respective creditors, or subordinate the Senior Notes or the guarantees to other claims of GTI or the subsidiary guarantors. The bankruptcy court might take these actions if it found, among other things, that GTI or the applicable subsidiary guarantor:

- received less than reasonably equivalent value or fair consideration for the issuance of the Senior Notes or the incurrence of its guarantee; and
- was (or was rendered) insolvent by such issuance or such incurrence;
- was engaged or about to engage in a business or transaction for which its assets constituted unreasonably small capital to carry on its business;
- intended to incur, or believed that it would incur, obligations beyond its ability to pay as the obligations matured; or
- was a defendant in an action for money damages, or had a judgment for money damages docketed against it and, in either case, after final judgment, the judgment was unsatisfied.

A court would likely find that GTI or a subsidiary guarantor received less than fair consideration or reasonably equivalent value for the Senior Notes or its guarantee to the extent that it did not receive direct or indirect substantial benefit from the issuance of the Senior Notes or the incurrence of the guarantee. A court could also void the Senior Notes or any guarantee if it found that GTI or the subsidiary guarantor issued the Senior Notes or incurred the guarantee with actual intent to hinder, delay, or defraud any present or future creditors. Although courts in different jurisdictions measure solvency differently, in general, an entity would be deemed insolvent if the sum of its debts, including contingent and unliquidated debts, exceeds the fair value of its assets or if the present fair saleable value of its assets is less than the amount that would be required to pay the expected liability on its debts, including contingent and unliquidated debts, as they become due. We cannot predict what standard a court would apply in order to determine whether any of the Issuer or a subsidiary guarantor was insolvent as of the relevant date or whether, regardless of the method of valuation, a court would determine that the subsidiary guarantor was insolvent on that date, or whether a court would determine that the payments thereunder constituted fraudulent transfers or conveyances on other grounds. If the issuance of the Senior Notes or the incurrence of the guarantee is deemed to be a fraudulent transfer, it could be voided altogether, or it could be subordinated to all other debts of GTI or the subsidiary guarantor, as applicable. In such case, any payment by GTI or the applicable subsidiary guarantor pursuant to the Senior Notes or its guarantee could be required to be returned to us or the applicable subsidiary guarantor or to a fund for the benefit of our or their respective creditors. Moreover, in such a case a court could subordinate the Senior Notes or guarantees to other claims of us or the subsidiary guarantor. If a guarantee is voided or held unenforceable for any other reason, holders of the Senior Notes would cease to have a claim against the subsidiary guarantor based on the guarantee and would be creditors only of GTI and any subsidiary guarantor whose guarantee was not similarly voided or otherwise held unenforceable.

Each guarantee will contain a provision intended to limit the subsidiary guarantor's liability to the maximum amount that it could incur without rendering the incurrence of obligations under its guarantee a fraudulent transfer. This provision may not be effective to protect the guarantees from being voided or subordinated under fraudulent transfer or conveyance law.

Forward Looking Statements

Forward Looking Statements and Risks. This Report contains forward looking statements. In addition, we or our representatives have made or may make forward looking statements on telephone or conference calls, by webcasts or emails, in person, in presentations or written materials, or otherwise. These include statements about such matters as future, targeted or expected (or the impact of current, future, expected or targeted): outlook for 2017 or beyond; operational and financial performance; growth prospects and rates; future or targeted profitability, cash flow, liquidity and capital resources, production rates, inventory levels and EBITDA; the impact of rationalization, product line change, cost and liquidity initiatives; changes in the operating rates or efficiency in our operations or our competitors' or customers' operations; product quality; diversification, new products, and product improvements and their impact on our business; the integration or impact of acquired businesses; divestitures, asset sales, investments and acquisitions that we may make in the future; possible debt or equity financing or refinancing (including factoring and supply chain financing) activities; the impact of customer bankruptcies; conditions and changes in the global financial and credit markets; possible changes in control of the Company and the impacts thereof; the impact of accounting changes; and currency exchange and interest rates and changes therein; .changes in production capacity in our operations and our competitors' or customers' operations and the utilization rates of that capacity; growth rates for, prices and sales of, and demand for, our products and our customers' products; costs of materials and production, including increases or decreases therein, our ability to pass on any such increases in our product prices or impose surcharges thereon, or customer or market demand to reduce our prices due to such decreases; changes in customer order patterns due to changes in economic conditions; productivity, business process and operational initiatives; the markets we serve and our position in those markets; financing and refinancing activities; investments and acquisitions and the performance of the businesses underlying such acquisitions and investments; employment and contributions of key personnel; employee relations and collective bargaining agreements covering many of our operations; tax rates and the effects of jurisdictional mix; capital expenditures and changes therein; nature and timing of restructuring and rationalization charges and payments; inventory and supply chain management; customer and supplier contractual provisions and related opportunities and issues; competitive activities; strategic plans, initiatives and business projects; regional and global economic and industry market conditions, the timing and magnitude of changes in such conditions; interest rate management activities; currency rate management activities; deleveraging activities; rationalization, restructuring, realignment, strategic alliance, raw material and supply chain, technology development and collaboration, investment, acquisition, venture, operational, tax, financial and capital projects; legal proceedings, investigations, contingencies, and environmental compliance including any regulatory initiatives with respect to greenhouse gas emissions; consulting projects; and costs, working capital, revenues, business opportunities, debt levels, cash flows, cost savings and reductions, margins, earnings and growth. The words “will,” “may,” “plan,” “estimate,” “project,” “believe,” “anticipate,” “expect,” “intend,” “should,” “would,” “could,” “target,” “goal,” “continue to,” “positioned t expressions, or the negatives thereof, identify some of these statements.

Our expectations and targets are not predictors of actual performance and historically our performance has deviated, often significantly, from our expectations and targets. Actual future events and circumstances (including future results and trends) could differ materially, positively or negatively, from those set forth in these statements due to various factors. These factors include:

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- the possibility that additions to capacity for producing EAF steel, increases in overall EAF steel production capacity, and increases or other changes in steel production may not occur or may not occur at the rates that we anticipate or may not be as geographically disbursed as we anticipate;
- the possibility that increases or decreases in graphite electrode manufacturing capacity (including growth by producers in developing countries), competitive pressures (including changes in, and the mix, distribution, and pricing of, competitive products), reduction in specific consumption rates, increases or decreases in customer inventory levels, or other changes in the graphite electrode markets may occur, which may impact demand for, prices or unit and dollar volume sales of graphite electrodes and growth or profitability of our graphite electrodes business;
- the possible failure of changes in EAF steel production or graphite electrode production to result in stable or increased, or offset decreases in, graphite electrode demand, prices, or sales volume;
- the possibility that a determination that we have failed to comply with one or more export controls or trade sanctions to which we are subject with respect to products or technology exported from the United States or other jurisdictions could result in civil or criminal penalties, denial of export privileges and loss of revenues from certain customers;
- the possibility that, for all of our product lines, capital improvement and expansion in our customers' operations or increases in demand for their products may not occur or may not occur at the rates that we anticipate or the demand for their products may decline, which may affect their demand for the products we sell to them, which could affect our profitability and cash flows as well as the recoverability of our assets;
- the possibility that assumptions related to future expectations of financial performance materially change and impact our goodwill and long-lived asset carrying values;
- the possibility that our financial assumptions and expectations materially change as a result of government or state-owned government subsidies, incentives and trade barriers;
- the possibility that current economic disruptions or other conditions may result in idling or permanent closing of blast furnace capacity or delay of blast furnace capacity additions or replacements which may affect demand and prices for our refractory products;
- the possibility that continued global consolidation of the world's largest steel producers could impact our business or industry;
- the possibility that average graphite electrode revenue per metric ton in the future may be different than current spot or market prices due to changes in product mix, changes in currency exchange rates, changes in competitive market conditions or other factors;
- the possibility that price increases, adjustments or surcharges may not be realized or that price decreases may occur;
- the possibility that current challenging economic conditions and economic demand reduction may continue to impact our revenues and costs;
- the possibility that U.S., European, Chinese, or other governmental monetary or fiscal policy may adversely affect global economic activity and demand for our products;
- the possibility that potential future cuts in defense spending by the United States government as a part of efforts to reduce federal budget deficits could reduce demand for certain of our products and associated revenue;
- the possibility that decreases in prices for energy and raw materials may lead to downward pressure on prices for our products and delays in customer orders for our products as customers anticipate possible future lower prices;
- the possibility that customers may delay or cancel orders;
- the possibility that we may not be able to reduce production costs or delay or cancel raw material purchase commitments;

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- the possibility that economic, political and other risks associated with operating globally, including national and international conflicts, terrorist acts, political and economic instability, civil unrest, community activism and natural or nuclear calamities might interfere with our supply chains, customers or activities in a particular location;
- the possibility that reductions in customers' production, increases in competitors' capacity, competitive pressures, or other changes in other markets we serve may occur, which may impact demand for, prices of or unit and dollar volume sales of, our other products, or growth or profitability of our other product lines, or change our position in such markets;
- the possibility that we will not be able to hire and retain key personnel, maintain appropriate relations with unions, associations and employees or to renew or extend our collective bargaining or similar agreements on reasonable terms as they expire or do so without a work stoppage or strike;
- the possibility that an adverse determination in litigation pending in Brazil involving disputes related to the proper interpretation of certain collectively bargained wage increase provisions applicable to both us and other employers in the Bahia region might result in the filing of claims against our Brazilian subsidiary;
- the possibility that a Brazilian graphite electrode antitrust investigation could result in material fines or penalties;
- the possibility that we will fail to retain or develop new customers or applications for our Engineered Solutions products or such new product applications will not be adopted by the market place;
- the possibility that our manufacturing capabilities may not be sufficient or that we may experience delays in expanding or fail to expand our manufacturing capacity to meet demand for existing, new or improved products;
- the possibility that we may propose acquisitions or divestitures in the future, that we may not complete the acquisitions or divestitures, and that investments and acquisitions that we may make in the future may not be successfully integrated into our business or provide the performance or returns expected or that divestitures may not generate the proceeds anticipated;
- the possibility that challenging conditions or changes in the capital markets will limit our ability to undertake refinancing activities or obtain financing for growth and other initiatives, on acceptable terms or at all;
- the possibility that conditions or changes in the global equity markets may have a material impact on our future pension funding obligations and liabilities on our balance sheet;
- the possibility that the amount or timing of our anticipated capital expenditures may be limited by our financial resources or financing arrangements or that our ability to complete capital projects may not occur timely enough to adapt to changes in market conditions or changes in regulatory requirements;
- the possibility that the actual outcome of uncertainties associated with assumptions and estimates using judgment when applying critical accounting policies and preparing financial statements may have a material impact on our results of operations or financial position;
- the possibility that we may be unable to protect our intellectual property or may infringe the intellectual property rights of others, resulting in damages, limitations on our ability to produce or sell products or limitations on our ability to prevent others from using that intellectual property to produce or sell products;
- the occurrence of unanticipated events or circumstances or changing interpretations and enforcement agendas relating to legal proceedings or compliance programs;
- the occurrence of unanticipated events or circumstances or changing interpretations and enforcement agendas relating to health, safety or environmental compliance or remediation obligations or liabilities to third parties or relating to labor relations;
- the possibility that new or expanded regulatory initiatives with respect to greenhouse gas emissions could increase the capital intensive nature of our business and add to our costs of production;
- the possibility that our provision for income taxes and effective income tax rate or cash tax rate may fluctuate significantly due to (i) changes in applicable tax rates or laws, (ii) changes in the sources of our income, (iii) changes in tax planning, (iv) new or changing interpretations of applicable regulations, (v) changes in profitability,

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(vi) changes in our estimate of our future ability to use foreign tax credits or other tax attributes, and (vii) other factors;

- the possibility of changes in interest or currency exchange rates or in inflation or deflation;
- the possibility that our outlook could be significantly impacted by, among other things, developments in North Africa, the Middle East, North Korea, and other areas of concern, the occurrence of further terrorist acts and developments resulting from the war on terrorism;
- the possibility that interruption in our major raw material, energy or utility supplies due to, among other things, natural or nuclear disasters, process interruptions, actions by producers and capacity limitations, may adversely affect our ability to manufacture and supply our products or result in higher costs;
- the possibility that the magnitude of changes in the cost of major raw materials, energy or utility suppliers by reason of shortages, changes in market pricing, pricing terms in applicable supply contracts, or other events may adversely affect our ability to manufacture and supply our products or result in higher costs;
- the possibility of interruptions in production at our facilities due to, among other things, critical equipment failure, which may adversely affect our ability to manufacture and supply our products or result in higher costs;
- the possibility that we may not achieve the earnings or other financial or operational metrics that we provide as guidance from time to time;
- the possibility that the anticipated benefits from rationalizations and other cost savings initiatives may be delayed or may not occur, may vary in cost or may result in unanticipated disruptions;
- the possibility of security breaches affecting our information technology systems;
- the possibility that our disclosure or internal controls may become inadequate because of changes in conditions or personnel or that those controls may not operate effectively and may not prevent or detect misstatements or errors;
- the possibility that severe economic conditions may adversely affect our business, liquidity or capital resources;
- the possibility that delays may occur in the financial statement closing process;
- the possibility of changes in performance that may affect financial covenant compliance or funds available for borrowing; and
- other risks and uncertainties, including those described elsewhere in this Report or our other SEC filings, as well as future decisions by us.

Occurrence of any of the events or circumstance described above could also have a material adverse effect on our business, financial condition, results of operations or cash flows or the market price of our common stock.

No assurance can be given that any future transaction about which forward looking statements may be made will be completed or as to the timing or terms of any such transaction.

All subsequent written and oral forward looking statements by or attributable to us or persons acting on our behalf are expressly qualified in their entirety by these factors. Except as otherwise required to be disclosed in periodic reports required to be filed by public companies with the SEC pursuant to the SEC's rules, we have no duty to update these statements.

Item 1B. Unresolved Staff Comments

- Not applicable.

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Item 2. Properties

We currently operate the following facilities, which are owned or leased as indicated.

Location of Facility	Primary Use	Owned or Leased
U.S.		
Independence, Ohio	Corporate Headquarters	Leased
Brooklyn Heights, Ohio	Innovation and Technology Center	Leased
St. Marys, Pennsylvania	Graphite Electrode Manufacturing Facility	Owned
Port Lavaca, Texas	Needle Coke Manufacturing Facility	Owned
Europe		
Calais, France	Graphite Electrode Manufacturing Facility	Owned
Moscow, Russia	Sales Office	Leased
Pamplona, Spain	Graphite Electrode Manufacturing Facility and Sales Office	Owned
Bussigny, Switzerland	Sales Office	Leased
Other International		
Beijing, China	Sales Office	Leased
Hong Kong, China	Sales Office	Leased
Monterrey, Mexico	Graphite Electrode Manufacturing Facility and Sales Office	Owned
Assets Held for Sale:		
Parma, Ohio	Advanced Graphite Materials Machine Shop	Owned
Lakewood, Ohio	Advanced Electronics Technologies Manufacturing Facility and Sales Office	Owned
Sharon Center, Ohio	Advanced Electronics Technologies Manufacturing Facility	Owned
Columbia, Tennessee	Advanced Graphite Materials and Refractory Products Manufacturing, Warehousing Facility and Sales Office	Owned
Lawrenceburg, Tennessee	Refractory Products Manufacturing Facility	Owned

Clarksburg, West Virginia	Advanced Graphite Materials Manufacturing Facility, Machine Shop and Sales Office	Owned
Malonno, Italy	Advanced Graphite Materials Manufacturing and Machine Shop and Sales Office	Owned
Meyerton, South Africa	Refractory Machine Shop and Sales Office	Owned
Salvador, Bahia, Brazil	Graphite Electrode Machine Shop (will be maintained after sale)	Owned
Shanghai, China	Sales Office	Leased

During the first quarter of 2016, we announced that we are exploring strategic options for our Engineered Solutions business to focus our efforts on our graphite electrode business. The assets categorized above as "Assets Held for Sale" represent mostly the assets pertaining to our Engineered Solutions business. A portion of our facility in Salvadore, Bahia, Brazil is currently being marketed as we have eliminated graphite electrode production in this facility. We will maintain a graphite electrode machine shop at our Brazil facility after any potential sale. Other than the assets discussed therein, we believe that our facilities, which are of varying ages and types of construction, are in good condition, are suitable for our operations and generally provide sufficient capacity to meet our requirements for the foreseeable future.

Item 3. Legal Proceedings

We are involved in various investigations, lawsuits, claims, demands, environmental compliance programs, labor disputes and other legal proceedings arising out of or incidental to the conduct of our business. While it is not

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possible to determine the ultimate disposition of each of these matters and proceedings, we do not believe that their ultimate disposition will have a material adverse effect on our financial position, results of operations or cash flows. Litigation has been pending in Brazil brought by employees seeking to recover additional amounts under certain wage increase provisions applicable in 1989 and 1990 under collective bargaining agreements to which employers in the Bahia region of Brazil were a party (including our subsidiary in Brazil), plus interest thereon. Prior to October 1, 2015, we were not party to such litigation. Companies in Brazil have recently settled claims arising out of these provisions and, in May 2015, the litigation was remanded, in favor of the employees, by the Brazil Supreme Court to the lower courts for further proceedings which included procedural aspects of the case, such as admissibility of instruments filed by the parties. We cannot predict the outcome of such litigation. On October 1, 2015, an action was filed by current and former employees against our subsidiary in Brazil to recover amounts under such provisions, plus interest thereon, which amounts together with interest could be material to us. We intend to vigorously defend such action.

Item 4. Mine Safety Disclosures

•Not applicable.

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PART II

Item 5. Market for Registrant's Common Equity, Related Stockholder Matters and Issuer Purchases of Equity Securities.

Market Information

There is no market for our Common Stock.

Holders

As of December 31, 2016, Brookfield was the sole holder of our Common Stock.

Dividend Policies and Restrictions

It has generally been the policy of our Board of Directors to retain earnings to finance strategic and other plans and programs, conduct business operations, fund acquisitions, meet obligations and repay debt. We did not pay any cash dividends in 2014, 2015 or 2016. We periodically review our dividend policy.

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Item 6. Selected Financial Data

The data set forth below should be read in conjunction with “Part I. Preliminary Notes-Important Terms”, “Item 7. Management’s Discussion and Analysis of Financial Condition and Results of Operations” and the Consolidated Financial Statements and Notes thereto.

	Predecessor				Successor	
	Year Ended December 31,			For the Period January 1 Through August 14, 2015	For the Period August 15 Through December 31, 2015	Year Ended December 31,
	2012	2013	2014			2016
	(Dollars in thousands)					
Statement of Operations Data: (a)		(a)				
Net sales	$1,003,283	$893,844	$825,145	$339,907	$193,133	$437,963
Income (loss) from continuing operations (b)	105,846	(35,591)	(152,520)	(101,970)	(28,625)	(108,869)
Net income (loss)	117,641	(27,259)	(285,376)	(120,649)	(33,551)	(235,843)
Basic earnings (loss) per common share:						
Income (loss) from continuing operations per share	$0.76	$(0.26)	$(1.12)	$(0.74)	N/A	N/A
Weighted average common shares outstanding (in thousands)	138,552	135,067	136,155	137,152	N/A	N/A
Diluted earnings (loss) per common share:						
Income (loss) from continuing operations per share	$0.76	$(0.26)	$(1.12)	$(0.74)	N/A	N/A
Weighted average common shares outstanding (in thousands)	139,700	135,067	136,155	137,152	N/A	N/A
Balance sheet data (at period end):						
Total assets	$2,297,915	$2,217,848	$1,833,805	N/A (d)	$1,422,015	$1,172,276
Other long-term obligations (c)	125,000	97,947	107,586	N/A (d)	94,318	82,148
Total long-term debt	535,709	541,593	341,615	N/A (d)	362,455	356,580
Other financial data:						
Net cash provided by operating activities	$101,400	$116,837	$120,903	$28,323	$23,115	$22,815
Net cash used in investing activities	(119,962)	(83,801)	(78,952)	(39,918)	(17,484)	(10,471)
Net cash (used in) provided by financing activities	24,112	(37,645)	(35,077)	20,824	(23,072)	(8,317)

(a) 2012 and 2013 results do not represent complete discontinued operations as adjustments for interest allocations and Corporate and R&D expense were not reclassified prior to 2014. All interest remains in continuing operations and an estimate of 80% of Corporate and R&D expenses was assumed to support continuing operations.

(b) Income by period includes items listed below, which are pre-tax in nature unless otherwise noted.

(c) Represents pension and post-retirement benefits and related costs and miscellaneous other long-term obligations.

(d) A closing balance sheet as of August 14, 2015 was not required as part of previous filings.

For the Year Ended December 31, 2012:

- a non-cash interest charge of $10.7 million related to the amortization of the discount on the Senior Subordinated Notes,
- a $22.3 million charge related to the amortization of acquired intangible assets,

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- a $8.8 million loss for the MTM Adjustment for our pension and OPEB benefit plans, driven primarily by a decrease in the discount rate due to lower interest rates.

For the Year Ended December 31, 2013:

- a $62.1 million charge for rationalization and rationalization related activities. This includes $18.9 million of severance and related charges, and $28.3 million of accelerated depreciation expense
- a non-cash interest charge of $11.5 million related to the amortization of the discount on the Senior Subordinated Notes,
- a $20.5 million charge related to the amortization of acquired intangible assets,
- a $14.4 million gain for the MTM Adjustment for our pension and OPEB benefit plans, driven primarily by a increase in discount rates.

For the Year Ended December 31, 2014:

- A goodwill impairment of $76.1 million related to our needle coke reporting unit,
- a $40.8 million charge for rationalization and rationalization related activities. This includes $22.4 million of rationalization related depreciation expense, $7.9 million of severance and contract termination costs,
- a non-cash interest charge of $12.3 million related to the amortization of the discount on the Senior Subordinated Notes,
- a $19.0 million charge related to the amortization of acquired intangible assets,
- a $19.0 million loss for the MTM Adjustment for our pension and OPEB benefit plans, driven primarily by a decrease in discount rates and adoption of new mortality tables in 2014.

For the Period January 1 through August 14, 2015:

- a $35.4 million goodwill impairment charge related to our needle coke reporting unit,
- $4.4 million charge for rationalization and related activities,
- $23.6 million of charges related to our tender offer and proxy battle, which includes a $12.7 million charge related to stock-based compensation which was the result of change of control provisions that were triggered by our acquisition,
- a non-cash interest charge of $12.0 million related to the accelerated amortization of the discount on the Senior Subordinated Notes,
- a $10.8 million charge related to the amortization of acquired intangible assets,

For the Period August 15 through December 31, 2015:

- a $1.8 million loss for the MTM adjustment for our pension and OPEB benefit plans

For the year ended December 31, 2016:

- a lower of cost or market adjustment to inventory of $19.0 million
- a $2.8 million charge to lower the carrying value of assets held for sale
- a $2.9 million gain for the MTM adjustment for our pension and OPEB benefit plans

Quarterly Data:

The following quarterly selected consolidated financial data have been derived from the Consolidated Financial Statements for the periods indicated which have not been audited. The selected quarterly consolidated financial data set forth below should be read in conjunction with “Part I. Preliminary Notes–Presentation of Financial, Market and Legal Data,” “Item 7. Management’s Discussion and Analysis of Financial Condition and Results of Operations” and the Consolidated Financial Statements and Notes thereto.

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	Predecessor			Successor	
	First Quarter	Second Quarter	For the Period July 1 Through August 14, 2015	For the Period August 15 Through September 30, 2015	Fourth Quarter
	(Dollars in thousands, except per share data)				
2015					
Net sales	$162,494	$125,809	$51,604	$74,774	$118,359
Gross profit	16,492	14,218	4,196	6,887	5,401
Net income (loss) (a)	(55,608)	(22,817)	(42,224)	(7,303)	(26,250)
Basic loss per common share	(0.08)	(0.17)	(0.31)	N/A	N/A

	Successor			
	First Quarter	Second Quarter	Third Quarter	Fourth Quarter
	(Dollars in thousands, except per share data)			
2016				
Net sales	$95,576	$115,365	$111,590	$115,432
Gross profit (loss)	(12,975)	(8,405)	(6,910)	(737)
Net income (loss) (b)	(36,375)	(128,399)	(22,967)	(48,102)

(a) Net income by quarter for 2015 includes the following items:

First Quarter

- $35.4 million impairment charge to write down goodwill associated with the Needle Coke reporting unit;
- Rationalization and related charges of $3.4 million;
- Amortization of acquired intangibles totaling $4.3 million, and
- Interest expense of $8.9 million, driven by $4.8 million of expense related to the Senior Notes.

Second Quarter

- Rationalization and related charges $0.8 million;
- Expenses related to our proxy and tender offer totaling $3.3 million;
- Amortization of intangibles totaling $4.4 million;
- Interest expense of $9.2 million driven primarily by $4.8 of expense related to the Senior Notes.

Third Quarter

- Expenses related to our proxy and tender offer totaling $21.2 million;
- Interest expense of $12.7 million, driven by $4.8 million of expense related to the Senior Notes and $4.5 million of additional expense resulting from the prepayment our Senior Subordinated Notes

Fourth Quarter

- a $1.8 million loss for the MTM adjustment for our pension and OPEB benefit plans

(b) Net income by quarter for 2016 includes the following items:

First Quarter

- $11.1 million lower of cost or market adjustment to inventory;
- Amortization of intangibles totaling $3.6 million.

Second Quarter

- $3.5 million lower of cost or market adjustment to inventory
- Amortization of intangibles totaling $3.6 million.

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Third Quarter

- $4.9 million lower of cost or market adjustment to inventory;
- Amortization of intangibles totaling $3.5 million.

Fourth Quarter

- a $2.9 million gain for the MTM adjustment for our pension and OPEB benefit plans;
- Amortization of intangibles totaling $3.6 million;
- A $0.5 million favorable adjustment to the lower of cost or market inventory reserve.

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Item 7. Management’s Discussion and Analysis of Financial Condition and Results of Operations.

General

Management’s Discussion and Analysis of Financial Condition and Results of Operations (“MD&A”) is designed to provide information that is supplemental to, and should be read together with, our Consolidated Financial Statements and the accompanying notes. Information in this Item is intended to assist the reader in obtaining an understanding of our Consolidated Financial Statements, the changes in certain key items in those financial statements from year-to-year, the primary factors that accounted for those changes, any known trends or uncertainties that we are aware of that may have a material effect on our future performance, as well as how certain accounting principles affect our Consolidated Financial Statements. In addition, this Item provides information about our business segments and how the results of those segments impact our financial condition and results of operations as a whole.

Executive Summary

The world economy continued to experience rates of growth below pre-recession levels. The year began with the International Monetary Fund (IMF) forecasting a global growth rate of 3.4 percent. This estimate was revised downward twice during the year with additional downside risk noted after the United Kingdom's referendum to exit the European Union ("Brexit") ending at the most recent estimate of 3.1 percent. The graphite electrode industry saw further price declines in 2016, however, some indicators signal a potential bottoming out. The steel industry has experienced increases in the costs of key raw materials to run blasts furnaces coupled with declines in the price of scrap steel needed in EAF plants. These factors are beginning to re-balance the economics that make EAF mills more competitive. This resulted in an increase in our sales volume over the prior year, however, the decline in prices more than offset volume increases. Declines in the price of oil and our rationalization initiatives over the past 3 years have significantly improved our cost structure and have positioned us to benefit from any potential recovery.

In the first half of 2016, we completed our evaluation of strategic alternatives for our Engineered Solutions segment and determined that we would sell its businesses. This will allow us to focus on our core competency, which is to be a leading low-cost, high quality provider of graphite electrodes. As of June 30, 2016 the Engineered Solutions business qualified for held for sale status. As a result, the operations of the Engineered solutions have been excluded from continuing operations and are shown in discontinued operations for all current and prior periods.

We have two major product categories within our continuing operations: graphite electrodes and needle coke products, which comprise our only reportable segment, Industrial Materials.

Reference is made to the information under “Part I” for background information on our businesses, industry and related matters.

Global Economic Conditions and Outlook

2017 Outlook. We are impacted in varying degrees, both positively and negatively, as global, regional or country conditions fluctuate. Our discussions about market data and global economic conditions below are based on or derived from published industry accounts and statistics.

In its January, 2017 report, the International Monetary Fund (IMF) estimated global growth at 3.4 percent in 2017. The IMF noted however that there is significant uncertainty in the forecast for advanced economies due to potential changes in the policy stance of the United States under the new administration.

In its short range outlook released on October 11, 2016, the World Steel Association (WSA) forecasts that global steel demand will increase by 0.2% percent to 1,501 million tons in 2016 and will increase 0.5% in 2017. This estimate is higher than the 1,488 million tons that WSA forecasted in April for 2016. WSA noted that the increase was primarily attributable to a better than expected forecast for China and continued growth in emerging economies. In developed economies, the WSA expects steel demand to grow by 0.2% in 2016 and 1.1% in 2017. This represents a downward of the estimate by 1.5% for 2016 due to slower growth in the United States and the effects of Brexit.

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Financing Transactions
Senior Notes
On November 20, 2012, the Company issued $300 million principal amount of Senior Notes. These Senior Notes are the Company's senior unsecured obligations and rank pari passu with all of the Company's existing and future senior unsecured indebtedness. The Senior Notes are guaranteed on a senior unsecured basis by each of the Company's existing and future subsidiaries that guarantee certain other indebtedness of the Company or another guarantor. The Senior Notes bear interest at a rate of 6.375% per year, payable semi-annually in arrears on May 15 and November 15 of each year. The Senior Notes mature on November 15, 2020.
The Company is entitled to redeem some or all of the Senior Notes at any time on or after November 15, 2016, at the redemption prices set forth in the Indenture. In addition, prior to November 15, 2016, the Company may redeem some or all of the Senior Notes at a price equal to 100% of the principal amount thereof, plus accrued and unpaid interest, if any, plus a “make whole” premium determined as set forth in the Indenture.
If, prior to maturity, a change in control (as defined in the Indenture) of the Company occurs and thereafter certain downgrades of the ratings of the Senior Notes as specified in the Indenture occur, the Company will be required to offer to repurchase any or all of the Senior Notes at a repurchase price equal to 101% of the aggregate principal amount of the Senior Notes, plus any accrued and unpaid interest.
The Senior Notes also contain covenants that, among other things, limit the ability of the Company and certain of its subsidiaries to: (i) create liens or use assets as security in other transactions; (ii) engage in certain sale/leaseback transactions; and (iii) merge, consolidate or sell, transfer, lease or dispose of substantially all of their assets.
The Senior Notes also contain customary events of default, including (i) failure to pay principal or interest on the Senior Notes when due and payable, (ii) failure to comply with covenants or agreements in the Indenture or the Senior Notes which failures are not cured or waived as provided in the Indenture, (iii) failure to pay indebtedness of the Company, any Subsidiary Guarantor or Significant Subsidiary (as defined in the Indenture) within any applicable grace period after maturity or acceleration and the total amount of such indebtedness unpaid or accelerated exceeds $50.0 million, (iv) certain events of bankruptcy, insolvency, or reorganization, (v) failure to pay any judgment or decree for an amount in excess of $50.0 million against the Company, any Subsidiary Guarantor or any Significant Subsidiary that is not discharged, waived or stayed as provided in the Indenture, (vi) cessation of any subsidiary guarantee to be in full force and effect or denial or disaffirmance by any Subsidiary Guarantor of its obligations under its subsidiary guarantee, and (vii) a default under the Company's Senior Subordinated Notes. In the case of an event of default, the principal amount of the Senior Notes plus accrued and unpaid interest may be accelerated.
Revolving Credit Facility
On April 23, 2014, the Company and certain of its subsidiaries entered into an Amended and Restated Credit Agreement with a borrowing capacity of $400 million and a maturity date of April 2019 (the "Revolving Facility"). On February 27, 2015, GrafTech and certain of its subsidiaries entered into a further Amended and Restated Credit Agreement that provides for, among other things, greater financial flexibility and a $40 million senior secured delayed draw term loan facility (the "Term Loan Facility").
On July 28, 2015, GrafTech and certain of its subsidiaries entered into an amendment to the Amended and Restated Credit Agreement to change the terms regarding the occurrence of a default upon a change in control (which is defined thereunder to include the acquisition by any person of more than 25 percent of GrafTech’s outstanding shares) to exclude the acquisition of shares by Brookfield (see Note 2). In addition, effective upon such acquisition, the financial covenants were eased, resulting in increased availability under the Revolving Facility. The size of the Revolving Facility was also reduced from $400 million to $375 million. The size of the Term Loan Facility remained at $40 million.
On April 27, 2016, GrafTech and certain of its subsidiaries entered into an amendment to the Revolving Facility. The size of the Revolving Facility was permanently reduced from $375 million to $225 million. New covenants were also added to the Revolving Facility, including a requirement to make mandatory repayments of outstanding amounts under the Revolving Facility and the Term Loan Facility with the proceeds of any sale of all or any substantial part of the assets included in the Engineered Solutions segment and a requirement to maintain minimum liquidity (consisting of domestic cash, cash equivalents and availability under the Revolving Facility) in excess of $25 million. The

covenants were also modified to provide for: the elimination of certain exceptions to the Company’s negative covenants limiting the Company’s ability to make certain investments, sell assets, make restricted payments, incur liens and incur debt;

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a restriction on the amount of cash and cash equivalents permitted to be held on the balance sheet at any one time without paying down the Revolving Facility and the Term Loan Facility; and changes to the Company's financial covenants so that until the earlier of March 31, 2019 or the Company has $75 million in trailing twelve month EBITDA (as defined in the Revolving Facility), the Company is required to maintain trailing twelve month EBITDA above certain minimums ranging from ($40 million) to $35 million after which the Company's existing financial covenants under the Revolving Facility will apply.

With this amendment, the Company has full access to the $225 million Revolving Facility, subject to the $25 million minimum liquidity requirement. As of December 31, 2016, the Company had $61.2 million of borrowings on the Revolving Facility and $12.3 million of letters of credit drawn against the Revolving Facility.

The $40 million Term Loan Facility was fully drawn on August 11, 2015, in connection with the repayment of the Senior Subordinated Notes. The balance of the Term Loan Facility was $29.5 million as of December 31, 2016.

The interest rate applicable to the Revolving Facility and Term Loan Facility is LIBOR plus a margin ranging from 2.25% to 4.75% (depending on our total senior secured leverage ratio). The borrowers pay a per annum fee ranging from 0.35% to 0.70% (depending on our senior secured leverage ratio) on the undrawn portion of the commitments under the Revolving Facility.

Senior Subordinated Notes

On November 30, 2010, in connection with the acquisition of Seadrift Coke LP and C/G Electrodes LLC, we issued Senior Subordinated Notes for an aggregate total face amount of $200 million. These Senior Subordinated Notes were non-interest bearing and scheduled to mature in 2015. Because the Notes were non-interest bearing, we were required to record them at their present value (determined using an interest rate of 7%). The difference between the face amount of the Notes and their present value was recorded as debt discount. The debt discount was amortized using the imputed interest method, over the life of the Notes.

On August 11, 2015, we prepaid the entire $200,000,000 aggregate principal amount of the Notes after the Company's receipt of the proceeds of the issuance of Preferred Stock to Brookfield's affiliate. See Note 2 to the Financial Statements for further discussion of the Preferred stock issuance.

Customer Base

We are a global company and sell our products in every major geographic market. Sales of these products to buyers outside the U.S. accounted for about 76% in 2014, 80% in 2015 and 83% in 2016. In 2016, three of our ten largest customers were based in Europe, and one each in the U.S., Korea, Japan, Brazil, Russia, Egypt and India, however, all are multi-national operations.

In 2016, eight of our ten largest customers were purchasers of our Industrial Materials products. No single customer or group of affiliated customers accounted for more than 10% of our net sales in 2016.

Results of Operations and Segment Review

2016. The world economy continued to experience rates of growth below pre-recession levels. The year began with the International Monetary Fund (IMF) forecasting a global growth rate of 3.4 percent. This estimate was revised downward twice during the year with additional downside risk noted after the United Kingdom's referendum to exit the European Union ("Brexit") ending at the most recent estimate of 3.1 percent. The graphite electrode industry saw further price declines in 2016, however, some indicators signal a potential bottoming out. The steel industry has experienced increases in the costs of key raw materials to run blasts furnaces coupled with declines in the price of scrap steel needed in EAF plants. These factors are beginning to re-balance the economics that make EAF mills more competitive. This resulted in an increase in our sales volume over the prior year, however, the decline in prices more than offset volume increases. Declines in the price of oil and our rationalization initiatives over the past 3 years have significantly improved our cost structure and have positioned us to benefit from any potential recovery.

In the first half of 2016, we completed our evaluation of strategic alternatives for our Engineered Solutions segment and determined that we would sell its businesses. This will allow us to focus on our core competency, which is to be a leading low-cost, high quality provider of graphite electrodes. As of June 30, 2016 the Engineered Solutions

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business qualified for held for sale status. As a result the operations of the Engineered solutions have been excluded from continuing operations and are shown in discontinued operations for all current and prior periods.

2015. Our business faced significant headwinds in the major industries that we serve throughout 2015. The U.S. and European steel markets, which represent our largest markets, have been flooded with large quantities of low cost imports, primarily from China. These imports and over-capacity in the steel industry have driven down prices as demand has not kept pace. Additionally, there has been a significant decline in the price of iron ore which is a key raw material for blast furnaces. Scrap steel, which is the key raw material for EAF production, has experienced price reductions as well, however not at the same rate as iron ore. As a result, steel producers are utilizing blast furnaces at rates higher than we have historically seen. These pressures have reduced EAF steel production and driven down the prices and volumes on graphite electrodes. While the decline in the price of oil has benefited our Industrial Materials cost structure overall, it contributed to lower pricing for petroleum needle coke and, indirectly, graphite electrodes. Our Engineered Solutions segment suffered from declining prices and volumes as demand for our thermal solutions serving the advanced consumer electronics markets has declined. This decline in demand was driven by both decreased demand for the end product as well as competition from low cost producers. Our advanced graphite materials product line experienced new sales of high temperature furnace systems in 2014 that were not repeated in 2015 due to the bankruptcy of the primary customer we served.

2014. The slow rates of global economic growth continued throughout 2014. The year began with the IMF estimating 2014 growth at a rate of 3.7%, which was revised downward throughout the year to 3.3%. The World Steel Association noted that steel production, excluding China, increased 1.3% in 2014. This slow economic growth and stagnation in steel production year over year exerted continued downward pressure on prices for our Industrial Materials products during the year, which negatively impacted our profitability in 2014.

Our Engineered Solutions segment experienced 2014 sales growth in one of our AGM product group lines prior to the unexpected bankruptcy of our primary customer in that field. Our advanced consumer electronics products experienced pricing pressure and decreased demand throughout 2014 which decreased margins and sales. In the second quarter of 2014, we announced that we were ceasing production of our isomolded product group within AGM and undertaking rationalization initiatives to reduce costs and increase our global competitiveness.

In the third quarter of 2014 we announced rationalization initiatives to the Company’s operating and management structure in order to streamline, simplify and decentralize the organization. The Company incurred significant costs during 2014 related to these rationalization plans.

The tables presented in our year-over-year comparisons summarize our consolidated statements of income and illustrate key financial indicators used to assess the consolidated financial results. Financial information is presented for the years ended December 31, 2014, 2015, and 2016.

Throughout our MD&A, changes that are less than 5% or less than $1.0 million, may be deemed not material and excluded from the discussion. During 2014, as part of our initiative to decentralize the organization and reduce the costs of the global headquarter functions, the performance measure of our existing segments was changed to reflect our new management and operating structure. In the first quarter of 2016, the Company reorganized its businesses and moved the Refractory product line from the Industrial Materials segment to the Engineered Solutions segment. Advanced materials products will now be a part of the business segment where these products are produced. During the second quarter of 2016, our Engineered Solutions business qualified as held for sale status. All of Engineered Solutions' results have been excluded from continuing operations for both the current and prior years. All amounts below reflect these changes.

Results of Operations for 2016 as Compared to 2015

Business Combination Accounting

As a result of business combination accounting resulting from our acquisition by Brookfield (see Note 2 "Preferred Share Issuance and Merger" to the Financial Statements), the Company's financial statements are separated into two distinct periods, the period before the consummation of the Brookfield transaction (labeled predecessor) and the period after that date (labeled successor), to indicate the application of the different basis of accounting between the periods presented. There were no operational activities that changed as a result of the acquisition of the predecessor.

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(in thousands)	Predecessor For the Period January 1 Through August 14, 2015	Successor For the Period August 15, 2015 Through December 31, 2015	For the Year Ended December 31, 2016
Net sales	$339,907	$193,133	$437,963
Cost of sales	305,001	180,845	448,016
Additions to lower of cost or market inventory reserve	—	—	18,974
Gross profit (loss)	34,906	12,288	(29,027)
Research and development	3,377	1,083	2,399
Selling and administrative expenses	64,383	23,485	57,725
Impairment of long-lived assets and goodwill	35,381	—	2,843
Rationalizations	14	283	59
Operating loss	(68,249)	(12,563)	(92,053)
Other expense (income), net	1,421	(813)	(2,188)
Interest expense	26,211	9,999	26,914
Interest income	(363)	(6)	(358)
Loss from continuing operations before provision for income taxes	(95,518)	(21,743)	(116,421)
(Benefit) provision for income taxes	6,452	6,882	(7,552)
Net loss from continuing operations	$(101,970)	$(28,625)	$(108,869)
Loss from discontinued operations, net of tax	(18,679)	(4,926)	(126,974)
Net loss	$(120,649)	$(33,551)	$(235,843)

Net sales. Net sales for our Industrial Materials segment decreased from $339.9 million in the period January 1 through August 14, 2015, and $193.1 million in the period August 15 through December 31, 2015, to $438.0 million in 2016. This decrease was driven by a 27% decrease in prices for graphite electrodes. The price decrease was driven by overcapacity within the graphite electrode industry. Our customers were also negatively impacted by imported finished steel from China, which drove down production levels in the markets that we serve. The decrease in price was partially offset by a 12% increase in sales volumes.

Cost of sales. We experienced a decrease in cost of sales from $305.0 million in the period January 1 through August 14, 2015 and $180.8 million in the period August 15 through December 31, 2015 to $448.0 million in 2016. We achieved this reduction despite a 12% increase in sales volumes and increased depreciation expense resulting from the increase in fixed asset carrying value due to the step-up in value after our acquisition by Brookfield. We have benefited from the decrease in oil prices, which has driven down the price of decant oil, the key raw material to our production platform. Additionally, costs savings resulting from our rationalization initiatives that we have undertaken over the last 3 years generated the remainder of the favorable impact to cost of sales.

Lower of cost or market inventory adjustment. In 2016, we incurred a lower of cost or market adjustment of $19.0 million in certain product lines within our graphite electrode business reflecting the aforementioned decreased pricing.

Research and Development. Research and development expenses decreased from $3.4 million in the period January 1 through August 14, 2015, and $1.1 million in the period August 15 through December 31, 2015 to $2.4 million in 2016. This decrease was primarily driven by headcount reductions and our cost cutting efforts.

Selling and administrative expenses. Selling and general administrative expenses decreased from $64.4 million in the period January 1 through August 14, 2015, and $23.5 million in the period August 15 through December 31, 2015 to

$57.7 million in 2016. This decrease was primarily driven by the reduction in non-recurring charges: fees associated with our proxy and tender offer represented $23.6 million in 2015 while we incurred one-time charges of $5.8 million in 2016 for organizational restructuring. Additionally, we incurred a $2.9 million decrease in our 2016 MTM

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adjustment as compared to 2015. The remainder of the decrease was the result of headcount reductions and cost-cutting measures.

Impairments. As a result of our ongoing monitoring of triggering events, we recorded a goodwill impairment charge in our needle coke reporting unit totaling $35.4 million during the first quarter of 2015. During the fourth quarter of 2016 we impaired the value of assets held for sale at our facility in Brazil totaling $2.8 million.

Other expense (income). Other expense (income) decreased from $1.4 million of expense in the period January 1 through August 14, 2015, and $0.8 million of income in the period August 15 through December 31, 2015 to $2.2 million of income in 2016. The decrease was due to advantageous foreign currency impacts on non-operating assets and liabilities.

Interest expense. Interest expense decreased from $26.2 million in the period January 1 through August 14, 2015, and $10.0 million in the period August 15 through December 31, 2015 to $26.9 million in 2016. The decrease was due to prepayment of our Senior Subordinated Notes in 2015.

Loss from discontinued operations. We experienced an increase in the loss from discontinued operations from $18.7 million in the period January 1 through August 14, 2015, and $4.9 million in the period August 15 through December 31, 2015 to $127.0 million in 2016. This increase was primarily due to $119.9 million impairment charge to adjust the carrying value of assets held for sale to their fair value.

Segment operating income (loss). The following table represents our operating income (loss) by segment for 2015 and 2016:

	Predecessor	Successor	
	For the Period January 1 Through August 14, 2015	For the Period August 15, 2015 Through December 31, 2015	For the Year Ended December 31, 2016
	(Dollars in thousands)		
Industrial Materials	$(24,900)	$(2,529)	$(63,827)
Corporate, R&D and Other Expenses	(43,349)	(10,034)	(28,226)
Total operating loss	$(68,249)	$(12,563)	$(92,053)

Provision for income taxes. The following table summarizes the expense for income taxes in 2015 and 2016:

	Predecessor	Successor	
	For the Period January 1 Through August 14, 2015	For the Period August 15, 2015 Through December 31, 2015	For the Year Ended December 31, 2016
	(Dollars in thousands)		
Tax (benefit) expense	$6,452	$6,882	$(7,552)
Loss from continuing operations before provision for income taxes	(95,518)	(21,743)	$(116,421)
Effective tax rates	(6.8)%	(31.7)%	6.5%

During 2015, the effective tax rate differs from the U.S. statutory rate of 35 percent primarily due to recent losses in the U.S. where we receive no tax benefit due to a full valuation allowance and taxes on worldwide earnings from various other countries. The recognition of the valuation allowance does not result in or limit the Company’s ability to utilize these tax assets in the future.

During 2016, the effective rate differs from the U.S. statutory rate of 35% primarily due to recent losses in the U.S. and Switzerland where we receive no tax benefit due to a full valuation allowance and taxes on worldwide earnings from various other countries. The recognition of the valuation allowance does not result in or limit the Company's ability to utilize these tax assets in the future.

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Results of Operations for 2015 as Compared to 2014

Business Combination Accounting

As a result of business combination accounting resulting from our acquisition by Brookfield (see Note 2 "Preferred Share Issuance and Merger" to the Financial Statements), the Company's financial statements are separated into two distinct periods, the period before the consummation of the Brookfield transaction (labeled predecessor) and the period after that date (labeled successor), to indicate the application of the different basis of accounting between the periods presented. There were no operational activities that changed as a result of the acquisition of the predecessor.

(in thousands)	For the Year Ended December 31, 2014	For the Period January 1 Through August 14, 2015	For the Period August 15 Through December 31, 2015
Net sales	$825,145	$339,907	$193,133
Cost of sales	757,156	305,001	180,845
Gross profit (loss)	67,989	34,906	12,288
Research and development	9,738	3,377	1,083
Selling and administrative expenses	94,629	64,383	23,485
Impairment of long-lived assets and goodwill	75,650	35,381	—
Rationalizations	7,946	14	283
Operating loss	(119,974)	(68,249)	(12,563)
Other expense (income), net	2,920	1,421	(813)
Interest expense	35,736	26,211	9,999
Interest income	(320)	(363)	(6)
Loss from continuing operations before provision for income taxes	(158,310)	(95,518)	(21,743)
(Benefit) provision for income taxes	(5,790)	6,452	6,882
Net loss from continuing operations	$(152,520)	$(101,970)	$(28,625)
Loss from discontinued operations, net of tax	(132,856)	(18,679)	(4,926)
Net loss	$(285,376)	$(120,649)	$(33,551)

Net sales. Net sales for our Industrial Materials segment decreased from $825.1 million in 2014 to $339.9 million in the period January 1 through August 14, 2015, and $193.1 million in the period August 15 through December 31, 2015. This decrease was driven by a 23% decrease in volumes in our graphite electrode business caused by softening demand in the steel markets, particularly in EAF environments. This drove a decrease in the weighted average sales prices of 8 percent during 2015. Our graphite electrode product line was also negatively impacted by $37.8 million due to foreign currency rate declines primarily in the Euro region.

Cost of sales. We experienced decreases in cost of sales from $757.2 million in 2014 to $305.0 million in the period January 1 through August 14, 2015, and $180.8 million in the period August 15 through December 31, 2015. Lower volumes in our Industrial Materials segment resulted in a reduction of $105.2 million of cost in 2015 as compared to the same period of 2014. Decreases in the value of currencies in relation to the US Dollar, primarily in the euro region, benefited cost of sales by $37.5 million in the twelve months ended December 31, 2015 as compared to the same period of 2014. The remaining reduction in cost was driven by our improved cost structure resulting from our rationalization initiatives.

Research and Development. Research and development expenses were $9.7 million in 2014 compared to $3.4 million in the period January 1 through August 14, 2015, and $1.1 million in the period August 15 through December 31, 2015. This decrease was primarily driven by headcount reductions and our cost cutting efforts. Additionally, for the year ended December 31, 2014 our MTM adjustment resulted in an expense of $2.0 million in research and development. There was no significant MTM adjustment in 2015 within research and development.

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Selling and administrative expenses. Selling and general administrative expenses decreased from $94.6 million 2014 to $64.4 million in the period January 1 through August 14, 2015, and $23.5 million in the period August 15 through December 31, 2015. This decrease was primarily driven by headcount reductions and cost cutting efforts. Additionally, we incurred a $6.5 million decrease in our 2015 MTM adjustment as compared to 2014. Our 2015 selling and administrative expenses also included fees associated with our proxy and tender offer totaling $23.6 million as compared to $8.2 million in 2014.

Impairments. As a result of our ongoing monitoring of triggering events, we recorded a goodwill impairment charge in our needle coke reporting unit totaling $35.4 million during the first quarter of 2015. This charge was driven by the margin contraction for petroleum needle coke and followed a similar charge totaling $76.1 million in the fourth quarter of 2014.

Rationalizations. We recorded a $7.9 million charge for rationalizations in 2014 compared to none in the period January 1 through August 14, 2015, and $0.3 million in the period August 15 through December 31, 2015. Our Industrial Materials and corporate rationalization programs were announced in 2013 and 2014 respectively and these programs wound down through 2015 and are substantially complete.

Other expense (income). Other expense (income) decreased from $2.9 million of expense in 2014 to $1.4 million in the period January 1 through August 14, 2015, and $0.8 million of income in the period August 15 through December 31, 2015. The decrease was due to advantageous foreign currency impacts on non-operating assets and liabilities.

Segment operating income (loss). The following table represents our operating loss by segment for 2014 and 2015:

	For the Year Ended December 31, 2014	For the Period January 1 Through August 14, 2015	For the Period August 15 Through December 31, 2015
	(Dollars in thousands)		
Industrial Materials	$(51,300)	$(24,900)	$(2,529)
Corporate, R&D and Other Expenses	(68,674)	(43,349)	(10,034)
Total segment operating loss	$(119,974)	$(68,249)	$(12,563)

Provision for income taxes. The following table summarizes the expense for income taxes in 2014 and 2015:

	For the Year Ended December 31, 2014	For the Period January 1 Through August 14, 2015	For the Period August 15 Through December 31, 2015
	(Dollars in thousands)		
Tax (benefit) expense	$(5,790)	$6,452	$6,882
Loss from continuing operations before provision for income taxes	$(158,310)	$(95,518)	$(21,743)
Effective Tax Rates	3.7 %	(6.8)%	(31.7)%

During the twelve months ended December 31, 2014, the effective tax rate differs from the U.S. statutory rate of 35 percent primarily due to the recording of a valuation allowance against our U.S. deferred tax assets. During 2014, GrafTech impaired certain long-lived assets and announced the exit of certain product lines within our AGM product group as well as impaired goodwill on the needle coke reporting unit. See Note 3 and Note 6 to the Financial Statements. The impairment charges and other rationalization related charges were incurred primarily in the U.S. Therefore, it is no longer assured that it is more likely than not that we will generate sufficient future U.S. taxable income to realize our U.S. net deferred tax assets. As a result of recent losses, we recognized a $73.4 million non-cash charge in 2014 to increase the valuation allowance against these U.S. deferred tax assets, which adversely impacted our effective tax rate. The recognition of the valuation allowance does not result in or limit our ability to utilize these tax assets in the future.

Effects of Inflation

We incur costs in the U.S. and each of the non-U.S. countries in which we have a manufacturing facility. In general, our results of operations, cash flows and financial condition are affected by the effects of inflation on our costs incurred in each of these countries.

Currency Translation and Transactions

We translate the assets and liabilities of our non-U.S. subsidiaries into U.S. dollars for consolidation and reporting purposes in accordance with FASB ASC 830, Foreign Currency Matters. Foreign currency translation adjustments are generally recorded as part of stockholders' equity and identified as part of accumulated other comprehensive loss on the Consolidated Balance Sheets until such time as their operations are sold or substantially or completely liquidated.

We account for our Russian, Swiss, Luxembourg and Mexican subsidiaries using the dollar as the functional currency, as sales and purchases are predominantly dollar-denominated. Our remaining subsidiaries use their local currency as their functional currency.

We also record foreign currency transaction gains and losses from non-permanent intercompany balances as part of other (income) expense, net.

Significant changes in currency exchange rates impacting us are described under "Effects of Changes in Currency Exchange Rates" and "Results of Operations."

Effects of Changes in Currency Exchange Rates

When the currencies of non-U.S. countries in which we have a manufacturing facility decline (or increase) in value relative to the U.S. dollar, this has the effect of reducing (or increasing) the U.S. dollar equivalent cost of sales and other expenses with respect to those facilities. In certain countries where we have manufacturing facilities, and in certain instances where we price our products for sale in export markets, we sell in currencies other than the dollar. Accordingly, when these currencies increase (or decline) in value relative to the dollar, this has the effect of increasing (or reducing) net sales. The result of these effects is to increase (or decrease) operating profit and net income.

Many of the non-U.S. countries in which we have a manufacturing facility have been subject to economic and political changes, which have impacted currency exchange rates. We cannot predict changes in currency exchange rates in the future or whether those changes will have net positive or negative impacts on our net sales, cost of sales or net income.

For net sales of Industrial Materials, the impact of these events was an decrease of $1.2 million in 2014, an increase of $37.8 million in 2015, and a increase of $0.4 million in 2016. For Industrial Materials cost of sales, the impact of these events were decreases of $4.8 million, $37.5 million and $10.1 million in 2014, 2015 and 2016, respectively.

As part of our cash management, we have intercompany loans between some of our subsidiaries. These loans are deemed to be temporary and, as a result, remeasurement gains and losses on these loans are recorded as currency gains / losses in other income (expense), net, on the Consolidated Statements of Income.

We had a net total currency loss of $1.5 million in 2014, no net currency gain or loss in 2015 and a net currency loss of $0.6 million in 2016 resulting from the remeasurement of intercompany loans and the effect of transaction gains and losses on intercompany activities.

We have in the past and may in the future use various financial instruments to manage certain exposures to specific financial market risks caused by changes in currency exchange rates, as described under "Item 7A–Quantitative and Qualitative Disclosures about Market Risks."

Liquidity and Capital Resources

Our sources of funds have consisted principally of cash flow from operations and debt including the Revolving Facility. Our uses of those funds (other than for operations) have consisted principally of capital expenditures, cash paid for acquisitions and associated expenses and debt reduction payments and other obligations. Disruptions in the U.S. and international financial markets could adversely affect our liquidity and the cost and availability of financing to us in the future.

As of December 31, 2016, we had cash and cash equivalents of $11.6 million, long-term debt in the principal amount of $382.4 million, short-term debt of $8.9 million and stockholders' equity of $577 million. The Company has access to a $225 million Revolving Facility (subject to a $25 million minimum liquidity requirement). As of December 31, 2016, the Company had $61.2 million of borrowings and $12.3 million of letters of credit, for a total of $73.5 million drawn against the Revolving Facility.

In the event that operating cash flows fail to provide sufficient liquidity to meet our business needs, including capital expenditures, any such shortfall would need to be made up by increased borrowings under our Revolving Facility, to the extent available. During 2016, as a result of a strategic review, we decided to sell our Engineered Solutions businesses. In November, 2016, we completed the sale of our Fiber Materials Inc. business. Cash proceeds from this and future sales will be used for repayment of borrowings outstanding under the Revolving Facility. We cannot

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assure you that we will, or will be able to, consummate any such sales on acceptable terms or at all or as to the price, terms or conditions of any such sales.

We use cash flow from operations and funds available under the Revolving Facility (subject to continued compliance with the financial covenants and representations under the Revolving Facility) as well as cash on hand as our primary sources of liquidity.

As of December 31, 2016, we were in compliance with all financial and other covenants contained in the Revolving Facility, as applicable.

As of December 31, 2015 and December 31, 2016 approximately 75% of debt consists of fixed rate obligations.

As a part of our cash management activities, we manage accounts receivable credit risk, collections, and accounts payable vendor terms to maximize our free cash at any given time and minimize accounts receivable losses.

Long-Term Contractual, Commercial and Other Obligations and Commitments. The following tables summarize our long-term contractual obligations and other commercial commitments as of December 31, 2016.

	Payments Due by Year Ending December 31,				
	Total	2017	2018-2019	2020-2021	2022+
	(Dollars in Thousands)				
Contractual and Other Obligations					
Long-term debt (a)	$391,300	$8,852	$82,448	$300,000	$—
Interest on long-term debt (b)	75,703	19,125	38,250	18,328	$—
Leases	8,959	2,637	3,939	1,481	902
Total contractual obligations	475,962	30,614	124,637	319,809	902
Postretirement, pension and related benefits (c)	116,898	11,882	23,342	23,146	58,528
Other long-term obligations	11,898	7,996	689	360	2,853
Uncertain income tax provisions	3,338	—	1,348	1,990	—
Total contractual and other obligations (d)	$608,096	$50,492	$150,016	$345,305	$62,283
Other Commercial Commitments					
Guarantees (e)	5,681	5,681	—	—	—
Total other commercial commitments	$5,681	$5,681	$—	$—	$—

(a) Senior Notes presently valued at $274 million as a result of purchase accounting and will accrete to the full redemption value of $300 million in 2020.

(b) Represents interest payments required on Senior Notes with a fixed interest rate of 6.375%

(c) Represents estimated postretirement, pension and related benefits obligations based on actuarial calculations.

(d) Additional letters of credit of $12.3 million are issued under the Revolving Facility.

(e) Represents surety bonds which are renewed annually. If rates were unfavorable, the letters of credit under our Revolving Facility would be utilized.

Cash Flow and Plans to Manage Liquidity. Typically, our cash flow fluctuates significantly between quarters due to various factors. These factors include customer order patterns, fluctuations in working capital requirements, timing of capital expenditures, acquisitions, stock repurchases and other factors.

Certain of our obligations could have material impact on our liquidity. Cash flow from operations and from financing activities services payment of our obligations, thereby reducing funds available to us for other purposes. The Company has access to a $225 million Revolving Facility (subject to a $25 million minimum liquidity requirement). As of December 31, 2016, the Company had $61.2 million of borrowings and $12.3 million of letters of credit, for a total of $73.5 million drawn against the Revolving Facility.

Continued volatility in the global economy may require additional borrowings under our Revolving Facility. An improving economy, while resulting in improved results of operations, could increase our cash requirements to purchase inventories, make capital expenditures and fund payables and other obligations until increased accounts receivable are converted into cash. A downturn could significantly negatively impact our results of operations and cash flows, which, coupled with increased borrowings, could negatively impact our credit ratings, our ability to comply with debt covenants, our ability to secure additional financing and the cost of such financing, if available.

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As of December 31, 2016, we were in compliance with all financial and other covenants contained in the Revolving Facility, as applicable.

In order to seek to minimize our credit risks, we reduce our sales of, or refuse to sell (except for cash on delivery or under letters of credit) our products to some customers and potential customers. In the current economic environment, our customers may experience liquidity shortages or difficulties in obtaining credit, including letters of credit. Our unrecovered trade receivables worldwide have not been material during the last 3 years individually or in the aggregate. We cannot assure you that we will not be materially adversely affected by accounts receivable losses in the future.

We manage our capital expenditures taking into account quality, plant reliability, safety, environmental and regulatory requirements, prudent or essential maintenance requirements, global economic conditions, available capital resources, liquidity, long-term business strategy and return on invested capital for the relevant expenditures, cost of capital and return on invested capital of the relevant segment and the Company as a whole, and other factors.

We had positive cash flow from operating activities during 2014, 2015 and 2016. Although the global economic environment experienced significant swings in these periods, our working capital management and cost-control initiatives allowed us to remain operating cash flow positive in both times of declining and improving operating results.

Prior to 2013, we experienced increased inventory levels resulting from lower sales volumes driven by reduced demand for our products as well as from contractually obligated raw material purchases. We have since closed two graphite electrode manufacturing facilities to better align our production with customer demand and we reduced inventories in 2013 through 2016. We expect to continue to reduce inventory levels over the next 12 months which will provide positive cash flows and increase our liquidity.

Off-Balance Sheet Arrangements and Commitments. We have not undertaken or been a party to any material off-balance-sheet financing arrangements or other commitments (including non-exchange traded contracts), other than:

- Notional amount of foreign exchange and commodity contracts.
- Commitments under non-cancelable operating leases that, as of December 31, 2016, totaled no more than $2.6 million in each year and $9.0 million in the aggregate and as of December 31, 2016.
- Letters of credit outstanding under the Revolving Facility of $12.3 million as of December 31, 2016.
- Surety bonds and letters of credit with other banks totaling $5.7 million.

We are not affiliated with or related to any special purpose entity other than GrafTech Finance, our wholly-owned and consolidated finance subsidiary.

Cash Flows.

The following is a discussion of our cash flow activities:

	Predecessor		Successor	
	For the Year Ended December 31, 2014	For the January 1 Through August 14, 2015	For the Period August 15 Through December 31, 2015	For the Year Ended December 31, 2016
	(Dollars in millions)			
Cash flow provided by (used in):				
Operating activities	$120.9	$ 28.3	$23.1	$ 22.8
Investing activities	(79.0)	(39.9)	(17.5)	(10.5)
Financing activities	(35.1)	20.8	(23.1)	(8.3)

Operating Activities

Cash flow from operating activities represents cash receipts and cash disbursements related to all our activities other than to investing and financing activities. Operating cash flow is derived by adjusting net income for:

- Non-cash items such as depreciation and amortization; stock-based compensation charges; pension and post-retirement gains and losses, inventory write-downs

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- Gains and losses attributed to investing and financing activities such as gains and losses on the sale of assets and currency (gains) and losses
- Changes in operating short and long-term assets and liabilities which reflect timing differences between the receipt and payment of cash associated with transactions and when they are recognized in results of operations

The net impact of the changes in working capital (operating assets and liabilities), which are discussed in more detail below, include the impact of changes in: receivables, inventories, prepaid expenses, accounts payable, accrued liabilities, interest payable, and payments of other current liabilities. We continue to maximize our operating cash flows by focusing on those working capital items that are most directly affected by changes in sales volume, such as accounts receivable, inventories and accounts payable.

In 2014, changes in working capital resulted in a net source of funds of $56.8 million which was impacted by:

- source of funds of $28.5 million from the decrease in accounts receivable, which was due primarily to the timing of sales and collections during the year;
- source of funds from inventory reductions of $77.9 million primarily due to the planned reduction of inventory levels built up in prior years ; and
- use of funds of $33.5 million from a decreases in accounts payable and rationalization liabilities.

In the period January 1 through August 14, 2015, changes in working capital resulted in a net source of funds of $45.6 million which was impacted by:

- net cash inflows in accounts receivable of $61.0 million from the decrease in accounts receivable due to the timing and collection of customer sales and collections;
- net cash outflows from decreases in accounts payable and accruals of $18.7 million, due primarily to changes in tax accruals and payables; and
- a increase in interest payable of $2.3 million.

In the period August 15 through December 31, 2015, changes in working capital resulted in a net source of funds of $26.8 million which was impacted by:

- use of funds of $9.5 million from the increase in accounts receivable, which was due primarily to the timing of sales and collections during the year;
- source of funds from prepaid and other asset reductions of $14.2 million primarily related to value added tax (VAT) receivable collections;
- source of funds from inventory reductions of $47.9 million primarily due to the planned reduction of inventory levels built up in prior years ; and
- use of funds of $19.8 million from a decreases in accounts payable and rationalization liabilities.

In 2016, changes in working capital resulted in a net source of funds of $68.6 million which was impacted by:

- source of funds of $3.4 million from the decrease in accounts receivable, which was due primarily to the timing of sales and collections during the year;
- source of funds from inventory reductions of $53.5 million primarily due to the planned reduction of inventory levels built up in prior years ; and
- source of funds of $15.8 million from increases in accounts payable and rationalization liabilities.
- use of funds of $2.8 million for the extinguishment our rationalization related liabilities.

Operating cash flow also included cash outflows of $14.5 million, $14.6 million and $11.0 million for contributions to pension and post retirement plans in 2014, 2015 and 2016, respectively.

Investing Activities.

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Net cash used in investing activities was $79.0 million in 2014 and included:
- capital expenditures of $85.0 million;
- cash outflows of $2.0 million related to derivative instruments;
- cash inflows of $2.8 million related to insurance recoveries; and
- cash inflows of $5.0 million related to the sale of fixed assets.

Net cash used in investing activities was $39.9 million in the period of January 1 through August 14 through December 31, 2015 and included:
- capital expenditures of $32.3 million;
- payments for derivative instruments of $8.3 million; and
- cash inflows of $0.6 million related to the sale of fixed assets

Net cash used in investing activities was $17.5 million in the period of August 15 through December 31, 2015 and included:
- capital expenditures of $18.4 million; and
- cash inflows of $0.6 million related to the sale of fixed assets

Net cash used in investing activities was $10.5 million in 2016 and included:
- capital expenditures of $27.9 million;
- proceeds from the sale of fixed assets of $1.1 million; and
- cash inflows of $15.9 million from the divestiture of our Fiber Materials Inc. business.

Financing Activities.

Net cash flow used by financing activities was $35.1 million in 2014 and included:
- net payments on our Revolving Facility of $24.0 million;
- cash outflows of $9.5 million related to our supply chain financing agreement; and
- cash paid for refinancing fees and debt issuance costs of $3.3 million.

Net cash flow provided by financing activities was $20.8 million in the period January 1 through August 14, 2015 and included:
- cash proceeds of $150.0 million from our issuance of preferred shares;
- cash inflows for net borrowings on our Revolving Facility of $79.5 million;
- $200 million cash outflow for the prepayment of our Senior Subordinated Notes;
- cash outflows of $5.1 million for refinancing fees; and
- cash outflows of $3.4 million for issuance costs related to our preferred share issuance.

Net cash flow used by financing activities was $23.1 million for the period August 15 through December 31, 2015 and included:
- net payments on our Revolving Facility of $21.5 million; and
- cash outflows of $1.4 million for issuance costs related to our preferred share issuance.

Net cash flow used by financing activities was $8.3 million in 2016 and included:
- net payments on our Revolving Facility of $7.1 million; and
- net payments of $0.9 million for related to refinancing fees paid.

Costs Relating to Protection of the Environment

We have been and are subject to increasingly stringent environmental protection laws and regulations. In addition, we have an on-going commitment to rigorous internal environmental protection standards. Environmental considerations are part of all significant capital expenditure decisions. The following table sets forth certain information regarding environmental expenses and capital expenditures.

	For the Year Ended December 31,		
	2014	2015	2016
	(Dollars in thousands)		
Expenses relating to environmental protection	$10,439	$6,507	$8,255
Capital expenditures related to environmental protection	13,051	2,082	1,693

Critical Accounting Policies

Critical accounting policies are those that require difficult, subjective or complex judgments by management, often as a result of the need to make estimates about the effect of matters that are inherently uncertain and may change in subsequent periods. Our significant accounting policies are described in Note 1 “Business and Summary of Significant Accounting Policies” of the Notes to the Consolidated Financial Statements. The following accounting policies are deemed to be critical.

Business Combinations and Goodwill. The application of the purchase method of accounting for business combinations requires the use of significant estimates and assumptions in the determination of the fair value of assets acquired and liabilities assumed in order to properly allocate purchase price consideration between goodwill and assets that are depreciated and amortized. Our estimates of the fair values of assets and liabilities acquired are based on assumptions believed to be reasonable and, when appropriate, include assistance from independent third-party appraisal firms.

As a result of our acquisition by Brookfield, we have a significant amount of goodwill. Goodwill is tested for impairment annually or more frequently if an event or circumstance indicates that an impairment loss may have been incurred. Application of the goodwill impairment test requires judgment, including the identification of reporting units, assignment of assets and liabilities to reporting units, assignment of goodwill to reporting units and determination of the fair value of each reporting unit. We estimate the fair value of each reporting unit using a discounted cash flow methodology. This requires us to use significant judgment including estimation of future cash flows, which is based upon relevant market data, internal forecasts, estimation of the long-term growth for our business, the useful life over which cash flows will occur, determination of the weighted average cost of capital for purposes of establishing discount rate.

Refer to Note 1 “Business and Summary of Significant Accounting Policies” of the Notes to the Consolidated Financial Statements for information regarding our goodwill impairment testing.

Predecessor and Successor Reporting. On August 17, 2015, the Company was acquired by affiliates of Brookfield Asset Management Inc. (see Note 2 "Preferred Share Issuance and Merger"). We elected to account for the acquisition under the acquisition method of accounting. Under the acquisition method of accounting, the assets and liabilities of GTI were adjusted to their preliminary fair market value as of August 15, 2015, as this was the day that Brookfield effectively took control of the Company.

Our consolidated statements of operations subsequent to the Merger will include amortization expense relating to the fair value adjustments and depreciation expense based on the the fair value of the Company's property, plant and equipment that had previously been carried at historical cost less accumulated depreciation. Therefore, the Company's financial information prior to the Merger is not comparable to the financial information subsequent to the Merger. As a result, the financial statements and certain note presentations are separated into two distinct periods, the period before the consummation of the Merger (labeled "Predecessor") and the period after the date of merger (labeled "Successor"), to indicate the application of the different basis of accounting between the periods presented.

Reliance on Estimates. In preparing the Consolidated Financial Statements, we use and rely on estimates in determining the economic useful lives of our assets, obligations under our employee benefit plans, provisions for doubtful accounts, provisions for restructuring charges and contingencies, tax valuation allowances, evaluation of goodwill, other intangible assets, pension and postretirement benefit obligations and various other recorded or disclosed amounts, including inventory valuations. Estimates require us to use our judgment. While we believe that our estimates for these matters are reasonable, if the actual amount is significantly different than the estimated amount, our assets, liabilities or results of operations may be overstated or understated.

Employee Benefit Plans. We sponsor various retirement and pension plans, including defined benefit and defined contribution plans and postretirement benefit plans that cover most employees worldwide. Excluding the defined contribution plans, accounting for these plans requires assumptions as to the discount rate, expected return on plan assets, expected salary increases and health care cost trend rate. See Note 12 “Retirement Plans and Postretirement Benefits” of the Notes to the Consolidated Financial Statements for further details.

Contingencies. We account for contingencies by recording an estimated loss when information available prior to issuance of the Consolidated Financial Statements indicates that it is probable that an asset has been impaired or a liability has been incurred at the date of the Consolidated Financial Statements and the amount of the loss can be reasonably estimated. Accounting for contingencies such as those relating to environmental, legal and income tax matters requires us to use our judgment. While we believe that our accruals for these matters are adequate, if the actual loss is significantly different from the estimated loss, our results of operations may be overstated or understated. Legal costs expected to be incurred in connection with a loss contingency are expensed as incurred.

Impairments of Long-Lived Assets. We record impairment losses on long-lived assets used in operations when events and circumstances indicate that the assets might be impaired and the future undiscounted cash flows estimated to be generated by those assets are less than the carrying amount of those assets. Assets to be disposed are reported at the lower of the carrying amount or fair value less estimated costs to sell. Estimates of the future cash flows are subject to significant uncertainties and assumptions. If the actual value is significantly less than the estimated fair value, our assets may be overstated. Future events and circumstances, some of which are described below, may result in an impairment charge:

- new technological developments that provide significantly enhanced benefits over our current technology;
- significant negative economic or industry trends;
- changes in our business strategy that alter the expected usage of the related assets; and
- future economic results that are below our expectations used in the current assessments.

Accounting for Income Taxes. When we prepare the Consolidated Financial Statements, we are required to estimate our income taxes in each of the jurisdictions in which we operate. This process requires us to make the following assessments:

- estimate our actual current tax liability in each jurisdiction;
- estimate our temporary differences resulting from differing treatment of items for tax and accounting purposes (which result in deferred tax assets and liabilities that we include within the Consolidated Balance Sheets); and
- assess the likelihood that our deferred tax assets will be recovered from future taxable income and, if we believe that recovery is not more likely than not, a valuation allowance is established

If our estimates are incorrect, our deferred tax assets or liabilities may be overstated or understated.

Revenue Recognition. Revenue from sales of our commercial products is recognized when persuasive evidence of an arrangement exists, delivery has occurred, title has passed, the amount is determinable and collection is reasonably assured. Sales are recognized when both title and the risks and rewards of ownership are transferred to the customer or services have been rendered and fees have been earned in accordance with the contract.

Volume discounts and rebates are recorded as a reduction of revenue in conjunction with the sale of the related products. Changes to estimates are recorded when they become probable. Shipping and handling revenues relating to products sold are included as an increase to revenue. Shipping and handling costs related to products sold are included as an increase to cost of sales.

Discontinued Operations and Assets Held for Sale

When Management commits to a plan to sell assets or asset groups and a sale is probable, we reclassify those assets or asset groups into "Assets Held for Sale". Upon reclassification to assets held for sale, we evaluate the book value of the disposal groups against their fair value less costs to sell and as a result may impair the assets / asset groups. As and if new information becomes available on the fair value of the assets/asset groups , we may adjust accordingly the impairment.

Once the assets of a business have been classified as held for sale, we evaluate if the divestiture represents a strategic shift in operations and if so, we exclude the results of this business from continuing operations. All results are reported as gain or loss from discontinued operations, net of tax. During the second quarter of 2016, our Engineered Solutions business qualified as discontinued operations and as such, all results have been excluded from operations. See Note 3 "Discontinued Operations and Related Assets Held for Sale".

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Recent Accounting Pronouncements

We discuss recently adopted and issued accounting standards in Note 1 “Business and Summary of Significant Accounting Policies” of the Notes to the Consolidated Financial Statements.

Description of Our Financing Structure

We discuss our financing structure in more detail in Note 7 “Long-Term Debt and Liquidity” of the Notes to the Consolidated Financial Statements.

Item 7A. Quantitative and Qualitative Disclosures About Market Risk

We are exposed to market risks primarily from changes in interest rates, currency exchange rates, energy commodity prices and commercial energy rates. We, from time to time, routinely enter into various transactions that have been authorized according to documented policies and procedures to manage these well-defined risks. These transactions relate primarily to financial instruments described below. Since the counterparties to these financial instruments are large commercial banks and similar financial institutions, we do not believe that we are exposed to material counterparty credit risk. We do not use financial instruments for trading purposes.

Our exposure to changes in interest rates results primarily from floating rate long-term debt tied to LIBOR or Euro LIBOR. Our exposure to changes in currency exchange rates results primarily from:

- sales made by our subsidiaries in currencies other than local currencies;
- raw material purchases made by our foreign subsidiaries in currencies other than local currencies; and
- investments in and intercompany loans to our foreign subsidiaries and our share of the earnings of those subsidiaries, to the extent denominated in currencies other than the dollar.

Our exposure to changes in energy commodity prices and commercial energy rates results primarily from the purchase or sale of refined oil products and the purchase of natural gas and electricity for use in our manufacturing operations.

Currency Rate Management. We enter into foreign currency derivatives from time to time to attempt to manage exposure to changes in currency exchange rates. These foreign currency derivatives, which include, but are not limited to, forward exchange contracts and purchased currency options, attempt to hedge global currency exposures. Forward exchange contracts are agreements to exchange different currencies at a specified future date and at a specified rate. Purchased foreign currency options are instruments which give the holder the right, but not the obligation, to exchange

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different currencies at a specified rate at a specified date or over a range of specified dates. Forward exchange contracts and purchased currency options are carried at market value.

The outstanding foreign currency derivatives as of December 31, 2016 represented a net unrealized loss of $0.2 million. There were no outstanding gains or losses as of December 31, 2015.

Energy Commodity Management. We periodically enter into commodity derivative contracts and short duration fixed rate purchase contracts to effectively fix some or all of our natural gas and refined oil product exposure. We had no outstanding contracts as of December 31, 2015 and December 31, 2016.

Interest Rate Risk Management. We periodically implement interest rate management initiatives to seek to minimize our interest expense and the risk in our portfolio of fixed and variable interest rate obligations.

We periodically enter into agreements with financial institutions that are intended to limit, or cap, our exposure to incurrence of additional interest expense due to increases in variable interest rates. These instruments effectively cap our interest rate exposure. We currently do not have any such instruments outstanding.

Sensitivity Analysis. We use sensitivity analysis to quantify potential impacts that market rate changes may have on the fair values of our foreign currency derivatives and our commodity derivatives. The sensitivity analysis represents the hypothetical changes in value of the hedge position and does not reflect the related gain or loss on the forecasted underlying transaction. As of December 31, 2016, a 10% appreciation or depreciation in the value of the U.S. dollar against foreign currencies from the prevailing market rates would result in a corresponding increase or decrease of $1.9 million, respectively, in the fair value of the foreign currency hedge portfolio. We had no exposure to commodity prices as we had no commodity hedges outstanding as of December 31, 2016. Because of the high correlation between the hedging instrument and the underlying exposure, fluctuations in the value of the instruments are generally offset by reciprocal changes in the value of the underlying exposure.

We had no interest rate derivative instruments outstanding as of December 31, 2016. A hypothetical increase in interest rates of 100 basis points (1%) would have increased our interest expense by $1.0 million for the twelve months ended December 31, 2016.

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Item 8. Financial Statements and Supplementary Data

(Unless otherwise noted, all dollars are presented in thousands)

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See the Table of Contents located at the beginning of this Report for more detailed page references to information contained in this Item.

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Management's Report on Internal Control over Financial Reporting

Management is responsible for establishing and maintaining adequate internal control over financial reporting. Internal control over financial reporting is defined in Rules 13a-15(f) and 15d-15(f) under the Exchange Act as a process, designed by, or under the supervision of, the chief executive officer and chief financial officer and effected by the board of directors, management and other personnel of a company, 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 transactions and dispositions of assets of the company;
- 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 the board of directors; and
- provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use or disposition of assets of the company that could have a material effect on its financial statements.

Internal control over financial reporting has inherent limitations which 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 because the level of compliance with related policies or procedures may deteriorate.

Management has conducted an assessment of the effectiveness of our internal control over financial reporting as of December 31, 2016 using the criteria set forth by the Committee of Sponsoring Organizations of the Treadway Commission (COSO) in Internal Control-Integrated Framework (2013). Based on that assessment, management concluded that our internal control over financial reporting was effective as of December 31, 2016. The effectiveness of the Company's internal control over financial reporting as of December 31, 2016 has not been audited by Deloitte & Touche LLP, our independent registered public accounting firm.

Date: February 27, 2017

/S/   Jeffrey C. Dutton

Jeffrey C. Dutton

President and Chief Executive Officer

/S/   Quinn J. Coburn

Quinn J. Coburn

Vice President and Chief Financial Officer

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Report of Independent Registered Public Accounting Firm

To the Board of Directors and Stockholders of GrafTech International Ltd.

In our opinion, the consolidated statements of operations and comprehensive income (loss), of stockholders’ equity and of cash flows for the year ended December 31, 2014, before the effects of the adjustments to retrospectively reflect the discontinued operations described in Note 3 and before the effects of the adjustments to retrospectively reflect the change in the composition of reportable segments described in Note 5, present fairly, in all material respects, the results of operations and cash flows of GrafTech International Ltd. and its subsidiaries for the year ended December 31, 2014, in conformity with accounting principles generally accepted in the United States of America (the 2014 financial statements before the effects of the adjustments discussed in Notes 3 and 5 are not presented herein). These financial statements are the responsibility of the Company's management. Our responsibility is to express an opinion on these financial statements based on our audit. We conducted our audit, before the effects of the adjustments described above, of these financial statements in accordance with the standards of the Public Company Accounting Oversight Board (United States). Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free of material misstatement. An audit includes 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. We believe that our audit provides a reasonable basis for our opinion.

As noted in Note 7 to the consolidated financial statements, the Company amended its revolving agreement and entered into a new senior secured delayed draw term loan.

We were not engaged to audit, review, or apply any procedures to the adjustments to retrospectively reflect the discontinued operations described in Note 3 and the adjustments to retrospectively reflect the change in the composition of reportable segments described in Note 5 and accordingly, we do not express an opinion or any other form of assurance about whether such adjustments are appropriate and have been properly applied. Those adjustments were audited by other auditors.

/s/ PricewaterhouseCoopers LLP
PricewaterhouseCoopers LLP
Cleveland, Ohio
March 2, 2015

REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM
To the Board of Directors and Stockholders of
GrafTech International Ltd. and subsidiaries:

We have audited the accompanying consolidated balance sheets of GrafTech International Ltd. and its subsidiaries (the "Company") as of December 31, 2016 and 2015, and the related consolidated statements of operations and comprehensive income (loss), stockholders' equity, and cash flows for the years ended December 31, 2016 and 2015 (January 1, 2015 to August 14, 2015, Predecessor Period, and August 15, 2015 to December 31, 2015, Successor Period). These consolidated financial statements are the responsibility of the Company's management. Our responsibility is to express an opinion on these consolidated financial statements based on our audits. The consolidated financial statements of the Company for the year ended December 31, 2014, before the effects of the retrospective adjustments for the discontinued operations discussed in Note 3 and before the effects of the retrospective adjustments to the disclosures for a change in the composition of reportable segments discussed in Note 5 to the consolidated financial statements, were audited by other auditors whose report, dated March 2, 2015, expressed an unqualified opinion on those statements.

We conducted our audits in accordance with the standards of the Public Company Accounting Oversight Board (United States) and in accordance with auditing standards generally accepted in the United States of America. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the consolidated financial statements are free of material misstatement. The Company is not required to have, nor were we engaged to perform, an audit of its internal control over financial reporting. Our audits included consideration of internal control over financial reporting as a basis for designing audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the Company's internal control over financial reporting. Accordingly, we express no such opinion. An audit also includes examining, on a test basis, evidence supporting the amounts and disclosures in the consolidated financial statements, assessing the accounting principles used and significant estimates made by management, as well as evaluating the overall financial statement presentation. We believe that our audits provide a reasonable basis for our opinion.

In our opinion, such 2016 and 2015 consolidated financial statements present fairly, in all material respects, the financial position of GrafTech International Ltd. and its subsidiaries as of December 31, 2016 and 2015, and the results of their operations and their cash flows for the years ended December 31, 2016 and 2015 (January 1, 2015 to August 14, 2015, Predecessor Period, and August 15, 2015 to December 31, 2015, Successor Period), in conformity with accounting principles generally accepted in the United States of America.

We also have audited the retrospective adjustments to the 2014 consolidated financial statements for the operations discontinued in 2016, as discussed in Note 3 to the consolidated financial statements. We also have audited the adjustments to the 2014 consolidated financial statements to retrospectively adjust the disclosures for a change in the composition of reportable segments in 2016, as discussed in Note 5 to the consolidated financial statements. Our procedures over discontinued operations included (1) obtaining the Company's underlying accounting analysis prepared by management of the retrospective adjustments for discontinued operations and comparing the retrospectively adjusted amounts per the 2014 financial statements to such analysis, (2) comparing previously reported amounts to the previously issued financial statements for such year, (3) testing the mathematical accuracy of the accounting analysis, and (4) on a test basis, comparing the adjustments to retrospectively adjust the financial statements for discontinued operations to the Company's supporting documentation. Our procedures over the change in reportable segments included (1) comparing the adjustment amounts of segment revenues, operating income, and assets to the Company's underlying analysis and (2) testing the mathematical accuracy of the reconciliation of segment amounts to the consolidated financial statements. In our opinion, such retrospective adjustments are appropriate and have been properly applied. However, we were not engaged to audit, review, or apply any procedures to the 2014 consolidated financial statements of the Company other than with respect to the retrospective adjustments and, accordingly, we do not express an opinion or any other form of assurance on the 2014 consolidated financial statements taken as a whole.

/s/ Deloitte & Touche LLP
Deloitte & Touche LLP
Cleveland, Ohio
February 27, 2017

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GRAFTECH INTERNATIONAL LTD. AND SUBSIDIARIES
CONSOLIDATED BALANCE SHEETS
(Dollars in thousands, except share data)

	Successor As of December 31, 2015	As of, December 31, 2016
ASSETS		
Current assets:		
Cash and cash equivalents	$6,927	$11,610
Accounts and notes receivable, net of allowance for doubtful accounts of $244 as of December 31, 2015 and $326 as of December 31, 2016	82,390	80,568
Inventories	218,130	156,111
Prepaid expenses and other current assets	21,150	21,665
Current assets of discontinued operations	98,281	60,979
Total current assets	426,878	330,933
Property, plant and equipment	571,329	585,704
Less: accumulated depreciation	20,166	76,849
Net property, plant and equipment	551,163	508,855
Deferred income taxes	15,326	19,803
Goodwill	172,059	171,117
Other assets	152,614	141,568
Long-term assets of discontinued operations	103,975	—
Total assets	$1,422,015	$1,172,276
LIABILITIES AND STOCKHOLDERS’ EQUITY		
Current liabilities:		
Accounts payable	$40,147	$47,663
Short-term debt	4,772	8,852
Accrued income and other taxes	5,933	5,256
Rationalizations	1,195	75
Other accrued liabilities	20,987	30,519
Current liabilities of discontinued operations	23,082	20,042
Total current liabilities	96,116	112,407
Long-term debt	362,455	356,580
Other long-term obligations	94,318	82,148
Deferred income taxes	57,430	42,906
Long-term liabilities of discontinued operations	1,167	850
Commitments and Contingencies – Notes 11 and 13		
Stockholders’ equity:		
Preferred stock, par value $.01, 10,000,000 shares authorized, none issued	—	—
Common stock, par value $.01, 225,000,000 shares authorized, 100 shares authorized and issued as of December 31, 2015 and 2016	—	—
Additional paid – in capital	854,337	854,337
Accumulated other comprehensive loss	(10,257)	(7,558)
Accumulated deficit	(33,551)	(269,394)
Total stockholders’ equity	810,529	577,385
Total liabilities and stockholders’ equity	$1,422,015	$1,172,276

See accompanying Notes to the Consolidated Financial Statements

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GRAFTECH INTERNATIONAL LTD. AND SUBSIDIARIES
CONSOLIDATED STATEMENTS OF OPERATIONS AND COMPREHENSIVE INCOME (LOSS)
(Dollars in thousands, except per share data)

	Predecessor		Successor	
	For the Year Ended December 31, 2014	For the Period January 1 Through August 14, 2015	For the Period August 15 Through December 31, 2015	For the Year Ended December 31, 2016
Net sales	$825,145	$339,907	$193,133	$437,963
Cost of sales	757,156	305,001	180,845	448,016
Additions to lower of cost or market inventory reserve	—	—	—	18,974
Gross profit (loss)	67,989	34,906	12,288	(29,027)
Research and development	9,738	3,377	1,083	2,399
Selling and administrative expenses	94,629	64,383	23,485	57,725
Impairment of long-lived assets and goodwill	75,650	35,381	—	2,843
Rationalizations	7,946	14	283	59
Operating loss	(119,974)	(68,249)	(12,563)	(92,053)
Other expense (income), net	2,920	1,421	(813)	(2,188)
Interest expense	35,736	26,211	9,999	26,914
Interest income	(320)	(363)	(6)	(358)
Loss from continuing operations before provision for income taxes	(158,310)	(95,518)	(21,743)	(116,421)
(Benefit) provision for income taxes	(5,790)	6,452	6,882	(7,552)
Net loss from continuing operations	(152,520)	(101,970)	(28,625)	(108,869)
Loss from discontinued operations, net of tax*	(132,856)	(18,679)	(4,926)	$(126,974)
Net loss	$(285,376)	$(120,649)	$(33,551)	$(235,843)
Basic loss per common share:				
Net loss per share	$(2.10)	$(0.88)	N/A	N/A
Weighted average common shares outstanding	136,155	137,152	N/A	N/A
Diluted loss per common share:				
Net loss per share	$(2.10)	$(0.88)	N/A	N/A
Weighted average common shares outstanding	136,155	137,152	N/A	N/A
STATEMENTS OF COMPREHENSIVE INCOME (LOSS)				
Net loss	$(285,376)	$(120,649)	$(33,551)	$(235,843)
Other comprehensive income (loss):				
Foreign currency translation adjustments	(33,041)	(27,936)	(10,133)	2,574
Commodities and foreign currency derivatives and other, net of tax of ($63), ($68) and $21 and ($20), respectively	(10,859)	1,262	(124)	125
Other comprehensive (loss)income, net of tax:	(43,900)	(26,674)	(10,257)	2,699
Comprehensive loss	$(329,276)	$(147,323)	$(43,808)	$(233,144)

* Loss on discontinued operations includes a pretax impairment charge of $119,907 in the twelve months ended December 31, 2016. See Note 3 "Discontinued Operations and Related Assets Held for Sale"

See accompanying Notes to the Consolidated Financial Statements

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GRAFTECH INTERNATIONAL LTD. AND SUBSIDIARIES
CONSOLIDATED STATEMENTS OF CASH FLOWS
(Dollars in thousands)

	Predecessor		Successor	
	For the Year Ended December 31, 2014	For the Period January 1 Through August 14, 2015	For the Period August 15 Through December 31, 2015	For the Year Ended December 31, 2016
Cash flow from operating activities:				
Net Loss	$(285,376)	$(120,649)	$(33,551)	$(235,843)
Adjustments to reconcile net loss to cash provided by operations:				
Depreciation and amortization	119,708	45,461	28,618	82,891
Impairment of long-lived assets and goodwill	197,220	35,381	—	122,750
Rationalization related fixed asset write offs	926	—	—	636
Inventory write-downs	19,600	—	—	1,770
Deferred income taxes	(16,003)	924	5,368	(12,062)
Post-retirement and pension plan charges	23,047	2,998	2,638	(698)
Stock-based compensation	5,577	15,357	—	—
Non-cash interest expense	15,693	14,180	2,351	6,551
Loss on divestiture	—	—	—	198
Other charges, net	1,441	102	(1,934)	(2,641)
Net change in working capital*	56,846	45,594	26,763	68,630
Change in long-term assets and liabilities	(17,776)	(11,025)	(7,138)	(9,367)
Net cash provided by operating activities	120,903	28,323	23,115	22,815
Cash flow from investing activities:				
Capital expenditures	(84,981)	(32,301)	(18,442)	(27,858)
Insurance proceeds	2,834	—	—	—
Cash received from divestitures	—	—	—	15,889
Derivative instrument settlements, net	(2,025)	(8,263)	326	377
Proceeds from the sale of fixed assets	5,042	646	632	1,121
Other	178	—	—	—
Net cash used in investing activities	(78,952)	(39,918)	(17,484)	(10,471)
Cash flow from financing activities:				
Short-term debt (reductions) borrowings, net	(1,021)	18,511	(15,504)	7,363
Credit Facility borrowings	269,000	160,000	62,000	56,000
Credit Facility reductions	(293,000)	(99,000)	(68,000)	(70,469)
Repayment of Senior Subordinated Notes	—	(200,000)	—	—
Issuance of preferred shares	—	150,000	—	—
Principal payments on long-term debt	(192)	(89)	(183)	(289)
Supply chain financing	(9,455)	—	—	—
Proceeds from exercise of stock options	2,813	32	—	—
Purchase of treasury shares	(894)	(63)	—	—
Refinancing fees and debt issuance costs	(3,279)	(5,068)	—	(922)
Other	951	(3,499)	(1,385)	—
Net cash (used in) provided by financing activities	(35,077)	20,824	(23,072)	(8,317)

Net change in cash and cash equivalents	6,874	9,229	(17,441)	4,027
Effect of exchange rate changes on cash and cash equivalents	(1,212)	(1,746)	(665)	656
Cash and cash equivalents at beginning of period	11,888	17,550	25,033	6,927
Cash and cash equivalents at end of period	$17,550	$25,033	$6,927	$11,610

See accompanying Notes to the Consolidated Financial Statements

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GRAFTECH INTERNATIONAL LTD. AND SUBSIDIARIES
CONSOLIDATED STATEMENTS OF CASH FLOWS (Continued)
(Dollars in thousands)

	Predecessor		Successor	
	For the Year Ended December 31, 2014	For the Period January 1 Through August 14, 2015	For the Period August 15 Through December 31, 2015	For the Year Ended December 31, 2016
Supplemental disclosures of cash flow information:				
Net cash paid during the periods for:				
Interest	$21,549	$10,661	$10,880	$23,578
Income taxes	10,611	5,016	1,646	3,329
Non-cash operating, investing and financing activities:				
Common stock issued to savings and pension plan trusts	4,381	1,874	—	—
* Net change in working capital due to the following components:				
Decrease (increase) in current assets:				
Accounts and notes receivable, net	$28,466	$61,008	$(9,524)	$3,432
Inventories	77,875	1,164	47,853	53,548
Prepaid expenses and other current assets	(14,898)	2,551	15,935	(1,424)
Change in accounts payables and accruals	(25,849)	(18,728)	(21,503)	15,757
Rationalizations	(8,732)	(2,677)	(3,756)	(2,758)
Increase in interest payable	(16)	2,276	(2,242)	75
Decrease in working capital	$56,846	$45,594	$26,763	$68,630

See accompanying Notes to the Consolidated Financial Statements

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GRAFTECH INTERNATIONAL LTD. AND SUBSIDIARIES
CONSOLIDATED STATEMENTS OF STOCKHOLDERS' EQUITY
(Dollars in thousands, except share data)
PREDECESSOR

	Issued Shares of Common Stock	Common Stock	Additional Paid-in Capital	Accumulated Other Comprehensive Loss	Retained Earnings (Accumulated Deficit)	Treasury Stock	Common Stock Held in Employee Benefit & Compensation Trust	Total Stockholders' Equity
Balance at January 1, 2014	151,929,565	$ 1,519	$ 1,820,451	$ (292,624)	$ 39,625	$ (247,190)	$ (1,032)	$ 1,320,749
Comprehensive income (loss):								
Net loss	—	—	—	—	(285,376)	—	—	(285,376)
Other comprehensive income (loss):								
Commodity and foreign currency derivatives and other, net of tax of ($63)	—	—	—	(10,859)	—	—	—	(10,859)
Foreign currency translation adjustments	—	—	—	(33,041)	—	—	—	(33,041)
Total other comprehensive income (loss)	—	—	—	(43,900)	—	—	—	(43,900)
Stock-based compensation	322	—	(1,765)	—	—	7,379	—	5,614
Common stock issued to savings and pension plan trusts	574,973	6	4,381	—	—	—	236	4,623
Sale of common stock under stock options	316,151	3	2,813	—	—	—	—	2,816
Balance at December 31, 2014	152,821,011	$ 1,528	$ 1,825,880	$ (336,524)	$ (245,751)	$ (239,811)	$ (796)	$ 1,004,526
Comprehensive income (loss):								
Net loss	—	—	—	—	(120,649)	—	—	(120,649)
Other comprehensive income (loss):								
Commodity and foreign currency	—	—	—	1,262	—	—	—	1,262

derivatives and other, net of tax of ($68)								
Foreign currency translation adjustments	—	—	—	(27,936)	—	—	—	(27,936)
Total other comprehensive income (loss)	—	—	—	(26,674)	—	—	—	(26,674)
Brookfield preferred share issuance	—	—	145,205	—	—	—	—	145,205
Stock-based compensation	(2,331)	—	(16,530)	—	—	31,826	—	15,296
Common stock issued to savings and pension plan trusts	423,273	4	1,874	—	—	—	796	2,674
Sale of common stock under stock options	7,450	—	32	—	—	—	—	32
Balance at August 14, 2015	153,249,403	$ 1,532	$ 1,956,461	$ (363,198)	$ (366,400)	$ (207,985)	$ —	$ 1,020,410

See accompanying Notes to the Consolidated Financial Statements

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GRAFTECH INTERNATIONAL LTD. AND SUBSIDIARIES
CONSOLIDATED STATEMENTS OF STOCKHOLDERS' EQUITY (Continued)
(Dollars in thousands, except share data)
SUCCESSOR

	Issued Shares of Common Stock	Common Stock	Additional Paid-in Capital	Accumulated Other Comprehensive Loss	Retained Earnings (Accumulated Deficit)	Treasury Stock	Common Stock Held in Employee Benefit & Compensation Trust	Total Stockholders' Equity
Balance at August 15, 2015	—	$ —	$ —	$ —	$ —	$ —	$ —	—
Brookfield capital contribution	100	—	854,337	—	—	—	—	854,337
Other comprehensive income (loss):								
Net loss	—	—	—	—	(33,551)	—	—	(33,551)
Other comprehensive income (loss):								
Commodity and foreign currency derivatives and other, net of tax of $21	—	—	—	(124)	—	—	—	(124)
Foreign currency translation adjustments	—	—	—	(10,133)	—	—	—	(10,133)
Total other comprehensive income (loss)	—	—	—	(10,257)	—	—	—	(10,257)
Balance at December 31, 2015	100	—	854,337	(10,257)	(33,551)	—	—	810,529
Balance at January 1, 2016	100	—	854,337	(10,257)	(33,551)	—	—	810,529
Net loss	—	—	—	—	(235,843)	—	—	(235,843)
Other comprehensive income (loss):								
Commodity and foreign currency derivatives and other, net of tax of ($20)	—	—	—	125	—	—	—	125
Foreign currency translation adjustments	—	—	—	2,574	—	—	—	2,574
Total other comprehensive (loss) income	—	—	—	2,699	—	—	—	2,699
Balance at December 31, 2016	100	$ —	$ 854,337	$ (7,558)	$ (269,394)	$ —	$ —	$ 577,385

See accompanying Notes to the Consolidated Financial Statements

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GRAFTECH INTERNATIONAL LTD. AND SUBSIDIARIES
NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS
(Dollars in thousands, except as otherwise noted)

(1) Business and Summary of Significant Accounting Policies

Discussion of Business and Structure

GrafTech International Ltd. is one of the world's largest manufacturers and providers of high quality synthetic and natural graphite and carbon based products. References herein to "GTI," "we," "our," or "us" refer collectively to GrafTech International Ltd. and its subsidiaries. We have seven major product categories: graphite electrodes, refractory products, needle coke products, advanced graphite materials, advanced composite materials, advanced electronics technologies, and advanced materials, which are reported in the following segments:

On February 26, 2016, the Company announced it plans to realign its two business segments. Industrial Materials will now be comprised of graphite electrodes and needle coke products. Engineered Solutions will now be comprised of advanced graphite materials, advanced composite materials, advanced electronic technologies, and refractory products. Refractory products was previously included in the Industrial Materials business segment. Advanced materials products will now be a part of the business segment where these products are produced. This realignment of the business segments will allow the Company to better direct its resources and simplify its operations. The Industrial Materials business segment will continue to focus on being the lowest cost producer providing the best quality of graphite electrodes in a very challenging market. The Engineered Solutions business segment will continue to leverage the intellectual property of carbon and graphite material science to innovate and commercialize advanced technologies and new products in high growth markets. The Company also announced that it was reviewing strategic alternatives for its Engineered Solutions business segment, as newly defined.

During the 2nd quarter 2016, the ES segment met the criteria of held-for-sale and because the contemplated divestiture represented a major strategic shift, we reclassified it as discontinued operations. All amounts within the financial statements and footnotes represent continuing operations, unless otherwise noted.

Summary of Significant Accounting Policies

The Consolidated Financial Statements include the financial statements of GrafTech International Ltd. and its wholly-owned subsidiaries. All intercompany transactions have been eliminated in consolidation.

Cash Equivalents

We consider all highly liquid financial instruments with original maturities of three months or less to be cash equivalents. Cash equivalents consist of certificates of deposit, money market funds and commercial paper.

Revenue Recognition

Revenue from sales of our commercial products is recognized when they meet four basic criteria (1) persuasive evidence of an arrangement exists, (2) delivery has occurred, (3) the amount is determinable and (4) collection is reasonably assured. Sales are recognized when both title and the risks and rewards of ownership are transferred to the customer or services have been rendered and fees have been earned in accordance with the contract.

Volume discounts and rebates are estimated and are recorded as a reduction of revenue in conjunction with the sale of the related products. Changes to estimates are recorded when they become probable. Shipping and handling revenues billed to our customers are included in net sales and the related shipping and handling costs are included as an increase to cost of sales.

Inventories

Inventories are stated at the lower of cost or market. Cost is principally determined using the "first-in first-out" ("FIFO") and average cost, which approximates FIFO, methods. Elements of cost in inventory include raw materials, direct labor and manufacturing overhead.

We allocate fixed production overheads to the costs of conversion based on normal capacity of the production facilities. We recognize abnormal amounts of idle facility expense, freight, handling costs, and wasted materials (spoilage) as current period charges.

Property, Plant and Equipment

Expenditures for property, plant and equipment are recorded at cost. Maintenance and repairs of property and equipment are expensed as incurred. Expenditures for replacements and betterments are capitalized and the replaced assets are retired. Gains and losses from the sale of property are included in cost of goods sold or other (income) expense, net. We depreciate our assets using the straight-line method over the estimated useful lives of the assets. The ranges of estimated useful lives are as follows:

	Years
Buildings	25-40
Land improvements	20
Machinery and equipment	5-20
Furniture and fixtures	5-10

The carrying value of fixed assets is assessed when events and circumstances indicating impairment are present. Recoverability of assets to be held and used is measured by a comparison of the carrying amount of the assets to future undiscounted net cash flows expected to be generated by the assets. If the assets are considered to be impaired, the impairment to be recognized is measured by the amount by which the carrying amount of the assets exceeds the fair value of the assets. Assets to be disposed of are reported at the lower of the carrying amount or fair value less costs to sell.

Depreciation expense was $79.3 million for 2014. Depreciation expense was $26.7 million for the period January 1 through August 14, 2015 and $18.8 million for the period August 15 through December 31, 2015. Depreciation expense was $63.4 million in 2016.

Accounts Receivable

Trade accounts receivable primarily arise from sales of goods to customers and distributors in the normal course of business.

Allowance for Doubtful Accounts

Considerable judgment is required in assessing the likelihood of collection of receivables, including the current creditworthiness of each customer, related aging of the past due balances and the facts and circumstances surrounding any non-payment. We evaluate specific accounts when we become aware of a situation where a customer may not be able to meet its financial obligations. The reserve requirements are based on the best facts available to us and are reevaluated and adjusted as additional information is received. Receivables are charged off when amounts are determined to be uncollectible.

Capitalized Bank Fees

We capitalize bank fees upon the incurrence of debt and record them as a contra-liability against our debt. As of December 31, 2015 we had no capitalized bank fees and $0.7 million of capitalized bank fees as of December 31, 2016. We amortize such amounts over the life of the respective debt instrument using the effective interest method. The estimated life may be adjusted upon the occurrence of a triggering event. Amortization of capitalized bank fees amounted to $2.1 million in the period January 1 through August 14, 2015, none in the period August 15 through December 31, 2015, and $0.2 million in 2016, respectively. Capitalized bank fee amortization is included in interest expense.

Derivative Financial Instruments

We do not use derivative financial instruments for trading purposes. They are used to manage well-defined commercial risks associated with commodity contracts and currency exchange rate risks.

Foreign Currency Derivatives

We enter into foreign currency derivatives from time to time to manage exposure to changes in currency exchange rates. These instruments, which include, but are not limited to, forward exchange contracts and purchased currency options, attempt to hedge global currency exposures, relating to non-dollar denominated debt and identifiable foreign currency receivables, payables and commitments held by our foreign and domestic subsidiaries. Forward exchange contracts are agreements to exchange different currencies at a specified future date and at a specified rate. Purchased foreign currency options are instruments which give the holder the right, but not the obligation, to exchange different currencies at a specified rate at a specified date or over a range of specified dates. The result is the creation of a range in which a best and worst price is defined, while minimizing option cost. Forward exchange contracts and purchased currency options are carried at fair value. These contracts are treated as hedges to the extent they are effective. Changes in fair values related to these contracts are recognized in other comprehensive income in the Consolidated Balance Sheets until settlement. At the time of settlement, realized gains and losses are recognized in revenue or cost of goods sold on the Consolidated Statements of Operations. For derivatives that are not designated as a hedge, any gain or loss is immediately recognized in Cost of Goods Sold or Other (Income) Expense on the Consolidated Statements of Operations. Derivatives used in this manner relate to risks resulting from assets or liabilities denominated in a foreign currency.

Commodity Derivative Contracts

We periodically enter into derivative contracts for natural gas and certain refined oil products. These contracts are entered into to protect against the risk that eventual cash flows related to these products will be adversely affected by future changes in prices. All commodity contracts are carried at fair value and are treated as hedges to the extent they are effective. Changes in their fair values are included in other comprehensive loss in the Consolidated Balance Sheets until settlement. At the time of settlement of these hedge contracts, realized gains and losses are recognized as part of cost of goods sold on the Consolidated Statements of Operations.

Research and Development

Expenditures relating to the development of new products and processes, including significant improvements to existing products, are expensed as incurred.

Income Taxes

We file a consolidated United States ("U.S.") federal income tax return for GTI and its eligible domestic subsidiaries. Our non-U.S. subsidiaries file income tax returns in their respective local jurisdictions. We account for income taxes under the asset and liability method. Deferred tax assets and liabilities are recognized for the future tax consequences attributable to temporary differences between the financial statement carrying amounts of existing assets and liabilities and their respective tax bases and tax benefit carry forwards. Deferred tax assets and liabilities at the end of each period are determined using enacted tax rates. A valuation allowance is established or maintained, when, based on currently available information and other factors, it is more likely than not that all or a portion of a deferred tax asset will not be realized.

Under the guidance on accounting for uncertainty in income taxes, we recognize the benefit from an uncertain tax position only if it is more likely than not that the tax position will be sustained on examination by taxing authorities, based on the technical merits of the position. The tax benefits recognized in the financial statements from such a position are measured based on the largest benefit that has a greater than fifty percent likelihood of being realized upon ultimate settlement. The guidance on accounting for uncertainty in income taxes also provides guidance on derecognition, classification, interest and penalties on income taxes, and accounting in interim periods.

Retirement Plans and Postretirement Benefits

We use actuarial methods and assumptions to account for our defined benefit pension plans and our postretirement benefits. We immediately recognize the change in the fair value of plan assets and net actuarial gains and losses annually in the fourth quarter of each year (MTM Adjustment) and whenever a plan is remeasured (e.g. due to a significant curtailment, settlement, etc.). Pension and postretirement benefits expense includes the MTM adjustment, actuarially computed cost of benefits earned during the current service period, the interest cost on accrued obligations, the expected return on plan assets based on fair market values, and adjustments due to plan settlements and curtailments. Contributions to the qualified U.S. retirement plan are made in accordance with the requirements of the Employee Retirement Income Security Act of 1974.

Postretirement benefits and benefits under the non-qualified retirement plan have been accrued, but not funded. The estimated cost of future postretirement life insurance benefits is determined by the Company with assistance from independent actuarial firms using the “projected unit credit” actuarial cost method. Such costs are recognized as employees render the service necessary to earn the postretirement benefits. We record our balance sheet position based on the funded status of the plan.

We exclude the inactive participant portion of our pension and other postretirement benefit costs when calculating inventoriable costs. Additional information with respect to benefits plans is set forth in Note 12, “Retirement Plans and Postretirement Benefits.”

Environmental, Health and Safety Matters

Our operations are governed by laws addressing protection of the environment and worker safety and health. These laws provide for civil and criminal penalties and fines, as well as injunctive and remedial relief, for noncompliance and require remediation at sites where hazardous substances have been released into the environment.

We have been in the past, and may become in the future, the subject of formal or informal enforcement actions or proceedings regarding noncompliance with these laws or the remediation of company-related substances released into the environment. Historically, such matters have been resolved by negotiation with regulatory authorities resulting in commitments to compliance, abatement or remediation programs and in some cases payment of penalties. Historically, neither the commitments undertaken nor the penalties imposed on us have been material.

Environmental considerations are part of all significant capital expenditure decisions. Environmental remediation, compliance and management expenses were approximately $10.4 million in 2014, $6.5 million in 2015, and $8.3 million in 2016. The accrued liability relating to environmental remediation was $5.0 million as of December 31, 2015 and $5.2 million as of December 31, 2016. A charge to income is recorded when it is probable that a liability has been incurred and the cost can be reasonably estimated. When payments are fixed or determinable, the liability is discounted using a rate at which the payments could be effectively settled.

Our environmental liabilities do not take into consideration possible recoveries of insurance proceeds. Because of the uncertainties associated with environmental remediation activities at sites where we may be potentially liable, future expenses to remediate sites could be considerably higher than the accrued liability.

Foreign Currency Translation

We translate the financial statements of foreign subsidiaries, whose local currency is their functional currency, to U.S. dollars using period-end exchange rates for assets and liabilities and weighted average exchange rates for each period for revenues, expenses, gains and losses. Differences arising from exchange rate changes are included in accumulated other comprehensive loss on the Consolidated Balance Sheets until such time as the operations of such non-U.S. subsidiaries are sold or substantially or completely liquidated.

For our Mexican, Swiss and Russian subsidiaries, whose functional currency is the U.S. dollar, we remeasure non-monetary balance sheet accounts and the related income statement accounts at historical exchange rates. Resulting gains and losses arising from the fluctuations in currency for monetary accounts are recognized in other (income) expense, net, in the Consolidated Statements of Operations. Gains and losses arising from fluctuations in currency exchange rates on transactions denominated in currencies other than the functional currency are recognized in earnings as incurred.

We have non-dollar denominated intercompany loans between some of our foreign subsidiaries. These loans are subject to remeasurement gains and losses due to changes in currency exchange rates. Certain of these loans had been deemed to be essentially permanent prior to settlement and, as a result, remeasurement gains and losses

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on these loans were recorded as a component of accumulated other comprehensive income (loss) in the stockholders' equity section of the Consolidated Balance Sheets. The remaining loans are deemed to be temporary and, as a result, remeasurement gains and losses on these loans are recorded as currency (gains/losses) in other (income) expense, net, on the Consolidated Statements of Operations.

Rationalizations

We record costs for rationalization actions implemented to reduce excess and high-cost manufacturing capacity and operating and administrative costs. For ongoing post-employment benefit arrangements, a liability is recognized when it is probable that employees will be entitled to benefits and the amount can be reasonably estimated. These conditions are generally met when the rationalization plan is approved by management. For one-time benefit arrangements, a liability is incurred and must be accrued at the date the plan is communicated to employees, unless they will be retained beyond a minimum retention period. In this case, the liability is calculated at the date the plan is communicated to employees and is accrued ratably over the future service period. Other costs reported under Rationalization include contract termination costs.

In connection with rationalization initiatives, the company incurs additional costs such as inventory losses, fixed assets write-offs, impairment and accelerated depreciation as well as various non-recurring costs for dismantling, transferring or disposing of equipment and inventory. These rationalization related costs are measured and recorded based on the appropriate accounting guidance. Inventory losses are recorded in cost of sales. Fixed assets write-offs and accelerated depreciation are recorded in cost of sales, R&D and SG&A based upon the asset utilization. Other non-recurring costs are recorded in cost of sales and SG&A.

Goodwill and Other Intangible Assets

Goodwill is the excess of the acquisition cost of businesses over the fair value of the identifiable net assets acquired. We do not recognize deferred income taxes for the difference between the assigned value and the tax basis related to nondeductible goodwill. Goodwill is not amortized; however, impairment testing is performed annually or more frequently if circumstances indicate that impairment may have occurred. We perform the goodwill impairment test annually at December 31.

The impairment test for goodwill uses a two-step approach, which is performed at the reporting unit level. Step one compares the fair value of the reporting unit to its carrying value. The fair value for each reporting unit with goodwill is determined in accordance with accounting guidance on determining fair value, which requires consideration of the income, market, and cost approaches as applicable. If the carrying value exceeds the fair value, there is potential impairment and step two must be performed. Step two compares the carrying value of the reporting unit's goodwill to its implied fair value (i.e., fair value of the reporting unit less the fair value of the unit's assets and liabilities, including identifiable intangible assets). If the implied fair value of goodwill is less than the carrying amount of goodwill, an impairment is recognized.

Other amortizable intangible assets, which consist primarily of trademarks and trade names, customer-related intangibles, and technological know-how, are amortized over their estimated useful lives using the straight line or sum-of-the-years digits method. The estimated useful lives for each major category of amortizable intangible assets are:

	Years
Trade name	5-10
Technology and know-how	5-9
Customer related intangible	5-14

Additional information about goodwill and other intangibles is set forth in Note 6 "Goodwill and Other Intangible Assets."

Major Maintenance and Repair Costs

We perform scheduled major maintenance of the storage and processing units at our Seadrift plant (referred to as "overhaul"). Time periods between overhauls vary by unit. We also perform an annual scheduled significant maintenance and repair shutdown of the plant (referred to as "turnaround").

Costs of overhauls and turnarounds include plant personnel, contract services, materials, and rental equipment. We defer these costs when incurred and use the straight-line method to amortize them over the period of

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time estimated to lapse until the next scheduled overhaul of the applicable storage or processing unit. Under this policy in 2015, costs deferred were $9.9 million and costs amortized in the period January 1 through August 14, 2015 were $4.3 million and $2.1 million in the period August 15 through December 31, 2015. We deferred no additional amounts in 2016 and amortization of deferred costs totaled $7.0 million.

Use of Estimates

The preparation of financial statements in conformity with U.S. generally accepted accounting principles (“GAAP”) requires us to make estimates and assumptions that affect the reported amounts of assets and liabilities and disclosure of contingent liabilities at the date of the Consolidated Financial Statements and the reported amounts of revenue and expenses. Significant estimates and assumptions are used for, but are not limited to inventory valuation, pension and other post-retirement benefits, allowance for doubtful accounts, accruals and valuation allowances, asset impairment, and environmental-related accruals. Actual results could differ from our estimates.

Discontinued Operations and Assets Held for Sale

When Management commits to a plan to sell assets or asset groups and a sale is probable, we reclassify those assets or asset groups into "Assets Held for Sale". Upon reclassification to assets held for sale, we evaluate the book value of the disposal groups against their fair value less costs to sell and as a result may impair the assets / asset groups. As and if new information becomes available on the fair value of the assets/asset groups , we may adjust accordingly the impairment.

Once the assets of a business have been classified as held for sale, we evaluate if the divestiture represents a strategic shift in operations and if so, we exclude the results of this business from continuing operations. All results are reported as gain or loss from discontinued operations, net of tax. During the second quarter of 2016, our Engineered Solutions business qualified as discontinued operations and as such, all its results have been excluded from continuing operations. See Note 3 "Discontinued Operations and Related Assets Held for Sale".

Reclassification

Certain amounts previously reported have been reclassified to conform to the current year presentation.

Subsequent Events

We evaluate events that occur after the balance sheet date but before financial statements are issued to determine if a material event requires our amending the financial statements or disclosing the event.

Predecessor and Successor Reporting

On August 17, 2015, the Company was acquired by affiliates of Brookfield Asset Management Inc. (see Note 2 "Preferred Share Issuance and Merger"). We elected to account for the acquisition under the acquisition method of accounting. Under the acquisition method of accounting, the assets and liabilities of GTI were adjusted to their fair market value as of August 15, 2015, as this was the day that Brookfield effectively took control of the Company.

Our consolidated statements of operations subsequent to the Merger will include amortization expense relating to the fair value adjustment of intangibles and depreciation expense based on the fair value of the Company's property, plant and equipment that had previously been carried at historical cost less accumulated depreciation. Therefore, the Company's financial information prior to the Merger is not comparable to the financial information subsequent to the Merger. As a result, the financial statements and certain note presentations are separated into two distinct periods, the period before the consummation of the Merger (labeled "Predecessor") and the period after the date of merger (labeled "Successor"), to indicate the application of the different basis of accounting between the periods presented.

Recent Accounting Standards

Recently Adopted Accounting Standards

In November 2015 the Financial Accounting Standards Board (FASB) issued ASU 2015-17, “Balance Sheet Classification of Deferred Taxes” (ASU 2015-17), which changes how deferred taxes are classified on our balance sheets and is effective for financial statements issued for annual periods beginning after December 15, 2016, with early adoption permitted. ASU 2015-17 requires all deferred tax assets and liabilities to be classified as non-current. We adopted the provisions of ASU 2015-17 as of December 31, 2015 on a prospective basis and as such we reclassified

$10.7 million of current deferred tax assets and $23.3 million of current deferred tax liabilities to long term in our December 31, 2015 balance sheet.

In September 2015, the FASB issued ASU 2015-16, "Business Combinations - Simplifying the Accounting for Measurement-Period Adjustments." ASU 2015-16 requires the recognition of adjustments to provisional amounts that are identified during the measurement period in the reporting period in which the adjustments are determined. The effects of the adjustments to provisional amounts on depreciation, amortization or other income effects should be recognized in current-period earnings as if the accounting had been completed at the acquisition date. Disclosure of the portion of the adjustment recorded in current-period earnings that would have been reported in prior reporting periods if the adjustment to the provisional amounts had been recognized at the acquisition date is also required. The Company adopted ASU 2015-16 as of December 31, 2015. The adoption of ASU 2015-16 did not materially affect the Company's results of operations, statement of financial position or financial statement disclosures. See Note 2 "Preferred Share Issuance and Merger" for details of post-acquisition adjustments to goodwill.

In July 2015 the FASB issued ASU 2015-11, "Inventory - Simplifying the Measurement of Inventory"" which requires companies to measure inventory (valued using first-in, first-out or average cost methods) at the lower of cost or net realizable value. Net realizable value is the estimated selling price in the ordinary course of business, less reasonably predictable costs of completion, disposal and transportation. The measurement of inventory valued using the last-in, first-out method is unchanged. ASU 2015-11 is effective for financial statements issued for fiscal years beginning after December 15, 2016, and interim periods within those fiscal years with early implementation permitted. The Company adopted ASU 2015-11 as of December 31, 2015 with no impact to the Company's financial position, results of operations or cash flows.

In April, 2015, the FASB issued ASU 2015-03, Simplifying the Presentation of Debt Issuance Costs, which requires debt issuance costs to be presented in the balance sheet as a direct deduction from the carrying value of the associated debt liability. The standard is effective for financial statements issued for fiscal years beginning after December 15, 2015 with early adoption permitted. The Company adopted ASU 2015-03 in the first quarter of 2016. We had no capitalized bank fees as of December 31, 2015 and $0.7 million of capitalized bank fees as of December 31, 2016 included within long-term debt.

Accounting Standards Not Yet Adopted

In May 2014, the FASB issued ASU No. 2014-09, Revenue from Contracts with Customers. This ASU supersedes the revenue recognition requirements in Accounting Standards Codification 605—Revenue Recognition and most industry-specific guidance throughout the Codification. This ASU requires that an entity recognize revenue to depict the transfer of promised goods or services to customers in an amount that reflects the consideration to which the entity expects to be entitled in exchange for those goods or services. This ASU was expected to be effective for fiscal years beginning after December 15, 2016, and for interim periods within those fiscal years. On July 9, 2015, the FASB deferred the effective date to fiscal years beginning after December 15, 2017. During the fourth quarter of 2016, we completed the initial evaluation of the new standard and the related assessment and review of a representative sample of existing revenue contracts with our customers. We determined, on a preliminary basis, that although the timing and pattern of revenue recognition may change, the amount of revenue recognized during the year should remain substantially the same.

In February 2016, the FASB issued ASU No. 2016-02, Leases (Topic 842). Under this new guidance, a company will now recognize most leases on its balance sheet as lease liabilities with corresponding right-of-use assets. This ASU is effective for fiscal years beginning after December 15, 2018. The Company is currently evaluating the impact of the adoption of this standard on its financial position, results of operations or cash flows.

In January 2017, the FASB issued ASU No. 2017-04 Intangibles-Goodwill and Other (Topic 350). This guidance was issued to simplify the accounting for goodwill impairment. The guidance removes the second step of the goodwill impairment test, which requires that a hypothetical purchase price allocation be performed to determine the amount of impairment, if any. Under this new guidance, a goodwill impairment charge will be based on the amount by which a reporting unit’s carrying value exceeds its fair value, not to exceed the carrying amount of goodwill. The guidance will become effective on a prospective basis for the Company on January 1, 2020 with early adoption permitted for interim or annual goodwill impairment tests performed on testing dates after January 1, 2017.

(2) Preferred Share Issuance and Merger

Preferred Stock

On August 11, 2015, the Company issued and sold to BCP IV GrafTech Holdings LP, an affiliate of Brookfield Asset Management Inc. ("Brookfield") (i) 136,616 shares of a new Series A Convertible Preferred Stock, par value $0.01 per share (the "Series A Preferred Stock"), convertible into 19.9% of the shares of Common Stock of the Company outstanding immediately prior to such issuance and (ii) 13,384 shares of a new Series B Convertible Preferred Stock, par value $0.01 per share (the "Series B Preferred Stock," and, together with the Series A Preferred Stock, the "Preferred Stock"), for an aggregate purchase price of $150,000,000 in cash (the "Purchase Price"), under the Investment Agreement dated May 4, 2014 (the "Investment Agreement") between the Company and Brookfield.

The closing of such issuance and sale occurred after the satisfaction of the closing conditions set forth in the Investment Agreement.

Pursuant to the Investment Agreement, the Company reimbursed Brookfield for $500,000 in out-of-pocket fees and expenses (including fees and expenses of legal counsel) incurred by Brookfield in connection with the transaction.

The proceeds from the issuance and sale were used by the Company, along with funds available under the Company's $40 million delayed draw term loan facility, Revolving Facility and cash on hand, to prepay the Company's $200 million Senior Subordinated Notes due November 30, 2015.

Merger Agreement

On May 18, 2015, the Company entered into an Agreement and Plan of Merger (the "Merger Agreement"), dated May 17, 2015, with Brookfield (called "Parent" therein) and Athena Acquisition Subsidiary Inc. a wholly owned subsidiary of Parent ("Acquisition Sub"). Pursuant to the Merger Agreement, on May 26, 2015, Parent commenced a cash tender offer to purchase any and all of the outstanding shares of Common Stock, par value $0.01 per share (the "Shares"), of the Company, at a purchase price of $5.05 per Share in cash (the "Offer Price"), on the terms and subject to the conditions set forth in the Offer to Purchase, dated May 26, 2015 (together with any amendments and supplements thereto, the "Offer to Purchase") and in the related Letter of Transmittal (the "Letter of Transmittal" and, together with the Offer to Purchase, the "Offer").

On August 14, 2015, Acquisition Sub accepted for payment all Shares validly tendered in the Offer and not withdrawn prior to the expiration of the Offer, and payment of the Offer Price for such Shares was made promptly. On August 17, 2015, Acquisition Sub merged with and into the Company, with the Company surviving as a wholly-owned subsidiary of Parent (the "Merger").

Pursuant to the Merger Agreement, upon consummation of the Merger, each Share that was not tendered and accepted pursuant to the Offer (other than canceled Shares, dissenting Shares and Shares held by the Company's subsidiaries or Parent's subsidiaries (other than Acquisition Sub)) was canceled and converted into cash consideration in an amount equal to the Offer Price.

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Business Combination
The computation of the fair value of the total consideration at the date of acquisition follows:
Purchase Consideration
(In thousands except share price)

	# Shares	Unit Price	Amount
Convertible Preferred Equity			
Series A and B	150	$1,000.00	$150,000
Common Equity			
Common Shares	139,397	$5.05	$703,955
Net value of options			$382
Total			$854,337

Recording of assets acquired and liabilities assumed: The acquisition was accounted for using the acquisition method of accounting. Under the acquisition method, the identifiable assets acquired and the liabilities assumed are assigned a new basis of accounting reflecting their estimated fair values. The information included herein has been prepared based on the allocation of purchase price using estimates of the fair values and useful lives of assets acquired and liabilities assumed based on the best available information determined with the assistance of independent valuations, quoted market prices and management estimates.
The following table summarizes the fair values of the identifiable assets acquired and liabilities assumed at the acquisition date:

Net identifiable assets acquired	
Cash	$25,032
Accounts receivable	94,298
Inventories	344,765
Property, plant and equipment	650,405
Intangible assets	155,700
Deferred tax assets	41,606
Prepaid and other current assets	49,716
Other non-current assets	8,428
Accounts payable	(68,005)
Short-term debt	(18,779)
Other accrued liabilities	(53,252)
Long-term debt	(367,811)
Other long-term liabilities	(101,648)
Deferred tax liabilities	(79,235)
Net identifiable assets acquired	$681,220
Goodwill	$173,117
Net assets acquired	$854,337

Goodwill: Goodwill of approximately $173.1 million was recognized for the acquisition and is calculated as the excess of the consideration transferred over the net assets acquired and represents the future economic benefits arising from other assets acquired that could not be individually identified and separately recognized. Goodwill was increased by $1.1 million in March 2016, as a result of a decreased inventory valuation of $2.0 million offset by an increase to deferred tax assets of $0.9 million.
(3) Discontinued Operations and Related Assets Held for Sale

On February 26, 2016, the Company announced that it had initiated a strategic review of its Engineered Solutions business segment to better direct its resources and simplify its operations. Any potential sale of assets was prohibited by the Revolving Facility without approval of the requisite lenders thereunder. On April 27, 2016, GrafTech and certain of its subsidiaries entered into an amendment to the Revolving Facility (see Note 7 "Debt and Liquidity") which, among other things, permits the sale of assets with the restriction that the proceeds be utilized to pay down revolver borrowings. As of June 30, 2016, the Engineered Solutions segment qualified for reporting as discontinued operations as we expect the divestiture to be complete within 12 months of the qualification.

During the second quarter of 2016, we evaluated the fair value of the Engineered Solutions business segment utilizing the market approach (Level 3 measure). As a result, we incurred an impairment charge to our Engineered Solutions business segment of $105.6 million to align the carrying value with estimated fair value. The analysis was updated as of December 31, 2016, resulting in an additional impairment charge of $14.3 million. The estimate reflects Management’s view of the manner in which the Engineered Solutions business will be divested, including assumptions as to if and how it will be split, given the lines of business and asset groups that constitute the Engineered Solutions segment. Amongst other things, the split into groups influences the computation of the impairment charge. These assumptions and estimates are subject to change until divestiture is completed and may be adjusted in the quarter that the information becomes available.

On November 30, 2016, we completed the sale of our Fiber Materials Inc. business, which was a business line within our former Engineered Solutions business. The sale resulted in cash proceeds of $15.9 million and a loss of $0.2 million. We have the ability to realize up to $8.5 million of additional proceeds based on the earnings of the Fiber Materials business over the 24 months following the transaction. We have elected to record this contingent consideration as it is realized and as such it is not part of the gain recognized thus far on the transaction.

The following tables summarize the results of the Engineered Solutions business segment, reclassified as discontinued operations:

	For the Year Ended December 31, 2014	For the Period January 1 Through August 14, 2015	For the Period August 15 Through December 31, 2015	For the Year Ended December 31, 2016
	(dollars in thousands)			
Net sales	$260,160	$98,024	$55,608	$115,336
Cost of sales	235,901	94,817	49,068	98,440
Gross profit	24,259	3,207	6,540	16,896
Research and development	5,107	2,179	1,265	3,145
Selling and administrative expenses	29,550	16,764	8,627	19,220
Rationalizations	3,679	4,492	791	(405)
Impairment	121,570	—	—	119,907
Operating loss	(135,647)	(20,228)	(4,143)	(124,971)
Other expense (income)	(485)	(90)	(135)	(66)
Interest expense	1,320	907	918	3,258
Loss from discontinued operations before income taxes	(136,482)	(21,045)	(4,926)	(128,163)
Benefit for income taxes on discontinued operations	(3,626)	(2,366)	—	(1,189)
Loss from discontinued operations	$(132,856)	$(18,679)	$(4,926)	$(126,974)

During 2014, GrafTech impaired certain long-lived assets and announced exiting the isomolded product line within our AGM product group resulting in the above impairment and rationalization charges.

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The significant components of our Statements of Cash Flows for discontinued operations held for sale are as follows:

	For the Year Ended December 31, 2014	For the Period January 1 Through August 14, 2015	For the Period August 15 Through September 30, 2015	For the Year Ended December 31, 2016
		(dollars in thousands)		
Depreciation and amortization	$ 21,780	$ 7,988	$ 4,194	$ 5,277
Impairment	121,570	—	—	119,907
Deferred income taxes	(3,626)	(2,366)	—	(1,189)
Cash received from divestitures	—	—	—	15,889
Capital expenditures	24,018	10,104	4,447	4,713
Credit Facility reductions	—	—	—	(15,889)

The following table summarizes the carrying value of the assets and liabilities of discontinued operations as of December 31, 2015 and December 31, 2016.

	As of December 31, 2015	As of December 31, 2016
	(dollars in thousands)	
Assets of discontinued operations:		
Accounts receivable	$ 20,425	$ 17,094
Inventories	77,332	71,816
Prepaid expenses and other current assets	524	320
Net property plant and equipment	86,369	79,048
Other assets	17,606	12,608
Total assets of discontinued operations prior to impairment	202,256	180,886
Impairment of assets held for sale	—	(119,907)
Total assets of discontinued operations	$ 202,256	$ 60,979
Liabilities of discontinued operations:		
Accounts payable	$ 9,331	$ 7,253
Accrued income and other taxes	3,113	2,326
Other accrued liabilities	10,638	10,463
Total current liabilities of discontinued operations	23,082	20,042
Other long-term obligations	1,167	850
Total liabilities of discontinued operations	$ 24,249	$ 20,892

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(4) Rationalizations

Throughout 2013, 2014 and 2015 the Company undertook rationalization plans in order to streamline its organization and lower its production costs. On October 31, 2013, we announced a global initiative to reduce our Industrial Materials segment's cost base and improve our competitive position. As part of this initiative, we ceased production at our two highest cost graphite electrode plants, located in Brazil and South Africa, as well as a machine shop in Russia.

On July 29, 2014, we announced additional rationalization initiatives to increase profitability, reduce cost and improve global competitiveness in our former Engineered Solutions segment, which impacted our Corporate, R&D and other. During the third quarter of 2014, we announced the conclusion of another phase of our on-going company-wide cost savings assessment. This resulted in changes to the Company’s operating and management structure in order to streamline, simplify and decentralize the organization. These actions were designed to reduce costs by a combination of reduced contractor costs, attrition, early retirements and layoffs. Additionally, the Company downsized its corporate functions by approximately 25 percent, relocated to a smaller, more cost effective corporate headquarters and established a new Technology and Innovation Center.

These initiatives were substantially complete as of December 31, 2016. The rationalization liability as of December 31, 2016 was $0.1 million consisting of the plan described below and severance payouts related to prior rationalization plans. In June of 2016, we further impaired assets related to our South African facility within discontinued operations by $0.6 million to reflect a decline in market value. In December 2016, we further impaired assets related to our facility in Brazil within continuing operations by $2.8 million to reflect a decline in market value.

The following tables illustrate the impacts of these rationalization initiatives on our results of operations for 2014, 2015 and 2016.

For the Year Ended December 31, 2014 (Predecessor)

	Industrial Materials Segment	Corporate, R&D and Other	Total
	(Dollars in thousands)		
Recorded in Cost of Sales			
Accelerated depreciation	$22,388	$ —	$22,388
Inventory loss	941	—	941
Fixed asset write-offs and other	5,552	—	5,552
Recorded in Research and Development			
Accelerated depreciation	—	2,312	2,312
Recorded in Selling and General Administrative			
Accelerated depreciation	—	608	608
Other	89	515	604
Recorded in Rationalizations			
Severance and related costs	5,040	2,425	7,465
Contract terminations	469	11	480
Total 2014 rationalization and related charges	$34,479	$ 5,871	$40,350

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For the Period January 1 Through August 14, 2015 (Predecessor)

	Industrial Materials Segment	Corporate, R&D and Other	Total
	(Dollars in thousands)		
Recorded in Cost of Sales			
Accelerated depreciation	$432	$ 940	1,372
Inventory loss	(33)	—	(33)
Fixed asset write-offs and other	1,715	—	1,715
Recorded in Selling and General Administrative			
Other	400	954	1,354
Recorded in Rationalizations			
Severance and related costs	157	(168)	(11)
Contract terminations	25	—	25
Total	$2,696	$ 1,726	$4,422

For the Period August 15 Through December 31, 2015 (Successor)

	Industrial Materials Segment	Corporate, R&D and Other	Total
Recorded in Cost of Sales			
Inventory loss	$(649)	$ —	$(649)
Fixed asset write-offs and other	329	—	329
Recorded in Selling and General Administrative			
Other	135	290	425
Recorded in Rationalizations			
Severance and related costs	154	71	225
Contract terminations	59	—	59
Total	$28	$ 361	$389

For the Year Ended December 31, 2016 (Successor)

	Industrial Materials Segment	Corporate, R&D and Other	Total
Recorded in Cost of Sales			
Fixed asset write-offs and other	$636	$ —	$636
Recorded in Selling and General Administrative			
Other	1,258	412	1,670
Recorded in Rationalizations			
Severance and related costs	(52)	111	59
Total	$1,842	$ 523	$2,365

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(5) Segment Reporting

We previously operated two reportable business segments, Industrial Materials and Engineered Solutions. In the first quarter of 2016, the Company reorganized its businesses and moved the Refractory product line from the Industrial Materials segment to the Engineered Solutions segment. Additionally, advanced materials products will now be a part of the business segment where these products are produced. All prior period amounts have been recast to reflect this change.
During the second quarter of 2016 the Company decided to sell the businesses that comprised our Engineered Solutions segment to focus our Industrial Materials segment. As such, the Engineered Solutions business qualified as held for sale status and as such the related results have been excluded from continuing operations. See Note 3 "Discontinued Operations and Assets Held for Sale" for significant components of the results of our Engineered Solutions segment.
Our Industrial Materials segment manufactures and delivers high quality graphite electrodes and needle coke products. Electrodes are key components of the conductive power systems used to produce steel and other non-ferrous metals. Needle coke, a crystalline form of carbon derived from decant oil, is the key ingredient in, and is used primarily in, the production of graphite electrodes.
During 2014, as part of our initiative to decentralize the organization and reduce the costs of the global headquarter functions, the performance measure of our existing segments was changed to reflect our new management and operating structure. We currently exclude such expenses from the segment operating income measure and report them under “Corporate, R&D and Other Expenses” in order to reconcile to the consolidated operating income of the Company.
The following tables summarize financial information concerning our reportable segments and all prior periods have been recast to reflect our new methodology:

	Predecessor		Successor	
	For the Year Ended December 31, 2014	For the Period January 1 Through August 14, 2015	For the Period August 15 Through December 31, 2015	For the Year Ended December 31, 2016
	(Dollars in thousands)			
Net sales to external customers:				
Industrial Materials	$825,145	$339,907	$193,133	$437,963
Segment operating income (loss):				
Industrial Materials	$(51,300)	$(24,900)	$(2,529)	$(63,827)
Corporate, R&D and Other expenses	(68,674)	(43,349)	(10,034)	(28,226)
Total segment operating income (loss)	$(119,974)	$(68,249)	$(12,563)	$(92,053)
Reconciliation of segment operating income (loss) to loss from continuing operations before provision for income taxes:				
Other expense (income), net	$2,920	$1,421	$(813)	$(2,188)
Interest expense	35,736	26,211	9,999	26,914
Interest income	(320)	(363)	(6)	(358)
Loss before provision for income taxes	$(158,310)	$(95,518)	$(21,743)	$(116,421)

Industrial Materials' operating loss for the year ended December 31, 2016 included $19.0 million of lower of cost or market inventory write-downs.

Industrial Materials' operating loss for the period January 1 through August 14, 2015 includes a $35.4 million goodwill impairment charge, $2.7 million of rationalization and related charges and $3.2 million of costs associated with the preferred share issuance. Corporate, R&D and Other expenses for the period January 1 through August 14, 2015 includes $19.4 million of costs associated with the preferred share issuance, tender offer and proxy contest and $1.7 million of rationalization and related costs.

Operating loss for the year ended December 31, 2014 includes a $76.1 million goodwill impairment charge in Industrial Materials. 2014 Operating loss also includes rationalization related charges of $34.5 million in Industrial Materials and $6.3 million in Corporate, R&D and Other expenses, as well as a pension mark-to-market loss of $3.5 million in Industrial Materials and $6.3 million in Corporate, R&D and Other expenses. Corporate, R&D and Other expenses includes $2.4 million of fees associated with proxy contest costs in 2014.

Assets are managed based on geographic location because certain continuing and discontinued operations share certain facilities. Assets by reportable segment are estimated based on the value of long-lived assets at each location and the activities performed at the location. All assets are assigned to our Industrial Materials segment as all of our operations exist to support that business.

The following tables summarize information as to our operations in different geographic areas.

	2014	2015	2016
	(Dollars in thousands)		
Net sales:*			
U.S.	$195,264	$107,517	$74,526
Americas	165,761	132,917	116,944
Asia Pacific	80,832	37,509	41,302
Europe, Middle East, Africa	383,288	255,097	205,191
Total	$825,145	$533,040	$437,963

* Net Sales were not impacted by purchase price accounting adjustments.

	At December 31,	
	2015	2016
	(Dollars in thousands)	
Long-lived assets (a):		
U.S. and Canada	$209,634	$191,502
Mexico	158,950	151,288
Brazil	8,787	6,100
France	76,535	69,558
Spain	93,049	87,614
South Africa	2,879	2,547
Italy	1,032	10
Switzerland	266	192
Other countries	31	44
Total	$551,163	$508,855

(a) Long-lived assets represent fixed assets, net of accumulated depreciation.

(6) Goodwill and Other Intangible Assets

We are required to review goodwill and indefinite-lived intangible assets annually for impairment. Goodwill impairment is tested at the reporting unit level on an annual basis and between annual tests if an event occurs or circumstances change that would more likely than not reduce the fair value of a reporting unit below its carrying value.

Our annual impairment test of goodwill was performed as of December 31, 2014 for all reporting units. The estimated fair values of our reporting units were determined based on the income approach, using assumptions and estimates from the standpoint of potential market participants. Based on these valuations, the fair value for the needle coke reporting unit was below its carrying value resulting in a step two analysis and consequently a goodwill impairment charge of $76.1 million for the year ended December 31, 2014.

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We received notice, in March 2015, that the market prices for needle coke were decreasing by an additional 18%, effective for the second quarter of 2015. This decline further compressed our margins for needle coke products versus our annual plan assumptions. We determined that this change, which is driven by over capacity in the market indicated that the needle coke industry is facing a deeper and longer trough than previously expected. As such, we considered the additional price change as a triggering event for our Needle coke reporting unit and tested its goodwill for impairment as of March 31, 2015. In the first step of the analysis, we compared the estimated fair value of the reporting unit to its carrying value, including goodwill. The fair value of the reporting unit was determined based on an income approach, using a discounted cash-flow (“DCF”) model from a market participant’s perspective. The estimated future cash-flows were updated versus the year-end analysis to reflect the expectation of a longer trough. A discount rate of 10.5% was applied to the forecasted cash-flows and is based on a weighted average cost of capital ("WACC"). Company specific beta and mix of debt to equity are inputs into the determination of the WACC, which is then qualitatively assessed from the standpoint of potential market participants. Based on the step one analysis described earlier, the fair value of the needle coke reporting unit was below its carrying value, resulting in a step two analysis and consequently the full impairment of the needle coke goodwill, resulting in a charge of $35.4 million.
As a result of our acquisition by Brookfield, our goodwill and intangibles were revalued as of August 15, 2015. See Note 2 "Preferred Share Issuance and Merger" for description of the Merger and the results of purchase price accounting. The following tables represents the changes in the carrying value of goodwill and intangibles during the predecessor entity period of January 1, 2015 through August 14, 2015 and the successor entity from August 15, 2015 through December 31, 2016:
The changes in the Company’s carrying value of goodwill during the years ended December 31, 2015 and 2016 are as follows:

	Total
Predecessor	(Dollars in Thousands)
Balance as of December 31, 2014	$ 420,129
Impairment	(35,381)
Currency translation effect	(616)
Balance as of August 14, 2015	$ 384,132
Successor	
Balance as of August 15, 2015	$ 170,418
Adjustments	1,641
Balance as of December 31, 2015	172,059
Adjustments (See Note 2)	1,058
Goodwill transferred to discontinued operations	(2,000)
Balance as of December 31, 2016	$ 171,117

The following table summarizes acquired intangible assets with determinable useful lives by major category :

	As of December 31, 2015			As of December 31, 2016		
	Gross Carrying Amount	Accumulated Amortization	Net Carrying Amount	Gross Carrying Amount	Accumulated Amortization / Impairment	Net Carrying Amount
	(Dollars in Thousands)			(Dollars in Thousands)		
Trade name	22,500	(889)	21,611	22,500	(3,235)	19,265
Technology and know-how	55,300	(2,900)	52,400	55,300	(10,397)	44,903
Customer related intangible	64,500	(1,688)	62,812	64,500	(6,177)	58,323
Total finite-lived intangible assets	$142,300	$ (5,477)	$136,823	$142,300	$ (19,809)	$122,491

Amortization expense of intangible assets in 2014 was $18.4 million. Amortization expense of intangible assets was $10.5 million in the period January 1 through August 14, 2015 and $5.5 million in the period August 15 through December 31, 2015. Amortization expense of intangible assets totaled $14.3 million in 2016. Estimated annual amortization expense for the next five years will approximate $13.6 million in 2017, $12.9 million in 2018, $12.2 million in 2019, $11.4 million in 2020 and $10.7 million in 2021.

(7) Debt and Liquidity

The following table presents our long-term debt:

	As of December 31, 2015	As of December 31, 2016
	(Dollars in thousands)	
Credit Facility (Revolving Facility and Term Loan Facility)	$98,000	$90,731
Senior Notes	267,827	274,132
Other Debt	1,400	569
Total Debt	367,227	365,432
Less: Short-term Debt	(4,772)	(8,852)
Long-term Debt	$362,455	$356,580

Revolving Facility

On April 23, 2014, the Company and certain of its subsidiaries entered into an Amended and Restated Credit Agreement with a borrowing capacity of $400 million and a maturity date of April 2019 (the "Revolving Facility"). On February 27, 2015, GrafTech and certain of its subsidiaries entered into a further Amended and Restated Credit Agreement that provides for, among other things, greater financial flexibility and a $40 million senior secured delayed draw term loan facility (the "Term Loan Facility").

On July 28, 2015, GrafTech and certain of its subsidiaries entered into an amendment to the Amended and Restated Credit Agreement to change the terms regarding the occurrence of a default upon a change in control (which is defined thereunder to include the acquisition by any person of more than 25 percent of GrafTech's outstanding shares) to exclude the acquisition of shares by Brookfield (see Note 2). In addition, effective upon such acquisition, the financial covenants were eased, resulting in increased availability under the Revolving Facility. The size of the Revolving Facility was also reduced from $400 million to $375 million. The size of the Term Loan Facility remained at $40 million.

On April 27, 2016, GrafTech and certain of its subsidiaries entered into an amendment to the Revolving Facility. The size of the Revolving Facility was permanently reduced from $375 million to $225 million. New covenants were also added to the Revolving Facility, including a requirement to make mandatory repayments of outstanding amounts under the Revolving Facility and the Term Loan Facility with the proceeds of any sale of all or any substantial part of the assets included in the Engineered Solutions segment and a requirement to maintain minimum liquidity (consisting of domestic cash, cash equivalents and availability under the Revolving Facility) in excess of $25 million. The covenants were also modified to provide for: the elimination of certain exceptions to the Company's negative covenants limiting the Company's ability to make certain investments, sell assets, make restricted payments, incur liens and incur debt; a restriction on the amount of cash and cash equivalents permitted to be held on the balance sheet at any one time without paying down the Revolving Facility and the Term Loan Facility; and changes to the Company's financial covenants so that until the earlier of March 31, 2019 or the Company has $75 million in trailing twelve month EBITDA (as defined in the Revolving Facility), the Company is required to maintain trailing twelve month EBITDA above certain minimums ranging from ($40 million) to $35 million after which the Company's existing financial covenants under the Revolving Facility will apply.

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With this amendment, the Company has full access to the $225 million Revolving Facility, subject to the $25 million minimum liquidity requirement. As of December 31, 2016, the Company had $61.2 million of borrowings on the Revolving Facility and $12.3 million of letters of credit drawn against the Revolving Facility.

The $40 million Term Loan Facility was fully drawn on August 11, 2015, in connection with the repayment of the Senior Subordinated Notes. The balance of the Term Loan Facility was $29.5 million as of December 31, 2016.

The interest rate applicable to the Revolving Facility and Term Loan Facility is LIBOR plus a margin ranging from 2.25% to 4.75% (depending on our total senior secured leverage ratio). The borrowers pay a per annum fee ranging from 0.35% to 0.70% (depending on our senior secured leverage ratio) on the undrawn portion of the commitments under the Revolving Facility.

In the event that operating cash flows fail to provide sufficient liquidity to meet our business needs, including capital expenditures, any such shortfall would need to be made up by increased borrowings under our Revolving Facility, to the extent available. We will use cash proceeds from the sale of our Engineered Solutions businesses to repay borrowings outstanding under the Revolving Facility and the Term Loan. We cannot assure you that we will, or will be able to, consummate any such sales on acceptable terms or at all or as to the price, terms or conditions of any such sales.

As of December 31, 2016, we were in compliance with all financial and other covenants contained in the Revolving Facility, as applicable.

Senior Notes

On November 20, 2012, the Company issued $300 million principal amount of 6.375% Senior Notes due 2020 (the "Senior Notes"). The Senior Notes are the Company's senior unsecured obligations and rank pari passu with all of the Company's existing and future senior unsecured indebtedness. The Senior Notes are guaranteed on a senior unsecured basis by each of the Company's existing and future subsidiaries that guarantee certain other indebtedness of the Company or another guarantor.

The Senior Notes bear interest at a rate of 6.375% per year, payable semi-annually in arrears on May 15 and November 15 of each year. The Senior Notes mature on November 15, 2020.

The Company is entitled to redeem some or all of the Senior Notes at any time on or after November 15, 2016, at the redemption prices set forth in the indenture. In addition, prior to November 15, 2016, the Company may redeem some or all of the Senior Notes at a price equal to 100% of the principal amount thereof, plus accrued and unpaid interest, if any, plus a “make whole” premium determined as set forth in the indenture.

If, prior to maturity, a change in control (as defined in the indenture) of the Company occurs and thereafter certain downgrades of the ratings of the Senior Notes as specified in the indenture occur, the Company will be required to offer to repurchase any or all of the Senior Notes at a repurchase price equal to 101% of the aggregate principal amount of the Senior Notes, plus any accrued and unpaid interest. On August 17, 2015 a change in control occurred due the merger (see Note 2 to the Financial Statements). However, the downgrade of the ratings of the Senior Notes, as specified in the indenture, did not occur. Therefore, the company was not and will not be required to offer to repurchase the Senior Notes as a result of the merger.

The indenture for the Senior Notes also contains covenants that, among other things, limit the ability of the Company and certain of its subsidiaries to: (i) create liens or use assets as security in other transactions; (ii) engage in certain sale/leaseback transactions; and (iii) merge, consolidate or sell, transfer, lease or dispose of substantially all of their assets.

The indenture for the Senior Notes also contains customary events of default, including (i) failure to pay principal or interest on the Senior Notes when due and payable, (ii) failure to comply with covenants or agreements in the indenture or the Senior Notes which failures are not cured or waived as provided in the indenture, (iii) failure to pay indebtedness of the Company, any Subsidiary Guarantor or Significant Subsidiary (each, as defined in the indenture) within any applicable grace period after maturity or acceleration and the total amount of such indebtedness unpaid or accelerated exceeds $50.0 million, (iv) certain events of bankruptcy, insolvency, or reorganization, (v) failure to pay any judgment or decree for an amount in excess of $50.0 million against the Company, any Subsidiary Guarantor or

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any Significant Subsidiary that is not discharged, waived or stayed as provided in the indenture, (vi) cessation of any Subsidiary Guarantee (as defined in the indenture) to be in full force and effect or denial or disaffirmance by any subsidiary guarantor of its obligations under its subsidiary guarantee, and (vii) a default under the Company's Senior Subordinated Notes. In the case of an event of default, the principal amount of the Senior Notes plus accrued and unpaid interest may be accelerated.

Senior Subordinated Notes

On November 30, 2010, in connection with the acquisitions of Seadrift Coke LP and C/G Electrodes, LLC, the Company issued Senior Subordinated Notes in an aggregate total face amount of $200 million. These Senior Subordinated Notes were non-interest bearing and matured in 2015. Because the Senior Subordinated Notes were non-interest bearing, the Company was required to record them at their present value (determined using an interest rate of 7%). The difference between the face amount of the Senior Subordinated Notes and their present value is recorded as debt discount. The debt discount was amortized to income using the interest method, over the life of the Senior Subordinated Notes.

On July 9, 2015, the Company provided notice to all holders of the Senior Subordinated Notes that, as permitted under the Senior Subordinated Notes, the Company intended to prepay in full the entire $200 million aggregate principal amount of the Senior Subordinated Notes after the Company's receipt of the proceeds of the issuance of Preferred Stock to Brookfield. See Note 2 for further discussion of the Preferred Stock issuance. This prepayment was consummated on August 11, 2015.

(8) Interest Expense

The following table presents an analysis of interest expense:

	Predecessor		Successor	
	For the year Ended December 31,2014	For the Period January 1 Through August 14, 2015	For the Period August 15 Through December 31, 2015	For the year Ended December 31,2016
	(Dollars in thousands)			
Interest incurred on debt	$20,099	$12,066	$7,694	$ 20,408
Amortization of discount on Senior Subordinated Notes	12,298	12,027	—	—
Accretion of fair value adjustment on Senior Notes	—	—	2,305	6,305
Amortization of debt issuance costs	3,339	2,118	—	201
Total interest expense	$35,736	$26,211	$9,999	$ 26,914

Interest rates

The Revolving Facility had an effective interest rate of 2.68% and 5.52% as of December 31, 2015 and 2016, respectively. The Senior Notes carry an interest rate of 6.375%. The Senior Subordinated Notes had an implied rate of 7.00%.

On August 11, 2015, we prepaid our Senior Subordinated Notes (see Note 7 "Debt and Liquidity"). This prepayment resulted in accelerated amortization of $4.5 million as the Notes were prepaid at the face value. The accelerated expense was recorded in the predecessor period.

(9) Fair Value Measurements and Derivative Instruments

Fair Market Value Measurements

Depending on the inputs, we classify each fair value measurement as follows:

• Level 1 – based upon quoted prices for identical instruments in active markets,

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- Level 2 – based upon quoted prices for similar instruments, prices for identical or similar instruments in markets that are not active, or model-derived valuations of all of whose significant inputs are observable, and
- Level 3 – based upon one or more significant unobservable inputs.

The following section describes key inputs and assumptions used in valuation methodologies of our assets and liabilities measured at fair value on a recurring basis:
Cash and cash equivalents, short-term notes and accounts receivable, accounts payable and other current payables – The carrying amount approximates fair value because of the short maturity of these instruments.
Debt – The fair value of our debt as of December 31, 2015, was $273.4 million versus a book value of $367.2 million. As of December 31, 2016, the fair value was $342.1 million, versus a book value of $365.4 million. The fair values of the Senior Notes and the Revolving Facility were determined using level 1 and level 3 inputs, respectively.
Assets held for sale – Assets held for sale values are determined using Level 3 fair value inputs. These represent management's estimate of fair value based upon current quotes from participants in the sales process.
Foreign currency derivatives – Foreign currency derivatives are carried at market value using Level 2 inputs. There were no outstanding gains or losses as of December 31 2015 and $0.2 million of outstanding losses as of December 31, 2016.
Commodity derivative contracts – Commodity derivative contracts are carried at fair value. We determine the fair value using observable, quoted natural gas and refined oil product prices that are determined by active markets and therefore classify the commodity derivative contracts as Level 2. There were no outstanding gains or losses as of December 31, 2015 and 2016.
Additional fair value information related to our Pension funds' assets can be found in Note 12 "Retirement Plans and Postretirement Benefits".
Derivative Instruments
We use derivative instruments as part of our overall foreign currency and commodity risk management strategies to manage the risk of exchange rate movements that would reduce the value of our foreign cash flows and to minimize commodity price volatility. Foreign currency exchange rate movements create a degree of risk by affecting the value of sales made and costs incurred in currencies other than the US Dollar.
Certain of our derivative contracts contain provisions that require us to provide collateral. Since the counterparties to these financial instruments are large commercial banks and similar financial institutions, we do not believe that we are exposed to material counterparty credit risk. We do not anticipate nonperformance by any of the counter-parties to our instruments.
Foreign currency derivatives
We enter into foreign currency derivatives from time to time to attempt to manage exposure to changes in currency exchange rates. These foreign currency instruments, which include, but are not limited to, forward exchange contracts and purchased currency options, attempt to hedge global currency exposures such as foreign currency denominated debt, sales, receivables, payables, and purchases. Forward exchange contracts are agreements to exchange different currencies at a specified future date and at a specified rate. There was no ineffectiveness on these contracts during the twelve months ended December 31, 2015 or 2016.
In 2015 and 2016, we entered into foreign forward currency derivatives as hedges of anticipated cash flows denominated in the Mexican peso, South African rand, euro and Japanese yen. These derivatives were entered into to protect the risk that the eventual cash flows resulting from such transactions will be adversely affected by changes in exchange rates between the US dollar and the Mexican peso, South African rand, euro and Japanese yen. As of December 31, 2015, we had outstanding Mexican peso, Brazilian real, South African rand, euro, and Japanese yen currency contracts, with aggregate notional amounts of $18.7 million. As of December 31, 2016, we had outstanding Mexican peso, euro and Japanese yen currency contracts, with aggregate notional amounts of $22.6 million.
The foreign currency derivatives outstanding as of December 31, 2016 have a maturity date of January, 27 2017.

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Commodity derivative contracts
We may periodically enter into derivative contracts for natural gas and certain refined oil products. These contracts are entered into to protect against the risk that eventual cash flows related to these products will be adversely affected by future changes in prices. We had no outstanding commodity derivative contracts as of December 31, 2016.
Net Investment Hedges
We use certain intercompany debt to hedge a portion of our net investment in our foreign operations against currency exposure (net investment hedge). Intercompany debt designated in foreign currency and designated as a non-derivative net investment hedging instrument was $11.8 million and $13.3 million as of December 31, 2015 and December 31, 2016, respectively. Within our currency translation adjustment portion of other comprehensive income, we recorded a gain of $1.4 million in the year ended December 31, 2015, and a loss of $1.5 million in the year ended December 31, 2016, resulting from these net investment hedges.
The fair value of all derivatives is recorded as assets or liabilities on a gross basis in our Consolidated Balance Sheets. At December 31, 2015 and 2016, the fair value of our derivatives and their respective balance sheet locations are presented in the following table:

	Asset Derivatives		Liability Derivatives	
	Location	Fair Value	Location	Fair Value
As of December 31, 2015	(Dollars in Thousands)			
Derivatives not designated as hedges:				
Foreign currency derivatives	Prepaid and other current assets	$ 76	Other current liabilities	$ 11
Total fair value		$ 76		$ 11
As of December 31, 2016				
Derivatives not designated as hedges:				
Foreign currency derivatives	Prepaid and other current assets	$ 10	Other current liabilities	$ 188
Total fair value		$ 10		$ 188

The location and amount of realized (gains) losses on derivatives are recognized in the Statements of Operations when the hedged item impacts earnings and are as follows for the years ended 2015 and 2016:

		Amount of (Gain)/Loss Recognized (EffectivePortion)			
	Location of (Gain)/Loss Reclassified from Other Comprehensive Income (Effective Portion)	2014	For the Period January 1 Through August 14, 2015	For the Period August 15 Through December 31, 2015	2016
Derivatives designated as cash flow hedges:		(Dollars in Thousands)			
Foreign currency derivatives, excluding tax of $85, $106, $17 and $32, respectively	Revenue/Cost of goods sold Other expense / (income)	$(849)	$(1,062)	$ (172)	$(322)

Commodity forward derivatives, excluding tax of $(120), $(424) and $0 respectively	Cost of goods sold	$328	$1,161	$ —	$—

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	Location of (Gain)/Loss Recognized in the Consolidated Statement of Income	Amount of (Gain)/Loss Recognized 2014	For the Period January 1 Through August 14, 2015	For the Period August 15 Through December 31, 2015	2016
Derivatives not designated as hedges:		(Dollars in thousands)			
Foreign currency derivatives	Cost of goods sold / Other expense / (income)	$ 1,020	$ 1,060	$ (560)	$ 549

Our foreign currency and commodity derivatives are treated as hedges and are required to be measured at fair value on a recurring basis. With respect to the inputs used to determine the fair value, we use observable, quoted rates that are determined by active markets and, therefore, classify the contracts as “Level 2”.

(10) Supplementary Balance Sheet Detail

The following tables present supplementary balance sheet details:

	At December 31, 2015	2016
	(Dollars in thousands)	
Inventories:		
Raw materials and supplies	$66,201	$54,469
Work in process	89,453	52,379
Finished goods	62,476	49,263
	218,130	156,111
Prepaid expenses and other current assets:		
Prepaid expenses	$9,041	$6,096
Value added tax and other indirect taxes receivable	10,069	12,984
Other current assets	2,040	2,585
	$21,150	$21,665
Property, plant and equipment:		
Land and improvements	$44,052	$43,737
Buildings	55,843	55,440
Machinery and equipment and other	431,226	460,892
Construction in progress	40,208	25,635
	$571,329	$585,704
Other accrued liabilities:		
Payrolls (including incentive programs)	$4,028	$4,802
Employee compensation and benefits	6,199	11,439
Other	10,760	14,278
	$20,987	$30,519

Other long term obligations:		
Postretirement benefits	$20,102	$19,002
Pension and related benefits	55,364	45,876
Other	18,852	17,270
	$94,318	$82,148

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The following table presents an analysis of the allowance for doubtful accounts:

	2014	For the Period January 1 through August 14, 2015	For the Period August 15 through December 31, 2015	2016
	(Dollars in thousands)			
Balance at beginning of year	$6,262	$6,969	$ —	$244
Additions	3,520	85	244	129
Deductions	(2,813)	(1,177)	—	(47)
Balance at end of year	$6,969	$5,877	$ 244	$326

(11) Commitments

Lease commitments under non-cancelable operating leases extending for one year or more will require the following future payments:

	(Dollars in thousands)
2017	$ 2,637
2018	2,158
2019	1,781
2020	1,108
2021	373
After 2021	902

Total lease and rental expenses under non-cancelable operating leases extending for one year or more approximated $7.1 million in 2014, $6.2 million in 2015 and $3.6 million in 2016.

(12) Retirement Plans and Postretirement Benefits

Retirement Plans

On February 26, 1991, we formed our own retirement plan covering substantially all our U.S. employees. Under our plan, covered employees earned benefit payments based primarily on their service credits and wages subsequent to February 26, 1991.

Prior to that date, substantially all our U.S. employees were participants in the U.S. retirement plan of Union Carbide Corporation (“Union Carbide”). While service credit was frozen, covered employees continued to earn benefits under the Union Carbide plan based on their final average wages through February 26, 1991, adjusted for salary increases (not to exceed six percent per annum) through January 26, 1995, the date Union Carbide ceased to own a minimum 50% of the equity of GTI. The Union Carbide plan is responsible for paying retirement and death benefits earned as of February 26, 1991.

Effective January 1, 2002, we established a defined contribution plan for U.S. employees. Certain employees had the option to remain in our defined benefit plan for an additional period of up to five years. Employees not covered by this option had their benefits under our defined benefit plan frozen as of December 31, 2001, and began participating in the defined contribution plan.

Effective March 31, 2003, we curtailed our qualified benefit plan and the benefits were frozen as of that date for the U.S. employees who had the option to remain in our defined benefit plan. We also closed our non-qualified U.S. defined benefit plan for the participating salaried workforce. The employees began participating in the defined contribution plan as of April 1, 2003.

Pension coverage for employees of foreign subsidiaries is provided, to the extent deemed appropriate, through separate plans. Obligations under such plans are systematically provided for by depositing funds with trustees, under insurance policies or by book reserves.

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On March 27, 2015, we settled $62.0 million of projected benefit obligations for our United Kingdom plan through the purchase of a group annuity contract. The purchase was fully funded with pension plan assets.
The components of our consolidated net pension costs are set forth in the following table:

	Predecessor				Successor	
	2014		For the Period January 1 Through August 14, 2015		For the Period August 15 Through December 31, 2015	
	U.S.	Foreign	U.S.	Foreign	U.S.	Foreign
	(Dollars in thousands)					
Service cost	$750	$1,107	$151	$98	$386	$281
Interest cost	5,983	2,669	854	554	2,200	94
Expected return on assets	(5,215)	(2,516)	—	—	(1,885)	(59)
Amortization of prior service cost	—	2	—	(12)	—	—
Curtailment gain	—	(28)	—	—	—	(675)
Mark-to-market loss (gain)	18,431	(534)	—	—	716	1,843
Pension costs	$19,949	$700	$1,005	$640	$1,417	$1,484

	Successor	
	2016	
	U.S.	Foreign
Service cost	$1,325	$698
Interest cost	5,744	243
Expected return on assets	(4,940)	(298)
Mark-to-market loss (gain)	(2,322)	(220)
Pension costs	$(193)	$423

The mark-to-market loss in 2015 was caused by changes to the discount rate. The mark-to-market gain in 2016 was the result of better than expected asset returns and favorable change to the mortality tables, partially offset by unfavorable changes to the discount rate.

Amounts recognized in other comprehensive income did not represent a significant portion of our total post-retirement cost. As a result of our acquisition by Brookfield (see Note 2 "Preferred Share Issuance and Merger"), our pension and post-retirement obligations were revalued as of August 15, 2015. The result of this valuation eliminated historical components of Other Comprehensive Income.

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The reconciliation of the beginning and ending balances of our pension plans' benefit obligations, fair value of assets, and funded status at December 31, 2015 and 2016 are:

	As of December 31, 2015		As of December 31, 2016	
	U.S.	Foreign	U.S.	Foreign
	(Dollars in thousands)			
Changes in Benefit Obligation:				
Net benefit obligation at beginning of period, August 15, 2015 and January 1, 2016, respectively	$146,790	$18,512	$142,126	$18,271
Service cost	386	281	1,325	698
Interest cost	2,200	94	5,744	243
Participant contributions	—	79	—	256
Plan amendments / curtailments	—	(578)	—	(122)
Foreign currency exchange changes	—	(480)	—	(527)
Actuarial loss (gain)	(3,896)	377	1,293	(18)
Benefits paid	(3,354)	(14)	(10,258)	(564)
Net benefit obligation at end of period	$142,126	$18,271	$140,230	$18,237
Changes in Plan Assets:				
Fair value of plan assets at beginning of period, August 15, 2015 and January 1, 2016, respectively	$97,473	$12,811	$93,897	$11,293
Actual return on plan assets	(2,727)	(1,407)	8,556	378
Foreign currency exchange rate changes	—	(346)	—	(346)
Employer contributions	2,505	170	8,710	854
Participant contributions	—	79	—	256
Benefits paid	(3,354)	(14)	(10,258)	(564)
Fair value of plan assets at end of period	$93,897	$11,293	$100,905	$11,871
Funded status (underfunded):	$(48,229)	$(6,978)	$(39,325)	$(6,366)
Amounts recognized in accumulated other comprehensive loss:				
Prior service credit	$—	$(95)	$—	$—
Amounts recognized in the statement of financial position:				
Non-current assets	$—	$—	$—	$—
Current liabilities	(437)	(253)	(435)	(128)
Non-current liabilities	(47,792)	(6,725)	(38,890)	(6,238)
Net amount recognized	$(48,229)	$(6,978)	$(39,325)	$(6,366)

The accumulated benefit obligation for all defined benefit pension plans was $158.9 million and $157.0 million at December 31, 2015 and 2016, respectively. We made contributions to the plan of $4.3 million and paid benefits of $5.3 million during the period January 1 through August 14, 2015. As a result of our acquisition by Brookfield and subsequent purchase price allocation, our assets and liabilities associated with the plans were revalued as of August 15, 2015.

Plan Assets

The accounting guidance on fair value measurements specifies a hierarchy based on the observability of inputs used in valuation techniques (Level 1, 2 and 3). See Note 9, "Fair Value Measurements and Derivative Instruments," for a discussion of the fair value hierarchy.

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The following describes the methods and significant assumptions used to estimate the fair value of the investments:
Cash and cash equivalents – Valued at cost. Cash equivalents are valued at net asset value as provided by the administrator of the fund.
Foreign government bonds – Valued by the trustees using various pricing services of financial institutions.
Debt securities – Valued by the trustee at year-end using various pricing services of financial institutions, including Interactive Data Corporation, Standard & Poor's and Telekurs.
Equity securities – Valued at the closing price reported on the active market on which the security is traded.
Fixed insurance contract – Valued at the present value of the guaranteed payment streams.
Investment contracts – Valued at the total cost of annuity contracts purchased, adjusted for market differences from the date of purchase to year-end.
Collective trusts – Valued at the net asset value provided by the administrator of the fund. The net asset value is based on the value of the underlying assets owned by the fund, minus its liabilities, divided by the number of units outstanding.

The fair value of the plan assets by category is summarized below (dollars in thousands):

	December 31, 2015				December 31, 2016			
	Level 1	Level 2	Level 3	Total	Level 1	Level 2	Level 3	Total
U.S. Plan Assets								
Cash and cash equivalents	$1,986	$—	$—	$1,986	$1,502	$—	$—	$1,502
Collective trusts	—	91,911	—	91,911	—	99,403	—	99,403
Total	$1,986	$91,911	$—	$93,897	$1,502	$99,403	$—	$100,905
International Plan Assets								
Foreign government bonds	—	840	—	840	—	729	—	729
Fixed insurance contracts	—	—	10,453	10,453	—	—	11,142	11,142
Total	$—	$840	$10,453	$11,293	$—	$729	$11,142	$11,871

The following table presents the changes for those financial instruments classified within Level 3 of the valuation hierarchy for international plan pension assets for the years ended December 31, 2015 and 2016 (dollars in thousands):

	Fixed Insurance Contracts
Balance as of August 15, 2015 (Predecessor)	$ 13,336
Gain / contributions / currency impact	(2,883)
Distributions	—
Balance at December 31, 2015 (Successor)	10,453
Gain / contributions / currency impact	707
Distributions	(18)
Balance at December 31, 2016 (Successor)	$ 11,142

We annually re-evaluate assumptions and estimates used in projecting pension assets, liabilities and expenses. These assumptions and estimates may affect the carrying value of pension assets, liabilities and expenses in our Consolidated Financial Statements. Assumptions used to determine net pension costs and projected benefit obligations are:

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Pension Benefit Obligations Key Assumptions	As of December 31,	
	2015	2016
Weighted average assumptions to determine benefit obligations:		
Discount rate	3.86%	3.61%
Rate of compensation increase	1.84%	1.57%

Pension Cost Key Assumptions		
Weighted average assumptions to determine net cost:		
Discount rate	3.79%	3.86%
Expected return on plan assets	3.99%	4.97%
Rate of compensation increase	2.08%	1.84%

We adjust our discount rate annually in relation to the rate at which the benefits could be effectively settled. Discount rates are set for each plan in reference to the yields available on AA-rated corporate bonds of appropriate currency and duration. The appropriate discount rate is derived by developing an AA-rated corporate bond yield curve in each currency. The discount rate for a given plan is the rate implied by the yield curve for the duration of that plan's liabilities. In certain countries, where little public information is available on which to base discount rate assumptions, the discount rate is based on government bond yields or other indices and approximate adjustments to allow for the differences in weighted durations for the specific plans and/or allowance for assumed credit spreads between government and AA rated corporate bonds.

The expected return on assets assumption represents our best estimate of the long-term return on plan assets and generally was estimated by computing a weighted average return of the underlying long-term expected returns on the different asset classes, based on the target asset allocations. The expected return on assets assumption is a long-term assumption that is expected to remain the same from one year to the next unless there is a significant change in the target asset allocation, the fees and expenses paid by the plan or market conditions.

The rate of compensation increase assumption is generally based on salary increases.

Plan Assets. The following table presents our retirement plan weighted average asset allocations at December 31, 2016, by asset category:

	Percentage of Plan Assets as of December 31, 2016			
	US		Foreign	
Equity securities and return seeking assets	20	%	—	%
Fixed income, debt securities, or cash	80	%	100	%
Total	100	%	100	%

Investment Policy and Strategy. The investment policy and strategy of the U.S. plan is to invest approximately 20% in equities and return seeking assets and approximately 80% in fixed income securities. Rebalancing is undertaken monthly. To the extent we maintain plans in other countries, target asset allocation is 100% fixed income investments. For each plan, the investment policy is set within both asset return and local statutory requirements.

Information for our pension plans with an accumulated benefit obligation in excess of plan assets at December 31, 2015 and 2016 follows:

	2015		2016	
	U.S.	Foreign	U.S.	Foreign
	(Dollars in thousands)			
Accumulated benefit obligation	$142,126	$16,749	$140,230	$16,057
Fair value of plan assets	93,897	11,293	100,905	11,142

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Information for our pension plans with a projected benefit obligation in excess of plan assets at December 31, 2015 and 2016 follows:

	2015		2016	
	U.S.	Foreign	U.S.	Foreign
	(Dollars in thousands)			
Projected benefit obligation	$142,126	$18,271	$140,230	$17,415
Fair value of plan assets	93,897	11,293	100,905	11,142

Following is our projected future pension plan cash flow by year:

	U.S.	Foreign
	(Dollars in thousands)	
Expected contributions in 2017:		
Expected employer contributions	$ 6,654	$ 561
Expected employee contributions	—	—
Estimated future benefit payments reflecting expected future service for the years ending December 31:		
2017	9,259	751
2018	9,247	696
2019	9,218	643
2020	9,256	720
2021	9,278	670
2022-2026	45,917	5,705

Post-Employment Benefit Plans

We provide life insurance benefits for eligible retired employees. These benefits are provided through various insurance companies. We accrue the estimated net postretirement benefit costs during the employees' credited service periods.

In July 2002, we amended our U.S. postretirement medical coverage. In 2003 and 2004, we discontinued the Medicare Supplement Plan (for retirees 65 years or older or those eligible for Medicare benefits). This change applied to all U.S. active employees and retirees. In June 2003, we announced the termination of the existing early retiree medical plan for retirees under age 65, effective December 31, 2005. In addition, we limited the amount of retiree's life insurance after December 31, 2004. These modifications are accounted for prospectively. The impact of these changes is being amortized over the average remaining period to full eligibility of the related postretirement benefits.

During 2009, we amended one of our U.S. plans to eliminate the life insurance benefit for certain non-pooled participants.

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The components of our consolidated net postretirement costs are set forth in the following table:

	Predecessor				Successor	
	2014		For the Period January 1 through August 14, 2015		For the Period August 15 Through December 31, 2015	
	U.S.	Foreign	U.S.	Foreign	U.S.	Foreign
	(Dollars in thousands)					
Service cost		$71	$—	$ 9	—	$5
Interest cost	396	976	223	433	142	289
Amortization of prior service credit	—	(180)	—	—	—	—
Plan amendment / curtailment	—	(294)	—	—	—	—
Mark-to-market (gain) loss	1,151	1,456	—	—	(100)	(621)
Post-employment benefits cost (benefit)	$1,547	$2,029	$223	$ 442	$42	$(327)

	Successor	
	2016	
	U.S.	Foreign
Service cost	$—	$4
Interest cost	360	764
Plan amendment / curtailment	—	(993)
Mark-to-market (gain) loss	(191)	(225)
Post-employment benefits cost (benefit)	$169	$(450)

Amounts recognized in other comprehensive income did not represent a significant portion of our total post-retirement cost. As a result of our acquisition by Brookfield (see Note 2 "Preferred Share Issuance and Merger"), our pension and post-retirement obligations were revalued as of August 15, 2015. The result of this valuation eliminated historical components of Other Comprehensive Income.

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The reconciliation of beginning and ending balances of benefit obligations under, fair value of assets of, and the funded status of, our postretirement plans is set forth in the following table:

Postretirement Benefits	As of December 31, 2015		As of December 31, 2016	
	U.S.	Foreign	U.S.	Foreign
	(Dollars in thousands)			
Changes in Benefit Obligation:				
Net benefit obligation at beginning of period, August 15, 2015 and January 1, 2016, respectively	$11,395	$13,457	$10,859	$11,296
Service cost	—	5	—	4
Interest cost	142	289	360	764
Foreign currency exchange rates	—	(1,489)	—	709
Actuarial loss (gain)	(100)	(621)	(191)	(225)
Gross benefits paid	(578)	(345)	(853)	(855)
Plan amendment	—	—	—	(993)
Net benefit obligation at end of period	$10,859	$11,296	$10,175	$10,700
Changes in Plan Assets:				
Fair value of plan assets at beginning of period	$—	$—	$—	$—
Employer contributions	578	345	853	855
Gross benefits paid	(578)	(345)	(853)	(855)
Fair value of plan assets at end of period	$—	$—	$—	$—
Funded status:	$(10,859)	$(11,296)	$(10,175)	$(10,700)
Amounts recognized in accumulated other comprehensive loss:				
Prior service credit	$—	$—	$—	$—
Amounts recognized in the statement of financial position:				
Current liabilities	$(1,298)	$(755)	$(1,134)	$(738)
Non-current liabilities	(9,561)	(10,541)	(9,041)	(9,962)
Net amount recognized	$(10,859)	$(11,296)	$(10,175)	$(10,700)

We made contributions to the plan of $1.6 million and paid benefits of $1.6 million during the period January 1 through August 14, 2015. As a result of our acquisition by Brookfield and subsequent purchase price allocation, the liabilities associated with the plans were revalued as of August 15, 2015.

We annually re-evaluate assumptions and estimates used in projecting the postretirement liabilities and expenses. These assumptions and estimates may affect the carrying value of postretirement plan liabilities and expenses in our Consolidated Financial Statements. Assumptions used to determine net postretirement benefit costs and postretirement projected benefit obligation are set forth in the following table:

Postretirement Benefit Obligations	2015	2016
Weighted average assumptions to determine benefit obligations:		
Discount rate	5.10%	4.80%
Health care cost trend on covered charges:		
Initial	6.67%	6.80%
Ultimate	6.48%	5.96%
Years to ultimate	2	8

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Postretirement Benefit Costs

	2015	2016
Weighted average assumptions to determine net cost:		
Discount rate	4.91%	5.10%
Health care cost trend on covered charges:		
Initial	6.55%	6.67%
Ultimate	6.18%	6.48%
Years to ultimate	0	1

Assumed health care cost trend rates have a significant effect on the amounts reported for our postretirement benefits. A one-percentage point change in assumed health care cost trend rates would have the following effects at December 31, 2016:

	One Percentage Point Increase		One Percentage Point Decrease	
	U.S.	Foreign	U.S.	Foreign
	(Dollars in thousands)			
Effect on total service cost and interest cost components	$2	$ 75	$(2)	$(63)
Effect on benefit obligations	$67	$ 599	$(63)	$(507)

Discount rates are set for each plan in reference to the yields available on AA-rated corporate bonds of appropriate currency and duration. The appropriate discount rate is derived by developing an AA-rated corporate bond yield curve in each currency. The discount rate for a given plan is the rate implied by the yield curve for the duration of that plan's liabilities. In certain countries, where little public information is available on which to base discount rate assumptions, the discount rate is based on government bond yields or other indices and approximate adjustments to allow for the differences in weighted durations for the specific plans and/or allowance for assumed credit spreads between government and AA-rated corporate bonds.

The following table represents projected future postretirement cash flow by year:

	U.S.	Foreign
	(Dollars in thousands)	
Expected contributions in 2017:		
Expected employer contributions	$ 1,134	$ 738
Expected employee contributions	—	—
Estimated future benefit payments reflecting expected future service for the years ending December 31:		
2017	1,134	738
2018	1,065	742
2019	984	747
2020	898	754
2021	809	761
2020-2024	2,975	3,931

Savings Plan

Our employee savings plan provides eligible employees the opportunity for long-term savings and investment. The plan allows employees to contribute up to 5% of pay as a basic contribution and an additional 45% of pay as supplemental contribution. For 2014, and part of 2015, we contributed on behalf of each participating employee, in units of a fund that invested entirely in our Common Stock, 3% on the first 100% contributed by the employee and 5% on the next 20% contributed by the employee. We contributed 581,006 shares in 2014, resulting in an expense of $4.4 million; 321,107 shares in 2015, resulting in an expense of $1.4 million. During 2015 we changed our method of funding the plan to cash contributions. We contributed $2.5 million to our Savings Plan in 2016.

(13) Contingencies

Legal Proceedings

We are involved in various investigations, lawsuits, claims, demands, environmental compliance programs and other legal proceedings arising out of or incidental to the conduct of our business. While it is not possible to determine the ultimate disposition of each of these matters, we do not believe that their ultimate disposition will have a material adverse effect on our financial position, results of operations or cash flows.

Litigation has been pending in Brazil brought by employees seeking to recover additional amounts under certain wage increase provisions applicable in 1989 and 1990 under collective bargaining agreements to which employers in the Bahia region of Brazil were a party (including our subsidiary in Brazil), plus interest thereon. Prior to October 1, 2015, we were not party to such litigation. Companies in Brazil have recently settled claims arising out of these provisions and, in May 2015, the litigation was remanded, in favor of the employees, by the Brazil Supreme Court to the lower courts for further proceedings which included procedural aspects of the case, such as admissibility of instruments filed by the parties. We cannot predict the outcome of such litigation. On October 1, 2015, an action was filed by current and former employees against our subsidiary in Brazil to recover amounts under such provisions, plus interest thereon, which amounts together with interest could be material to us. We intend to vigorously defend such action.

Product Warranties

We generally sell products with a limited warranty. We accrue for known warranty claims if a loss is probable and can be reasonably estimated. We also accrue for estimated warranty claims incurred based on a historical claims charge analysis. Product warranties were not impacted by purchase price accounting adjustments. Claims accrued but not yet paid and the related activity within the reserve for 2015 and 2016 are as follows:

	(Dollars in Thousands)	
Balance as of December 31, 2014	$ 520	
Product warranty charges/adjustments	346	
Payments and settlements	(69	)
Balance as of August 14, 2015	$ 797	
Balance as of August 15, 2015	$ 797	
Product warranty charges/adjustments	(324	)
Payments and settlements	(85	)
Balance as of December 31, 2015	$ 388	
Product warranty charges/adjustments	1,285	
Payments and settlements	(704	)
Balance as of December 31, 2016	$ 969	

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(14) Income Taxes
The following table summarizes the U.S. and non-U.S. components of income (loss) before provision (benefit) for income taxes:

	Predecessor		Successor	
	For the Year Ended December 31, 2014	For the Period January 1 Through August 14, 2015	For the Period August 15 Through December 31, 2015	For the Year Ended December 31, 2016
	(Dollars in thousands)			
U.S.	$(127,707)	$(84,599)	$(16,827)	$ (44,971)
Non-U.S.	(30,603)	(10,919)	(4,916)	(71,450)
	$(158,310)	$(95,518)	$(21,743)	$ (116,421)

Income tax expense (benefit) consists of the following:

	Predecessor		Successor	
	For the Year Ended December 31, 2014	For the Period January 1 Through August 14, 2015	For the Period August 15 Through December 31, 2015	For the Year Ended December 31, 2016
	(Dollars in thousands)			
U.S income taxes:				
Current	$(1,261)	$(20)	$(52)	$ (878)
Deferred	(537)	403	686	1,152
	(1,798)	383	634	274
Non-U.S. income taxes:				
Current	11,474	5,547	1,566	5,389
Deferred	(15,466)	522	4,682	(13,215)
	(3,992)	6,069	6,248	(7,826)
Total income tax benefit	$(5,790)	$6,452	$6,882	$ (7,552)

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Income tax expense (benefit) differed from the amounts computed by applying the U.S. federal income tax rate of 35% to income before provision (benefit) for income taxes as set forth in the following table:

	Predecessor		Successor	
	For the Year Ended December 31, 2014	For the Period January 1 Through August 14, 2015	For the Period August 15 Through December 31, 2015	For the Year Ended December 31, 2016
	(Dollars in thousands)			
Tax at statutory U.S. federal rate	$(55,409)	$(33,431)	$(7,610)	$ (40,747)
U.S. valuation allowance, net	26,175	21,532	7,355	35,091
State taxes, net of federal tax benefit	(4,387)	(2,005)	(697)	(2,324)
U.S. tax return adjustments to estimated taxes	(368)	—	—	—
Resolution of uncertain tax positions	(513)	71	64	(513)
Adjustment for foreign income taxed at different rates	10,408	11,136	7,120	12,738
U.S. tax credits	(1,000)	—	—	—
Non-U.S. tax exemptions, holidays and credits	—	(691)	228	(175)
Goodwill impairment	17,161	8,026	—	—
Capital loss expiration	2,422	—	—	—
Investment in subsidiary impairment deduction	—	—	—	(10,111)
Other	(279)	1,814	422	(1,511)
Total income tax (benefit) expense	$(5,790)	$6,452	$6,882	$ (7,552)

The Company has been granted a tax holiday in Brazil, which expires in 2024. The availability of the tax holiday in Brazil did not have a significant impact on the current tax year.

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The tax effects of temporary differences that give rise to significant components of the deferred tax assets and deferred tax liabilities at December 31, 2015, and December 31, 2016 are set forth in the following table:

	As of December 31,	
	2015	2016
	(Dollars in thousands)	
Deferred tax assets:		
Fixed assets	$10,128	$41,677
Postretirement and other employee benefits	34,713	32,275
Foreign tax credit and other carryforwards	115,163	153,169
Capitalized research and experimental costs	21,592	18,146
Environmental reserves	4,273	4,237
Inventory	12,719	15,227
Original issue discount	—	6,461
Long-term contract option amortization	2,138	2,074
Provision for rationalization charges	5,967	7,498
Other	1,005	3,391
Total gross deferred tax assets	207,698	284,155
Less: valuation allowance	(165,539)	(244,841)
Total deferred tax assets	42,159	39,314
Deferred tax liabilities:		
Fixed assets	$64,278	$47,346
Debt discount amortization / Deferred financing fees	7,666	6,544
Inventory	4,985	3,482
Goodwill and acquired intangibles	2,686	2,295
Other	4,647	2,751
Total deferred tax liabilities	84,262	62,418
Net deferred tax (liability) asset	$(42,103)	$(23,104)

In November 2015, the Financial Accounting Standards Board (“FASB”) issued Accounting Standards Update (“ASU”) No. 2015-17, “Income Taxes (Topic 740): Balance Sheet Classification of Deferred Taxes,” which requires deferred tax assets and liabilities, as well as any related valuation allowance, be classified as noncurrent on the balance sheet. As a result, each jurisdiction will only have one net noncurrent deferred tax asset or liability. This ASU does not change the existing requirement that only permits offsetting within a jurisdiction. The amendments in the update may be applied either prospectively or retrospectively to all prior periods presented. The new guidance is effective for annual periods beginning after December 15, 2016, and interim periods within those annual periods, with early adoption permitted.
We adopted the amendments as of December 31, 2015 on a prospective basis. Adoption of the amendments resulted in the presentation of all deferred income tax assets as noncurrent deferred income tax assets in our Consolidated Balance Sheet as of December 31, 2015. No prior periods were retrospectively adjusted and the adoption of the amendments had no impact on our consolidated results of operations or cash flows. Net non-current deferred tax assets are separately stated as deferred income taxes in the amount of $15.3 million as of December 31, 2015 and $19.8 million as of December 31, 2016. Net non-current deferred tax liabilities are separately stated as deferred income taxes in the amount of $57.4 million at December 31, 2015 and $42.9 million at December 31, 2016.
We continue to assess the need for valuation allowances against deferred tax assets based on determinations of whether it is more likely than not that deferred tax benefits will be realized through the generation of future taxable income. Appropriate consideration is given to all available evidence, both positive and negative, in assessing the need for a valuation allowance. Examples of positive evidence would include a strong earnings history, an event or events that would increase our taxable income through a continued reduction of expenses, and tax planning strategies that would indicate an ability to realize deferred tax assets. Examples of negative evidence would include cumulative

losses in recent years and history of tax attributes expiring unused.
GrafTech impaired the fixed assets and announced exiting of certain product lines in our Advanced Graphite Material ("AGM") product group, in the Company’s second quarter Form 10-Q of 2014. During the third quarter of 2014,

we announced the conclusion of another phase of our on-going companywide cost savings assessment. This resulted in changes to the Company's operating and management structure in order to streamline, simplify and decentralize the organization. The impairment charges and other rationalization related charges were incurred primarily in the U.S. jurisdiction. As a result, we determined that it is no longer "more likely than not" that we will generate sufficient future U.S. taxable income to realize our deferred tax assets related to U.S. foreign tax credits and state net operating loss carryforwards, as well as our net U.S. deferred tax assets. With the additional significant negative evidence of recent losses, the Company recognized a $73.4 million non-cash charge to the Statement of Operations in 2014 to reflect a full valuation allowance against these U.S. deferred income tax assets. The recognition of the valuation allowance does not result in or limit the Company's ability to utilize these tax assets in the future.

During 2016, an affiliate of Brookfield, our parent company, purchased on the open market in aggregate approximately $53 million of GrafTech's traded senior notes. This related party transaction generated a gain due to the discount at which the senior note was trading. This gain is taxable to GrafTech in 2016 and generates a deferred tax asset for an original issuance discount of approximately $6.5 million.

Valuation allowance activity for the years ended December 31, 2014, 2015 and 2016 is as follows:

Predecessor	(Dollars in thousands)
Balance as of January 1, 2014	$ 20,411
(Credited) / charged to income	74,157
Translation adjustment	(800)
Changes attributable to movement in underlying assets	1,953
Balance at December 31, 2014	$ 95,721
(Credited) / charged to income	29,363
Translation adjustment	(1,467)
Changes attributable to movement in underlying assets	(8,168)
Balance as of August 14, 2015	$ 115,449
Successor	
Balance as of August 15, 2015	$ 115,449
(Credited) / charged to income	6,780
Translation adjustment	(101)
Changes attributable to movement in underlying assets	43,411
Balance as of December 31, 2015	$ 165,539
(Credited) / charged to income	78,469
Translation adjustment	583
Changes attributable to movement in underlying assets	250
Balance as of December 31, 2016	$ 244,841

We have total foreign tax credit carryforwards of $19.7 million as of December 31, 2016, for which a full valuation allowance is recorded. These tax credit carryforwards begin to expire as of March 15, 2017. In addition, we have a federal net operating loss carryforward of $244.6 million and state net operating losses carryforwards of $290.5 million, which can be carried forward from 5 to 20 years. These net operating losses carryforwards generate a deferred tax asset of $95.5 million as of December 31, 2016. We also have U.S. non-net operating loss related deferred tax assets of $100.9 million as of December 31, 2016. The federal net operating loss carryforward and foreign tax credit utilization will be limited by IRC §382 and §383, respectively.

We have assessed the need for valuation allowances against these deferred tax assets based on determinations of whether it is more likely than not that deferred tax benefits will be realized through the generation of future taxable income. Appropriate consideration is given to all available evidence, both positive and negative, in assessing the need for a valuation allowance, including existing level of profitability and recently available projections of future taxable income, which are comparable with current year results.

Based upon the levels of historical federal and state taxable income and projections of future federal and state taxable income over the periods during which the carryforwards can be utilized, we do not believe it is more likely than not that we will realize the tax benefits of these deferred tax assets. Until we determine that we will generate sufficient jurisdictional taxable income to realize our net operating losses and deferred tax assets, these assets will continue to be fully reserved.

We have non-U.S. loss and tax credit carryforwards on a gross tax effected basis of $34.3 million, which can be carried forward from 7 years to indefinitely.

As of December 31, 2016, we had unrecognized tax benefits of $3.3 million, $3.0 million of which, if recognized, would have a favorable impact on our effective tax rate. We have elected to report interest and penalties related to uncertain tax positions as income tax expense. Accrued interest and penalties were $0.5 million as of December 31, 2014 (a reduction of $0.1 million), $0.7 million as of December 31, 2015 (an increase of $0.2 million) and $0.8 million as of December 31, 2016 (an increase of $0.1 million). A reconciliation of the beginning and ending amount of unrecognized tax benefits is as follows:

Predecessor	(Dollars in thousands)
Balance at January 1	$ 7,203
Additions based on tax positions related to the current year	268
Additions for tax positions of prior years	232
Reductions for tax positions of prior years	(1,204)
Lapse of statutes of limitations	(1,180)
Settlements	(1,503)
Foreign currency impact	(106)
Balance at December 31, 2014	$ 3,710
Foreign currency impact	(21)
Balance as of August 14, 2015	$ 3,689
Successor	
Balance as of August 15, 2015	$ 3,689
Additions for tax positions of prior years	301
Foreign currency impact	(69)
Balance as of December 31, 2015	$ 3,921
Lapse of statutes of limitations	(603)
Foreign currency impact	20
Balance as of December 31, 2016	$ 3,338

It is reasonably possible that a reduction of unrecognized tax benefits of up to $1.0 million may occur within 12 months due to settlements and the expiration of statutes of limitation.

We file income tax returns in the U.S. federal jurisdiction, and various state and foreign jurisdictions. All U.S. federal tax years prior to 2013 are generally closed by statute or have been audited and settled with the applicable domestic tax authorities. All other jurisdictions are still open to examination beginning after 2010.

The Company has not provided for U.S. income taxes or foreign withholding taxes on the differences between the financial reporting basis in our foreign investments, and the tax basis in such investments, estimated to be $472.8 million, which are considered to be permanently reinvested as of December 31, 2016. Any outside basis difference would be taxable upon the sale or liquidation of the foreign subsidiaries, or upon the remittance of dividends. The measurement of the unrecognized U.S. income taxes, if any, that may be associated with these outside basis differences, is not practicable.

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(15) Accumulated Other Comprehensive Loss
The balance in our accumulated other comprehensive loss is set forth in the following table:

	As of December 31, 2015	As of December 31, 2016
	(Dollars in thousands)	
Foreign currency translation adjustments	$ 10,134	$ 7,560
Commodities and foreign currency derivatives	123	(2)
Total accumulated comprehensive loss	$ 10,257	$ 7,558

As a result of our acquisition by Brookfield and the subsequent purchase price accounting adjustments, accumulated comprehensive losses in equity were reset on August 15, 2015.
(16) Guarantor Information

On November 20, 2012, GrafTech International Ltd. (the "Parent"), issued $300 million aggregate principal amount of Senior Notes. The Senior Notes mature on November 15, 2020 and bear interest at a rate of 6.375% per year, payable semi-annually in arrears on May 15 and November 15 of each year. The Senior Notes have been guaranteed on a senior basis by the following wholly-owned direct and indirect subsidiaries of the Parent: GrafTech Finance Inc., GrafTech Holdings Inc., GrafTech USA LLC, Seadrift Coke LLP, Fiber Materials, Inc., Intermat, GrafTech Global Enterprises Inc., GrafTech International Holdings Inc., GrafTech DE LLC, GrafTech Seadrift Holding Corp, GrafTech International Trading Inc., GrafTech Technology LLC, GrafTech NY Inc., and Graphite Electrode Network LLC.

The guarantors of the Senior Notes, solely in their respective capacities as such, are collectively called the "Guarantors." Our other subsidiaries, which are not guarantors of the Senior Notes, are called the "Non-Guarantors."

All of the guarantees are unsecured. All of the guarantees are full, unconditional (subject to limited exceptions described below) and joint and several. Each of the Guarantors are 100% owned, directly or indirectly, by the Parent. All of the guarantees of the Senior Notes continue until the Senior Notes have been paid in full, and payment under such guarantees could be required immediately upon the occurrence of an event of default under the Senior Notes. If a Guarantor makes a payment under its guarantee of the Senior Notes, it would have the right under certain circumstances to seek contribution from the other Guarantors.

The Guarantors will be released from the guarantees upon the occurrence of certain events, including the following: the unconditional release or discharge of any guarantee or indebtedness that resulted in the creation of the guarantee of the Senior Notes by such Guarantor; the sale or other disposition, including by way of merger or consolidation or the sale of its capital stock, following which such Guarantor is no longer a subsidiary of the Parent; or the Parent's exercise of its legal defeasance option or its covenant defeasance option as described in the indenture applicable to the Senior Notes. If any Guarantor is released, no holder of the Senior Notes will have a claim as a creditor against such Guarantor and the indebtedness and other liabilities, including trade payables and preferred stock, if any, of such Guarantor will be effectively senior to the claim of any holders of the Senior Notes.

Investments in subsidiaries are recorded on the equity basis.

The following tables set forth condensed consolidating balance sheets as of December 31, 2015 and December 31, 2016 and condensed consolidating statements of operations and comprehensive income (loss) for the year ended December 31, 2014, 2015 and 2016 and condensed consolidating statements of cash flows for 2014, 2015 and 2016 of the Parent, Guarantors and the Non-Guarantors.

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CONDENSED CONSOLIDATING BALANCE SHEETS
As of December 31, 2015
(in thousands)

	Parent	Guarantors	Non-Guarantors	Consolidating Entries and Eliminations	Consolidated
ASSETS					
Current Assets:					
Cash and cash equivalents	$—	$646	$ 6,281	$—	$ 6,927
Accounts receivable - affiliates	51,592	9,803	19,505	(80,900)	—
Accounts receivable - trade	—	7,599	74,791	—	82,390
Inventories	—	54,613	163,517	—	218,130
Prepaid and other current assets	—	7,907	13,243	—	21,150
Current assets of discontinued operations	—	81,638	17,520	(877)	98,281
Total current assets	51,592	162,206	294,857	(81,777)	426,878
Investment in affiliates	1,068,028	668,113	—	(1,736,141)	—
Property, plant and equipment	—	209,633	341,530	—	551,163
Deferred income taxes	—	—	15,326	—	15,326
Goodwill	—	72,399	99,660	—	172,059
Notes receivable - affiliate	—	46,074	—	(46,074)	—
Other assets	—	79,368	73,246	—	152,614
Long-term assets of discontinued operations	—	99,457	4,518	—	103,975
Total Assets	$1,119,620	$1,337,250	$ 829,137	$(1,863,992)	$ 1,422,015
LIABILITIES AND STOCKHOLDERS' EQUITY					
Current Liabilities:					
Accounts payable - affiliate	$159	$71,099	$ 9,642	$(80,900)	$—
Accounts payable - trade	—	11,191	28,956	—	40,147
Short-term debt	—	4,636	136	—	4,772
Accrued income and other taxes	—	2,824	3,109	—	5,933
Rationalizations	—	995	200	—	1,195
Other accrued liabilities	2,444	4,841	13,702	—	20,987
Current liabilities of discontinued operations	—	18,384	5,575	(877)	23,082
Total current liabilities	2,603	113,970	61,320	(81,777)	96,116
Long-term debt - affiliate	38,661	—	7,413	(46,074)	—
Long-term debt - third party	267,827	93,758	870	—	362,455
Other long-term obligations	—	60,508	33,810	—	94,318
Deferred income taxes	—	248	57,182	—	57,430
Long-term liabilities of discontinued operations	—	738	429	—	1,167
Stockholders' equity	810,529	1,068,028	668,113	(1,736,141)	810,529
Total Liabilities and Stockholders' Equity	$1,119,620	$1,337,250	$ 829,137	$(1,863,992)	$ 1,422,015

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CONDENSED CONSOLIDATING BALANCE SHEETS
As of December 31, 2016
(in thousands)

	Parent	Guarantors	Non-Guarantors	Consolidating Entries and Eliminations	Consolidated
ASSETS					
Current Assets:					
Cash and cash equivalents	$—	$636	$ 10,974	$—	$ 11,610
Accounts receivable - affiliates	51,592	3,624	19,643	(74,859)	—
Accounts receivable - trade	—	7,518	73,050	—	80,568
Inventories	—	44,563	111,548	—	156,111
Prepaid and other current assets	1,350	4,853	15,462	—	21,665
Current assets of discontinued operations	—	51,160	14,296	(4,477)	60,979
Total current assets	52,942	112,354	244,973	(79,336)	330,933
Investment in affiliates	844,379	601,597	—	(1,445,976)	—
Property, plant and equipment	—	191,503	317,352	—	508,855
Deferred income taxes	—	—	19,803	—	19,803
Goodwill	—	70,399	100,718	—	171,117
Notes receivable - affiliate	—	49,003	—	(49,003)	—
Other assets	—	70,767	70,801	—	141,568
Total Assets	$897,321	$1,095,623	$ 753,647	$(1,574,315)	$ 1,172,276
LIABILITIES AND STOCKHOLDERS' EQUITY					
Current Liabilities:					
Accounts payable - affiliate	$806	$71,243	$ 2,810	$(74,859)	$—
Accounts payable - trade	964	8,033	38,666	—	47,663
Short-term debt	—	3,062	5,790	—	8,852
Accrued income and other taxes	—	2,095	3,161	—	5,256
Rationalizations	—	57	18	—	75
Other accrued liabilities	2,444	12,148	15,927	—	30,519
Current liabilities of discontinued operations	—	20,381	4,138	(4,477)	20,042
Total current liabilities	4,214	117,019	70,510	(79,336)	112,407
Long-term debt - affiliate	41,590	—	7,413	(49,003)	—
Long-term debt - third party	274,132	81,695	753	—	356,580
Other long-term obligations	—	50,943	31,205	—	82,148
Deferred income taxes	—	909	41,997	—	42,906
Long-term liabilities of discontinued operations	—	678	172	—	850
Stockholders' equity	577,385	844,379	601,597	(1,445,976)	577,385
Total Liabilities and Stockholders' Equity	$897,321	$1,095,623	$ 753,647	$(1,574,315)	$ 1,172,276

GRAFTECH INTERNATIONAL LTD. AND SUBSIDIARIES
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CONDENSED CONSOLIDATING STATEMENTS OF OPERATIONS AND COMPREHENSIVE INCOME
For the year ended December 31, 2014 (Predecessor)
(in thousands)

	Parent	Guarantors	Non-Guarantors	Consolidating Entries and Eliminations	Consolidated
Sales - affiliates	$—	$240,295	$142,651	$(382,946)	$—
Sales - third party	—	203,609	621,536	—	825,145
Net sales	—	443,904	764,187	(382,946)	825,145
Cost of sales	—	403,058	737,044	(382,946)	757,156
Gross profit	—	40,846	27,143	—	67,989
Research and development	—	9,738	—	—	9,738
Selling and administrative expenses	—	33,108	61,521	—	94,629
Impairments	—	75,650	—	—	75,650
Rationalizations	—	5,431	2,515	—	7,946
Operating loss	—	(83,081)	(36,893)	—	(119,974)
Other expense (income), net	—	2,049	871	—	2,920
Interest expense - affiliate	—	806	—	(806)	—
Interest expense - third party	32,118	2,721	897	—	35,736
Interest income - affiliate	(806)	—	—	806	—
Interest income - third party	—	—	(320)	—	(320)
Loss from continuing operations before provision for income taxes	(31,312)	(88,657)	(38,341)	—	`(158,310)
Provision for income taxes	15,443	(17,240)	(3,993)	—	(5,790)
Equity in loss from continuing operations of subsidiary	(105,765)	(34,348)	—	140,113	—
Net loss from continuing operations	(152,520)	(105,765)	(34,348)	140,113	(152,520)
Loss from discontinued operations, net of tax	—	(126,217)	(6,639)	—	(132,856)
Equity in loss from discontinued operations of subsidiary	(132,856)	(6,639)	—	139,495	—
Loss on discontinued operations	(132,856)	(132,856)	(6,639)	139,495	(132,856)
Net loss	(285,376)	(238,621)	(40,987)	279,608	(285,376)
Statements of Comprehensive Income (Loss)					
Net loss	$(285,376)	$(238,621)	$(40,987)	$279,608	$(285,376)
Other comprehensive loss	(43,900)	(43,900)	(28,650)	72,550	(43,900)
Comprehensive loss	$(329,276)	$(282,521)	$(69,637)	$352,158	$(329,276)

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CONDENSED CONSOLIDATING STATEMENTS OF OPERATIONS AND COMPREHENSIVE INCOME
For the Period January 1 through August 14, 2015 (Predecessor)
(in thousands)

	Parent	Guarantors	Non-Guarantors	Consolidating Entries and Eliminations	Consolidated
Sales - affiliates	$—	$117,366	$52,683	$(170,049)	$—
Sales - third party	—	80,243	259,664	—	339,907
Net sales	—	197,609	312,347	(170,049)	339,907
Cost of sales	—	180,983	294,067	(170,049)	305,001
Gross profit	—	16,626	18,280	—	34,906
Research and development	—	3,377	—	—	3,377
Selling and administrative expenses	6,750	31,513	26,120	—	64,383
Impairments	—	35,381	—	—	35,381
Rationalizations	—	(68)	82	—	14
Operating loss	(6,750)	(53,577)	(7,922)	—	(68,249)
Other expense (income), net	—	889	532	—	1,421
Interest expense - affiliate	3	372	—	(375)	—
Interest expense - third party	24,366	1,574	271	—	26,211
Interest income - affiliate	(372)	(3)	—	375	—
Interest income - third party	—	—	(363)	—	(363)
Loss from continuing operations before provision for income taxes	(30,747)	(56,409)	(8,362)	—	(95,518)
Provision for income taxes	—	384	6,068	—	6,452
Equity in loss from continuing operations of subsidiary	(71,223)	(14,430)	—	85,653	—
Net loss from continuing operations	(101,970)	(71,223)	(14,430)	85,653	(101,970)
Loss from discontinued operations, net of tax	—	(13,430)	(5,249)	—	(18,679)
Equity in loss from discontinued operations of subsidiary	(18,679)	(5,249)	—	23,928	—
Loss on discontinued operations	(18,679)	(18,679)	(5,249)	23,928	(18,679)
Net loss	(120,649)	(89,902)	(19,679)	109,581	(120,649)
Statements of Comprehensive Income (Loss)					
Net loss	$(120,649)	$(89,902)	$(19,679)	$109,581	$(120,649)
Other comprehensive loss	(26,674)	(26,674)	(28,041)	54,715	(26,674)
Comprehensive loss	$(147,323)	$(116,576)	$(47,720)	$164,296	$(147,323)

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GRAFTECH INTERNATIONAL LTD. AND SUBSIDIARIES
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CONDENSED CONSOLIDATING STATEMENTS OF OPERATIONS AND COMPREHENSIVE INCOME
For the Period August 15 Through December 31, 2015 (Successor)
(in thousands)

	Parent	Guarantors	Non-Guarantors	Consolidating Entries and Eliminations	Consolidated
Sales - affiliates	$—	$48,988	$31,898	$(80,886)	$—
Sales - third party	—	40,279	152,854	—	193,133
Net sales	—	89,267	184,752	(80,886)	193,133
Cost of sales	—	87,683	174,048	(80,886)	180,845
Gross profit	—	1,584	10,704	—	12,288
Research and development	—	1,083	—	—	1,083
Selling and administrative expenses	—	5,556	17,929	—	23,485
Rationalizations	—	70	213	—	283
Operating loss	—	(5,125)	(7,438)	—	(12,563)
Other expense (income), net	—	1,286	(2,099)	—	(813)
Interest expense - affiliate	226	—	—	(226)	—
Interest expense - third party	9,552	161	286	—	9,999
Interest income - affiliate	—	(226)	—	226	—
Interest income - third party	—	—	(6)	—	(6)
Loss from continuing operations before provision for income taxes	(9,778)	(6,346)	(5,619)	—	`(21,743)
Provision for income taxes	—	634	6,248	—	6,882
Equity in loss from continuing operations of subsidiary	(18,847)	(11,868)	—	30,715	—
Net loss from continuing operations	(28,625)	(18,848)	(11,867)	30,715	(28,625)
Loss from discontinued operations, net of tax	—	(4,154)	(772)	—	(4,926)
Equity in loss from discontinued operations of subsidiary	(4,926)	(772)	—	5,698	—
Loss on discontinued operations	(4,926)	(4,926)	(772)	5,698	(4,926)
Net loss	(33,551)	(23,774)	(12,639)	36,413	(33,551)
Statements of Comprehensive Income (Loss)					
Net loss	$(33,551)	$(23,774)	$(12,639)	$36,413	$(33,551)
Other comprehensive loss	(10,257)	(10,257)	(10,257)	20,514	(10,257)
Comprehensive loss	$(43,808)	$(34,031)	$(22,896)	$56,927	$(43,808)

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CONDENSED CONSOLIDATING STATEMENTS OF OPERATIONS AND COMPREHENSIVE INCOME
For the year ended December 31, 2016 (Successor)
(in thousands)

	Parent	Guarantors	Non-Guarantors	Consolidating Entries and Eliminations	Consolidated
Sales - affiliates	$—	$122,164	$57,099	$(179,263)	$—
Sales - third party	—	87,028	350,935	—	437,963
Net sales	—	209,192	408,034	(179,263)	437,963
Cost of sales	—	190,558	436,721	(179,263)	448,016
Additions to lower of cost or market inventory reserve	—	6,822	12,152	—	18,974
Gross profit (loss)	—	11,812	(40,839)	—	(29,027)
Research and development	—	2,399	—	—	2,399
Selling and administrative expenses	—	23,831	33,894	—	57,725
Impairments	—	—	2,843	—	2,843
Rationalizations	—	110	(51)	—	59
Operating loss	—	(14,528)	(77,525)	—	(92,053)
Other expense (income), net	6	1,492	(3,686)	—	(2,188)
Interest expense - affiliate	984	—	—	(984)	—
Interest expense - third party	25,430	1,136	348	—	26,914
Interest income - affiliate	—	(984)	—	984	—
Interest income - third party	—	—	(358)	—	(358)
Loss from continuing operations before provision for income taxes	(26,420)	(16,172)	(73,829)	—	(116,421)
Provision for income taxes	—	274	(7,826)	—	(7,552)
Equity in loss from continuing operations of subsidiary	(82,449)	(66,003)	—	148,452	—
Net loss from continuing operations	(108,869)	(82,449)	(66,003)	148,452	(108,869)
Loss from discontinued operations, net of tax	(1,918)	(121,741)	(3,315)	—	(126,974)
Equity in loss from discontinued operations of subsidiary	(125,056)	(3,315)	—	128,371	—
Loss on discontinued operations	(126,974)	(125,056)	(3,315)	128,371	(126,974)
Net loss	(235,843)	(207,505)	(69,318)	276,823	(235,843)
Statements of Comprehensive Income (Loss)					
Net loss	$(235,843)	$(207,505)	$(69,318)	$276,823	$(235,843)
Other comprehensive income (loss)	2,699	2,699	2,699	(5,398)	2,699
Comprehensive loss	$(233,144)	$(204,806)	$(66,619)	$271,425	$(233,144)

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GRAFTECH INTERNATIONAL LTD. AND SUBSIDIARIES
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CONDENSED CONSOLIDATING STATEMENTS OF CASH FLOWS
For the year ended December 31, 2014
(in thousands)

	Parent	Guarantors	Non-Guarantors	Consolidating Entries and Eliminations	Consolidated
Net cash (used in) provided by operating activities:	$(9,474)	$ 79,864	$ 50,513	$ —	$ 120,903
Cash flow from investing activities:					
Loan repayments from affiliates	6,604	—	—	(6,604)	—
Capital expenditures	—	(58,926)	(26,055)	—	(84,981)
Insurance recoveries	—	—	2,834	—	2,834
Proceeds (payments) for derivatives	—	(2,195)	170	—	(2,025)
Proceeds from fixed asset sales	—	1,700	3,342	—	5,042
Other	—	—	178	—	178
Net cash provided by (used in) investing activities	6,604	(59,421)	(19,531)	(6,604)	(78,952)
Cash flow from financing activities:					
Loans repayments to affiliates	—	(6,604)	—	6,604	—
Short-term debt borrowings	—	(34)	(987)	—	(1,021)
Revolving Facility borrowings	—	183,000	86,000	—	269,000
Revolving Facility reductions	—	(193,000)	(100,000)	—	(293,000)
Principal payments on long term debt	—	(132)	(60)	—	(192)
Supply chain financing	—	—	(9,455)	—	(9,455)
Proceeds from exercise of stock options	2,813	—	—	—	2,813
Purchase of treasury shares	(894)	—	—	—	(894)
Refinancing fees and debt issuance costs	—	(2,922)	(357)	—	(3,279)
Other	951	—	—	—	951
Net cash (used in) provided by financing activities	2,870	(19,692)	(24,859)	6,604	(35,077)
Net increase in cash and cash equivalents	—	751	6,123	—	6,874
Effect of exchange rate changes on cash and cash equivalents	—	—	(1,212)	—	(1,212)
Cash and cash equivalents at beginning of period	—	4,752	7,136	—	11,888
Cash and cash equivalents at end of period	$—	$ 5,503	$ 12,047	$ —	$ 17,550

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GRAFTECH INTERNATIONAL LTD. AND SUBSIDIARIES
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CONDENSED CONSOLIDATING STATEMENTS OF CASH FLOWS
For the Period January 1 through August 14, 2015 (Predecessor)
(in thousands)

	Parent	Guarantors	Non-Guarantors	Consolidating Entries and Eliminations	Consolidated
Net cash (used in) provided by operating activities:	$(4,017)	$ 34,418	$ 25,632	$ (27,710)	$ 28,323
Cash flow from investing activities:					
Loans from (repayments to) affiliates	36,204	(21,343)	—	(14,861)	—
Capital expenditures	—	(20,572)	(11,729)	—	(32,301)
Payments for derivative instruments	—	(7,595)	(668)	—	(8,263)
Proceeds from sale of assets	—	397	249	—	646
Net cash provided by (used in) investing activities	36,204	(49,113)	(12,148)	(14,861)	(39,918)
Cash flow from financing activities:					
Loans from (repayments to) affiliates	21,343	(36,204)	—	14,861	—
Dividends to affiliates	—	—	(27,710)	27,710	—
Short-term debt, net	—	14,002	4,509	—	18,511
Revolving Facility borrowings	—	126,000	34,000	—	160,000
Revolving Facility reductions	—	(87,000)	(12,000)	—	(99,000)
Repayment of Senior Subordinated Notes	(200,000)	—	—	—	(200,000)
Issuance of Preferred Shares	150,000	—	—	—	150,000
Principal payments on long term debt	—	(89)	—	—	(89)
Proceeds from exercise of stock options	32	—	—	—	32
Purchase of treasury shares	(63)	—	—	—	(63)
Revolver facility refinancing	—	(5,037)	(31)	—	(5,068)
Other	(3,499)	—	—	—	(3,499)
Net cash (used in) provided by financing activities	(32,187)	11,672	(1,232)	42,571	20,824
Net (decrease) increase in cash and cash equivalents	—	(3,023)	12,252	—	9,229
Effect of exchange rate changes on cash and cash equivalents	—	—	(1,746)	—	(1,746)
Cash and cash equivalents at beginning of period	—	5,503	12,047	—	17,550
Cash and cash equivalents at end of period	$—	$ 2,480	$ 22,553	$ —	$ 25,033

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GRAFTECH INTERNATIONAL LTD. AND SUBSIDIARIES
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CONDENSED CONSOLIDATING STATEMENTS OF CASH FLOWS
For the Period August 15 Through December 31, 2015 (Successor)
(in thousands)

	Parent	Guarantors	Non-Guarantors	Consolidating Entries and Eliminations	Consolidated
Net cash (used in) provided by operating activities:	$(15,930)	$ 18,471	$ 20,574	$ —	$ 23,115
Cash flow from investing activities:					
Loans from (repayments to) affiliates	—	(17,315)	—	17,315	—
Capital expenditures	—	(8,438)	(10,004)	—	(18,442)
Payments for derivative instruments	—	—	326	—	326
Proceeds from sale of assets	—	492	140	—	632
Net cash provided by (used in) investing activities	—	(25,261)	(9,538)	17,315	(17,484)
Cash flow from financing activities:					
Loans from (repayments to) affiliates	17,315	—	—	(17,315)	—
Short-term debt, net	—	(10,998)	(4,506)	—	(15,504)
Revolving Facility borrowings	—	52,000	10,000	—	62,000
Revolving Facility reductions	—	(36,000)	(32,000)	—	(68,000)
Issuance of Preferred Shares	(1,385)	—	—	—	(1,385)
Principal payments on long term debt	—	(46)	(137)	—	(183)
Net cash (used in) provided by financing activities	15,930	4,956	(26,643)	(17,315)	(23,072)
Decrease in cash and cash equivalents	—	(1,834)	(15,607)	—	(17,441)
Effect of exchange rate changes on cash and cash equivalents	—	—	(665)	—	(665)
Cash and cash equivalents at beginning of period	—	2,480	22,553	—	25,033
Cash and cash equivalents at end of period	$—	$ 646	$ 6,281	$ —	$ 6,927

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GRAFTECH INTERNATIONAL LTD. AND SUBSIDIARIES
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CONDENSED CONSOLIDATING STATEMENTS OF CASH FLOWS
For the year ended December 31, 2016
(in thousands)

	Parent	Guarantors	Non-Guarantors	Consolidating Entries and Eliminations	Consolidated
Net cash (used in) provided by operating activities:	$(19,032)	$ 25,527	$ 16,320	$ —	$ 22,815
Cash flow from investing activities:					
Loan repayments from affiliates	—	(2,067)	—	2,067	—
Capital expenditures	—	(9,019)	(18,839)	—	(27,858)
Payments for derivatives	—	—	377	—	377
Proceeds from the sale of fixed assets	—	462	659	—	1,121
Cash received (disposed) on divestiture	16,173	(284)	—	—	15,889
Net cash provided by (used in) investing activities	16,173	(10,908)	(17,803)	2,067	(10,471)
Cash flow from financing activities:					
Loans repayments to affiliates	2,067	—	—	(2,067)	—
Dividends to affiliates	792	(792)			—
Short-term debt borrowings	—	1,705	5,658	—	7,363
Revolving Facility borrowings	—	51,000	5,000	—	56,000
Revolving Facility reductions	—	(65,469)	(5,000)	—	(70,469)
Principal payments on long term debt	—	(151)	(138)	—	(289)
Refinancing fees and debt issuance costs	—	(922)	—	—	(922)
Net cash provided by (used in) financing activities	2,859	(14,629)	5,520	(2,067)	(8,317)
Net (decrease) increase in cash and cash equivalents	—	(10)	4,037	—	4,027
Effect of exchange rate changes on cash and cash equivalents	—	—	656	—	656
Cash and cash equivalents at beginning of period	—	646	6,281	—	6,927
Cash and cash equivalents at end of period	$—	$ 636	$ 10,974	$ —	$ 11,610

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Item 9. Changes in and Disagreements with Accountants on Accounting and Financial Disclosure

As a result of our acquisition by Brookfield, on August 14, 2015 PricewaterhouseCoopers LLP ("PwC") resigned as the independent registered public accounting firm of the Company. PwC's resignation resulted from its determination that it would no longer satisfy the independence requirement for continuing as the Company's independent registered public accounting firm. Prior to such acquisition, PwC served as the Company's independent registered public accounting firm and also provided services to Brookfield. The services provided to Brookfield included services that, under the Sarbanes-Oxley Act of 2002, are considered services that are prohibited services that an independent registered public accounting firm may not provide to an audit client.

The report of PwC on the financial statements of the Company for the fiscal year ended December 31, 2014 contained no adverse opinion or disclaimer of opinion, and was not qualified or modified as to uncertainty, audit scope, or accounting principle.

During the Company's fiscal year ended December 31, 2014 and the subsequent interim period through August 14, 2015, there were no disagreements (as defined in Item 304 of Regulation S-K) with PwC on any matter of accounting principles or practices, financial statement disclosure, or auditing scope or procedure, which disagreements, if not resolved to the satisfaction of PwC, would have caused them to make reference thereto in their reports on the financial statements for such periods. Further, during the Company's two most recent fiscal years ended December 31, 2014 and the subsequent interim period through August 14, 2015, there were no reportable events (as defined in Item 304(a)(1)(v) of Regulation S-K).

On October 1, 2015, GrafTech International Ltd. (the "Company") appointed Deloitte & Touche, LLP as its independent registered public accounting firm. During the Company's two most recent fiscal years (and the subsequent interim period prior to such engagement), neither the Company nor anyone on its behalf consulted Deloitte & Touche LLP regarding the application of accounting principles to a specified transaction (either completed or proposed) or the type of audit opinion that might be rendered on the Company's financial statements, or any matter that was the subject of a disagreement or a reportable event.

Item 9A. Controls and Procedures

Disclosure Controls and Procedures

The Company maintains disclosure controls and procedures that are designed to ensure that information required to be disclosed in the Company's reports under the Securities Exchange Act of 1934, as amended, is recorded, processed, summarized and reported within the time periods specified in the Commission's rules and forms and that such information is accumulated and communicated to the Company's management, including its Chief Executive Officer and Chief Financial Officer, as appropriate, to allow for timely decisions regarding required disclosure. In designing and evaluating the disclosure controls and procedures, management recognizes that any controls and procedures, no matter how well designed and operated, can provide only reasonable assurance of achieving the desired control objectives, and management is required to apply its judgment in evaluating the cost-benefit relationship of possible controls and procedures.

The Company carries out a variety of on-going procedures, under the supervision and with the participation of the Company's management, including the Company's Chief Executive Officer and Chief Financial Officer, to evaluate the effectiveness of the design and operation of the Company's disclosure controls and procedures. Based on the foregoing, the Company's Chief Executive Officer and Chief Financial Officer concluded that the Company's disclosure controls and procedures were effective at a reasonable assurance level as of the end of the period covered by this report.

MANAGEMENT'S REPORT ON INTERNAL CONTROL OVER FINANCIAL REPORTING

Management is responsible for establishing and maintaining adequate internal control over financial reporting, as defined in Exchange Act Rule 13a-15(f). The 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 accounting principles generally accepted in the United States of America.

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

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may become inadequate because of changes in conditions, or that the degree of compliance with the policies or procedures may deteriorate.

Under the supervision and with the participation of management, including the Chief Executive Officer and Chief Financial Officer, the Company conducted an evaluation of the effectiveness of the Company's internal control over financial reporting based on the framework in "Internal Control — Integrated Framework" issued during 2013 by the Committee of Sponsoring Organizations of the Treadway Commission. Based on this assessment, management has concluded that the internal control over financial reporting was effective as of December 31, 2016.

Changes in Internal Control over Financial Reporting

There has been no change in the Company's internal controls over financial reporting during the Company's most recent fiscal quarter that has materially affected, or is reasonably likely to materially affect, the Company's internal controls over financial reporting.

Item 9B. Other Information

On February 27, 2017, Jeffrey C. Dutton and Ron Bloom were elected as directors of the Company, each to hold office in accordance with the certificate of incorporation and bylaws of the Company until their respective successors are duly elected or appointed and qualified. Biographical information regarding Messrs. Dutton and Bloom is set forth in Item 10.

PART III

ITEM 10. DIRECTORS, EXECUTIVE OFFICERS AND CORPORATE GOVERNANCE

The following table sets forth information with respect to our current directors, including their ages, as of February 27, 2017.

J. PETER GORDON Age: 56 Director Since: August 2015 Managing Partner, Brookfield Current Public Company Directorships: Norbord Inc., North American Palladium Ltd. Prior Public Company Directorships: Western Forest Products Inc., Fraser Papers Inc. and Ainsworth Lumber Co. Ltd.	Mr. Gordon was elected to the Board in August 2015 and became Chairman of GrafTech's Board in September 2015. Mr. Gordon is a Managing Partner at Brookfield, where he is a senior manager with Brookfield Business Partners, L.P. He has over 25 years of industrial experience, principally in the mining and forest products industries, having held a number of senior management positions in the Brookfield portfolio companies, most recently as the President and CEO of Fraser Papers Inc. from 2007 to 2010.

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Jeffrey C. Dutton Age: 53 Director Since: February 2017 Chief Executive Officer, GrafTech Board Committees: None Current Public Company Directorships: GrafTech International Ltd. Prior Public Company Directorships: None	Mr. Dutton became President and Chief Executive Officer January 2017. Previously, Mr. Dutton served as Vice President & Chief Operating Officer of the Company from August 2015 until January 2017 and oversaw all aspects of both the Industrial Materials and Engineered Solutions businesses. Mr. Dutton has served as Senior Vice President of Brookfield Asset Management Inc. ("BAM") since 2013. BAM became the Company's indirect parent company in August 2015. Mr. Dutton served as the Chief Executive Officer and President of Twin Rivers Paper Company, from 2010 to 2013. Mr. Dutton served in various executive capacities at Fraser Papers Inc. from 2008 to 2010, and as General Manager of East Papers operations at Fraser Papers Inc. from 2006 to 2008. He served as President of Republic Paperboard Company of Eagle Materials Inc. from 2004 to 2006. Mr. Dutton served as a director of Twin Rivers Paper Company in 2013 and has served as a director of the Hammerstone Corporation since 2014. Mr. Dutton received his Bachelor of Science in Mechanical Engineering Technology from the University of Maine.
Ron A. Bloom Age: 61 Director Since: February 2017 Managing Partner and Vice Chairman at Brookfield Board Committees: None Current Public Company Directorships: None	Ron Bloom is a Managing Partner and Vice Chairman at Brookfield, where he focuses on managing of the firm’s private equity investments. Prior to joining Brookfield, Mr. Bloom was Vice Chairman, U.S. Investment Banking, at Lazard, focused on restructurings, and mergers and acquisitions. Prior to joining Lazard, Mr. Bloom served as Assistant to the President for Manufacturing Policy where he provided leadership on policy development and strategic planning for the Administration’s agenda to revitalize the manufacturing sector. He led the discussions with the auto industry which resulted in the industry’s support for new fuel economy standards. Prior to joining the White House, Mr. Bloom served as Senior Advisor to the Secretary of the Treasury where he helped lead the restructuring of General Motors and Chrysler LLC, and then led the Treasury’s oversight of the companies thereafter, including GM’s Initial Public Offering, the largest IPO in US history. Mr. Bloom received his undergraduate degree from Wesleyan University and graduated with distinction from the Harvard Graduate School of Business Administration.

Prior Public
Company
Directorships:
None

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DENIS A. TURCOTTE Age: 55 Director Since: August 2015 President and CEO, North Channel Management and North Channel Capital Partners Current Public Company Directorships: Norbord Inc. and Domtar Corporation. Prior Public Company Directorships: Coalspur Mines, Ltd., Algoma Steel Inc.	Mr. Turcotte was elected to the Board in August 2015. Mr. Turcotte is currently president and chief executive officer of North Channel Management and North Channel Capital Partners, business consulting and private investing firms. He is also a member of the board of directors of the general partner of Brookfield Business Partners L.P., an affiliate of Brookfield Asset Management. From 2002 to 2008, Mr. Turcotte was the president and chief executive officer and a director of Algoma Steel Inc., a publicly listed North American steel company, and from 1992 to 2002 held a number of senior executive positions with companies in the pulp and paper industry, including president of the paper group and executive vice-president of corporate development and strategy of Tembec Inc., a leading integrated forest products company with operations in North America and France.

The following table sets forth information with respect to our current executive officers, including their ages, as of March 7, 2016. There are no family relationships between any of our executive officers.

Name	Age	Position
Jeffrey C. Dutton	53	President and Chief Executive Officer
Quinn J. Coburn	52	Vice President and Chief Financial Officer

Jeffrey C. Dutton, age 53, became President and Chief Executive Officer January 2017. Previously, Mr. Dutton served as Vice President & Chief Operating Officer of the Company from August 2015 until January 2017 and oversaw all aspects of both the Industrial Materials and Engineered Solutions businesses. Mr. Dutton has served as Senior Vice President of Brookfield Asset Management Inc. ("BAM") since 2013. BAM became the Company's indirect parent company in August 2015. Mr. Dutton served as the Chief Executive Officer and President of Twin Rivers Paper Company, from 2010 to 2013. Mr. Dutton served in various executive capacities at Fraser Papers Inc. from 2008 to 2010, and as General Manager of East Papers operations at Fraser Papers Inc. from 2006 to 2008. He served as President of Republic Paperboard Company of Eagle Materials Inc. from 2004 to 2006. Mr. Dutton served as a director of Twin Rivers Paper Company in 2013 and has served as a director of the Hammerstone Corporation since 2014. Mr. Dutton received his Bachelor of Science in Mechanical Engineering Technology from the University of Maine.

Quinn J. Coburn, age 52, became Chief Financial Officer in September 2015. Mr. Coburn served as interim Chief Financial Officer beginning in May 2015 after previously serving as Vice President of Finance and Treasurer. He joined GrafTech in August 2010 after working at NCR Corporation from December 1992 until August 2010, including service as that company’s Vice President and Treasurer. Mr. Coburn graduated with a B.S. in Accounting from Utah State University in 1988. He received an MBA from University of Pennsylvania's The Wharton School in 1992.

Section 16(a) Beneficial Ownership Reporting Compliance

Not applicable.

Structure of the Board

Under our by-laws, the Board fixes the size of the Board, so long as the number of directors is not less than three or more than fifteen. The Board currently consists of three members.

GrafTech no longer has a class of equity securities registered pursuant to Section 12 of the Exchange Act and, accordingly, is not required and does not have standing committees of the Board, including an audit committee, a nominating and governance committee or an executive compensation committee. Given that GrafTech is wholly-owned by Brookfield, there is no need for policies or procedures by which security holders may recommend nominees to the Board. The Board may periodically establish committees, in each case so that certain important matters can be addressed in greater depth than may be possible in a meeting of the entire Board.

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Code of Conduct and Ethics

We have had for many years a Code of Conduct and Ethics. Our Code of Conduct and Ethics applies to all employees, including senior executives and financial officers, as well as to all directors. A copy of our Code of Conduct and Ethics is available on our website at http://www.graftech.com under “Company” and “Corporate Ethics & Responsibilities”. The information contained on our website is not part of this annual report. Only the Board or the Audit Committee may waive the provisions of our Code of Conduct and Ethics with respect to executive officers and directors. Any such waivers will be posted on our website.

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Item 11. EXECUTIVE COMPENSATION

Compensation Discussion and Analysis

We have designed a compensation program for our named executive officers that is driven by our strategic goals with the primary emphasis on paying for performance. This section of this annual report describes the executive compensation program and explains the compensation policies and decisions with respect to our named executive officers. The compensation program for these employees primarily consists of a base salary and cash incentive awards.

During 2016, our named executive officers (and their positions in 2016) were:

- Joel L. Hawthorne, President and Chief Executive Officer
- Quinn J. Coburn, Vice President and Chief Financial Officer
- Jeffrey C. Dutton, Vice President and Chief Operating Officer
- Darrell A. Blair, President - Industrial Materials
- Lionel D. Batty, President - Engineered Solutions

Executive Summary

Leadership Changes

There were no substantial leadership changes in 2016.

On January 11, 2017, Mr. Hawthorne submitted his resignation for good reason, as defined in his July 13, 2000 Severance Compensation Agreement, as amended, to the GrafTech Board of Directors. Mr. Hawthorne's resignation was accepted and March 12, 2017 was agreed upon as the date of termination of his GrafTech employment. Settlement of Mr. Hawthorne's accrued compensation, severance and benefit continuation will be made in accordance with his Agreement.

Also on January 11, 2017, the GrafTech Board of Directors appointed Mr. Dutton as Mr. Hawthorne's successor.

In January, 2017, Mr. Batty submitted his resignation for good reason, as defined in his July 13, 2000 Severance Compensation Agreement, as amended, to the GrafTech Board of Directors. Mr. Batty's resignation was accepted and February 15, 2017 was agreed upon as the date of termination of his GrafTech employment. Settlement of Mr. Batty's accrued compensation, severance and benefit continuation will be made in accordance with his Agreement.

In January, 2017, Mr. Blair submitted his resignation for good reason, as defined in his March 16, 2015 Severance Compensation Agreement, as amended, to the GrafTech Board of Directors. Mr. Blair's resignation was accepted and February 28, 2017 was agreed upon as the date of termination of his GrafTech employment. Settlement of Mr. Blair's accrued compensation, severance and benefit continuation will be made in accordance with his Agreement.

Compensation Framework

We provide an executive compensation program that is focused on promoting performance and long-term value. The design and operation of the program reflect the following objectives:

- Driving long-term financial and operational performance that will deliver value, including through incentives that drive return based performance and propel growth.
- Attracting and retaining talented executive leadership.
- Providing competitive pay opportunities relative to equivalent positions with other global companies of comparable size and complexity as well as within the Company.
- Motivating executives to achieve or exceed Company and individual performance goals that are difficult to achieve.

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Our 2016 executive compensation program consisted of two elements: competitive base salary and pay for performance through an annual cash incentive program. Our executives also receive retirement and other customary welfare benefits. The annual cash incentive (bonus) plan only provides value if specific pre-established financial and performance goals are achieved.

2016 Compensation Decisions

The following summary highlights the key compensation decisions effective for 2016:

- In October 2014, we suspended the non-qualified matching allocations and non-qualified retirement contributions for our named executive officers and certain other corporate officers under various unfunded, non-qualified supplemental retirement and deferred compensation plans for certain eligible employees established by GrafTech through certain benefits protection trusts. This suspension continued through 2016.
- We reserved a 30% portion of the annual target bonus to be based on individual performance to goals, with the remainder of the annual target bonus based on Company performance goals. This revision applied to all salaried employees with the exception of the President & CEO.
- For our 2016 annual bonus program, we adopted performance measures based on business unit EBITDA.

Compensation Consultant

We discontinued our relationship with Mercer as our third-party consultant on executive compensation matters in August 2015 after the Brookfield acquisition of GrafTech. No executive compensation studies were commissioned in 2015 or 2016.

Structure of Executive Compensation Program

We believe that our executive compensation program, each element alone and in total, effectively achieves our objectives. The primary elements of our executive compensation program, which are key to the attraction, retention and motivation of our named executive officers, are shown in the following table. The amounts of compensation are determined by the Board of Directors based on the objectives described. The Board does not rely on formulas or survey results, but instead it uses its judgment based on its assessment of the Company's objectives and comparable executive compensation programs. The Board also does not have policies defining the parameters for the allocation between long-term and currently paid out portions of compensation. Executive officers generally play no role in determining executive compensation.

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Element	Objective	Key Features
Base Salary	Values the competencies, skills, experience and performance of individual executives. Attracts and retains executive talent by providing a fixed level of compensation that is financially stable and not "at risk."	Targeted at the median comparable companies.
Executive Incentive Compensation Plan ("Executive Plan" or "ICP" or "bonus plan")	Provides competitive incentives to executive officers by having a portion of their annual cash compensation dependent upon annual performance and "at risk." Motivates and rewards executives for the achievement of targeted financial and strategic operational goals.	Our annual cash bonus plan provides for awards targeted at market median. For 2016, the performance measures were Operating Income of Business Units (50%) and Operating Income of the total Company (50%).
Retirement Savings Plan	Provide competitive market-based retirement savings benefits in a tax- efficient manner.	Broad-based plan under which we make matching contributions that vary, based on the employee's contribution, on eligible earnings up to the Code limit of $265,000 for 2016.
Compensation Deferral Plan	Provides savings in a tax-efficient manner.	Non-Qualified deferral of up to 50% Salary and 85% Bonus.
Health, Welfare and Other Benefits	Attract and retain key executives by providing competitive health, welfare and other benefits.	Generally, benefits are made available to executive officers on the same basis as benefits are made available to other eligible employees.

Summary Compensation Table

The following table sets forth certain information concerning compensation received by our chief executive officer, our chief financial officer and the three other executive officers who were the most highly compensated for the year ended December 31, 2016, all of whom we refer to as our named executive officers.

Name and Principal Position	Year	Salary ($)	Bonus (1) ($)	Stock Awards ($)	Option Awards ($)	Change in Pension Value & Nonqualified Deferred Compensation Earnings (2) ($)	All Other Compensation (3) ($)	Total ($)
Joel L. Hawthorne	2016	700,000	—	—	—	5,490	14,443	719,933
President and CEO	2015	653,333	—	—	—	30,549	14,390	698,272
	2014	680,512	—	2,926,962	791,434	8,638	28,974	4,436,520
Quinn J. Coburn	2016	360,000	73,710	—	—	—	14,818	448,528
Vice President and CFO	2015	310,667	—	—	—	—	39,018	349,685
Jeffrey C. Dutton	2016	410,000	—	—	—	—	41,574	451,574
Vice President and COO (4)	2015	97,500	—	—	—	—	8,749	106,249
Darrell A. Blair	2016	394,400	73,061	—	—	2,280	61,504	531,245
President, Industrial	2015	380,217	—	—	—	—	43,309	423,526

Materials	2014	414,332	—	366,336	91,584	—	50,882	923,134
Lionel D. Batty	2016	300,000	57,050	—	—	—	11,543	368,593
President, Engineered	2015	290,000	—	—	—	—	9,974	299,974
Solutions	2014	299,026	—	305,280	76,320	—	10,450	691,076

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(1) Mr. Coburn's bonus for 2016 is an estimate. The exact amount will not be calculable until March 15, 2017.

(2) Nonqualified deferred compensation earnings in 2016 for Mr. Hawthorne, Mr. Coburn, Mr. Blair and Mr. Batty were $396, $292, $2,807 and $36,552 respectively. None of these earnings were "above market" or preferential and so have not been included in this column. In accordance with the Instructions to Item 402(c)(2)(viii), negative amounts are not reflected in the Summary Compensation Table, which include for Mr. Blair, negative changes in pension value of $31,382 in 2015 and for Mr. Batty, negative changes in pension value of $5,221 in 2016 and $41,803 in 2015.

(3) For 2016, all other compensation for Mr. Hawthorne includes $10,000 in matching contributions to the Company's savings plan and a $2,650 contribution to the Company's defined contribution retirement plan and $1,793 in life insurance premiums under the Company's group life insurance plan. For 2016, all other compensation for Mr. Coburn includes $10,600 in matching contributions to the Company's savings plan and $3,093 contribution to the Company's defined contribution retirement plan and $855 in life insurance premiums under the Company's group life insurance plan. For 2016, all other compensation for Mr. Blair includes $43,949 in relocation benefits and associated gross-up. For 2016, all other compensation for Mr. Batty, includes $6,500 in matching contributions to the Company's savings plan and $3,053 contribution to the Company's defined contribution retirement plan and $1,828 in life insurance premiums under the Company's group life insurance plan. For 2016, all other compensation for Mr. Dutton, includes $13,250 in matching contributions to a Brookfield 401k savings plan and $28,324 for housing and transportation expenses.

(4) Mr. Dutton is employed by an affiliate of GrafTech's parent company, Brookfield Asset Management. GrafTech reimburses Brookfield for his salary and 401(k) savings plan matching contributions.

There were no award grants made to a named executive officer in the last completed fiscal year under any plan of the Company, no equity awards exercised during the fiscal year and no equity awards were outstanding as of the end of the fiscal year.

Severance Agreements

Double-trigger Change in Control Agreements

Each named executive officer, other than Mr. Dutton, entered into a double-trigger Severance Compensation Agreement with us that applies only when there is (i) a change in control of the Company and (ii) the executive's employment is terminated in connection with or following such change in control. Both a change in control of the Company and corresponding executive termination must occur to trigger payment of the benefits under the Severance Compensation Agreement. A change in control occurred under each of the Agreements on August 11, 2015.

Under the Agreements, if a named executive officer's employment is terminated due to a Termination for Cause or by the named executive officer other than with Good Reason for Resignation, upon death or due to Disability or Retirement (as such terms are defined in the Severance Compensation Agreements), the executive will be paid his full base salary and accrued vacation pay through the date of termination, plus any benefits or awards which have been earned or become payable but which have not yet been paid.

If the named executive officer's employment is terminated due to Retirement (as such term is defined in the Severance Compensation Agreements) or death, the executive's benefits will be determined in accordance with GrafTech's retirement, disability and insurance programs then in effect.

Under each of the Agreements, upon termination following a change in control, the named executive officer is entitled to certain benefits. If the named executive officer's employment is terminated subsequent to a change in control (a) by GrafTech other than for Retirement, death, Disability or Termination for Cause or (b) by the executive for Good Reason for Resignation, then the executive is entitled to the following benefits: accrued salary and vacation pay through the date of termination; accrued ICP compensation at target for the prior year if not previously paid plus a prorated portion of the targeted ICP compensation for the year of termination; a severance payment equal to 2.0 multiplied by the sum of the following amounts: (X) the greater of the named executive officer's annual base salary immediately to the date of termination or immediately prior to the change in control; plus (Y) the greater of the amount of the named executive officer's target ICP (or comparable compensation payment) for the year in which the date of termination occurs or for the year in which the change in control occurs; extended health, life and disability coverage; and with respect to Mr. Hawthorne and Mr. Batty, reimbursement for certain excise tax liabilities (and income tax liabilities attributable to the excise tax reimbursement) if the total severance equals or exceeds three times the executive's "base amount" (as determined pursuant to Section 280G of the Code) by more than $50,000.

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During any period prior to the date of termination that the named executive officer is Disabled, the executive will continue to receive his or her base salary at the rate in effect at the commencement of the Disability period, together with all other compensation and benefits that are payable or provided under GrafTech's benefit plans, including its disability plans. After the date of termination for Disability, the executive's benefits shall be determined in accordance with any retirement plan, insurance and other applicable programs of GrafTech. The compensation and benefits, other than salary, payable or provided under the Agreement by reason of a Disability will be the greater of (x) the amounts computed under any retirement plan, disability benefit plan, insurance and other applicable program in effect immediately prior to a change in control and (y) the amounts computed under any retirement plan, disability benefit plan, insurance and other applicable program in effect at the time the compensation and benefits are paid.

Under the Agreements, "Good Reason for Resignation" includes certain changes in the named executive officer's status or position, reductions in the level of reporting responsibility, diminution of duties or responsibilities, reductions in compensation or benefits, relocation, failure of a successor to assume the severance agreement, and failure to pay certain earned compensation.

Effect of a Change in Control on Compensation Deferral Arrangements

Amounts deferred under the Compensation Deferral Plan become immediately payable upon a change in control if the participant elected to receive payment of deferred amounts upon a change in control. All other payments under the Compensation Deferral Plan will be distributed in accordance with the elections of the executive, which may include payments of all or some of the deferred amounts upon termination of employment. A change in control occurred on August 11, 2015.

Pension Benefits at Fiscal Year-End December 31, 2016

The following table shows the number of years of service credited to the named executive officers under the GrafTech International Holdings Inc. Retirement Plan, which has been frozen, including the number of such years credited for service with Union Carbide and its affiliates, as well as the present value of the executives' benefits and payments made to the executives in the last fiscal year. The terms of the Retirement Plan are described below the table.

Name	Plan Name	Number of Years Credited Service (#)	Present Value of Accumulated Benefit ($) (1)		Payments During Last Fiscal Year ($)
Joel L. Hawthorne	GrafTech International Holdings Inc.	2(2)	74,535	(3)	—
Quinn J. Coburn	n/a	—			—
Jeffrey C. Dutton	n/a	—			—
Darrell A. Blair	GrafTech International Holdings Inc.	22(4)	497,045	(5)	—
Lionel D. Batty	GrafTech International Holdings Inc.	20(6)	621,344	(7)	—

(1) The present values have been computed using an interest rate of 3.96% and using the RP-2014 tables with Scale MP-2016 mortality improvement (fully generational projection) as of December 31, 2016, which is the same pension plan measurement date used for our financial reporting purposes.

(2) Includes for Mr. Hawthorne 2 years of service with GrafTech through December 31, 2001 (the date that non-grandfathered participants ceased accruing benefits and had their benefit accruals frozen under the Retirement Plan).

(3) Mr. Hawthorne's benefit has been valued assuming termination of employment as of December 31, 2016 and retirement at age 62, the earliest time at which Mr. Hawthorne may retire without any benefit reduction due to age.

(4) Includes for Mr. Blair 22 years of service with GrafTech through March 31, 2003 (the date that grandfathered participants ceased accruing benefits and had their benefit accruals frozen under the Retirement Plan).

(5) Mr. Blair's benefit has been valued assuming termination of employment as of December 31, 2016 and retirement as of January 1, 2017, the earliest time at which Mr. Blair may retire without any benefit reduction due to age.

(6)

Includes for Mr. Batty 20 years of service with GrafTech through March 31, 2003 (the date that grandfathered participants ceased accruing benefits and had their benefit accruals frozen under the Retirement Plan).

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(7) Mr. Batty's benefit has been valued assuming termination of employment as of December 31, 2016 and retirement as of January 1, 2017, the earliest time at which Mr. Batty may retire without any benefit reduction due to age.

For further information concerning our pension plan, including assumptions and estimates used in projecting pension costs and projected benefit obligations, see Note 12 of our Consolidated Financial Statements contained in our Annual Report on Form 10-K for the year ended December 31, 2016, as filed with the SEC and "Compensation Discussion and Analysis" above.

Other Compensation Arrangements

Savings Plan

All of our regular, full-time U.S. employees, including eligible named executive officers, are eligible to participate in our Savings Plan. Assets in the Savings Plan are held in five types of accounts: an after-tax account to which participants may make contributions on an after-tax basis; a before-tax account to which participants may make contributions on a pre-tax basis; a Company contribution account to which matching contributions are allocated; an employer contribution account to which certain additional Company contributions are allocated; and a Roth 401(k) after-tax account to which participants may make contributions on an after-tax basis. The maximum employee contribution (pre-tax and after-tax combined) for any year for any participant is 50.0% of such participant's compensation (subject to statutory limits).

We make a matching contribution to the Savings Plan for each participant who elects to contribute to the Savings Plan. The matching contribution is 100% of the first 3% of compensation and 50% of the next 2% of compensation that a participant contributes. Matching contributions under the Savings Plan are fully vested at all times. In addition to matching contributions, we make employer contributions to the Savings Plan each year equal to 1% of a participant's eligible compensation. A participant becomes vested in these employer contributions to the Savings Plan once he or she has completed three years of service.

Contributions to the Savings Plan are invested, as the employee directs, in various funds offered under the Savings Plan from time to time. Amounts invested under the Savings Plan may be switched into another investment option at any time. The account balances of participants reflect both their contributions and our contributions as well as the investment performance of the investments in which those amounts are invested. Distributions of account balances from the Savings Plan are generally made upon retirement or other termination of employment, unless deferred by the participant.

Non-Qualified Deferred Compensation

The following table shows the executive's contributions, company contributions, earnings and year-end account balances for our named executive officers in GrafTech's Compensation Deferral Plan, which is an unfunded, unsecured deferred compensation plan. The terms of the Compensation Deferral Plan are described below the table.

Executive	Executive Contributions in Last FY ($)	Company Contribution in Last FY ($)	Aggregate Earnings in Last FY ($) (1)	Aggregate Withdrawals or Distributions in Last FY ($)	Aggregate Balance at Last FYE ($)
Hawthorne, J.L.	—	—	396	—	5,370
Coburn, Q.J.	—	—	292	—	4,010
Blair, D.A.	—	—	2,807	—	26,432
Batty, L.D.	—	—	36,552	—	239,767

(1) The amounts Listed in this column are not included in the Summary Compensation Table because none of the earnings were "above market" or "preferential". Earnings are based on the performance of investments available under the Compensation Deferral Plan, which are "notional" investments, including any interest and dividends paid on the investments.

(2) The amounts Listed in this column are not included in the Summary Compensation Table because none of the earnings were "above market" or "preferential". Earnings are based on the performance of investments available under the Compensation Deferral Plan, which are "notional" investments, including any interest and dividends paid on the

investments.

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The named executive officers, with the exception of Mr. Dutton, all participate in our non-qualified Compensation Deferral Plan. Under the Compensation Deferral Plan, participants are able to defer up to 85% of their ICP compensation, up to 50% of their base salary.

Deferrals and contributions to our Compensation Deferral Plan are credited with a rate of return based on the performance of various funds selected by the participants from indices which are designated by the Plan Administrator. An employee may prospectively change the funds for crediting rates of return at any time. The account balances of participants are credited with both their deferrals and our additions, as well as the rate of return on the funds selected by the participants for those amounts. Frozen Lump Sums and their earnings are held in notional investment accounts selected by the employee

Distributions of account balances from the Compensation Deferral Plan are generally made in January following retirement or other termination of employment or, if elected by the participant, upon a future date specified by the participant, except that Frozen Lump Sums and GrafTech allocations may not be distributed prior to age 50. Participants may also elect to have their account balances distributed upon a change in control of GrafTech. For purposes of the Compensation Deferral Plan, a change in control is generally defined in accordance with requirements of the American Jobs Creation Act of 2004 for amounts deferred as noted after December 31, 2004. For amounts accrued and vested as of December 31, 2004, the definition of a change in control is described under "Potential Payments on Termination or Change in Control." The Compensation Deferral Plan is intended to comply with Section 409A of the Code governing deferred compensation arrangements except that amounts that were contributed to the Compensation Deferral Plan and fully vested by December 31, 2004, including all of the Frozen Lump Sums, are not subject to the restrictions of Section 409A. Amounts under the Compensation Deferral Plan are generally payable in a lump sum, although participants may elect to have their accounts payable in annual installments instead.

Director Compensation

Non-employee director Peter Gordon received no compensation from GrafTech for his services in 2016.

Non-employee director Denis Turcotte received $75,000 in meeting fees plus reimbursement for travel expenses and incidentals.

Director Committees

GrafTech no longer has a class of equity securities registered pursuant to Section 12 of the Exchange Act and, accordingly, is not required to have standing committees of the Board, including an audit committee, a nominating and governance committee or an executive compensation committee. Given that GrafTech is wholly-owned by Brookfield, there is no need for policies or procedures by which security holders may recommend nominees or otherwise communicate with the Board. The Board may periodically establish committees, in each case so that certain important matters can be addressed in greater depth than may be possible in a meeting of the entire Board. We also do not currently feel an audit committee or compensation committee is required at this time due to the small size of the Board of Directors and the fact that three of the four members of the Board are deemed to be independent under New York Stock Exchange rules. As such, we do not have an audit committee financial expert.

Compensation Plan Risk

We regularly assess the risks related to our compensation programs and policies, including our executive compensation programs, and analyze the checks and balances associated with such plans. We have implemented control to manage those risks that include:

- balanced and competitive mix of salaries, benefits, and annual and long-term incentives aligned with our operational and strategic goals;
- our Board's guidance in developing our compensation arrangements, plans, programs and policies;
- approval by our Board of significant compensation plans and programs; and
- oversight by the Board of compensation plans and programs for management employees, including approval of incentive plan goals, review of actual performance against goals, and approval of award payouts.

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

All issued and outstanding shares of our Common Stock are owned by Brookfield. Upon the consummation of our acquisition by Brookfield, all compensation plans (including individual compensation arrangements) under which equity securities of the Company were previously authorized for issuance (whether or not previously approved by security holders) were terminated. Accordingly, the Company does not have any securities authorized for issuance under equity compensation plans.

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

The Board has determined that, to be considered independent, an outside director may not have a material relationship with the Company (directly or as a partner, stockholder or officer of an organization that has a relationship with the Company). In determining whether a material relationship exists, the Board considers, among other things, whether a director or a member of his or her immediate family received in any 12-month period during the past three years more than $120,000 in direct compensation from the Company (other than director fees and pension or other deferred compensation for prior service), whether the director has in the last three years been a Company employee (or whether a member of the director's immediate family has in the last three years been a GrafTech executive officer), whether the director or a member of the director's immediate family is or has been affiliated with a current or former auditor of GrafTech, and whether the director is or has been part of an interlocking directorate.

The Board currently consists of four members. Mr. Dutton, who is a GrafTech employee, is not an independent director (within the meaning of the "independence" described above). Based on the criteria described above, each of the other members of the Board have been determined to be an independent director.

Due to their relationship with Brookfield, Messrs. Bloom, Gordon and Turcotte may be deemed to have an indirect interest in Brookfield's investment in GrafTech and any payments made by GrafTech to Brookfield. Details of such transactions are described in the Company's Current Reports on Form 8-K filed with the SEC on August 11, 2015 and August 18, 2015, which are incorporated by reference herein.

Item 14. PRINCIPAL ACCOUNTANT FEES AND SERVICES

Registered Independent Public Accounting Firm's Fees

The following table sets forth fees paid or payable to Deloitte & Touche LLP, our independent registered public accounting firm appointed in October 1st, 2015. All of the services provided to us by Deloitte & Touche LLP were approved by the Audit Committee in accordance with this pre-approval policy and procedure.

	2015	2016
Audit Fees (a)	$1,694,684	$1,407,000
Tax Fees (b)	—	$101,947
Total	$1,694,684	$1,508,947

(a) The category of "Audit Fees" includes fees in connection with:

- audits of our annual consolidated financial statements;
- reviews of our quarterly financial statements; and
- statutory and regulatory audits of subsidiaries.

(b) The category of "Tax Fees" includes fees in connection with:

- Tax compliance and consulting services

PART IV

Item 15. Exhibits and Financial Statement Schedules

(a)(1)Financial Statements

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See Index to Consolidated Financial Statements at page 63 of this Report.

(2) Financial Statement Schedules

None.

(b) Exhibits

The exhibits listed in the following table have been filed with, or incorporated by reference into, this Report.

Exhibit Number	Description of Exhibit
2.1.0(1)	Recapitalization and Stock Purchase and Sale Agreement dated as of November 14, 1994 among Union Carbide Corporation, Mitsubishi Corporation, GrafTech International Ltd. and GrafTech International Acquisition Inc. and Guaranty made by Blackstone Capital Partners II Merchant Banking Fund L.P. and Blackstone Offshore Capital Partners II L.P.
2.2.0(1)	Stock Purchase and Sale Agreement dated as of November 9, 1990 among Mitsubishi Corporation, Union Carbide Corporation and UCAR Carbon Company Inc.
2.3.0(1)	Transfer Agreement dated January 1, 1989 between Union Carbide Corporation and UCAR Carbon Company Inc.
2.3.1(1)	Amendment No. 1 to Transfer Agreement dated December 31, 1989.
2.3.2(1)	Amendment No. 2 to Transfer Agreement dated July 2, 1990.
2.3.3(1)	Amendment No. 3 to Transfer Agreement dated as of February 25, 1991.
2.4.0(1)	Amended and Restated Realignment Indemnification Agreement dated as of June 4, 1992 among Union Carbide Corporation, Union Carbide Chemicals and Plastics Company Inc., Union Carbide Industrial Gases Inc., UCAR Carbon Company Inc. and Union Carbide Coatings Service Corporation.
2.5.0(1)	Environmental Management Services and Liabilities Allocation Agreement dated as of January 1, 1990 among Union Carbide Corporation, Union Carbide Chemicals and Plastics Company Inc., UCAR Carbon Company Inc., Union Carbide Industrial Gases Inc. and Union Carbide Coatings Service Corporation.
2.5.1(1)	Amendment No. 1 to Environmental Management Services and Liabilities Allocation Agreement dated as of June 4, 1992.
2.6.0(2)	Trade Name and Trademark License Agreement dated March 1, 1996 between Union Carbide Corporation and UCAR Carbon Technology Corporation.
2.7.0(1)	Employee Benefit Services and Liabilities Agreement dated January 1, 1990 between Union Carbide Corporation and UCAR Carbon Company Inc.
2.7.1(1)	Amendment to Employee Benefit Services and Liabilities Agreement dated January 15, 1991.
2.7.2(1)	Supplemental Agreement to Employee Benefit Services and Liabilities Agreement dated February 25, 1991.
2.8.0(1)	Letter Agreement dated December 31, 1990 among Union Carbide Chemicals and Plastics Company Inc., UCAR Carbon Company Inc., Union Carbide Grafito, Inc. and Union Carbide Corporation.
2.9.0(37)	Agreement and Plan of Merger dated as of May 17, 2015 among GrafTech International Ltd., BCP IV GrafTech Holdings LP and Athena Acquisition Subsidiary, Inc.
3.1.0(36)	Amended and Restated Certificate of Incorporation of GrafTech International Ltd. dated August 2015.
3.2.0(36)	Amended and Restated By-Laws of GrafTech International Ltd. dated as of August 2015.
4.1.0(29)	6.375% Senior Notes due 2020.
10.1.0(27)	European Guarantee and Luxembourg Security Agreement dated as of April 20, 2012, made by GrafTech Luxembourg I S.à.r.l., GrafTech Luxembourg II S.à.r.l. and GrafTech Switzerland S.A., in favor of JPMorgan Chase Bank, N.A., as collateral agent for the Secured Parties (as defined therein).

Exhibit Number	Description of Exhibit
10.1.1(27)	Second Amended and Restated Indemnity, Subrogation and Contribution Agreement dated as of April 20,

2012, among GrafTech International Ltd., GrafTech Finance Inc., each of the other Domestic Subsidiaries (as
defined therein) from time to time party thereto, and JPMorgan Chase Bank, N.A., as collateral agent for the
Secured Parties (as defined therein).

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10.1.2(27)	Pledge Agreement dated as of March 26, 2012, by GrafTech Luxembourg I S.à.r.l. in favor of JPMorgan Chase Bank, N.A., as collateral agent for the Secured Parties (as defined therein).
10.1.3(27)	Pledge Agreement dated as of March 30, 2012, by GrafTech Luxembourg II S.à.r.l. in favor of JPMorgan Chase Bank, N.A., as collateral agent for the Secured Parties (as defined therein).
10.1.4(21)	Amended and Restated Intellectual Property Security Agreement dated as of April 28, 2010 made by GrafTech International Ltd., GrafTech Global Enterprises Inc., GrafTech Finance Inc., and the other subsidiaries of GrafTech International Ltd. from time to time party thereto, in favor of JPMorgan Chase Bank, N.A., as Collateral Agent for the Secured Parties.
10.1.5(21)	Swiss Security Agreement dated April 28, 2010 between GrafTech Switzerland S.A., as Assignor, and JPMorgan Chase Bank, N.A., as Assignee.
10.1.6(21)	Form of LC Subsidiary Agreement among GrafTech Finance Inc. or GrafTech Switzerland S.A., as the Applicable Borrower, the applicable LC Subsidiary and JPMorgan Chase Bank, N.A., as Administrative Agent.
10.1.7(39)	Second Amended and Restated Credit Agreement dated as of February 27, 2015, among GrafTech International Ltd., GrafTech Finance Inc., GrafTech Luxembourg I S.à.r.l., GrafTech Luxembourg II S.à.r.l. and GrafTech Switzerland S.A.; the LC Subsidiaries (as defined therein) from time to time party thereto; and JPMorgan Chase Bank, N.A., as Administrative Agent and Collateral Agent, as an Issuing Bank and as Swingline Lender (as defined therein), filed as Exhibit A to the Second Amendment and Restatement Agreement dated as of February 27, 2015, among such parties.
10.1.8(40)	Second Amendment dated as of July 28, 2015 in respect of the Second Amended and Restated Credit Agreement dated as of February 27, 2015 among GrafTech International Ltd., GrafTech Finance Inc., GrafTech Luxembourg I SarL, GrafTech Luxembourg II SarL, GrafTech Switzerland S.A., the LC Subsidiaries from time to time party thereto, the Lenders from time to time party thereto, and JPMorgan Chase Bank, N.A., as Administrative Agent and Collateral Agent, as an Issuing Bank and as Swingline Lender.
10.1.9(34)	Second Amended and Restated Pledge Agreement dated as of April 23, 2014, by GrafTech Switzerland S.A. in favor of JPMorgan Chase Bank, N.A., as collateral agent for the Secured Parties (as defined therein).
10.1.10(34)	Third Amended and Restated Pledge Agreement dated as of April 23, 2014, among GrafTech International Ltd., GrafTech Finance Inc., the other subsidiaries of GrafTech International Ltd. from time to time party thereto, and JPMorgan Chase Bank, N.A., as collateral agent for the Secured Parties (as defined therein).
10.1.11(34)	Third Amended and Restated Security Agreement dated as of April 23, 2014, made by GrafTech International Ltd., GrafTech Finance Inc., and the other subsidiaries of GrafTech International Ltd. from time to time party thereto, in favor of JPMorgan Chase Bank, N.A., as collateral agent for the Secured Parties (as defined therein).
10.1.12(39)	2015 U.S. Reaffirmation Agreement dated as of February 27, 2015, among GrafTech International Ltd., GrafTech Finance Inc., GrafTech Luxembourg I S.à.r.l., GrafTech Luxembourg II S.à.r.l. and GrafTech Switzerland S.A.; the Subsidiaries party thereto; and JPMorgan Chase Bank, N.A., as Administrative Agent and Collateral Agent.
10.1.13(39)	2015 Luxembourg Reaffirmation Agreement dated as of February 27, 2015, among GrafTech International Holdings, Inc., GrafTech Luxembourg I S.à.r.l., and JPMorgan Chase Bank, N.A., as

	Administrative Agent and Collateral Agent.
10.1.14(27)	Second Amended and Restated Guarantee Agreement dated as of April 20, 2012, made by GrafTech International Ltd., GrafTech Finance Inc., and the other subsidiaries of GrafTech International Ltd. from time to time party thereto, in favor of JPMorgan Chase Bank, N.A., as collateral agent for the Secured Parties (as defined therein).
10.2.0(8)	Form of Restricted Stock Unit Agreement.
10.3.0(14)	Forms of Restricted Stock Agreement (2005 LTIP Version).
10.4.0(26)	Form of Long Term Incentive Plan Award Agreement (2010 Version).
10.4.1(26)	Form of Long Term Incentive Plan Award Agreement (2011 Version).
10.4.2(30)	Form of Long Term Incentive Plan Award Agreement (2012 Version).
10.4.3(31)	Form of Long Term Incentive Plan Award Agreement (2013 Version).
10.4.4(36)	Form of Equity Incentive Plan Award Agreement (Standard Version Effective 2014).
10.4.5(33)	Restricted Stock Agreement (2005 Plan; Director Version)
10.5.0(9)	GrafTech International Ltd. Management Stock Incentive Plan (Senior Version) as amended and restated through July 31, 2003.
10.6.0(10)	GrafTech International Ltd. Incentive Compensation Plan, effective January 1, 2003.

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10.6.1(16)	Amendment No. 1 GrafTech International Ltd. Incentive Compensation Plan dated December 29, 2008.
10.7.0(11)	Form of Restricted Stock Agreement (Standard Form).
10.8.0(16)	GrafTech International Holdings Inc. Compensation Deferral Program as amended and restated (December 29, 2008).

Exhibit Number	Description of Exhibit
10.9.0(26)	Amended and Restated GrafTech International Ltd. 2005 Equity Incentive Plan.
10.10.0(8)	Form of Severance Compensation Agreement for senior management (U.S. 2.99 Version).
10.10.1(16)	Form of IRS 409A Amendment to Severance Compensation Agreement for senior management (December 2008 U.S. 2.99 Version).
10.10.2(25)	Form of Severance Compensation Agreement for senior management (U.S. 2.99 Version - Revised).
10.10.3(34)	GrafTech International Holdings Inc. 2014-2016 Executive Selective Severance Program
10.10.4(41)	Form of 2014 - 2016 Executive Selective Severance Program Notification Letter
10.11.0(16)	Form of IRS 409A Amendment to Severance Compensation Agreement for senior management (December 2008 International 2.99 Version).
10.12.0(14)	Form of Non-qualified Stock Option Agreement.
10.14.0(14)	Form of Terms and Conditions of Sale to standard contract of sale (2007 revision)
10.15.0(13)	Technology License Agreement, dated as of December 5, 2006, among GrafTech International Ltd., UCAR Carbon Company Inc., Alcan France, and Carbone Savoie (confidential treatment requested under Rule 24b-2 as to certain portions which are omitted and filed separately with the SEC.)
10.16.0(24)	Form of Indemnification Agreement with Directors and Executive Officers.
10.17.0(18)	Executive Incentive Compensation Plan.
10.19.0(23)	Registration Rights and Stockholders' Agreement, dated as of November 30, 2010, by and among GrafTech International Ltd. and each of the stockholders party thereto entered into pursuant to April 28, 2010 Agreements and Plans of Merger.
10.20.0(29)	Indenture, dated November 20, 2012, among GrafTech International Ltd., the Subsidiary Guarantors and U.S. Bank National Association, as Trustee.
10.21.0(38)	Investment Agreement, dated as of May 4, 2015, among GrafTech International Ltd. and BCP IV GrafTech Holdings LP.
12.1.0(42)	Computation of Ratio of Earnings to Fixed Charges.
21.1.0(31)	List of subsidiaries of GrafTech International Ltd.
24.1.0(42)	Powers of Attorney. (Included on Signatures pages).
31.1.0(42)	Certification pursuant to Rule 13a-14(a) under the Exchange Act by Joel L. Hawthorne, Chief Executive Officer and President.
31.2.0(42)	Certification pursuant to Rule 13a-14(a) under the Exchange Act by Quinn J. Coburn, Vice President and Chief Financial Officer.
32.1.0(42)	Certification pursuant to Section 906 of the Sarbanes-Oxley Act of 2002, by Joel L. Hawthorne, Chief Executive Officer and President.
32.2.0(42)	Certification pursuant to Section 906 of the Sarbanes-Oxley Act of 2002, by Quinn J. Coburn, Vice President and Chief Financial Officer.
101	INS XBRL Instance Document
101	SCH XBRL Taxonomy Extension Schema Document
101	CAL XBRL Taxonomy Extension Calculation Linkbase Document
101	DEF XBRL Taxonomy Extension Definition Linkbase Document
101	LAB XBRL Taxonomy Extension Label Linkbase Document
101	PRE XBRL Taxonomy Extension Presentation Linkbase Document

(1)

Incorporated by reference to the Registration Statement of GrafTech International Ltd. and GrafTech Global Enterprises Inc. on Form S-1 (Registration No. 33-84850).

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(2) Incorporated by reference to the Quarterly Report of the registrant on Form 10-Q for the quarter ended March 31, 1996 (File No. 1-13888).
(3) Incorporated by reference to the Annual Report of the registrant on Form 10-K for the year ended December 31, 1998 (File No. 1-13888).
(4) Incorporated by reference to the Quarterly Report of the registrant on Form 10-Q for the quarter ended June 30, 2003 (File No. 1-13888).
(5) Incorporated by reference to the Annual Report of the registrant on Form 10-K for the year ended December 31, 2001 (File No. 1-3888).
(6) Incorporated by reference to the Annual Report of the registrant on Form 10-K for the year ended December 31, 2004 (File No. 1-13888).
(7) Incorporated by reference to the Quarterly Report of the registrant on Form 10-Q for the quarter ended September 30, 2005 (File No. 1-13888).
(8) Incorporated by reference to the Annual Report of the registrant on Form 10-K for the year ended December 31, 2005 (File No. 1-13888).
(9) Incorporated by reference to the Registration Statement of the registrant on Form S-3 (Registration No. 333-108039).
(10) Incorporated by reference to the Quarterly Report of the registrant on Form 10-Q for the quarter ended March 31, 2006 (File No. 1-13888).
(11) Incorporated by reference to the Current Report of the registrant on Form 8-K filed on September 6, 2005 (File No. 1-13888).
(12) Incorporated by reference to the Quarterly Report of the registrant on Form 10-Q for the quarter ended June 30, 2001 (File No. 1-13888).
(13) Incorporated by reference to the Annual Report of the registrant on Form 10-K for the year ended December 31, 2006 (File No. 1-13888).
(14) Incorporated by reference to the Annual Report of the registrant on Form 10-K for the year ended December 31, 2007 (File No. 1-13888).
(15) Incorporated by reference to the Quarterly Report of the registrant on Form 10-Q for the quarter ended June 30, 2008 (File No. 1-13888).
(16) Incorporated by reference to the Annual Report of the registrant on Form 10-K for the year ended December 31, 2008 (File No. 1-13888).
(17) Incorporated by reference to the Quarterly Report of the registrant on Form 10-Q for the quarter ended March 31, 2009 (File No. 1-13888).
(18) Incorporated by reference to the Definitive Proxy Statement for the 2009 Annual Meeting of Stockholders of the registrant (File No. 1-13888).
(19) Incorporated by reference to the Annual Report of the registrant on Form 10-K for the year ended December 31, 2009 (File No. 1-13888).
(20) Incorporated by reference to Amendment No. 1 to the Annual Report of the registrant on Amendment No.1 to Form 10-K for the year ended December 31, 2009 (File No. 1-13888).
(21) Incorporated by reference to the Registration Statement of GrafTech Holdings Inc. on Form S-4 (Registration No. 167446) filed June 10, 2010.
(22) Incorporated by reference to Amendment No. 1 to the Registration Statement of GrafTech Holdings Inc. on Form S-4 (Registration No. 167446) filed August 19, 2010.
(23) Incorporated by reference to the Current Report of the registrant on Form 8-K filed on November 30, 2010 (File No. 1-13888).
(24) Incorporated by reference to the Annual Report of the registrant on Form 10-K for the year ended December 31, 2010 (File No. 1-13888).
(25) Incorporated by reference to the Quarterly Report of the registrant on Form 10-Q for the quarter ended June 30, 2011 (File No. 1-13888).
(26)

Incorporated by reference to the Annual Report of the registrant on Form 10-K for the year ended December 31, 2011 (File No. 1-13888).

(27) Incorporated by reference to the Quarterly Report of the registrant on Form 10-Q for the quarter ended March 31, 2012 (File No. 1-13888).

(28) Incorporated by reference to the Quarterly Report of the registrant on Form 10-Q for the quarter ended September 30, 2012 (File No. 1-13888).

(29) Incorporated by reference to the Current Report of the registrant on Form 8-K filed on November 20, 2012 (File No. 1-13888).

(30) Incorporated by reference to the Annual Report of the registrant on Form 10-K for the year ended December 31, 2012 (File No. 1-13888).

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(31) Incorporated by reference to the Annual Report of the registrant on Form 10-K for the year ended December 31, 2013 (File No. 1-13888).
(32) Incorporated by reference to the Current Report of the registrant on Form 8-K filed on November 25, 2014 (File No. 1-13888).
(33) Incorporated by reference to the Quarterly Report of the registrant on Form 10-Q for the quarter ended June 30, 2014 (File No. 1-13888).
(34) Incorporated by reference to the Quarterly Report of the registrant on Form 10-Q for the quarter ended March 31, 2014 (File No. 1-13888).
(35) Incorporated by reference to the Quarterly Report of the registrant on Form 10-Q for the quarter ended September 30, 2014 (File No. 1-13888).
(36) Incorporated by reference to the Current Report of the registrant on Form 8-K filed on August 20, 2015 (File No. 1-13888).
(37) Incorporated by reference to the Current Report of the registrant on Form 8-K filed on May 18, 2015 (File No. 1-13888).
(38) Incorporated by reference to the Current Report of the registrant on Form 8-K filed on May 4, 2015 (File No. 1-13888).
(39) Incorporated by reference to the Current Report of the registrant on Form 8-K filed on March 3, 2015 (File No. 1-13888).
(40) Incorporated by reference to the Quarterly Report of the registrant on Form 10-Q for the quarter ended June 30, 2015 (File No. 1-13888).
(41) Incorporated by reference to the Annual Report of the registrant on Form 10-K for the year ended December 31, 2014 (File No. 1-13888).
(42) Filed herewith.

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EXHIBIT INDEX

The exhibits listed in the following table have been filed with this Report.

Exhibit Number	Description of Exhibit
12.1.0	Computation of Ratio of Earnings to Fixed Charges
24.1.0	Powers of Attorney (Included on Signatures pages)
31.1.0	Certification pursuant to Rule 13a-14(a) under the Exchange Act by Joel L. Hawthorne, President and Chief Executive Officer.
31.2.0	Certification pursuant to Rule 13a-14(a) under the Exchange Act by Quinn J. Coburn, Vice President and Chief Financial Officer .
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SIGNATURES

Pursuant to the requirements 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.

GRAFTECH INTERNATIONAL LTD.

February 27, 2017	By:	/s/ Jeffrey C. Dutton
		Jeffrey C. Dutton
	Title:	President and Chief Executive Officer
February 27, 2017	By:	/s/ Quinn J. Coburn
		Quinn J. Coburn
	Title:	Vice President and Chief Financial Officer

KNOW ALL MEN BY THESE PRESENTS, that each individual whose signature appears below hereby constitutes and appoints Jeffrey C. Dutton and Quinn J. Coburn, and each of them individually, his or her true and lawful agent, proxy and attorney-in-fact, with full power of substitution and resubstitution, for him or her and in his or her name, place and stead, in any and all capacities, to (i) act on, sign and file with the Securities and Exchange Commission any and all amendments to this Report together with all schedules and exhibits thereto, (ii) act on, sign and file with the Securities and Exchange Commission any and all exhibits to this Report and any and all exhibits and schedules thereto, (iii) act on, sign and file any and all such certificates, notices, communications, reports, instruments, agreements and other documents as may be necessary or appropriate in connection therewith and (iv) take any and all such actions which may be necessary or appropriate in connection therewith, granting unto such agents, proxies and attorneys-in-fact, and each of them individually, full power and authority to do and perform each and every act and thing necessary or appropriate to be done, as fully for all intents and purposes as he or she might or could do in person, and hereby approving, ratifying and confirming all that such agents, proxies and attorneys-in-fact, any of them or any of his, her or their substitute or substitutes, may lawfully do or cause to be done by virtue hereof.

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.

Signatures	Title	Date
/s/ Jeffrey C. Dutton	President and Chief Executive Officer (Principal Executive Officer)	February 27, 2017
Jeffrey C. Dutton		
/s/ Quinn J. Coburn	Vice President and Chief Financial Officer (Principal Financial Officer)	February 27, 2017
Quinn J. Coburn		
/s/ J. Peter Gordon	Director	February 27, 2017
J. Peter Gordon		
/s/ Denis A. Turcotte	Director	February 27, 2017
Denis A. Turcotte		
/s/ Ron A. Bloom	Director	February 27, 2017
Ron A. Bloom		