GRAFTECH INTERNATIONAL LTD
Form 10-K
March 07, 2016
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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, 2015
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 x 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

The aggregate market value of our outstanding common stock held by non-affiliates, computed by reference to the closing price of our common stock on June 30, 2015, was approximately $641.6 million. On January 31, 2016, 100 shares of our common stock were outstanding.

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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 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 and July 28, 2015.

"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 postretirement 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.

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 guage 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 also produce needle coke products, which are the primary raw material needed in the manufacture of graphite electrodes. We also manufacture carbon, graphite, and semi-graphite refractory products, which protect the walls of blast furnaces and submerged arc furnaces. We are one of the leading manufacturers of high quality flexible graphite products, enabling thermal management solutions for the electronics industry. We are one of the largest manufacturers and providers of advanced graphite and carbon materials used in the transportation, solar and oil and gas exploration industries.We design, manufacture and test advanced composites used in many applications including ultra-light-weight thermal protection, high-strength heat shields and various other components.

We currently manufacture our products in 16 manufacturing facilities strategically located on four continents. We believe our Industrial Materials business has the largest manufacturing capacity and 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 and Engineered Solutions businesses for success. As a result we have reduced our manufacturing facilities in both businesses, reduced graphite electrode capacity and exited certain product lines in the Engineered Solutions business. 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 629 issued and pending patent applications and have been the recipient of eight R&D 100 Awards in the past 12 years. Our technological capabilities include developing products with superior thermal, electrical and physical characteristics that provide a differentiated advantage.

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.

Products. 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.

Reportable Segments. Our businesses are reported in the following reportable segments: Industrial Materials, which include graphite electrodes, refractory products and needle coke products; and Engineered Solutions, which includes advanced graphite materials, advanced composite materials, advanced electronics technologies and advanced materials.

Industrial Materials. Our Industrial Materials segment manufactures and delivers high quality graphite electrodes, refractory products and needle coke products. 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.

GrafTech is also a leading global supplier of carbon, semi-graphitic and graphite refractory hearth linings for blast and submerged arc furnaces used to produce iron and ferroalloys. Carbon and graphite refractory products are used to protect the walls and bottoms of these furnaces due to their ability to withstand extreme conditions, thermally and mechanically. Among the major refractory product suppliers, GrafTech has one of the most complete offerings, including a full range of brick, block, ramming paste, cement and grout products.

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.

Engineered Solutions. The Engineered Solutions segment includes advanced graphite materials, advanced composite materials, advanced electronics technologies and advanced 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 composite materials are highly engineered carbon products that are woven into various shapes, primarily to support the aerospace and defense industries. Advanced electronics technologies products consist of electronic thermal management solutions, fuel cell components, and sealing materials. Advanced materials use carbon and graphite powders as components or additives in a variety of industries, including lithium ion batteries, metallurgical processing, fuel cell components and polymer additives.

Industrial Materials Segment

Our Industrial Materials segment, which had net sales of $909 million in 2013, $840 million in 2014 and $535 million in 2015 manufactures and delivers high quality graphite electrodes, refractory products and needle coke products, as well as provides customer technical services. Industrial Materials sales represented approximately 82%, of consolidated net sales in 2013 and 78% in 2014, and 2015. We estimate that the worldwide sales for products serviced by our Industrial Materials segment was approximately $5 billion in 2014 and approximately $3.5 billion in 2015. 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.

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 2% of the total cost of producing steel in a typical electric arc furnace.

EAF steel production was estimated to be approximately 398 million metric tons in 2015, representing approximately 25% of the world's steel production. The World Steel Association's utilization rate for the total steel market was 73% in 2014 and 70% in 2015. 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 1.94 million metric tons for 2013, 1.88 million metric tons for 2014 and approximately 1.85 million metric tons for 2015. We believe that the graphite electrode industry manufacturing capacity utilization rate worldwide was approximately 70% for 2014 and 65% for 2015. 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 2015. This production capacity is down approximately 60,000 metric tons from previous years due to our rationalization initiatives. See Note 3 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.

Refractory Products. We manufacture carbon and semi-graphite, HotPressed™ refractory bricks, as well as other graphite and carbon refractory blocks, all of which are used primarily for their durability in very demanding high temperature melting environments. Common applications are in blast furnaces and submerged arc furnaces for ferroalloy production include cooling courses in the hearth bottoms for heat distribution and removal, backup linings in hearth walls for improved heat transfer and lintels over copper coding plates where a single brick cannot span the cooling plate. Our refractories are especially suitable for the lower part of these furnaces, where refractory performance is the most critical to ensure high productivity and long campaign lives.

In manufacturing the HotPressed™ bricks, GrafTech uses a proprietary carbon making process. The raw material is heated in brick sized molds and high pressure is applied simultaneously. This results in bricks with very competitive properties for these melting applications produced in only minutes compared to the month required in the traditional block process. We believe that Graftech refractory solutions offer reliability and a safer working environment for iron and ferroalloy makers all around the world.

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 Segment

Our Engineered Solutions segment had sales of $257.2 million in 2013, $245.2 million in 2014 and $151.5 million in 2015. Engineered Solutions represented approximately 22% of consolidated net sales for 2013, 2014 and 2015. We estimate that the addressable worldwide demand for Engineered Solutions products was $2,300 million in 2013, $2,400 million in 2014 and $2,800 million in 2015.

Advanced Graphite Materials. We manufacture extruded and molded graphite blocks weighing up to ten metric tons and machined graphite parts used in many applications including metallurgy, high-temperature industrial, and alternative energy applications. In addition, we produce a line of high temperature (> 1200C) insulation for induction furnaces, high temperature vacuum furnaces, direct solidification furnaces and other high temperature furnace applications.

Advanced Composite Materials. We design, manufacture and test advanced composites used in many applications including ultra-light-weight thermal protection, high-strength heat shields and various other components. Markets include automotive, petrochemical and aerospace/defense. Fiber Materials Inc. (FMI), is recognized as an industry leader producing high-temperature materials and advanced composite products for extremely demanding applications.

Advanced Electronics Technologies. We manufacture flexible natural and synthetic graphite products. Applications include thermal management solutions used in advanced consumer electronics (including smart phones, televisions, tablets and displays), and sealing in the automotive, petrochemical and alternative energy industries. We are one of the world's largest manufacturers of flexible natural and synthetic graphite products for these uses and applications.

Advanced Materials. We manufacture primary synthetic graphite powders, natural flake graphite powders, coke powders, and various other carbon/graphite powder derivatives. Markets include lithium ion batteries, industrial lubricants, hot metal forming lubricants and conductive polymer fillers.

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 in our major product lines, 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
- 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 75% of net sales in 2013, approximately 74% of net sales in 2014 and 2015. No single customer or group of affiliated customers accounted for more than 10% of our total net sales in 2013, 2014 or 2015.

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. As discussed in Note 3 of the Financial Statements, we have closed two graphite electrode manufacturing facilities to better align our production with customer demand. We reduced our inventory levels during 2013, 2014 and 2015 and plan to further reduce inventory levels in 2016. 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. We are applying these methodologies and tools to not only our manufacturing processes; but also to our transactional and business processes such as accounts receivable, new product introduction, and cash forecasting in order to develop a high-performing value stream.

Accelerating Commercialization of Advantaged Technologies. We believe that our technological capabilities for developing products with superior thermal, electrical and physical characteristics provide us with a potential growth opportunity as well as a competitive advantage. We exploit these capabilities and our intellectual property portfolio to accelerate development and commercialization of these technologies across all of our businesses, to improve existing products, and to develop and commercialize new products for higher growth rate areas such as electronic thermal management technologies. We have received R&D Magazine's prestigious R&D 100 Award in eight of the past 12 years. The R&D 100 Award honors the 100 most technologically significant products introduced into the marketplace each year. We received this Award in 2003 and 2004 for our achievements in electronic thermal management products, in 2005 for our large-diameter pinless graphite electrodes, in 2006 for GRAFOAM® carbon foam, a unique high strength, light weight carbon foam, in 2007 for GrafCell® flow field plates, a key component to the commercialization of fuel cells, in 2009 for our GRAFIHX^{tm} Flexible Heat Exchangers, a graphite solution uniquely suited for radiant floor heating systems, in 2011 for the eGRAF® Spreadershield SS1500™ and in 2015 for 3D polymer matrix composites.

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 200 engineers and specialists around the world, 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 Stockholder 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, 2015, we had outstanding borrowings under our Revolving Facility of $98 million, Senior Notes with a carrying value of $268 million which will mature in 2020 with a redemption value of $300 million and cash and cash equivalents of $6.9 million. As of December 31, 2014, we had outstanding borrowings under our Revolving Facility of $40 million, $300 million of

Senior Notes, $188 million of Senior Subordinated Notes and cash and cash equivalents of $17.6 million. We had approximately $205 million of unused borrowing capacity under the Revolving facility (after considering financial covenants restrictions and the outstanding letters of credit of approximately $7.9 million) as of December 31, 2015. 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 or issuing more equity. We may at any time buy or sell assets, product lines or businesses.

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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 2013, we closed our graphite electrode manufacturing facilities in Brazil and South Africa, as well as our machine shop in Russia. See Note 3 of the financial statements for further discussion. During 2016, we plan to temporarily idle our U.S. facility to align with overall demand.

Refractory Products. Refractory bricks are manufactured in the United States, using a proprietary process. We have two primary grades of refractory products. The manufacture of a refractory block begins with the mixing and blending of the raw materials. The raw materials are fed into molds and pressed into shape. Intense heat and pressure are then applied. The bricks are cooled and then cut into the desired shapes. Our bricks are generally smaller than our competitors’ products. We believe our smaller brick size creates an easier installation process compared to larger bricks. We manufacture refractory bricks into sizes up to 18 inches, although we can manufacture bricks into a multitude of sizes and shapes to meet the needs of our customers.

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.

Advanced Graphite Materials. Advanced graphite materials are manufactured using processes and technologies similar to those of graphite electrodes. Manufacturing lead times range between four to twelve months for most products and depend on the specific material properties that are needed to be imparted in the final billet. After the forming, baking, impregnation, rebaking and graphitization steps, the billets are either dressed and sold as raw stock or are machined into custom parts against proprietary specifications supplied by our customers. We primarily produce advanced graphite materials in the United States and Italy.

Advanced Composite Materials. Advanced composite materials are primarily manufactured using a 3-dimensional carbon-fiber-composite weaving process. The 3-dimensional weaving process uses two sets of yarn woven in the fabric-width and length directions (X-Y) and a third yarn woven into the fabric thickness (Axial or Z direction) using specialty weaving equipment. This process results in a volumetric solid with yarns reinforcing both the planar and axial (Z) directions. Advanced composite materials are manufactured in two U.S. facilities.

Advanced Electronics Technologies. We use a proprietary process to convert mined natural graphite flake into expandable graphite, an intermediate product. We manufacture flexible graphite by subjecting expandable graphite to additional proprietary processing. We also produce synthetic flexible graphite through a proprietary process. Our

Advanced Electronics Technologies business primarily operates two manufacturing facilities in the U.S. We believe that we operate one of the world’s most sophisticated advanced natural and synthetic flexible graphite production lines.

Advanced Materials. We manufacture primary synthetic graphite powders, natural flake graphite powders, coke powders, and various other carbon/graphite powder derivatives. We manufacture advanced materials in both

Industrial Materials and Engineered Solutions locations in the United States, France, Mexico, Spain and Italy, with some final processing done in the United States.

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. Advanced electronics technologies has a quality assurance system designed to meet the most stringent requirements of its customers and is ISO TS 16949:2009 certified. 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 plan to obtain a substantial portion of our 2016 needle coke requirements internally.

Raw materials for refractory products are primarily sourced internally and from a variety of third parties. The primary raw material used in refractory products is crushed graphite.

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 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 200 engineers and specialists around the world, 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.

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 14 sales offices located around the world.

Industrial Materials. 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. We employ approximately 110 engineers and technicians in our Industrial Materials segment, a portion of who 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.

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

The majority of our products are custom built to customer specifications after an iterative review process between the customer's engineers and our sales and technical service employees. Our sales personnel are trained and experienced with the products they sell. We provide technical service to our customers through dedicated technical service engineers who operate out of our North American facilities, European facilities and Asian offices. We believe that our technical service differentiates us from our competition and take pride in our ability to support the technical requirements of our customers.

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. Over the past several years, we have analyzed our intellectual property portfolio to identify new product opportunities with high growth potential for us, redirected research to enhance and exploit our portfolio and accelerated development of such products.

Research and Development. We conduct our research and development both independently and in conjunction with our strategic suppliers, customers and others. We have a new dedicated innovation and technology center located near our corporate headquarters in Ohio that opened in February 2015 which focuses on all products. This new facility will place a greater emphasis on driving innovation to support new product development and focus on commercializing 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 $10.4 million in 2013, $14.8 million in 2014, and $5.6 million in the period January 1 through August 14, 2015 and $2.3 million in the period August 15 through December 31, 2015.

We believe that our technological and manufacturing strengths and capabilities provide us with a significant growth opportunity as well as a competitive advantage and are important factors in our selection by industry leaders and others as a strategic partner. Our technological capabilities include developing products with superior thermal, electrical and physical characteristics that provide a differentiating advantage. We seek to exploit these strengths and capabilities across all of our businesses, to improve existing products and to develop and commercialize new products with high growth potential.

A significant portion of our research and development is focused on new product development, particularly Engineered Solutions for advanced energy applications such as electronic thermal management and energy storage. Other significant work focuses on advancements in electrode technology and raw material optimization.

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 629 U.S. and foreign patents and published patent applications which are carbon and graphite related, which we believe is more than any of our major competitors (in the business segments in which we operate). Among our competitors, we hold one of the largest number of patents for flexible graphite, as well as the largest number of patents relating to the use of natural graphite for certain fuel cell applications. These patents expire at various times over the next two decades.

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 has been 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

Industrial Materials. 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.

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. In this segment, 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.

Our refractory products business competes based on product quality, useful life, and technology. We believe our proprietary hot press process and the smaller shape of our refractory bricks provides a more versatile product that is easier to install than larger refractory bricks.

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.

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. In 2012, our Seadrift production team collaborated with scientists from our Engineered Solutions segment to develop a super-premium grade of needle coke that we have successfully commercialized.

We believe there are currently approximately nine other firms producing needle coke. These competitors include Philips 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).

Engineered Solutions. Competitors of our Engineered Solutions segment compete on product differentiation and innovation, quality, price, delivery reliability and customer service depending on the specific demands or product applications.

We believe we are the technology leader within the segments we participate in, and we differentiate ourselves based on our ability to provide customers with a solution that gives them one of the lowest total operational costs in meeting their product manufacturing needs. We achieve this by using our extensive product, process and application knowledge.

We believe there are certain barriers to entry into this industry, including the need for extensive product and process know-how, intellectual property and a high initial capital investment.

We compete with other major specialty graphite competitors who manufacture and sell on a global basis. These competitors include SGL Carbon A.G. (Germany), Mersen S.A. (France), Tokai Carbon Co., Ltd. (Japan), Toyo Tanso Co., Ltd. (Japan), SEC Carbon Ltd. (Japan), Nippon Carbon Co. Ltd (Japan) and Graphite India Ltd. (India) and several other competitors, a number of which are in China and Japan. We also compete with Panasonic Corporation (Japan), and Kaneka Corporation (Japan) in certain thermal management markets.

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;
- 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 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, 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 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, 2015, we had 1,921 employees (excluding contractors), a decrease of 476 employees from December 31, 2014. A total of 434 employees were in Europe (including Russia), 564 were in Mexico and Brazil, 23 were in South Africa, 880 were in the U.S. and 20 were in the Asia Pacific region. As of December 31, 2015, 1,065 of our employees were hourly employees.

As of December 31, 2015, approximately 42% 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, 2015, approximately 523 employees, or 27% of our employees, were covered by agreements which expire, or are subject to renegotiation, at various times through December 31, 2016. 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.

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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.

While the global recovery continues, the pace of recovery remains sluggish and uneven geographically. Downside risks remain, including high unemployment, reduced consumer spending, high deficit spending by governments, turbulent financial markets (particularly in the euro area), tighter monetary policies (particularly in emerging markets). In the U.S., the uncertainty regarding government shutdowns and threatened shutdowns, significant mandated tax increases, government debt ceiling limitations, sequestration and government spending cuts and budget negotiations pose a serious risk for the U.S. economy and consumer confidence. In the event that the U.S. federal government is unable to achieve a resolution of these issues there could be an adverse impact on the U.S. economy, which could 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.

The International Monetary Fund reported GDP growth figures for 2015 at approximately 3.1%. We believe that in the graphite electrode markets the capacity utilization rate was approximately 70% for 2014 and 65% for 2015. 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 2016.

We are dependent on the global steel industry and also sell products used in the transportation, semiconductor, solar, petrochemical, electronics, and other industries which are susceptible to global and regional economic downturns.

We sell our Industrial Materials products, which accounted for about 78% of our total net sales in 2015, primarily to the EAF steel production industry. 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. 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.

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.

The steel industry, in particular, 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.

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, 2015, we had approximately $394.6 million of total indebtedness principal outstanding, including approximately $98.0 million of secured indebtedness outstanding under the Revolving Facility, and $267.8 million of Senior Notes ($300.0 million due upon maturity). Additionally, as of December 31, 2015, we had approximately $205.0 million of unused borrowing capacity under the Revolving Facility (after considering financial covenants restrictions and the outstanding letters of credit of approximately $7.9 million).

. 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;
- 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 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 include 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

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:

- 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, 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

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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 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.

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.

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.

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, 2015, GTI's subsidiaries that are not guarantors of the Senior Notes had total liabilities, including trade payables (but excluding intercompany liabilities), of approximately $144.4 million or 24% of our total liabilities, and total assets (excluding intercompany receivables) of approximately $808.3 million, or 57% of our total assets. In addition, for the year ended December 31, 2015, our subsidiaries that are not guarantors of the Senior Notes generated approximately $439.9 million, or 64%, of our consolidated revenues and approximately $23.8 million of our consolidated operating loss of $105.2 million.

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). As of December 31, 2015, there was approximately $205.0 million of unused borrowing capacity under the Revolving facility (after considering financial covenants restrictions and the outstanding letters of credit of approximately $7.9 million). 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;
- 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 2016 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,” “intend,” “should,” “would,” “could,” “target,” “goal,” “continue to,” “positioned to” and similar expressions, or the negatives 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:

- 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;
- 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 of delays in or failure to achieve successful development and commercialization of new or improved Engineered Solutions products or that such products or solutions could be subsequently displaced by other products or technologies;
- the possibility that we will fail to 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, (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.

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.		
Biddeford, Maine (2 facilities)	Advanced Composite Materials Manufacturing (both)	Owned (both)
Independence, Ohio	Corporate Headquarters	Leased
Brooklyn Heights, Ohio	Innovation and Technology Center	Leased
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
St. Marys, Pennsylvania	Graphite Electrode 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
Port Lavaca, Texas	Needle Coke Manufacturing Facility	Owned
Clarksburg, West Virginia	Advanced Graphite Materials Manufacturing Facility, Machine Shop and Sales Office	Owned
Europe		
Calais, France	Graphite Electrode Manufacturing Facility	Owned
Malonno, Italy	Advanced Graphite Materials Manufacturing and Machine Shop and Sales Office	Owned
Moscow, Russia	Sales Office	Leased
Pamplona, Spain	Graphite Electrode Manufacturing Facility and Sales Office	Owned
Bussigny, Switzerland	Sales Office	Leased
Other International		
Salvador Bahia, Brazil	Graphite Electrode Machine Shop	Owned

Beijing, China	Sales Office	Leased
Hong Kong, China	Sales Office	Leased
Shanghai, China	Sales Office	Leased
Monterrey, Mexico	Graphite Electrode Manufacturing Facility and Sales Office	Owned
Meyerton, South Africa	Refractory Machine Shop and Sales Office	Owned

We are currently preparing our former headquarters and research and development facility in Parma, Ohio for sale. Portions of our facilities in Salvadore Bahia, Brazil and Meyerton, South Africa are currently being marketed as we have eliminated graphite electrode production in these facilities. 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 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

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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.

On October 8, 2014, the General Superintendent of the Administrative Council of Economic Defense in Brazil (“CADE”) announced that the agency would be continuing an investigation of anticompetitive activity allegedly affecting the Brazilian market from 1992 to 1998. The investigation was originally commenced in 2002 and was essentially been dormant for many years. The investigation purportedly relates to violations of antitrust laws that were previously investigated in from 1997 to 2002 by the U.S. Department of Justice, the European Commission, and other countries in connection with the sale of graphite electrodes. Those antitrust investigations and related lawsuits and claims have long been resolved and all fines and settlements timely paid many years ago. On May 14, 2015, the Public Prosecutors’ Office published its legal opinion recommending that the case be dismissed based on (i) the interim statute of limitation and (ii) the lack of effect of the cartel on the Brazilian market, and the CADE Commissioners unanimously terminated the case on or about October 14, 2015. No penalties were assessed against us, and we have been advised that this decision is not capable of appeal.

Item 4. Mine Safety Disclosures

- Not applicable.

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, 2015, 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 2013, 2014 or 2015. We periodically review our dividend policy.

Under the Revolving Facility, in general, GrafTech is permitted to pay dividends and repurchase common stock in an aggregate amount (cumulative from April 23, 2014) up to $75 million (or $500 million, if certain leverage ratio requirements are satisfied) plus, each year, an aggregate amount equal to 50% of the consolidated net income in the prior year.

Unregistered Sales of Equity Securities and Use of Proceeds

On August 11, 2015, the Company issued 150,000 convertible preferred shares in a private placement transaction. No underwriter was involved. See Note 2 to the Financial Statements.

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
	2011	2012	2013	2014		
	(Dollars in thousands)					
Statement of Operations Data:						
Net sales	$1,320,184	$1,248,264	$1,166,674	$1,085,304	$437,931	$248,741
Income (loss) from continuing operations (a)	153,184	117,641	(27,259)	(285,376)	(120,649)	(33,551)
Basic earnings (loss) per common share:						
Net income (loss) per share	$1.06	$0.85	$(0.20)	$(2.10)	$(0.88)	N/A
Weighted average common shares outstanding (in thousands)	145,156	138,552	135,067	136,155	137,152	N/A
Diluted earnings (loss) per common share:						
Net income (loss) per share	$1.05	$0.84	$(0.20)	$(2.10)	$(0.88)	N/A
Weighted average common shares outstanding (in thousands)	146,402	139,700	135,067	136,155	137,152	N/A
Balance sheet data (at period end):						
Total assets	$2,168,366	$2,297,915	$2,217,848	$1,833,805	$1,681,669	$1,422,015
Other long-term obligations (b)	131,300	125,005	97,947	107,566	96,763	95,485
Total long-term debt	387,624	535,709	541,593	341,615	402,311	362,455
Other financial data:						
Net cash provided by operating activities	$76,597	$101,400	$116,837	$120,903	$28,323	$23,115
Net cash used in investing activities	(161,966)	(119,962)	(83,801)	(78,952)	(39,918)	(17,484)
Net cash (used in) provided by financing activities	85,461	24,112	(37,645)	(35,077)	20,824	(23,072)

(a) Income by period includes (items listed are pre-tax in nature unless otherwise noted)

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

For the Year Ended December 31, 2011 (Micron Research Corporation and Fiber Materials, Inc. are included in our Consolidated Financial Statements beginning as of February 10, 2011 and November 1, 2011, respectively):

- a $26.5 million income tax benefit primarily attributable to the release of valuation allowance for foreign tax credits carryforwards which are expected to be utilized in future years,

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a non-cash interest charge of $10.0 million related to the amortization of the discount on the Senior Subordinated Notes,

- a $2 million charge related to the amortization of acquired intangible assets,
- a $9.0 million charge related to stock-based compensation during 2011, and

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- a $22.3 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, 2012:

- a $15.1 million charge related to our incentive compensation plans,
- 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,
- a $9.6 million charge related to stock-based compensation during 2012, and
- 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 $65.7 million charge for rationalization and rationalization related activities. This includes $19.3 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 $6.9 million charge related to stock-based compensation during 2013, and
- 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:

- impairments of $197.2 million which include a goodwill impairment of $75.7 million related to our needle coke reporting unit and impairment of long-lived assets of $121.6 million related to our isomolded product line and our decision to cease production,
- a $62.8 million charge for rationalization and rationalization related activities. This includes $29.0 million of rationalization related depreciation expense, $11.6 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 $5.6 million charge related to stock-based compensation during 2014, and
- 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,
- $11.7 million charge for rationalization and related activities,
- $25.1 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 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 $3.4 million charge for rationalization and related activities,
- a $1.8 million loss 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.

	Predecessor			
	First Quarter	Second Quarter	Third Quarter	Fourth Quarter
	(Dollars in thousands, except per share data)			
2014				
Net sales	$280,791	$284,184	$260,458	$259,871
Gross profit	25,694	17,953	17,644	30,956
Net income (a)	(11,517)	(155,433)	(34,943)	(83,483)
Basic earnings (loss) per common share	$(0.08)	$(1.14)	$(0.26)	$(0.61)
Diluted earnings (loss) per common share	$(0.08)	$(1.14)	$(0.26)	$(0.61)

	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	$207,211	$165,122	$65,598	$94,591	$154,150
Gross profit	20,763	15,939	1,411	8,991	9,838
Net income (loss) (b)	(55,608)	(22,817)	(42,224)	(7,303)	(26,248)
Basic earnings (loss) per common share	$(0.41)	$(0.17)	$(0.31)	N/A	N/A
Diluted earnings (loss) per common share	$(0.41)	$(0.17)	$(0.31)	N/A	N/A

(a) Net income by quarter for 2014 includes the following items:

First Quarter

- Rationalization and related charges of $17.9 million, of which $17.4 million related to accelerated depreciation;
- Amortization of acquired intangibles totaling $4.8 million, and
- Interest expense of $9.0 million, driven by $4.8 million of expense related to the Senior Notes.

Second Quarter

- Impairment of long-lived assets of $121.6 million as a result of the company's decision to cease production of isomolded products;
- Rationalization and related charges of $20.6 million, of which $10.9 million related to inventory losses and$4.2 million related to accelerated depreciation. The majority of the remaining costs related to cleaning, moving and dismantling costs;
- Amortization of acquired intangibles totaling $5.5 million, which included a $0.4 million goodwill impairment charge related to the rationalizations discussed above and
- Interest expense of $9.2 million, driven by $4.8 million of expense related to the Senior Notes.

Third Quarter

- Rationalization and related charges of $19.0 million, including $10.8 million of severance and contract termination costs, $3.7 million of accelerated depreciation and $2.9 million of inventory losses;

- a $4.8 million charge for customer bad debt and related inventory charges in resulting from the bankruptcy of a customer;

- Amortization of acquired intangibles totaling $4.7 million, and
- Interest expense of $9.1 million, driven by $4.8 million of expense related to the Senior Notes.

Fourth Quarter:

- A goodwill impairment charge of $75.7 million related to our needle coke reporting unit:
- A $19.0 million charge for the MTM adjustment for our pension and OPEB benefit plans, driven primarily by a decrease in discount rates and new mortality tables adopted in 2014;
- Rationalization and related charges of $5.4 million, including $3.5 million of accelerated depreciation;
- Amortization of acquired intangibles totaling $4.0 million, and
- Interest expense of $9.8 million, driven by $4.8 million of expense related to the Senior Notes.

(b) 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 $6.5 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 $4.1 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

- Rationalization and related charges of $2.4 million;
- 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 $1.6 million charge for rationalization and related activities,
- a $1.8 million loss for the MTM adjustment for our pension and OPEB benefit plans

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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 operation as a whole.

Executive Summary

The slow rates of global economic growth experienced in 2014 continued throughout 2015. The year began with the IMF estimating 2015 growth at a rate of 3.5%. In October 2015, the IMF estimated 2015 growth at 3.1% and projected global activity increases to be more gradual than initially estimated. The World Steel Association noted that steel production, excluding China, decreased 2.8% in 2015. Additionally, as the Chinese economy has slowed, exports have increased. These Chinese steel exports have flooded the markets that we serve, severely impacting our customers. The capacity utilization rate in the steel industry has fallen to 70%. This slowdown in steel production exerted continued downward pressure on both prices and volumes for our Industrial Materials products during the year, which negatively impacted our profitability in 2015. Our Industrial Materials rationalization initiatives have yielded cost savings which have helped to offset the impacts from the decrease in demand.

Our Engineered Solutions segment had decreased sales and margins in 2015 resulting primarily from our advanced consumer electronics products experiencing pricing pressure and decreased demand throughout 2015. Our AGM product group was negatively impacted year over year as a result of the bankruptcy of a customer in a new market that we began to serve in 2014.

We have combated these negative market trends in both segments by continuing to cut costs and right size our operations until we exit this down cycle.

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.

Reportable Segments. Our businesses are reported in the following segments:

- Industrial Materials, which consists of graphite electrodes, refractory products and needle coke products.
- Engineered Solutions, which includes advanced graphite materials, advanced composite materials, advanced electronics technologies, and advanced 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

2016 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, 2016 report, the International Monetary Fund (IMF) estimated global growth at 3.6 percent in 2016, moderately higher than its 3.1 percent estimate for 2015. The report stated that in advanced economies a modest and uneven recovery is expected, while activity in emerging market and developing economies is projected to increase slightly after declining for five years in a row. The IMF also indicated that risks remain tilted to the downside and relate to the ongoing adjustments to the global economy.

In its Short Range Outlook released on October 12, 2015, the World Steel Association (WSA) forecast that global steel demand will decrease by 1.7 percent to 1,513 million tons in 2015, following growth of 0.7 percent in 2014. In 2016, WSA forecast that world steel demand will show growth of 0.7 percent and will reach 1,523 million tons.

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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.

The issuance of the Senior Notes was registered under the Securities Act of 1933, as amended.

Revolving Credit Facility

On October 7, 2011, we successfully completed the amendment and restatement of the Credit Agreement that governs our principal revolving credit facility, the Revolving Facility. Borrowers under the Revolving Facility were GrafTech Finance Inc. (“GrafTech Finance”) and GrafTech Switzerland S.A. (“Swissco”), both wholly-owned subsidiaries. On August 28, 2012, as permitted by the Credit Agreement, GrafTech Luxembourg II S.à.r.l. (“Luxembourg Holdco”) replaced Swissco as a borrower. Swissco is no longer entitled to borrow loans under the Revolving Facility although it is entitled to request letters of credit thereunder only for its own use.

Under the Revolving Facility, we have flexibility for investments, capital expenditures, acquisitions and restricted payments and we can issue letters of credit under the Revolving Facility in an amount not to exceed $50 million. We are permitted to pay dividends and repurchase our common stock in an aggregate amount (cumulative from October 2011) up to $75 million (or $500 million, if certain leverage ratio requirements are satisfied), plus, each year, an aggregate amount equal to 50% of the consolidated net income in the prior year.

On April 23, 2014, the Credit Agreement was further amended and restated to provide for, among other things, a five-year tenor, reduced borrowing spreads and greater financial flexibility. The Revolving Facility had a maximum borrowing capacity of $470 million principal and matured in April 2019.

On November 19, 2014, we amended the Credit Agreement to, among other things, modify the definition of EBITDA to exclude certain restructuring costs, increasing availability of borrowings thereunder, and reduce maximum principal amount to $400 million.

On February 27, 2015, we amended and restated the Credit Agreement to provide for, among other things, greater financial flexibility and a new $40 million senior secured delayed draw term loan facility.

On June 26, 2015, we amended the Credit Agreement to permit the issuance of preferred stock to Brookfield.

On July 28, 2015, we amended the 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 to the Financial Statements). In addition, effective upon such acquisition, the financial covenants were eased, resulting in increased availability under the Revolving Facility. The maximum principal amount of the Revolving Facility was reduced from $400 million to $375 million.

The interest rate applicable to the Revolving Facility and the 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. The new financial covenants require us to maintain a minimum cash interest coverage ratio ranging from 1.50 to 2.50 and a maximum senior secured leverage ratio ranging from 5.75 to 3.00, subject to adjustment over time.

As of December 31, 2015, we had outstanding borrowings of $98.0 million and outstanding letters of credit of $7.9 million 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.

On occasion, we have sold accounts receivable without recourse to a third party. We did not sell any receivables during 2014 or 2015.

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 75% in 2013, 74% in 2014 and 74% in 2015. In 2015, 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 2015, 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 2015.

Results of Operations and Segment Review

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 low cost imports, primarily from China. These imports and over-capacity in the steel industry has 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 has negatively impacted 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 the 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.

2013. The slow rates of global economic growth experienced in 2012 continued throughout 2013. The year began with the IMF cautiously estimating growth at a rate of 3.5%, which was adjusted downward three times throughout the year before a modest final increase to 3.0%. The World Steel Association noted that steel production, excluding China, was essentially flat compared to 2012. This slow economic growth and stagnation in steel production year over year exerted significant downward pressure on prices for our Industrial Materials products during the year, which negatively impacted our profitability in 2013. Due to this difficult environment, we announced global initiatives to position our Industrial Materials segment to significantly reduce its cost basis and improve our competitive position. As part of this initiative, we will close our two highest cost graphite electrode plants, which are located in Brazil and South Africa, as well as our machine shop in Russia. These initiatives also included reductions in corporate overhead.

Our Engineered Solutions segment continued to see sales growth throughout 2013, due primarily to further market penetration in sales of our advanced consumer electronics products. Engineered Solutions contributed over 20% of total company sales during the year and achieved the highest net sales for the segment in company history.

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, 2013, 2014, and 2015.

Results of Operations for 2015 as Compared to 2014

The tables presented in our period-over-period 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 year ended December 31, 2014 and 2015. Throughout our MD&A, changes that are less than 5% or less than $1.0 million, may be deemed not meaningful 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. All amounts below reflect this change. See Note 3 to the financial statements for further discussion.

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 the of different basis of accounting between the periods presented. There were no operational activities that changed as a result of the acquisition of the predecessor.

	Predecessor		Successor
(in thousands, except per share data and % change)	For the Year Ended December 31, 2014	For the Period January 1, 2015 Through August 14, 2015	For the Period August 15, 2015 Through December 31, 2015
Net sales	$1,085,304	$437,931	$248,741
Cost of sales	993,057	399,817	229,912
Gross profit	92,247	38,114	18,829
Research and development	14,844	5,556	2,348
Selling and administrative expenses	124,178	81,147	32,115
Impairment of long-lived assets	197,220	35,381	—
Rationalizations	11,625	4,507	1,075
Operating loss	(255,620)	(88,477)	(16,709)
Other expense (income), net	2,445	1,335	(943)
Interest expense	37,057	27,118	10,916
Interest income	(330)	(367)	(11)
Loss before provision for income taxes	(294,792)	(116,563)	(26,671)
(Benefit) provision for income taxes	(9,416)	4,086	6,880
Net loss	$(285,376)	$(120,649)	$(33,551)
Basic loss per common share:	$(2.10)	$(0.88)	N/A
Diluted loss per common share:	$(2.10)	$(0.88)	N/A

Net sales, by reportable segment for the year ended December 31, 2014 and 2015 were:

	Predecessor		Successor
(in thousands, except per % change)	For the Year Ended December 31, 2014	For the Period January 1, 2015 Through August 14, 2015	For the Period August 15, 2015 Through December 31, 2015
Industrial Materials	$840,103	$341,974	$193,223
Engineered Solutions	245,201	95,957	55,518
Total net sales	$1,085,304	$437,931	$248,741

An analysis of the components of change in net sales for Industrial Materials and Engineered Solutions is set forth in the following table:

	Volume	Price/Mix	Currency	Net Change
Industrial Materials	(24)%	(8)%	(4)%	(36)%
Engineered Solutions	(33)%	(3)%	(2)%	(38)%

Net sales. Net sales for our Industrial Materials segment decreased from $840.1 million in 2014 to $342.0 million in the period January 1 through August 14, 2015, and $193.2 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.

Net sales for our Engineered Solutions segment decreased from $245.2 million in 2014 to $96.0 million in the period January 1 through August 14, 2015, and $55.5 million in the period August 15 through December 31, 2015. The decrease in revenue was primarily driven by both decreased pricing and volumes for our thermal solutions serving the advanced consumer electronics markets. Sales of our AGM products decreased $17.5 million driven by the non-

recurrence of 2014 sales of high temperature furnace systems servicing a single customer that filed for bankruptcy in October 2014. We also experienced lower demand in our products serving the oil and gas drilling markets.

Cost of sales. We experienced decreases in cost of sales from $993.1 million in 2014 to $399.8 million in the period January 1 through August 14, 2015, and $229.9 million in the period August 15 through December 31, 2015. Lower volumes across both Industrial Materials and Engineered Solutions segments resulted in a reduction of $177.7 million of cost in 2015 as compared to the same period of 2014. Rationalization related expenses within cost of sales decreased by $43.3 million in the twelve months ended December 31, 2015 as compared to the same period of 2014 as our larger industrial materials rationalization initiatives are substantially complete. Decreases in the value of currencies in relation to the US Dollar, primarily in the euro region, benefited cost of sales by $41.0 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 $14.8 million in 2014 compared to $5.6 million in the period January 1 through August 14, 2015, and $2.3 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 research and development was charged negative MTM adjustment of $2.0 million. There was no significant MTM adjustment in 2015 within research and development.

Selling and administrative expenses. Selling and general administrative expenses decreased from $124.2 million 2014 to $81.1 million in the period January 1 through August 14, 2015, and $32.1 million in the period August 15 through December 31, 2015. This decrease was primarily driven by a 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 $25.0 million as compared to $8.2 million in 2014.

Rationalizations. We recorded a $11.6 million charge for rationalizations in 2014 compared to $4.5 million in the period January 1 through August 14, 2015, and $1.1 million in the period August 15 through December 31, 2015. Our largest rationalization programs were announced in 2013 and 2014. These programs have wound down through 2015 and are substantially complete.

Impairments. As a result of our annual goodwill impairment testing and our routine 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 $75.7 million in the fourth quarter of 2014. During the second quarter of 2014 we announced rationalization initiatives in our Engineered Solutions segment resulting from deteriorated pricing and competitor responses for certain products. As a result, we recorded long-lived asset impairment charges of $121.6 million.

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

	Predecessor		Successor
	For the Year Ended December 31, 2014	For the Period January 1, 2015 Through August 14, 2015	For the Period August 15, 2015 Through December 31, 2015
	(Dollars in thousands)		
Industrial Materials	$(50,260)	$(25,678)	$(4,017)
Engineered Solutions	(138,271)	(15,368)	(457)
Total segment operating loss	(188,531)	(41,046)	(4,474)
Corporate, R&D and Other Expenses	(67,089)	(47,431)	(12,235)
Total operating loss	$(255,620)	$(88,477)	$(16,709)

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

	Predecessor		Successor
	For the Year Ended December 31, 2014	For the Period January 1, 2015 Through August 14, 2015	For the Period August 15, 2015 Through December 31, 2015
	(Dollars in thousands)		
Tax (benefit) expense	$(9,416)	$4,086	$6,880
Pretax loss	(294,792)	(116,563)	$(26,671)
Effective tax rates	3.2%	(3.5)%	(25.8)%

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 5 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.

For the period January 1, 2015 through August 14, 2015 and the period August 15, through December 31, 2015, the effective rate differs from the U.S. statutory rate of 35% 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.

Results of Operations for 2014 as Compared to 2013

(in thousands, except per share data and % change)	2013	2014	Increase (Decrease)	% Change
Net sales	$1,166,674	$1,085,304	$(81,370)	(7)%
Cost of sales	1,027,608	993,057	(34,551)	(3)%
Gross profit	139,066	92,247	(46,819)	(34)%
Research and development	10,437	14,844	4,407	42%
Selling and administrative expenses	111,043	124,178	13,135	12%
Rationalizations	20,156	11,625	(8,531)	N/A
Impairment of long-lived assets and goodwill	—	197,220	197,220	N/A
Operating income (loss)	(2,570)	(255,620)	(55,830)	2,172%
Other (income) expense, net	1,698	2,445	747	44%
Interest expense	36,037	37,057	1,020	3%
Interest income	(203)	(330)	(127)	63%
Income (loss) before provision for income taxes	(40,102)	(294,792)	(57,470)	143%
Provision (benefit) for income taxes	(12,843)	(9,416)	3,427	(27)%
Net income (loss)	$(27,259)	$(285,376)	$(60,897)	223%
Basic income (loss) per common share	$(0.20)	$(2.10)	$(1.90)	
Diluted income (loss) per common share	$(0.20)	$(2.10)	$(1.90)	

Net sales. Net sales by reportable segment for the years ended December 31, 2013 and 2014 were:

(in thousands, except per share data and % change)	2013	2014	Increase (Decrease)	% Change
Industrial Materials	$909,448	$840,103	$(69,345)	(8)%
Engineered Solutions	257,226	245,201	(12,025)	(5)%
Total net sales	$1,166,674	$1,085,304	$(81,370)	(7)%

Our analysis of the percentage change in net sales from 2013 to 2014 for Industrial Materials and Engineered Solutions is set forth in the following table:

	Volume	Price/Mix	Currency	Net Change
Industrial Materials	3%	(11)%	—%	(8)%
Engineered Solutions	2%	(7)%	—%	(5)%

Net sales. Net sales for our Industrial Materials segment decreased by $69.3 million in 2014 compared to 2013. Net sales were impacted by a deterioration in the realized selling price of electrodes in 2014. The weighted average selling price of electrodes, excluding currency impacts, decreased approximately 10% compared to 2013. We also experienced lower third party sales and pricing in our needle coke business as we have sourced a greater percentage of needle coke internally. Partially offsetting these decreases in electrode pricing and needle coke was an increase in segment volumes of 3%, driven primarily by a 4% increase in graphite electrode volumes from 181.8 thousand metric tons to 187.9 thousand metric tons.

Net sales for our Engineered Solutions segment decreased $12.0 million in 2014 compared to 2013. This decrease was primarily driven by lower advanced electronics technologies product sales of $27.7 million due to pricing and volume declines in products serving the advanced consumer electronics markets. Offsetting this decrease were increased sales of $22.6 million of our AGM products. The increase in revenue was primarily driven by $17.6 million of new product sales of high temperature furnace systems servicing a single customer that filed for bankruptcy in October 2014, which has created uncertainty related to future high temperature furnace systems sales.

Cost of sales. We experienced decreases in cost of sales of $34.6 million compared to 2013 due to a $44.6 million benefit of an improved cost structure resulting from our rationalization initiatives. Additionally, the increased use of internally sourced needle coke has decreased our cost of sales. Offsetting these decreases was increased variable costs of $18.7 million driven by a 3 percent increase in graphite electrode volumes. Additionally, we incurred a year over year increase in pension mark to market charges of $15.9 million.

Research and Development. Research and development expenses were $14.8 million in 2014 which represented a $4.4 million increase over 2013. This increase was primarily driven by a negative MTM adjustment of $2.0 million in 2014 compared to a benefit of $1.4 million in 2013 and rationalization related accelerated depreciation totaling $2.3 million. Excluding these charges, research and development expense decreased $1.3 million.

Selling and administrative expenses. Selling and general administrative expenses increased $13.1 million to $124.2 million in 2014. This increase was primarily driven by a negative MTM adjustment of $8.3 million in 2014, compared to a benefit of $5.8 million in 2013. We also recorded in selling and administrative expense rationalization related charges of $1.3 million and proxy contest fees of $2.4 million. Excluding these charges our selling and administrative expenses decreased $4.7 million in 2014 as compared to 2013.

Rationalizations. We recorded an $11.6 million charge for rationalizations in 2014, a decrease of $8.5 million from 2013. The 2014 rationalization charges related primarily to severance and contract termination costs resulting from our Engineered Solutions and corporate and research and development rationalizations initiatives. The Engineered Solutions initiative began in the second quarter of 2014 and will wind down through the first half of 2015. The corporate and research and development initiative was announced in the third quarter of 2014 and resulted in changes to our operating and management structure in order to streamline, simplify and decentralize the organization. The related rationalization costs will be substantially completed by the third quarter of 2015.

We recorded $20.2 million of rationalization charges in 2013 related primarily to our Industrial Materials rationalization initiatives. These charges were due to the closures of our South Africa and Brazil graphite electrode plants and our machine shop in Russia, as well as headcount reductions throughout our Industrial Materials segment and at our corporate facility in Parma, Ohio. See Note 2 to the financial statements for further discussion of rationalization activities.

Impairments. As a result of our annual goodwill impairment testing and our routine monitoring of triggering events, we recorded a goodwill impairment charge in our needle coke reporting unit totaling $75.7 million during the fourth quarter of 2014. This charge was driven by the margin contraction for petroleum needle coke. See Note 5 to the financial statements for a full discussion of our goodwill impairment testing and results.

Additionally, in the second quarter of 2014, we announced rationalization initiatives in our Engineered Solutions segment resulting from deteriorated pricing and competitor responses for certain products. As a result, we recorded long-lived asset impairment charges of $121.6 million.

Interest expense. Interest expense increased $1.0 million in 2014 as compared to 2013 due to costs incurred while amending our revolving credit facility in April and November of 2014.

Segment operating income. The following table represents our operating income by segment for 2013 and 2014:

	For the Year ended December 31,	
	2013	2014
	(Dollars in thousands)	
Industrial Materials	$20,007	$(50,260)
Engineered Solutions	28,392	(138,271)
Corporate, Research and Development, and Other Expenses	(50,969)	(67,089)
Total segment operating loss	$(2,570)	$(255,620)

Segment operating costs and expenses as a percentage of sales for Industrial Materials increased to 106 percent in 2014, primarily caused by the goodwill impairment charge of $75.7 million in the Needle coke reporting unit. Additionally, the segment was charged $3.5 million of pension MTM costs in 2014 versus a credit of $4.2 million in 2013. Offsetting these unfavorable impacts, rationalization and related charges for Industrial materials decreased $25.8 million to $34.5 million, or 4 percent of total costs in 2014. Excluding those non-recurring items, segment operating costs and expenses as a percentage of sales increased marginally versus prior year despite the increased variable costs resulting from a 3 percent volume increase and a 10 percent price decline in graphite electrodes. This was achieved through $39.9 million of cost reductions resulting from our rationalization initiatives.

Segment operating costs and expenses as a percentage of sales for Engineered Solutions increased to 156 percent in 2014, primarily caused by the second quarter long-lived asset impairment charge of $121.6 million associated with the decision to discontinue the manufacturing of the isomolded products. Additionally, rationalization and related charges increased by $18.4 million to $22.0 million in 2014. The Engineered Solutions segment also incurred a $9.2 million pension MTM charge in 2014 versus a credit of $5.8 million in 2013. The bankruptcy of an Advanced Graphite Materials customer triggered an inventory write-off and bad debt reserve of $4.8 million in the third quarter 2014. Excluding these non-recurring charges, segment operating costs and expenses would have increased to 94 percent of sales. This increase was due to the decreased prices and volumes in our consumer electronics business and higher costs related to the manufacturing of new products.

Operating costs and expense as a percentage of sales for our Corporate, Research and Development, and Other increased $16.1 million in 2014 as compared to 2013. This increase was driven primarily by a MTM charge of $6.3 million in 2014 versus a MTM gain of $4.2 million in 2013. We also incurred additional fees related to our proxy filings of $2.4 million in 2014. Excluding these MTM and proxy charges, expenses decreased $1.3 million in 2014 when compared to 2013.

Provision for income taxes. The following table summarizes the expense for income taxes in 2012 and 2013:

	For the Year Ended December 31	
	2013	2014
	(Dollars in thousands)	
Tax (benefit)	$(12,843)	$(9,416)
Pretax Income (loss)	$(40,102)	$(294,792)
Effective Tax Rates	32.0 %	3.2 %

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 2 and Note 3 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.

On October 31, 2013, we announced a global initiative to reduce our Industrial Materials' cost base and improve our competitive position. These actions resulted in $65.7 million of rationalization and related charges for the year ended December 31, 2013. See Note 3 to the Financial Statements for more information. The effective tax rate for the twelve months ended December 31, 2013 differs from the U.S. statutory rate of 35 percent due to the jurisdictional mix of income driven by the rationalization charges. In addition, our tax rate for the year ended December 31, 2013 was favorably impacted by the effective resolution of uncertain tax positions from prior years and by tax credits that were recognized in support of the research and development efforts of our Engineered Solutions products.

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 $2.2 million in 2013, an increase of $1.2 million in 2014, and a decrease of $37.8 million in 2015. For Industrial Materials cost of sales, the impact of these events were decreases of $7.6 million, $4.8 million and $37.5 million in 2013, 2014 and 2015, 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 2013, a net currency gain of $2.2 million in 2014 resulting from the remeasurement of intercompany loans and the effect of transaction gains and losses on intercompany activities. We had no impact in 2015.

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, 2015, we had cash and cash equivalents of $6.9 million, long-term debt in the principal amount of $394.6 million, short-term debt of $4.8 million and stockholders' equity of $811 million. We also had $205 million of unused borrowing capacity under the Revolving facility (after considering financial covenants restrictions and the outstanding letters of credit of approximately $7.9 million).

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 have begun to look at strategic alternatives for our Engineered Solutions businesses that could result in the sale of one or more of such businesses. We currently expect that cash proceeds from such sales would be used for general corporate purposes, including repayment of borrowings outstanding under the Revolving Facility. 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.

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. The Revolving Facility is secured, and provides for maximum borrowings of up to $375 million including a letter of credit sub-facility of up to $50 million and is subject to certain conditions (including a maximum senior secured leverage ratio test). The Revolving Facility matures in April 2019. As of December 31, 2015, we had outstanding borrowings drawn from the Revolving Facility of $98.0 million and outstanding letters of credit of $7.9 million.

As of December 31, 2015, we were in compliance with all financial and other covenants contained in the Revolving Facility, as applicable. These covenants include maintaining a cash minimum interest coverage ratio of at least 1.50 to 2.50 and a maximum senior secured leverage ratio of 5.75 to 3.00, which are measured based on a rolling average of the prior four quarters. Under current industry conditions, we are uncertain as to our continued compliance with certain of the financial covenants throughout 2016. We plan to pursue an amendment with the lenders under the Revolving Facility to avoid a potential non-compliance with such covenants and anticipate entering into a satisfactory amendment. Our ability to enter into an amendment or, if needed, obtain a waiver of non-compliance, or 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 enter into an amendment or, if needed, obtain a waiver of non-compliance, or restructure or refinance any of our indebtedness on commercially reasonable terms or at all.

As of December 31, 2015 approximately 73% of debt consists of fixed rate or zero interest rate obligations. As of December 31, 2014 approximately 92% of our debt consisted do fixed rate or zero interest 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, 2015.

	Payments Due by Year Ending December 31,				
	Total	2016	2017-2018	2019-2020	2021+
	(Dollars in Thousands)				
Contractual and Other Obligations					
Long-term debt (a)	$394,600	$4,500	$19,833	$370,267	$—
Leases	11,268	3,957	4,559	2,707	45
Purchase obligations (b)	14,959	14,959	—	—	—
Total contractual obligations	420,827	23,416	24,392	372,974	45
Postretirement, pension and related benefits (c)	78,209	12,099	23,954	23,471	18,685
Other long-term obligations	5,979	2,053	656	380	2,890
Uncertain income tax provisions	3,922	603	1,329	1,990	—
Total contractual and other obligations (b)(c)	$508,937	$38,171	$50,331	$398,815	$21,620
Other Commercial Commitments (d)					
Guarantees (e)	6,002	6,002	—	—	—
Total other commercial commitments	$6,002	$6,002	$—	$—	$—

(a) Bonds presently valued at $267 million as a result of purchase accounting and will accrete to the full redemption value of $300 million in 2020.

(b) Based on the estimated timing of deliveries under supply contracts.

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

(d) Additional letters of credit of $7.9 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. As of December 31, 2015, we had $205 million of unused borrowing capacity under the Revolving facility (after considering financial covenants restrictions and the outstanding letters of credit of approximately $7.9 million). 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.

As of December 31, 2015, we were in compliance with all financial and other covenants contained in the Revolving Facility, as applicable. These covenants include maintaining a cash minimum interest coverage ratio of at least 1.50 to 2.50 and a maximum senior secured leverage ratio of 5.75 to 3.00, which are measured based on a rolling average of the prior four quarters. Under current industry conditions, we are uncertain as to our continued compliance with certain of the financial covenants throughout 2016. We plan to pursue an amendment with the lenders under the Revolving Facility to avoid a potential non-compliance with such covenants and anticipate entering into a satisfactory amendment. Our ability to enter into an amendment or, if needed, obtain a waiver of non-compliance, or 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 enter into an amendment or, if needed, obtain a waiver of non-compliance, or restructure or refinance any of our indebtedness on commercially reasonable terms or at all.

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 2013, 2014 and 2015. 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 2015. 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, 2015, totaled no more than $4.0million in each year and $11.3 million in the aggregate and as of December 31, 2015.
- Letters of credit outstanding under the Revolving Facility of $7.9 million as of December 31, 2015.
- Surety bonds and letters of credit with other banks totaling $6.0 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,		For the Period January 1 Through August 14, 2015	For the Period August 15 Through December 31, 2015
	2013	2014		
	(Dollars in millions)			
Cash flow provided by (used in):				
Operating activities	$116.8	$120.9	$28.3	$23.1
Investing activities	(83.8)	(79.0)	(39.9)	(17.5)
Financing activities	(37.6)	(35.1)	20.8	(23.1)

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; write-down of our investment in our non-consolidated affiliate; stock-based compensation charges; equity in losses of our previously non-consolidated affiliate
- 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 2013, changes in working capital resulted in a net source of funds of $32.0 million which was impacted by:

- source of funds of $37.4 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 $14.3 million primarily due to the planned reduction of inventory levels built up in prior years and the reduction in contractually obligated raw material purchases during 2013; and
- use of funds of $38.2 million from a decrease in accounts payable and accruals, primarily due to payments made for contractually obligated raw material purchases made in 2012 and 2013

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.

Operating cash flow also included cash outflows of $12.4 million, $14.5 million and $14.6 million for contributions to pension and post retirement plans in 2013, 2014 and 2015, respectively.

Investing Activities.

Net cash used in investing activities was $83.8 million in 2013 and included:

- capital expenditures of $86.3 million;
- cash inflows of $0.1 million related to proceeds from derivative instruments; and
- cash inflows of $1.5 million related to insurance recoveries.

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

Financing Activities.

Net cash flow used by financing activities was $37.6 million in 2013 and included:

- net payments on our Revolving Facility of $5.5 million;
- cash outflows of $17.5 million related to our supply chain financing agreement;
- cash outflows of $1.8 million related to the repurchase of treasury shares; and
- cash paid for refinancing fees and debt issuance costs of $0.6 million.

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.

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,		
	2013	2014	2015
	(Dollars in thousands)		
Expenses relating to environmental protection	$14,612	$17,027	$11,122
Capital expenditures related to environmental protection	22,128	14,314	2,103

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 acquisitions 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.

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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.

Stock-Based Compensation Plans. Stock-based compensation expense is measured at the grant date, based on the fair market value of the award and recognized over the requisite service period. The fair value of restricted stock is based on the trading price of our common stock on the date of grant, less required adjustments to reflect dividends paid and expected forfeitures or cancellations of awards throughout the vesting period, which ranges between one and three years. Our stock option compensation expense calculated under the fair value method, using a Black Scholes model, is recognized over the vesting period, which ranges between one and three years. As a result of our acquisition by Brookfield all oustanding stock awards have vested.

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 6 “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 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, 2014 represented a net unrealized loss of $0.9 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. The outstanding contracts represented a net unrealized loss of $7.1 million as of December 31, 2014 and no unrealized gain or loss as of December 31, 2015.

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, 2015, 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 decrease of $1.0 million or a corresponding increase of $1.0 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,

2015. 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, 2015. A hypothetical increase in interest rates of 100 basis points (1%) would have increased our interest expense by $1.2 million for the twelve months ended December 31, 2015.

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, 2015 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, 2015. The effectiveness of the Company’s internal control over financial reporting has been audited by Deloitte & Touche LLP, our independent registered public accounting firm, as stated in their report which is presented in this Annual Report on Form 10-K.

Date: March 7, 2016

/S/ Joel L. Hawthorne
Joel L. Hawthorne,
President and Chief Executive Officer

/S/ Quinn J. Coburn
Quinn J. Coburn
Vice President and Chief Financial
Officer

Report of Independent Registered Public Accounting Firm

The Board of Directors and Stockholder of GrafTech International Ltd. and subsidiaries

We have audited the internal control over financial reporting of GrafTech International Ltd. and subsidiaries (the "Company") as of December 31, 2015, based on criteria established in Internal Control - Integrated Framework (2013) issued by the Committee of Sponsoring Organizations of the Treadway Commission. The Company's management is responsible for maintaining effective internal control over financial reporting and for its assessment of the effectiveness of internal control over financial reporting, included in the accompanying Management’s Annual Report on Internal Control over Financial Reporting. Our responsibility is to express an opinion on the Company's internal control over financial reporting based on our audit.

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

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

Because of the inherent limitations of internal control over financial reporting, including the possibility of collusion or improper management override of controls, material misstatements due to error or fraud may not be prevented or detected on a timely basis. Also, projections of any evaluation of the effectiveness of the internal control over financial reporting to future periods are subject to the risk that the controls may become inadequate because of changes in conditions, or that the degree of compliance with the policies or procedures may deteriorate.

In our opinion, the Company maintained, in all material respects, effective internal control over financial reporting as of December 31, 2015, based on the criteria established in Internal Control - Integrated Framework (2013) issued by the Committee of Sponsoring Organizations of the Treadway Commission.

We have also audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States), the consolidated financial statements as of and for the year ended December 31, 2015 (January 1, 2015 to August 14, 2015, Predecessor Period, and August 15, 2015 to December 31, 2015, Successor Period) of the Company and our report dated March 7, 2016 expressed an unqualified opinion on those financial statements.

/s/ Deloitte & Touche LLP
Deloitte & Touche LLP
Cleveland, Ohio
March 7, 2016

Report of Independent Registered Public Accounting Firm

To the Board of Directors and Stockholders of GrafTech International Ltd

In our opinion, the consolidated balance sheet as of December 31, 2014 and the related consolidated statements of operations and comprehensive income, of stockholders’ equity and of cash flows for each of two years in the period ended December 31, 2014 present fairly, in all material respects, the financial position of GrafTech International Ltd. and its subsidiaries at December 31, 2014, and the results of their operations and their cash flows for each of the two years in the period ended December 31, 2014, in conformity with accounting principles generally accepted in the United States of America. 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 audits. We conducted our audits of these 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 audits provide a reasonable basis for our opinion.

As noted in Note 6 to the consolidated financial statements, the Company amended its revolving agreement and entered into a new senior secured delayed draw term loan.

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

Report of Independent Registered Public Accounting Firm

To the Board of Directors and Stockholder of GrafTech International Ltd. and subsidiaries:

We have audited the accompanying consolidated balance sheet of GrafTech International Ltd. and subsidiaries (the "Company") as of December 31, 2015, and the related consolidated statements of operations and comprehensive income (loss), stockholders' equity, and cash flows for the year ended December 31, 2015 (January 1, 2015 to August 14, 2015, Predecessor Period, and August 15, 2015 to December 31, 2015, Successor Period). These financial statements are the responsibility of the Company's management. Our responsibility is to express an opinion on the financial statements based on our audit.

We conducted our audit 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. An audit also includes assessing the accounting principles used and significant estimates made by management, as well as evaluating the overall financial statement presentation. We believe that our audit provides a reasonable basis for our opinion.

In our opinion, such consolidated financial statements present fairly, in all material respects, the financial position of GrafTech International Ltd. and subsidiaries as of December 31, 2015, and the results of their operations and their cash flows for the year ended December 31, 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 have also audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States), the Company's internal control over financial reporting as of December 31, 2015, based on the criteria established in Internal Control - Integrated Framework (2013) issued by the Committee of Sponsoring Organizations of the Treadway Commission and our report dated March 7, 2016 expressed an unqualified opinion on the Company's internal control over financial reporting.

/s/ Deloitte & Touche LLP
Deloitte & Touche LLP
Cleveland, Ohio
March 7, 2016

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

	Predecessor	Successor
	As of December 31, 2014	As of, December 31, 2015
ASSETS		
Current assets:		
Cash and cash equivalents	$17,550	$6,927
Accounts and notes receivable, net of allowance for doubtful accounts of $7,471 as of December 31, 2014 and $304 as of December 31, 2015	162,919	102,815
Inventories	382,903	295,462
Prepaid expenses and other current assets	81,623	21,674
Total current assets	644,995	426,878
Property, plant and equipment	1,500,821	660,880
Less: accumulated depreciation	846,781	23,347
Net property, plant and equipment	654,040	637,533
Deferred income taxes	16,819	15,327
Goodwill	420,129	172,059
Other assets	97,822	170,218
Total assets	$1,833,805	$1,422,015
LIABILITIES AND STOCKHOLDERS' EQUITY		
Current liabilities:		
Accounts payable	$86,409	$49,478
Short-term debt	188,104	4,772
Accrued income and other taxes	24,506	9,039
Rationalizations	9,563	3,048
Other accrued liabilities	43,319	29,779
Total current liabilities	351,901	96,116
Long-term debt	341,615	362,455
Other long-term obligations	107,566	95,485
Deferred income taxes	28,197	57,430
Commitments and Contingencies – Notes 10 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, 152,821,011 shares issued as of December 31, 2014 and 100 shares authorized and issued as of December 31, 2015	1,528	—
Additional paid – in capital	1,825,880	854,337
Accumulated other comprehensive loss	(336,524)	(10,257)
Accumulated deficit	(245,751)	(33,551)
Less: cost of common stock held in treasury, 15,922,729 shares as of December 31, 2014 and 0 as of December 31, 2015	(239,811)	—
Less: common stock held in employee benefit and compensation trusts, 80,967 shares as of December 31, 2014 and 0 shares as of December 31, 2015	(796)	—
Total stockholders' equity	1,004,526	810,529
Total liabilities and stockholders' equity	$1,833,805	$1,422,015

See accompanying Notes to the Consolidated Financial Statements

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,		For the Period January 1 Through August 14, 2015	For the Period August 15 Through December 31, 2015
	2013	2014		
Net sales	$1,166,674	$1,085,304	$437,931	$248,741
Cost of sales	1,027,608	993,057	399,817	229,912
Gross profit	139,066	92,247	38,114	18,829
Research and development	10,437	14,844	5,556	2,348
Selling and administrative expenses	111,043	124,178	81,147	32,115
Impairment of long-lived assets and goodwill	—	197,220	35,381	—
Rationalizations	20,156	11,625	4,507	1,075
Operating loss	(2,570)	(255,620)	(88,477)	(16,709)
Other expense (income), net	1,698	2,445	1,335	(943)
Interest expense	36,037	37,057	27,118	10,916
Interest income	(203)	(330)	(367)	(11)
Loss before income taxes	(40,102)	(294,792)	(116,563)	(26,671)
(Benefit) provision for income taxes	(12,843)	(9,416)	4,086	6,880
Net loss	$(27,259)	$(285,376)	$(120,649)	$(33,551)
Basic loss per common share:				
Net loss per share	$(0.20)	$(2.10)	$(0.88)	N/A
Weighted average common shares outstanding	135,067	136,155	137,152	N/A
Diluted loss per common share:				
Net loss per share	$(0.20)	$(2.10)	$(0.88)	N/A
Weighted average common shares outstanding	135,067	136,155	137,152	N/A
STATEMENTS OF COMPREHENSIVE INCOME (LOSS)				
Net loss	$(27,259)	$(285,376)	$(120,649)	$(33,551)
Other comprehensive income (loss):				
Foreign currency translation adjustments	(13,981)	(33,041)	(27,936)	(10,133)
Commodities and foreign currency derivatives and other, net of tax of ($300), ($63) and $(68) and $21, respectively	2,035	(10,859)	1,262	(124)
Other comprehensive loss, net of tax:	(11,946)	(43,900)	(26,674)	(10,257)
Comprehensive loss	$(39,205)	$(329,276)	$(147,323)	$(43,808)

See accompanying Notes to the Consolidated Financial Statements

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

	Predecessor For the year ended December 31,			Successor
	2013	2014	For the Period January 1 Through August 14, 2015	For the Period August 15 Through December 31, 2015
Cash flow from operating activities:				
Net Loss	$(27,259)	$(285,376)	$(120,649)	$(33,551)
Adjustments to reconcile net loss to cash provided by operations:				
Depreciation and amortization	123,397	119,708	45,461	28,618
Impairment of long-lived assets and goodwill	—	197,220	35,381	—
Rationalization related fixed asset write offs	8,010	926	—	—
Inventory write-downs	—	19,600	—	—
Deferred income taxes	(22,369)	(16,003)	924	5,368
Post-retirement and pension plan changes	(10,544)	23,047	2,998	2,638
Stock-based compensation	8,035	5,577	15,357	—
Non-cash interest expense	14,052	15,693	14,180	2,351
Other charges, net	7,162	1,441	102	(1,934)
Net change in working capital*	31,980	56,846	45,594	26,763
Increase in long-term assets and liabilities	(15,627)	(17,776)	(11,025)	(7,138)
Net cash provided by operating activities	116,837	120,903	28,323	23,115
Cash flow from investing activities:				
Capital expenditures	(86,344)	(84,981)	(32,301)	(18,442)
Insurance recoveries	1,500	2,834		—
Derivative instrument settlements, net	114	(2,025)	(8,263)	326
Proceeds from the sale of fixed assets	—	5,042	646	632
Other	929	178	—	—
Net cash used in investing activities	(83,801)	(78,952)	(39,918)	(17,484)
Cash flow from financing activities:				
Short-term debt (reductions) borrowings, net	(7,265)	(1,021)	18,511	(15,504)
Revolving Facility borrowings	166,000	269,000	160,000	62,000
Revolving Facility reductions	(171,500)	(293,000)	(99,000)	(68,000)
Repayment of Senior Subordinated Notes	—	—	(200,000)	—
Issuance of preferred shares	—	—	150,000	
Principal payments on long-term debt	(225)	(192)	(89)	(183)
Supply chain financing	(17,508)	(9,455)	—	—
Proceeds from exercise of stock options	448	2,813	32	—
Purchase of treasury shares	(1,825)	(894)	(63)	—
Refinancing fees and debt issuance costs	(560)	(3,279)	(5,068)	—
Other	(5,210)	951	(3,499)	(1,385)
Net cash (used in) provided by financing activities	(37,645)	(35,077)	20,824	(23,072)
Net (decrease) increase in cash and cash equivalents	(4,609)	6,874	9,229	(17,441)
	(820)	(1,212)	(1,746)	(665)

Effect of exchange rate changes on cash and cash equivalents				
Cash and cash equivalents at beginning of period	17,317	11,888	17,550	25,033
Cash and cash equivalents at end of period	$11,888	$17,550	$25,033	$6,927

See accompanying Notes to the Consolidated Financial Statements

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

	Predecessor For the year ended December 31,			Successor
	2013	2014	For the Period January 1 Through August 14, 2015	For the Period August 15 Through December 31, 2015
Supplemental disclosures of cash flow information:				
Net cash paid during the periods for:				
Interest	$21,825	$21,549	$10,661	$10,880
Income taxes	8,357	10,611	5,016	1,646
Non-cash operating, investing and financing activities:				
Common stock issued to savings and pension plan trusts	4,561	4,381	1,874	—
* Net change in working capital due to the following components:				
Decrease (increase) in current assets:				
Accounts and notes receivable, net	$37,366	$28,466	$61,008	$(9,524)
Inventories	14,324	77,875	1,164	47,853
Prepaid expenses and other current assets	(209)	(14,898)	2,551	15,935
Decrease in accounts payables and accruals	(38,198)	(25,849)	(18,728)	(21,503)
Rationalizations	18,421	(8,732)	(2,677)	(3,756)
Increase in interest payable	276	(16)	2,276	(2,242)
Decrease in working capital	$31,980	$56,846	$45,594	$26,763

See accompanying Notes to the Consolidated Financial Statements

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

	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, 2013	150,869,227	$1,509	$1,812,592	$(280,678)	$66,884	$(249,487)	$(969)	$1,349,851
Comprehensive income (loss):								
Net loss	—	—	—	—	(27,259)	—	—	(27,259)
Other comprehensive income (loss):								
Commodity and foreign currency derivatives and other, net of tax of ($300)	—	—	—	2,035	—	—	—	2,035
Foreign currency translation adjustments	—	—	—	(13,981)	—	—	—	(13,981)
Total other comprehensive income (loss)	—	—	—	(11,946)	—	—	—	(11,946)
Stock-based compensation	405,168	4	2,850	—	—	2,297	—	5,151
Common stock issued to savings and pension plan trusts	564,435	6	4,561	—	—	—	(63)	4,504
Sale of common stock under stock options	90,735	—	448	—	—	—	—	448
Balance at December 31, 2013	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	—	—	—	(10,859)	—	—	—	(10,859)

derivatives and other, net of tax of ($63)								
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

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)
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 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 derivatives and other, net of tax of ($68)	—	—	—	1,262	—	—	—	1,262
Foreign currency translation adjustments	—	—	—	(27,936)	—	—	—	(27,936)
Total other comprehensive (loss) income	—	—	—	(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
SUCCESSOR								
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

See accompanying Notes to the Consolidated Financial Statements

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:

- Industrial Materials includes graphite electrodes, refractory products and needle coke products, and primarily serves the steel industry.
- Engineered Solutions includes advanced graphite materials, advanced composite materials, advanced electronics technologies, and advanced materials and provides primary and specialty products to the advanced electronics, industrial, energy, transportation and defense markets.

Summary of Significant Accounting Policies

The Consolidated Financial Statements include the financial statements of GrafTech International Ltd. and its wholly-owned subsidiaries. All significant 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.

Earnings per Share

The calculation of basic earnings per share was based on the weighted-average number of our common shares outstanding during the applicable period. We used the two-class method of computing earnings per share for our instruments granted in share-based payment transactions that are determined to be participating securities prior to vesting. Earnings per share calculations are not required after August 14, 2015 as a result of our acquisition by Brookfield.

Diluted earnings per share recognizes the dilution that would occur if outstanding stock options and restricted stock awards were exercised or converted into common shares. We use the treasury stock method to compute the dilutive effect of our stock options and restricted stock awards (using the average market price for the period).

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 $102.9 million for 2013 (including $28.3 million of rationalization related accelerated depreciation), $100.4 million for 2014 (including $26.0 million of rationalization related accelerated depreciation). Depreciation expense was $34.5 million for the period January 1 through August 14, 2015 and $22.4 million for the period August 15 through December 31, 2015.

Accounts Receivable

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

Sales of trade accounts receivable

We have in the past sold certain trade accounts receivable to a bank under a factoring arrangement. The receivables were sold at a discount on a nonrecourse basis and we did not retain interests in the receivables sold. We also acted as a servicer of the sold receivables for a fee. The servicing duties included collecting payments on receivables and remitting them to the bank. While servicing the receivables, we applied the same servicing policies and procedures that are applied to our owned accounts receivable.

Allowance for Doubtful Accounts

Considerable judgment is required in assessing the realizability 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. As of December 31, 2014 capitalized bank fees amounted to $9.7 million. We have no capitalized bank fees as of December 31, 2015. 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 $2.5 million in 2013, $3.3 million in 2014, and $2.1 million in the period January 1 through August 14, 2015, respectively. We had no amortization of capitalized bank fees in the period August 15 through December 31, 2015. 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 income 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.

Stock-Based Compensation Plans

We have had various plans that provided for the granting of stock-based compensation to employees and, in certain instances, to non-employee directors, which are described more fully in Note 12, "Management Compensation and Incentive Plans." Shares are issued upon vesting or option exercise from authorized, unissued shares or treasury shares. We account for those plans under the applicable standards on accounting for share-based payment. For transactions in which we obtain employee services in exchange for an award of equity instruments, we measure the cost of the services based on the grant date fair value of the award. We recognize the cost over the period during which an employee is required to provide services in exchange for the award, known as the requisite service period (usually the vesting period). Costs related to plans with graded vesting are generally recognized using a straight-line method. Cash flows resulting from tax benefits for deductions in excess of compensation cost recognized are included in financing cash flows.

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 as a component of inventoriable costs. Additional information with respect to benefits plans is set forth in Note 11, "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 $14.6 million in 2013, $17.0 million in 2014, and $11.1 million in 2015. The accrued liability relating to environmental remediation was $6.9 million as of December 31, 2014 and $5.9 million as of December 31, 2015. 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 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.

Software Development Costs

In connection with our development and implementation of global enterprise resource planning systems with advanced manufacturing, planning and scheduling software, we capitalize certain computer software costs after technological feasibility is established. These costs are capitalized within property, plant and equipment and are amortized utilizing the straight-line method over the economic lives of the related products. Total costs capitalized as of December 31, 2014 and 2015 amounted to $15.6 million and $6.9 million, respectively. Amortization expense for capitalized software was $1.0 million for 2013 , $0.5 million for 2014 and $0.2 million for the period January 1 through August 14, 2015 and $0.3 million in the period August 15, 2015 through December 31, 2015.

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 (using a discounted cash flow method) 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 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 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 5 “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 time estimated to lapse until the next scheduled overhaul of the applicable storage or processing unit. Under this policy in 2014, costs deferred were $13.3 million and costs amortized were $6.6 million. Costs deferred in 2015 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.

Our turnaround was completed during September and October of 2015.

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, 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.

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 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.

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 have 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. Our December 31, 2014 balance sheet contains $28.4 million of current deferred tax assets and $7.2 million of deferred tax liabilities that would have been classified as long-term had the standard been applied retrospectively.

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.

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. We are in the process of assessing the impact of the adoption of ASU 2014-09 on the Company's financial position, results of operations and cash flows.

In April, 2015, the FASB issued ASU 2015-3, 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 had $9.7 million of capitalized bank fees included within "Other Assets" on our consolidated balance sheets as of December 31, 2014. We had no capitalized bank fees as of December 31, 2015. We do not anticipate the adoption of this ASU having a significant impact on the Company's financial position, results of operations or cash flows.

(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.

GRAFTECH INTERNATIONAL LTD. AND SUBSIDIARIES
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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 preliminary 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	Previously Reported
Cash	$25,032
Accounts receivable	94,298
Inventories	346,645
Property, plant and equipment	650,405
Intangible assets	155,700
Deferred tax assets	40,904
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	(101,768)
Deferred tax liabilities	(79,235)
Net identifiable assets acquired	$682,278
Goodwill	$172,059
Net assets acquired	$854,337

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(3) Rationalizations

Throughout 2014 and 2015 the Company undertook rationalization plans in order to streamline our organization and lower our production costs. The following tables summarize the total rationalization and related charges incurred during 2014 and 2015 followed by the details of each plan.

	For the Year Ended December 31, 2013 (Predecessor)			
All Plans	Industrial Materials Segment	Engineered Solutions Segment	Corporate, R&D and Other	Total
	(Dollars in thousands)			
Recorded in Cost of Sales				
Accelerated depreciation	$28,326	$—	$—	$28,326
Inventory loss	7,886	896	—	8,782
Fixed asset write-offs and other	6,104	2,274	—	8,378
Recorded in Selling and General Administrative				
Other	59	—	—	59
Recorded in Rationalizations				
Severance and related costs	17,072	458	1,816	19,346
Contract terminations	810	—	—	810
Total 2013 rationalization and related charges	$60,257	$3,628	$1,816	$65,701

	For the Year Ended December 31, 2014 (Predecessor)			
All Plans	Industrial Materials Segment	Engineered Solutions Segment	Corporate, R&D and Other	Total
	(Dollars in thousands)			
Recorded in Cost of Sales				
Accelerated depreciation	$22,388	$3,649	$—	$26,037
Inventory loss	961	13,711	—	14,672
Fixed asset write-offs and other	5,552	1,278	—	6,830
Recorded in Research and Development				
Accelerated depreciation	—	—	2,312	2,312
Recorded in Selling and General Administrative				
Accelerated depreciation	—	—	608	608
Other	89	121	515	725
Recorded in Rationalizations				
Severance and related costs	5,040	3,113	2,845	10,998
Contract terminations	469	146	11	626
Impairment of long-lived assets	—	121,570	—	121,570
Total 2014 rationalization and related charges	$34,499	$143,588	$6,291	$184,378

	For the Period January 1 Through August 14, 2015 (Predecessor)			
All Plans	Industrial Materials Segment	Engineered Solutions Segment	Corporate, R&D and Other	Total
	(Dollars in thousands)			
Recorded in Cost of Sales				
Accelerated depreciation	$432	$—	$940	1,372
Inventory loss	(33)	975	—	942
Fixed asset write-offs and other	1,715	1,078	—	2,793
Recorded in Selling and General Administrative				
Other	400	755	954	2,109
Recorded in Rationalizations				
Severance and related costs	157	4,288	(168)	4,277
Contract terminations	25	204	—	229
Total	$2,696	$7,300	$1,726	$11,722

	For the Period August 15 Through December 31, 2015 (Successor)			
All Plans	Industrial Materials Segment	Engineered Solutions Segment	Corporate, R&D and Other	Total
	(Dollars in thousands)			
Recorded in Cost of Sales				
Inventory loss	$(639)	$206	$—	$(433)
Fixed asset write-offs and other	329	697	—	1,026
Recorded in Selling and General Administrative				
Other	135	1,323	290	1,748
Recorded in Rationalizations				
Severance and related costs	154	769	71	994
Contract terminations	59	22	—	81
Total	$38	$3,017	$361	$3,416

2013 Industrial Materials Rationalization

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. Our graphite electrode capacity was reduced by approximately 60,000 metric tons as a result of these actions. In parallel, we adopted measures for reductions in overhead and related corporate operations. These actions and measures reduced global headcount by approximately 600 people, or approximately 20 percent of our global workforce. These actions were substantially completed during the first half of 2014.

2013 Engineered Solutions Rationalization

In order to optimize our Engineered Solutions platform and improve our cost structure, we also initiated actions to centralize certain operations and reduce overhead in our Engineered Solutions segment. These actions reduced global headcount by approximately 40 people and were substantially completed during 2014.

Charges incurred related to the 2013 rationalization initiatives for the year ended December 31, 2014 and 2015 are as follows:

2013 Plans	For the Year Ended December 31, 2013			
	Industrial Materials Segment	Engineered Solutions Segment	Corporate, R&D and Other	Total
	(Dollars in thousands)			
Recorded in Cost of Sales				
Accelerated depreciation	$28,326	$—	$—	$28,326
Inventory loss	7,886	896	—	8,782
Fixed asset write-offs and other	6,104	2,274	—	8,378
Recorded in Selling and General Administrative				
Other	59	—	—	59
Recorded in Rationalizations				
Severance and related costs	17,072	458	1,816	19,346
Contract terminations	810	—	—	810
Total 2013 rationalization plan and related charges	$60,257	$3,628	$1,816	$65,701

2013 Plans	For the Year Ended December 31, 2014			
	Industrial Materials Segment	Engineered Solutions Segment	Corporate, R&D and Other	Total
	(Dollars in thousands)			
Recorded in Cost of Sales				
Accelerated depreciation	$22,388	827	—	23,215
Inventory loss	961	485	—	1,446
Fixed asset write-offs and other	5,374	233		5,607
Recorded in Selling and General Administrative				
Other	89	—		89
Recorded in Rationalizations				
Severance and related costs	433	(28)	—	405
Contract terminations	469	—	—	469
Total 2013 rationalization plan and related charges	$29,714	$1,517	$—	$31,231

2013 Plans	For the Period January 1 Through August 14, 2015 (Predecessor)			
	Industrial Materials Segment	Engineered Solutions Segment	Corporate, R&D and Other	Total
	(Dollars in thousands)			
Recorded in Cost of Sales				
Accelerated depreciation	$432	—	—	432
Inventory loss	(33)	—	—	(33)
Fixed asset write-offs and other	1,715	270		1,985
Recorded in Rationalizations				
Severance and related costs	97	156	—	253
Contract terminations	25	—	—	25
Total 2013 rationalization plan and related charges	$2,236	$426	$—	$2,662

2013 Plans	For the Period August 15 Through December 31, 2015 (Successor)			
	Industrial Materials Segment	Engineered Solutions Segment	Corporate, R&D and Other	Total
	(Dollars in thousands)			
Recorded in Cost of Sales				
Inventory loss	$(278)	$(29)		$(307)
Fixed asset write-offs and other	329	71		400
Recorded in Selling and General Administrative				
Other	245	—	—	245
Recorded in Rationalizations				
Severance and related costs	177	—	—	177
Contract terminations	59	—	—	59
Total 2013 rationalization plan and related charges	$532	$42	$—	$574

During the second quarter of 2015, in connection with our rationalization initiatives, two sites, located in Salvador, Brazil and Pennsylvania, United States, substantially completed their decommissioning efforts and met the criteria for assets held for sale. Because the carrying value of the sites did not exceed their estimated fair value, no additional impairment was recorded. Our Pennsylvania facility was sold in the third quarter of 2015 for a gain of $0.3 million. Additionally, during the third quarter of 2015, our facility in Meyerton, South Africa substantially completed their decommissioning efforts and met the criteria for assets held for sale. As of December 31, 2015, the sites held for sale represent $6.6 million of assets reported under "Property, plant and equipment" and $1.2 million of liabilities, reported under "Other accrued liabilities".

The following table represents the roll-forward of the liability incurred for employee termination benefits and contract termination costs incurred in connection with the rationalization initiatives described above. This liability is recorded as a current liability on the Consolidated Balance Sheet.

	(Dollars in thousands)	
Balance as of December 31, 2013	$ 18,421	
Charges incurred	613	
Change in estimates	153	
Payments and settlements	(16,494	)
Effect of change in currency exchange rates	(1,658	)
Balance as of December 31, 2014	1,035	
Charges incurred	40	
Change in estimates	227	
Payments and settlements	(1,102	