

GRAFTECH INTERNATIONAL LTD
Form S-1/A
April 04, 2018

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As filed with the Securities and Exchange Commission on April 4, 2018.

Registration No. 333-223791

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

**Amendment No. 3 to
FORM S-1
REGISTRATION STATEMENT
UNDER
THE SECURITIES ACT OF 1933**

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

Delaware
(State or other jurisdiction of
incorporation or organization)

3620
(Primary Standard Industrial
Classification Code Number)

27-2496053
(I.R.S. Employer
Identification No.)

**982 Keynote Circle
Brooklyn Heights, OH 44131
(216) 676-2000**

(Address, including zip code, and telephone number,
including area code, of registrant's principal executive offices)

**David J. Rintoul
Chief Executive Officer
GrafTech International Ltd.
982 Keynote Circle
Brooklyn Heights, OH 44131**

(216) 676-2000

(Name, address, including zip code, and telephone number,
including area code, of agent for service)

(Copies of all communications, including communications sent to agent for service)

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Approximate date of commencement of proposed sale to the public: As soon as practicable after this registration statement becomes effective.

If any of the securities being registered on this Form are to be offered on a delayed or continuous basis pursuant to Rule 415 under the Securities Act of 1933 check the following box:

If this Form is filed to register additional securities for an offering pursuant to Rule 462(b) under the Securities Act, check the following box and list the Securities Act registration statement number of the earlier effective registration statement for the same offering.

If this Form is a post-effective amendment filed pursuant to Rule 462(c) under the Securities Act, check the following box and list the Securities Act registration statement number of the earlier effective registration statement for the same offering.

If this Form is a post-effective amendment filed pursuant to Rule 462(d) under the Securities Act, check the following box and list the Securities Act registration statement number of the earlier effective registration statement for the same offering.

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

Large accelerated filer <input type="radio"/>	Accelerated filer <input type="radio"/>	Non-accelerated filer <input checked="" type="radio"/> (Do not check if a smaller reporting company)	Smaller reporting company <input type="radio"/> Emerging growth company <input type="radio"/>
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If an emerging growth company, indicate by check mark if the registrant has elected not to use the extended transition period for complying with any new or revised financial accounting standards provided pursuant to Section 7(a)(2)(B) of the Securities Act.

CALCULATION OF REGISTRATION FEE

Title of each class of securities to be registered	Amount to be registered(1)(2)	Proposed maximum offering price per share(2)(3)	Proposed maximum aggregate offering price	Amount of registration fee(4)
Common stock, \$0.01 par value per share	43,444,443	\$24.00	\$1,042,666,632	\$129,812

(1) Includes shares of common stock to be sold by the selling stockholder and shares to be sold upon exercise of the underwriters' overallotment option.

(2) Estimated solely for the purpose of calculating the registration fee pursuant to Rule 457(a) under the Securities Act of 1933, as amended (or the Securities Act).

(3) Anticipated to be between \$21.00 and \$24.00.

(4) Includes \$12,450 the registrant previously paid in connection with the initial filing of this registration statement.

The registrant hereby amends this registration statement on such date or dates as may be necessary to delay its effective date until the registrant shall file a further amendment which specifically states that this registration statement shall thereafter become effective in accordance with Section 8(a) of the Securities Act or until the registration statement shall become effective on such date as the Securities and Exchange Commission, acting pursuant to said Section 8(a), may determine.

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Subject to completion, dated April 4, 2018

The information in this prospectus is not complete and may be changed. We may not sell these securities until the registration statement filed with the Securities and Exchange Commission is effective. This prospectus is not an offer to sell these securities and it is not soliciting an offer to buy these securities in any jurisdiction where the offer or sale is not permitted.

Preliminary Prospectus

37,777,777 shares

Common stock

This is an initial public offering of common stock of GrafTech International Ltd. The selling stockholder identified in this prospectus is selling 37,777,777 shares of our common stock. We will not receive any of the proceeds from the sale of shares of our common stock by the selling stockholder.

This is our initial public offering and no public market currently exists for our common stock. The estimated initial public offering price is between \$21.00 and \$24.00 per share. We have applied to list our common stock on the New York Stock Exchange (NYSE) under the symbol "EAF."

We are an "emerging growth company" as defined in Section 2(a) of the Securities Act of 1933, as amended (or the Securities Act) and will be subject to reduced public company reporting requirements. See "Prospectus Summary Implications of Being an Emerging Growth Company."

Investing in our common stock involves risks. See "Risk Factors" beginning on page 27.

	Per share	Total
Public offering price	\$	\$
Underwriting discount ⁽¹⁾	\$	\$
Proceeds to the selling stockholder	\$	\$

(1) See "Underwriting" beginning on page 175 of the prospectus for additional information regarding total underwriting compensation. The underwriters will not receive an underwriting discount or commission on the sale of our common stock to certain independent director nominees, which allocation will be made at our direction. The selling stockholder will receive the full public offering price for such shares. See "Certain relationships and related party transactions Participation in our Initial Public Offering" for additional information regarding the sale of our common stock to certain independent director nominees.

The selling stockholder has granted the underwriters the right to purchase up to 5,666,666 additional shares of common stock at the public offering price less underwriting discounts and commissions, for the purpose of covering overallotments.

The underwriters expect to deliver the shares of common stock to investors on or about _____, 2018.

Neither the Securities and Exchange Commission (or SEC) nor any state securities commission has approved or disapproved of these securities or determined if this prospectus is truthful or complete. Any representation to the contrary is a criminal offense.

J.P. Morgan

Credit Suisse

Citigroup

RBC Capital Markets

HSBC

**BMO Capital
Markets**

**BNP
PARIBAS**

**CIBC Capital
Markets**

**National Bank
Financial**

**TD
Securities**

The date of this prospectus is

_____, 2018.

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We are responsible for the information contained in this prospectus and in any related free-writing prospectus we may prepare or authorize to be delivered to you. We have not authorized anyone to give you any other information, and we take no responsibility for any other information that others may give you. We and the selling stockholder are not, and the underwriters are not, making an offer of these securities in any jurisdiction where the offer is not permitted. You should not assume that the information contained in this prospectus is accurate as of any date other than the date on the front of this prospectus.

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Market and industry data and forecasts

Certain market and industry data included in this prospectus has been obtained from third party sources that we believe to be reliable. Market estimates are calculated by using independent industry publications, government publications and third party forecasts in conjunction with our assumptions about our markets. We have not independently verified such third party information. While we are not aware of any misstatements regarding any market, industry or similar data presented herein, such data involves risks and uncertainties and is subject to change based on various factors, including those discussed under the headings "Special Note Regarding Forward-Looking Statements" and "Risk Factors" in this prospectus.

Trademarks

We own or otherwise have rights to the trademarks, service marks, copyrights and trade names, including those mentioned in this prospectus, used in conjunction with the marketing and sale of our products and services. This prospectus includes trademarks, which are protected under applicable intellectual property laws and are our property and/or the property of our subsidiaries. This prospectus may also contain trademarks, service marks, copyrights and trade names of other companies, which are the property of their respective owners. We do not intend our use or display of other companies' trademarks, service marks, copyrights or trade names to imply a relationship with, or endorsement or sponsorship of us by, any other companies. Solely for convenience, our trademarks, service marks and trade names referred to in this prospectus may appear without the ®, ™, or SM symbols, but such references are not intended to indicate, in any way, that we will not assert, to the fullest extent under applicable law, our rights to these trademarks, service marks and trade names.

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Prospectus summary

This summary highlights information contained elsewhere in this prospectus. It may not contain all the information that may be important to you. You should read the entire prospectus carefully, including the section entitled "Risk Factors" and our financial statements and the related notes included elsewhere in this prospectus, before making an investment decision to purchase shares of our common stock.

Unless the context suggests otherwise, references in this prospectus to "GrafTech," the "Company," "we," "us," and "our" refer to GrafTech International Ltd., a Delaware corporation, and its consolidated subsidiaries. See "Our company" below for more information. References in this prospectus to the "selling stockholder" refer to BCP IV GrafTech Holdings LP, an affiliate of Brookfield Asset Management Inc. and Brookfield Business Partners L.P., and the direct owner of GrafTech. References in this prospectus to "Brookfield" refer to Brookfield Asset Management Inc. and its affiliates. All dollar amounts in this prospectus are in U.S. dollars and are expressed in thousands unless specified otherwise. The financial statements have been prepared in accordance with generally accepted accounting principles in the United States (or GAAP).

Our company

We are a leading manufacturer of high quality graphite electrode products essential to the production of electric arc furnace (or EAF) steel and other ferrous and non-ferrous metals. We believe that we have the most competitive portfolio of low-cost graphite electrode manufacturing facilities in the industry, including three of the five highest capacity facilities in the world (excluding China). We are the only large scale graphite electrode producer that is substantially vertically integrated into petroleum needle coke, the primary raw material for graphite electrode manufacturing, which is currently in limited supply. This unique position provides us with competitive advantages in product quality and cost. Founded in 1886, we have over 125 years of experience in the research and development (or R&D) of graphite- and carbon-based solutions, and our intellectual property portfolio is extensive. We currently have graphite electrode manufacturing facilities in Calais, France, Pamplona, Spain, Monterrey, Mexico and St. Marys, Pennsylvania. Our customers include major steel producers and other ferrous and non-ferrous metal producers in Europe, the Middle East and Africa (or EMEA), the Americas and Asia-Pacific (or APAC), which sell their products into the automotive, construction, appliance, machinery, equipment and transportation industries. Our vision is to be the lowest cost, highest quality producer of graphite electrodes while providing the best customer service. Based on the high quality of our graphite electrodes, reliability of our petroleum needle coke supply and our excellent customer service, we believe that we are viewed as the preferred supplier to the global EAF steel producer market.

Graphite electrodes are an industrial consumable product used primarily in EAF steel production, one of the two primary methods of steel production and the steelmaking technology used by all "mini-mills." 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. We estimate that, on average, the cost of graphite electrodes represents only approximately 1% to 5% of the total production cost of steel in a typical EAF, but they are essential to EAF steel production. Graphite electrodes are currently the only known commercially available products that have the high levels of electrical conductivity and the capability to sustain the high levels of heat generated in EAF steel production. As a result, EAF steel manufacturers have been willing to pay a premium for a reliable supply of high quality graphite electrodes, and, in some cases, to pass on this premium to their customers in the form of surcharges. Graphite

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electrodes are also used in steel refining in ladle furnaces and in other processes, such as the production of titanium dioxide, stainless steel, aluminum, silicon metals and other ferrous and non-ferrous metals.

Petroleum needle coke, a crystalline form of carbon derived from decant oil, is the primary raw material used in the production of graphite electrodes. We achieved substantial vertical integration with this critical raw material source through our acquisition of Seadrift Coke LP (or Seadrift) in November 2010, significantly reducing our reliance on other suppliers. The petroleum needle coke industry is highly concentrated, with what we believe to be the largest producer, Phillips 66, controlling approximately 50% of capacity. We believe Seadrift is the second largest petroleum needle coke producer in the world. We also believe that the quality of Seadrift's petroleum needle coke is superior for graphite electrode production compared to most of the petroleum needle coke available to our peers on the open market, allowing us to produce higher quality electrodes in a cost-efficient manner. Additionally, we believe that this vertical integration provides a significant cost advantage relative to our competitors in periods of tight petroleum needle coke supply, such as the current market environment. We believe this cost advantage will grow as demand for petroleum needle coke increases for use in lithium-ion batteries in electric vehicles. The demand for petroleum needle coke in lithium-ion batteries is growing rapidly, with usage going from approximately 1,000 MT in 2014 to 60,000 MT in 2017 (representing approximately 9% of 2017 petroleum needle coke demand). This rapidly growing alternative source of demand is a significant development for the petroleum needle coke industry and is contributing to the global shortage in petroleum needle coke.

According to the World Steel Association (or WSA), EAFs accounted for 45%, or 367 million metric tons (or MT), of global crude steel production (excluding China) in 2016. Between 1984 and 2011, EAF steelmaking was the fastest-growing segment of the steel sector, with production increasing at an average rate of 3.5% per year, based on WSA data. Historically, EAF steel production has grown faster than the overall steel market due to the greater resilience, more variable cost structure, lower capital intensity and more environmentally friendly nature of EAF steelmaking. This trend was partially reversed between 2011 and 2015 due to global steel production overcapacity driven largely by Chinese blast furnace (or BOF) steel production. Beginning in 2016, efforts by the Chinese government to restructure China's domestic steel industry have led to limits on Chinese BOF steel production and lower export levels. In addition, developed economies, which typically have much larger EAF steel industries, have instituted a number of trade policies in support of domestic steel producers. As a result, since 2016, the EAF steel market has rebounded strongly and resumed its long-term growth trajectory. This revival in EAF steel production has resulted in increased demand for our graphite electrodes.

At the same time, two supply-side structural changes have contributed to recent record high prices of graphite electrodes. First, ongoing consolidation and rationalization of graphite electrode production capacity have limited the ability of graphite electrode producers to meet demand. We estimate that approximately 20% of graphite electrode industry production capacity (excluding China) has been closed or repurposed since the beginning of 2014, and we believe the majority of these closures represent permanent reductions. Second, demand for petroleum needle coke has outpaced supply due to increasing demand for petroleum needle coke for lithium-ion batteries used in electric vehicles. As a result, graphite electrode prices have recently reached record high prices. Historically, between 2006 and 2016, our weighted average realized price of graphite electrodes was approximately \$4,500 per MT (on an inflation-adjusted basis using constant 2017 dollars) and fell to a historic low of approximately \$2,500 per MT in 2016. With the renewed demand for, and constrained supply of, graphite electrodes, industry spot prices reached record levels of as high as \$15,000 to \$30,000 per MT in the first quarter of 2018. In light of improved market conditions, the long lead time required to produce our products, our position as one of the market's largest producers and our ability, through our substantial vertical integration with Seadrift, to

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provide customers with a reliable long-term supply of graphite electrodes despite the market shortage of petroleum needle coke, we have implemented a new commercial strategy to sell 60% to 65% of our production capacity to our strategic customers through three- to five-year take-or-pay contracts.

GrafTech historical weighted average realized prices and signed three- to five-year weighted average contract prices for graphite electrodes

(1) Weighted average realized price for a period reflects the total revenues from sales of graphite electrodes for the period divided by the graphite electrode sales volume for that period. The weighted average realized prices in this chart are shown in constant 2017 dollars for comparability. See "Management's Discussion and Analysis of Financial Condition and Results of Operations Key Operating Metrics."

(2) Weighted average contract price for a period reflects the volume-weighted average price for graphite electrodes to be delivered under the three- to five-year take-or-pay contracts we have entered into as of March 1, 2018. All of these contracts have fixed prices and either fixed volumes (85% of the portfolio) or a specified volume range (15% of the portfolio). For those contracts with a specified volume range, weighted average contract prices are computed using the volume midpoint. The aggregate difference between the volume midpoint and the minimum and maximum volumes across our cumulative portfolio of take-or-pay contracts with specified volume ranges is approximately 5,000 MT per year in 2019-2022. See "Business Contracts and Customers."

As a leading producer of graphite electrodes, we believe we are well-positioned to benefit from this industry transformation. In 2017, based on our three currently operating facilities, we had the capability, depending on product demand and mix, to manufacture approximately 167,000 MT of graphite electrodes per year. We are also in the process of an operational improvement and debottlenecking initiative and are on target to grow our production capacity at these facilities by approximately 21% to approximately 202,000 MT of production capacity by the end of 2018. If we were then to restart our currently idled St. Marys facility, our overall production capacity would increase by another approximately 14% to 230,000 MT per year. This total production capacity would be comparable to our largest competitor, which we estimate currently has a total of approximately 230,000 MT of production capacity (excluding China). We believe the total worldwide graphite electrode production capacity was approximately 800,000 MT (excluding China), with a capacity utilization of approximately 90% (excluding China), in 2017. Electrode production globally (excluding China) is focused on the manufacture of ultra-high power (or UHP) electrodes for EAFs, while the majority of Chinese production is of ladle electrodes for BOFs. The production of UHP electrodes requires an extensive proprietary manufacturing process and material science knowledge, including the use of superior needle coke blends. As a result, graphite electrode producers inside and outside of China are generally not in direct competition with each other for major product lines.

On August 15, 2015, we became an indirect wholly owned subsidiary of Brookfield through a tender offer to shareholders and subsequent merger transaction. Brookfield is an experienced operator of industrial,

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natural resource and other tangible asset businesses. This transaction has provided us with a stable equity partner with experience in industrial sectors.

Our executive offices are located at 982 Keynote Circle, Brooklyn Heights, Ohio 44131 and our telephone number is (216) 676-2000. Our Internet website address is www.graftech.com. Information on, or accessible through, our website is not part of this prospectus. We have included our website address only as an inactive textual reference and do not intend it to be an active link to our website.

Key developments

Three major developments have repositioned GrafTech and the graphite electrode industry for long-term growth and significantly improved our financial and operating results:

the restructuring and repositioning of GrafTech;

the return of the EAF steel industry to long-term growth, leading to improved demand for graphite electrodes; and

structural changes in the graphite electrode and petroleum needle coke industries.

We have restructured and repositioned GrafTech for a sustainable leadership position in the graphite electrode industry

Since 2012, we have executed a three-part transformation plan to improve our competitive position and allow us to better serve our customers.

We have achieved annual fixed manufacturing cost improvements and capital expenditure reductions of approximately \$190 million since 2012, while also improving the productivity of our plant network

We have strategically shifted production from our lowest to our highest production capacity facilities to increase fixed cost absorption. In 2018, we expect to produce a greater quantity of graphite electrodes from our three operating facilities in Calais, France, Pamplona, Spain and Monterrey, Mexico, than we did from our six operating facilities in 2012. As a result, we have achieved significant operating leverage at higher capacity utilizations. In our experience, high capacity manufacturing facilities can have operating costs of more than \$1,000 per MT lower than low capacity manufacturing facilities. In addition, we have streamlined fixed costs across our plant network, including a 50% headcount reduction at Seadrift since 2014 and an optimization of Seadrift's systems and manufacturing process to reduce capital expenditure requirements. As a result of these actions, by the end of 2016, we had reduced our annual fixed manufacturing costs by approximately \$80 million and our maintenance capital expenditure requirements by approximately \$45 million since 2012.

By the end of 2016, we had also reduced our annual overhead expenses by approximately \$65 million since 2012 by simplifying our corporate structure from a conglomerate model to a centralized business focused exclusively on the production of graphite electrodes and petroleum needle coke. In addition, we have streamlined and combined our workforce and various administrative functions for efficiency, and eliminated R&D functions unrelated to graphite electrodes.

In addition to our fixed cost reductions, we have been able to achieve significant productivity improvements and variable cost reductions across our plants since 2014. We have improved our manufacturing processes and made strategic investments across our plant network, which have improved productivity, including improvements of approximately 20% at both our Seadrift and Monterrey plants,

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while also reducing our energy and raw material consumption. Our more efficient graphite electrode plants produced at record breaking levels in 2017. In 2017, the Calais and Pamplona plants exceeded previous annual record production levels by 15% and 12%, respectively, and production at the Monterrey plant was 12% higher than the highest annual production level during the past 10 years. We have achieved these production increases by exploiting latent capacity in our plants, which historically have had uneven levels of capacity across each manufacturing process step, by removing artificial constraints on cycle times and improving scheduling processes. The next stage of our operational improvement and debottlenecking initiative is a small capital program concentrated on the graphitizing stage of production at our plants, which we expect will increase our current operating capacity by approximately 21%, or 35,000 MT, by the end of 2018, allowing us to achieve further improvements in our cost structure. As a result of our prior operational improvement activities, we are able to achieve this large capacity increase with specific, highly targeted capital investments. We expect the capital investment for this initiative to be \$37 million. We believe that the optimization of our plant network will continue to drive improved fixed cost absorption and meaningfully lower variable costs.

We have reoriented our commercial strategy

In light of improved market conditions, the long lead time required to produce our products, our position as one of the market's largest producers and our ability, through our substantial vertical integration with Seadrift, to provide customers with a reliable long-term supply of graphite electrodes despite the market shortage of petroleum needle coke, we have implemented a new commercial strategy to sell approximately 60% to 65% of our production capacity to our strategic customers through three- to five-year take-or-pay contracts. These contracts define volumes and prices, along with price-escalation mechanisms for inflation, and include significant termination payments (typically, 50% to 70% of remaining contracted revenue) and, in certain cases, parent guarantees and collateral arrangements to manage our customer credit risk. These new commercial initiatives have led to approximately 636,000 MT, or 60% to 65% of our cumulative production capacity from 2018 to 2022, being contracted as of March 1, 2018. Approximately 132,000 MT of this contracted volume is for 2018. Together with sales volume committed by purchase orders, approximately 96% of our 2018 production capacity is contracted or committed by purchase orders. For future years, our strategy is to retain approximately 35% to 40% of our production capacity for sales on a shorter term or spot basis. Prices in the spot market have currently reached a level three to six times higher than our historical weighted average realized price of \$4,500 per MT (on an inflation-adjusted basis using constant 2017 dollars) between 2006 and 2016. We expect the incremental volume from our operational improvement and debottlenecking initiative to be available to customers on a spot basis, further increasing our exposure to spot prices. Seadrift produces sufficient needle coke to supply 100% of the graphite electrode production that we have contracted under our new take-or-pay contracts. In the first quarter of 2018, the estimated cost of goods sold (excluding depreciation) for electrodes produced with Seadrift needle coke is approximately \$2,600/MT and the estimated variable cost (excluding needle coke and decant oil) is approximately \$1,150/MT. To align with our three- to five-year contract profile, we have hedged the decant oil required to produce all of the graphite electrodes sold under these contracts, providing us with substantial visibility into our future raw material costs. We intend to match the volume and term of our shorter term and spot sales with our third party needle coke purchases. As our currently operating facilities are now operating at or near full production capacity, we also have reviewed our product portfolio and restructured our sales force incentives to maximize the profitability of our product mix.

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We are focused on being the industry's leading producer of the highest performing electrodes

The divestiture of our non-core legacy Engineered Solutions businesses in 2016 and 2017 has allowed our management team to focus on our core competency of graphite electrode production and generated approximately \$60 million in cash proceeds and release of working capital. By focusing our management's attention and R&D spending exclusively on the graphite electrode business, we have been able to meaningfully improve the quality of our graphite electrodes, repositioning ourselves as an industry quality leader and improving our relationships with strategic customers. Our focus on improving the quality of petroleum needle coke through R&D has led to our petroleum needle coke production at Seadrift now being best-in-class for use in the manufacturing of highly durable UHP electrodes. Our customers have responded favorably to the increased quality of our graphite electrodes, and we have increased our market share with leading EAF steel manufacturers as a result.

The EAF steel industry has strengthened, improving demand for our graphite electrodes

Historically, EAF steel production has grown faster than the overall steel market due to the greater resilience, more variable cost structure, lower capital intensity and more environmentally friendly nature of EAF steelmaking. This trend was partially reversed between 2011 and 2015 due to global steel production overcapacity driven largely by Chinese BOF steel production. Beginning in 2016, efforts by the Chinese government to eliminate excess steelmaking production capacity and improve environmental and health conditions have led to limits on Chinese BOF steel production, including the closure of over 200 million MT of its steel production capacity, based on data from S&P Global Platts and the Ministry of Commerce of the People's Republic of China. In 2017, Chinese steel exports fell by more than 30% from 2016, including 17 consecutive months of year-over-year declines, according to the National Bureau of Statistics of China. Reflecting the reduction in steelmaking production capacity, as of October 2017, Chinese steel imports had increased significantly year-over-year, including a 64% year-over-year increase in semi-finished steel billet imports. Further, developed economies, which typically have much larger EAF steel industries, have instituted a number of trade policies in support of domestic steel producers. Declining Chinese steel exports and increasing steel imports should provide additional opportunity for EAF producers outside of China to increase production, thereby increasing demand for graphite electrodes.

We estimate that in 2017, EAF steel production grew at an annual pace of at least 8% to 10% compared with 5% for steelmaking overall. We believe EAF steel producers will continue to take market share from BOF steel producers. As of 2016, according to the WSA, EAF steel production had grown to 67% of total U.S. steel production from 47% in 2000, 44% of total EMEA steel production from 33% in 2000 and 40% of total APAC (excluding China) steel production from 36% in 2000. Over the same period, global EAF production increased from 287 million MT in 2000 to 418 million MT in 2016, while non-EAF steel production (excluding China) was flat at 453 million MT in both 2000 and 2016.

We estimate that at least 105 new EAFs, reflecting 66 million MT of new annual steelmaking production capacity, have been installed or have commenced construction in China in 2017, compared to only 52 million MT of Chinese EAF steel production in 2016. As a result of significantly increased steel production since 2000, the supply of Chinese scrap has increased substantially, providing the Chinese EAF steel manufacturing industry with local scrap feedstock that was not historically available. We believe continued Chinese government environmental actions and an increasing domestic scrap supply will support the ongoing global shift towards EAF steelmaking. Assuming completion of new EAF construction and full EAF capacity utilization, we estimate total graphite electrode demand in China could increase in 2018 by over 100,000 MT from 2017.

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The recent restructuring of the graphite electrode industry and changes in the petroleum needle coke industry have reduced supply as demand is recovering

Significant amounts of graphite electrode industry production capacity have recently been removed from the market globally. We estimate that approximately 20% of industry production capacity (excluding China) has been closed or repurposed since the beginning of 2014. Some of these closed manufacturing facilities have sold off equipment, been demolished, undertaken long-term environmental remediation or been repurposed for other manufacturing uses. Accordingly, we believe the majority of these closures represent permanent reductions. As part of this overall industry rationalization, we permanently shut down two plants and temporarily idled our St. Marys plant, reducing our electrode manufacturing from six operating facilities in 2012 to three operating facilities in 2017. Also, in October 2017, the third largest graphite electrode producer acquired the second largest producer.

Further affecting the availability of graphite electrodes, supplies of petroleum needle coke and coal tar (or pitch) needle coke, a less favorable substitute for petroleum needle coke, have been limited starting in the second half of 2017. Demand for petroleum needle coke has outpaced supply due to increasing demand for petroleum needle coke in the production of lithium-ion batteries used in electric vehicles. Supply of pitch for pitch needle coke production has fallen as a result of decreasing coke production for the BOF steel industry. These graphite electrode supply constraints have coincided with the recovery in EAF demand for graphite electrodes, resulting in stronger market conditions for our products.

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The table below summarizes these key changes in the industry.

	2011 - 2015	2017
EAF Steel Industry <i>Electrode Demand</i>	EAF steel production declined approximately 10% from 2011 to 2015 after growing faster than the overall steel market for more than 25 years.	EAFs regained market share and resumed faster growth than the overall steel market.
Graphite Electrodes <i>Electrode Supply</i>	<i>China net exports of BOF steel displaced EAF production worldwide.</i> Oversupply driven by historic trough in demand and production capacity additions.	<i>China steel exports are down more than 30% in 2017 from 2016 and are continuing to fall, according to the National Bureau of Statistics of China.</i> We estimate that approximately 20% of graphite electrode production capacity (excluding China) has been closed or repurposed since the beginning of 2014.
	<i>We estimate global production capacity (excluding China) was approximately 1,000,000 MT at 30 plants in 2013.</i>	<i>We estimate current global graphite electrode production capacity (excluding China) is 800,000 MT at 21 plants.</i>
Petroleum Needle Coke <i>Electrode Supply</i>	Excess production capacity and cost disadvantage versus pitch needle coke.	Tight supply due to new demand from lithium-ion batteries for electric vehicles and improving graphite electrode demand.
	<i>Reduced demand from graphite electrodes.</i>	<i>Increased demand has led to pricing increases of four to six times for petroleum needle coke in the current market compared to one year ago.</i>

During the most recent demand trough, the combination of decreased demand from the EAF steel industry and overcapacity in the graphite electrode industry had an adverse effect on the profitability of our operations, including a net loss of \$235.8 million for the year ended December 31, 2016. We also experienced a net loss from continuing operations of \$108.9 million for the year ended December 31, 2016. However, as a result of the recent developments in the industry summarized above, we expect to experience significant improvement in our 2018 financial results relative to these prior results. We also expect a high degree of stability in our future operating results due to our recent three- to five-year contracting initiative. As of March 1, 2018, we have entered into three- to five-year take-or-pay contracts to sell approximately 132,406, 138,446, 134,831, 117,600 and 112,883 MT in 2018, 2019, 2020, 2021 and 2022, respectively.

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Set forth below are selected preliminary estimated unaudited financial results from continuing operations for the two months ended February 28, 2018 and the three months ended March 31, 2018. These financial results are unaudited and should be considered preliminary and subject to change. We have provided

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ranges, rather than specific amounts, for the preliminary results described below as our final results remain subject to the completion of our closing procedures, final adjustments, developments that may arise between now and the time the financial results are finalized, and management's and the audit committee's final reviews. Accordingly, you should not place undue reliance on this preliminary data, which may differ materially from our final results. Please see "Risk Factors," "Special Note Regarding Forward-Looking Statements" and "Management's Discussion and Analysis of Financial Condition and Results of Operations" for a discussion of certain factors that could result in differences between the preliminary financial data reported below and the final results. These preliminary estimates should not be viewed as a substitute for our full unaudited condensed consolidated financial statements prepared in accordance with U.S. GAAP. In addition, they are not necessarily indicative of the results to be achieved in any future period.

These estimates have been prepared by and are the responsibility of management. Our independent registered public accounting firm has not audited, compiled, performed any procedures on or reviewed the preliminary financial data, and accordingly does not express an opinion or any other form of assurance with respect to the preliminary financial data.

For the two months ended February 28, 2018, management estimates:

Sales volume in the range of approximately 27,800 to 28,600 MT

Weighted average realized price in the range of approximately \$9,925 to \$9,975 per MT

Net sales in the range of approximately \$285 to \$294 million

Cost of sales in the range of approximately \$92.5 to \$97 million

Selling and administrative expenses in the range of approximately \$10 to \$11 million including approximately \$1.9 to \$2.4 million of expenses related to this offering and \$0.3 to \$0.5 million of pension and other post-employment benefit (or OPEB) plan expenses

Research and development expenses in the range of approximately \$0.2 to \$0.4 million

Depreciation and amortization in the range of approximately \$10.5 to \$11.5 million (included in cost of sales, selling and administrative expenses, and research and development expenses above)

Other expense in the range of approximately \$1 to \$1.5 million including a non-cash loss on foreign currency remeasurement of \$1 to \$1.5 million

For the three months ended March 31, 2018, management estimates:

Sales volume in the range of approximately 43,000 to 44,000 MT

Weighted average realized price in the range of approximately \$10,000 to \$10,150 per MT

Net sales in the range of approximately \$440 to \$460 million

Cost of sales in the range of approximately \$140 to \$155 million

Selling and administrative expenses in the range of approximately \$16 to \$17 million including approximately \$2.75 to \$3.25 million of expenses related to this offering and \$0.4 to \$0.6 million of pension and OPEB plan expenses

Research and development expenses in the range of approximately \$0.3 to \$0.7 million

Depreciation and amortization in the range of approximately \$15.5 to \$16.5 million (included in cost of sales, selling and administrative expenses, and research and development expenses above)

Other expense in the range of approximately \$1.5 to \$2.5 million including a non-cash loss on foreign currency remeasurement of \$1.5 to \$2.5 million

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Weighted average realized price for the two months ended February 28, 2018 benefited from a small portion of our electrode sales being sold on a spot basis. Industry spot prices are at record levels of as high as \$15,000 to \$30,000 per MT. However, as a result of our recent three- to five-year contracting

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initiative and other sales commitments, approximately 96% of our 2018 production capacity is now contracted or committed by purchase orders and will not be available for spot sales. The weighted average selling price of our currently contracted and committed orders for the remaining quarters of 2018 is expected to be approximately \$9,650 per MT. This represents a combination of our three-to five-year take-or-pay contracts as well as other committed business for 2018, which was mostly negotiated in 2017 at lower prices.

We have made the strategic decision to service our long-term strategic customers through our contracted and committed purchase order volume in the second and third quarters of 2018, and as a result, expect to have only minimal production volume available for sales into the spot market during those quarters.

We expect the results of our operational improvement and debottlenecking initiative to increase our production capacity by approximately 21% beginning in the fourth quarter of 2018. We expect the majority of the incremental volume from our capacity expansion to be available for sale to customers on a spot basis going forward.

We expect that the quarter ended March 31, 2018 will benefit from lower cost of goods sold than future quarters of 2018 due to higher input raw material purchase costs in 2018, which will be reflected in cost of goods sold in future quarters.

Competitive strengths

We are one of the two largest producers of graphite electrodes outside of China, accounting for approximately 21% of global production capacity (excluding China), and we believe our strategically positioned global footprint provides us with competitive advantages

We believe our facilities are among the most strategically located and lowest cost large-scale graphite electrode manufacturing plants in the world. Of the 21 graphite electrode manufacturing facilities currently operating outside of China, we estimate that our three operating manufacturing facilities represent approximately 21% of estimated production capacity for graphite electrodes, making us a critical supplier to global EAF steel manufacturers. Our manufacturing facilities are located in the Americas and EMEA, providing us with access to low-cost and reliable energy sources, logistical and freight advantages in sourcing raw materials and shipping our graphite electrodes to our customers compared to our competitors, and excellent visibility into the large North American and European EAF steelmaking markets. Our experience in producing graphite electrodes for a varied global customer base positions us to meet customer requirements across a range of product types and quality levels, including support and technical services, further distinguishing us from our competitors.

We are a pure-play provider of an essential consumable for EAF steel producers, the fastest-growing sector of the steel industry

We estimate that EAF steelmaking grew at an annual pace of at least 8% to 10% in 2017, compared with 5% for steelmaking overall. As a result of the increasing global availability of steel scrap and the more resilient, high-variable cost and environmentally friendly EAF model, we expect EAF producers to continue to grow at a faster rate than BOF producers globally. Additionally, EAF producers are increasingly able to utilize higher quality scrap and iron units, their two primary raw materials, to produce higher quality steel grades and capture market share from BOF producers, while maintaining a favorable cost structure. According to the WSA, in EMEA and the Americas, which together made up 92% of our 2017 net sales, EAF

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producers have increased market share from approximately 37% in 2000 to 48% in 2016, reflecting growth from 190 million MT to 237 million MT. In APAC, which made up approximately 9% of our 2017 net sales, government initiatives in China are expected to result in a greater use of the EAF method in steelmaking despite the historical dominance of BOF producers. These initiatives are the result of efforts to eliminate excess steelmaking production capacity and to improve environmental conditions. The EAF method produces approximately 25% of the carbon dioxide (or CO₂) emissions of a BOF facility and does not require the smelting of virgin iron ore or the burning of coal. Additionally, as a result of significantly increased steel production in China since 2000, the supply of Chinese scrap is expected to increase substantially, which may result in lower scrap prices and provide the Chinese steel manufacturing industry with local scrap feedstock that was not historically available. We believe these trends will allow EAF steel producers to increase their market share and grow at a faster rate than BOF steel producers, resulting in increasing demand for graphite electrodes.

We have capital-efficient growth opportunities available to us

The graphite electrode industry responded to oversupplied markets from 2011 to 2015 with production capacity rationalization and consolidation, and after the normalization of the market for EAF steel in 2017, we expect the resulting graphite electrode supply deficit could last for some time. Additionally, we believe the lead time from initial permitting to full production of a greenfield graphite electrode manufacturing facility would be approximately five to ten years and cost approximately \$10,000 per MT. Similarly, brownfield development is complicated by significant capital costs and space and process constraints. Only one new greenfield graphite electrode facility outside of China has been built since the 1980s and only one significant brownfield expansion has occurred, reflecting the historical difficulty of adding further graphite electrode production capacity. As a result of this long and uncertain time horizon to build new plants, we believe only a few companies have the necessary technology and expertise to meet the rising demand for graphite electrodes.

Our current facilities are modern, strategically located and well-maintained, providing us with ample operational optimization capabilities. We are in the process of expanding our current production capacity of 167,000 MT by approximately 21%, or 35,000 MT, by the end of 2018 through strategic capital investments and operational improvements in baking cycles and the graphitization process. We estimate that the capital cost to achieve this production capacity expansion is approximately \$37 million, or approximately \$1,000 per MT. As a result of our prior operational improvement activities, we are able to achieve this large capacity increase with specific, highly targeted capital investments. We expect these expansions to provide additional fixed cost absorption and drive further efficiencies of scale across our manufacturing base. We also can increase production by resuming production at our currently idled St. Marys facility, depending on market conditions, which would add 28,000 MT, or an increase of approximately 14%, to our expected production capacity at the end of 2018. We believe that resuming production at our St. Marys facility, which we believe is cost-competitive with facilities currently operated by our competitors, would cost approximately \$5 million to \$11 million in capital expenditures and start-up staffing requirements, depending on our targeted production capacity.

We believe we have the industry's most efficient production platform of high production capacity assets with substantial vertical integration

Based on our experience, high capacity manufacturing facilities can have operating costs of more than \$1,000 per MT lower than low capacity manufacturing facilities. Our recent restructuring activities have included the closures of our lower capacity manufacturing facilities in South Africa and Brazil and the

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idling of our St. Marys facility, which together accounted for approximately 35% of our previous production capacity. Our restructuring actions have eliminated approximately \$125 million of annual fixed manufacturing costs and maintenance capital expenditure requirements since 2012. These actions allow us to run our Calais, Pamplona and Monterrey plants at or near 100% capacity utilization. Since 2014, we have also improved our manufacturing processes and made strategic investments across our plant network, which have improved productivity while also reducing our energy and raw material consumption. Following our footprint optimization, we expect to produce a greater quantity of graphite electrodes in 2018 from our three operating facilities than we did from our six operating facilities in 2012.