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THE BALLGAME IS JUST GETTING INTERESTING...

By James D. McClaskey
President, Midrex Technologies, Inc.

It’s truly amazing to think about how much this industry has grown and evolved in such a relatively short period of time.

In 2013, more than 75 million metric tons of DRI products were produced in 27 countries from every region of the world. DRI production has increased almost a hundredfold since 1970, and in that time new ways to make, transport and use DRI have been introduced and proven. In recent years, however, the industry has also faced new challenges in raw materials typically used to make DRI. This has included the availability and cost of natural gas in specific regions as well as the availability of quality iron-bearing materials. There is also no doubt that these challenges have the potential to continue affecting future DRI production.

Midrex has responded to these challenges by developing, scaling up and delivering the broadest range of commercially available energy options in the direct reduction industry. In the case of areas lacking low-cost, quality natural gas, MIDREX® Plants are operating with synthesis gas derived from natural gas, coal gas, coke oven gas and export gas from the COREX® Hot Metal Process as reducing gas. Work is currently underway with leading energy companies to identify and develop other innovative solutions.

MIDREX® Plants have processed iron-bearing materials of varying quality from more than 50 sources around the world. It is important to remember that iron ore quality affects the quality of the DRI, not the ability of the MIDREX® Shaft Furnace to reduce it. Some companies reduce blast furnace-grade pellets (lower iron, higher gangue) to maintain their steelmaking operation when cost or availability of DR-grade pellets is an issue.

This year marks the 30th anniversary of the start-up of the first MIDREX® Hot Briquetted Iron (HBI) Plant on Labuan Island in Malaysia. Next year, the world’s largest HBI plant will be started up in Corpus Christi, Texas, for the voestalpine Group, Austria. In addition to being the first ever HBI plant in North America, voestalpine Texas will be the first HBI plant built primarily to supply blast furnace operations, which promises to be a growth market of the future.

There is a saying in the sport of baseball, “Keep your eye on the ball”. For Midrex, that means focusing on what most benefits steelmakers because the purpose of DRI is to provide iron for making steel. Therefore, we are constantly looking for ways that MIDREX® Direct Reduction Technology can help increase the productivity, broaden the range of products, lower the cost per ton and reduce the environmental impact of making steel.

Midrex has assembled a uniquely qualified team to bring innovations and improvements to life, starting with our highly experienced and dedicated employees. Our Construction Licensees are acknowledged leaders in their fields, from design and supply of ironmaking technology and steelmaking furnaces to the production of steel. Through two-way interaction with our growing family of Process Licensees, both at plant sites and during the annual seminar, and our relationships with key equipment suppliers, we are continuously advancing the state-of-the-art of MIDREX® Technology.

DRI is more relevant today than at any time since DRI-based mini mills made steel production a reality for emerging economies in the 1970s. As an industry, we can be proud of how far we have come, but let us never forget there is still much to be done.
Construction of the world’s largest HBI plant at Corpus Christi, Texas, now in full swing

By
Matthias Pastl -
The voestalpine Group

Christian Böhm, Erwin Unterauer,
Johannes Rothberger -
Siemens VAI

Christopher Ravenscroft -
Midrex Technologies, Inc.

EDITOR’S NOTE: Barbeque, belt buckles, trucks, Stetson® Hats ...and now Hot Briquetted Iron? People in Texas are known for doing things bigger! Thus when the voestalpine Group announced back in July of 2013 that it was going to build a MIDREX® HBI plant in the Lone Star state, it was no real surprise that the Austrian steelmakers revealed this plant would be the largest HBI plant in the world to date! With the official ground breaking earlier this year and construction well underway, we thought we’d visit the gulf coast of the 28th State of the United States to bring you up to speed on voestalpine Texas.

The voestalpine Group is taking an active part in the reindustrialization of North America as well as reintroducing Direct Reduction Ironmaking back into the USA by building the world’s largest MIDREX® hot briquetted iron (HBI) Plant. Midrex and Siemens VAI are currently in the process of building the first two million ton per year HBI MIDREX® Direct Reduction Plant in Texas for the Austrian steel producer. The project will reduce iron ore through the state-of-the-art MIDREX® Process, an environmentally friendly and efficient ironmaking technology, by capitalizing on the competitively priced natural gas in the United States.

BACKGROUND

In July of last year, Siemens Industry, Inc., USA, and Midrex Technologies, Inc. received the order from voestalpine to build a direct reduction plant in the U.S. The endeavor was quickly named the “Go West project” and is now known officially as voestalpine Texas, llc. At the contract signing, Wolfgang Eder, CEO and Chairman of the Management Board of voestalpine AG, said, “With Siemens and Midrex, we have highly competent partners with a proven technology by our side.” The ground-breaking ceremony took place in April 2014 at the La Quinta Trade Gateway site in San Patricio County near the city of Corpus Christi, and the plant is due to begin operations in late 2015.

Core technology, engineering, mechanical equipment and electrical systems for the direct reduction plant are being supplied by a consortium comprising U.S.-based Midrex
Technologies, Inc. and Siemens Industry, Inc. This ironmaking facility will produce value-added metallic briquettes, about half of which will be used in voestalpine’s Austrian steel production sites in Linz and Donawitz, with the remaining available as a high-quality metallic product for partners worldwide interested in longer-term supply contracts. Already in August 2014, Altos Hornos de México (AHMSA), Mexico’s largest steel manufacturer, signed a five-year agreement with voestalpine for the supply of 400,000–650,000 tons per year of high-quality HBI from the new voestalpine location.

When it commences operation, the MIDREX® Plant will produce two million metric tons of HBI per year. voestalpine is investing about €550 million, which also covers comprehensive infrastructure improvements and upgrading of the existing port facilities on the Gulf of Mexico.

BENEFITS

voestalpine Texas represents an important step toward the achievement of the voestalpine Group’s energy-efficiency and climate-protection objectives. However, the impact will go beyond just the production of the HBI. The electric steelmaking production route is not the only consumer of DRI/HBI.

Conventional wisdom has always held that DRI is not suitable as a significant feed material for a blast furnace. However, more and more integrated steel producers today are considering the use of HBI for their blast furnaces on a regular basis, rather than just on occasions in order to increase the hot metal output of their furnaces when one blast furnace is down. The benefits of both the production and use of HBI are as follows:

- **Higher productivity:**
  - When using HBI in a blast furnace, primary reduction work has already taken place outside of the blast furnace in a direct reduction shaft. More reduction gas is thus available within the blast furnace to reduce the remaining burden, which results in increased blast furnace productivity. A rule of thumb is that for each 10% increase in burden metallization, production output rises by 8%.

- **Lower coke consumption:**
  - The new reduction plant will use only natural gas, which is much more environmentally friendly than using coke as the main reducing agent, as in traditional blast furnaces.
  - Additionally, when less reduction gas is required to reduce the burden in the blast furnace at the same productivity level, the coke consumption is lowered. Again, a rule of thumb is that for each 10% increase in burden metallization, the coke rate decreases by 7%.

- **Reduced CO₂ emissions:**
  - Iron ore reduction in a MIDREX® Plant is based on the use
of natural gas, which is processed by a reformer to generate a reduction gas that consists of approximately 2/3 H₂ and 1/3 CO. During the reduction process, CO is converted to CO₂ and H₂ to H₂O (water). The reduction of iron ore by means of hydrogen gas creates no CO₂ at all.

> In a blast furnace, the major source of the reduction gas is coal, which produces mostly CO and CO₂, and very little H₂. Therefore, the carbon footprint of voestalpine’s steelmaking operations is reduced as is the carbon footprint of other HBI users.

- **Safer handling, transport and storage of HBI:**
  > Despite its high furnace-exit temperature of approximately 700°C (1,300°F), the direct reduced iron (DRI) is not in a molten state. This reduces the danger of product handling compared to traditional blast furnaces where hot metal is tapped at temperatures in the range of 1,500°C (2,700°F).

> Another important benefit of HBI is that it can be shipped more easily and safely than cold DRI. According to the International Maritime Organization (IMO), HBI shipments remain as the only recognized way to safely transport DRI products by sea without additional precautions. IMO transportation guidelines for HBI briquettes are considerably less stringent than those for DRI. Ships with non-briquetted DRI cargoes must have their holds inerted with a non-reactive gas such as nitrogen. Maintaining the required nitrogen gas level can be costly over long voyages, such as during ocean crossings. The insurance cost for HBI cargoes is also considerably less than those for non-briquetted DRI shipments.

> HBI can be stored at almost any location, much like scrap steel. In contrast, non-briquetted DRI must be kept not only out of the rain but also off the ground in order to prevent contact with moisture, which could lead to oxidation and combustion.

The new voestalpine Texas plant offers an impressive example of a cleaner and safer form of ironmaking that takes advantage of lower-cost American natural gas. With its new direct reduction facility, voestalpine can reduce its carbon footprint and simultaneously profit from the increased global demand for HBI.

For more information, please refer to: www.voestalpine.com/texas
SOLUTIONS FOR THE INCREASED USAGE OF DRI IN THE ELECTRIC ARC FURNACE

by Markus Abel, Michel Hein, Christian Böhm, Wolfgang Sterrer, and Denis Vaillancourt
-Siemens VAI

Editor’s Note: The following article is adapted from a technical paper presented at AISTech 2014. All mentions of ton in this article are the metric ton. In addition, the article uses DRI as a generic term to describe various forms of direct reduced iron such as cold DRI (CDRI), hot briquetted iron (HBI) and hot DRI (HDRI). When a specific form such as CDRI, or HDRI is used it is meant to describe that specific product.

INTRODUCTION

Decreases in scrap quality and limited scrap availability (which in turn can increase scrap pricing) are causing the electric arc furnace (EAF) industry to consider using new forms of metallic iron such as DRI products to melt in the EAF. In light of low natural gas prices in North America, largely due to the shale gas exploration, many steelmakers are considering the strategic opportunity to invest in DRI plants and to adapt their EAFs for greater DRI input. This article will examine this scenario and present the latest results of plants that use high percentages of DRI, such as Qatar Steel, and also the outcome of several studies that Siemens VAI performed for different steelmakers.

Typical DRI products’ energy use ranges between 420 and 600 kWh/metric ton depending on metallization, carbon content and amount of gangue, as can be seen in figure 1. As a result, replacing scrap with DRI products such as cold DRI (CDRI) or hot briquetted iron (HBI) increases the electrical energy consumption per ton of steel and reduces the productivity of the plant if the transformer has no spare capacity. This could be balanced by using hot DRI (HDRI). Energy savings by using HDRI instead of CDRI can be between 100 and 150kWh/t with a 100% DRI charge.
Due to the different melting behavior of DRI products compared to scrap, DRI is not directly attacked by the electric arc but melts in the liquid pool. DRI at rates above 20 - 30% must be continuously charged through the roof instead of mixed with the scrap in the scrap buckets.

The feed rate of DRI depends on its quality (especially gangue and carbon) and the material temperature. The feed rate is defined in mass per time and per electrical power input (kg per min and MW).

In order to avoid not only the creation of icebergs in the EAF but also overheating of the bath, the general feed rates shown in Table 1 have to be respected.

**Table 2** shows how the material energy use changes when iron ore is processed to DRI with different goals in term of material discharge temperature and carbon content. The final temperature and the carbon content are in a strict dependency and cannot be changed individually. The lowest energy requirement to melt the DRI in the EAF is when charging DRI at the highest possible temperature, even considering that the material energy use at ambient temperature is slightly higher due to the lower metallization and the lower carbon content.

### CHANGE IN OPERATING PRACTICE

When considering the input of DRI into the EAF, a lot of different aspects not limited to process and operation have to be considered. In the following, some important points are mentioned:

#### Basics
- DRI has to be melted before reactions can start, with a bath temperature of 1,540 – 1,560°C
- DRI thus must be continuously charged at rates above 20 - 30%; with lower rates bucket charge is possible
- Depending on the DRI chemistry, the slag amount can increase

---

### Table 1  Dependency of feed rate on material conditions

<table>
<thead>
<tr>
<th>Component</th>
<th>kg / (min x MW)</th>
<th>min</th>
<th>max</th>
</tr>
</thead>
<tbody>
<tr>
<td>CDRI</td>
<td></td>
<td>38</td>
<td>44</td>
</tr>
<tr>
<td>HDRi</td>
<td></td>
<td>50</td>
<td>65</td>
</tr>
</tbody>
</table>

### Table 2  Typical North American DRI quality in relation to different temperatures and carbon contents

<table>
<thead>
<tr>
<th>Sample 1</th>
<th>Sample 2</th>
<th>Sample 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Component</td>
<td>% Weight</td>
<td>% Weight</td>
</tr>
<tr>
<td>Total Iron</td>
<td>91.5</td>
<td>92.5</td>
</tr>
<tr>
<td>FeO</td>
<td>5.09</td>
<td>5.24</td>
</tr>
<tr>
<td>Fe Met</td>
<td>87.55</td>
<td>88.43</td>
</tr>
<tr>
<td>Metallization</td>
<td>95.73</td>
<td>95.65</td>
</tr>
<tr>
<td>Carbon</td>
<td>2.99</td>
<td>1.91</td>
</tr>
<tr>
<td>Total Gangue</td>
<td>4.32</td>
<td>4.36</td>
</tr>
<tr>
<td>CaO</td>
<td>0.94</td>
<td>0.94</td>
</tr>
<tr>
<td>MgO</td>
<td>0.76</td>
<td>0.77</td>
</tr>
<tr>
<td>SiO₂</td>
<td>2.00</td>
<td>2.02</td>
</tr>
<tr>
<td>Al₂O₃</td>
<td>0.62</td>
<td>0.63</td>
</tr>
<tr>
<td>Feeding Temperature</td>
<td>550°C</td>
<td>650°C</td>
</tr>
<tr>
<td>Energy to melt @ 25°C</td>
<td>468kWh/ton DRI</td>
<td>469kWh/ton DRI</td>
</tr>
<tr>
<td>Energy to melt @ Temp.</td>
<td>384kWh/ton DRI</td>
<td>369kWh/ton DRI</td>
</tr>
</tbody>
</table>
EAF

- Working with a bigger liquid heel in the range of 20 - 30% is favorable due to the improved heat transfer to the DRI
- Strict temperature control of the steel bath during DRI feeding is necessary
- Feeding point and feeding angle are of highest importance in order to achieve a good yield and a reliable melting process
- All operation profiles like electric power input and oxygen and carbon injection rates have to be adjusted to the DRI ratio and DRI quality
- The slag chemistry has to be adjusted and the slag pot size has to be checked to ensure it is big enough in case the slag amount increases

Auxiliaries

- Stable feeding systems for DRI, lime and carbon are necessary
- The complete feeding system, from discharge of the DRI plant up to the feeding point in the EAF roof, has to be designed for high feed rates
- For HDRI, the feeding system has to be kept sealed and inerted in order to avoid oxidation losses in the DRI and the risk of fire

When operating an EAF with a high ratio of DRI products, there is an advantage compared to scrap; that is, the chemical composition of the input material is well known and the feeding rate of the material can be adjusted in a reliable way. These are perfect conditions to operate an EAF with Level 2 process models, limiting the operator involvement to an absolute minimum, as seen in figure 2.

The following rules should be taken into consideration when operating via Level 2 models:

- Working profiles to be set up in the Level 2 system ensure an operation with the highest consistency
- Adjustment of DRI quality in the Level 2 system once per shift when a new delivery arrives and is considered for operation
- Adjustment of the HDRI temperature in the Level 2 system once per heat

DIFFERENT METHODS OF CONVEYING DRI TO THE EAF

There are different ways of conveying the DRI from the DRI plant or the storage area to the EAF.

- CDRI is generally stored in big storage bunkers. The material is fed to intermediate bunkers in the steel plant building, which are sized to store the materials for one or two heats and are redundant, in order to always have one being charged from the storage area/bunker and the other one discharged into the EAF
- HDRI is generally transported directly from the DRI to intermediate bunkers in the steel plant building; they are also sized to store the materials for one or two heats and are redundant, in order to always have one being charged from the storage area/bunker and the other one discharged into the EAF
- The way of transportation can vary depending on the DRI plant supplier, such as conveying by bucket conveyor, transport in closed containers or pneumatic feeding
- Some of the highest delivered temperatures of HDRI have been demonstrated by the 3 various MIDREX® systems (see figure 3 on page 9)
**COREX® PLANT COMBINED WITH DRI PLANT**

If raw materials like iron ore and coal are available in a reasonable amount and if a high steel productivity is needed, it can be beneficial to install a combination of a COREX® Plant that is producing hot metal and a direct reduction plant that is producing DRI.

The benefit comes from the fact that the COREX export gas can be used to reduce the iron ore in the DRI plant. Typical combinations are for example the production of

- 1 million tons of hot metal for every 0.87 million tons of DRI or
- 1.5 million tons of hot metal for every 1.25 million tons of DRI.

With such a ratio of approximately 54% hot metal and 46% DRI input into the EAF, yearly production rates of

- 1.7 million tons or
- 2.48 million tons of high quality steel can be achieved.

The products of both plants – the hot metal as well the DRI, either in cold or hot conditions – can be directly used in the EAF for the production of high quality steel with a high productivity as the sensible heat coming from the hot metal balances the higher energy needs from the DRI input.

References for such plant combinations (figure 4) can be found currently in South Africa and India.
Hadeed
Plant Design and Connection of Ironmaking/Steelmaking
Hadeed decided to install a new DRI plant when installing EAF#5 (Figure 6) and using HDRI as input material. Siemens VAI, together with Midrex, installed an HDRI transport system made out of special sealed bucket conveyors that can be seen in Figure 5. With such a concept that is now operating since 2007, the DRI transport is done in a safe and economic way directly from the discharge of the DRI plant into the intermediate bunkers above the EAF, from where the feeding into the EAF is done by gravity.

![HDRI Connection](image)

**SVAI / MIDREX® HTS Technology**
Location: Al Jubail, Kingdom of Saudi Arabia
Capacity: 1.76 million mt/year Hot DRI Start-up: September 2007

**Concept:** Hot transport by sealed special bucket-type apron conveyor to hot DRI hoppers and hot feeding to EAF by gravity (conveyor system provided by Aumund Fördertechnik GmbH)

**FIGURE 5 HADEED transport of HDRI**

**FIGURE 6 Layout and design features of HADEED EAF #5**

### Design EAF

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>150mt – 130 MVA</td>
<td></td>
</tr>
<tr>
<td>EO-EBT</td>
<td>7.1m</td>
</tr>
<tr>
<td>Panels</td>
<td>1.9m</td>
</tr>
<tr>
<td>Roof</td>
<td>1.1m</td>
</tr>
<tr>
<td>Electrodes</td>
<td>610mm</td>
</tr>
<tr>
<td>3 RCB</td>
<td></td>
</tr>
<tr>
<td>3 Carbon injection lances</td>
<td></td>
</tr>
<tr>
<td>3 Lime injection nozzles in roof</td>
<td></td>
</tr>
<tr>
<td>4 Plugs bottom stirring system</td>
<td></td>
</tr>
<tr>
<td><strong>Transformer:</strong></td>
<td></td>
</tr>
<tr>
<td>130MVA with 740 – 1.350 V</td>
<td></td>
</tr>
<tr>
<td><strong>Input Options:</strong></td>
<td></td>
</tr>
<tr>
<td>25% Scrap &amp; 75% CDRI</td>
<td></td>
</tr>
<tr>
<td>100% CDRI</td>
<td></td>
</tr>
<tr>
<td>100% HDRI</td>
<td></td>
</tr>
<tr>
<td><strong>Production Record:</strong></td>
<td></td>
</tr>
<tr>
<td>27 heats per day (with 75% CDRI)</td>
<td></td>
</tr>
</tbody>
</table>
PERFORMANCE WITH CDRI AND HDRI

During the 48h performance test which was done with the input of 75% DRI and 25% scrap, a new HADEED record of 27 heats in 24 hours was achieved with the results shown in table 3. The DRI quality was: 94% metallization and 2.4% carbon.

Also shown in table 3 are the outstanding results of the 48h performance test with the input of 100% of HDRI. The HDRI quality was: 95% metallization and 2.1% carbon. It has to be noted that these results have been achieved with an HDRI temperature of 579°C in the feeding hoppers above the EAF.

<table>
<thead>
<tr>
<th></th>
<th>CDRI</th>
<th>HDRI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of heats</td>
<td>50</td>
<td>60</td>
</tr>
<tr>
<td>Tapping weight</td>
<td>150 t</td>
<td>152 t</td>
</tr>
<tr>
<td>Oxygen Total</td>
<td>22.6 Nm³/t</td>
<td>26 Nm³/t</td>
</tr>
<tr>
<td>Gas</td>
<td>2 Nm³/t</td>
<td>1.4 Nm³/t</td>
</tr>
<tr>
<td>Electrical energy</td>
<td>492.8 kWh/t</td>
<td>385 kWh/t</td>
</tr>
<tr>
<td>Electrodes</td>
<td>1.1 kg/t</td>
<td>0.8 kg/t</td>
</tr>
<tr>
<td>Power On Time</td>
<td>45.8 Min</td>
<td>39.6 Min</td>
</tr>
<tr>
<td>TTT</td>
<td>54.5 Min</td>
<td>48.6 Min</td>
</tr>
<tr>
<td>Productivity</td>
<td>165.1 t/h</td>
<td>187.7 t/h</td>
</tr>
</tbody>
</table>

TABLE 3  HADEED performance with 75% CDRI and 100% HDRI @ 579°C

Qatar Steel’s new plant

The latest Siemens VAI reference plant with DRI charging is the new plant of Qatar Steel with its 110 ton EAF (figure 7) LF and Billet-CCM, where Siemens VAI designed and supplied not only the core units, but also the material handling system including DRI, as well as the dedusting system and the electrical substation for the complete plant.

![Image](110mt-125-MVA.png)

FIGURE 7  Layout and design features of Qatar Steel’s new EAF steel plant

A production rate of 31 heats per day with excellent consumption figures below 500kWh/t of liquid steel was already achieved approximately 2 months after commissioning of the plant. Today, 33 heats per day are produced on a regular basis with a record of 36 heats. This shows that the supplied equipment and operational support of Siemens VAI combined with the excellent operation personnel of Qatar Steel performed in a great way.
In figure 8, the DRI quality of the used material is shown, which is supplied by the existing DRI plant from Qatar Steel:

<table>
<thead>
<tr>
<th>Component</th>
<th>% Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Iron</td>
<td>91.8</td>
</tr>
<tr>
<td>FeO</td>
<td>5.75</td>
</tr>
<tr>
<td>Fe Met</td>
<td>85.89</td>
</tr>
<tr>
<td>Metallization</td>
<td>93.73</td>
</tr>
<tr>
<td>Carbon</td>
<td>2.66</td>
</tr>
<tr>
<td>Total Gangue</td>
<td>3.55</td>
</tr>
<tr>
<td>CaO</td>
<td>1.06</td>
</tr>
<tr>
<td>MgO</td>
<td>0.36</td>
</tr>
<tr>
<td>SiO₂</td>
<td>1.58</td>
</tr>
<tr>
<td>Al₂O₃</td>
<td>0.55</td>
</tr>
<tr>
<td>Feeding Temperature</td>
<td>ambient</td>
</tr>
<tr>
<td>Energy Use @ 25°C</td>
<td>495kWh/ton DRI</td>
</tr>
</tbody>
</table>

The material handling system (figure 9) is storing and feeding the lime and dololime as well as the DRI in a completely automatic mode, controlled by the Level 2 system with its process models.
CONCLUSION

The latest market trends in electric steelmaking – especially in the US as well as the Middle East and East Asia – have required a deeper understanding of using DRI in its various forms as input material into the EAF. Together with the combined force and experience of the departments of ironmaking and steelmaking within Siemens VAI, a large number of studies and contracts have been successfully completed.

As a conclusion, it can be stated that

• When replacing scrap with DRI in an existing melt shop and if the EAF transformer doesn't have any extra capacity, the only way to maintain the productivity is by using HDRI.

• For the input of 100% DRI, it is quite difficult to handle a high carbon content in the DRI due to the required decarburization of the melt.

• If a very high productivity is needed, it can be beneficial and economical to install a combination of Ironmaking plants: a COREX Plant producing hot metal together with a DRI plant.

• Finally, considering the use of DRI into an EAF – either in an existing melt shop or in a new one – it is always necessary to thoroughly investigate the available raw materials in combination with the produced steel grades and the required production rates.

Siemens VAI, with its vast experience in the design and supply of EAF not only for scrap but also HDRI or CDRI products and also with its operational support for the efficient use of DRI products, is in a position to assist steelmakers in the decision making stages for the use of such materials in their EAF as well as later on in the successful implementation and operation within their plants.

News & Views

2014 MIDREX® Operations Seminar in Munich, Germany

In order to further promote technology sharing and improve operations of various plants, Midrex hosts an annual Plant Operations Seminar. This year the annual seminar, known as the International Conference on MIDREX® Technology, brought together plant operators from around the world to meet in Munich, Germany to discuss new innovations and exchange ideas. As MIDREX® Process Licensees, MIDREX® Plants and their operators benefit from the knowledge and experience of our Midrex staff as well as the ever expanding group of operating MIDREX® Plants worldwide. By providing our clients with opportunities such as this program, Midrex helps our Process Licensees and broadens our network of technical information, operating data, and experiences that keep MIDREX® Direct Reduction Technology on the leading edge.
Christopher M. Ravenscroft: Editor

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Editor’s note: All references
to “tons” are metric tons.

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