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# CISDI

## NEWSLETTER

### Vol. 8, 2019



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## Technology and Solutions Partner for the Global Metals Industry

### ☀ FULL-PROCESS SERVICES

CISDI provides full-process services from the bulk material handling yard to the final post-processing line of rolling mill.

### ☀ FULL-FUNCTION SERVICES

CISDI provides standard and customized consulting, execution, and operations management services.

### FULL-LIFE-CYCLE SERVICES

- ☀ CISDI provides the FEED (front-end engineering & design), implementation, and production and operations management services throughout the entire project life cycle and provides continuous after care services and support.



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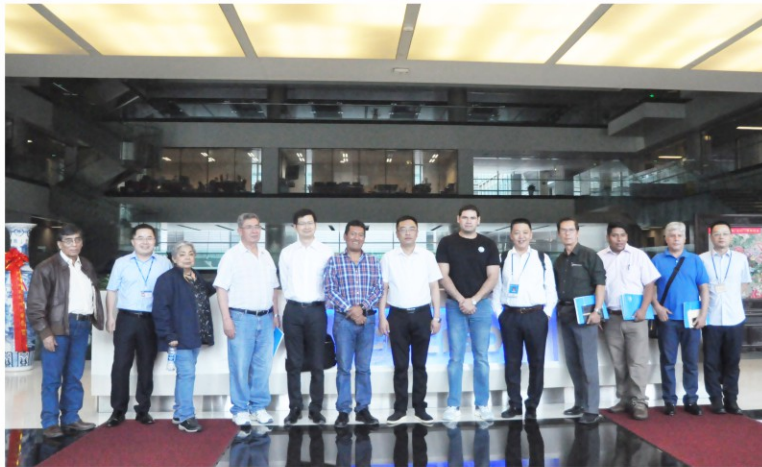
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# CISDI welcomes steel boss from Bolivia



Representatives from ESM and CISDI pictured at CISDI headquarters

A delegation from Bolivia recently visited CISDI headquarters in Chongqing.

The chairman of Empresa Siderúrgica del Mutún (ESM) Jesús Lara met with CISDI's chairman Xuewen Xiao and the project team which is creating the EIMutún steelworks in Bolivia - the plant expected to drive its country's industrial modernisation and increase local employment.

CISDI is providing total process engineering consulting for EIMutún. With an annual production capacity of 150,000 tonnes, the plant will greatly reduce the country's need to

import steel, potentially saving the country around \$230 million a year.

EIMutún steelworks is located on the border between Bolivia and Brazil, an area boasting both a rich ecological system and rich mineral reserves.

ESM's ore is 64 per cent iron and building a steelworks has been talked about for many years.

"ESM has a bright future in steel and CISDI is committed to equipping this steelworks with high-quality technology and project management," said chairman Xiao, "We also want to provide our intelligent and green



Artist's impression of the EIMutún steelworks

manufacturing products to ESM."

CISDI briefed ESM's executive board and project supervision representatives on the corporate situation and international strategy and development. The project team also reported on progress at the steelworks.

Jesús Lara commented: "ESM is pleased with CISDI's contribution. We attach great importance to our relationship and believe that CISDI's services will contribute to the steelworks' success and result in positive change for Bolivia's steel industry. Future co-operation could be on agenda."

# CISDI forms partnership with German software giant to pursue green solutions

CISDI has pledged to form a close partnership with globally-respected German software company PSI Metals in the bid to find new ways of building green and intelligent steelworks.

Based in Düsseldorf, PSI Metals is the world's largest provider of production management software solutions for the metals industry.

Its intelligent solutions for planning, manufacturing, logistics, automation and plant optimisation secure competitive advantages for a diverse range of metals producers around the world.

PSI Metals' CEO Sven Bosch met in China with CISDI's chairman Xuewen Xiao.

Mr Bosch pointed out the two companies' common bonds, as engineering service providers each with a history of over 50 years.

"We have wide references both at home and abroad and even share customers in common," he commented, adding that he welcomed the opportunity of a close partnership.



PSI and CISDI teams meet at CISDI headquarters

CISDI's chairman stressed the major challenges ahead for the metals industry. "In the face of unprecedented challenges from steel overcapacity and environmental threats, ferrous metallurgy has to make urgent transformations to green, intelligent, high-efficiency and low-consumption construction," he said.

"CISDI has been an energetic supplier of new thinking and methodology for the industry's production, management and operations procedures.

"We need PSI as our lead partner for production management. We feel the time is right for both parties to explore a long-term relationship which will provide total solutions to our customers."

During the meeting, CISDI vice president Yong Zhang and PSI China's president Xiaoqiang Liu also took the opportunity to exchange information on their company's business and development news.

# Dalipal Tube Mill passes entire hot test

## Success of CISDI-designed and -manufactured three major tube mill trains



Dalipal's mandrel tube mill during hot-commissioning; the mill was designed and manufactured by CISDI



The tube mandrel mill being manufactured and assembled in the workshops at CISDI Equipment Co. Chongqing

A new production line is now operating smoothly at Dalipal Tube Mill.

The plant's new piercing, mandrel tube and stretch reducing mills, all designed and manufactured by CISDI, were successfully hot-commissioned, enabling the entire production line to go into operation on schedule.

Mill trains for tubular stock rolling and deformation have been given the most advanced core technology and equipment. Their performance is critical to the plant, as it determines the final dimensions and quality of the seamless tube produced.

CISDI is also the project's EPC-based contractor and Dalipal is CISDI's first reference for the independent design, manufacture and commissioning of three such major mills.

# CISDI wins more intelligence orders with WISCO

## Upstream-blast furnace and flats hot rolling centralised control centers boosts best in class products



Shaogang's upstream-BF intelligent integrated control centre, built by CISDI on an EPC basis, has now been started up

CISDI has won two EPC orders for WISCO's intelligent integrated control centre.

The Chinese company will create an upstream-blast furnace and a flats hot-rolling centralised control centre for WISCO in Wuhan.

The core production base of Baowu Group, WISCO has embarked on a journey of intelligent and green steel manufacturing.

The BF control centre will focus on transforming steel production to digital and intelligent processes.

Costs and energy consumption will be reduced. An integrated big data platform controlling the production from stockyard to ironmaking will

enable more intensive production and increase management efficiency.

The flats hot-rolling control centre emphasising on steel product quality control will be the first of its kind in the world for flat steel production.

WISCO's 2,250mm and 1,580mm hot strip mills will be managed by the centralised control centre. The operation of both rolling lines will be coordinated and their operation, control and management will become more efficient.

In addition, the production of high-end flats will become more stable and efficient and result in better-quality product.

CISDI is utilising the experience its teams gained during the completion of a centralised control centre for Shaogang's upstream-BF plants, the first of its kind in the world for ironmaking. And it is now building a centralised control centre for Shaogang's wire rod and bar mill, which will be a world first for long steel production.

CISDI has been a long-term service provider for WISCO. In the 1970s, its teams took part in the supportive design and imported engineering management of WISCO's 1,700mm hot strip mill. CISDI then went on to plan and design WISCO's 2,250mm and 1,580mm hot strip mills.

## CISDI wins two accolades at ASSB Kuantan's topping-out ceremony



The CISDI-supplied wire-rod mill for ASSB Kuantan



Aerial view of ASSB Kuantan

ASSB's 3.5 million tonne integrated steel project at the Malaysia-China Kuantan Industrial Park (MCKIP) has been completed.

At the topping-out ceremony, which was attended by over 300 guests from China and Malaysia, CISDI was awarded Best Designer and Best Package Supplier for technology and services.

The steelworks covers an area of 710 acres and mainly produces high-carbon steel, H section steel, and high-speed wire rods and rebars with more than 30 specifications.

Some 70 per cent of products are exported to more than 20 countries and regions.

The steelworks has created 4,000 jobs for local people and has been widely welcomed by the local government and population.

Located inside the Malaysia-China Kuantan Industrial Park, the plant is a benchmark project for the Belt and Road Initiative.

It is a prime example of China's ability to build projects far ahead of the contractual schedule. Construction began in November 2016 and took only 20 months, with hot-commissioning happening in August 2018.

The most advanced steelworks in Malaysia, it has the largest volume blast furnace in the country and sets the standard for energy conservation, environmental protection and technological process.

CISDI undertook ASSB's general design and package supplies for the stockyard, blast furnace ironmaking, BOF steelmaking and wire rod and bar mill. Its teams also provided management services for equipment and logistics.

Since startup, the blast furnace has been producing with a productivity of 4.16t/(m<sup>3</sup>·d); the BOF daily output has reached 11,500 tonnes, 1.5 times its designed output; and all plants are performing smoothly and stably.

## Zhanjiang Steel's new all-weather wharf reduces labour by 50 per cent

A new intelligent manufacturing reference has come to fruition at Zhanjiang Steel's all-weather wharf rebuild, which has been transformed into a manpower-reduced operation.

Conventional wharfs rely on manual operators for machine scheduling, coil product lifting and loading onto ships. A large workforce is required and working conditions are poor and unsafe.

CISDI's intelligent solutions to these problems include the driver-less crane,

warehousing intelligent control and machine vision.

Online operation fully controls the machine at the port and enables the machine inside the ship cabin to run with reduced labour. The entire wharf operation can be run with 50 per cent fewer staff.

The wharf is the second reference for CISDI's intelligent warehousing products. Its first was the application of an intermediate warehouse and final product warehouse for Baosteel Bayi Steel's hot strip mill.

## CISDI's second techno breakthrough for Ansteel

After its first breakthrough in ultra-deep-drawing production technology for automobile sheet, CISDI has now achieved another - galvaluminizing production technology for household appliances sheet.

CISDI's achievement came during the rebuild of a continuous annealing furnace for Ansteel's galvaluminizing line, which produces sheeting for household appliances.

The rebuild has taken 40 days, matching the build record for similar projects in China.

Features include an advanced non-oxidizing annealing furnace and safety interlock, a unique cooling roller, stably-performing

post-plating cooler and air-mist cooling section.

CISDI's subsidiary, the Thermal and Environmental Engineering Co., built the Ansteel O4-grade automobile sheet unit. The products are proving popular in China's high-end market.

CISDI Thermal's expertise in galvaluminized sheet has also been applied at Siemens and LG household appliances.

The Ansteel projects have resulted in CISDI being awarded two patents for non-oxidizing annealing furnace proprietary technologies.



The feeding system in operation at Zhanjiang Steel's new ore yard

## CISDI expertise brings big results to Zhanjiang Steel's ore yard

The hot commissioning of Zhanjiang Steel's eco-friendly ore yard feeding system has been successful.

The feeding system runs from the wharf to the B4 stacking area at Zhanjiang's type-C ore yard.

The yard upgrade has been created with CISDI's intelligent and clean production expertise. Its process arrangement, equipment configuration, systematic flow and environmental protection have all been improved.

Labour productivity has

increased, safety has been improved and the yard is meeting ultra-low emission targets.

The eco-friendly yard, which spans 90 metres by 650 metres long, features CISDI's patented method of creating two routes for one stockpile at the discharging side, a China's first.

A conventional type-C yard is designed with two routes at both the feeding and discharging side.

Zhanjiang's new yard has two stockpiles inside, thus

composing two feeding routes and four discharging routes.

Stacking capacity is 6,250 tonnes an hour, with a reclaiming capacity of 2,500 tonnes an hour, maximum design targets for China.

CISDI is contracted to build the yard, its wharf feeding and yard discharging facilities.

In Zhanjiang city, CISDI has undertaken the Longteng stockyard, Zhanjiang Steel's phase I stockyard and type-D coal yard.

## CISDI wins refractory orders from Oyak



CISDI has won contracts to supply refractories for the Turkish steel sector.

Oyak Group's Isdemir steelworks has placed an

order for a new blast furnace 1, which will have a volume of 3,500 cubic metres.

Meanwhile the group's Erdemir works requires a new blast furnace 2, which will have a volume of 2,100 cubic metres.

Oyak has an annual steel output of over 8 million tonnes. It is the largest steel producer in Turkey and ranks in the world's top 50. As such, it is one of CISDI's most important clients in Turkey and the Middle East.

Refractories play a major role in the service life of a blast furnace. Both blast furnaces' refractories will be package-supplied by CISDI and the orders are seen as recognition of CISDI's global-sourcing capability.

Oyak's expertise ranges from iron and steel production to chemistry, cement production, energy and automotives.

## CISDI to supply water treatment plant for Zhanjiang

CISDI is to supply a packaged water treatment system for Zhanjiang Steel's Phase II 1,780mm hot strip mill.

The order includes water supply and drainage technology, an electric, instrument and automation system, ventilation and thermal equipment.

In addition, CISDI will supply the necessary technical assistance services for commissioning and training.

CISDI has now won water treatment package supply contracts for all of Zhanjiang Steel's hot strip mills (2,250mm and 1,780mm).

## CISDI to supply a long steel rolling intelligent control centre to Shaogang

CISDI will continue creating more intelligent solutions for Shaogang as it focuses on a greener future.

A pioneer of intelligent manufacturing under Baowu Group, Shaogang aims to be the most competitive long steel production base in Southern China.

Shaogang has planned to put the Intelligent Centre 2.0 strategy into practice – technically speaking, an inclusion of steelmaking and rolling intelligent control centre and an optimisation of “island-layout”

for upstream-blast furnace and energy media intelligent control centre, and strategically future-oriented and profiting.

The on-operation centres have shown tangible economic benefits and as a result, CISDI is now supplying the company with a long products rolling intelligent integrated centre.

Centralised control centres play a major role in industrial upgrading – providing our services as products, delivering products on platforms and forming eco-platform systems.

## CISDI to transform Changjiang Steel's stockyard to eco-friendly

CISDI met the challenge of uncharted waters head on when it bid for the contract to transform Changjiang Steel's stockyard with an eco-friendly revamp.

The plant has a 30-metre-long square silo and needed to be redesigned with a super-large capacity and CISDI had no references or experience of a similar project to learn from.

But CISDI's Shanghai team met the challenge and won the tender by consolidating the bulk

material handling and civil workforce to make multiple site surveys and conduct revisions of technical proposal and optimise solutions.

The contract will entail enclosing the existing yard 1's open stockpile to the type B yard, building a coke silo for stockpile 1 of the new yard 4, and building a new coke silo for the new yard X2 as well as rebuilds of the relevant support facilities.

## CISDI tailor-makes new industry firsts for TATA Steel UK



The CISDI-delivered FSB, running smoothly at TATA UK's hot strip mill

TATA Steel UK's hot strip mill plant has successfully started up one of its most important upgrades.

Its new FSB, FM drive-side reaction block and latch and modular approach table, the first to be seen in the steel industry, are running smoothly.

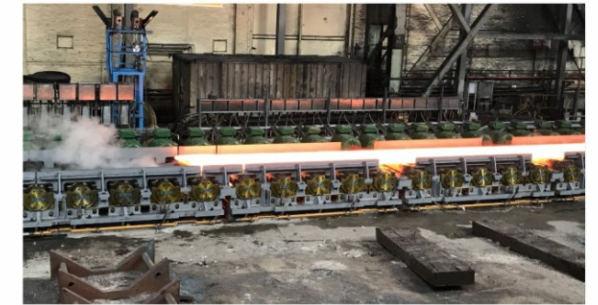
The equipment was tailor-made by CISDI, who carried out the design, supply and installation over a three-year period. In particular, CISDI

### ■ FSB – the first modular replacement of the scale breaker.

This CISDI-developed, fifth-generation finishing mill scale breaker taking up less space has a remarkable descaling effect, conserves energy, highly-effective sealing performance and is very easy to maintain.

### ■ Reaction block and latch – the first integration of a rolling mill spindle positioner with the reaction block at the drive side.

This new design for a reaction block has a compact structure and a strong bending force. Multi-functioning, the reaction block features a simple and orderly piping design and is easy to maintain.



The modular approach table runs with hot strip at the TATA UK Plant

Equipment Co. was responsible for manufacture and delivery.

The finishing mill's reaction block and latch equipment was CISDI's first package supply to TATA Steel European Plant.

Since that first order was placed in 2016, CISDI has undertaken over 20 projects and services for TATA UK, one of its most strategically-significant customers.

### ■ Modular approach table – the first modular exchangeability and replacement of a hot mill roller table.

This modular table can be easily exchanged in groups and be replaced by a fast lifting. The bearing chock's shock resistance has also been improved. The rebuild did not touch much of the original equipment foundation, which saved costs.

Inspection and Test Plan (ITP) has been strictly carried out throughout the manufacture. Delicacy management has been implemented for the control of each and every manufacture and integration detail and the integrated mechanical-electric-hydraulic test.

All boundary conditions set for equipment integration have either been reached or surpassed.

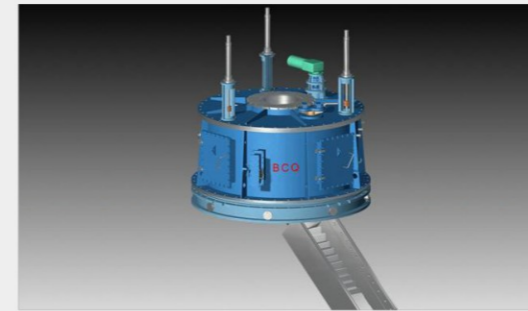
# Advanced, Tailored Blast Furnace Solutions Provider

## TECHNICAL HIGHLIGHTS

- CISDI, the subsidiary of MCC group, has supplied 178 blast furnaces over the past 60 years
- In the past one decade In average 7 of CISDI-designed blast furnaces have been put into operation every year
- Among the blast furnaces in a volume of over 4,000m<sup>3</sup> 27 of them were designed or supplied by CISDI, with the most references of its kind
- Performance highlights of CISDI-supplied blast furnaces High efficiency, low consumption, cost competitiveness, long campaign and environmental protection

| Blast Furnace Volume                     | Quantity | Remarks   |
|--|----------|---|
| >5,000m <sup>3</sup>                     | 7        | Inida TATA Steel TSK 5,870m <sup>3</sup> BF,<br>Ukraine AMKR 5,050m <sup>3</sup> BF               |
| 4,000m <sup>3</sup> ~5,000m <sup>3</sup> | 20       | Vietnam Formosa Ha Tinh Steel 2x4,350m <sup>3</sup>   |
| 2,000m <sup>3</sup> ~4,000m <sup>3</sup> | 25       |   |
| 1,000m <sup>3</sup> ~2,000m <sup>3</sup> | 35       | Brasil Gerdau Acominas 1,750m <sup>3</sup> BF,<br>Malaysia Kuantan Steel 2x1,080m <sup>3</sup> BF |
| <1,000m <sup>3</sup>                     | 91       |   |
| Total                                    | 178      |   |

## EXPERTISE & EQUIPMENT



### BCQ No-Bell Top System:

- Compact – Simple structure
- Accurate – High control accuracy of tilting ±0.1°
- Adaptive – High top temperature adaptability for >800°C
- Convenient – Maintenance time decrease by ½
- Stable – Well accepted in Baosteel, Formosa, POSCO since 2014

### 1,300°C Top combustion hot stoves:

- 1,300°C with only BF Gas or with COG enrichment  
Oxygen Enrichment Burning Technology
- Advanced and Mature pipeline network design  
Highest Average Hot Blast Temperature in the world:
- 1,270°C – Baosteel Zhanjiang 5,050m<sup>3</sup> BF
- 1,270°C – Taiyuan Steel No.6 4,350m<sup>3</sup> BF



### Eco-friendly Drum Type Slag Granulation:

- Automatic speed regulation with different slag volume
- Drum size Φ5,000×5,420, Φ5,000×6,420, Φ5,000×8,440
- 29 sets of references, manufactured in CISDI workshop

### Excellent Cast-house Fume Extraction:

- Full flat cast house with high efficiency fume extraction system
- Fume extraction system stack dust emission <10mg/Nm<sup>3</sup>





**CISDI's blast furnace fast revamp expertise**

CISDI has a strong reference list of fast revamp expertise and provides both conventional and modularized technologies for the fast revamp and

expansion of blast furnaces. Its tailored rebuilds are carried out to short schedules and result in significant economies.



Online Internal Combustion Hot Stove Revamping to Top Combustion Hot Stove

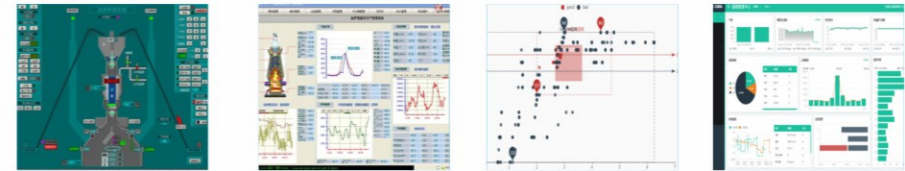
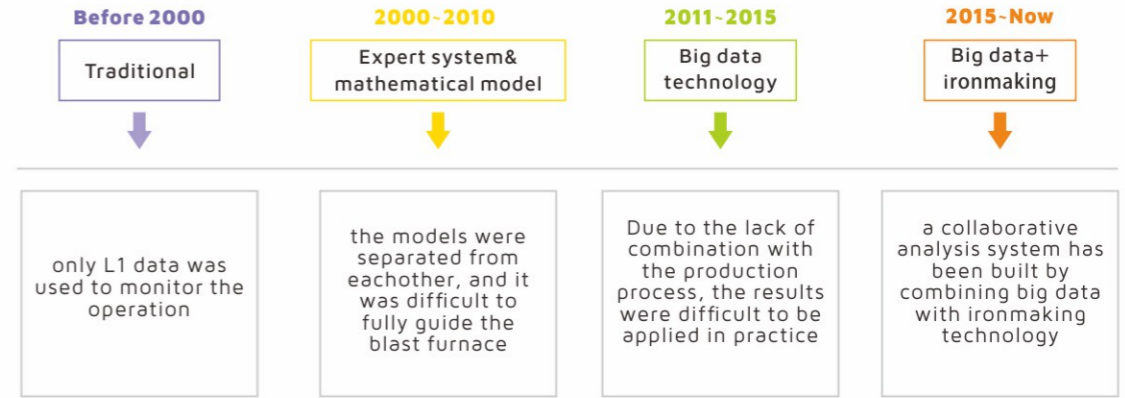
| Client   | BF     | Vol.(m <sup>3</sup> ) | Cycle(days) | Year |
|----------|--------|-----------------------|-------------|------|
| Baosteel | new #3 | 4,850                 | 76          | 2013 |
| Baosteel | new #1 | 5,046                 | 78          | 2009 |
| Baosteel | new #2 | 4,706                 | 98          | 2006 |



Typical projects of online internal combustion to top combustion hot stove modernization.

**Intelligent Center and Big Data Expertise**

The development history of big data application in China's ironmaking industry



**Upstream-BF Intelligent Centre for Baowu Group's Shaogang, China**



Blast furnace performance trend with application of intelligent center.

**TYPICAL REFERENCE**

**Twin blast furnaces, each in a volume of 4,350m<sup>3</sup>, for Formosa Ha Tinh Steel Vietnam**

The world's largest blast furnace project built on an EPC basis in recent 10 years

Applied CISDI's no-bell tops, intelligent production management systems and other advanced technologies and equipment



Project Profile:  
 Inner volume: 2 X 4,350 m<sup>3</sup>  
 Design capacity: 3.2 Mt/a  
 Service mode: EPC  
 Construction cycle: 30 months

**Twin blast furnaces, each in a volume of 5,050m<sup>3</sup>, for Baosteel Zhanjiang China**

China's largest new blast furnace project

All the equipment and materials supplied by Chinese manufacturers except for some carbon bricks

Applied CISDI's top-combustion stoves blasting a stable and high temperature of 1,270°C, and no-bell tops, bag filter gas cleaning systems, and other advanced technologies and equipment

Typical Average Production Parameters:

Inner Volume Productivity: 2.3t/(m<sup>3</sup>\*d)

Coke Ratio: 305 kg/t HM

Coal Ratio: 180 kg/t HM

Fuel Ratio: 485kg/t HM

Blast Temp.: 1,270 °C



# CISDI's Eco-friendly Solid Waste Treatment & Utilization Center



Baowu Group's Zhanjiang Steel Eco-friendly Solid Waste Treatment & Utilization Center, China

CISDI has successfully built the world's first Utilization Center for treating BF dust, BOF's OG dust, and other Fe- and Zn-bearing dusts at Baowu Group's Zhanjiang Steel, an important booster for creating an eco-friendly and cost-effective Greenfield steelworks by recovering Fe and reusing Zn from dusts, resulted in a metallization ratio no less than (≥) 70% and a dezincification ratio no less than (≥) 85%.

## HIGHLIGHTS

**CISDI trailblazing the rotary hearth furnace industry is**

- Player with China's No.1 market share in this regard
- Provider of China's first overall plan and total solution to Fe- and Zn-bearing solid waste treatment
- Full life-cycle services provider from consulting to turnkey, operations management, and after-sales services

Two 200,000t/a Rotary Hearth Furnaces at Yanshan Steel, China (Phase I started up in 2015, Phase II in 2018)



A 200,000t/a Rotary Hearth Furnace at Baowu Group's Zhanjiang Steel, China

(Phase I started up in 2016, ramped up within 1 month after startup, delivering DRI to twin 5,050m<sup>3</sup> blast furnaces)



A 300,000t/a Rotary Hearth Furnace at Shougang Jingtang Plant, China (to be started up in 2020)



Two 250,000t/a Rotary Hearth Furnaces at Baowu Group Shanghai, China (to be started up in 2020)

