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CISDI NEWSLETTER

Issue 5: May 2023

CISDI's ECIA-C coal yard 1 enters pilot production at JISCO

IN THIS ISSUE

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.

TABLE OF CONTENTS

CISDI and ArcelorMittal talk tech at Jinxi Steel

Latest developments in tech and green steel solutions were on the agenda when CISDI met for recent talks with ArcelorMittal.

The event, hosted by Jinxi Steel in China's Hebei Province, was attended by ArcelorMittal's executive vice-president Brad Davey and chief technology officer Pinakin Chaubal, and CISDI Engineering Company's vice-president John Lester and chief engineer Xinku Fan.

ArcelorMittal and CISDI executives meet at Jinxi Steel

John Lester commented: "CISDI has long been committed to the research, development and application of green, low-carbon and intelligent technologies to assist its global clients.

"Many of its innovative and expertly-delivered projects are now operating successfully. Its standout developments include the low-carbon, green blast furnace, the AutoARC EAF, the smart, centralised control centre and eco-friendly, intelligent stockyard, and a host of autonomous, unmanned products, plus projects running with green energy and zero liquid discharge.

"CISDI will be pursuing outstanding results for ArcelorMittal."

Chief engineer Xinku Fan added: "CISDI hopes to contribute its 65 years of experience in steel engineering and future-oriented creative solutions to widen mutual co-operation with AM."

AM's strong interest in CISDI's unique, ground-breaking tech and products was voiced by its executive vice-president.

Brad Davey commented: "The global steel industry is rapidly developing and reaching higher and higher standards of green, low-carbon, intelligent and efficient levels. We anticipate an increasing number of new ideas and solutions from CISDI and hope to stage more focus-group discussions in the next phase."

Both parties pledged to meet for in-depth discussions at the upcoming METEC 2023 conference in June.

536.7t teeming ladle delivery arrives safely at Tata Steel UK

A 536.7 tonne delivery arrived safely at Tata Steel's Port Talbot plant in the UK this April.

The shipment of seven CISDI teeming ladles comprised of five ladles each weighing 76.9 tonnes and two at 76.1 tonnes apiece.

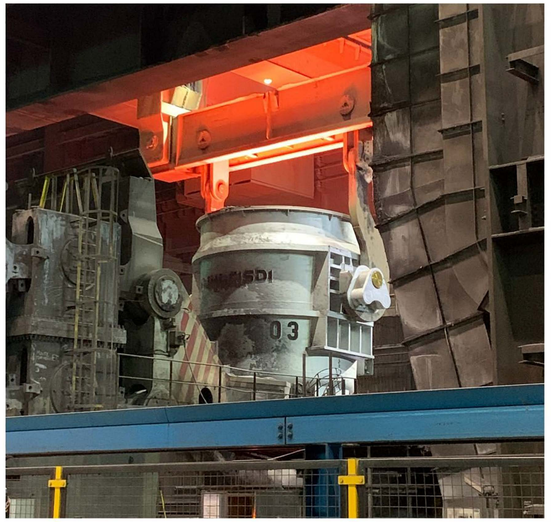
It represented the fourth time CISDI has successfully designed, supplied and shipped its large metallurgical ladles to the UK market and signifies a growing recognition from overseas customers for the company's core tech and equipment.

Tata Steel's plant at Port Talbot has a 100-year history and is Britain's largest steelworks, producing around 3.50 million tonnes of crude steel a year.

The new ladles will replace models which have been in service for 30 years and will further upgrade the plant. CISDI has already supplied Tata Steel Port Talbot with five 315-tonne hot metal ladles all of which are operating successfully.

CISDI's strict quality and schedule control of the ladle design process, its high standard of manufacturing supervision and its meticulously-planned logistics ensured Tata Steel's exacting requirements for appearance and flaw detection were fulfilled.

The teeming ladle being lifted at the Port before shipment

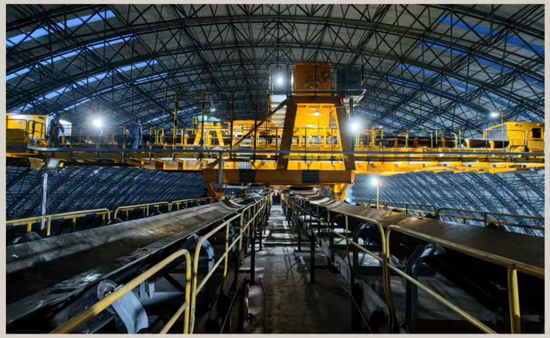


A CISDI-supplied teeming ladle in service at Tata Steel's Port Talbot plant

The project is a showcase for CISDI's world-class strengths in large metallurgical equipment supply.

CISDI's ECIA-C coal yard 1 enters pilot production at JISCO

Exterior view of JISCO's coal yard 1



An interior view of coal yard 1 at JISCO

An intelligent, greener coal yard supplied by CISDI has successfully completed its pilot production tests at Jiadong's stockyard plant at Jiuquan Iron and Steel Co.

The Guangxi Province project was built by CISDI to an EPC mode. Its eco-friendly, intelligent yard ECIA patented tech was applied.

Coal yard 1 has a general span of 100 metres and is 282 metres in length. With the help of a cantilever reversing belt conveyor, two tripper cars sharing one rail achieve coal stacking at one or both sides. The tripper cars are interchangeable.

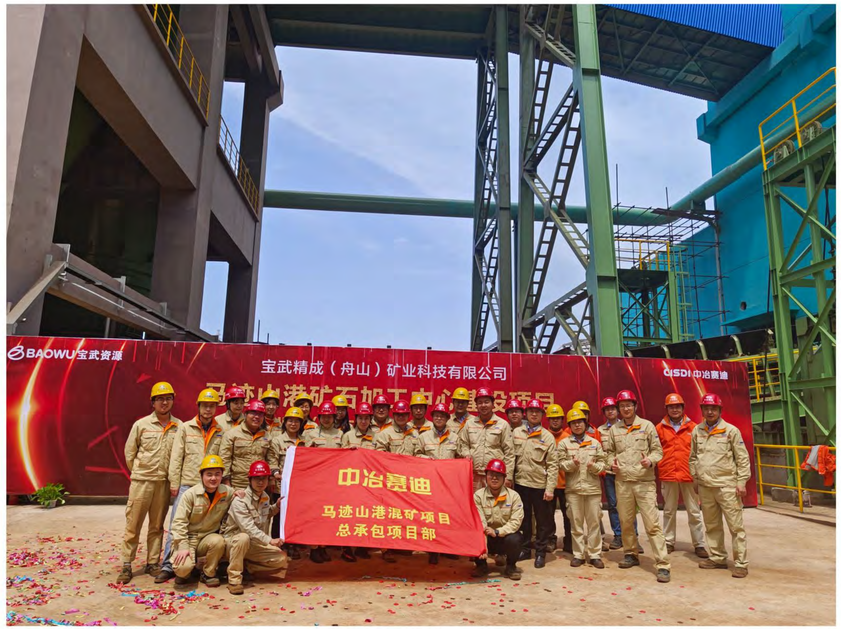
CISDI created the coloured tiles for the yard's top arched shed as one whole section and installed it in a single process, using a deck-type, movable elevated pressing platform and a tile press. This method greatly reduced the construction schedule.

In addition to coal yard 1, JISCO's stockyard plant has a further two 100-metre-span yards, which have the relevant charging and discharging facilities.

They cover a 90,000 square metre footprint and once completed, will be able to store at least a million tonnes.

Coal yard 1 broke ground in April 2022. The entire CISDI team made huge efforts in the face of difficulties posed by the pandemic, winter conditions and sandstorms and ensured every milestone arrived on schedule and to quality standards.

World's first fine blending of ores triumph at Majishan Port



The CISDI team, pictured at Majishan Port Ore Preparation Centre's site office

The new Majishan Port Ore Preparation Centre has successfully carried out its first fine ore blending and shipping process.

The order was sent to Zhoushan City in China's Zhejiang Province on April 15.

The ore preparation centre was created with investment from Baowu Jingcheng (Zhoushan) Mining Technology Co and co-funding from Baowu Resources and Chongqing Steel.

CISDI was the EPC-based service provider and the project was the first launch of its diversified ores intensified blending expertise.

It is a breakthrough in ore deep processing at a port and plays a major part in creating a demo for ore preparation plants around the world.

It follows on from CISDI's construction of China's Minmetals Caofeidian Ore Trading Centre in Tangshan City, Hebei Province.

At Majishan, smart, green, optimal and innovative concepts were introduced

throughout ore proportioning and intensified blending, central scraper feeding, belt scale weighing and online measuring.

Technological applications for multiple flying dust collection and clean transport have ensured the entire production process meets environmental standards.

The fine blending system continuously supplies reliable, high-quality blended ores thanks to its online automatic composition analysis, real-time monitoring and full-range precision control.

Fine blending core tech for proportioning and intensified blending reduces costs, increases flexibility and requires only a small footprint.

Once ramped up, the system's fine blending capacity will hit 20 million tonnes a year,

The Majishan Port Ore Preparation Centre during construction, which was carried out by CISDI to an EPC mode

transforming Majishan Port from trans-shipment only to processing and trading.

CISDI's team maintained a close interaction with engineers and prevented any site issues by minimising the impact of the pandemic and typhoons.

Artist's view of fine blending of ores triumph at Majishan Port

CISDI and client visit the central control room of Majishan Port Ore Preparation Centre

CISDI's metallurgical motor system wins big accolades for its energy conservation

The MVC1200-series HV frequency converter, a star energy-conserving control product for CISDI Electric's metallurgical motor system

CISDI Electric Co's revolutionary metallurgical industrial motor system has won accolades for its energy-conserving capabilities.

In 2022 the system was included in *The Directory of Energy Conservation Tech and Equipment Recommendations by China's Ministry of Industry and Information Technology.*

It won this national and sectoral recognition for its energy-saving and carbon-reducing achievements.

A number of the system's products have increased energy conservation credentials. They include:

The world-class metallurgical industrial HV frequency control equipment, which was ranked in *The Directory of Industrial Power Demand Side Recommendations by China's Ministry of Industry and Information Technology (3rd Batch)* and *MCC's Top 10 Core Tech Typed Products*

- Energy-conserving motors, driven unit and drive system
- Energy-saving pipeline network system
- Optimised collaborative components or sub-systems
- Energy-efficient system control units

- The process control model for hot rolling's scale breaking and BOF dust collection by integrating the domain knowledge and the digital tech.

The system achieves remarkable reductions in carbon emissions when applied to high-pressure scale breaking and BOF primary dust collection systems. It also achieves:

- An increase in overall power saving rate of 5 to 10 per cent
- A 15 per cent reduction in the system's fault rate
- A 15 per cent productivity enhancement.

CISDI Electric's MVC1200-06k/195 HV frequency converter is applied for a casthouse's dedusting fan at a blast furnace ironmaking plant. It resulted in a 10.5 per cent power saving and an annual power consumption reduction of $1.26x10^6$ kilowatt per hour, equivalent to savings of around US$ 90,000.

Case study

A (1,700mm) hot rolling line's high-pressure scale breaking system originally applied five water pumps, each with a power output of 710-kilowatts.

Water delivery pressure was regulated by operating a variable number of pumps.

The outdated production method caused discontinuous pressure control, heavy pump wear and high maintenance costs.

The line was modified by applying CISDI Electric's scale breaking system solutions, which replaced the original five pumps with one water pump with an output power of 4,500 kilowatts.

The new system takes eight seconds to accelerate from 15 to 50 hertz and needs 20 seconds to decelerate to 15 hertz.

The outstanding speed regulation performance reduces the system's vibration, extends the water pump's service life and enhances the automation level.

This advanced solution has resulted in annual maintenance and power savings totalling hundreds of thousands of US dollars.

All three Baosteel Desheng blast furnaces are now meeting ULE standards

Baosteel Desheng's blast furnace 3 in China's Fujian Province is now meeting ultra-low emissions standards, thanks to CISDI's modifications.

All three of Desheng's 450 cubic metre volume blast furnaces have now been rebuilt, completing the plant's environmental protection upgrading programme.

Furnace 1 hit ULE targets in March and furnace 2 followed suit in September 2022.

Furnace 3 became cleaner in April. Tightly-scheduled milestones were met during the 4-month modification process. The Purchase Agreement was signed in early January 2023, designs were closed off and equipment arrived at site in mid March.

"We achieved clean production at furnace 3 thanks to CISDI team's hard working. Their project manager, engineering manager, commissioning manager, process and drive engineers were onsite throughout March and April, helping us to coordinate all parties, problem-solve and ensure the furnace's blow-in was on schedule," commented a spokesperson for Baosteel Desheng.

Cleaner production: Desheng's modified furnace 3 taps hot metal

The rebuilt blast furnace 3 at Desheng is now meeting ULE standard

Another CISDI green first - pneumatic transport system solves dusts issue at Shaogang BF7

CISDI has created another first to boost the steel sector's pursuit of greener production methods.

It has developed a unique environmentally-friendlier solution for the transportation of dusts to a steel plant's exterior bins.

A pneumatic transport system has been built for dusts collected from a gravity dust catcher at Baowu Shaogang's blast furnace 7.

The Guangdong Province steelworks' new system smoothly transports the dusts to a central bin 100 metres away.

Previously, it was believed the dusts from the gravity dust catcher were unviable for pneumatic transport because of their uneven granular sizes and large weights, which ranged from 1.6 to 1.8 tonnes per cubic metre.

A suction/exhaust tank car or truck was used to transport them to an outside bin. But this method was prone to releasing flying dusts into the atmosphere. It also took up a huge amount of energy and was a laborious task.

CISDI's team carried out a specialist study and spent over a year to design, optimise, commission and operate the solution - a pneumatic transport system.

Efficient, green smelting: Shaogang blast furnace 7 is operating with CISDI's innovative dust transport system

Dusts are now transported in an enclosed working environment and there is no risk of flying dust when the dusts are loaded into the car.

CISDI's solution has achieved:

- Fully automatic operation
- Intelligent judgment of abnormities and alarm-raising
- Automatic correction without any external/manual interference
- All-weather monitoring of gravity dust catcher system
- Timely resolution of dust accumulation.

CISDI wins big order from Inner Mongolia

China's first pickling line and tandem cold mill package supply with will produce thinnest strip specification and maximum 1Mt/a

CISDI is to supply a 6-stand, 6-hi PL-TCM to Chifeng Lixin Metals Co in Inner Mongolia.

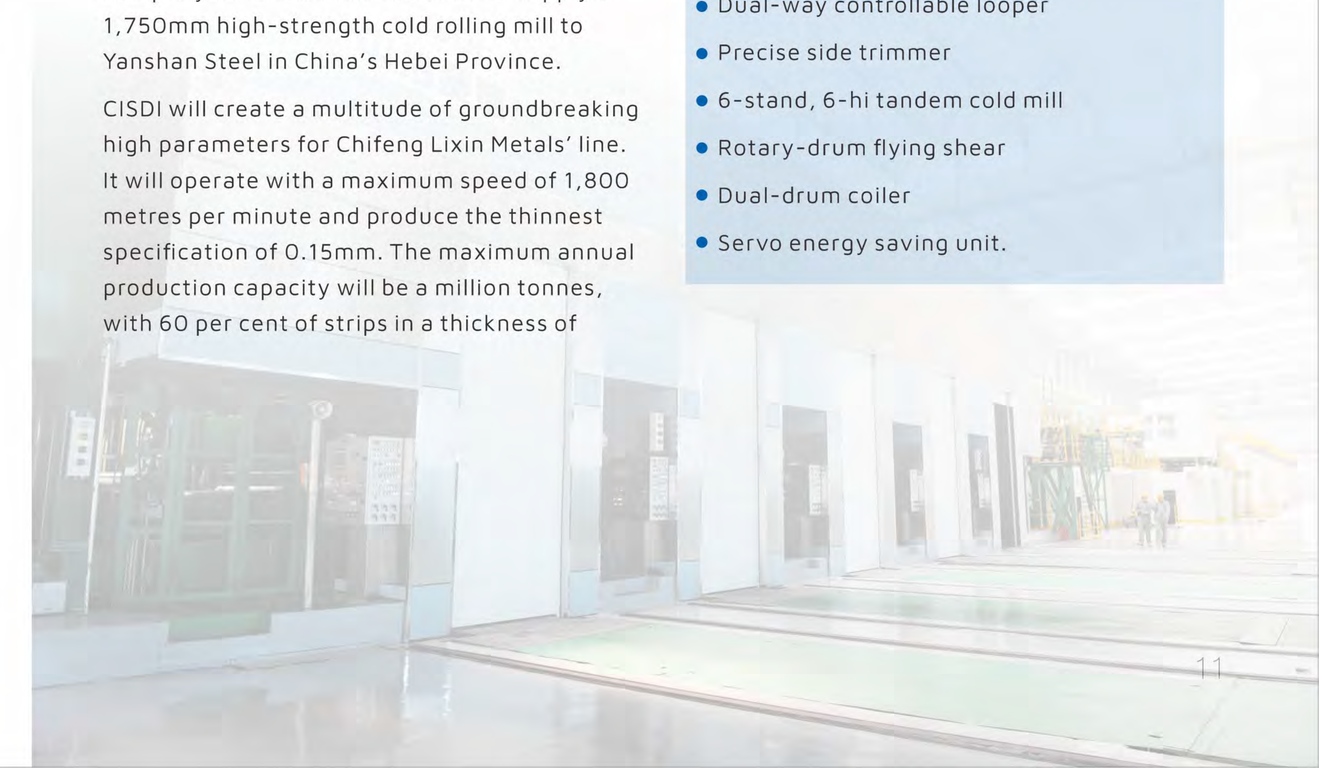
The plant's production line will become China's benchmark for producing wide and super-thin strips and rolling with a large screw-down ratio and an ultra-high speed.

Winning the order signifies further market recognition of CISDI's expertise in extremely-thin cold-rolled strip production. Recently the company was also commissioned to supply a 1,750mm high-strength cold rolling mill to Yanshan Steel in China's Hebei Province.

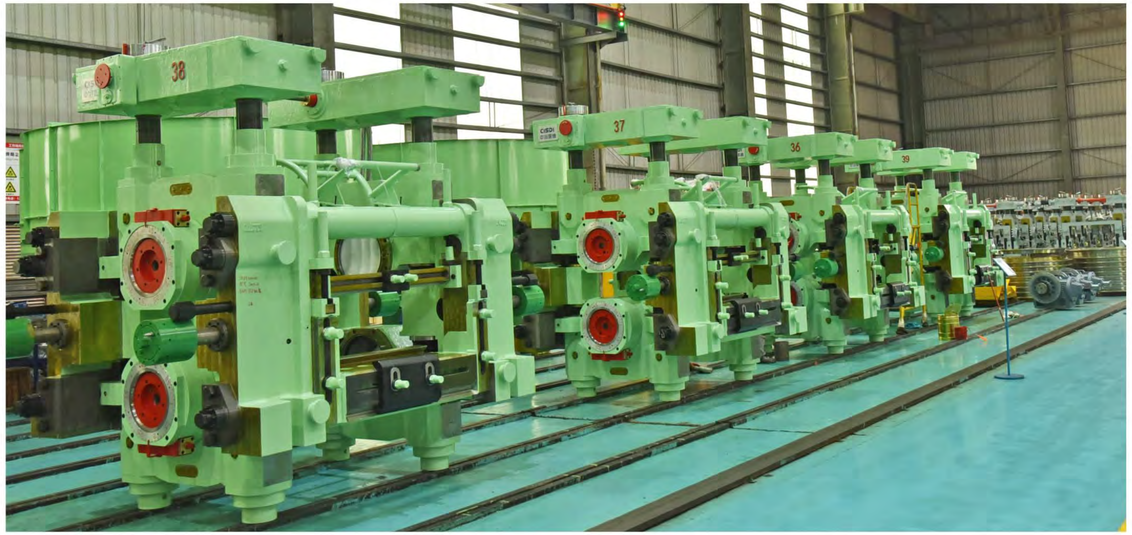
CISDI will create a multitude of groundbreaking high parameters for Chifeng Lixin Metals' line. It will operate with a maximum speed of 1,800 metres per minute and produce the thinnest specification of 0.15mm. The maximum annual production capacity will be a million tonnes, with 60 per cent of strips in a thickness of 0.3mm or less.

In response to Lixin's product orientation to thin specification, high precision and quality, CISDI is applying the following state-of-the-art pickling and rolling tech and products:

- Highly-efficient scale breaker
- High-performance turbulent pickling process and equipment
- Dual-way controllable looper
- Precise side trimmer
- 6-stand, 6-hi tandem cold mill
- Rotary-drum flying shear
- Dual-drum coiler
- Servo energy saving unit.



CISDI's electro-mechanical-hydraulic equipment set to boost Changqiang Steel's bar production



CISDI's star product – these short-stress path rolling mills are ready to deliver from the company's Jiangjin-based equipment manufacturing workshop to a Chinese steel plant
Over 1,500 sets of standard mills are now in use at high-quality long products rolling lines.
The product ranks as the number one market share in China.

CISDI Equipment Co is manufacturing electro-mechanical-hydraulic equipment for Changjiang Steel's bar production line's rolling area.

The steel company is based in China's Jiangsu Province and its existing line runs to a designed capacity of 500,000 tonnes a year.

Its main products are alloy steel, high-pressure boiler pipe's alloy structural steel, low-alloy structural steel, quality carbon structural steel and carbon structural steel.

Feed square billet's specification range is 155mmx155mm and 180mmx220mm. Correspondingly, product specifications range in diameter from 45-65mm and from 70-130mm.

CISDI's modification will add four stands of short-stress path rolling mills and feed with only one specification of billet (180mmx220mm).

This will not only help relieve bar rolling's upstream procedure - continuous casting's loads - it will markedly increase the line's production capacity.

World-class Industrial Intelligent Applications

CISDI's digital, intelligent solutions, based on a plant-wide industrial internet platform, has transformed conventional steel manufacturing.

The world's first delayering architecture with platform plus application has spearheaded intelligent manufacturing at blast furnace/basic oxygen furnace-centred plants.

The solutions have already achieved impressive global firsts at China's Baowu Shaogang, Masteel, Baosteel WISCO and Zhanjiang Steel. The steel giants are showcasing safer, smarter, more efficient and more transparent data, lower operational costs and other overall benefits.

Star project

Yongfeng Lingang intelligent manufacturing project in China's Shandong Province

This unified industrial internet platform-based full-process Greenfield intelligent steel plant is the first of its kind in the world.

Its benchmark indicators:

- per capita crude steel output is over 1,600 tonnes a year, and costs per tonne of crude steel have been reduced by US$14.04 from previous costs at Yongfeng's manufacturing HQ
- a digital flow throughout charging, warehousing, machining and discharging, and a unified platform supporting staff, equipment, materials, media and production data and models
- digital, lean production management achieved in all procedures serving ironmaking, steelmaking and rolling and full-process integrated, intelligent controls
- optimal consumption and output achieved from full-process intelligent model plus coordinated model.