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CISDI

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Baosteel Zhanjiang: world's top green carbon steel production base

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CISDI

TOTAL SOLUTIONS AND TECHNOLOGY PROVIDER PREFERRED BY GLOBAL METAL INDUSTRY

Full-Process Services

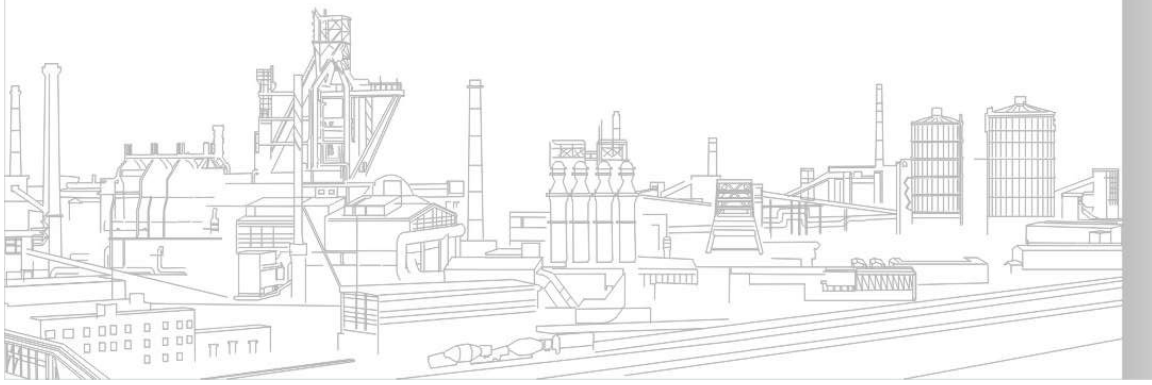
CISDI provides full-process services from the bulk material handling yard to the post-processing line of the hot mill.

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 through the entire project life cycle.



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ASSB Malaysia on target to be most competitive in Southeast Asia

Construction of Malaysia's flagship steel plant ASSB, designed to be the most competitive steel enterprise in Southeast Asia, is well on schedule.

The creation of the long products steel plant at the Malaysia-China Kuantan Industrial Park in Pahang began in November 2016 and is progressing well, report CISDI.

ASSB is the key inaugural project to be launched jointly by the governments of Malaysia and China, their response to the Belt and Road Initiative.

Xiao Xuewen, the chairman of CISDI Group, delivered a speech expressing the determination and commitment to building the ASSB flagship development at a progress meeting on July 23. The fourth of such meetings drew the leaders of 29 companies. Some 150 representatives from the fields of design, consultancy, construction, project management, equipment supply and logistics industries attended.

Wang Yong, China's State Councillor, remarked on the positive achievements made in the construction progress and commented on its quality. He was accompanied to the Malaysia-China Kuantan Industrial Park by China's ambassador to Malaysia.

CISDI is responsible for the general design of ASSB and the package supply of core process equipment.

Full-process iron and steel production technologies applied include CISDI's global leading environmentally-friendly stockyard system and compact single ladle hot metal transfer.

Overall plant operation indicators are designed to be world-leading. Over 90% of the power is generated from captive plant, 98% of solid waste is recycled and outsourced fresh water consumption is very low at only 1.6m^3 per tonne of finished steel products.

In addition to a host of other groundbreaking features, the transportation distance of hot metal will be a mere 0.15km, and the footprint will be 0.68m^2 per tonne of finished steel products.

Wang Yong, China's State Councillor, visits ASSB. He is pictured centre, front row

The leadership team pictured at the fourth ASSB progress meeting

The ASSB construction site

At the time of going to press 80% of the Number 1 Blast Furnace Proper has been completed, 70% of hot blast stoves have been constructed and the ASSB meltshop (for steelmaking and casting) is at 35% construction level.

Erection of the main workshop building columns for the high-speed wire rod mill and #2 bar mill have been completed. Crane beams and roofing beam steel structures are underway.

Overview of ASSB

Project name: ASSB 3.50Mt/a steel complex

Location: MCKIP at Kuantan, Pahang in Malaysia

Built by: ALLIANCE STEEL (M) SDN BHD

Products and size: bars, wire rods and sections totalling 3.50Mt/a

Schedule: Phase 1 wire rod and bar mills to be started up by December 31, 2017

blast furnace to be started up by March 2018

entire plant to be started up by September 2018

Project Highlights

◆ **Advanced equipment and technology features:**

Highly-efficient blast furnace featuring low consumption & a long campaign life

Innovative CISDI-SACS BOF (self-adaptive constraint system, 4-point linkage suspension system)

Billet Caster

Bar & Wire-rod Mills

◆ **Green, energy-efficient features:**

Environment-friendly and smart Model B Stockyard

Highly-efficient energy recovery & reuse

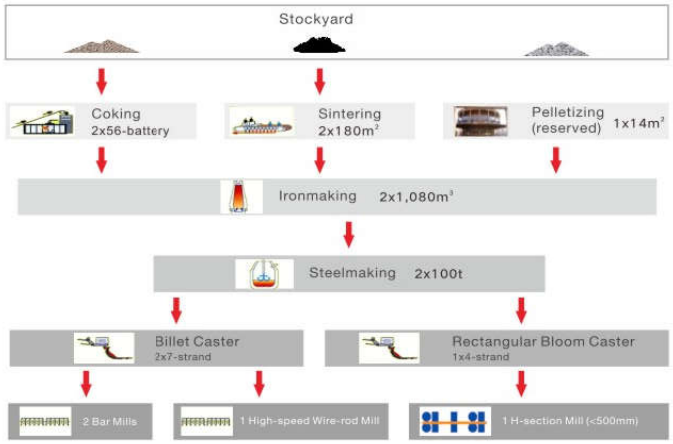
Energy-efficient, compact single ladle hot metal transfer process

Rainwater collection & recycle

◆ **High-performance logistics:**

Out-plant Tubular Belt Conveyor System based on logistics simulation

In-plant area-wise organised transportation



Process Configuration

CISDI is awarded Taishan Steel BF1 revamp project

CISDI has been awarded the EPC contract for the revamping of Taishan Steel's Blast Furnace 1.

The contract was awarded on July 28 and will upgrade the 1,780m^3 volume BF1, which had been in operation since October 2011.

CISDI will be replacing the existing hearth refractory and part of the cooling staves, installing a new top pressure equalising gas recovery system, modifying the casthouse dedusting system and installing CISDI's hearth long-campaign management model.

CISDI's big data reporting system will also be installed during the revamp.

CISDI to create largest domestic gas holder of its kind for Meishan Steel

Meishan Steel's new BFG holder project has been awarded to CISDI on an EPC basis.

The contract was awarded on June 23 and will lead to the creation of the biggest domestic gas holder of its kind, which will boast the highest pressure and be capable of bearing the heaviest wind, snow and seismic loads.

One-section rubber membrane technology will be used for the BFG holder, which will have a volume of 135,000m^3.

Self-balancing piston patent technology will be applied by CISDI and is expected to reduce the emission rate of the BFG system and maintain stable pipeline pressure. It will result in substantial economic and environmental benefits.

Rebuild of Yieh United Steel Corp. 100tLF won by CISDI

CISDI has been contracted to deliver the rebuild of Yieh United Steel Corporation's 100tLF in Taiwan.

CISDI will be upgrading the existing LF conductive arm, electrode regulator, hydraulic system, bottom blowing system, temperature measurement and sampling device and electrics to enhance productivity at the Brownfield project in Kaohsiung. The contract was won on June 22.

Baosteel's hot mill slitting line upgraded in record time

Commissioning has now been completed for Baosteel's upgraded and modernised 2,050mm hot mill slitting line.

CISDI undertook the plant design and partial mechanical and hydraulic package supply for the extremely challenging project.

The slitting line was 30 years old and not capable of matching product upgrade and expansion needs of the plant. But there was a very limited time schedule and physical constraints on site - CISDI had to add and replace equipment within a compact space.

An additional problem also had to be overcome - original drawings and documents from 30 years ago had to be located so that complicated interfaces and takeover points had to be rearranged.

It only took 83 days to complete the modifications from the halting of production on March 28. To the client's delight, automation commissioning was handed over one week ahead of schedule.

Commissioning was completed on June 19 and the modernised hot mill slitting line handed over to the client for pilot production.

Baosteel Zhanjiang: world's top green carbon steel production base

Overview:

CISDI is assisting Baosteel in its bid to build the world's premier carbon steel production base in the world on modern, eco-friendly and highly-efficient principles.

Qualified as the 'excellent supplier' for Zhanjiang Phase I in 2016, CISDI has undertaken the general design, plus the design of 10 process units and 20 project supply packages or EPC services.

Zhanjiang's BF2 was started up this July, marking the completion of Phase I, and current technical and economic indicators have either achieved, or in some cases surpassed, the original design values.

Already, Zhanjiang is ranking highly among the world's most competitive green steel plants in terms of its cost efficiency, high quality products and it environmental protection safeguards.

Location: Guangdong

Construction period: May 2013 ~ July 2016 for Phase I

Capacity: 8.75Mt/a for Phase I

Main configuration: 5,050m^3 BFs, 350t BOFs, 2,250mm HSM and 4,200mm wide plate mill

Main products: High-end auto sheets, pipeline steel

Milestones

A decade on from the initiation of Baosteel Zhanjiang, its general designer CISDI is carrying forward the motto of 'creating values for client' throughout the design and construction process.

Time line:

Feb. 2004

General design contract signed between Baosteel and CISDI

CISDI is involved in the early stages, assisting Baosteel in selecting a location, assessing land space requirements and a wharf proposal

Jun. 2008

Feasibility study report starts

CISDI completes 3 revisions of the project application reports, 4 revisions of the feasibility study reports, 3 revisions of the preliminary design and dozens of general design proposals, with hundreds of technological verifications

May 2012

Construction begins

After assessing the complicated local geography, the high salt and strong corrosion elements of the site's marine climate and the additional threat of typhoon and monsoon, CISDI creates an efficient, practicable and safe process for construction

Aug. 2015

Stockyard's main process equipment is started up

CISDI applies its unique, patented technologies for the environment-friendly stockyard and clean transfer, resulting in a more environmentally friendly solution and significant savings on BF operating costs

Sept. 2015

BF1 is blown in and 2,150mm CCM is hot-tested

As the general designer, CISDI controls the integration of the caster process equipment and makes several optimisations that result in significant cost reductions

Oct. 2015

Rush to protect the site from the threat of Typhoon Mujigae

Blast furnace recovery crisis planning is rushed through overnight by CISDI's teams in case Typhoon Mujigae hits the site

Dec. 2015

2,250mm HSM is hot-commissioned

CISDI-designed 2,250mm hot strip mill is hot-commissioned smoothly and 108 days ahead of schedule. Of the four hot mills at Baosteel, it produces the best maiden coil in tower shape, profile and surface quality.

May 2016

2,300mm 2-strand slab caster is hot-commissioned

In addition to the general design and integration, CISDI revamps and upgrades mechanical equipment from another site to Zhanjiang and also develops a new caster process model to improve the finished slab quality

Jul. 2016

BF2 is blown in

The CISDI-designed BF2 is blown in and the first phase of production begins, symbolising the completion of Zhanjiang Phase I and production capacity up to 9Mt/a.

Consulting and General Design

A highly competitive overall plan, based on the application of advanced and efficient processes, short and smooth logistics and a compact general layout, results in economic and technical indicators which exceed some of the world-leading values, including the footprint per tonne of steel, rainwater reuse volume per tonne of steel, carbon dioxide emission per tonne of steel, solid waste comprehensive re-utilisation ratio, labour productivity and hot metal transfer distance. Construction costs are reduced and environmental friendliness improved.

◆ **Main technical features:**

Hot metal transfer distance between ironmaking and steelmaking shops: <1.0km

Plant-wide Fe primary utilization ratio: >97%

Solid waste reutilisation ratio: 99.93%

Fresh water consumption per tonne steel: 1.5m^3

Industrial water recycle rate: 98%

State-of-the-art Equipment and Core Technology

The four principal process units undertaken by CISDI illustrate the company's excellence in innovation and system integration.

CISDI's unique advanced technologies and equipment are put into operation and greatly enhance cost efficiency, resulting in high praise from Baosteel.

◆ **Stockyard**

Equipment: large-sized environment-friendly integrated stockyard

Technology: Stock storage and handling technology characteristic of large capacity and environmental protection

L1 control and smart management technology

Clean transfer integrated technology

◆ **Blast furnace**

Equipment: 5,050m^3 mega blast furnaces

Technology: Integrated new-type serial-hopper no-bell top, made domestically

Integrated technology for one campaign more than 20 years

Top combustion stove technology reaching 1,300℃ high blast temperature

Compact arrangement between ironmaking and steelmaking interface achieved, resulting in higher reliability during transportation

◆ **CMM**

Equipment: The world's largest ladle turret at 520t

High-performance slab caster

Technology: General layout logistics optimisation and simulation

2,300mm caster secondary cooling model and soft reduction model

◆ **Hot Mill**

Equipment: Hot wide strip mill

Technology: High-tensile steel coil dividing and skin-pass mill

Reheating furnace with digital pulse combustion control

Reheating furnace flue equipped with air preheater to preheat the air up to 610℃

High efficiency burner

Environmental protection - core technologies and products

CISDI has developed its own series of technologies and products specifically designed to shrink the carbon footprint of the steel industry and greatly reduce damage to the environment. CISDI's environmental efforts have contributed to the building of a green and sustainable Baosteel Zhanjiang.

◆ **Environment-friendly stockyard**

Replacing some of the mechanical extraction of dust with dry fog dust suppression has resulted in substantial power and water savings

Fully clean production technology developed, and a facility to conceal coal, ores and other stocks during storage and handling

◆ **Solid waste treatment centre**

Baosteel and CISDI co-build the world's first iron-bearing solid waste treatment centre. Features include a rotary hearth furnace, homogenising line, cold briquetting and scale screening line.

The rotary hearth furnace technology achieves >85% dezincification ratio and >75% metallisation ratio.

◆ **Plant-wide water treatment and rainwater collection**

An innovative design for a rainwater collection tank at Zhanjiang Steel is enabling the plant to collect 12 million cubic metres of rainwater a year and save fresh water consumption by a third.

Highly-efficient waste water treatment and desalination technology

Advanced process route - pre-treatment + Stage 1 reverse osmosis (RO) + Stage 2 RO + concentrate intensified oxidation is resulting in the discharge of non-polluting waste water as low as 0.12m^3/t per tonne of steel, a world-leading performance indicator.

CISDI's dual-modular wire-rod FM achieving outstanding quality and energy savings

The advanced dual-modular wire-rod finishing mill developed by CISDI was commissioned and successfully started up at Haicheng Liaonan Steel in Anshan City on July 8.

The 6-stand finishing mill train has adopted the CISDI-designed 3-set dual-modular finishing mill, which was developed by CISDI on the basis of a separated drive reducing and sizing (SRSCD) 2-stand reducing mill and renovated with a new mechanical drive.

The advantages of the dual-modular FM lie in its simple structure, ease of installation, its compact layout, flexible groove design and process arrangement.

Technical and economical benefits are substantial. Its idle stands can be stopped, lowering power consumption and reducing production cost. Approximately 30% of power consumption is saved by the new technology, compared with a conventional centralized driven FM.

The end user is reporting that the rebar surface quality produced from the downstream dual-modular FM is superior to similar products on the market.

Mass production of hot-rolled 1.52mm ultra-thin high-strength weatherproof steel achieved

Yanshan Steel's 1,580mm HSM successfully rolled out its first batch of new specification ultra-thin, high-strength weatherproof steel on July 6.

It was a smooth rolling process resulting in a high-standard of finished coil indicators. CISDI supplied the automation package for L1, L2 and MES.

The 1.52mm x 1,175mm weatherproof steel (SPA-H) has a cold yield strength of up to 590MPa (measured), equivalent to that of X80 (measured 550MPa).

The successful rolling of such coils demonstrates CISDI's excellence in AGC, off-tracking control, roll crown and strip profile control and full-process temperature control.

CISDI is fully committed to expanding the product development database and will be utilising AI (artificial intelligence) and big data technologies to improve hot rolling competitiveness.

CISDI: the total solutions and technology provider preferred by the global metal industry

- 38 of the world's top 50 steel enterprises are our clients
- We provide full-process solutions and plant-wide systematic services centred on enhancing competitiveness and are leaders in the core technological development of industrial upgrading

Baosteel Zhanjiang, China
A world-leading carbon steel plate base, modernised, eco-friendly and high performing
CISDI undertakes the general design and core units/projects E, EP or EPC services

Formosa Ha Tinh (FHS), Vietnam
The largest steel complex in Southeast Asia
CISDI undertakes the consulting, general design and core units/projects E, EP or EPC services

CISDI GROUP CO., LTD.