



An Engineering Service Provider Preferred by the Steel Producer

Add No.1 Shuanggang Road, Yuzhong District, Chongqing, 400013, P. R. China  
Tel +86-23-63850431/63545030  
Fax +86-23-63548888  
Web [www.cisdigroup.com](http://www.cisdigroup.com)  
E-mail [OB@cisdi.com.cn](mailto:OB@cisdi.com.cn)

Published By CISDI Corporate Culture Dept. in Sept. 2011

# CISDI

METALLURGY EXPERT

**CISDI ENGINEERING CO., LTD.**

Chongqing, China

**An Engineering Service Provider  
 Preferred by the Steel Producer**



TABLE OF CONTENTS

<b>About CISDI</b>	
Company Profile .....	01
Evolution .....	02
Development Strategy .....	03
Qualification and Credit .....	04
Human Resource .....	05
Informationization .....	06
Social Responsibility .....	07
Award .....	08
<b>Technology and Reference</b>	
Profile .....	09
Technical Expertise .....	10
Comprehensive Service .....	11
Consulting .....	12
General Layout .....	13
Bulk Material Storage & Handling .....	15
Ironmaking .....	17
Steelmaking .....	19
Rolling Mills .....	21
Industrial Furnace .....	23
Technical Service for Operation .....	24
Automation .....	25
Energy Efficiency & Environmental Protection .....	27
<b>R &amp; D System</b>	
Profile .....	29
R & D Platform .....	29
R & D Achievements .....	30
Pilot Plant and Core Equipment Manufacture .....	31

# Company Profile

CISDI Engineering Co., Ltd. (CISDI), a big state-owned technology-intensive engineering company, with major stake held by China Metallurgical Group Corporation(MCC)-one of the Global 500 in the newly released Fortune, Chongqing Iron and Steel Designing Institute, one of China most competitive designing institutes serving the metal industry has shifted its main business and related qualifications to CISDI. It has been ranked among the top seven survey and engineering companies in China since 2003 in terms of revenue.



Legal Representative and Chairman of the Board: Mr. Xiao Xuewen

## Business Portfolio

- Overall solution to steel producers
- Engineering consulting
- Engineering design
- EPC
- EP
- Project supervision
- Operation service

# Evolution

The predecessor of CISDI is Chongqing Iron & Steel Designing Institute, a key Grade-A metallurgical designing institute of China with over fifty years history.



# Development Strategy

CISDI devotes to building a fully functional international engineering company that provides full life-cycle service for project, becomes a respectable, learning, open and innovative company preferred by global steel industry.



# Qualification and Credit

## Occupational Qualification

Granted Grade A, the highest engineering qualification by China Ministry of Housing and Urban-Rural Development, which is only owned by 30 enterprises in China.



## Bank Credit Rating

AAA Credit of China Minsheng Bank, AAA Credit of China EverBright Bank; total credit extension line amounting to \$1.25 billion.



## Quality System Certified

Quality, Environment & Occupational Health & Safety Control System Certified.



# Human Resource

CISDI has endeavored to develop three professional teams for technical expertise, project management and business management, including:

- 2 national engineering masters, 1 national project supervision master and 5 survey & design masters of Chongqing
- 44 experts with special government grants
- Over 700 senior professionals
- Over 400 professional certificate holders, including those granted by RICS and CIOB
- Over 800 master- and doctor-degree holders



Engineering Design Master of China: Mr. Liang Liqun



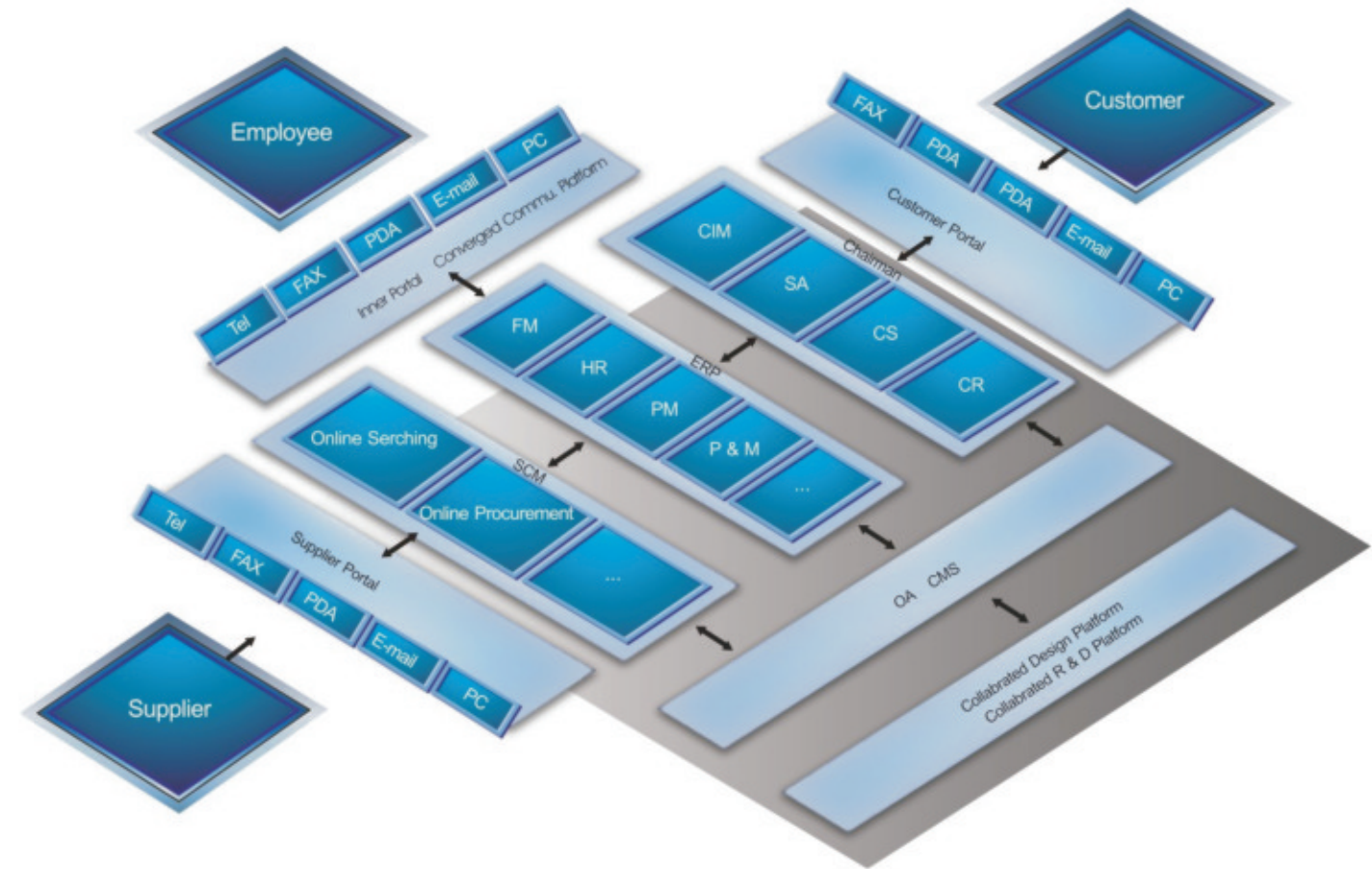
Engineering Design Master of China: Mr. Xiang Zhongyong



# Informationization

CISDI is the first engineering company with IT-based & fully-digitalized management. It can provide such services as strategy & management consulting, IT planning, ERP system consulting and implementation, MES system consulting and implementation, intelligent building consulting & implementation, 3D collaborative design consulting & implementation, CAE simulation analysis consulting & implementation, IT technology support & service. Its business is supported by self-developed software products, including CEIS (ERP system suiting for medium & small sized enterprises), new generation MES solution and intelligent building control system, etc.).

## CISDI Blueprint of IT Development



# Social Responsibility

- As a socially responsible company who aiming to be an excellent global corporate citizen, CISDI has always actively participated in innovative technology promotion and low-carbon & livable concept publicity to make our planet better by sustainable development.
- As a major player in China metal industry, CISDI is fully aware of its responsibilities for the society, employees and environment. It always upholds integrity and faith in dealing with clients, investors, suppliers and strategic partners to achieve win-win progress. CISDI has gained a strong brand identity by its great efforts in being a respectable company.
- As an active charity participant, CISDI has donated app. RMB11 million worth of goods and cash from 2003 to 2010.
- In support of local government's strategy for "livable Chongqing", CISDI has jointed hands with world famous partners to develop Chongqing's first low carbon industrial park in Ba'nan, Chongqing.

# Award

- China Top 100 Engineering Company in terms of Operation Revenue
- One of the Chinese Dual Top 60 Contractors and Engineering Design Enterprises
- China Top 100 Electronic Information Companies
- China Top 100 Companies by Software Revenues
- China Top 10 Innovative Software Enterprises
- China Model Company for Intellectual Property Excellency
- One of the Best Ten Innovative Enterprises in China Survey and Design Industry
- One of National Excellent Enterprises for Metallurgical Construction Industry
- One of Top Ten Innovative Hi-tech Enterprises in Chongqing
- National Demonstration Unit for Corporate Culture Construction

Social  
Responsibility



Signing Strategic Collaboration Agreement for Building Chongqing Low-Carbon Industrial Park with Chongqing Banan District, AECOM, Wales Low-carbon Energy Research Institute



Completion Ceremony for China's Biggest Rehousing Base for Sichuan Earthquake-affected Children-New Tanghu Elementary School (EPC)



Donation for Earthquake Relief



# Profile

- CISDI cut a brilliant figure by independent design of Panzihua Steel, the first large iron & steel base in China, and plant design of Baosteel, the pace-setter of Chinese steel producers. It has also served more key steelmakers in China than any other competitors.
- Almost all the key steelmakers in China are long-standing clients of CISDI, including Baosteel, Ansteel, Benxi Steel, Panzihua Steel, WISCO, TISCO and Shagang. Having served 35 out of the world's top 80 steelmakers with references found in Brazil, Argentina, Spain, America, Australia, Japan, Saudi Arabia, Vietnam and Malaysia, etc., CISDI has come to the world's attention, especially in metal industry in South America.



Baosteel – China's most modern large-sized iron & steel complex for which CISDI played as an engineering contractor



Pzsteel – China first large-sized iron & steel complex build up by Chinese independently for which CISDI played as an engineering contractor



Chongqing Steel relocation project which was overall designed and self-integrated by CISDI within two years-Shaped it into a new green, energy-saving and environment-friendly Chongqing Steel which adopted 8-steps terrace layout

# Technical Expertise

- Consulting
- Plant Planning
- Stockyard
- Large-sized Blast Furnace
- Large-sized Converter
- Secondary Refining
- Slab Caster
- Hot Strip Mill
- Plate Mill
- Steckel Mill
- Reversible Cold Strip Mill
- Cold Strip Mill
- Large & Medium Section Mills
- Large-sized Breakdown Mill
- Long Product Mill
- Tube Mill
- Post Processing Line
- Industrial Furnace
- Automation System Integration
- Industrial Water Treatment
- Architecture Engineering
- Gas Holders

### Awards for China Excellent Engineering Design

Grand Prize for China Best Engineering Design	Golden Prize	Silver Prize	Bronze Prize
1	9	8	9

### Awards for China Excellent Consulting Outcome, Excellent EPC Project and Quality Project

Consulting	EPC	Quality Project	
5	4	3(Golden Prize)	4(Silver Prize)



1 2  
3

- ① Engineering Design for BF No.3 Relocation Revamping of TISCO which Won Golden Prize for China Excellent Engineering Design
- ② EPC Projects for New No.1 & No.2 Converters and No.2 Billet Caster of PZH Steel, which Won Silver Key Prize for China Excellent EPC Project
- ③ Technical Modernization for HSM Producing Stainless Steel and Carbon Steel, Shanghai Steel Plant No.1, Baosteel, which Won Golden Prize for China Quality Project

# Comprehensive Service

CISDI is committed to providing engineering services for global steel producers during the entire project life cycle.

### Service for the whole process route:

To serve the steel producers from stockyard to processing line.

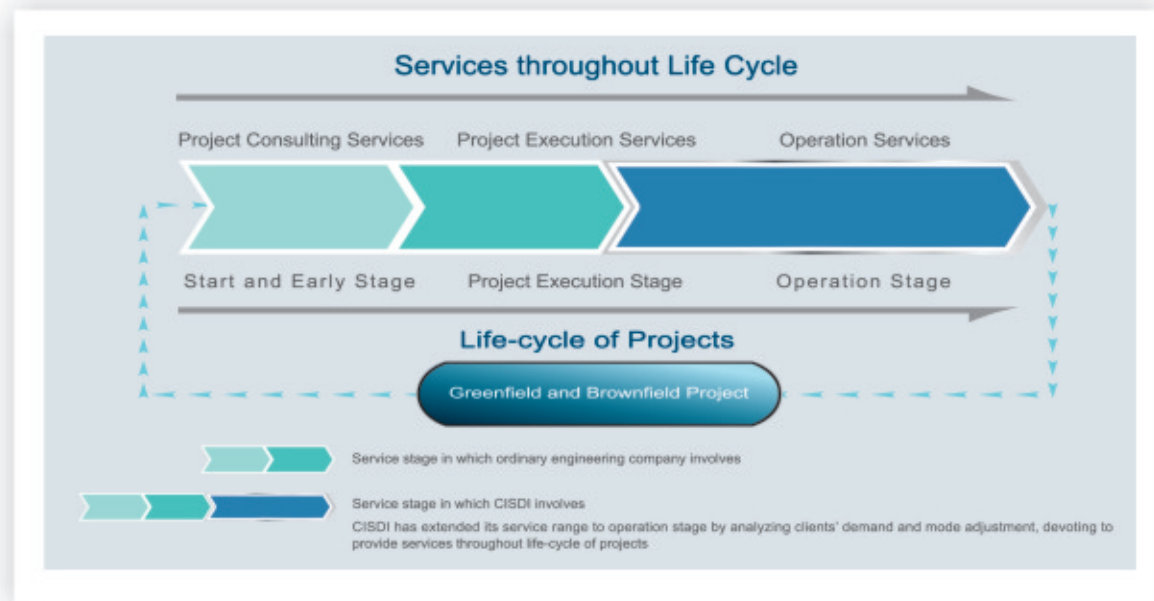
### Multi-faceted service:

Depending on the client requirements and the project features, CISDI can provide project consultancy, project execution & operation services, etc..

Project consultancy services	Project execution services	Project operation services
<ul style="list-style-type: none"> <li>Pre-project management</li> <li>Corporate strategy research</li> <li>Conceptual study</li> <li>Pre-feasibility study</li> <li>Feasibility study</li> <li>Investment and financing service</li> </ul>	<ul style="list-style-type: none"> <li>Plant and equipment design</li> <li>Supply of equipment package</li> <li>EPC</li> <li>Equipment manufacturing</li> <li>Project supervision</li> <li>Start-operation and ramp-up service</li> </ul>	<ul style="list-style-type: none"> <li>Improvement of existing operation</li> <li>On-line diagnosis and remote maintenance</li> <li>Real simulation and virtual implementation</li> <li>Spare parts delivery and management optimization</li> <li>On-line training</li> <li>Joint development of key technologies, equipment and new products</li> <li>Consultancy for energy conservation and cost reduction</li> <li>Upgrade of tech., equipment, processes and products</li> <li>Management and upgrade of information system</li> </ul>

### Service during entire project life cycle:

To provide services during the entire life cycle of the project, starting from the FEL, project, execution till project operation.



# Consulting

With 50 years' practices and experience in consulting service, CISDI has become one of the leading consultants in steel industry in China. From 1999 to 2011, nearly 500 consulting contracts with domestic and foreign customers were executed, gaining a good image identity and business reputation.

### Scope of Consulting Service

- Overall planning: Medium-and long-term enterprise planning, product mix restructuring planning, general layout planning and assets restructuring, etc..
- Feasibility study and assessment on single projects of steelworks such as all the subsystems of blast furnace-based ironmaking plant, COREX plant, steelmaking plant, continuous casting plant, rolling mill, energy-saving & environmental protection units, etc..
- Analysis and evaluation on CAPEX construction projects, special item analysis and market study, project management and project proposal;
- In-process diagnosis: Quality control, process control and system diagnosis;
- Others.

### Highlights of Consulting Service

- Maximize the Customer Benefit with Optimized Solutions
- Low-cost CAPEX Project Planning with Employing Global Resources
- Mature and Full-scale Operating Experience in Steel Industry
- Capability of Low-cost Process Optimization for Integrated Steel Complexes
- Professional Tailor-made Services to Customers with Respect

### Typical Projects

- Feasibility Study for Expansion Project of Baosteel (Phase III), China
- Overall Planning, Feasibility Study for Baosteel Zhanjiang Base(10.00Mt/a), Guangdong, China
- Feasibility Study for CSV Steel Works with Output of 5.00Mt/a Slab
- Consulting Service for 3.00Mt/a Expansion Project of Gerdau Group's Plant in Peru
- Feasibility Study for Construction of ITAGUAI Steelworks (4.50Mt/a), Brazil, jointly Invested by CSN, Brazil and Baosteel, China
- Basic Engineering and Feasibility Study for Construction of a Billet Plant (2.00Mt/a) of Thach Khe Iron Joint Stock Company, Vietnam
- Overall Planning and General Layout for Steel Complex of FORMOSA HA TINH STEEL CORPORATION(20.00Mt/a)
- Consulting Service for Greenfield 5.00Mt/a Steel Complex, Boulder Steel Co., Ltd., Australia

# General Layout

CISDI is in a position to provide overall solution to clients, and its distinguished expertise in plant planning has been widely recognized. CISDI made its reputations home and abroad for independent design of Panzhihua Steel and plant design of Baosteel. It has provided general planning or FEL consulting for many greenfield iron & steel complex and brownfield projects in China and abroad such as Baosteel Zhanjiang Steel Base, Ansteel, TISCO, BV Steelworks in Brazil, etc.

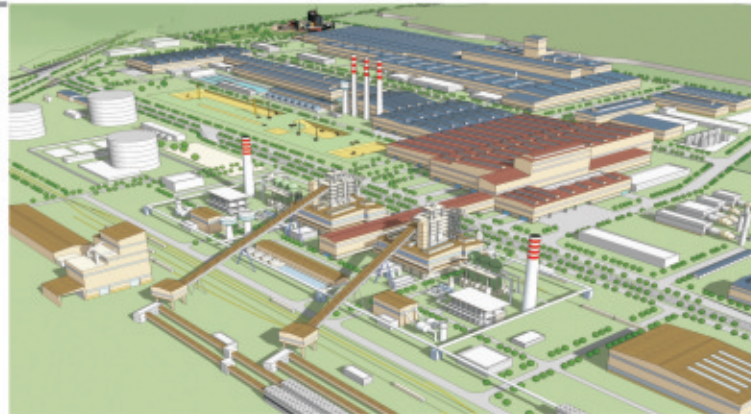
## Material Flow Analysis and Optimization for Steel Enterprises

By this system, mass data to be obtained (impossible in case of manual calculation), which can serve as the good basis for logic design. It has been applied to logistics analysis for Zhanjiang Iron & Steel Base and a Brazil steel plant, contributing to logic logistics, short route, low cost and good return on investment.



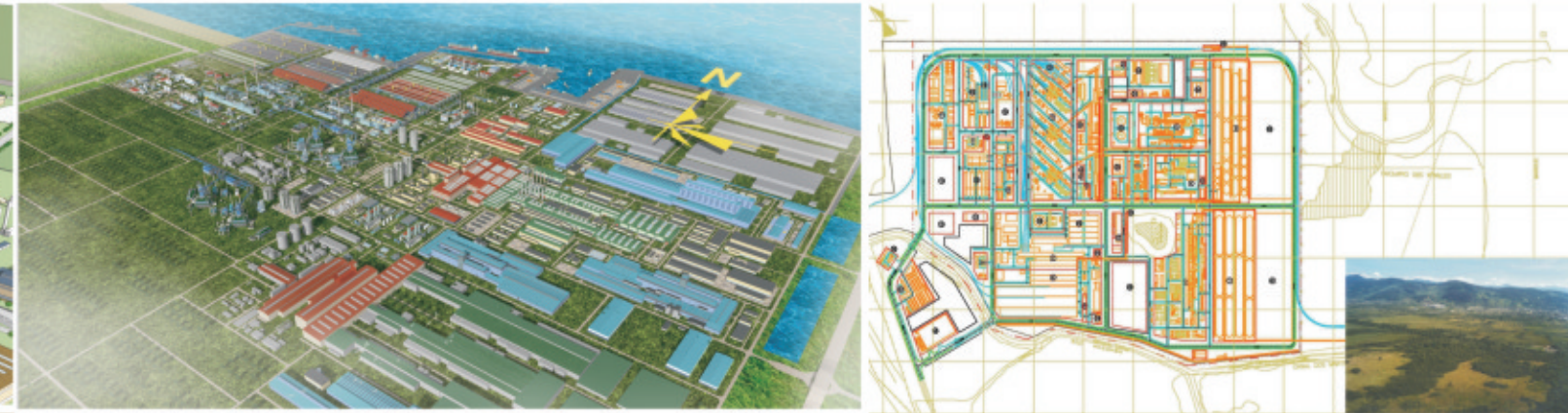
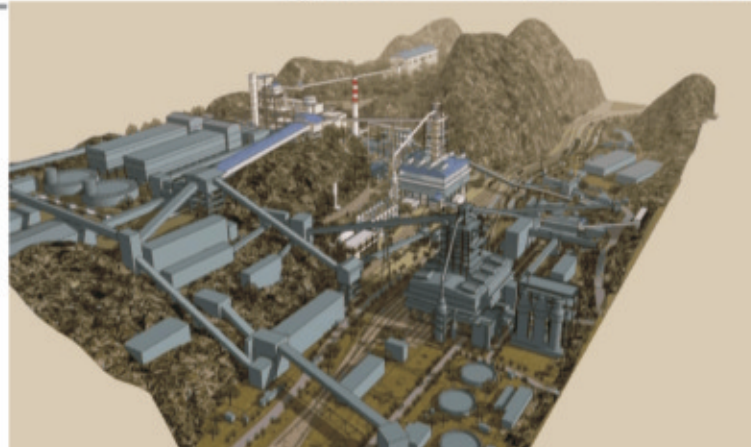
## Ironmaking and Steelmaking Interface

Hot metal will be handled by crane and transfer cars instead of conventional transportation by railway and roads with big benefits due to less energy consumption, less emission and less land occupation. The solution is especially suitable for plants featuring limited space and difficult railway connection. It has been applied to Xinyu Steel, greenfield plant of Chongqing Steel, Xichang Iron & Steel Base of Panzhihua Steel.



## Elevation Design Analysis

This analysis is applicable for steel complex to be built in mountain area or where the landform is complicated. It has been successfully applied to Zhanjiang Iron & Steel Base, Xichang Base of Panzhihua Steel, greenfield plant of Chongqing Steel, Shuicheng Steel and Desheng Steel.



- |   |  |
|---|--|
| 1 | ① Feasibility Study and Overall Planning for Relocation Project of Chongqing Steel           |
| 2 | ② Baosteel Zhanjiang 10.00Mt/a Greenfield Iron & Steel Base (Planning and Feasibility Study) |
| 3 | ③ Feasibility Study for Construction of ITAGUAI Steelworks (4.50Mt/a), CSN, Brazil           |

# Bulk Material Storage & Handling

CISDI owns good expertise for design and control of large stockyard, stockyard material flow simulation & analysis, environment-friendly stockyard technology, etc. With dozens of national patents, wide experience and good references, CISDI distinguishes itself as a leader in steelmaker raw material treatment in China. Over the past 50 years, CISDI has successfully provided consultancy, design or EPC services for over 60 stockyards for steelmakers at home and abroad, including Baosteel, Panzihua Steel, Panzihua Steel Xichang Base, TISCO, Bayuquan plant of Anshan Steel, Zhanjiang Base of Baosteel, Thach Khe Steel of Vietnam, VALE, Itaguaí and BV steel plants of Brazil.

## Design and Control for Large-sized Stockyard

Baosteel Stockyard designed by CISDI is the large-sized integrated stockyard with the highest-level equipment and automation, process and control level taking the lead in the world.



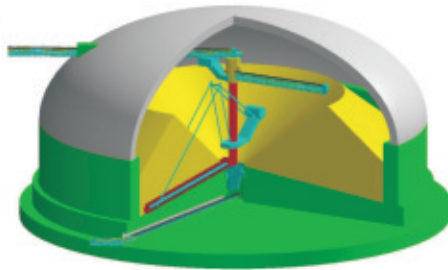
## Mass Flow Simulation and Mass Flow Study of Large Stockyard

By applying mass flow simulation method and combining stockyard scheduling strategy with computer simulation, it can realize simulation study on sophisticated stockyards in steel plants, better optimized design & production scheduling, precise verification and evaluation. It has been used in stockyard of Zhanjiang Steel Base with good performance.

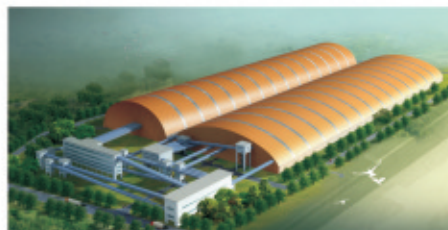


## Environmentally Friendly Stockyard Technology

CISDI has been always devoted to the R & D of environmentally friendly stockyard technology and its industrial application, such process and equipment as surface covering, sprinkler, wind-proof net (wall), closed-type stockyard, environmentally friendly dummy car, dust control technology at material transfer point have found wide promotion and application in projects undertaken, also good results have been made in dust control, energy efficiency and environmental protection.



The closed stockyard features large storage capacity, small land occupancy, less rain impact and dust control, high energy efficiency, improving working condition, stabilizing material character, anti-freezing, waterproof and windproof, etc. It has been widely applied in Zhanjiang Longteng stockyard, stockyard of Chongqing Steel, stockyard of Panzihua Steel Xichang Steel Base, stockyard of Handan Steel, etc. which were undertaken by CISDI on engineering or EPC basis.

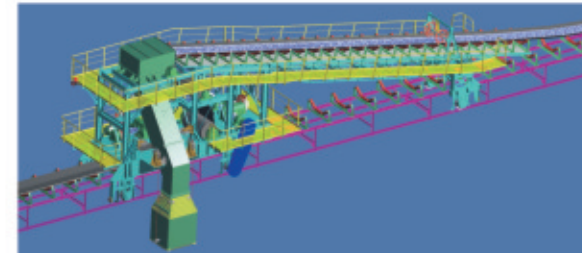


## Zhanjiang Longteng Stockyard of Baosteel (EPC)

It is the first large environmentally friendly, energy-saving longitudinal closed stock yard in China, its single span is 100m, the length is 600m and the storage capacity is 1.02Mt(max.).

## Key Equipment Development

With good competence at product development and calculation & dynamic analysis for raw material handling equipment, CISDI has developed heavy-duty shuttle belt conveyor, environmental-friendly tripper, telescoping device at conveyor head and heavy-duty belt conveyor.



## Ansteel Bayuquan Stockyard (Engineering)

The typical reference of large integrated stockyard located in coastal and northern cold region which successfully applied wind-proof, antifreeze, recycled material treatment and recycled utilization technologies.



## Shuicheng Steel Stockyard (Engineering)

Typical reference of small and medium sized integrated stockyard in mountainous region of Southwest China.



# Ironmaking

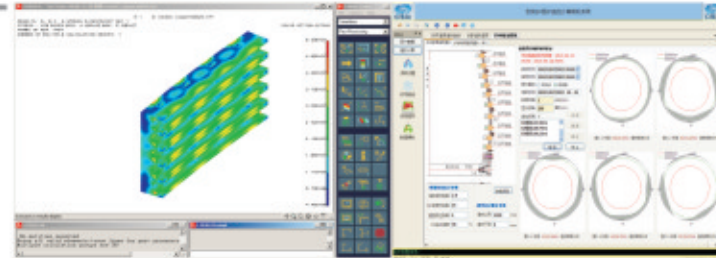
CISDI provides technical services covering the whole iron-making process for our customers. The company is technically-powerful in building and revamping blast furnace, hot blast stove, BF PCI and slag treatment system and has well established itself in building blast furnace series of 1000m<sup>3</sup> to 5000m<sup>3</sup>. It is one of the enterprises in the world that have built most blast furnaces of above 4000 m<sup>3</sup>. As the company that has designed and built most blast furnace volume in China, CISDI is still keeping many records in China on design, EPC, export, hot metal output per volume in one campaign, etc.

BFs designed and constructed by CISDI on EPC basis so far

>4000 m <sup>3</sup>	<4000 m <sup>3</sup> ~2000 m <sup>3</sup>	<2000 m <sup>3</sup> ~1000 m <sup>3</sup>	<1000 m <sup>3</sup>	Total
13	22	32	91	158

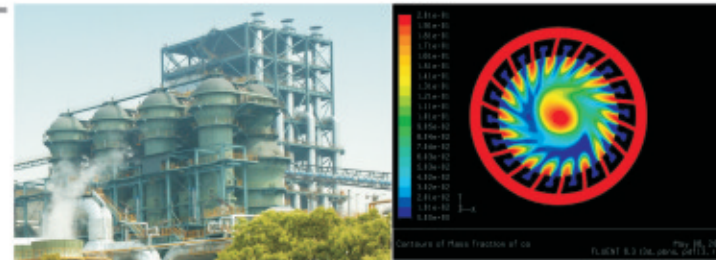
## Long Campaign Life for BF

CISDI has unparalleled advantage in BF profile design, BF cooling equipment and refractory layout and BF lining wear analysis, which ensures long campaign life for blast furnaces.



## Hot Stove with Ultra-high Blast Temperature

With dozens of patents and proprietary technologies including external combustion type, inner combustion type and top combustion type hot stoves, high blast temperature with only BFG burning and non-steady heat-transfer models for hot stoves, CISDI is strong in hot stoves with high blast temperature and long service life.



## Slag Granulation and Casthouse Equipment

The environmental-friendly & energy-efficient granulated slag disposal device developed by CISDI with intellectual property is implemented with rotary drum filtering and high-level emission technology, featuring high capacity, low steam emission, low energy consumption and low makeup water demand. It has been successfully applied to BFs in Baosteel and Shuicheng Steel. The casthouse equipment including fully-hydraulic suspension cover manipulator and portable tilting chute are simple in design, stable in operation and high in efficiency.



- 1 ① BF#2(1750m<sup>3</sup>) of Gerdau Açominas, Brazil (EP)
- 2 ② COREX C3000 of Baosteel Luojing Plant (Design)
- 3 ③ Blast Furnaces of Baosteel (Design)

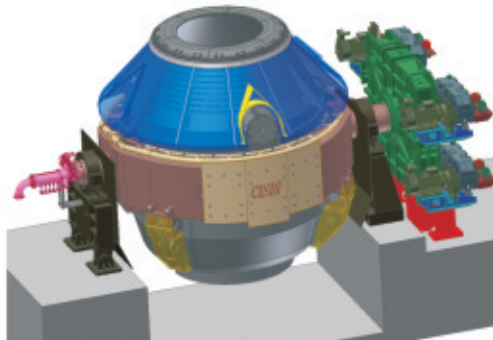
# Steelmaking

CISDI could provide full life-cycle services covering the whole steelmaking process for clients and strong in hot metal pre-treatment, large converter steelmaking, liquid steel secondary metallurgy, alloy steel continuous casting and heavy slab casting, etc. It boasts a package of proprietary core technologies and products including CISDI-SACS bottom-suspension converter, converter sub-lance, wet and dry type desusting, Ma-based compound injection, KR stirring De-S, LF, VD, hydraulic mould oscillator and soft reduction. It has provided design, EP and EPC services for over hundred steelmaking projects at home and abroad.

BOF	De-S	EAF	Secondary Metallurgy	Slab Caster	Billet/Bloom Caster	Alloy steel Caster	Round Billet Caster	Finishing Line
98	41	54	108	35	28	4	4	6

## CISDI-SACS Bottom-suspension Converter

CISDI-SACS converter features simple construction, light equipment, low cost, maintenance free, long service life and high reliability. It has formed a series of converter products (50t, 180t, 200t, 250t, 300t, etc.). 30 converters in Panzhihua Steel, Bayi Steel, Lingyuan Steel, Chengde Steel, Chongqing Steel and Meishan Steel, etc, and exported to overseas market.



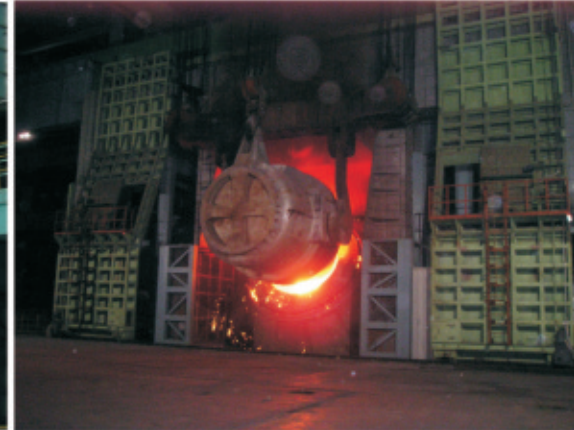
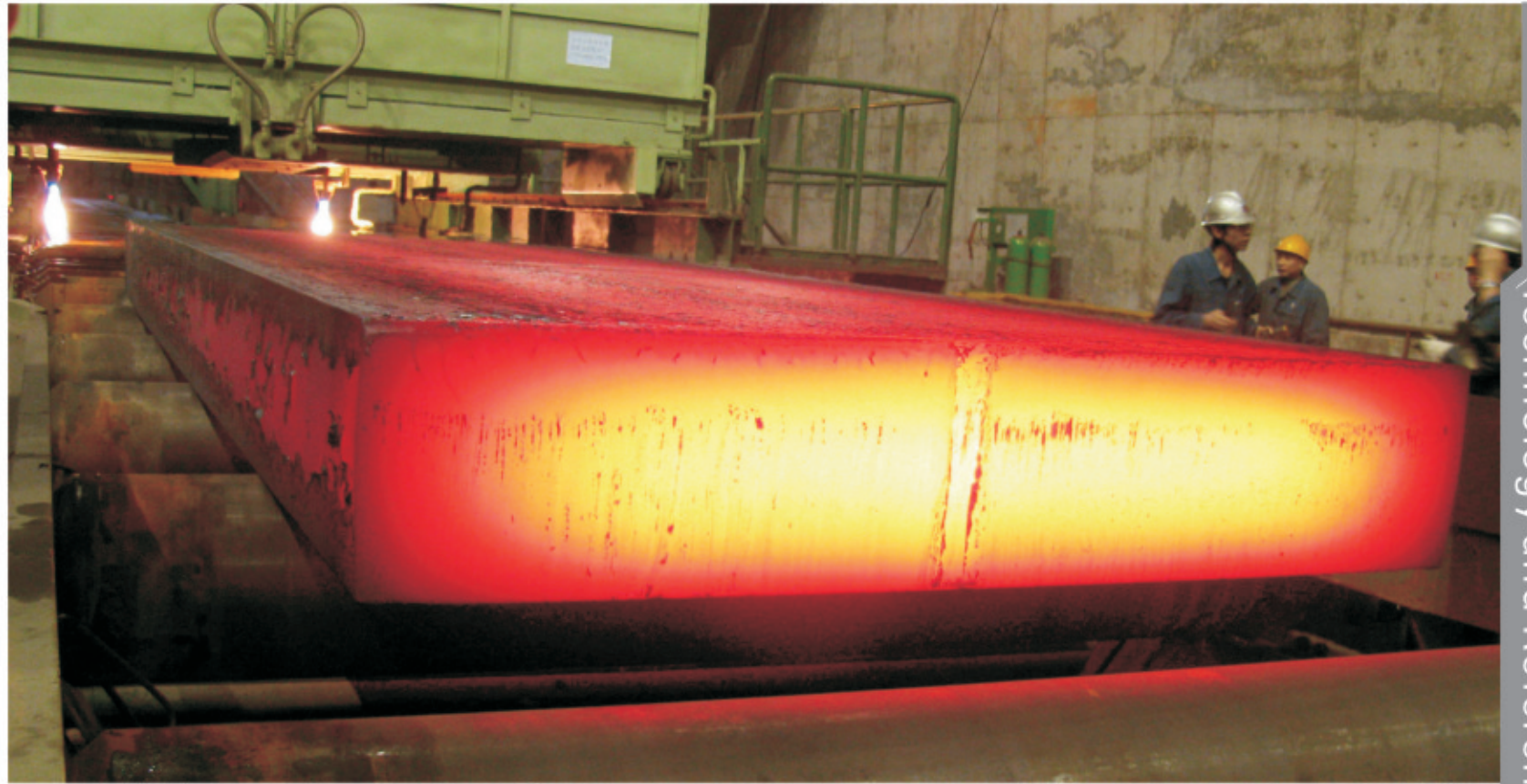
## Hydraulic Mould Oscillation Package

Successfully applied in CCM #6 of Liuzhou Steel, etc. This technology has reached international top level in various performance indices: lateral deflection  $\leq 0.1$ mm, double-cylinder's synchronization error  $\leq 5\%$ , maximal vibration frequency 400Hz and maximal wave deviation 0.4. It's a stably-running system with complete control functions, playing an important role metallurgically in improving strand's surface quality.



## Soft Reduction for Slab Caster

Successfully applied in CCM#6 of Liuzhou Steel, CCM#5 and #4 of Bayi Steel, CCM#1 and #2 of Xinyu Steel (Phase 3), CCM#1 of greenfield Chongqing Steel, where the package is proved effective in central segregation and central porosity improvement for cast slabs.



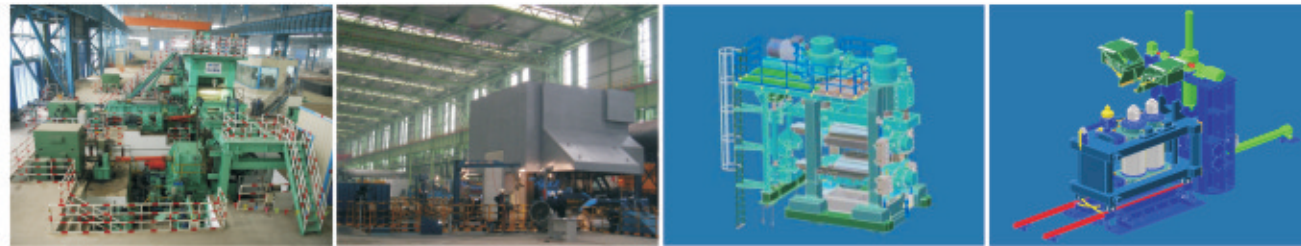
- ① 420mm Slab Caster of Xinyu Steel, the First one of its Kind in the World (Engineering)
- ② Greenfield 1.5Mt/a Stainless Steelmaking Plant of TISCO (Engineering)
- ③ 210t BOF in Steelmaking Plant of Chongqing Steel (EPC)
- ④ 8-strand Blooms & Round Billets Caster for Hot Rolling Mills of Tiantie Steel (EPC Supply)

# Rolling Mills

CISDI boasts many proprietary core technologies and products for rolling such as hot strip mill, flying shear, coiler, skin pass and coil dividing mill for hot strip, crosscut shear for hot strip, online hot dividing shear for heavy plates, air-mist cooling device, plate leveller, 3-high tandem rolling mill, tube mill, micro-tension tube reducing and sizing mills, tube quenching machine, CPCM technical package, new blooming mill in series, housing-type wire and bar mills and short-stress wire mill. The company has also gained rich experience in building and revamping hot strip mill, hot plate mill, cold strip mill, seamless pipe and welded pipe mill, various sections, bars, wires mills and metallic products. We are especially good at design of hot strip mill, heavy plate mill Steckel-mill, heavy rail mill, large-sized section mill, quality high-speed wire and bar mills; We have also done well in design, EPC and package supply of cold strip mill, large and medium section mill, heavy-duty blooming rail mill, large and medium alloy steel bar mill, high-speed quality wire rolling line, cold rolling processing line, etc.

Rolling Mills constructed by CISDI on E and EPC basis

HSM	Skin Pass & Dividing Line	Plate Mill	CSM	Section, Wire & Rod Mills	Tube Mill
27	14	13	42	97	43



## Skin Passing and Coil Dividing Line for HSM

Skin passing line for a full spectrum of products: 1450mm, 1500mm, 1580mm, 1750mm, 1880mm, 2050mm, 2250mm and 2300mm; Capability to handle strips with tensile strength up to 1,200MPa; Individual work roll shifting of 300mm, contributing to uniform roll wear and 30% longer roll service life; Max. speed of 600m/min; With dual speed ratio, dual tension reel and coiler.

## Six-High Single-Stand Reversible Cold Rolling Line

The single-stand reversible cold rolling line supplied by CISDI on EP basis is the one with highest rolling speed (1,200m/min.) among all the fully-localized single-stand reversible cold mills in China.

## Breakdown Mill in Series

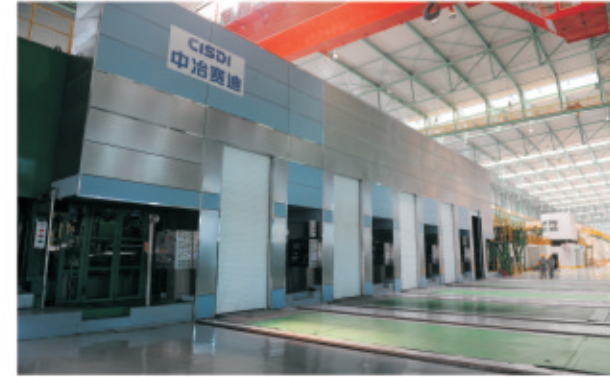
CISDI can provide new type two-hi reversible breakdown mill, include several standards (BDCD850-BDCD1350), which are applied in roughing mills for alloy steel, bar, large-sized section and H section steel.

## Housing Rolling Mill in Series

CISDI can provide a series of high-rigidity housing mills including HSCD700, etc., which can be used for mills from rougher up to pre-finishing mill in bar rolling line and high-speed wire rolling line.



1,750mm HSM of Xinjiang Bayi Steel, which is integrated by CISDI with overall technical responsibility, sets a good example for heavy-duty equipment localization.



1450mm cold rolling & galvanizing line of Tangshan Fengnan Steel, supplied by CISDI on EPC basis, is the first modern cold rolling line supplied by a Chinese engineering company with overall technical responsibility.



5000 mm Heavy Plate Mill of Shagang Group (Engineering)



Wire (bar) mills of KINSTEEL (Malaysia) (EP supply)



Arcelor Mittal 600,000t/a seamless tube mills in Saudi Arabia (engineering and technical service)

# Industrial Furnace

CISDI could provide full life-cycle services in thermal technical field for clients worldwide and has wide experience and unparalleled technical advantages in various industrial furnace system integration, especially for large-sized slab/billet/bloom reheating furnace, silicon steel reheating furnace, stainless steel reheating furnace, large-sized rotary hearth furnace for tube mill and various heat treatment furnaces, taking the lead in steel thermal field. CISDI has owned dozens of energy-saving & environment-friendly products and high-efficient EIC integrated control system which are successfully applied in reheating furnaces for HSMs of Baosteel, TISCO and PZH Steel, etc. For recent years, it also provided engineering and EP services for overseas RHF projects in Brazil, Spain and Iran, etc..



RHF for 1580mm HSM of WISCO (EPC)



Φ 50m Rotary RHF for Continuous Tube Mill of Lubao Steel Pipe (EP) —China's Largest Rotary RHF so far



Heat Treatment Line for Medium Plate Mill of Xinjiang Bayi Steel, Baosteel (EPC)



Tube Casing Heat Treatment Line in Baosteel (EP)

# Technical Service for Operation

*CISDI provides all-round production and operation services to meet customers' needs*

- OOS— Operation Optimize Service
- OSS— Operation Support Service
- MSS— Maintenance Support Service
- KRS— Key Research Service
- OTS— Online Training Service

CISDI set up the department of production technology service, which signed contracts with many steel enterprises such as Desheng Steel Company and Shandong Fada Delicate Sheet Company for services like production guidance, maintenance, repair, operator training, etc.

CISDI set up remote diagnosis and maintenance center, by information technology, it tends to synchronize remotely the real running data tracking (RDT), and achieve online diagnosis and provide support to production and trouble-shooting. CISDI has applied the RDT to Tangshan Fengnan 1450mm CPCM (continuous pickling and cold rolling mill) and Liuzhou Steel Casting projects, and been providing the relevant assistances.

By referring to the practical production process and data in advanced company, it tends to develop simulation modeling to form series of E-process and integrate it into E-plant, thereby helping customer deal with bottleneck problems. It can contribute to understanding the new equipment's impact on the whole plant running and yield, and to analyzing the capital/asset investment and equipment renovation for higher productivity. CISDI has supplied a simulation modeling on existent railway transportation system to a Brazil's customer which built the works in 1940s. Such modeling acts very well for the customer to solve the logistics and transport limitation in expanding project.

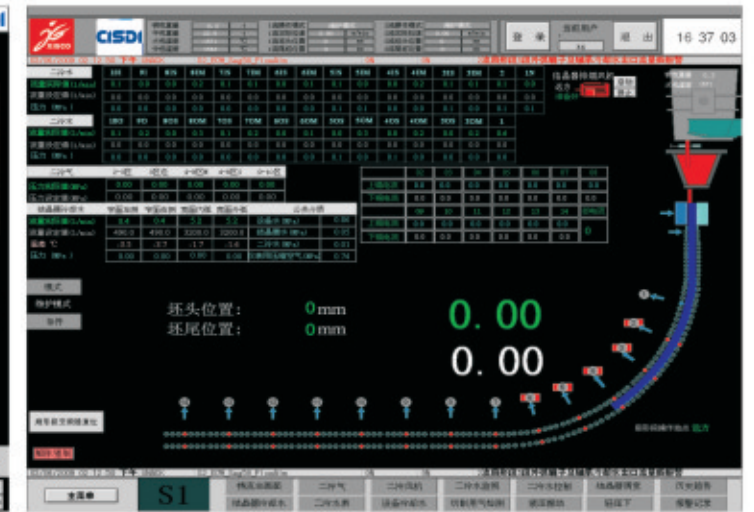
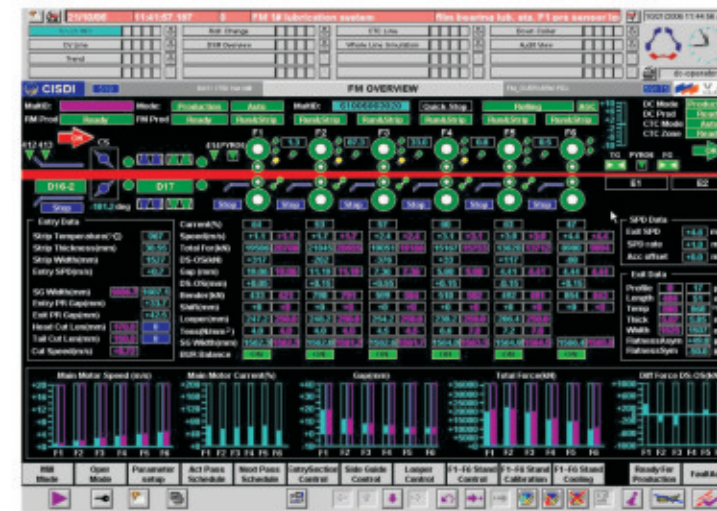
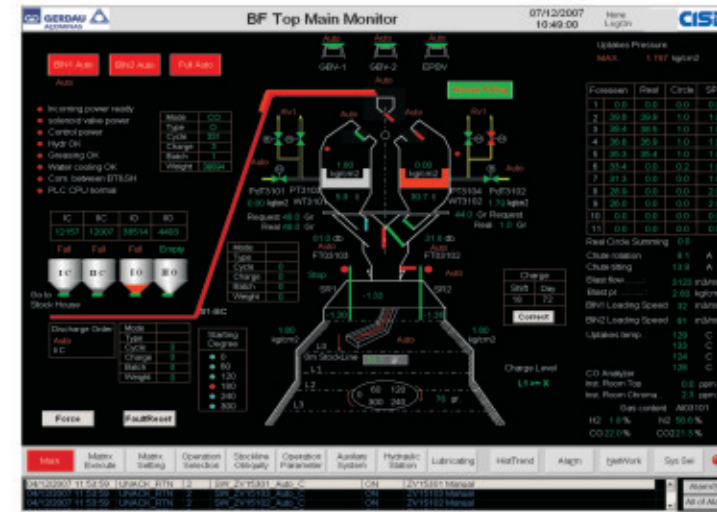


# Automation

CISDI Automation has formed its own technical expertise and unique features, possesses such technologies as modern process, automation control, software development and system integration, etc. It can provide automation control, mathematics model, expert system, system integration and integrated solution in steelproducing full route ( from raw material to finished products).

*CISDI is able to provide:*

- Expert systems
- Control models
- MES
- ERP
- Control systems and software development
- System integration
- Automation platform and tool



- |   |   |  |
|---|---|--|
| 1 | 2 | ① BF No.2 of Gerdau Acominas, Brazil   |
| 3 | 4 | ② Slab Caster of Xinyu Iron & Steel Co., China                               |
| 5 |   | ③ 1750mm HSM of Baosteel Xinjiang Bayi Steel, China                          |
|   |   | ④ 1450mm CSM of Tangshan Fengnan Cold Rolling & Galvanizing Co., Ltd., China |
|   |   | ⑤ Building Management System of CISDI  |

# Energy Efficiency & Environmental Protection

CISDI has studied on second energy recycling, etc., and widely applied in projects CISDI undertakes, aiming at sustainable development. 153 patents have been filed for national invention and utility model, including 62 patents for invention.

## R & D Objectives

- Energy recycling for steel plants
- Gas storage & use including gas holder, CCPP and top gas utilization, etc.
- Sintering offgas De-S
- Water system optimization
- Energy optimization management
- Gas cleaning for steel plant
- Ventilation & dedusting
- Solid waste resource recycling
- Environmental impact assessment and urban sewage treatment technology study

## 3D- EIA

GIS and 3D technology are introduced into the environment impact assessment, it can realize the three-dimensional EIA and dynamic display, which has greatly enhanced the technical level of environment and ensure the CISDI EIA technology taking the lead in China.



## CCPP with Low-Calorie Gas

CISDI has designed the largest variety of CCPP with low-calorie gas in China, including 145MW CCPP burning only BFG, 50MW CCPP burning mixed BFG and COG, 50MW CCPP burning only BFG and the first 170MW CCPP burning only COREX gas in the world.



300,000m<sup>3</sup> Gas Holder in Baosteel (EPC), the first one in the world (pressure: 15kpa)

## Gas Holders

- CISDI proprietary new-POC gas holder is absolutely leading among the high-pressure gas holders in China
- Over 90% share in China's high-pressure gas holder market
- The frequent record-breaker in China: max. storage capacity (300,000m<sup>3</sup>), max. storage pressure (15kPa)
- Pace setter in China for gas holder design and manufacturing

## Dry BFG Dedusting

Several patented techniques are integrated in dry dedusting system; Meanwhile, the fluidized pneumatic ash-transferring system independently developed by CISDI has solved the problem of ash-transferring choking that is always troubling steel industry, it is running steadily with safety and reliability. It has been successfully applied in BFs (750m<sup>3</sup>~5000m<sup>3</sup>).



BFG dry bag filter for Baosteel No.1 BF revamp – China's first BFG dry bag filter application to mega blast furnace

## Dry LDG Electrical Dedusting

- The most leading LDG cleaning process due to less water and electricity consumption, high efficiency and high calorific value of recycled gas.
- The system dust level is up to 10mg/Nm<sup>3</sup>, featuring 50% less water consumption and 40% less electricity consumption, contributing to less emission and higher profit.



Primary dry dedusting system for 3x180t duplex converter of Chongqing Steel greenfield plant (EPC)

## Profile

CISDI has been constantly laying great emphasis on strengthening the capability in independent innovation, independent integration and sustainable technological progress with an aim to further sharpening the far-reaching core competitiveness and being an enterprise possessing more technologies and products with intellectual property rights.

App. RMB 1.337 billion was invested in science & technology development from 2006 to 2010 and the annual average investment makes up 4% of the company's total revenue.

## R & D Platform

**Chongqing CISDI Engineering Research Center for Iron & Steelmaking Plant Integration Co., Ltd.**

- 17 specialized R & D departments ( CAE technical center, R & D department for ironmaking, etc.)
- Nearly 200 full-time R & D professionals
- Equipped with world-leading CAE simulation analysis and aided study and engineering system for metallurgical technology and plant, featuring good networking, systematic and integration; system for metallurgical automation integration test, analysis and training
- To study the core technology, prospective technology and key technology which aid the development of industry and CISDI

### Innovation Platform

- National Engineering Research Center for Iron & Steelmaking Plant Integration
- 4 Provincial Engineering (Technology) Research Centers
- 2 R & D Sub-centers of MCC Group

### Laboratory

- Lab for cooling control of hot rolling
- Lab for hydraulic servo system
- Lab for automation control system
- CAE simulation technology center
- Core equipment integration & test platform
- CISDI thermal process lab

### Post-Doctoral Workstation

Several doctors work there.



National Engineering Research Center Founded in CISDI for Iron & Steelmaking Plant Integration

## R & D Achievements

### Awards

CISDI is being appraised as Top 100 Electronic Information Company of China, one of the China's top 100 software enterprises in terms of revenue, China Top 10 independent innovation enterprises in exploration and design industry, national outstanding enterprise in technological progress during the country's 10th Five-year Plan for Economic and Social Development, National Intellectual Property Demonstration Enterprise, China Top Ten Innovative Software Enterprises, etc..

### Technological Achievement and Awards

CISDI has won over 200 provincial/ministerial awards for technological achievements, 34 of which are national awards, including 3 for technical invention, 3 First Prizes for technological progress, one national gold prize and one honorable prize for invention, etc..

### Patents

Since 2006, CISDI have been applying 50% more patents year-on-year on average. So far CISDI has applied for more than 700 patents, and over 300 granted. Over 70% CISDI patents have been put into practice.

### Standards

Since 2006, CISDI was in charge of editing 12 national standards and 4 standards in the industry.

### Outcome Application

Application rate of CISDI R&D outcomes is up to 85% with an average conversion period of four years.



CISDI-SACS BOF



New-type Breakdown Mill in Series

# Pilot Plant and Core Equipment Manufacture

CISDI has set up pilot plant and core equipment manufacturing base in Chongqing, Shaanxi and Beijing to facilitate the commercialization of R & D outcomes.

## CISDI Heavy Machinery Co., Ltd.

CISDI Heavy Machinery Co., Ltd. is CISDI's R & D and pilot base of new technology and new product; protection and manufacturing base for core products and proprietary technologies; industrialization base for EP and general assembly integration.

The company mainly produces package equipment for metallurgy, burner for industrial furnaces, hydraulic lubrication equipment, EIC equipment and large heavy equipment. It is a technological manufacture of metallurgical equipment.



- |   |   |
|---|---|
| 1 | 2 |
| 3 | 4 |
- ① Imported Floor-type Boring-milling Machine
  - ② The first CTP mandrel circulation system in the world for big-diameter seamless pipe rolling mill of Jiangsu Valin Xigang Special Steel Co., which was manufactured by CISDI Heavy Machinery Co.
  - ③ Baosteel COREX gas annular gap scrubber, the first one in China, which was designed independently by CISDI and manufactured by CISDI Heavy Machinery Co.
  - ④ NC Fixed-beam Gantry Milling Mill

## CISDI Electrical Engineering Co., Ltd.

CISDI Electrics Technology Co., Ltd is a base of electric and automation product research, pilot and manufacture for CISDI, embracing consulting, engineering, software development, equipment package, commercial trade, turnkey project, technical service and other high & new technological businesses.



CISDI Electrical Base in Yizhuang, Beijing



Remote Diagnosis & Maintenance Center

## MCC-Xi'an Electric Furnace Institute Co., Ltd.

MCC-Xi'an Electric Furnace Institute Co, Ltd, which is a high-tech enterprise in Shaanxi Province with Xi'an electric furnace institute set up in 1963 as its predecessor, is CISDI's R & D and manufacturing base of electric furnaces.



220t EAF in Turkey