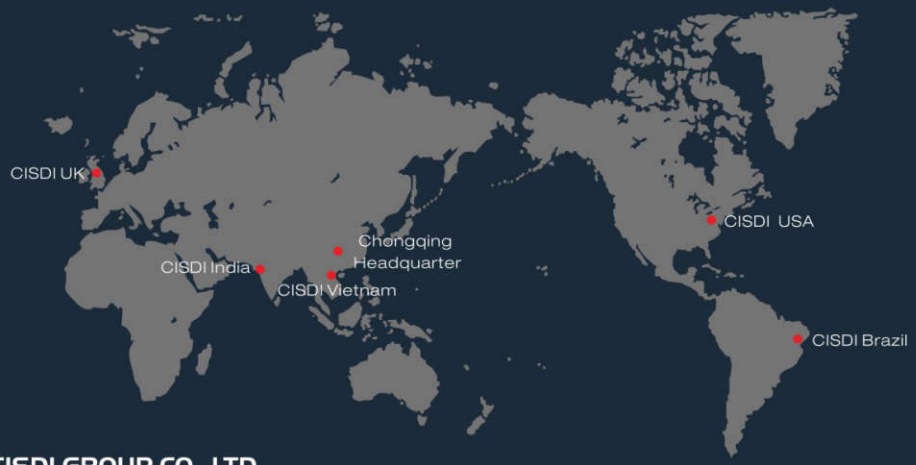


CISDI GROUP CO., LTD.

Chongqing Headquarters
Address: No.1 Shuanggang Road, Yuzhong District, Chongqing 400013, China
Tel.: +86 23 6354 5366
Email: OB@cisdi.com.cn
Website: www.cisdigroup.com.cn

CISDI UK
Address: CISDI HOUSE, 8 Furnival Rd, Sheffield, S4 7YA, UK
Tel.: +44 1142291067
Email: info@cisdi.co.uk
Website: www.cisdi.co.uk

CISDI India
Address: 503-504, 5th Floor, A-Wing, Galleria Building, Hiranandani Gardens, Powai, Mumbai, India. 400076
Tel.: +91-9702043402
+91 22-49701004
Email: yong.liu@cisdi.com.cn

CISDI Brazil
Address: Rua Pernambuco 1002, Sala 902, Bairro Funcionarios, Belo Horizonte, CEP 30.130151, Minas Gerais, Brasil
Tel.: +55 31 34638880
Email: hao.wu@cisdi.com.cn

CISDI Vietnam
Address: Thuy Hang Hotel, Ky Anh City, Ha Tinh Province, Vietnam
Tel.: +84 912485711
Email: haixiong.luo@cisdi.com.cn

CISDI USA
Address: One PPG Place, Suite 3100, Pittsburgh, PA 15222.
Tel: +44 (0)114 229 1067
Email: info@cisdiusa.com
Website: www.cisdiusa.com

Published By CISDI Corporate Culture Department

CISDI
NEWSLETTER

Vol. 1,2019

CISDI's RH integrated dip tube wins award for excellence

IN THIS ISSUE

CISDI

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

New Year address from Chairman Xuewen Xiao

2018 signified a major stride of the Group's digitalisation. Intelligence and big data will be a major driver of progress for the metals industry and for CISDI's future development.

Dear friends and associates,

I would like, on behalf of CISDI Group, extend my cordial greetings to you and your families, wishing you a happy, healthy, peaceful and prosperous new year.

2018 saw an all-round upgrade in the Group's internationalisation. We have been tasked with a global view of strategic development and resources allocation in addition to going global for bid awards.

CISDI remains committed to its internationalisation process. A wide coverage of worldwide hot spot areas has CISDI's footprint – Europe, North America, South America, India, Vietnam, Malaysia and Turkey – where the employees take the physical bases for consolidating and expanding communications and collaboration with the local clients and partners. A host of CISDI staff is working overseas for presenting and promoting the optimum products and services to clients.

2018 witnessed a surging dynamism of the Group's industrial advancement. CISDI has been focusing on core technological upgrades with a stand on the high end of global steel industry. It has devoted, taking pulse of frontline of industrial chain, to reinforcing its competence in technological integration, systematic solutions and product-oriented applications of technology and services.

Striving for enhancement of its full-function, full-process and full-life-cycle services, CISDI has reaped successive milestone achievements in the past year – startup of Formosa Ha Tinh Steel's blast furnace 2 in Vietnam and ASSB's blast furnaces, billet and bloom casters, and bar and section mills. In the meanwhile, at home, CISDI has set out its design and services for Baowu Zhanjiang Steel's blast furnace 3-centred system (an integrated system comprised of BF-BOF-HSM-CSM); abroad, CISDI has been energetically impressing the markets in east Malaysia, Australia, the Philippians, Indonesia and other BRI route regions, as well as Pacific rim.

2018 signified a major stride of the Group's digitalisation. Intelligence and big data will be a major driver of progress for the metals industry and for CISDI's future development.

We aim to synergise display of digital and metals industry. Digitalisation will impact all aspects of the metals production chain by changing the interlinking way of knowledge, technology and application and empowering the enterprises' value creation with different solutions.

We have created a five-pronged capability system which encompasses intelligent and IT-based platforms, intelligent methodology and products, big data and cloud computing, automation and digital design. We just built Baowu Shaogang upstream-BF integrated intelligent control platform, a demonstration of intelligent manufacturing which can reduce the labour cost by 40 per cent by innovatively optimising the steel production organisation structure.

It is CISDI's unique advantage that coordinates different disciplines and interfaces in provision of total solutions to a smart plant. Digital design is fundamental to intelligent manufacturing, in other words, Dark Factory or Smart Plant could not be realised without digital design. In a bid to re-collect various resources for those smart entities, we must see to it that the technological chain gets through from basic automation to data analysis, intelligent methodology and information platform, the integration between data acquisition and execution comes true, and finally, the data chain takes form from digital design to production and upstream management. CISDI holds it a common goal with our global clients through our concerted diligence and intelligence.

2018 marked the 60th anniversary of the Group. The Group hosted a commemorative event at its Chongqing headquarters in mid December. Together with its staff and 30-plus partners and fellow enterprises, CISDI reflected on its 60-year evolution and looked forward to the exciting innovations and global projects on the road ahead.

I am proud of all the employees, the most valuable reserve of the company, and the solutions that the company has endeavoured to offer. I deeply appreciate the trust and support that clients have endowed to us. Only through doubled efforts for delivery of satisfactory products and services can we be able to live up to your expectations and co-operative opportunities.

Everything takes on a new look in the New Year. CISDI will stay true to creation of values for clients in spite of changing steel landscape around the world.

In this first issue of newsletter is underlined our commitment: We are ready to support you in pioneering the future of metals production and achieving an all-win result with our global clients and partners in the trail ahead blazed for industrial intelligence and greener, leaner developments.

Xuewen Xiao
CISDI Chairman
January 2019

Messages from other heads:

John Lester, president of CISDI UK

As a New Year begins, we at CISDI UK would like to take the opportunity to thank all our customers, suppliers, partners, friends and colleagues across the globe for their custom and co-operation during 2018.

The past year brought numerous challenges and opportunities and we appreciate the time and effort everyone spent with our team from the UK.

We look forward to continuing and strengthening our friendships throughout 2019, taking the opportunities to grow our business and at the same time growing and adding value to the businesses of our customers.

2018 saw the business of the UK office grow substantially and we look forward to creating new friends and partners as we continue our growth and further globalisation in the year ahead.

Robert Smith, president of CISDI USA

Over the past year, CISDI USA has made strong inroads into the North American market.

Our focus has been the integrated producers for capital projects, replacement parts, modernisations and upgrades, and engineering/feasibility studies.

The company successfully completed an important project for a major client this year, to the customer's full satisfaction.

We look forward to continued cooperation with our customers and clients within the North American market, and improving and strengthening our relationships in the coming year.

With this perspective, we will take new opportunities to expand our business by adding value to our client base, addressing their specific requirements and market demands, and tailoring CISDI's technical solutions for their most immediate needs.

Hatee Ram Pattanayak, president of CISDI India

In 2019 CISDI India will be pursuing its assistance in marketing and promoting CISDI's technology, products and services to the Indian market.

Most eminent Indian steel-makers today (TSL & JSW in particular) recognise CISDI as one of the world leaders in the design, manufacture and supply of a full range of environment-friendly technological solutions for the iron and steel industry.

CISDI has made entry into medium-scale steel enterprises such as TSIL, ASL, AISRM and others, providing engineering consultancy to assist in the setting up mini-steel plants, and EP services for setting up downstream mills and finishing facilities.

CISDI India's team is devoted to supporting CISDI's technical and commercial efforts to win more and more business in India's emerging market. This includes assistance in exploring possible partnerships on an exclusive basis with Tata Steel, and sourcing local services and equipment to enable Indian projects for to be more competitive.

India is poised to enhance its crude steelmaking capacity to 300 mtpa by 2030 (currently capacity is around 125 mtpa). This will create immense opportunities to tap into.

In 2019, CISDI India will organise and strengthen itself for the possible local sourcing of items to serve CISDI.

China is seizing the opportunities, responding to enquiries for steel plant projects and turning them into orders.

Xin Yan, president of CISDI Brasil

As we begin a new year, CISDI DO BRASIL celebrates eight years of success in Brazil.

We thank all our Brazilian clients for giving us the opportunity to work together in 2018 and hope that this year CISDI will provide you with even more services and share with you their successful experiences in China and other countries.

We aim to promote economic exchanges between Brazil and China and together make valued contributions to the development of the BRICS countries.

Lei Ai, general manager of CISDI's Iron & Steel Business Division

We celebrated CISDI's 60th anniversary in 2018 and in that remarkable year, we saw major success at ASSB with all process units up and running.

In addition, a bid was awarded to us by Liberty Primary Steel for its project in Whyalla, Southern Australia, which has a target production capacity of 10 million tonnes a year.

The year also saw an EPC-based contract signed for Xin Wu'an Samalaju's 3.50million-tonne steel plant in Eastern Malaysia - two projects which are boosting CISDI's brand image in global steels.

In the New Year, we continue our commitment to becoming an innovation-driven provider of total solutions and advanced technology for the global metals industry.

The corporate business will be led by consulting and focussed on intelligence, to give our integration competitiveness full-play. We are resolute in our determination to contribute to building new-generation steelworks which are green and intelligent.

Xinku Fan, general manager of CISDI Consulting Business Department

My department is tasked by CISDI's corporate front-end engineering and consulting business. My department employs cross-disciplinary full-process technologies to create designs that result in major economic savings for steel plants, industrial parks and economic zones.

Our systematic solutions can be applied throughout the full life-cycle of an industrial complex. Our dynamic and accurate design methodology is constantly looking forward and keeping abreast of trending developments.

2018 was a fruitful year for our department. We worked on numerous feasibility studies and consulting projects, including those for the Xin Wu'an Samalaju steel plant in Eastern Malaysia, GHP Suroyam's 1rmillion-tonne vanadium-titanium magnetic steel plant in Russia, and now Liberty Primary Steel's Whyalla project, a 10-million-tonne steel plant in Australia.

In addition, we continued our consulting services for Baosteel Zhanjiang in China and Formosa Ha Tinh Steel in Vietnam.

Internally, we made an in-depth composition of master design target system and methodology model with system and economy as the guideline.

We also established an intelligent consulting work platform, integrating big data, a GIS database and model tools. We developed smart logistics solutions to multiple LiveApps for the unmanned management of stockyards, final products warehouses and mixed transportation systems, which will reduce labour costs across steel plants.

We carry all of this expertise and scrupulous workmanship in 2019, putting clients' needs first and providing ever-greater tailored solutions to new and rebuild projects.

Shichang Xiao, president of CISDI Thermal & Environmental Engineering

CISDI Thermal made major progresses in technological breakthroughs and applications in 2018.

Keen to transfer our process and intelligent expertise into products and respond to ultra-low-emission environmental requirements, we have developed dual-regenerative reheating furnace back-blowing expertise, applying it successfully for Tangshan Ganglu Steel and Yanshan Steel.

We vigorously promoted the de-nitration technology for conventional reheating furnace plants, and put the latest developments for fuel burners and LPG+BFG dual-regenerative burners into use in India and Vietnam.

We are pushing forward with developments for radiant tube and self-preheating burners, which are soon to be verified at our trial plant.

To drive new business for CISDI, we have launched enriched oxygen and pure oxygen combustion developments and ultra-low NOx technology.

This was developed for a hazardous waste treatment EPC order from the East Junggar Basin Economic and Technological Development Area in the Xinjiang Uygur Autonomous Region.

Our consulting services are keeping multiple metallurgical solid waste treatment projects on track.

A highlight of 2018 was our technological development for the smoother, faster and more economical running of rotary hearth furnaces.

Yanshan Steel's Phase II RHF saw tangible benefits from our development, and our solution to core equipment bottlenecks won us contracts for Jingtang Steel's RHF to an EPC mode and Baosteel RHF's design and technological integration.

Creating savings for clients is always our goal and in 2019 we will be creating more advanced and market-oriented technologies and products.

Xingli Zhong, president of CISDI Research & Development

Making CISDI R&D a world-renowned centre of innovation is our agenda.

Through years of investment and development, we have broken through the barriers that have hindered corporate access to the markets. Our leading technologies and products are now widely recognised by the steel industry.

We are now at a crucial stage, meeting the challenges posed by the new technology revolution which is driving industrial transformation and economic reform.

Our dedicated team is researching and developing the new processes, new equipment and new materials which will meet our clients' requirements, while also strengthening our reputation for innovation.

In the New Year we are setting ever-higher targets for ourselves, ensuring we stay ahead of market needs.

CISDI wins prime role in Liberty's game-changing steel plans Down Under

The signing ceremony between GFG Alliance and MCC-CISDI

Leaders of GFG Alliance and China Metallurgical Group Corporation at Whyalla

Whyalla upgrading begins and feasibility study for mega plant is launched

Two major transformational steel projects got underway at the Whyalla Steelworks in Southern Australia during December.

A feasibility study began for a new 10 million-tonne mega steel plant at the site, which would be one of the largest in the world.

In addition, upgrades started at the site's existing pulverised coal injection plant. Both projects are being heralded as game-changing for the city of Whyalla 400 kilometres north-west of Adelaide.

They are being carried out by GFG Alliance's global steel manufacturing arm Liberty Primary Steel, with assistance from CISDI.

GFG Alliance is an international grouping of businesses founded by the British Gupta family. Its business model encompasses mining, energy generation, metals and engineering, underpinned by financial services and a substantial property portfolio.

Liberty Steel's range of manufactured products comply with national and international quality-certified standards and meet stringent customer specifications.

The newly-signed financing feasibility study will assess proposals for a greenfield 10-million-tonne capacity steelworks, which will be sited beside the existing 1.20-million-tonne plant in Whyalla City, and become a major slab supply base.

Proposals are for the development to be carried out in three phases, each with an output capacity of 3.50 million tonnes a year.

The new steelworks will feature three blast furnaces, each with a volume of 4,350 cubic metres, four 250-tonne basic oxygen furnaces, five slab casters plus sintering, coking and plant-wide utilities plants.

Australia's Prime Minister Scott Morrison attended the signing ceremony for both projects, along with Australia's Labour Party leader Bill Shorten, the governor of South Australia Steven Marshall.

The mayor of Whyalla City, Clare McLaughlin. GFG's executive chairman and CEO Sanjeev Gupta and president of Metallurgical Corporation of China Ltd. Mengxing Zhang were also present.

Mr Gupta shared his story of coming to Australia to build a steel plant and expressed his confidence in MCC and the future success of Whyalla.

He commented: "This transformation will vastly improve the operational, financial and environmental performance and the new steelworks will pave the way for Whyalla to become an enticing, global hub for innovative industry and contribute to the development of the city of Whyalla and to the whole Australian economy and society."

"MCC represents state-of-the-art steel engineering and its corporation, and CISDI is highly capable of providing the full-process and intelligent solutions for our plant."

The city's mayor welcomed the scheme. "With GFG committed to prioritising local skills, this project will create thousands of additional construction jobs and several hundred ongoing jobs," commented Clare McLaughlin.

MCC's Mengxing Zhang emphasised that steel was MCC's core business and was expecting the highest standards from its subsidiaries. "Your work is a reflection of China's steel skills and you will be utilising the most advanced concepts and expertise for the creation of a steelworks which will be a world-class benchmark for green, efficient and smart steel manufacture," he told his teams.

This is CISDI's first export of full-process steel engineering to a developed country and its second feasibility study project for a 10-million-tonne steelworks in the Pacific Rim. It will showcase CISDI's bespoke design and financing feasibility expertise.

CISDI's team, working at Whyalla Steelworks

CISDI releases its latest solutions for intelligent manufacturing

The CISDigital product system is launched on-stage

CISDI Group released the latest of its intelligent manufacturing total solutions at a 60th anniversary celebration held at its headquarters in Chongqing in mid December.

The new developments are an endorsement of the company's determination and commitment to the development of intelligence-led steel enterprises.

They were showcased to staff, over 30 CISDI partners and fellow steel at the event, an opportunity for CISDI to reflect on its 60-year evolution and looked forward to the exciting innovations and global projects on the road ahead. CISDI Information Technology Company's vice-president Jinsong Wang introduced the company's understanding of intelligent manufacturing and intelligent steelworks and proposed the intelligent development routes for a steelworks.

Fellow VP Qiang Li showcased the CISDigital product system and highlighted multiple basic products developed from digital, application and intelligent users, which are able to swiftly adapt to clients' expectations for intelligent solutions.

Baosteel Zhanjiang's chairman Genghong Sheng, who was among the guests, told the audience: "CISDI and Baosteel are long-term partners. We shared the journey of Baosteel Shanghai's construction early in China's reform, worked together through China's opening up in the 1980s and on the creation of Baosteel Zhanjiang from when preliminary construction began in 2008.

"Baosteel can bear witness to CISDI's business diversification and innovation. CISDI has grown into a strong-hearted, unswerving and commendable enterprise with great integrity.

"Baosteel hopes CISDI will open a glorious new chapter for the intelligence-led steel industry and be a driving force for a new round of developments for high-quality steels."

Funing Zhang, the president of Formosa Ha Tinh Steel in Vietnam, also addressed the gathering. He thanked CISDI for its solid and sustained support during FHS's construction.

"Our two blast furnaces have ramped up production and are producing high-quality products which have been approved by shareholders China Steel Corporation and JFE, and end-users in the ASEAN countries," he commented.

Mr Zhang also expressed FHS's keenness to seek even closer collaboration with CISDI, whether for production technology upgrades, intelligent rebuilds or expansion plans.

At the event a film documenting CISDI's achievements and the remarkable story of China's steel industry transformation was shown, and business partners were invited to trial the intelligent products.

Praise came from a number of the businesses present.

Xueyun Lu, vice-president of Shaogang, commented: "CISDI has been spearheading the industry's reform and is an active player in the new round of industrial revolution."

Wanneng Yuan, vice-president of Bayi Steel, identified CISDI's deeply-rooted knowledge and digital expertise: "CISDI's dedicated steelworks systematic analysis team work out advanced solutions to make steel enterprises greener and smarter," he said.

Baosteel Desheng Stainless Steel's VP Wei Lin praised CISDI's time-honored engineering experience and enriched process database. "Its reserves and resources are so valuable in its march into intelligent manufacturing. That's why CISDI's intelligent solutions are so suited to the real needs of a steel enterprise."

FHS's president Funing Zhang visits CISDI's R&D Centre

Baosteel Zhanjiang's chairman Genghong Sheng enjoys a user experience

Baowu Zhanjiang Steel, China: a demonstration steel base for China's supply-side structural reform in steel industry and the world's most advanced and competitive green steelworks

Construction of third blast furnace underway at Baosteel Zhanjiang

> "CISDI is undertaking the master design of Phase II and the design of its stockyard, BF, CCM and HSM"

Construction began on Baosteel Zhanjiang's Phase II centred blast furnace 3 at the end of 2018.

The furnace will meet new intelligent manufacturing needs and a host of eco-friendly regulations.

Streamlined, high-efficiency methods of construction will be employed, in line with those used for the construction of Baosteel's Phase I.

Phase II's full process flows will have ultra-low emissions, in line with the pledge to make Zhanjiang one of the most advanced, efficient and competitive green steelworks in the world.

CISDI is undertaking the master design of Phase II and the design of its stockyard, BF, CCM and HSM.

Zhaohui Yu, CEO of CISDI Group, commented at the Phase II launch ceremony: "CISDI and Baosteel have worked together through many changes to the industrial landscape over the past 40 years and have built up a lasting partnership of mutual trust.

"CISDI will follow new development concepts in line with Zhanjiang's targets, and will push forward technological innovation, applying its optimised intelligent manufacturing, energy conservation and environmental protection expertise to Phase II's process, equipment and production consultancy. "

He added: "We have learned a great deal from building BF1 and 2 for Zhanjiang, which will result in further improvement. We will be closely working with other contracted companies and are proud to be part of creating the world's most modernised and green carbon steel production base."

As the master designer and the predominant service provider for Zhanjiang, CISDI applied a number of IIPR-based core technologies, many of which are technological Chinese firsts. Over 100 relate to energy conservation and environmental protection and have been hailed as major drivers for China's pledge to improve steel industry layouts and structures, product mix, flows and energy mix.

FACT FILE:

Zhanjiang Steel made a profit the year after start-up and gained higher margins than other comparable steelworks.

After start-up, Zhanjiang was swiftly ranked among the world's leanest and green steelworks. It was credited with having leading levels of intelligence, eco features and product quality.

Since Zhanjiang Phase I started up in 2016, numerous technical and economical indices have been reached. In some cases, design values have been excelled. Results, compared to industry averages in China, include:

- Coverage area: 20% reduction
- Logistics costs: 25% less
- Consumption of fresh industrial water per tonne of steel: 33% less
- Plant-wide dust and offgas emissions: 25% less
- OPEX: 15% less
- Labour productivity: 40% increase

CISDI undertook:

- The master design
- Design of 10 process units
- Package supply or EPC services of around 20 projects

CISDI to build intelligent stockyard for Laiwu Steel

Laiwu Steel in China's Shandong Province has entrusted CISDI with the building of its intelligent stockyard to an EPC mode.

This comprehensive intelligent upgrade will create an intelligent logistics centralised control system and an intelligent blending and batching system. Other intelligent features to be developed by CISDI include an automatic stacking and reclaiming system, a digital yard system and improvements to the existing system.

CISDI launched its latest intelligent stockyard technology early in 2018, which helped it to win the Laiwu Steel project.

The environment-friendly yard is the most intelligent of its kind in the world and was

The world's first unmanned and digital stockyard at Baosteel Zhanjiang

package-supplied by CISDI. Its technological features enable green and clean production methods, digital yard management and unmanned operation.

Basic design is wrapped up for Ansteel's galvaluminium annealing furnace rebuild

Having completed the basic design, CISDI is heading to the Ansteel galvaluminium line in April to work on-site for an anticipated 40 days.

CISDI has made a number of technological breakthroughs for galvaluminium lines producing metals for household appliances, by drawing on its successful history in automobile-oriented, ultra-deep drawing production equipment and technology.

CISDI has already rebuilt the annealing furnace for Ansteel cold plant's No.5 galvanizing line, a shared investment between Ansteel and Thyssenkrupp which produces high-end automobile sheets. It is now running and achieving remarkable results in O5-standard auto sheet quality and bringing about substantial economic returns.

CISDI's design features a scale-free annealing furnace, unique cooling roller and stabilised post-plating cooler.

CISDI's groundbreaking skin pass mill to create energy savings at Jingye

Hebei Jingye Group has contracted its skin pass mill package supply project to CISDI.

Its 1,780mm hot strip mill will be upgraded within nine months.

Hebei Jingye Group is a conglomerate with steel as its core business. Its other interests include chemical production, hotels and real estate.

CISDI's skin pass mill for hot strip mills is currently producing over 60 per cent of China's market share.

The intelligent, ultra-high strength SPM, which has been awarded 10 patents, reduces roll wear and energy consumption. It features bending and shifting integration, a high-rigidity large-force leveller and high-tension coiler, high-strength strip pay-off and an innovative tension device and hydraulic shears.

Jingye was the third steel company to place an order during 2018.

The high-tech units are already operating successfully at Baowu Shanghai's 1,880mm and 2,050mm hot strip mills, Shougang's 2,250mm mill, Meishan Steel's 1,780mm mill and also at Benxi Steel (2,300mm), Pangang Xichang (2,050mm), Baowu Zhanjiang (2,250mm) and Handan Steel (1,780mm).

CISDI has incorporated its expertise into a national code for skin pass mill specifications and strength serialisation, entitled the Design of Flat Products Finishing Technology.


The skin pass mill supplied by CISDI for Baowu Shanghai's 1,880mm hot strip mill

CISDI's patented rotary hearth furnace set to solve problems for Jingtang

CISDI is supplying its revolutionary eco-friendly rotary hearth furnace to solve zinc waste problems at Shougang Jingtang United Iron & Steel.

Based at the Tangshan Caofeidian Industrial Zone in China's Hebei Province, the plant's current furnace, which has an output of 300,000 tonnes, treats zinc-bearing solid waste and has a 150,000-tonne homogenising line.

Jingtang urgently needs to build a replacement so it can turn its waste into resources.

Environmental regulations which came into force in 2018 now prevent the sale of zinc-bearing solid waste. And because of the composition of its stock materials, Jiangtang's zinc load far exceeds the trade's average.

CISDI Thermal & Environmental Engineering's rotary hearth furnace has been awarded over 30 patents and six project references.

Iron, zinc and carbon solid wastes can be treated and transformed into resources. Its design solves the industry's chronic problem of solid waste treatment and the difficulties of achieving a zero discharge of iron-bearing dusts.

An open-loop recycling system for treating zinc waste will be created, with a zero-discharge and zero-landing target.

CISDI Thermal won the Engineering, Procurement and Construction contract thanks to its success at Yanshan Steel and Baowu Zhanjiang, where CISDI-designed and supplied fast ramp-up RHFs are giving optimal production results and world-leading indicators of over 85 per cent of the final de-zincification ratio.

CISDI Thermal is already developing other core equipment in line with the furnace's complex technology.

Baowu Zhanjiang's solid waste system is China's first metallurgical solid waste treatment and waste-to-energy centre. Built by rotary furnace hearth experts at CISDI Thermal, the patented technology solved the steelwork's iron-bearing dust treatment issue and achieved dust recycling throughout the plant

Package supplies to 3.5-million-tonne steel plant in Indonesia

CISDI will supply equipment and non-standard design and technical assistance services for four production lines - the light section mill, CSP, medium section mill and blast furnace 2 - at PT. GUNUNG RAJA PAKS.

Package supplies to TATA Steel Kalinganagar

CISDI is designing TSK's blast furnace 2 to a volume of 5,873 cubic metres and with an output of 4.375 million tonnes a year. The world's largest blast furnace under construction is scheduled to start up by 2020. The package supply contract includes blast furnace 2's PCI, granulation drum and stockhouse and casthouse dedusting system.

Rizhao Steel's ESP5 is entrusted to CISDI on an EPC basis

An EPC order for a new ESP5 production line and supportive BOF rebuild and utilities has been placed with CISDI by Rizhao Steel.

CISDI's RH integrated dip tube wins award for excellence

CISDI has won its eighth top patents award for excellence, more than any other Chinese metallurgical engineering company.

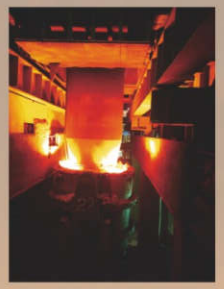
Integrated dip tube technology for the RH vacuum degassing refining process, patent number 201310074271.7, won the company its latest accolade.

Though the RH process is a representative procedure when mass-producing high-quality steel, many small and medium-sized steel plants find it difficult to apply. Improving a small-tonnage ladle's RH efficiency has become a technical bottleneck for surmounting.

CISDI's innovation, the integrated dip tube, solves RH efficiency restrictions. The central distance between the rising dip tube and the down-coming dip tube is reduced, thus forming an integrated dip tube. This increases the cross section of liquid steel flow and the liquid steel loop flow. As a result, the RH efficiency can be enhanced.

Minmetals' Medium Plate Mill Plant in Yingkou has applied this patented technology to its 120t-ladle and seen remarkable results. Greater efficiency has been achieved in a shorter treatment cycle time, resulting in significant financial savings.

The integrated dip tube vacuum tank being handled at a steelmaking plant



The dip tube during treatment process

Deposit welding Robot is commissioned at SFRE

CISDI teams have created a robot capable of high-quality deposit welding.

During pilot tests, the robot was able to perform surface deposit welding on wedges, guides and support sleeves.

It has now been handed over to SFRE and is in commission in one of its workshops, where the robot's welds are so reliable, no defects have been detected by the surface flaw inspector.

Copper surface deposit welding prevails at SFRE. However, it's a dangerous task; high-heat toxic gas, metal steam and metal dust are generated which are dangerous to workers' health. Producing welds of consistent quality also requires a high level of skill and labour and procedure-transfer costs can be high.

The Robot can complete non-standard copper deposit welding at one duty position and reduces manpower.

CISDI will transplant the knowledge it has gained into other metallurgical robot developments.

● Deposit welding robot fact file

Applicable for non-standard copper deposit welding in a single piece and in small batches, with diverse varieties and without clamps, and also for the automatic deposit welding of carbon steel and stainless steel

Stable and reliable quality

Gives a high degree of flexibility. The robot can be adapted for various shapes of surface deposit welding and for non-standard, clamp-free and positioning-free pieces

Easy training – no need for repeat programming

Much less labour-intensive

Can be programmed offline

Capable of deposit welding on curves in a complicated space

● Comparisons between robot-work and manual deposit welding

Method	Efficiency						Quality	Human Risk
	Rectangular surface 230mm×85mm		Triangular surface 230mm,70mm		Long bar surface 1,180mm×20mm			
Robot	Preparation time (min.)	Welding time (min.)	Preparation time (min.)	Welding time (min.)	Preparation time (min.)	Welding time (min.)	Reliable and stable, a high first pass rate, zero re-working	No human involvement
	8	32	5	11	6	25		
Manual	Welding time (min.)		Welding time (min.)		Welding time (min.)		Unstable quality, a low pass rate, a high re-working rate	High risk of severe Injury from toxic gas and metals dust
	50		25		45			

The rotary arm of a deposit welding robot in action

Wedges with deposit welding completed by the robot

The working plane of a deposit welding robot

CISDI expert is rewarded IEC 1906 prize

An expert from CISDI's Xi'an Electric Furnace Institute has been awarded a top honour.

Huashan Ge's huge contribution to his industry has been rewarded with the IEC 1906, one of the International Electrotechnical Commission's most coveted honours.

It is awarded to experts who have made special contributions. In China 64 experts have been awarded the prize, 14 of them in 2018.

Huashan has been engaged in industrial electric heater standardisation at the Xi'an Electric Furnace Institute since 1987. He has either participated in, or chaired, the preparation and revision of over 50 national and industrial standards and 10 international standards.

He is now the convener of PT63078 of the IEC's industrial electric heating and electromagnetic technology commission (IEC/TC27), and a member of AG1, MT18, MT24 and MT32. Huashan is also a beneficiary of state specialist allowances.

1906 was the year the IEC was established.