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

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CISDI
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ASSB on track for greatness; production lines enter pilot stage

IN THIS ISSUE

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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CISDI SHOWCASES ITS PROWESS AT AISTECH 2018

AISTech 2018

CISDI was the sole representative of China's steel engineering prowess at a major U.S. exhibition set up to improve the competitiveness of steel producers around the world.

The company presented a paper on its range of experience in creating intelligent steel stockyards to over 500 companies from America, the UK, Canada and India at AISTech 2018.

Staged in Pennsylvania during May for over 7,000 attendees, the event sponsored by the American Iron and Steel Institute is seen as a powerful influence on the European and American markets.

CISDI showcased its expertise in total solutions, systematic optimisation, full-process core technology and products, and highlighted its experience in creating smart steel plants and intelligent products.

The exhibition enabled CISDI to exchange views and develop deeper understanding with clients and partners from across the globe. A spokesman told the audience, "CISDI will strive to further develop its intelligent manufacturing arm and reinforce our investments and studies in core technology. We aim to provide ever-improving bespoke services for the upgrading and transformation of the global steel industry."

Over 550 technological subjects were presented at AISTech 2018.

The team from CISDI who attended AISTech 2018

Members of the CISDI team exchanging views with partners and clients at the show

SECOND MEGA BLAST FURNACE AT FORMOSA HA TINH STARTS UP

Blast furnace at Formosa Ha Tinh

The second mega blast furnace at Formosa Ha Tinh Steel's £11 billion complex in Vietnam has now been started up, putting the plant on target to eventually produce a colossal 10 million tonnes of steel a year.

The Vietnamese subsidiary of Taiwanese industrial conglomerate Formosa Plastic Group, Formosa Ha Tinh is a leading project on the Belt and Road Initiative routes.

CISDI was awarded the contract for its two mega blast furnaces on an EPC basis and civil construction started in 2013.

A year on from the successful start up of Blast Furnace 1, its twin was successfully fired up on May 18 and had tapped hot metal 24 hours later.

Both have an inner volume of 4,350 cubic metres and the capacity to produce a hot metal output of 3.197Mt/a - rivalling the production capabilities of the world's biggest mega blast furnaces.

BF 1 has been operating stably for a year and has now passed all its function tests, with all of its indicators exceeding their designed values.

Formosa Ha Tinh will produce seven million tonnes of steel a year once its twin BF 2 is in operation and the final production target is a colossal 10 million tonnes a year.

BF 2 complies with environmental standards set by the Vietnamese Ministry of Natural Resources and Environment.

The twins' main technical and economical indicators are benchmarked at world record levels and CISDI's ultra-high performance and low energy consumption patented blast furnace technology has been applied to both.

Vietnamese government leaders, representatives of FHS and its contractors prepare to celebrate the startup of BF2

Vice president of CISDI Group Zhang Yong is pictured (centre) igniting one of the tuyeres for the blast furnace's startup

These unique technological features include new-generation 'no-bell top' distributors, slag granulating drums, high-blast-temperature and long-service-life external-combustion stoves and over 90% of the equipment has been made in China.

The furnaces also rely on CISDI's intelligent production management system (IPMS), which combines big data analysis with production and is capable of implementing intelligent operations.

CISDI will be providing ongoing technical assistance to the production process through the blast furnaces' life cycle.

CISDI's services at FHS also include the master plan and general consulting, stockyard design, reheating furnaces and gas holders and operations management.

Blast furnace 2, tapping hot metal

ASSB ON TRACK FOR GREATNESS PRODUCTION LINES ENTER PILOT STAGE

An aerial view of the ASSB Plant in Malaysia shows its Production Chain Line 1 in development

The successful start-up of the first blast furnace at ASSB's Malaysia plant puts it well on track to becoming the most competitive steel producer on the Belt and Road Initiative routes.

Phase I of the ASSB Plant will produce 3.50 million tonnes of high-end wire rods, bars and H sections for the ASEAN and surrounding markets.

As the ASSB production base takes shape, ten thousands of local jobs are expected to be created, boosting the regional economy. It is also hoped that ASSB's presence will attract other enterprises to the Belt and Road routes and bolster the region's service and supply industry.

CISDI, ASSB's most relied-upon contractor, has undertaken the master plan, plant design, procurement and equipment management and package supply of the plant's stockyard, blast furnace, BOF, caster and rolling mill, in addition to the EPC-based construction of the reheating furnaces.

Blast Furnace 1 was successfully started up on June 6 and hot metal was tapped and transported via a ladle car to the steelmaking workshop for smelting out the first heat.

The first billet cast by Continuous Caster 2 was of good surface quality and ASSB reports that main production equipment is running smoothly.

The production chain from Blast Furnace 1 to BOF 1 and Caster 2 marks the build completion of all units supplied by CISDI on an EP basis. The whole line now enters pilot production stage.

The blast furnace plant at ASSB with a shared casthouse

ASSB's blast furnace 1 taps hot metal

The ceremony at ASSB site as pilot production of ironmaking, steelmaking, casting and rolling began

Ironmaking plant

CISDI has designed and integrated ASSB's blast furnace-related process and core equipment using its patented technologies for efficiency and reducing energy consumption.

Its two blast furnaces will be the biggest and most advanced in Malaysia. Each will have a volume of 1,080 cubic metres and achieve an annual hot metal production of 2.53 million tonnes.

The blast furnaces feature CISDI's IIPR-based no-bell top control expertise, top-combustion stoves, hearth and stack long-campaign technology, compact one-ladle hot metal transfer technology, shared casthouse and highly-efficient bottom-filtering slag granulation technology.

Steelmaking plant

Having designed and built over 100 BOFs for steelmaking clients, CISDI used its vast range of experience to ensure dramatically improved efficiency, guaranteed equipment performance and a well-run project schedule at ASSB.

Applications include CISDI's self-adaptive constraint system (SACS) 4-Point Linkage Suspension System. It enjoys the advantages in absorbing a large degree of deformation, light weight of the facilities, simple structures, and easy maintenance.

The first heat of liquid steel is produced

Continuous casting plant

The hot-commissioned caster 2 is a seven-strand billet caster which adopts a hot-charge process.

Billet is cut at a high temperature and charged into the hot mill by the high-speed roller table, which means it does not need to be reheated by the reheating furnace. This direct hot charge and rolling process reduces heat loss.

Other installations which ensure a high degree of automation level, improved safety and product quality include tundish continuous temperature measurement, automatic control of the mould level, automatic addition of mould's protective slag, secondary cooling automatic control and strand's surface temperature measurement.

The ladle turret of Caster 2 begins continuous casting

Qualified billets being cast

CISDI AND ROCKWELL AUTOMATION ARE UNITED IN THEIR MISSION TO UPGRADE AND TRANSFORM

CISDI and Rockwell Automation have strengthened a partnership of 20 years by signing a new strategic global agreement.

The joint pledge, forged in May, will see the two companies joining forces to provide intelligent manufacturing solutions for steel transformation and upgrading. They will also be addressing potential co-operation with regard to metals, mines and intelligent manufacture.

Rockwell is a global powerhouse committed to delivering industrial automation and information technology and products to clients in the pursuit of productivity enhancement and sustainable development.

CISDI Group, one of Rockwell's six global strategic partners, provides green and intelligent solutions for the global metals industry. Its chairman, Xiao Xuewen, signed the agreement to form a global strategic league with Blake Moret, chairman and CEO of Rockwell Automation, at a meeting in Milwaukee.

CISDI Group chairman Xiao Xuewen and Blake Moret, chairman and CEO of Rockwell Automation, shake hands on the agreement

Both parties communicated on respective new competitiveness, business system, development plan and technological highlight, and consulted some action plans in unanimity.

BRAZIL'S FIRST DUAL-REGENERATIVE REHEATING FURNACE UP AND RUNNING

The CISDI-supplied dual-regenerative reheating furnace at GUSA in Brazil

The dual-regenerative reheating furnace successfully discharges its first billet for the wire-rod mill

The first dual-regenerative reheating furnace in Brazil, supplied by CISDI, has gone into operation.

The furnace, at GUSA Plant's high-speed wire-rod mill, successfully completed its first discharge of qualified reheated billet in mid May.

CISDI Thermal & Environmental Engineering Company undertook the package supply, its first successful export of IIPR-based technology and equipment of this kind.

Brazil's pioneering furnace has an output target of 120 tonnes an hour and is a stand-out example of energy efficiency, environmental protection and advanced intelligence.

Multiple CISDI patented technologies have been applied to ensure compatibility with the downstream 600,000-tonne high-speed wire-rod mill, supplied by Primetals.

Air-gas dual regenerative burners have been installed to enable low-heat-value blast furnace gas to be used by the mill's reheating furnace, resulting in reduced emissions of NOx and energy savings of more than 10 per cent.

The combustion control model which works in conjunction with the basic automation system (L1) and process automation system (L2) enables the furnace to operate virtually unmanned.

Ricardo Carvalho, director of GUSA board, and Sandro Marques Raposo, the head of GSUA Plant commented, "This very successful project has created the first dual-regenerative reheating furnace in the whole of Brazil and it is now operating with highly satisfactory indicators."

SFRE'S INNOVATIVE HIGH-SPEED ALUMINIUM STRIP MILL READY FOR MASS PRODUCTION

A ground-breaking new high-speed cold mill, only the fourth of its kind in China, has successfully trialled its production of aluminium strip.

The SFRE-manufactured 2,800mm CVC cold tandem mill at Mingtai Aluminium Industry Co is running stably and producing well-shaped aluminium coils of a uniform thickness, flatness and surface quality. Mass production is due to start soon.

Mingtai Aluminium is a private listed company in China's Henan province. Its main specialisms are aluminium deep processing and rolling of aluminium plates, strips and foils.

Renowned for its innovation and drive, the enterprise supplies qualified products to clients in the USA, Japan, South Korea and Singapore.

SFRE has made significant manufacturing breakthroughs with this innovative mill.

It can operate at a rolling speed of 1,200 metres a minute, three times the speed of a regular mill, and can produce products of a far greater width - up to 2,650mm.

And it can comfortably produce wide curtain wall boards, aluminium busbars, ultra-wide shipbuilding boards, tank car sheets, bins, skin sheets for new-energy buses, satellite antenna pot strips. None of these products can be produced by regular mills.

Performance indicators are surpassing China's national standards; product profiles are improved, the process is cleaner to run and more stable and a finer surface is being achieved on aluminium strips, sheets and plates, with a smaller allowance of product thickness.

This mill is a great contributor to the client's product development and market share. When mass production begins, its potential capacity will enable SFRE to dominate China's high-end wide aluminium processing sector.

MCC-SFRE Heavy Industry Equipment completed the manufacture and supply to demanding quality, schedule and supervision service specifications.

Trial production in progress at the SFRE-manufactured mill at Mingtai Aluminium Industry

CISDI TO CREATE GREENER SILOS FOR MASTEEL

CISDI is to carry out a green rebuild of 20 silos at Masteel.

The online, environment-friendly rebuild project is of great importance to Masteel.

The contract was awarded in May on an EPC basis in light of CISDI's proposal for a phased construction of the 20 large silos over 30 months.

Each silo has a diameter of 21 metres and can store 10,000 tonnes of bulk materials.

The silos will be built at the coal yard, a challenging task due to existing site problems ranging from environmental pollution and material loss to moisture variation, inferior automation levels at the plant and the risk of the online rebuild affecting production.

CISDI's investigative team assessed site conditions and the plant design and worked out how to plan around them during the technological process and construction phase.

TANGSHAN GANGLU STEEL'S PLUME REMOVAL PROJECT IS ENTRUSTED TO CISDI

CISDI has won the contract to carry out Tangshan Ganglu Steel's plume removal project.

The task involves removing smoke plumes from the slag granulation processes of six blast furnaces at the steelworks on an EP basis.

The contract sees CISDI enter a new business sector and involves air-cooled tower condensation, smoke injection, exhaustion, and instrumentation systems.

CISDI's innovative plume removal system carries a Chinese utility patent. It has a beneficial effect on the environment, boosts economies, requires a short process flow and is low cost.

One of its innovative techniques utilises excess heat from local low-temperature exhaust gas to remove the plume - a complex procedure, as re-collecting low temperature exhausts is difficult.

The condensate of plumes can also be recovered, while mixed gas in the chimneys can be kept on track online. The condensation system's working proportion can be adjusted according to the seasonal and daily changes and the entire unit becomes more energy efficient.

Technological highlights:

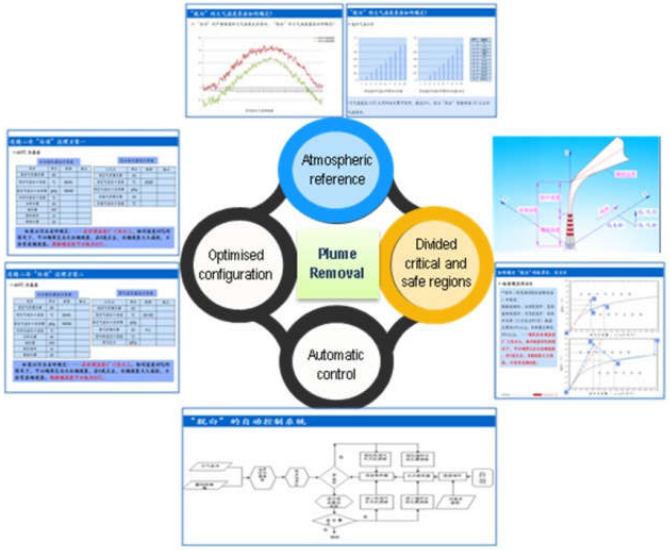
- Scientific definition on the atmospheric reference for plume removal can be made
- Scientific demarcation on the critical region and safe region can be calculated
- The optimised configuration on the plume removal system and unit can be found

To achieve these benefits, CISDI's team carries out studies on the plume's generation mechanism and smoke composition, temperature and humidity from various sources.

All available exhausts are brought into use, according to their excess heat conditions, as the main means to remove plumes and optimise a cost-competitive configuration on the removal system according to the defined atmospheric reference, divided critical and safe regions and plume and excess heat's characteristics.

- Establishing automatic control

To automate the removal system, CISDI has developed a basic data base and basic model to enable the system to automatically identify the removal's critical and safe regions, judge the removal results and control the working points within a safe region, and to enable the system to automatically evaluate the cost competitiveness so as to control the OPEX.



CISDI's plume removal system features the four main approaching aspects

CISDI'S LATEST SUCCESS IN GREEN REBUILD OF JIUJIANG STEEL'S STOCKYARD

The integral relocation of the No.3 bucket wheel stacker-reclaimer at Jiujiang Steel's Stockyard was completed by CISDI in mid May.

The entire stockyard is going through an online rebuild to make it more environmentally friendly and relocating this section was of paramount importance.

The 395-tonne stacker-reclaimer was moved 40 metres. Its relocation had to line up with existing facilities, a complicated electric system, a long distance and reconstruction complexity. The final step was the sliding into position of its tripper car.

CISDI had to complete the task to an extremely tight schedule, which made a traditional disassembly and recombination method impossible. Instead CISDI took a holistic relocation approach, bringing in unit-wise sliding and local lifting operations.

The project enriches CISDI's online rebuild references and lays the foundation for further milestones in the rebuild at Jiujiang.

Holistic relocation of the No.3 stacker-reclaimer in progress

TATA STEEL INTRODUCED TO THE BENEFITS OF CISDI'S BIM TECHNOLOGY

BIM render of ArcelorMittal's Saudi Arabian seamless steel tube mill

CISDI gave TATA Steel's heads an illuminating talk on processes scheduled for the KPO BF2 engineering project by utilsing its Building Information Modelling technology.

BIM was introduced into CISDI's projects in 2000 and has been applied to blast furnace 2 at TATA Steel KPO, Formosa Ha Tinh Steel's two blast furnaces, Gerdau Acominas's blast furnace 2, GUSA's BOF and ArcelorMittal's Saudi Arabian seamless steel tube mill.

BIM enables CISDI to optimise designs at an early stage, reducing the need for changes during construction. It also enables the client to assess the feasibility of the design and proposal.

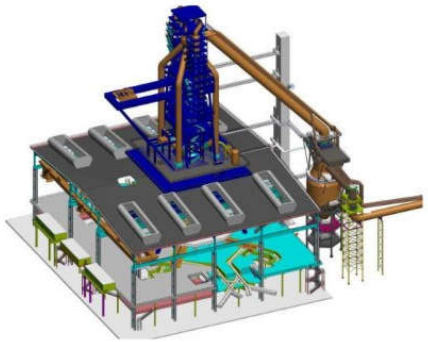
During a meeting at CISDI's Shanghai subsidiary, CISDI used BMI models to explain the blast furnace-related systems' inspections and maintenance plans for the site. Attending were RRJHA , vice president of TATA Steel Construction, Rajiv Kumar, vice president of TATA Steel Production, and Niraj Kumar, TATA Steel's project manager.

Detailed presentation and visualisation models enabled TATA to understand precisely the movement track for equipment lifting, the equipment travel scope and the relative positions between equipment and structures.

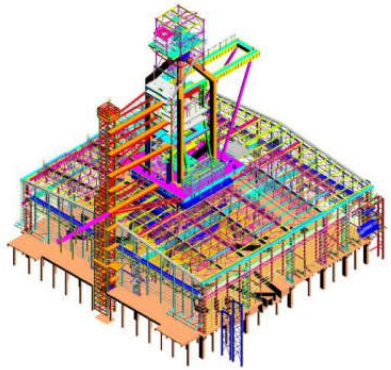
The process enabled CISDI to demonstrate how it would add new lifting holes at Column axle 16 on Platform +37.3m of the stockhouse discharge car.

CISDI's project manager used the BIM model to demonstrate how the equipment would be located around the environments and how equipment during lifting would have to be interfered with the charge belt conveyor on Platform +37.3m, the passenger walkway, the lower return belt conveyors respectively at Platform +13.1m and +7.0m if the lifting holes were required adding at that place.

CISDI is currently developing a BIM-based management platform to provide full life-cycle BIM support - from design to construction - and for operations management.



A BIM render of TATA Steel's KPO BF2



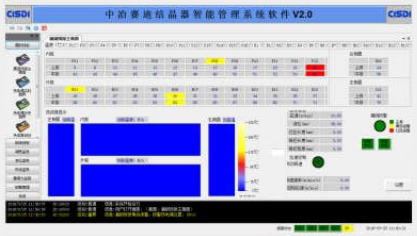
BIM render of Formosa Ha Tinh Steel's blast furnaces

CISDI'S INTELLIGENT CASTING AND ROLLING EXPERTISE

Intelligent continuous casting

Mould intelligent management system enables:

Prediction of mould's breakout, prediction of sticking, analysis of friction force, monitor of thermal imaging, monitor of steel level, monitor of width adjustment and offline simulation



3D dynamic secondary cooling model gives:

Uniform control of strand's temperature for reducing the possibility of corner cracks or longitudinal defects on the strand

Reduces nozzle blockage ratio by 50 per cent compared with traditional working results

Remarkably improved strand quality

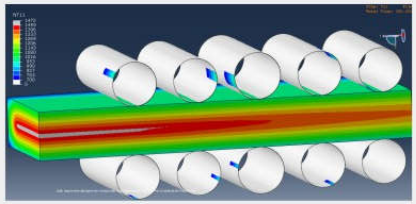
Reduces operation costs

Dynamic soft reduction model results in:

An integrated dynamic soft reduction model and a high-precision roll gap technology for segments

Improvements strand's internal quality

Upgrades the strand's central segregation indicator by at least one level

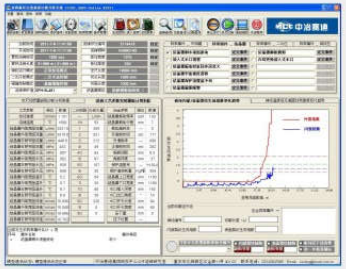


Strand's quality online diagnosis and control creates:

A real-time forecast on the strand's quality information, including the inner and outer defects of cut-length strand (surface cross crack, surface longitudinal crack, corner crack, centerline crack, middle crack and triangular crack), central segregation, solidification structural characteristics

A quality control model which is at least 87 per cent more precision on identification of the strand's quality defects

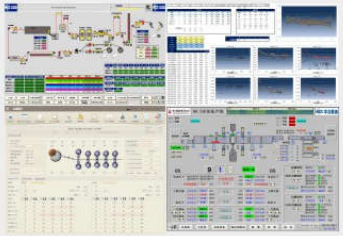
World-leading function and performance indicators



Intelligent rolling

Intelligent rolling technology and model gives:

Adaptable specifications for rolling, new product development and high-precision quality control



Intelligent skin-pass mill benefits:

A fully automatic production process, including the operations of automatic identification of coil codes, loading, strap cutting, head pre-bending, uncoiling, threading, leveling, recoiling, sampling, bundling, unloading and storage, and roll change

A tailored production process, including multi-mode management, leveling models, and custom recovery

A comprehensive quality analysis on surface quality, thickness, width, flatness and performance

Intelligent warehouse benefits:

Crane's unmanned operation at high-temperatures and in complicated working environments

Intelligent control of warehousing activities

Reduces warehouse labour by at least 50 per cent, and increases warehousing efficiency by at least 30 per cent

Extends the service life of warehouse equipment

Improves safety for workers

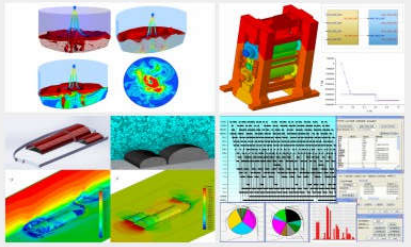
Particularly recommended for hot-rolled coils warehouses, slab warehouses and other metallurgical buffer storage and final products storage

Remote diagnosis and maintenance

- Specialised services create a maintenance network connecting CISDI, the client's control centre and the production site, which means online services can be conducted and problems solved swiftly. Co-development and upgrading is continuous
- A safe, efficient and reliable network design offers VPN, risk detection, load balancing, hot standby and 3G/4G wireless connection

Numerical simulation

- Specialises in fluids simulation, solid simulation and system simulation
- Combined and cross-disciplinary simulation encompasses full blast furnace numerical simulation, gas-solid-liquid coupling simulation, mechanical-electric-hydraulic-control simulation
- Mass-energy-cost multi-factor coupling simulation and optimisation



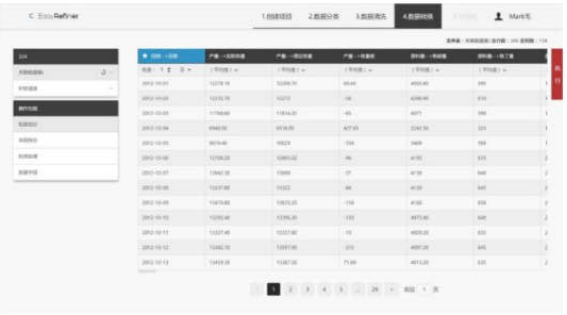
Big data — one-stop cloud platform

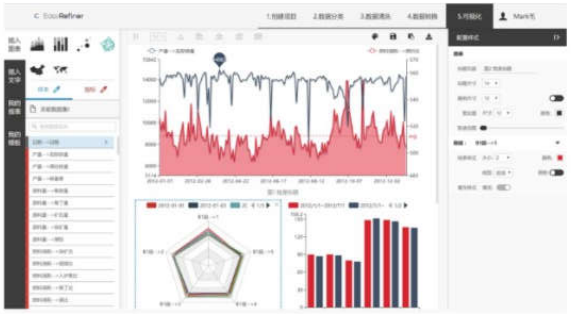
CISDI's cloud platform is a big data-driven production decision-making platform, which helps enterprises to enhance quality and efficiency while shortening product development cycle time.

It is used to analyse and explore industrial production data, raw material data, equipment data and lab data for data classification, data cleaning, data conversion, data fusion, multi-dimensional visualised presentation, correlation analysis, key factor analysis and quantitative optimisation.

The platform has been applied to ironmaking, steelmaking and casting processes.

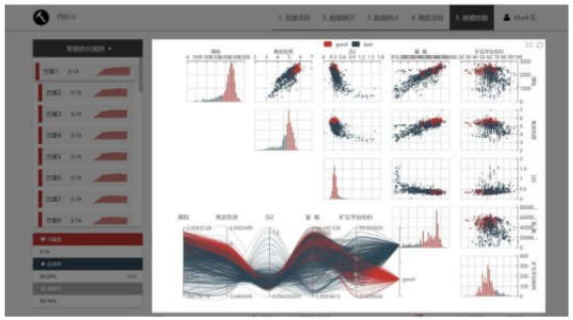
Its features are:

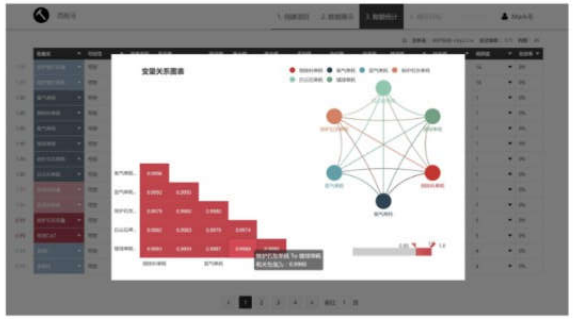




Easy Refiner:

This one-touch and visualized AI product features data classification, cleaning and integration





Easy Miner:

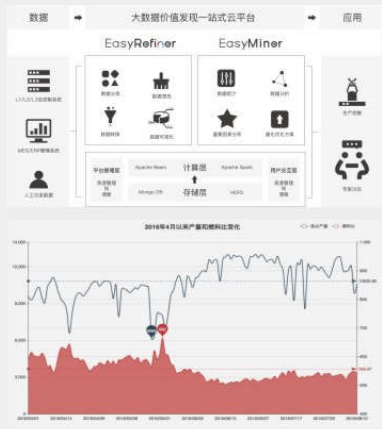
A deep data mining product for optimising performance indicators and providing

Example of CISDI's Big Data is operation at an ironmaking plant:

Seven years of data recorded on the blast furnace's raw material use, operations, status and economic indicators since its blow-in are collected for analysis on CISDI's platform.

The results are used to guide improvements to the blast furnace's productivity (cost indicator) by 30 per cent and reduce the fuel ratio (cost-environmental indicators) by 12 per cent.

Such figures are equivalent to a reduction of 660,000 tonnes of CO_2 emissions a year and a 230,000-tonne reduction of standard coal consumption a year.



CISDI'S GREEN STOCKYARD TECHNOLOGY WINS PATENT IN JAPAN

CISDI's bulk material storage and enclosed stockyard technology has been granted a patent by Japan's Patent Office.

The innovative technology won a Chinese patents award in 2017 for its excellence in promoting energy efficiency, consumption and cost reduction and green online rebuilds.

It addresses common stockyard problems such as lack of available space, limited storage capacity and variety, and inferior adaptability of materials' property.

The stockyard patent, granted by Japan in May, integrates CISDI's Model B, C, D and E enclosed yards.

CISDI's environmental-protection stockyard expertise has been successfully applied at Tangshan Ruifeng Steel and Qianjin Steel in China and overseas at JSW and TATA Steel in India.

The world's first application of CISDI's Eco-friendly, Competitive, Integrated, Adaptable stockyard technology

ECIA is a flagship product proven to cut material losses by around 30,000 tonnes, reduce land use by 65 per cent, create 90 per cent less dust emissions and reduce labour by at least 40 per cent.

CISDI's WATER TREATMENT TECHNOLOGY

CISDI's Water Resources Business Division is committed to providing innovative industrial water treatment system solutions.

Its design, research and development and simulation platforms work together to conserve water resources, protect the safety of water environments and reduce water consumption.

Its methods optimise raw water and upgrade water supply structures, quality and volume.

TYPICAL REFERENCES:

Baosteel Zhanjiang's water resources comprehensive treatment project:

- The largest rainwater recycle in China and a world-leading seawater desalination system has been created
- Reclaimed water is recirculated and re-employed for cascade use
- Utilisation of water resources at the industrial park

Hebei Jingye Group's ZLD project:

- A combined means for testing, CAE plus lab test, pilot and commercialisation has been employed
- The comprehensive waste water treatment solution modifies biochemical treatment, preassembled/integrated facility treatment, deep processing and recycling
- The system is resulting in zero liquid discharge

CISDI GROUP CO., LTD.