

CNBM

sinoma

Sinoma International
Engineering Co., Ltd.

TIANJIN CEMENT INDUSTRY DESIGN & RESEARCH INSTITUTE CO.,LTD.
SINOMA TECHNOLOGY & EQUIPMENT GROUP CO., LTD.

A wide-angle photograph of an industrial construction site at night. The sky is a deep, dark blue with some light clouds. In the foreground, a long, curved line of bright, starburst lights stretches across the frame. In the middle ground, several large, dark, dome-shaped structures are visible, some of which are illuminated from within. To the left, there are several tall, vertical structures, possibly chimneys or towers, also illuminated. The overall scene is a mix of dark silhouettes and bright, artificial lights.

**Devote its efforts to become the world
first-class developer and service
provider in the industrial construction field**



Speech by Chairman

Tianjin Cement Industry Design & Research Institute Co., Ltd. has more than four thousand highly qualified technical and management personnel, has the international leading capacity in scientific research, development and technical strength, has excellent project implementation reference and experience, enjoys a high brand awareness in global cement industrial engineering market, and leads the cement industry developed into an energy conservation and emission reduction, low-carbon environmental protection, green and safety industry. TCDRI is committed to become a world-class integrated engineering company, and wishes to provide project implementation plan with cost-effective, good economic and remarkable social effects to the investors in global building materials, electric power and infrastructure field.



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Company Profile

Tianjin Cement Industry Design & Research Institute Co., Ltd. (hereinafter referred to as "TCDRI") established in 1953, is one of the earliest large-scale national industrial design institutes in China. Now TCDRI has developed into one powerful international engineering company.

Sinoma Technology & Equipment Group Co., Ltd. (hereinafter referred to as "Sinoma-tec") established in 2011, which based on the equipment business originated from TCDRI, nowadays Sinoma-tec already became an internationally competitive large-scale equipment manufacturing group.

Today's TCDRI (previous TCDRI + Sinoma-tec) is a wholly-owned subsidiary of SINOMA International Engineering Co., Ltd, which is a listed company under the Fortune Global 500---China National Building Material Group Co., Ltd.

Relying on independent technology and key equipment export to stimulate his complete sets of equipment exporting and project contracting, TCDRI positions scientific and technological innovation as the central competitiveness, forms its special project general contracting mode "Technology + Equipment " as core force in cement industrial construction field, forms its integrated industrial chain consisting of project consulting, scientific research and development, engineering design, construction, equipment supply, commissioning & training and plant operation.

TCDRI can provide financial support services for customers, and it is the Class AAA customer of China Export & Credit Insurance Corporation (SINOSURE). TCDRI cooperates with The Bank of China, Industrial and Commercial Bank of China, Export-Import Bank of China and many other companies. The cooperative customers include Heidelberg Cement (Germany), LafargeHolcim (France), CEMEX Cement (Mexico) and other world famous cement group.



- 3611** • Employees
- 1317** • Head office staff who are mainly professional and technical personnel
- 2294** • Working in the equipment manufacturing base and mainly processing and manufacturing technical workers.
- 1** • National master in engineering survey and design
- 194** • Professor of Engineering
- 336** • Employees in all disciplines doctorate or master
- 152** • All types of registered engineer



Global Management

Facing the strategic opportunities and competition challenges of Economic Globalization, TCDRI adjusted its internationalized development strategy, took over the HAZEMAG and India LNVT with financial means such as overseas investment and merger. Their alliance and cooperation in the international EPC market, achieving complementary advantages of each other, sharing brand, technology, management and international marketing channels to enhance their competitiveness in the international market and achieve sustainable development.

Financial Support

TCDRI can provide financial support services to customers. As the AAA-rated customer of China Export & Credit Insurance Corporation, TCDRI cooperates with Bank of China, Industrial and Commercial Bank of China and Export-Import Bank of China, etc.





TCDRI is mainly engaged in EP/EPC project in cement and mining industry for domestic and overseas market, provides customers with full service including project consulting, scientific research and development, engineering design, construction, equipment supply, commissioning and training, plant operation and financing support services.



Engineering Design & Consulting



General Contracting



Production Operation and Spare Parts



Equipment Manufacturing



Technology Research and Development

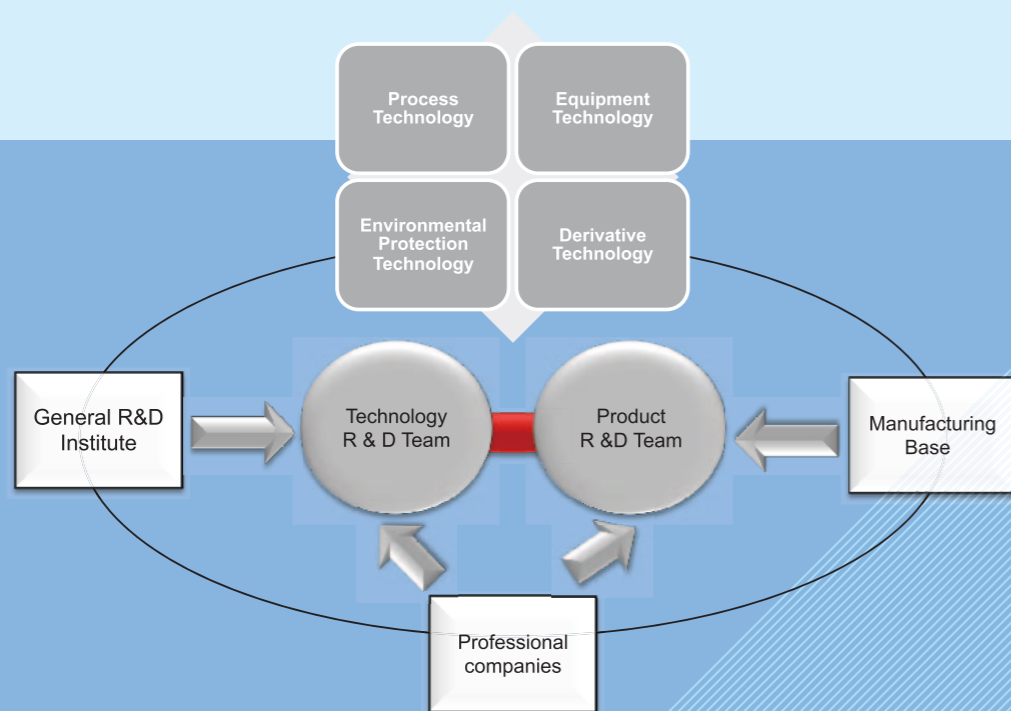
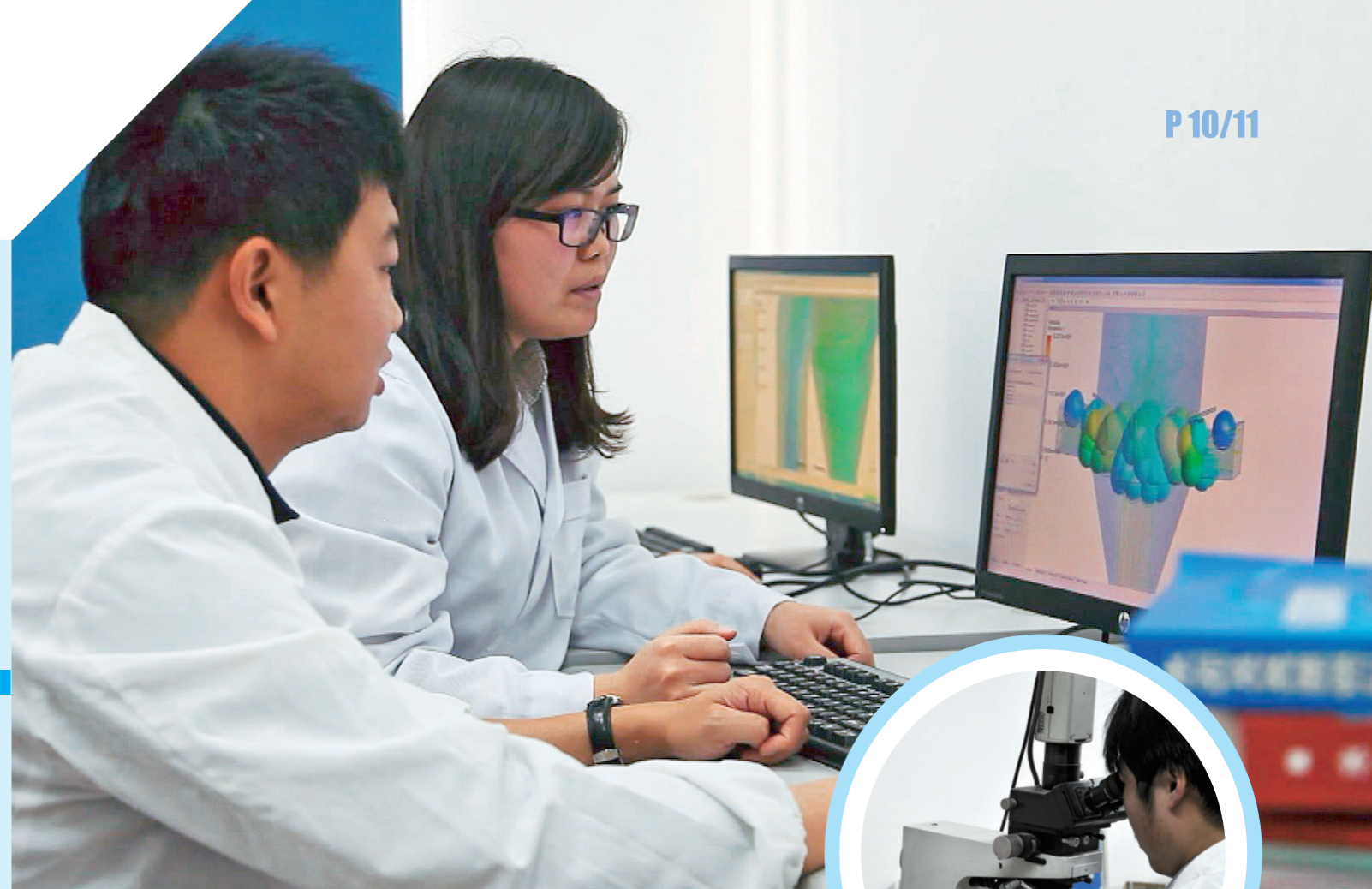


New Business



Technology Research and Development >>

Relying on the General R&D Institute of SINOMA International, TCDRI formed a competitive technology innovation system of cement technology and equipment, engineering, energy saving, new materials, etc.



TCDRI has completed the production of new dry process cement in China from 700t/d to 1,2000t/d each series in production process, technology and equipment development, reached the advanced level in the world, and made outstanding contribution to the development of China cement industry.

Develop and reserve a large number of internationally advanced level new-type equipment, energy saving equipment, environmental protection equipment, automation and control equipment and technology, many products are in advanced world standards.

TCDRI has presided over or participated in the formulation of more than 30 cement industrial standards and technical specifications in China.

The effective patents of TCDRI have covered the whole technological process of cement manufacturing. As of the end of 2017, it had 69 valid patents, of which 29 were invention patents.



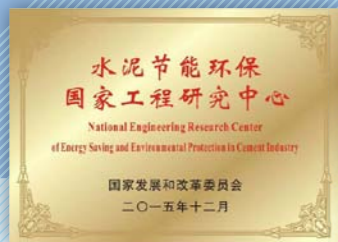
Technology Research and Development Platform

National level Research & Development Institution

1. National Cement Energy Saving & Environmental Protection Engineering Research Center
2. CCDC Physical & Chemical Inspection Institute
3. National Enterprise Technical Center
4. National Post-Doctoral Research Center

Ministerial & Provincial level Research & Development Institution

1. Tianjin Enterprise technical center
2. Tianjin Cement Equipment & Technology Engineering Center
3. Henan Provincial level Enterprise technical center
4. Henan Industrial De-dusting Engineering & Technological research center
5. Shandong Building Material Equipment Engineering & Technological Research Center



Main Technologies

1. Pyro-system

High efficient low resistance type pre-heater	Outlet exhaust gas temperature reducing to below 260°C; Outlet pressure loss reducing to below 5200Pa
Low NOx type calciner	Using calciner with stage combustion technology, equipped with independent DeNOx function, DeNOx efficiency is more than 50%, which is largely saving production cost.
Two pier support kiln	
Fourth generation cooler with middle roller crusher	
Low primary air new type burner	
A 5500t/d production line example	Heat consumption--below 665 kcal/kg.cl Standard coal consumption--below 95 kg/t.cl Cooler heat recovery efficiency--above 75% Nitrogen oxide emission--below 300mg/Nm ³ Clinker comprehensive power consumption--below 45kWh/t.cl.

2. Grinding-System

TCDRI has mainly dedicated the development and application of material bed grinding energy-saving new technology in the field of grinding technology.



Grinding-System	power consumption (For materials with medium grindability.)
Raw meal roller mill system	15-17 kWh/t
Raw meal roller press finish grinding system	10-13 kWh/t (reduce 8-10kWh/t power consumption than ball mill system)
Cement roller mill finish-grinding system	26-30 kWh/t
Cement roller press semi-finish grinding system & Cement roller mill	reduce at least 30% power consumption than closed-circuit ball mill system
Slag roller mill	reduce more than 35kWh/t power consumption than traditional ball mill system

3. Environmental Protection

TCDRI is committed to the research in the fields of energy-saving and emission reduction, comprehensive utilization of resources, safety environmental protection and waste disposal, plays an important role in promoting the cement industry transfer to resource- saving type and environment-friendly type.

- National energy saving and emission reduction technology in cement demonstration line
- Pre-calcining technology including combustibles raw meal
- 100% carbide slag replacing limestone technology for cement production
- White cement clinker technology localization in annual output of 400 thousand tons
- Exhaust gas denitrification & emission reduction technology
- Cement kiln industrial waste co-disposal technology
- Key equipment research and development with independent intellectual property rights
- New material research and development for soil conditioner and buoyancy material

Engineering Design and Consulting

Engineering design and consulting business of TCDRI have always maintained in industry leading level, TCDRI can provide 700t/d ~10,000t/d series with different capacities, different types of new-dry process cement clinker production line with high quality design and excellent engineering, to meet the market development and owner's requirement. TCDRI has created the highest engineering design quantities in domestic cement market, which is holding more than 70% of new dry process cement production capacity in China.

As China's first professional cement design institute, TCDRI presides over the draw up of many national norms, including cement plant design, safety and energy saving, each department's professionals are skilled in each types of national standards, along with the pace of the internationalization of the company, through the design and communication of a large numbers of foreign projects, TCDRI has mastered the relevant international standards, such as European standard and American standard.

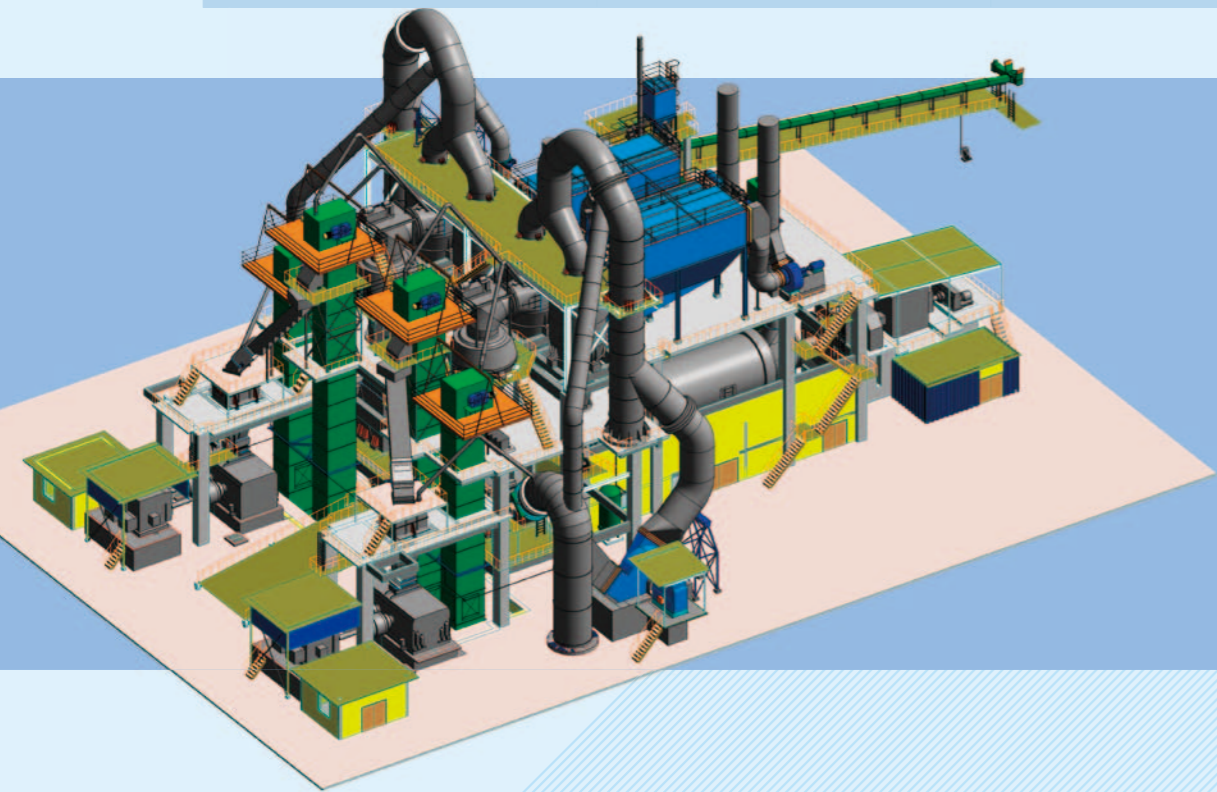
Based on the popularity of CAD design, TCDRI gradually using U.S. Autodesk Company Revit series software as the platform for 3D design, and by means of BIM application reaches design optimization.



BIM Engineering Solution

In the project and design coordination, full modeling design and collaborative design based on BIM as the core are established, which carried on data sharing and coordination among multi-specialty, and could carried out visual analysis and dynamic display. In the project management, the project management service system integrating design, procurement, logistics and construction with BIM technology as the core has been established, which integrates the information system of project management, human resources management, financial capital management, labor management and materials management to realize the enterprise management and the informatization of the main business, to realize the application of BIM in the whole project life cycle and to create the integrated BIM + ERP platform management.

Make efforts to create:
One center: enterprise-level Data Center;
Two platforms: BIM integrated application platform and cloud service platform;
Three systems: BIM collaborative design & management system, EPC project management system, as well as digital operation and maintenance management system.



Full project cycle

- Early-stage bidding
- Project implementation
- Commissioning production
- Customer service
- Project technical modification

Full life cycle management of EPC project

Information Sharing Collaborative work

Project parties

- The owner
- The general contractor
- The construction party
- The supervision party
- Supplier
- The bank



- Professional coordination
- Communication, discussion, decision-making
- Simulated experiment
- Design plan optimization

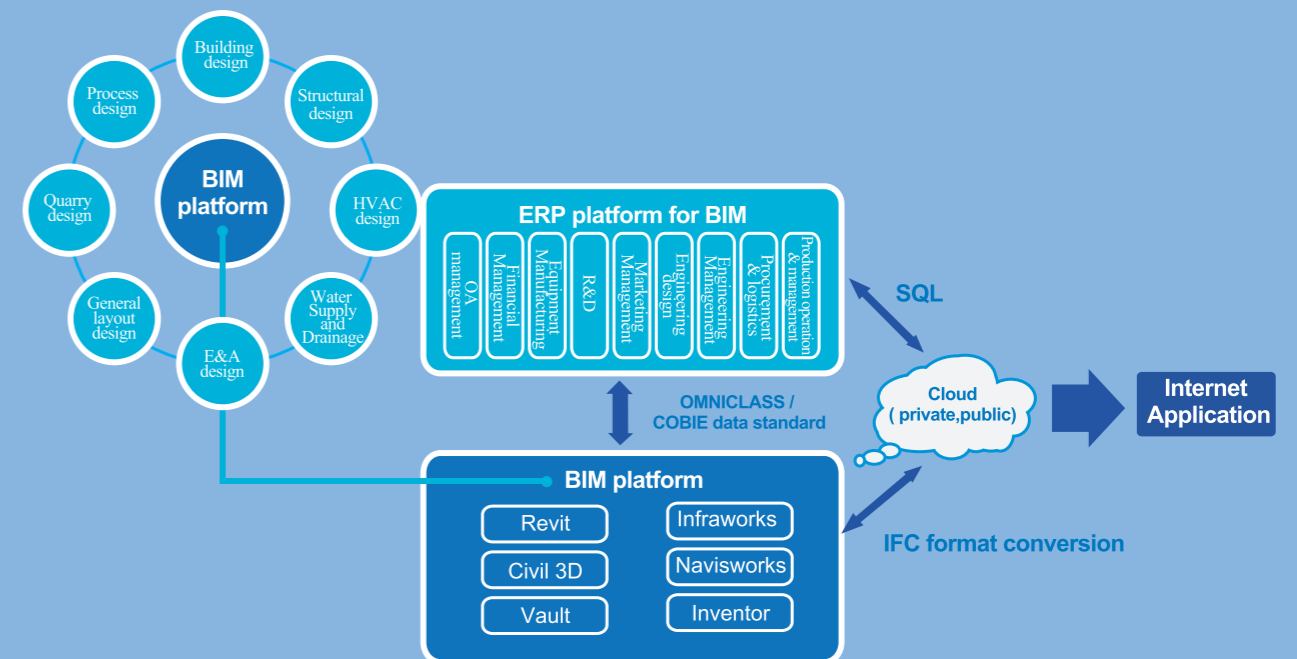
Visualized 3D models

Fine management

- Quantities rapid calculation
- Improve the accuracy and efficiency of construction budget

3D design

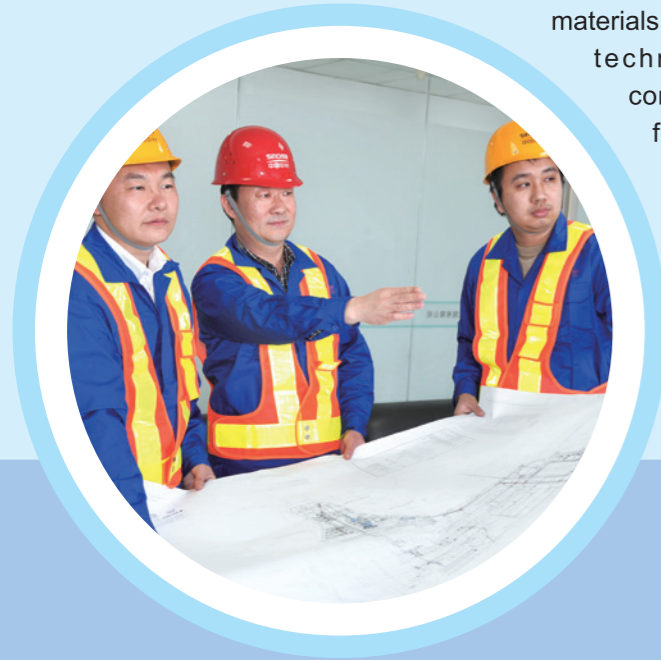
Schedule and cost improvement



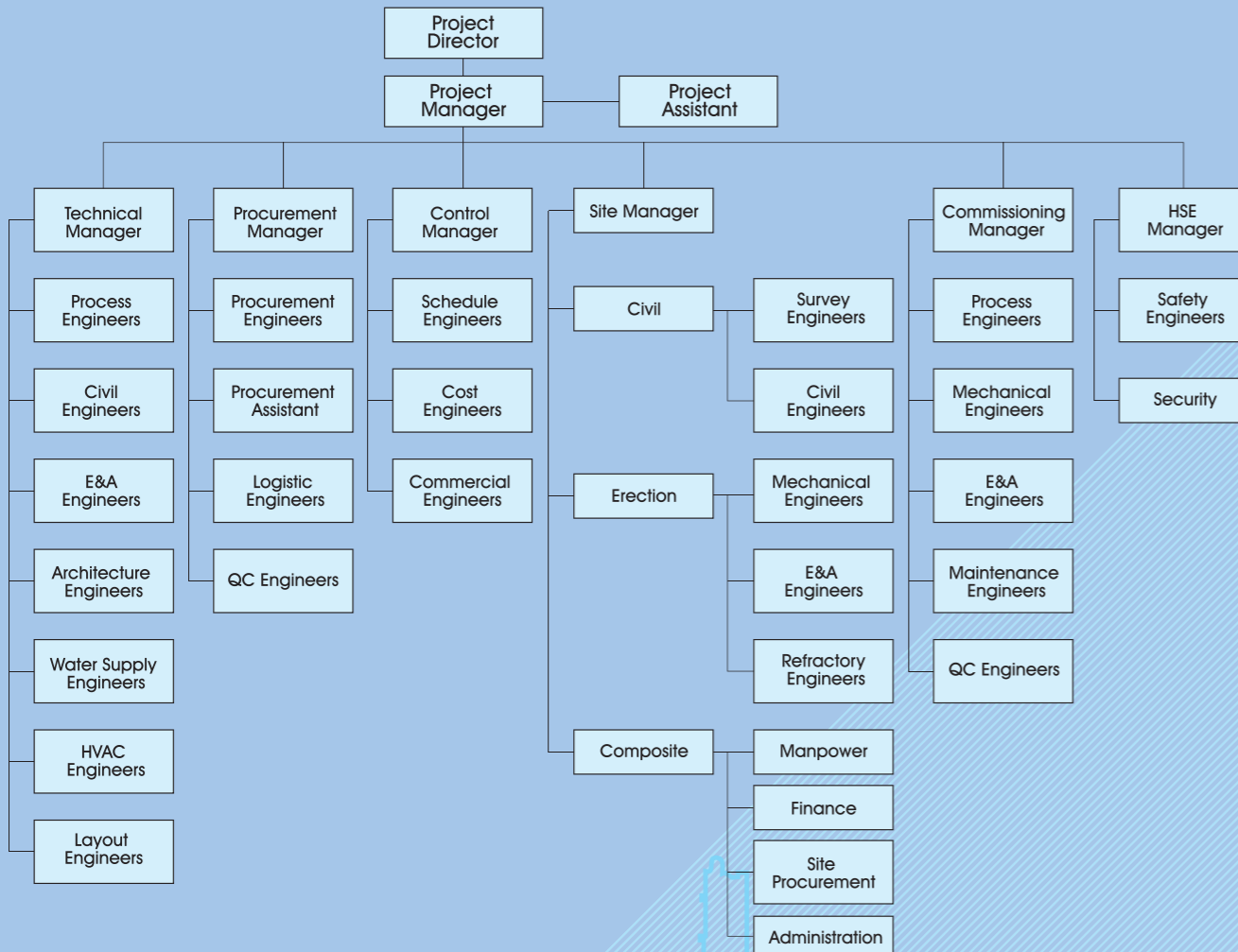


General Contracting Business

In accordance with international practice, TCDRI has established professional management system of project EPC contracting, applies “eight an integral wholes” management model including project manager, commercial manager, purchasing manager, site manager and safety manager, which realizes comprehensive site management of human resources, materials, machines and tools supply, technical guidance, quality control and safety assurance from integrating geological survey, civil construction, erection, production and commissioning these steps.



Project Organization



During the project execution, TCDRI always persists in safety management, quality management, schedule management and localization management; complies with local laws and regulations; respects the culture, religion faith in project located country; pays attention to fulfill company's social responsibility; keeps good relationships with local residents and facilitate the local employment.



Distribution map of TCDRI Overseas Footprint

In the end of 20th century, TCDRI implements internationalization “Going out strategy” and makes great effects to fulfill the requirement of international market and general international practice involving in technical standard, service function perfection, organization establishment, employee team and corporate culture construction. In the meanwhile, TCDRI attempts solutions of localized technical design, materials procurement, equipment manufacturing and human resources, creates new enterprise image with full of social responsibilities, and wins widely recognition of well-known transnational enterprises and regions where project locates.



Equipment Manufacturing & Supply >>

TCDRI totally completed the development and design of nearly 10,000 sets cement specialized and general used mechanical equipment and in possession of a batch of proprietary technology of intellectual property rights, fully covering the whole process of new dry process cement production line. More than 90% main product from domestic cement specialized equipment manufacturer directly or indirectly applies the technology of TCDRI, which promotes the continuously improvement and makes progress of the level of technology and equipment of cement industry.



Forthgoer of Chinese Cement Specialized Equipment

- The first domestic vertical EP
- The first TDM type pulse jet bag filter
- The first biomass power generating boiler bag filter
- The first domestic $\Phi 5 \times 10.5\text{m}$ unilateral dual drive sliding shoe air swept raw mill
- The first domestic annual 300,000 tons slag vertical mill TRMS31.3
- The first domestic 5,500tpd vertical raw mill TRM5341
- The first domestic 1,400t/h semi-mobile crushing station
- The first domestic pre-calcining pre-heater system
- The first domestic third generation TC type 2,000t/d air beam grate cooler
- The first domestic fourth generation 3,500t/d cooler
- The first domestic fourth generation 8,000t/d mid-roller crusher cooler
- The first domestic 5,500t/d energy saving environmental friendly type six-staged pre-heater
- The first plate chain elevator
- Maximum domestic vertical raw mill TRMR60.4
- Maximum domestic vertical cement mill TRMKS56.4
- The first domestic steel slag vertical mill TRMG32.2
- The first domestic nickel slag vertical mill TRMN43.4
- The maximum domestic clinker roller press TRP180-170
- The maximum domestic raw meal roller press TRP220-160
- The maximum domestic slag/steel slag roller press TRP140-140



- TCDRI initially starts up industrialization among all cement industrial design institutes of China and establishes machinery workshops and equipment manufacturing base.

- Nowadays, TCDRI basically formulates a large scale cement specialized equipment industrialization platform consisting of specialized product, professional manufacturing, oriented service and excellent quality, with annual manufacturing and supply capacity more than 150,000tons and fulfills all specialized equipment for new dry process cement production line ranging from 1,000~6,000t/d and fully successful applied in many cement projects.

- TCDRI also establishes the standardization of specialized equipment for 1,000~6,000t/d cement production line and partial equipment is already able to apply in 10,000t/d cement production line.



Sinoma (Xuzhou) Heavy Machinery Co., Ltd.



Sinoma (Changshu) Heavy Machinery Co., Ltd.



Sinoma (Zibo) Heavy Machinery Co., Ltd.



Sinoma (Shangrao) Machinery Co., Ltd.



Sinoma (Tangshan) Port Equipment Manufacturing Co., Ltd.



Sinoma (Tianjin) Heavy Machinery Co., Ltd.



Sinoma (Henan) Environmental Protection Co., Ltd.



Sinoma (Tangshan) Heavy Machinery Co., Ltd.



TCDRI develops and reserves a great amount of international level new type equipment, energy conservation equipment, environmental friendly equipment, automation control equipment and technology, especially newly developed 4th generation walking flow type cooler, specialized large scale crusher, vertical roller mill, large scale roller press, high efficiency separator and air-shaking bag filter, which create powerful guarantee and support for cement project realization.

Production Operation & Management Services

TCDRI all along upholds the service tenet of “customers' requirement is our greatest pursuit” and provides all types of professional and customized production operation management and technical service. It mainly undertakes EPC contract for cement producers, cement production management, commissioning of non-TCDRI contracted cement production line, technical modification, consulting and remote technical diagnosis and supporting, plant overhaul and relevant spare parts service business. Presently, TCDRI has cooperated with many Chinese and International enterprises and has developed production operation management business for cement producers.

Up to now, there are 3 ongoing EPC contracts for 5,000 t/d cement clinker production line and 6 ongoing projects of production management and technical services. Besides, we're negotiating several EPC projects with the clients in domestic and overseas market.

Customer Service Business



1/ After-Sales Service



- Undertake commissioning operations of EP, EPC and design project;
- Undertake technology services business of EP, EPC and design project;
- Undertake the new business, such as mineral potash fertilizer, dehydrating agent, denitration technology and sludge treatment projects;
- Cooperate with the research project;
- Provide technical service of sinoma-tec;
- Participate in preparation of project tender documents about commissioning.

2/ Production & Operation

- Commercial commissioning operation

- Make commissioning plan
- Troubleshooting defects of installation and equipment
- Propose rectify opinions
- Conduct commissioning and performance test of the production line

- Commercial technology services business



● Production Operation & Management Services

Service Model

General Contract Model

1. Leading production management work(including production management operation and execute/production plan/overhaul and quality control)
2. Provide all production personal(including management personal/technical manager/main staff/normal production personal and owner-hired local personal) and bear all their salary
3. Provide spare parts and consumable, and bear the cost
4. Bear the cost for overhaul and maintenance
5. Training of the owner personal in the production process

Partial Contract Model

1. Leading production management work(including production management operation and execute/production plan/overhaul and quality control)
2. Provide all production personal(including management personal/technical manager/main staff/normal production personal) and bear all their salary
3. Provide spare parts and consumable, and bear the cost
4. Bear the cost for overhaul and maintenance
5. Training of the owner personal in the production process

Single Production Management Contract Model

1. Leading production management work(including production management operation and execute/production plan/overhaul/production spare parts and consumable and quality control)
2. Provide some production personal(including management personal/technical manager/main staff) and bear all their salary
3. Training of the owner personal in the production process

Production Technical Service Contract Model

1. Support and assist partial production management work
2. Provide technical management staff and bear their salary
3. Guide owner personal's production technique

- Plant optimization service
- Maintenance service



3/ Technical Training

Undertake technical training of EP, EPC and design project
Undertake the training workshop authorized by NSTC
Commercial technical training



4/ Customer Services

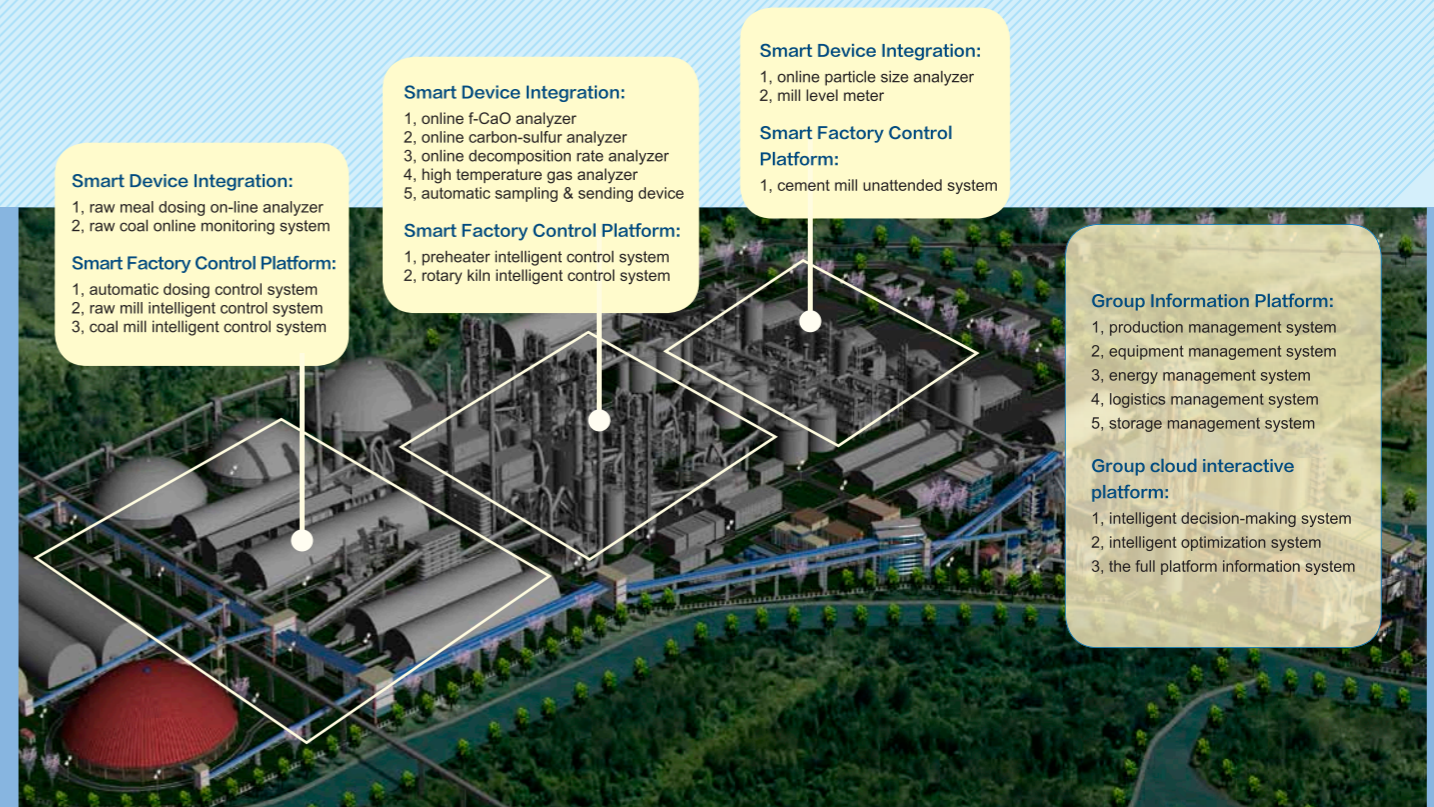
Responsible for customer technical service and consultation;
Coordinate and solve the customers' related technical demands;
Build mutual trust long-term partnership with customers;
Keep up with customer development trends and transfer information to relevant departments.

Intelligent Factory System

In March 2017, TCDRI and Zhejiang Bonyear Intelligent Technology Co., Ltd. jointly established Sinoma Bonyear (Hangzhou) Intelligent Technology Co., Ltd. It is currently the only one intelligent technology company who rely on cement technology and equipment research, through the design institute to share resources to implement intelligent technology research and development.

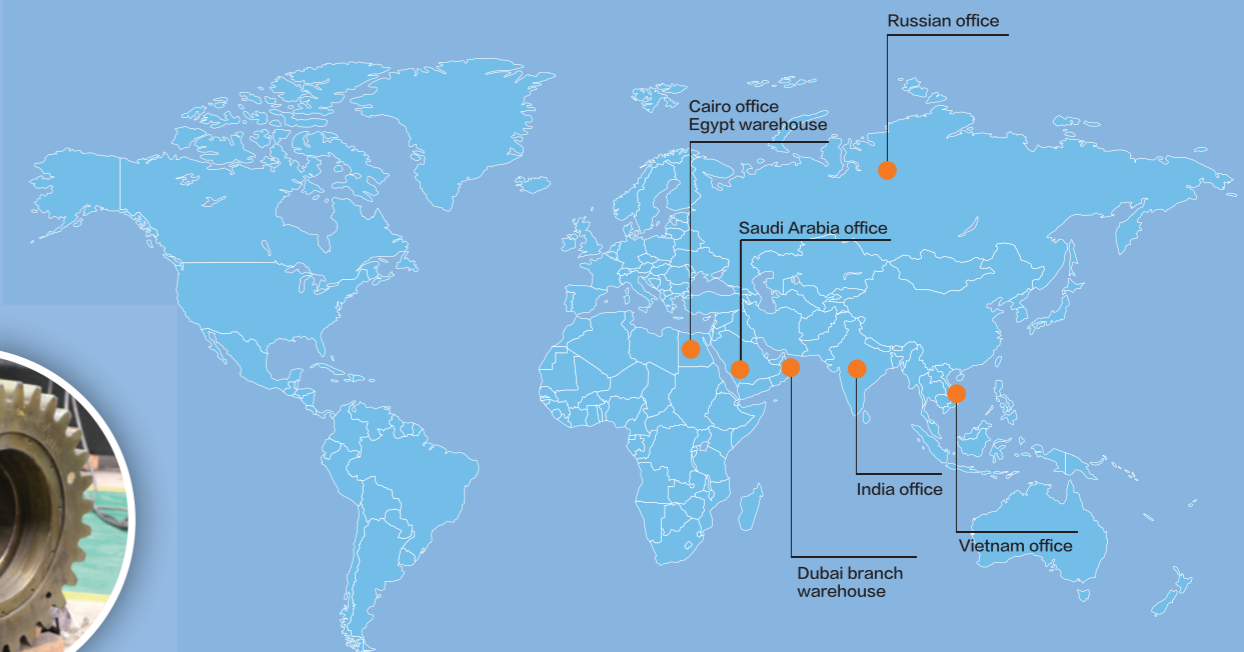
Main business areas:

- Intelligent equipment integration (automatic laboratory, on - line analyzers, smart meters, etc.); Intelligent factory control platform (preheater intelligent control system, kiln intelligent control system, grinding intelligent control system, etc.).
- Group information platform (production management, equipment management, energy management, logistics management, warehousing management, etc.).
- Group cloud interactive platform (intelligent decision system, intelligent optimization system, the group cloud view system),
- Smart factories full life cycle consulting and implementation of overall solution for process management.



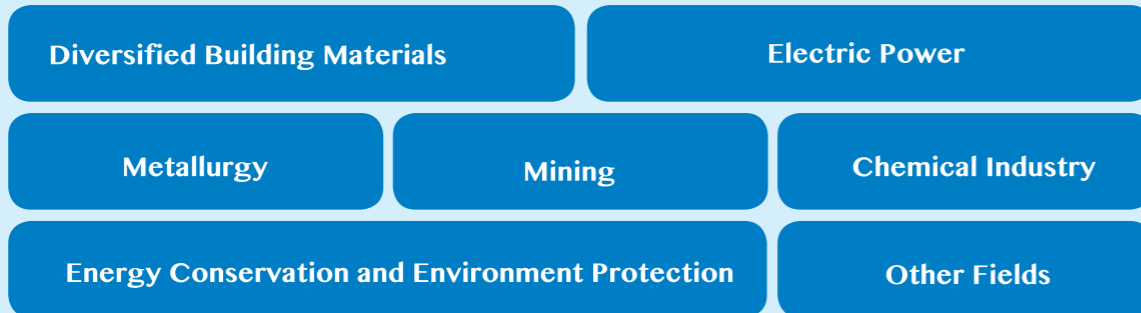
Full-range of Spare Parts Supply

TCDRI provides “spare parts general contracting”to the customers and supplies overhaul service one-stop optimization solution as the main business, by the implementation of "going out strategy" in overseas market development as new profit growth point, by building supply chain construction with“ well-known brands alliance” strategy as backup force, as well as six major domestic spare parts warehouse centre as hardware support, by applying “ Chinese cement spare parts supply centre website” and the business management portal system of TCDRI as software support , to provide fully service to domestic and overseas cement manufacturers.



New Business Development

Previously engineering general contracting services is the main business form of TCDRI, now the development of our business is covering diversified building materials, electric power, mining, metallurgy, chemical industry, environmental protection and other fields.



Quarry Field

1. Mining project design and EPC
2. Ore crushing transportation and storage design and EPC
3. Long distance belt conveyor design and EPC
4. Aggregate production line project design and EPC
5. Road project design and EPC



Waste Disposal Field

Waste Co-processing and De-NOx technologies have been widely applied in cement industry. 50 projects have been completed for sewage sludge, municipal waste, hazardous waste and normal solid waste with the international advanced level, including the Beijing cement plant, Zhejiang Hongshi cement plant, Xi'an Yaobai Fuping cement plant etc.

Project Characteristics

- (1) Normalized pre-treatment- ensure the waste stable feeding into kiln system
- (2) Waste in different shape and properties to be disposal in the most suitable position .
- (3) Product quantity, quality and environmental index all meet the requirement.



Agricultural Mineral Fertilizer Field

Developing insoluble potassium resources and producing Si-Ca-K-Mg Mineral Fertilizer:

- TCDRI possessed the rotary kiln activation and combustion technology for producing Mineral Fertilizer, by means of proportioning scheme, process solution and main equipment research and optimization.
- The research is financially supported by National Key Research & Development Program of China.
- TCDRI Mineral Fertilizer can provide more than 10 nutrient elements (Si, Ca, K, Mg, Fe, and Zn and so on) and adjust soil acidity. The product has been applied on more than 30 kinds of crops in more than 50 counties and cities, receiving amazing results with more than 3 years of field trails. TCDRI Mineral Fertilizer has become an important upgrading strategy due to its prominent results.
- TCDRI is planning to realize the total output capacity of 1,000,000 tons in 2020 domestic and overseas, and becoming the biggest company in the field of Soil improvement & Green ecological agriculture all over the world.





Achievements

Advanced concept, superb technology, considerate service and sustained efforts has shaped the brand of TCDRI, won the market and achieved remarkable results.



Jiangxi Wannian Cement Plant, China's first 2,000t/d new dry process cement production line, operated in 1986



Lafarge Chongqing 2,500t/d Line 2, our company's first EPC project for Lafarge, operated in 2005

Hebei Jidong Cement Plant Line 2, China's first localized equipment 4,000t/d production line, operated in 1996



Tibet Gaozheng Building material Co., Ltd. 2,000t/d Project, the highest altitude new dry process cement production line in the world (elevation is 3720 meters) , operated in 2004



Conch Zongyang Cement Co., Ltd Phase 3 Line 1, China's first 10,000 t/d new dry process cement production line, operated in 2004





Anqing Aalborg 1,300t/d White Cement Plant, the largest scale white cement production line in the world, operated in 2009



Egypt GOE 2×5,000t/d Cement Production Line, EPC and production operation service, operated in 2010



Heidelberg INDOCEMENT- P14 10,000t/d Project, our company's first EU standard overseas ten-thousand-ton-level EPC project, operated in 2016



Malaysia Hume Cement Line 1 & Line 2, with our company's all equipment products application, operated in 2012 & 2016

Indonesia BATURAJA 5,000t/d cement production line EPC project, complete all workshop performance tests 137 days in advance of contract and obtain PTCC(PAC) certificate issued by owner, the fastest construction period in Indonesia's history, operated in January 2018.



Heidelberg Guangzhou Sludge Treatment Project, dry sludge feeding into cement kiln for incineration, replacing partial raw materials and fuel, also achieving the complete sludge harmless disposal, which is the international advanced level, operated in 2008





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