



中信重工
CITIC HEAVY INDUSTRIES



COMMINUTION EQUIPMENT

PROCESS TECHNOLOGY
www.citic-hic.com

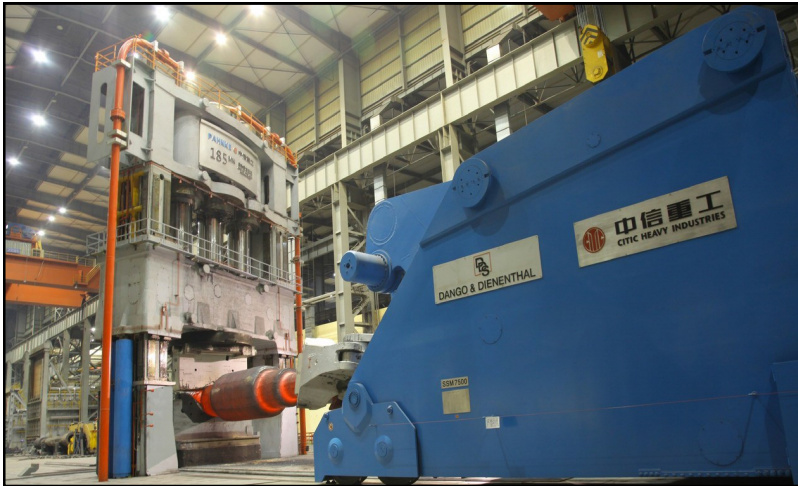
HEAVY MANUFACTURING

Introduction to CITIC Heavy Industries

CITIC HIC commenced business in 1958. After more than 50 years of evolution and development it has become a significant global supplier of mining, cement and metallurgical equipment. Our manufacturing facilities are located in Luoyang, China, and Pontevedra, Spain.

CITIC HIC produces over 200,000 tons of quality equipment annually. Our products include grinding mills, scrubbers, crushers, kilns, coolers, hoists, reducers, steam turbines and compressors. CITIC HIC also manufactures heavy castings and forgings, as well as electric/hydraulic control and lubrication systems.

Our factory in Luoyang covers more than 3 million square meters, of which 2 million square meters is under cover. It has a total workforce of approximately 10,000 employees of which more than 1,200 are engineers.



CITIC HIC has offices in Australia, Brazil, Canada, Chile, India, South Africa and Spain.

We encourage you to visit our impressive facilities.

CITIC HIC is the second-largest manufacturing facility in China.

The 18,500t forging press (see photo on left) is the world's largest, capable of handling a 400t single piece forging.

Our large casting workshop can pour a single 900t steel casting.

Facilities include:

- 3,000 machines including 70 large CNC machines
- CNC vertical boring up to $\varnothing 16\text{m}$
- Gear cutting up to $\varnothing 16\text{m}$
- Overhead crange up to 600t (height of 26m)
- Automatic welders up to $14 \times 10\text{m}$
- Multiple heat treating furnaces
- Shot blasting chamber up to $4.5\text{m} \times 30\text{m}$
- Mechanical assembly and testing facility

CITIC HIC is ISO9001 compliant and strives to promote an open and transparent quality management system ensuring continuous improvement.



Grinding Mills

CITIC HIC manufactures every component at our own works other than electric motors. Our designs range from 1.2m diameter up to 13.6m diameter with installed power of 35,000kW. Our grinding mills can be fully assembled and trial run at our facility prior to dispatch.

We also offer a 'Mill Enhancement Package' which includes the complete mill control system, temperature and vibration monitoring, oil film thickness analysis and other options to increase equipment availability.



Factory test run of AG Mill $\Phi 10.37\text{m} \times 5.19\text{m}$ (F/F) and Ball Mill $\Phi 7.32\text{m} \times 10.68\text{m}$ (F/F) for Jiangxi Copper Group's Dexing Copper Mine



Operating AG Mill $\Phi 10.37\text{m} \times 5.19\text{m}$ (F/F) and Ball Mill $\Phi 7.32\text{m} \times 10.68\text{m}$ (F/F) at Jiangxi Copper Group's Dexing Copper Mine



World's largest 6 of AG Mills $\Phi 12.2\text{m} \times 11\text{m}$ (F/F) with 28000kW Gearless Mill Drives
 And 6 off Ball Mills $\Phi 7.9\text{m} \times 13.6\text{m}$ (F/F) with 2 x 7800kW at
 CITIC Pacific Mining's Sino Iron Mine

Stirred Mills

The popularity of stirred media mills has risen in recent times. CITIC HIC has developed our own range of stirred media mill to complement our conventional grinding mills range, we have research and development team in Australia and China constantly working on improving the technology and efficiency of our Stirred Mills

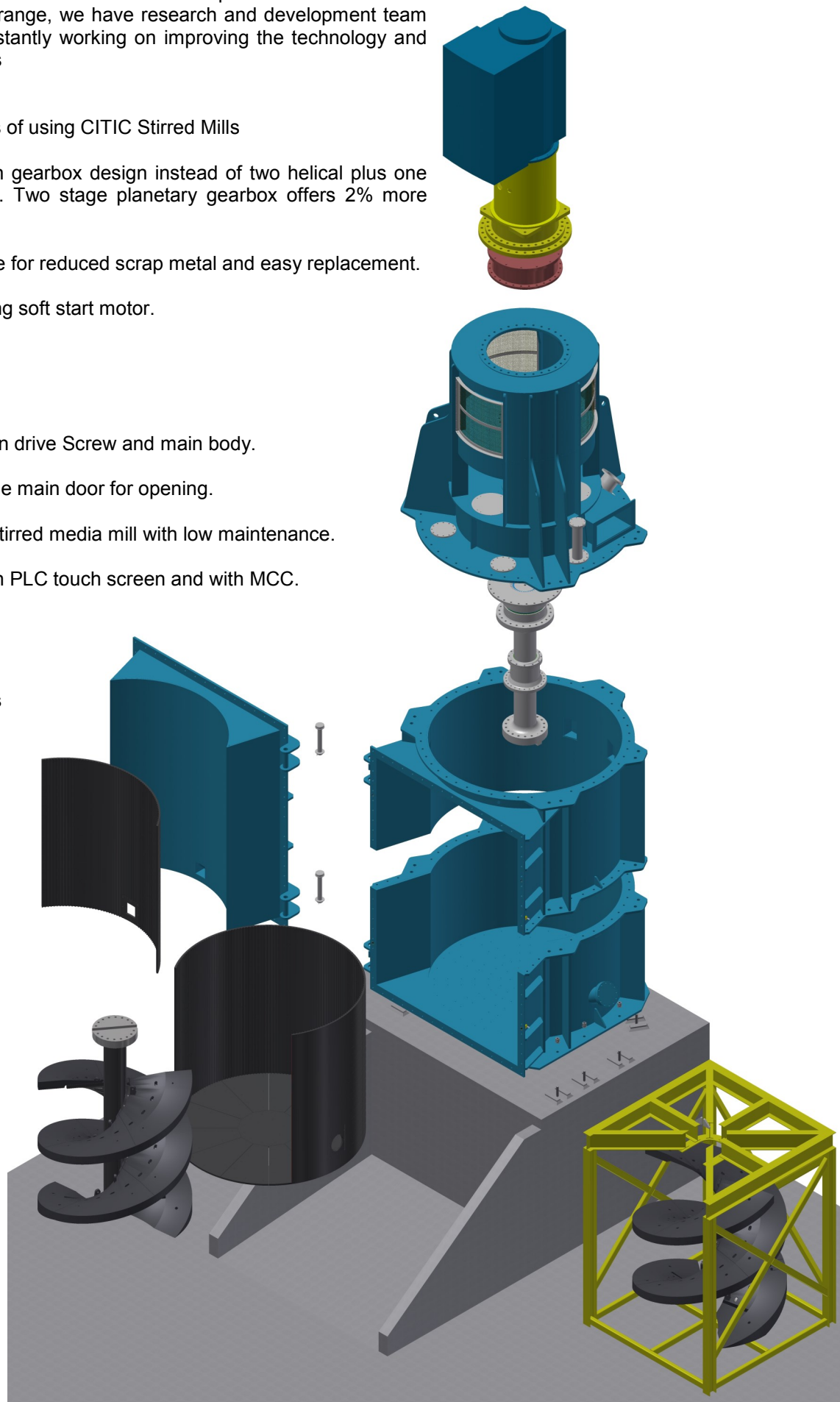
Design features/advantages of using CITIC Stirred Mills

1. Two stage planetary main gearbox design instead of two helical plus one planetary gearbox design. Two stage planetary gearbox offers 2% more efficiency.
2. Better design digging shoe for reduced scrap metal and easy replacement.
3. High efficiency high starting soft start motor.
4. Solid main screw shaft.
5. Magnetic shell liners.
6. Complete in-house FEA on drive Screw and main body.
7. Hydraulic jacks to crack the main door for opening.
8. High availability of CSM Stirred media mill with low maintenance.
9. Optional control panel with PLC touch screen and with MCC.

Range of CITIC Stirred Mills

| Models | Power |
|----------|--------|
| CSM250 | 250kW |
| CSM800 | 800kW |
| CSM1000 | 1000kW |
| CSM1200 | 1200kW |
| CSM1600 | 1600kW |
| CSM2000 | 2000kW |
| CSM2500 | 2500kW |
| CSM3000 | 3000kW |
| CSM3750 | 3750kW |
| CSM4500* | 4500kW |

*CSM 4500 is currently under design optimization phase and will soon become available commercially.



Gyratory Crushers

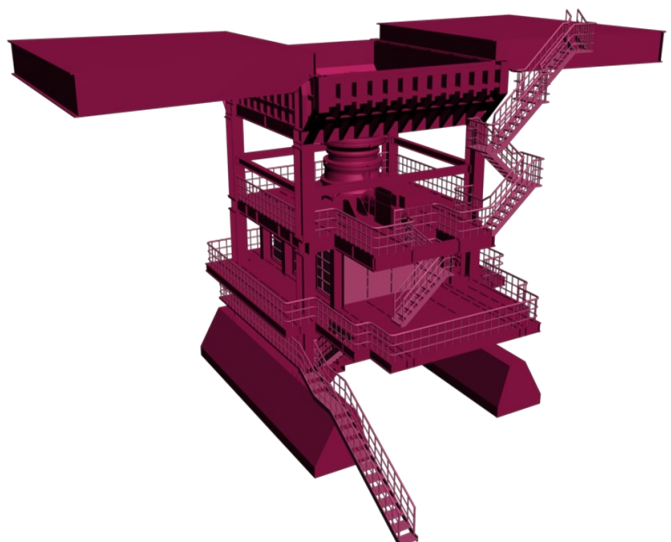
CITIC HIC manufactures every component at our own works other than electric motors. Our Gyratory Crusher designs range from 110-165 (42"-65") up to 152-287 (60"-113") and can handle feed sizes up to 1300-1400mm and capacities to 8000tph.



Workshop assembly and testing of Model PXZ137-191 (54"-75")



Site assembly Gyratory Crusher



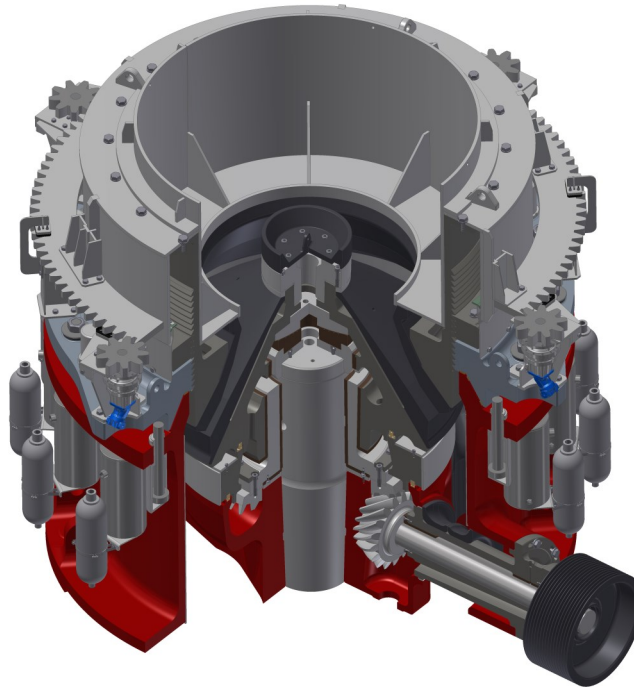
Semi-Mobile Crushing Station 3D model

Cone Crusher

CITIC HIC CC series cone crushers are designed with productivity, reliability and availability in mind. The CC crushers are a robust design capable of operating reliably in the most arduous applications in the mining and aggregate industries. The manufacturing capabilities of CITIC-HIC means that over 95% of the crusher can be manufactured in our own facilities. This allows greater control of the quality and lead times of our equipment.

Our Cone Crusher designs range from CC400 (536HP), CC500(670HP), CC600(804HP), CC800(1072HP) and CC1000 (1340HP).

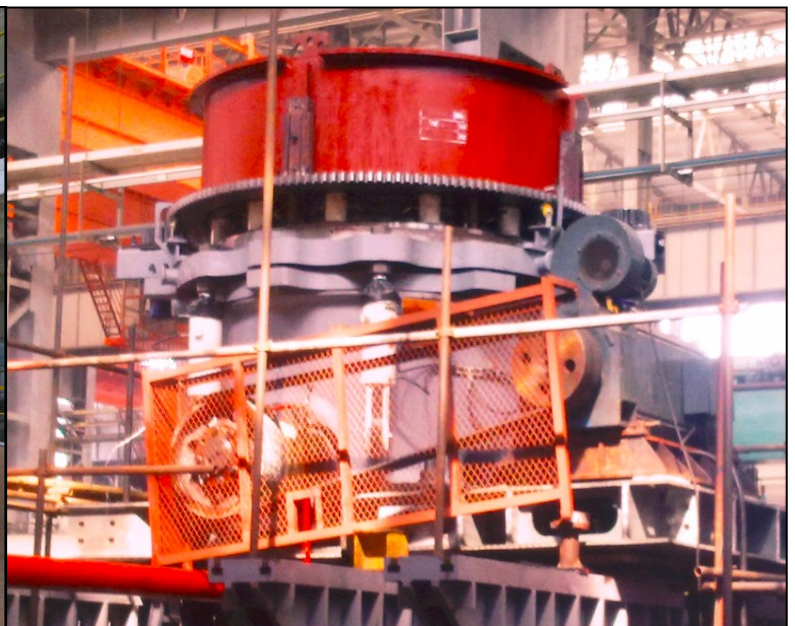
We also offer a 'Crusher Enhancement Package' which includes the complete crusher control system, temperature and vibration monitoring and other options to increase equipment availability.



3D Model of CC (CITIC Cone) Crusher



Site installed Cone Crusher Model CC500



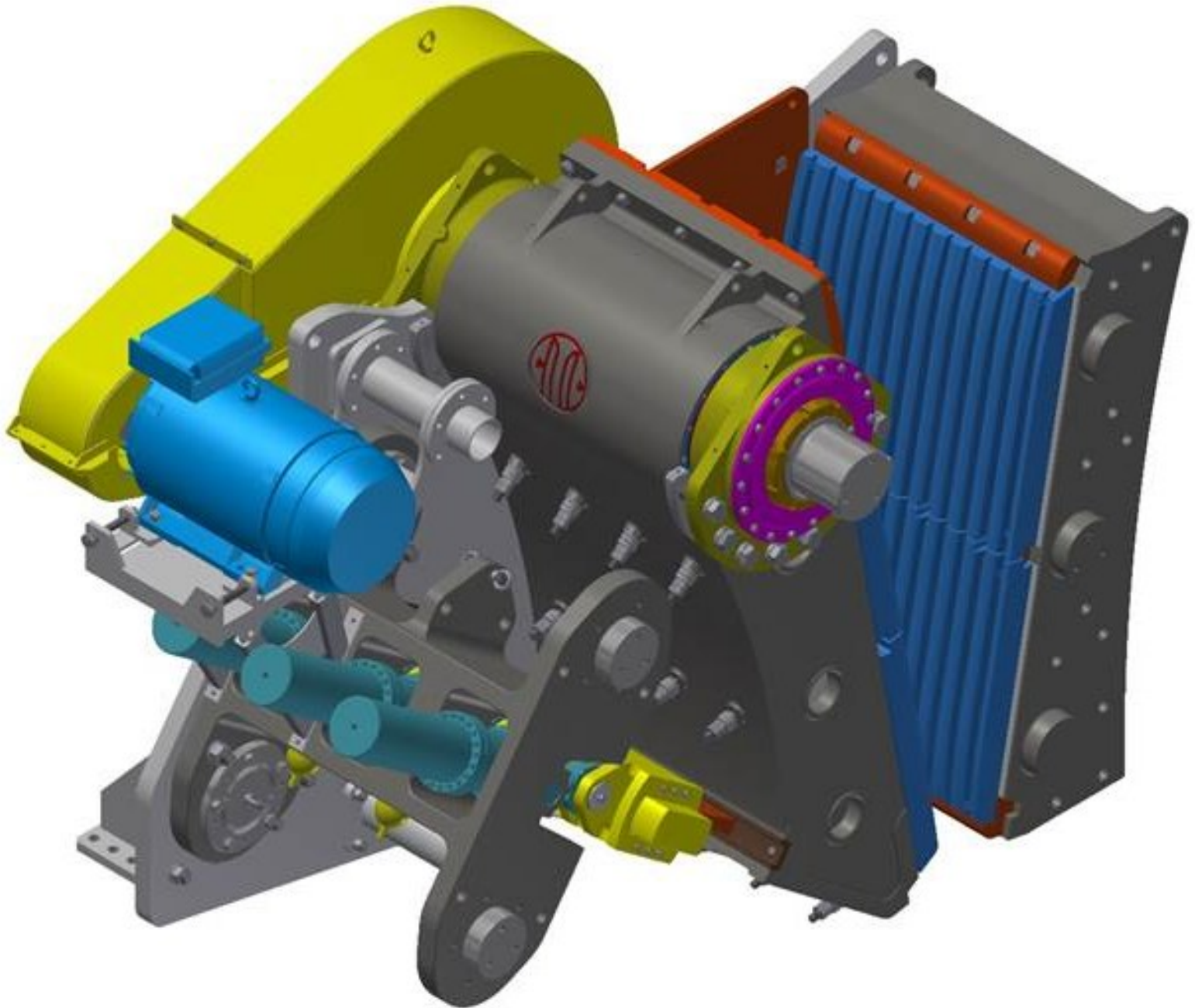
Factory assembled of Cone Crusher

CITIC HIC's ongoing commitment and support will work closely with our customers to optimise the performance of the crusher, through cavity studies and liner optimisation.

Auto Jaw Crusher

The CITIC-HIC AJ (Auto Jaw) Range of single toggle jaw crushers incorporates the use of a hybrid cylinder (patent pending) toggle system. The new design of toggle system has made the operation and maintenance of the jaw crusher is simpler and safer than other jaw crushers currently available in the market. The traditional tension rod system has been eliminated and replaced by a hybrid cylinder, the toggle arrangement allows for the equipment to be easily adjusted. This design also provides tramp relief for the equipment which adds another level of protection to the machine and minimises potential damage to the crusher when tramp material enters the crushing chamber.

An added advantage of this system, the crusher is able to be adjusted while the machine is running, which improves productivity of the crusher. The toggle system has also been designed with maintenance in mind, the toggle system pivots outward to create easy access to the toggle area for maintenance purposes.



CITIC Auto Jaw Crusher

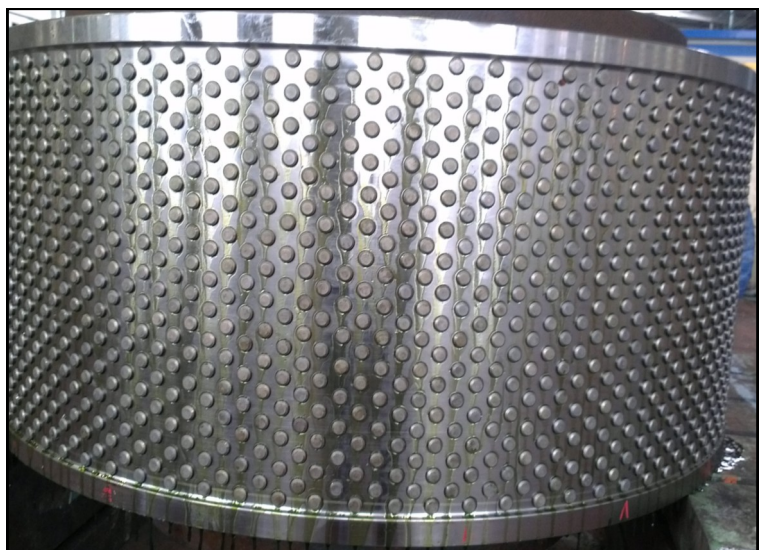
We also offer a 'Crusher Enhancement Package' which includes the complete crusher control system, temperature and vibration monitoring and other options to increase equipment availability.

High Pressure Grinding Rolls (HPGR)

CITIC HIC designs and manufactures a range of HPGRs to suit the cement and mineral processing industries. Our HPGR designs range from 120-50 (2 x 355kW) to 240-180 (2 x 3150kW).

Standard features include:

- Constant setting and pressure control
- Autogenous wear protection of rolls ensuring improved wear life
- Structurally sound welded frame verified using FEA complying to strictest design codes
- Dual planetary reducer drive system
- Four cylindrical roller bearings design
- PLC control system complete with operator panel
- 'HPGR Enhancement Package' which includes the complete HPGR control system, temperature and vibration monitoring and other options to increase equipment availability



Metallurgical and Other Products

CITIC HIC also supplies a range of rotary kilns, coolers, converters, furnaces, waste heat recover generators, vacuum disc filters, steam turbines and generators.



Three active lime rotary production lines 1000t/d



Φ4.4m × 20m Mixer



3500mm × 660mm Steckel Roller Mill



250t Converter



Waste heat from cement kilns power generation project

CITIC SMCC Process Technology

CITIC SMCC provides a range of technical services for mining companies in the areas of comminution circuit design, technology and equipment selection, and optimisation of mineral processing plants.

Dr Stephen Morrell, a world leading expert in comminution design and the founder and owner of SMCC, continues to work with CITIC SMCC for ongoing and future comminution projects, under a strategic partnership agreement. Dr Mike Daniel, who is also an expert in the comminution field, is also working with CITIC SMCC.



The formation of CITIC SMCC will expand CITIC HIC's current technical services and provide more complete solutions to its customers with the best suited solutions for milling technology selection, comminution circuit design and plant optimisation, which becomes more and more important due to the fact that typically a milling circuit constitutes over 70% of the overall capital equipment cost of a concentrator plant.

Following are the main technical services CITIC SMCC provides for mining companies and their projects:

- Laboratory and testing services
- Mine-to-mill studies
- Grinding technology and mill selection engineering studies
- Comminution circuit design for greenfield and brownfield projects
- Modelling and simulations for comminution circuits
- Geo-metallurgical modelling
- Comminution plant optimisation



Total After Market Services

CITIC HIC manufacture and service the Aftermarket in the following products: shaft hoists, crushers, grinding mills, rotary kilns, high pressure grinding rolls and scrubbers, heavy-duty gear reducers as well as other equipment.

Training Programs

We offer customer training programs designed around your equipment.

- To train your operators in the proper use of the equipment.
- To train your maintenance staff to troubleshoot the equipment.

This helps you get up and running faster and aids CITIC-HIC by providing valuable information about the problem areas prior to our service people coming to your site.

Maintenance training is one of the single most important parts of optimising maintenance operations. There are many disciplines necessary to enable maintenance to contribute to the profitability of any site. From work order control systems to preventative and predictive programs, maintenance planning and schedule programs computerised maintenance management systems all require resourced training.

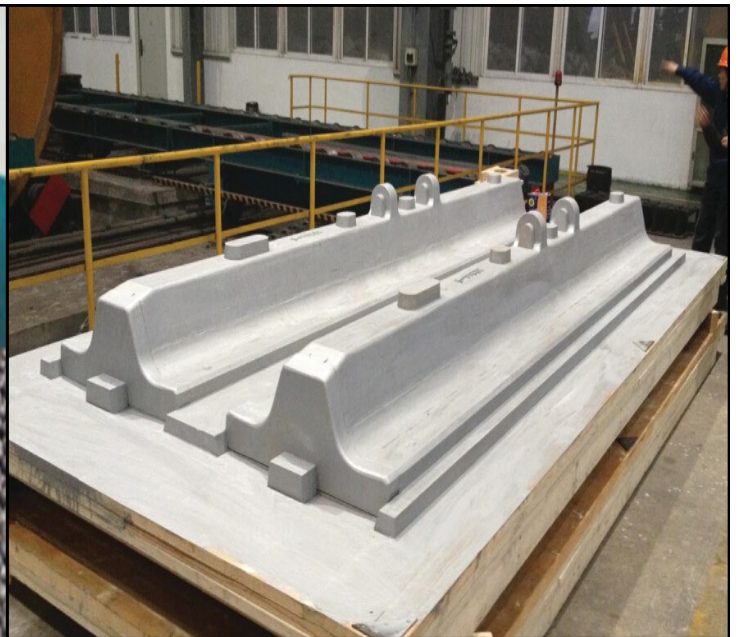
Preventative Maintenance Programs

Our PMP (Preventative Maintenance Programs) programs are tailored for each individual customer according to equipment, environment and usage. Ideally our Service Engineer would schedule a Preventive Maintenance Service Call every six months or at your convenience at which time they will perform the scheduled maintenance on your equipment.

CITIC HIC also offer forged steel balls (Grinding Media) & Cr-Moly steel liner for Grinding Mills and Manganese liners for all type of JAW, Cone and Gyratory crushers including other OEM supplied equipment. Furthermore we can supply spare parts for all other OEMs on request.



FORGED GRINDING MEDIA



GRINDING MILL STEEL LINER

Contact Details



CITIC Heavy Industries Co., Ltd

206 Jianshe Road, Luoyang,
Henan Province
471039 China

Head Office

Tel +86 379 6408 8888
Fax +86 379 6421 4680
Email: info@citic-hic.com.cn



CITIC SMCC Process Technology Pty Ltd

Cnr Coonan St. & Riverview Tce.
Unit 201, 167 Coonan Street,
Indooroopilly QLD 4068 Brisbane,
Australia

Tel +61 7 3720 3200
Fax +61 7 3720 3226
Email: info@citic-smcc.com
Web: www.citic-smcc.com



CITIC HIC Gandra Censa S.A.U

36400 Porrino (Pontevedra) ,Spain
Spain Office/Manufacturing Facility

Tel +34 986 34 6000
Fax +34 986 34 6268
Web: www.citic-censa.com
Email: secreteria@citic-censa.com

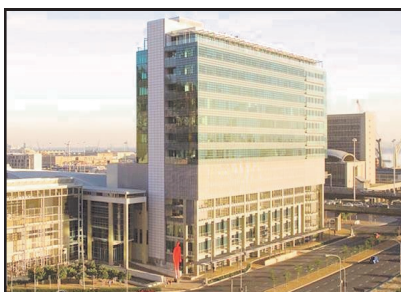


CITIC HIC Australia Pty Ltd

Level 2, Small Tower, Gateway
Business Park, 63 Parramatta Road,
Silverwater NSW 2128 Australia

Sydney Office

Tel +61 2 9735 5600
Fax +61 2 9737 0133
Email: info@citic-hic.com



CITIC Heavy Industries South Africa Pty Ltd

8th Floor Convention Towers
Cnr Heerengracht & Coen Steytler Rd
Cape Town, South Africa

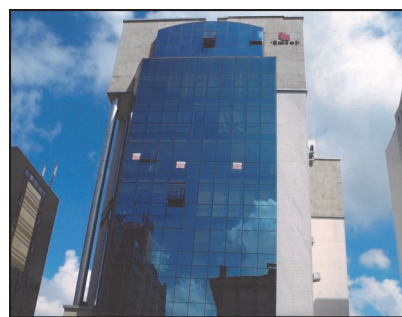
Tel +27 21 4014572
Fax +27 21 4014561
Email: infoae@citic-hic.com



CITIC HIC North America

6500 Trans Canada, Suite 320 Pointe
Claire, QC H9R 0A5 Canada

Tel +1 514 447 6111
Email: infona@citic-hic.com



CITIC Heavy Industries Brasil

Alameda da Serra, 400-9 floor
Nova Lima MG Brazil
Zip code 34.000-000

Brazil Office

Tel +55 31 3589 5600
Fax +55 31 3589 5601
Email: infofr@citic-hic.com



CITIC Heavy Industries Chile SpA

Isidora Goyenechea 2939 ,
7th Floor - Of. 702 Las Condes,
Santiago, Chile

Tel +562 2303 9390
Email: infosac@citic-hic.com



**AFTERMARKET SERVICES
CITIC HIC Sydney Australia**

Tel +61 9735 5611
Email: aftermarket@citic-hic.com