CITIC STIRRED MILLS (CSM)
A high proportion of new base metal resources are tending to be relatively fine grained which ultimately require grinding below 45 microns. As grinding gets finer, the surface area increases exponentially as does the power requirement. The traditional tumbling mills have been used for centuries for fine grinding, they have become inefficient with the development of stirred media mills in recent times, which have become the preferred option for regrind and fine grinding applications. There are only a few manufacturers producing stirred media mills in either vertical or horizontal design.

**CITIC RANGE OF STIRRED MILLS**

<table>
<thead>
<tr>
<th>Models</th>
<th>Power</th>
<th>Overall Dimension</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSM800</td>
<td>800kW</td>
<td>4000×4200×13000</td>
</tr>
<tr>
<td>CSM1000</td>
<td>1000kW</td>
<td>4500×4600×14000</td>
</tr>
<tr>
<td>CSM1200</td>
<td>1200kW</td>
<td>4900×5200×15000</td>
</tr>
<tr>
<td>CSM1600</td>
<td>1600kW</td>
<td>6300×6200×16400</td>
</tr>
<tr>
<td>CSM2500</td>
<td>2500kW</td>
<td>7900×7700×18550</td>
</tr>
<tr>
<td>CSM4000*</td>
<td>4000kW</td>
<td>TBA</td>
</tr>
</tbody>
</table>

* CSM 4000 is currently under design optimization phase and will soon become available commercially.
Grinding Power efficiencies are achieved by 100% filling of charge and smaller steel media (balls) used for fine grinding. Typically, stirred media mills use 25mm make-up balls, where conventional ball mills are using much larger grinding media.

The popularity of stirred media mills has risen in recent times. CITIC HIC has developed our own range of stirred media mills 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 equipment.

**FEATURES**

**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.
Experience & Know How

CITIC HIC commenced business in 1958. After more than 50 years of evolution and development it has become a significant global supplier of mining machinery equipment in the World. The works of CITIC HIC are located in Luoyang city, China. The factory at Luoyang covers more than 2 million square meters, of which one million square meters is under cover. It has a total workforce of approximately 10,500 of which more than 1,400 are technicians. Within CITIC HIC works there are 10 manufacturing departments including the Engineering and Design facility. These manufacturing departments produce quality products ranging a broad spectrum of disciplines including casting, forging, heat treatment, machining, fabrication, unit assembly, electric controls and hydraulic control systems.

CITIC HIC produces over 200,000 tons of quality equipment annually. This equipment covers a broad range of industries and product types including mining, crushing, hoisting, washing, gearing, automation, construction, excavation, power generation, research and others.

It is this broad spectrum of experience that provides our customers with confidence in CITIC HIC.
Machinery & Fabrication

CITIC HIC is extremely well equipped in relation to fabrication work. CITIC HIC is also a designated Training Base of the National Welding Institute. Over recent years CITIC has further expanded its machine base to include some of the largest machines in China, and in some instances the world.

Facilities include:
- More than 70 CNC based machines
- 80,000t annual fabrication capacity
- NDT and mechanical testing Laboratory with UT and RT equipment manned by certified technicians
- More than 3000 machines (incl. >70 CNC machines) including:
  - 105mmx4000mm & 160mmx4000mm Horizontal Plate Rolls
  - Automatic welders (14x10m, 10x10m, 7×7m, 6×6m, 5×5m...)
  - Narrow Gap welding units
  - Unionmelt welding, gas shield and arc welding units
  - A 4.5m×30m shot blasting chamber
  - Multiple heat treating furnaces ranging from Ø2mx30m shaft furnace to 9mx9mx15m furnaces as well as carburizing furnaces
  - Ø16m, 13m, 12m, 10m, 5m, 4m, 2.8m, 1.6m Gear Cutting Machines
  - Ø5m, 4m, 2.8m, 1.25m CNC Gear Grinding Machines
  - 600t Overhead crane (height of 26m)
  - Other cranes include 300t, 250t, 200t, 150t, 82t, 75t, 32t and others
  - Fabrication straddle 36m x 132m
  - Three Roll Straighteners
  - Ø16m CNC Vertical Borer
  - Also available to CITIC HIC are four external Fabrication and Machining works capable of producing large sized cement kilns up to 6m diameter and 95m long

Forgings

CITIC HIC possess hydraulic presses of 18500t (the largest in the world), 8400t, 3150t, 1600t using Open hammer and Die forging techniques. It can produce free forgings up to 400 tons, ring roll forgings up to a maximum diameter of 5.5m and 10 tons in carbon steel, alloy steel, heat-resistance alloy steel and non-ferrous alloy steels including copper, aluminum, titanium.
Lab equipment

- Jkmrc drop weight tester
- Ball Mill
- Vibrating mill
- V-type separator
- Lazer size analyser
- Riffle sampler
- Dry grinding
- HPGR
- Dry classifier
- others

Laboratory

CITIC HIC also has a fully equipped laboratory on site for material testing and reporting. Through material testing and analysis we can accurately select the right equipment to meet your requirements.

Testing Available

- Specific Gravity
- Hardness
- Compressive Strength
- Crushing Work Index
- Rod Mill Work Index
- Ball Mill Work Index
- HPGR Testing
- Particle Size Analysis
- Lime Calcining Test
- Flotation Testing
- Drying
- Others

Simulation

Further, at CITIC HIC we also run various software packages in order to simulate process circuits thereby optimizing equipment selection and operation. These software packages include:

- JK SimMet
- JK SimPlant
- MillTraj
- Various in-house programs
Total customer satisfaction is our everlasting pursuit!

CITIC HIC is ISO9001 accredited. With all the necessary qualified personnel, equipment and experience to ensure your equipment exceeds your quality expectations.

CITIC HIC works with leading mining equipment manufactures as well as EPCM’s and End Users around the globe to achieve international quality standards working to industry accepted specifications.

Our experience and expertise are there for you to rely on.

Quality Matters!

ISO9001:2000 Certificate
ISO14001:2004 Certificate
GB/T28001-2001 Certificate
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