Industrial Solutions

Gyratory crushers

State-of-the-art technology with throughput rates of up to 14,000 t/h
Our solutions for the hardest jobs

When it comes to the crunch, crushing systems from thyssenkrupp Industrial Solutions offer the ultimate in performance, reliability and cost-effectiveness. With us as your partner, you can expect the optimum, customized solution for even the most demanding of jobs.

Call on our services and you can count on a wealth of experience and constant innovative drive. As a leading manufacturer of machines and plants for the aggregates and mining industry, we supply well-engineered crushing systems that have stood the test of time in the hardest service conditions. At the same time, we invest in intensive research and development work to make proven solutions even better and to adapt to changing demands.

Fields of application and design characteristics

When it comes to crushing blasted hard rock in ore and natural stone mining, the efficiency of thyssenkrupp gyratory crushers in primary crushing is second to none.

With crushing chambers of varying designs, these machines have either a high crushing ratio for preparing raw materials for secondary crushing or a low crushing ratio for reducing overburden for transportation by belt conveyors.

The design of our gyratory crushers and jaw gyratory crushers is based on over one hundred years of experience gained by thyssenkrupp in the manufacture of these machines. Changing mining and processing techniques demand, besides new materials and design methods, continuous development of the products. thyssenkrupp gyratory crushers represent today’s state-of-the-art. They are designed for high performance and, at the same time, cost-effective operation, i.e. low servicing and maintenance costs.

Applications
• Large ore mines
• Limestone and cement industries
• Open pit and underground mining
• Aggregates industry

Features
• Cyclo-palloid spiral bevel gear
• Higher-capacity drive motors if required
• Rugged design
• Direct feed possible
• High throughput rate
• Optimum degree of comminution
• Stroke can be changed by adjusting the eccentricity
• High starting torque makes it easier to start the crusher under load (emergency case)
• Hydraulic main shaft adjustment for overload protection and to adjust the crushing gap to compensate for wear
• Low operating and maintenance costs
• Includes “Gyramatic” control system

Whether a standard or special design thyssenkrupp Industrial Solutions can provide the optimum solution to meet your needs. Our flexibility is a major plus. We act on your specific requirements and adapt our systems to suit the material to be crushed and the product size required, optimizing proven technology according to your specifications. The benefits of our systems are numerous: high throughput coupled with low costs, minimum maintenance, ease of operation and maximum reliability.
Design

A. Spider bearing in two-armed spider ensures spacious feed opening, automatic lubrication with electronic and visual level control
B. Main shaft
C. Crushing elements made of high-wear-resistant material
D. Cast steel shell sections; weight-optimized by means of FEA
E. Low-maintenance dust seal that is highly efficient as it is pressurized
F. Large material discharge openings thanks to three-armed bottom shell
G. Eccentric bearing assembly with inner bearing that can be replaced, or in some models turned, to adjust the stroke, integrated counterweight to correct imbalances
H. Countershaft assembly with a device for adjusting the backlash, reliable lubrication thanks to hermetically sealed splash lubrication, electronic and visual oil level and temperature control. Option: vibration monitor
I. Bevel gear and pinion of a cyclo-palloid spiral type ensures extremely smooth running
J. Step bearing
K. Hydraulic cylinder for easy main shaft adjustment under load

The bevel gear and pinion of the crusher are both of a cyclo-palloid spiral type, which allows greater forces to be absorbed and greater drive power to be installed.

In this way the crushing gap located between the fixed concaves in the crushe shell and the eccentrically gyrating mantle continuously changes.

The feed material that is fed into the crushing chamber from above is progressively crushed between the crushing elements (C), finally exiting the crushing chamber at the bottom (F) under the influence of gravity.

The crushing gap is adjusted by hydraulically lifting or lowering the main shaft. This hydraulic shaft adjustment is used mainly when crushing abrasive material and when the gap frequently needs to be corrected.

It also serves as overload protection when uncrushable tramp material enters the crushing chamber.

Moreover, the main shaft hydraulics make it easier to restart the crusher in an emergency when the crushing chamber is full by venting the main shaft from lifting off of the step bearing under adverse crushing conditions.

A pre-pressurized hydraulic system (balance unit) ensures continuous contact between the individual step bearing discs and prevents the main shaft from lifting off of the step bearing under adverse crushing conditions.

The feed material should be at least 20% smaller than the width of the feed opening. Adjustment drawing with fitting dimensions and loads on request.

The fixed material should be at least 20% smaller than the width of the feed opening. Arrangement drawing with selecting lifting dimensions and loads on request.

<table>
<thead>
<tr>
<th>Type</th>
<th>Feed opening</th>
<th>Mantle diameter</th>
<th>Speed eccentric bushing</th>
<th>Power motor</th>
<th>Total weight of gyratory crusher</th>
<th>Spider</th>
<th>Bottom shell</th>
<th>Main shaft</th>
<th>Eccentric bushing</th>
<th>Hydraulic cylinder</th>
</tr>
</thead>
<tbody>
<tr>
<td>KB 54-67</td>
<td>1,370 / 54</td>
<td>1,600 / 75</td>
<td>280 / 175</td>
<td>137</td>
<td>450</td>
<td>800</td>
<td>3,600</td>
<td>4,497</td>
<td>200</td>
<td>8,910</td>
</tr>
<tr>
<td>KB 54-75</td>
<td>1,370 / 54</td>
<td>1,960 / 75</td>
<td>280 / 175</td>
<td>137</td>
<td>650</td>
<td>800</td>
<td>3,600</td>
<td>4,497</td>
<td>200</td>
<td>8,910</td>
</tr>
<tr>
<td>KB 63-75</td>
<td>1,600 / 63</td>
<td>2,030 / 80</td>
<td>280 / 175</td>
<td>137</td>
<td>650</td>
<td>800</td>
<td>3,600</td>
<td>4,497</td>
<td>200</td>
<td>8,910</td>
</tr>
<tr>
<td>KB 63-89</td>
<td>1,600 / 63</td>
<td>2,260 / 89</td>
<td>280 / 175</td>
<td>137</td>
<td>650</td>
<td>800</td>
<td>3,600</td>
<td>4,497</td>
<td>200</td>
<td>8,910</td>
</tr>
<tr>
<td>KB 63-114*</td>
<td>1,600 / 63</td>
<td>3,300 / 130</td>
<td>280 / 175</td>
<td>137</td>
<td>650</td>
<td>800</td>
<td>3,600</td>
<td>4,497</td>
<td>200</td>
<td>8,910</td>
</tr>
</tbody>
</table>

The crusher configuration.

They depend on the feed characteristics and the crushe configuration.

The technical data is available for request.

All data should be used as a guide only and are not guaranteed.
The main characteristic of jaw gyratory crushers is their enlarged feed opening which is located on one side of the crusher only. It is normally serrated and, together with the upper part of the mantle, it forms the initial crushing zone. The coarsely crushed material is then reduced to the desired product size in the crushing chamber below. Jaw gyratory crushers can handle much bigger chunks of material than comparable gyratory crushers of the same mantle diameter. Jaw gyratory crushers feature a higher crushing ratio and less tendency to become clogged in the feed zone as a result of bridging.

Fields of application
- Coarse feed material
- Block cave mining
- Underground mining

The feed material should be at least 20% smaller than the width of the feed opening. Arrangement drawing with fitting dimensions and loads on request.

The feed openings of all Bauer crushers are large and perfectly aligned with the mantle. The angle at which the feed particles enter the crushing chamber is determined by the opening angle, which is ideally 60 degrees.

### Technical data

#### Jaw gyratory crushers

<table>
<thead>
<tr>
<th>Type</th>
<th>Feed opening</th>
<th>Mantle diameter (oversized)</th>
<th>Speed of eccentric bushing</th>
<th>Max. motor power</th>
<th>Total weight of crusher</th>
<th>Spider</th>
<th>Heaviest weight</th>
<th>Bottom shell</th>
<th>Main shaft</th>
<th>Eccentric bushing with bottom</th>
<th>Hydraulic cylinder</th>
</tr>
</thead>
<tbody>
<tr>
<td>BK 54-67</td>
<td>2,640 x 1,350 / 1,040 x 67</td>
<td>1,700 / 68 (1,750 / 69)</td>
<td>137</td>
<td>450</td>
<td>175,000</td>
<td>46,000</td>
<td>34,000</td>
<td>7,100</td>
<td>8,100</td>
<td></td>
<td></td>
</tr>
<tr>
<td>KB 63-75</td>
<td>3,080 x 1,680 / 1,120 x 66</td>
<td>1,900 / 75 (1,950 / 77)</td>
<td>137</td>
<td>650</td>
<td>209,000</td>
<td>50,400</td>
<td>45,500</td>
<td>8,500</td>
<td>9,500</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Throughput [t/h] with open side setting OSS [mm]

<table>
<thead>
<tr>
<th>Type</th>
<th>130</th>
<th>150</th>
<th>170</th>
<th>185</th>
<th>200</th>
</tr>
</thead>
<tbody>
<tr>
<td>BK 54-67</td>
<td>900</td>
<td>1,200</td>
<td>2,500</td>
<td>1,600</td>
<td>3,400</td>
</tr>
<tr>
<td>BK 63-75</td>
<td>1,100</td>
<td>2,400</td>
<td>4,000</td>
<td>3,000</td>
<td>4,600</td>
</tr>
</tbody>
</table>

### Notes

1) Average component weights including internals; safety margins for selecting lifting gear not included
2) including wear cap
3) excluding hydraulic cylinder
4) with “oversized” mantle diameter including crushing elements
5) Min: typical feed material with minimum eccentricity and F80 = 680 mm
Max: typical feed material with maximum eccentricity and F80 = 230 mm
Bulk density: 1,600 kg/m³
All data should be used as a guide only and are not guaranteed.
They depend on the feed characteristics and the crusher configuration.
Crusher drives

Nowadays, thyssenkrupp gyratory crushers are usually driven directly via a disc-pack coupling with a floating shaft and a safety coupling.

The disc-pack coupling compensates for geometric misalignments between the motor shaft and the countershaft while the safety coupling protects the crusher motor from overload when uncrushable tramp material enters the crusher. The floating shaft allows the countershaft to be removed without having to remove the motor.

The “Gyramatic” monitoring and control system for thyssenkrupp Industrial Solutions gyratory crushers ensures easy, safe operation of these crushers in a range of applications. This compact, robust unit consists of a control cabinet with a touch screen terminal. The terminal can be used interactively to input set points and read off operating data.

Gyratory crusher with a disc-pack coupling, floating shaft and safety coupling.

Customized crusher solutions

thyssenkrupp Industrial Solutions develops tailored plant solutions to meet customer requirements.

In particular, thyssenkrupp has a range of wear-resistant spiders and a special concave design, allowing us to offer the right solution for you, whatever the application.
Examples of crushing plants with a gyratory crusher

The performance and availability of gyratory crushers are optimized by designing and configuring the feed and discharge devices to suit the specific crushing job.

Above: One of two primary crushing plants for iron ore and overburden with KB 63-75 gyratory crusher. The crushers are directly fed from two sides by means of dump trucks.

Throughput: > 10,000 t/h

Below: BK 63-75 jaw gyratory crusher installed underground in a copper ore crushing plant.

Throughput: 2,000 t/h

Product: P80 ≤ 150 mm

Feed size in block caving: max. 2,000 x 1,500 x 1,000 mm

Right: Moving a semi-mobile crushing plant with KB 63-114 gyratory crusher for overburden and copper ore.

Throughput: > 10,000 t/h

Our services keep things running smoothly!

We offer our customers not only optimum, customized technical solutions, but also comprehensive, tailored service ranging from the engineering of individual crushers and entire plants to their operation, and modification if needed.

We usually start out by analyzing the storage areas and the feed material. Using state-of-the-art processes we characterize the respective material, which forms the basis for selecting the right crusher and any customer-specific adaptations that may be required. Then we perform testing under field conditions using a clever control and diagnostic system to check the main operating parameters again.

Whenever you need us, the maintenance and repair crews from thyssenkrupp Industrial Solutions are on hand to cater to your needs, from specialist advice, inspections and modifications through modernizations and performance enhancement to damage analyses and repairs, which are performed exclusively by our highly qualified assembly personnel using high-quality, certified spare parts. If necessary, we will maintain and repair your crusher at one of our service centers. You can call on these services not only for crushers from our own production lines, but also for machines manufactured by other suppliers.

Increase the productivity of your machines and plants! Call on our service team today.

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