OVAKO ROCK & ORE
PROCESSING STEEL
OPTIMIZED STEEL FOR PROFITABLE PERFORMANCE
THE SHORTEST ROUTE TO LONG-LASTING PERFORMANCE

From light to extra heavy-duty applications – and all types of wear in between – Ovako is a longstanding supplier of leading steel grades for ore grinding media, as well as for wear parts in crushers and screens. This means we can tailor the optimal steel to extend your equipment life, and deliver in a format that minimizes machining costs and yield loss.

When it comes to manufacturing the toughest components for ore and rock processing equipment, our customers have big ambitions. To meet real-world demands in the field, they need grades tailored to the precise type of abrasive, adhesive or erosive wear their equipment will face. In production, they demand flawless chemical consistency for repeatable hardening processes, along with special profiles and soft bars for easy machining and highly controlled quenching and tempering. This why every batch we deliver is engineered to meet your exacting requirements in terms of load case and manufacturing productivity.

The right wear-resistant steel for your load case

One of the keys to achieving the optimal balance of performance and cost-efficiency is to better understand each individual load case. To do this, we turned to the independent Swerea KIMAB Test Facility to simulate extreme conditions and see how we measure up against other hardening and pre-hardened steels. Based on that experience, we then built our own wear testing rig to optimize our grades for superior performance in each load case. As a result, we now can offer a selection of grades from our wide range of wear-resistant steel, WR-Steel®, to ensure optimal reliability for your components, even in the toughest conditions. It also gives us the knowledge to push the limits and develop new products as your needs evolve.

The right cost savings

Thanks to our integrated special services and logistics offerings, we can optimize all of these characteristics and more to boost productivity all along your supply and production chain. And as one of Europe’s largest suppliers of wear-resistant processing steels, our range is continually expanding. Whatever your ambitions may be, our global sales and R&D teams welcome the opportunity to develop specialized alloys or improved heat treatment steps to give you a sustained competitive edge.
Wear lining. Screen bars. Hammer crushers. In the world of wear parts, there’s never a one-size-fits-all solution. That’s why we’ve developed an industry-leading range of flat, round and profiled bars designed to give you just the right wear-resistant steel grade in the shape, width and profile you need.

Regardless of shape or size, Ovako bars for crushers and screens are mainly delivered in as-rolled condition. This softer steel makes final drilling and additional machining simpler and more flexible, with just a fraction of the wear and tear on your tools. In the following quenching and tempering stages, you can then optimize hardness for your specific requirements.

Add to this extremely tight tolerances and near-net-shape special profiles, and it’s easy to see how we can help bring your machining costs down to a bare minimum. Even basic profiles, such as flats with welding chamfers and rounded corners, can amount to considerable cost savings when compared with slitting of plate and machining the edges.

HOT-ROLLED FLAT BARS

Whether you need to produce crusher hammers or wear plate for lining the crusher’s wear zone, Ovako can supply flat bars in a broad dimension range. The bars are characterized by excellent straightness and shape as well as good surfaces and low decarburization.

The rolled shape is generally flat bars with square corner edges. It can also be rolled as flat bars with different corner radiiuses on request. The most common bar length is 6 meters, but lengths ranging from 2.8 to 21 meters are available. Bars can also be delivered sawn to exact lengths.

HOT-ROLLED ROUND BARS AND SPECIAL PROFILE BARS

Ovako offers both round and profiled bars to support your design specifications. Of course, these are also suitable for use in forging shops to produce hammers and other special wear components. Our hot-rolled round bars are characterized by close tolerances, excellent straightness and roundness, good surfaces and low decarburization. The standard size range is 13–120 mm.

By tailoring hot-rolled special profile bars to your specific needs, we make it possible to lower your costs by reducing multiple manufacturing steps. Special profiles include both symmetrical and asymmetrical shapes, such as the grouser bar shown here.
Every day, our hot-rolled grinding media is hard at work in the most demanding ore and mineral grinding mills and recycling plants. Delivering non-stop, consistent performance across a range of applications.

Whether you’re processing the toughest iron ore or softer recyclable waste, even the smallest variations in the hardness or microstructure of your grinding media can make a huge difference in wear resistance. This is why we’ve devoted decades of experience to ensuring that our high-carbon grinding balls and tailor-made grinding rods meet the highest levels of reliability. As a result, we can offer you long-lasting grinding media, tailored to the dimensions, hardness and grade your operations require.

All of this is due to our combined know-how from in-house steel making and the manufacturing of hot-rolled grinding media. This means we can offer a wide selection of steel grades and treatments in order to optimize performance under working conditions ranging from wet grinding of minerals such as iron, copper, gold and other metal minerals to grinding of recycling materials such as slag, glass and used carbide tools.

**GRINDING BALLS**
Grinding balls are delivered as-rolled or in the quenched and tempered condition. The standard grinding ball steel is A810, with hardness in the quenched and tempered condition. A810 grinding balls maintain the same wear resistance from start to finish. Grinding balls in other steel grades can be supplied upon request.

**GRINDING RODS**
Grinding rods are delivered in the as-rolled condition, or in our newly developed induction-hardened condition. Grinding rod steel is available in types CHA, C100 or C100mod. The dimension range is ø 40–120 mm, and the hardness range is 300–400 HBW.
## THE DIMENSIONS AND HARDNESS TO KEEP YOUR MILL ROLLING

### GRINDING BALLS

<table>
<thead>
<tr>
<th>Ø mm</th>
<th>Weight per ball g</th>
<th>Theoretical weight kg/m</th>
<th>Number of spherical balls</th>
<th>Surface area ball cm&lt;sup&gt;2&lt;/sup&gt;</th>
<th>Surface area m&lt;sup&gt;2&lt;/sup&gt;</th>
<th>Hardness HBW</th>
<th>CHA</th>
<th>Cond.</th>
<th>Bar diameter Ø mm</th>
<th>Hardness HRC</th>
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<td>33</td>
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<td>1,738 x 10&lt;sup&gt;3&lt;/sup&gt;</td>
<td>300-400</td>
<td>40-120</td>
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<td>40-120</td>
<td>300-400</td>
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<tr>
<td>25</td>
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<td>1,390 x 10&lt;sup&gt;3&lt;/sup&gt;</td>
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<td>40-120</td>
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<td>40-120</td>
<td>340-400</td>
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<tr>
<td>30</td>
<td>110</td>
<td>4,520</td>
<td>~9,100</td>
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<td>1,158 x 10&lt;sup&gt;3&lt;/sup&gt;</td>
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<td>175</td>
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#### Mechanical properties

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<th>Chemical composition</th>
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<th>Bar diameter Ø mm</th>
<th>Hardness HRC</th>
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### GRINDING RODS

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<th>Hardness</th>
<th>Nominal standard diameter Ø mm</th>
<th>Weight per ball g</th>
<th>Theoretical weight kg/m</th>
<th>Number of spherical balls</th>
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PROCESSING

STEEL GRADE OVERVIEW

For further information about these and other Ovako grades, see our Steel Navigator on www.ovako.com

<table>
<thead>
<tr>
<th>Application area</th>
<th>Part</th>
<th>Ovako grade</th>
<th>Similar intl std</th>
<th>Steel grade info</th>
<th>Attribute brand</th>
<th>Casting method</th>
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| Chemistry (typical) %

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<th>Cr</th>
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For further information about these and other Ovako grades, see our Steel Navigator on www.ovako.com
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