IMPACT CRUSHERS

- high operating reliability
- low costs for operation and maintenance
- simple attendance and maintenance
PSP Engineering has been producing and supplying impact crushers both with the horizontal and vertical shafts of the rotor used in primary, secondary or tertiary stages of crushing as well as in recycling of building materials. These crushers are also suitable for the one-stage material preparation in the cement industry.

The material is disintegrated by means of the rotating bars and impacts from the fixed plates. Impact crushers are manufactured with capacities ranging from several tons to more than 1800 t/h.

The exceptional operating properties of impact crushers are:

- High operating reliability
- Low cost for operating and maintenance
- Hydraulic opening of the crusher casing for adjustment and easy exchange of crushing elements
- Utilization of the crushing bars up to 40% of the total weight – reduction of operating cost
- Fast exchange of bars thanks to simple original fixing system
- Simple attendance and maintenance
- Crusher capacity does not change when bars are worn
- Highly wear resistant materials of main crushing components
- High throughput
- Degree of comminution higher than with other crusher types
- Outstanding shape index (b_1 < 20%)

Primary impact crushers ODH are used for crushing of medium hard materials such as limestone with the L.A. test higher than 30% usually for a single-stage primary crushing in cement plants where vertical mills are used for raw material grinding. In view of the inlet piece size (up to 1.5 m³) the crusher is equipped with the third finish crushing plate positioned underneath the rotor. The finish crushing plates calibrate the outlet size of the product. They can also be used for crushing of recycling material.

Secondary crushers ODN and ODH are used in the second or third stages of crushing for medium hard or hard materials. In view of hard material crushing, the crushers ODH are equipped with rotors with fixed bars.

### Principle parameters of primary impact crushers ODH

<table>
<thead>
<tr>
<th>Type</th>
<th>Inlet opening size</th>
<th>Entrance</th>
<th>Capacity</th>
<th>El. motor</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>mm</td>
<td>m³</td>
<td>t/h</td>
<td>kW</td>
</tr>
<tr>
<td>ODH 0907 - 1x</td>
<td>600x670</td>
<td>0.03</td>
<td>500</td>
<td>30 - 70</td>
</tr>
<tr>
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<td>45 - 75</td>
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<tr>
<td>ODH 0910 - 1x</td>
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<td>0.05</td>
<td>500</td>
<td>60 - 120</td>
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<tr>
<td></td>
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<td>75 - 110</td>
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<tr>
<td>ODH 0913 - 1x</td>
<td>600x1324</td>
<td>0.06</td>
<td>600</td>
<td>90 - 160</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>75 - 160</td>
</tr>
<tr>
<td>ODH 1110 - 1x</td>
<td>760x1000</td>
<td>0.1</td>
<td>800</td>
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<td></td>
<td></td>
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<td>110 - 200</td>
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<tr>
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<td>800</td>
<td>120 - 250</td>
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<td>132 - 250</td>
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<tr>
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### Principle parameters of secondary impact crushers ODH and ODN

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<th>Type</th>
<th>Inlet opening size</th>
<th>Entrance</th>
<th>Capacity</th>
<th>El. motor</th>
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<tr>
<td></td>
<td>mm</td>
<td>m³</td>
<td>t/h</td>
<td>kW</td>
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<td>45 - 75</td>
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<td>ODH 0910 - 2x</td>
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<td>400</td>
<td>60 - 120</td>
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<td>0.06</td>
<td>400</td>
<td>90 - 160</td>
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<td>75 - 110</td>
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<td>400</td>
<td>110 - 200</td>
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<td>110 - 200</td>
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<td>550x1324</td>
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<td>132 - 250</td>
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<td>160 - 315</td>
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<td>640x1655</td>
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<tr>
<td></td>
<td></td>
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<td>200 - 400</td>
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ODH crushers can be manufactured in two-plate or three-plate design, the number on the “x” position means the number of crushing plates.

Stated capacities are only informative and depend on the properties and composition of the crushed material and way of feeding.
Impact crushers

Dimensions principales

<table>
<thead>
<tr>
<th>Type</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
</tr>
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<tbody>
<tr>
<td>mm</td>
<td>mm</td>
<td>mm</td>
<td>mm</td>
<td>mm</td>
</tr>
<tr>
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<td>1600</td>
<td>2150</td>
<td>900</td>
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<td>ODH 0910-xx</td>
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<td>1940</td>
<td>2150</td>
<td>1230</td>
</tr>
<tr>
<td>ODH 0913-xx</td>
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<td>1560</td>
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<td>ODH 1110-xx</td>
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<td>ODH 1116-xx</td>
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<td>1900</td>
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<td>ODH 1313-xx</td>
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<td>2350</td>
<td>3000</td>
<td>1580</td>
</tr>
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<td>ODH 1316-xx</td>
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<td>3000</td>
<td>3000</td>
<td>1940</td>
</tr>
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<td>ODH 1616-xx</td>
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<td>ODH 1623-xx</td>
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</tr>
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<td>3326</td>
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<td>5800</td>
<td>5970</td>
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<td>ODN 1181</td>
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<td>1635</td>
<td>2220</td>
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<td>1920</td>
<td>1926</td>
<td>2320</td>
<td>1224</td>
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<td>3200</td>
<td>2890</td>
<td>3500</td>
<td>1810</td>
</tr>
</tbody>
</table>

Grain size composition of the product during crushing of aggregates

The field between black and blue curves characterizes the crushing ability of crushers used in primary crushing, the field between black and red curves in secondary crushing.
Impact crushers

Secondary impact crushers ODX

Impact crushers ODX are used for secondary crushing of hard materials such as gravel, sand, phonolite, greywacke, basalt and granite.

Principle parameters of impact crushers ODX

<table>
<thead>
<tr>
<th>Type</th>
<th>Size of inlet opening</th>
<th>Entrance*</th>
<th>Capacity</th>
<th>Crusher height</th>
<th>Crusher width</th>
<th>Crusher length</th>
<th>Power input</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>mm/mm</td>
<td>t/h</td>
<td>mm/mm/mm</td>
<td>mm/mm/mm/mm/mm</td>
<td>kW</td>
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<td>1877</td>
<td>2320</td>
<td>45-90</td>
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<tr>
<td>ODX 1161</td>
<td>400x1090</td>
<td>200</td>
<td>50-90</td>
<td>1845</td>
<td>2227</td>
<td>2320</td>
<td>75-132</td>
</tr>
<tr>
<td>ODX 1162</td>
<td>600x1090</td>
<td>300</td>
<td>90-130</td>
<td>2308</td>
<td>2305</td>
<td>2695</td>
<td>130-200</td>
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<tr>
<td>ODX 1163</td>
<td>600x1390</td>
<td>300</td>
<td>130-180</td>
<td>2308</td>
<td>2605</td>
<td>2695</td>
<td>160-250</td>
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</tbody>
</table>

Outlet grain size of the final product:
- 0 – 25 mm: 85%
- 0 – 40 mm: 99%

Tertiary impact crushers ODJ

Tertiary impact crushers ODJ are used in final stages of crushing of medium hard or hard materials where a higher degree of fineness of the final product is required. Material is crushed by means of rotating bars and impacts on stationary plates. Reverse crushers ODJ are equipped with a vertical material supply directly to a rotor and impact plate on both sides of the rotor.

The advantage of this design is that the shape index is very good (b_i < 20%) and the degree of comminution is high. The final product achieved by destruction along the natural cleavage planes contains minimum cracks without residual stress.

Principle parameters of impact crushers ODJ

<table>
<thead>
<tr>
<th>Type</th>
<th>Size of inlet opening</th>
<th>Entrance*</th>
<th>Capacity</th>
<th>Crusher height</th>
<th>Crusher width</th>
<th>Crusher length</th>
<th>Power input</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>mm/mm</td>
<td>t/h</td>
<td>mm/mm/mm</td>
<td>mm/mm/mm/mm/mm</td>
<td>kW</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ODJ 1121</td>
<td>250x640</td>
<td>50**/125***</td>
<td>35 - 75</td>
<td>1800</td>
<td>1750</td>
<td>2250</td>
<td>90-132</td>
</tr>
<tr>
<td>ODJ 1122</td>
<td>250x990</td>
<td>50**/125***</td>
<td>50 - 110</td>
<td>1800</td>
<td>2100</td>
<td>2250</td>
<td>132-200</td>
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<td>ODJ 1123</td>
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<td>65 - 135</td>
<td>1800</td>
<td>2450</td>
<td>2250</td>
<td>160-250</td>
</tr>
</tbody>
</table>

* undersize of square mesh size
Outlet grain size of the final product:
- Up to 5 mm: ** 85%
- ** 55%
Impact crushers

Recycling impact crushers ODR

Recycling impact crushers ODR are necessary for processing secondary materials such as building debris, plain concrete, reinforced concrete and bituminous surfaces of roads. Crushers ODR are adaptable for a single-stage crushing in cases of large inlet grain sizes.

Crushers ODR are also used in conventional treatment plants for medium hard and hard materials. The finish crushing plate positioned in the lower part of the crusher calibrates the outlet size of the product. In such cases the size of inlet material is adapted. The variability of the ODR crusher design allows operation in crushing stages where the materials are softer. The structure of the crusher is adaptable so that it can be mounted on wheels and for semi-mobile installations.

Principal parameters of impact crushers ODR

<table>
<thead>
<tr>
<th>Type</th>
<th>Size of inlet opening</th>
<th>Entrance</th>
<th>Capacity</th>
<th>Crusher width</th>
<th>Crusher length</th>
<th>Crusher height</th>
<th>Power input</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>mm m³ mm t/h</td>
<td>mm</td>
<td>mm</td>
<td>mm</td>
<td>mm</td>
<td>mm</td>
<td>kW</td>
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<td>1970</td>
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<td>0.06</td>
<td>1000</td>
<td>120 - 200</td>
<td>1900</td>
<td>2250</td>
<td>1970</td>
</tr>
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Outlet grain size of the product

<table>
<thead>
<tr>
<th>Bitumen</th>
<th>Building debris</th>
<th>Concrete</th>
<th>Gravel sand*</th>
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<tbody>
<tr>
<td>0 - 45 mm</td>
<td>0 - 40 mm</td>
<td>0 - 30 mm</td>
<td>0 - 45 mm</td>
</tr>
<tr>
<td>95%</td>
<td>99%</td>
<td>99%</td>
<td>95%</td>
</tr>
</tbody>
</table>

*inlet piece up to 200 mm
Stated capacities are only informative and depend on the properties and composition of the crushed material and way of feeding.

The rotor is designed with fixed bars facilitating rotation. At the crusher inlet there is a hydraulically controlled flap for unblocking of impaction material.

At present the use of recycled materials is wide-ranging. Impact crushers are used typically for the processing of quality products with guaranteed properties. The advantage of the design of crushers ODR is highly yielding for smaller fractions (< 45mm) with an excellent shape index ($b_{sh} < 20\%$). The final product achieved by destruction along the natural cleavage planes contains a minimum number of cracks without residual stress.

Pictures show examples of applications of crushers ODR in mobile and semi-mobile units which are fitted with a vibrating screen feeder VTP 1000x3000 for sorting of smaller portions before feeding to the crusher. The material is charged to the hopper by a wheel loader or conveyor belt.
PSP Engineering a.s. is a leading supplier of specialized products and entire processing plants for the building material and mineral processing industries. PSP Engineering has been involved in the design and construction of cement plants, lime works, quarry and crushing plants, as well as gravel and sand pits for more than 50 years.