Product Portfolio
Saint-Saulve, November, 2019
Product Portfolio – Steel Plant

In a nutshell

- As of today Ascoval Saint Saulve is active on the market.
- We can supply continuous cast rounds (CCR) in various diameters from 180 mm to 325 mm,
- In carbon and alloy steel (up to 13% Cr).
- Ascoval also produces forged products from 110 mm to 250 mm.
- Please visit our web site for more details. www.ascoval.fr

Portfolio

- More than 400 steel grades
- Close to 300 produced the last 18 months
- Steel grades cover following industries: mechanical engineering, construction, oil and gas, boilers, automotive, bearing
# Product Portfolio – Steel Plant

<table>
<thead>
<tr>
<th>Element minimum (%) except * maximum</th>
<th>C</th>
<th>Mn</th>
<th>Si</th>
<th>S</th>
<th>P*</th>
<th>Ni</th>
<th>Cr</th>
<th>Mo</th>
<th>V</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Oil and gas application</strong>&lt;br&gt;and accessories : Bars &amp; tubes</td>
<td>API5CT carbon steels and chromium steels : L80, P110, T95, 13%Cr, 4140, 4130, Line pipes API5L X52...&lt;br&gt;0.005% to 0.4%&lt;br&gt;0.3% to 1.4%&lt;br&gt;0.1% to 2%&lt;br&gt;0.01%&lt;br&gt;Up to 6%&lt;br&gt;0.2% to 13%&lt;br&gt;0.2% to 2.3%</td>
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<tr>
<td><strong>Electrical power plants/Boilers</strong></td>
<td>TÜV products, ASTM grades B, C, T11, T12, T22, T24, T91, T92, S355...&lt;br&gt;0.05% to 0.12%&lt;br&gt;0.3% to 0.6%&lt;br&gt;0.1% to 2%&lt;br&gt;0.01%&lt;br&gt;0.1% to 1.1%&lt;br&gt;0.8% to 9%&lt;br&gt;0.05% to 1%&lt;br&gt;0.2%</td>
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<tr>
<td><strong>Bearing steel</strong></td>
<td>100Cr6&lt;br&gt;0.93%&lt;br&gt;0.3% to 0.7%&lt;br&gt;0.2%&lt;br&gt;0.01%&lt;br&gt;1.3%</td>
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<tr>
<td><strong>Industry: Automotive,</strong>&lt;br&gt;mechanical,** construction**</td>
<td>Mechanical grades , Resulfurized grades, High yield grades : S355, C45, C55, 50CrMo4, 42CrMo4, 34CrNiMo6, 20Mn4-5-6, 18MnCr5...&lt;br&gt;0.07% to 0.7%&lt;br&gt;0.3% to 1.6%&lt;br&gt;Up to 1.3%&lt;br&gt;Up to 0.2%&lt;br&gt;0.01%&lt;br&gt;Up to 4%&lt;br&gt;Up to 2.5%&lt;br&gt;Up to 0.85%&lt;br&gt;Up to 0.24%</td>
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</tbody>
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Micro alloys possible depending on customer needs : B, Ti, V, Nb, Zr...
Product Portfolio – Steel Plant

Product shape and quality

**RCC blooms:** Ø180, 200, 220, 250, 260, 270, 280, 310 and 325 mm. Length: from 4 to 12 meters.

**Chemical analysis:**
In-house testing with optical emission spectrometer equipments except C, S and N with combustion method.
H2 measurement in tundish, 2ppm max from the 2^{nd} half of the first of sequence.

**Micro cleanliness:** based on ISO4967 meth A; depending on customer needs and as low as (except bearing steels):

<table>
<thead>
<tr>
<th>Sulfur</th>
<th>Alumina</th>
<th>Silicate</th>
<th>Oxides</th>
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</thead>
<tbody>
<tr>
<td>Thin</td>
<td>Thin</td>
<td>Thin</td>
<td>Thin</td>
</tr>
<tr>
<td>Thick</td>
<td>Thick</td>
<td>0</td>
<td>0</td>
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<tr>
<td></td>
<td></td>
<td>1</td>
<td>0.5</td>
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</tbody>
</table>

=S(f(S content))

**Oxygen content:** up to 10ppm maximum
Product Portfolio – Forge

Product shape and quality

<table>
<thead>
<tr>
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<th>Minimum diameter (mm)</th>
<th>Maximum diameter (mm)</th>
<th>Minimum length (m)</th>
<th>Maximum length (m)</th>
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</thead>
<tbody>
<tr>
<td>Input bar</td>
<td>180</td>
<td>270</td>
<td>2,7</td>
<td>6,9</td>
</tr>
<tr>
<td>Out bar</td>
<td>140</td>
<td>220</td>
<td>6</td>
<td>12,8</td>
</tr>
</tbody>
</table>

Current use:
- Reduction Ø220 -> Ø180 or Ø140
- Reduction Ø250 or Ø270 -> Ø180
- Reduction ratio up to 3,2

Capability (Need some studies for implementation):
- From Ø110 to Ø250 in final diameter
- Possibility of making tubes of form
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  www.ascoval.fr