Sandvik 5R60 is a molybdenum-alloyed (min. 2.5%) austenitic stainless chromium-nickel steel and a controlled carbon content in order to obtain improved strength at high temperatures.

STANDARDS
- ASTM: 316, 316H
- UNS: S31600, S31609
- EN Number: 1.4436
- W.Nr.: 1.4436
- SS: 2343
- AFNOR: Z7CND 18-14-03
- BS: 316S11

Product standard
- EN 10088-3
- ASTM A-314

Suitable for production of flanges etc. acc. to ASTM A-182

Certificates
Status according to EN 10 204 3.1

CHEMICAL COMPOSITION (NOMINAL) %

<table>
<thead>
<tr>
<th>C</th>
<th>Si</th>
<th>Mn</th>
<th>P</th>
<th>S</th>
<th>Cr</th>
<th>Ni</th>
<th>Mo</th>
<th>Others</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.04</td>
<td>0.4</td>
<td>1.7</td>
<td>≤0.040</td>
<td>≤0.025</td>
<td>17</td>
<td>12</td>
<td>2.6</td>
<td>-</td>
</tr>
</tbody>
</table>

FORMS OF SUPPLY
Sizes and tolerances
Round-cornered square, as well as round billets, are produced in a wide range of sizes according to the following tables. Larger sizes offered on request.

Surface conditions
Square billets
Unground, spot ground or fully ground condition.

Round billets
Peel turned or black condition.
Sizes and tolerances apply to the rolled/forged condition.

**Square billets**

<table>
<thead>
<tr>
<th>Size</th>
<th>Tolerance</th>
<th>Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>mm</td>
<td>mm</td>
<td>m</td>
</tr>
<tr>
<td>80</td>
<td>+/-2</td>
<td>4 - 6.3</td>
</tr>
<tr>
<td>100, 114, 126, 140, 150</td>
<td>+/-3</td>
<td>4 - 6.3</td>
</tr>
<tr>
<td>160, 180, 195, 200</td>
<td>+/-4</td>
<td>4 - 6.3</td>
</tr>
<tr>
<td>&gt;200 - 350</td>
<td>+/-5</td>
<td>3 - 5.3</td>
</tr>
</tbody>
</table>

**Peel turned round billets**

<table>
<thead>
<tr>
<th>Size</th>
<th>Tolerance</th>
<th>Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>mm</td>
<td>mm</td>
<td>m</td>
</tr>
<tr>
<td>75 - 200 (5 mm interval)</td>
<td>+/-1</td>
<td>max 10</td>
</tr>
<tr>
<td>&gt;200 - 450</td>
<td>+/-3</td>
<td>3 - 8</td>
</tr>
</tbody>
</table>

**Unground round billets**

<table>
<thead>
<tr>
<th>Size</th>
<th>Tolerance</th>
<th>Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>mm</td>
<td>mm</td>
<td>m</td>
</tr>
<tr>
<td>77 - 112 (5 mm interval)</td>
<td>+/-2</td>
<td>max 10</td>
</tr>
<tr>
<td>124, 134</td>
<td>+/-2</td>
<td>max 10</td>
</tr>
<tr>
<td>127, 147, 157</td>
<td>+/-2</td>
<td>max 10</td>
</tr>
<tr>
<td>142, 152, 163</td>
<td>+/-2</td>
<td>max 10</td>
</tr>
<tr>
<td>168, 178, 188</td>
<td>+/-2</td>
<td>max 10</td>
</tr>
<tr>
<td>183, 193</td>
<td>+/-2</td>
<td>max 10</td>
</tr>
</tbody>
</table>

**Other products**
- Hollow bar
- Welding wire
- Covered electrodes

**MECHANICAL PROPERTIES**

Testing is performed on separately solution annealed and quenched test piece.

The following figures apply on material in the solution annealed and quenched condition.

**At 20°C (68°F)**

<table>
<thead>
<tr>
<th>Metric units</th>
<th>Proof strength</th>
<th>Tensile strength</th>
<th>Elong.</th>
<th>Contr.</th>
<th>HB</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Rp0.2(\text{a)})</td>
<td>Rp1.0(\text{a)})</td>
<td>Rm</td>
<td>A(\text{b)})</td>
<td>Z</td>
</tr>
<tr>
<td>MPa</td>
<td>MPa</td>
<td>MPa</td>
<td>%</td>
<td>%</td>
<td></td>
</tr>
<tr>
<td>≥205</td>
<td>≥240</td>
<td>515-690</td>
<td>≥40</td>
<td>≥50</td>
<td>170</td>
</tr>
</tbody>
</table>

Datasheet updated 1/19/2017 12:26:49 PM (supersedes all previous editions)
### Imperial units

<table>
<thead>
<tr>
<th>Proof strength</th>
<th>Tensile strength</th>
<th>Elong.</th>
<th>Contr.</th>
<th>HB</th>
</tr>
</thead>
<tbody>
<tr>
<td>$R_{p0.2}$ a)</td>
<td>$R_{p1.0}$ a)</td>
<td>$R_m$</td>
<td>$A_{bi}$</td>
<td>$Z$</td>
</tr>
<tr>
<td>ksi</td>
<td>ksi</td>
<td>ksi</td>
<td>%</td>
<td>%</td>
</tr>
<tr>
<td>≥29.5</td>
<td>≥35</td>
<td>7.45-100</td>
<td>≥40</td>
<td>≥50</td>
</tr>
</tbody>
</table>

1 MPa = 1 N/mm²

a) $R_{p0.2}$ and $R_{p1.0}$ corresponds to 0.2% offset and 1.0% offset yield strength, respectively.
b) Based on $L_0 = 5.65\sqrt{S_0}$, where $L_0$ is the original gauge length and $S_0$ the original cross-section area.

The impact energy (Charpy V) at 20°C (68°F) is min 100 J (74 ft-lb).

### Metric units

<table>
<thead>
<tr>
<th>Temperature</th>
<th>Proof strength</th>
<th>Tensile strength</th>
</tr>
</thead>
<tbody>
<tr>
<td>°C</td>
<td>$R_{p0.2}$ MPa</td>
<td>$R_{p1.0}$ MPa</td>
</tr>
<tr>
<td>100</td>
<td>155</td>
<td>190</td>
</tr>
<tr>
<td>200</td>
<td>127</td>
<td>155</td>
</tr>
<tr>
<td>300</td>
<td>110</td>
<td>135</td>
</tr>
<tr>
<td>400</td>
<td>98</td>
<td>125</td>
</tr>
<tr>
<td>500</td>
<td>92</td>
<td>120</td>
</tr>
</tbody>
</table>

### Imperial units

<table>
<thead>
<tr>
<th>Temperature</th>
<th>Proof strength</th>
<th>Tensile strength</th>
</tr>
</thead>
<tbody>
<tr>
<td>°F</td>
<td>$R_{p0.2}$ ksi</td>
<td>$R_{p1.0}$ ksi</td>
</tr>
<tr>
<td>200</td>
<td>23.1</td>
<td>28.1</td>
</tr>
<tr>
<td>400</td>
<td>18.3</td>
<td>22.4</td>
</tr>
<tr>
<td>600</td>
<td>15.7</td>
<td>19.3</td>
</tr>
<tr>
<td>800</td>
<td>14.0</td>
<td>17.9</td>
</tr>
<tr>
<td>1000</td>
<td>13.1</td>
<td>17.4</td>
</tr>
</tbody>
</table>

Disclaimer: Recommendations are for guidance only, and the suitability of a material for a specific application can be confirmed only when we know the actual service conditions. Continuous development may necessitate changes in technical data without notice. This datasheet is only valid for Sandvik materials.