Stainless Steel 1.4724

This data sheet applies to hot and cold rolled sheet and strip, semi-finished products, bars, rods and sections.

Application
For construction parts, which should be resistant to scaling up to about 850°C and extensively inured to the effects of sulphurous gases. The inclination to carbonisation in reduced gases is very low.

Chemical Composition (heat analysis in %)

<table>
<thead>
<tr>
<th>Product Form</th>
<th>C</th>
<th>Si</th>
<th>Mn</th>
<th>P</th>
<th>S</th>
<th>Cr</th>
<th>Al</th>
</tr>
</thead>
<tbody>
<tr>
<td>C, H, P, L</td>
<td>≤ 0.12</td>
<td>0.70 - 1.40</td>
<td>≤ 1.00</td>
<td>≤ 0.040</td>
<td>≤ 0.015</td>
<td>12.00 - 14.00</td>
<td>0.70 - 1.20</td>
</tr>
</tbody>
</table>

C = cold-rolled strip  H = hot-rolled strip  P = hot rolled sheet  L = semi-finished products, bars, rods and sections

Mechanical Properties (at room temperature in annealed condition)

<table>
<thead>
<tr>
<th>Product Form</th>
<th>Thickness a or diameter d mm</th>
<th>HB max.</th>
<th>Proof Strength</th>
<th>Tensile Strength</th>
<th>Elongation min. in %</th>
</tr>
</thead>
<tbody>
<tr>
<td>C, H, P</td>
<td>a ≤ 12</td>
<td>192</td>
<td>250</td>
<td>450 - 650</td>
<td>15</td>
</tr>
<tr>
<td>L</td>
<td>d ≤ 25</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1) The maximum HB values may be raised by 100 units or the maximum tensile strength value may be raised by 200 N/mm² and the minimum elongation value be lowered to 20% for cold worked sections and bars of ≤ 35mm thickness.

2) For guidance only.

3) For rod, only the tensile values apply.

4) Longitudinal test piece.

5) Transverse test piece.

Estimated average values about the long-term behaviour at elevated temperatures

<table>
<thead>
<tr>
<th>Temperature °C</th>
<th>1% Elongation¹ for</th>
<th>Rupture² for</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1,000 h N/mm²</td>
<td>10,000 h N/mm²</td>
</tr>
<tr>
<td>500</td>
<td>80</td>
<td>50</td>
</tr>
<tr>
<td>600</td>
<td>27.5</td>
<td>17.5</td>
</tr>
<tr>
<td>700</td>
<td>8.5</td>
<td>4.7</td>
</tr>
<tr>
<td>800</td>
<td>3.7</td>
<td>2.1</td>
</tr>
<tr>
<td>900</td>
<td>1.8</td>
<td>1.0</td>
</tr>
</tbody>
</table>

¹) Stress related to the output cross section, which leads after 1,000 or 10,000 h to a permanent elongation of 1%.

²) Stress related to the output cross section, which leads after 1,000 or 10,000 or 100,000 h to breakage.
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Material Data Sheet

Reference data on some physical properties

<table>
<thead>
<tr>
<th>Property</th>
<th>20°C</th>
<th>500°C</th>
<th>Specific Thermal Capacity at 20°C J/kg K</th>
<th>Electrical Resistivity at 20°C Ω mm²/m</th>
</tr>
</thead>
<tbody>
<tr>
<td>Density at 20°C kg/dm³</td>
<td>7.7</td>
<td>21</td>
<td>23</td>
<td>500</td>
</tr>
<tr>
<td>Thermal Conductivity W/m K at 20°C</td>
<td>21</td>
<td>23</td>
<td></td>
<td>0.75</td>
</tr>
<tr>
<td>Thermal Conductivity W/m K at 500°C</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Specific Thermal Capacity at 20°C J/kg K</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Electrical Resistivity at 20°C Ω mm²/m</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coefficient of linear thermal expansion 10⁻⁶ K⁻¹ between 20°C and</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>200°C</td>
<td>11.5</td>
<td>12.0</td>
<td>12.5</td>
<td>-</td>
</tr>
<tr>
<td>400°C</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>600°C</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>800°C</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1000°C</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Guidelines on the temperature for hot forming and heat treatment*

<table>
<thead>
<tr>
<th>Hot Forming</th>
<th>Heat Treatment +A (annealed), Microstructure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temperature °C</td>
<td>Type of Cooling</td>
</tr>
<tr>
<td>1100 - 750</td>
<td>Air</td>
</tr>
</tbody>
</table>

¹) If heat treatment is carried out in a continuous furnace, the upper part of the range specified is usually preferred or even exceed.
²) In special cases, furnace cooling is also permitted.
* according to SEW 470

Processing / Welding

Standard welding processes for this steel grade are:
- TIG-Welding
- MAG-Welding Solid Wire
- Arc Welding (E)
- Submerged Arc Welding (SAW)

<table>
<thead>
<tr>
<th>Process</th>
<th>Filler Metal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Similar</td>
<td>Higher Alloyed</td>
</tr>
<tr>
<td>TIG</td>
<td>Thermanit D / 1.489</td>
</tr>
<tr>
<td>MAG Solid Wire</td>
<td>Thermanit 17</td>
</tr>
<tr>
<td>Arc Welding (E)</td>
<td>Thermanit 17</td>
</tr>
<tr>
<td>SAW</td>
<td>Thermanit 17, Marathon 213</td>
</tr>
</tbody>
</table>

Ferritic chrome steels are heat sensitive. Therefore the steel 1.4724 should be welded with lowest possible heat input by using thin electrode diameter, low current intensity and stringer bead welding. For wall thicknesses under 3mm, it is not necessary to preheat 1.4724. For thicker construction parts (>3mm) the preheating and interpass temperatures 200 - 300°C should not be under respectively over run. 1.4724 can be processed with similar or higher alloyed filler metals. With sulphurous atmospheres a ferritic top layer should be laid on the media side (Thermanit L 1.4820).

Cold Forming

When cold forming 1.4724, certain preventative measures should be observed. Sheets up to 3mm thickness can be cold bent if necessary preheating with 200 - 300°C should be done.
Products with thicknesses > 3mm must be preheated up to 600 - 800°C, concerning machinability 1.4724 can be compared to a low carbon steel.

**Embrittlement**
While heating 1.4724 over about 950 °C, embrittlement by grain growth occurs which cant be removed any more.

**Note**
The material is magnetizable.

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**Important Note**
Information given in this data sheet about the condition or usability of materials respectively products are no warranty for their properties, but act as a description.
The information, we give on for advice, comply to the experiences of the manufacturer as well as our own. We cannot give warranty for the results of processing and application of the products.