SPECIFICATION

21CrMoV5-7

MECHANICAL PROPERTIES

- Annealed condition: heat to 830 °C followed by slow cooling.
  - Brinell Hardness: 170
- Oil quench from 980 °C. Temper at 690 °C.

Tensile test at ambient temperature:
- UTS: 900 N/mm²
- 0.2 % Yield strength: 800 N/mm²
- Elongation (5d): 19 %
- Impact strength KCU: 150 J/cm²

Tensile test at 500 °C:
- UTS: 700 N/mm²
- 0.2 % Yield strength: 650 N/mm²
- Elongation (5d): 17 %
- Impact strength KCU: 110 J/cm²

Tensile test at 525 °C:
- UTS: 650 N/mm²
- 0.2 % Yield strength: 600 N/mm²
- Elongation (5d): 18 %
- Impact strength KCU: 110 J/cm²

Tensile test at 550 °C:
- UTS: 600 N/mm²
- 0.2 % Yield strength: 550 N/mm²
- Elongation (5d): 18.5 %
- Impact strength KCU: 110 J/cm²

Creep:

<table>
<thead>
<tr>
<th>Temperature in °C</th>
<th>Average load in N/mm² causing creep fracture in</th>
<th>Average load in N/mm² causing 1 % elongation in 100,000 hrs</th>
</tr>
</thead>
<tbody>
<tr>
<td>500</td>
<td>1000 hrs 10 000 hrs 100 000 hrs</td>
<td>180</td>
</tr>
<tr>
<td>525</td>
<td>330 220 150</td>
<td>110</td>
</tr>
<tr>
<td>550</td>
<td>270 180 120</td>
<td>80</td>
</tr>
</tbody>
</table>

COMPOSITION

<table>
<thead>
<tr>
<th>Carbon</th>
<th>Chromium</th>
<th>Molybdenum</th>
<th>Vanadium</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>................................. 0.25</td>
<td>................................. 1.50</td>
<td>................................. 0.60</td>
</tr>
</tbody>
</table>

APPLICATIONS

- Steam industry: fasteners for high temperature environments, manifolds and turbine parts.
- Gas turbine industry: turbofan discs.

CHARACTERISTICS

- Good resistance to high temperature oxidation.
**Heat Treatment**

- **Harden:**
  - Heat to 980 °C.
  - Oil quench or air cool.

- **Temper:**
  - Depending on properties required.

**Physical Properties**

- **Density:** 7.8

- **Mean coefficient of expansion in m/m. °C:**
  - between 20 °C and 200 °C: $12.5 \times 10^{-6}$
  - between 20 °C and 400 °C: $13.5 \times 10^{-6}$
  - between 20 °C and 600 °C: $14.3 \times 10^{-6}$
  - between 20 °C and 800 °C: $14.7 \times 10^{-6}$

- **Critical points:**
  - Ac 1: 770 °C
  - Ac 3: 890 °C

**Forging**

- **1150/950 °C**

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The data provided in this document represent typical or average values rather than maximum or minimum guaranteed values. The applications indicated for the grades described are given as guidance only in order to help the reader in his personal assessment. Please note that these do not constitute a guarantee whether implicit or explicit as to whether the grade selected is suited to specific requirements. Aubert & Duval’s liability shall not under any circumstances extend to product selection or to the consequences of that selection.