

I Buderus Hot Work Tool Steel 2367 ISO-B

| | C | Si | Mn | P | S | Cr | Mo | V |
|---------------------------------|-----------|-----------|-----------|---------|---------|-----------|-----------|-----------|
| Typical analysis | 0.36 | 0.40 | 0.45 | 0.020 | 0.003 | 5.00 | 3.00 | 0.50 |
| Chemical composition as per SEL | 0.35–0.40 | 0.30–0.50 | 0.30–0.50 | ≤ 0.030 | ≤ 0.020 | 4.80–5.20 | 2.70–3.20 | 0.40–0.60 |

Figures in % by mass

| | |
|-----------------------------------|----------------|
| Register of European Steels (SEL) | X 38 CrMoV 5-3 |
| DIN EN ISO 4957 | X 38 CrMoV 5-3 |
| AFNOR | Z 38 CDV 5.3 |

Characteristics

High-alloy hot work tool steel, CrMoV-based, with greater high-temperature strength and better tempering properties than grade 2344.

Extremely high hot wear resistance compared to grades 2344 and 2365.

Applications

Extrusion tools including pipe extruders, especially for liners for pressing steel, and for pipe mandrels (including water cooling).

Forging dies and press dies for extreme wearing stresses.

Die-casting moulds for Al and Mg die-casting.

Delivered condition

Annealed to max. 229 HB

Hardened and tempered to customer specification on request

Physical properties (reference values)

| | | | |
|---|-----------|-----------|-----------|
| Thermal expansion coefficient ($10^{-6}/K$) | 20–100 °C | 20–250 °C | 20–500 °C |
| | 11.9 | 12.6 | 13.1 |
| Thermal conductivity (W/mK) | 20 °C | 250 °C | 500 °C |
| | 29.7 | 33.5 | 34.8 |
| Young's modulus (GPa) | 20 °C | 250 °C | 500 °C |
| | 210 | 195 | 172 |

High-temperature yield strength

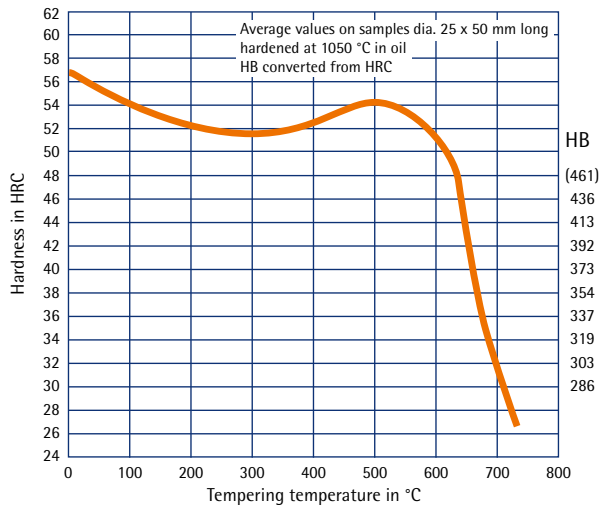
| Hardened and tempered state | 0.2 % yield strength in MPa at temperature | | | |
|-----------------------------|--|--------|--------|--------|
| | 450 °C | 500 °C | 550 °C | 600 °C |
| ~ 1570 MPa | 1180 | 1130 | 1030 | 770 |
| ~ 1370 MPa | 1030 | 880 | 830 | 690 |
| ~ 1180 MPa | 740 | 640 | 570 | 490 |

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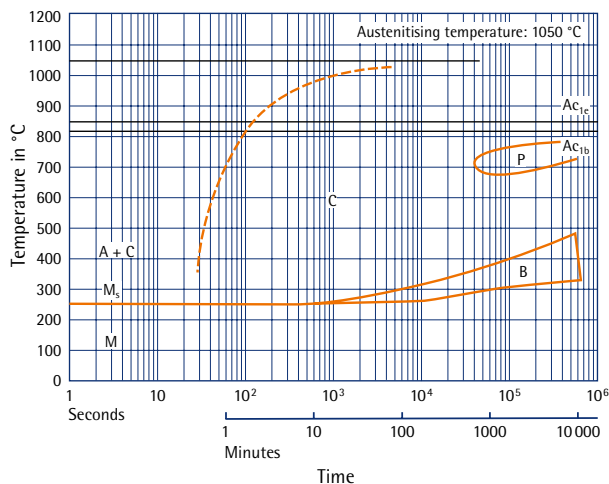
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| Heat treatment | |
|----------------------------|---|
| Stress relieving | Temperature: Approx. 650 °C in the annealed state Approx. 550 °C in the hardened and tempered state Duration: 1 hour per 50 mm wall thickness Cooling: Furnace |
| Soft annealing | Temperature: 820 °C Duration: 1 hour per 25 mm wall thickness Cooling: Furnace |
| Hardening | Temperature: 1050 °C Duration: 30 seconds per mm wall thickness |
| Quenching hardness | Max. 58 HRC in oil, hot bath, protective atmosphere, vacuum or air |
| Tempering (at least twice) | Temperature: See tempering curve Duration: 1 hour per 25 mm wall thickness Cooling: Air |
| Working hardness | 30–50 HRC |

Tempering curve



TTT curve (continuous)



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