

T42 3207 Steel

Designation by Standards

| Mat. No. | DIN | EN | AISI/SAE |
|----------|--------------|-------------|----------|
| 1.3207 | S10-4-3-10 † | HS10-4-3-10 | T42 |

Chemical Composition (in weight %)

| C | Cr | Mo | V | W | CO |
|------|------|------|------|------|-------|
| 1.26 | 4.00 | 3.60 | 3.20 | 9.30 | 10.00 |

Description

High performance high speed steel with optimum cutting performance and hot hardness plus a good degree of toughness.

Applications

Steel for universal application giving optimum tooling life times for cutting and milling tools. All kinds of profile blades for wood machining are manufactured from sheets. For severely stressed tools for fine and roughing work, cutting tools for very hard materials, turning blades, wood working tools and tools for cold work.

Physical properties (average values) at ambient temperature

Modulus of elasticity [$10^3 \times \text{N/mm}^2$]: 217

Density [g/cm^3]: 8.23

Thermal conductivity [W/m.K]: 19.0

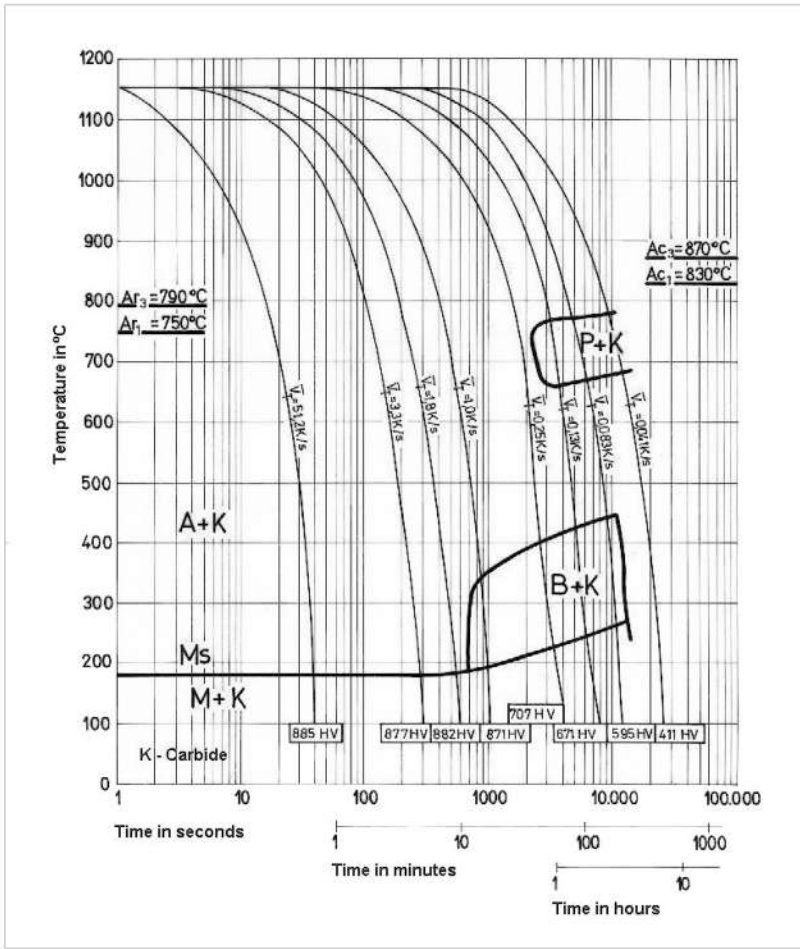
Electric resistivity [$\text{Ohm mm}^2/\text{m}$]: 0.80

Specific heat capacity [J/g.K]: 0.46

Coefficient of Linear Thermal Expansion $10^{-6} \text{ }^\circ\text{C}^{-1}$

| 20-100°C | 20-200°C | 20-300°C | 20-400°C | 20-500°C | 20-600°C | 20-700°C |
|----------|----------|----------|----------|----------|----------|----------|
| 9.6 | 10.0 | 10.1 | 10.3 | 10.5 | 10.7 | 10.7 |

Continuous Cooling Transformation (CCT) Diagram



Soft Annealing

Heat to 800-860°C, cool slowly in furnace. This will produce a maximum Brinell hardness of 300.

Stress Relieving

Stress relieving to remove machining stresses should be carried out by heating to 600-650°C, holding for one hour at heat, followed by air cooling. This operation is performed to reduce distortion during heat treatment.

Hardening

Harden from a temperature of 1200-1230°C followed by oil, air quenching or warm bath at 540°C. Hardness after quenching is 64-66 HRC.

Tempering

Tempering temperature: 540-570°C, at least 2x for 65 - 67 HRC. Hardness after tempering is 64-67 HRC.

Tempering Temperature (°C) vs. Hardness (HRC)

| 100°C | 200°C | 300°C | 400°C | 450°C | 500°C | 550°C | 600°C | 650°C |
|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 65.0 | 64.5 | 64.0 | 64.5 | 65.5 | 67.0 | 66.5 | 63.0 | 57.0 |

Tempering Diagram

