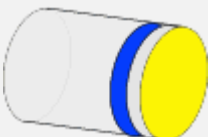


S1 TOOL STEEL (60WCRV7)

S1 toolsteel is a cold work steel with very good toughness, is dimensionally stable, and impact resistant, with high hardening capacity. Applications: Cold shear knives, paper and wood cutting knives, cutting tools for plates up to 10 mm, ejector pins, air hammers.

| | | |
|---|------------------------------|--------------------|
| Colour Code | Stocked Sizes | |
| Yellow/Blue | Rounds | 20 mm - 150 mm Dia |
|  | Condition of Delivery | |
| | Soft annealed to max. 229 HB | |

Related Specifications

| | |
|---------|------------|
| Germany | DIN 1.2550 |
| USA | AISI S1 |

Chemical Composition

| | % |
|----------|------|
| Carbon | 0.60 |
| Tungsten | 2.00 |
| Chromium | 1.00 |
| Vanadium | 0.15 |

Physical Properties

| | | | | | |
|-------------------------------|---|----------|----------|----------|----------|
| Thermal expansion coefficient | $\left[\frac{10^{-6} \text{ m}}{\text{m K}} \right]$ | 20-100°C | 20-200°C | 20-300°C | 20-400°C |
| | | 10,9 | 11,5 | 12,0 | 12,4 |
| Thermal conductivity | $\left[\frac{\text{W}}{\text{m K}} \right]$ | 20°C | 350°C | | |
| | | 31,9 | 29,6 | | |

Heat Treatment

Soft Annealing

| | |
|-------------|-------------|
| Temperature | 740 - 760°C |
| Cooling | furnace |
| Hardness | max 229 HB |

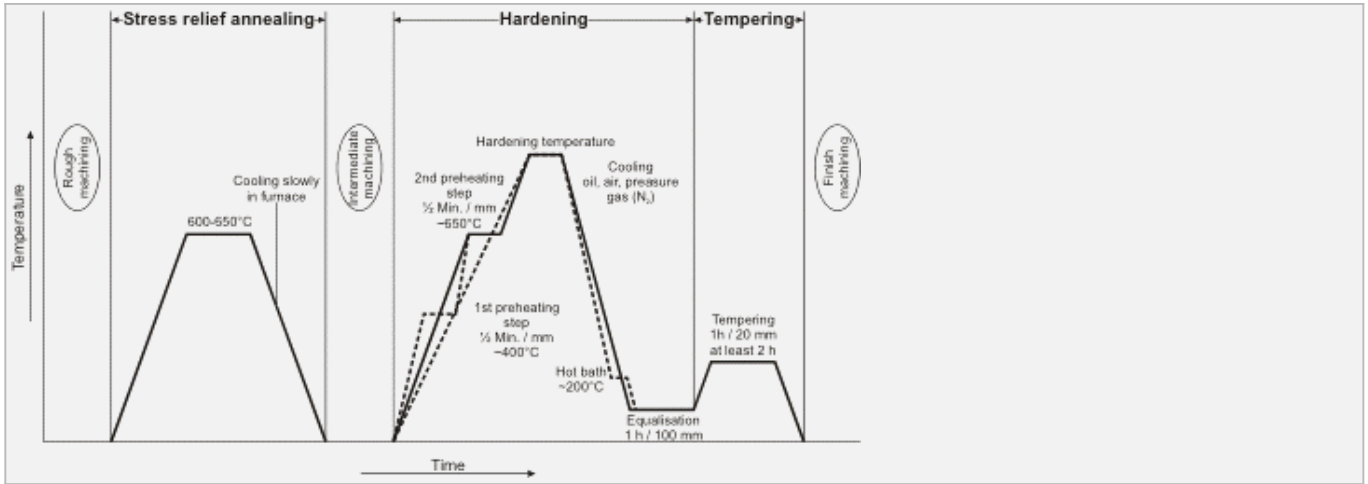
Stress Relief Annealing

| | |
|-------------|-------------|
| Temperature | 600 - 650°C |
| Cooling | furnace |

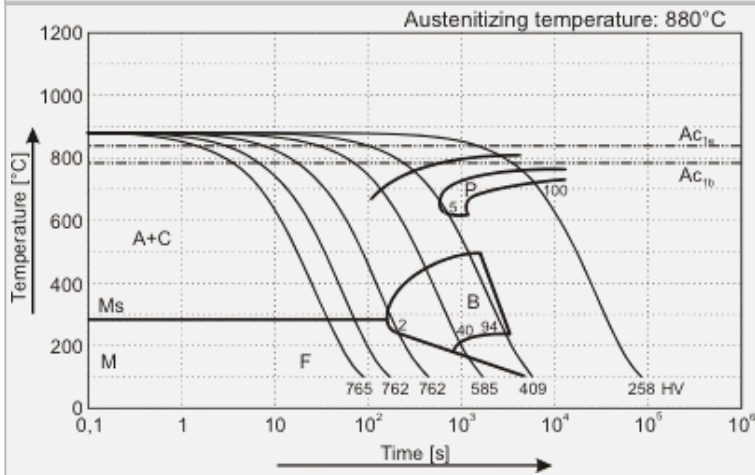
Hardening

| | |
|-------------|--------------------------------|
| Temperature | 860 - 900°C |
| Cooling | oil or hot bath 180 - 220°C |
| Hardness | see tempering diagram |

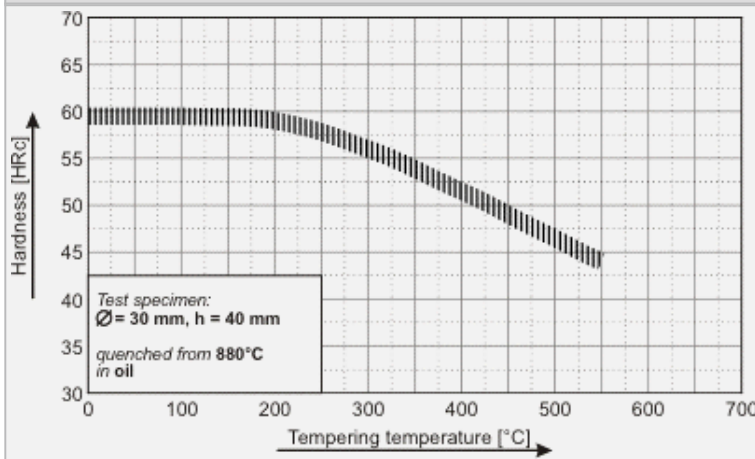
Thermal Cycle Diagram



Continuous Cooling Transformation Diagram (CCT)



Tempering Diagram



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