



Material No.: Code:
1.4112 X90CrMoV18

DE - Brand:
R17X

Chemical composition:
(Typical analysis in %)

| C | Cr | Mo | V | | | | |
|------|-------|------|------|--|--|--|--|
| 0,90 | 18,00 | 1,10 | 0,10 | | | | |

Steel properties:

Stainless martensitic alloy, good hardening capacity, high wear resistance. Similar to AISI 440B.

Applications:

Knives and cutting tools, punching discs, screw parts for plastic processing, ball bearings, injection moulding nozzles.

Condition of delivery:

Soft annealed to max. 265 HB

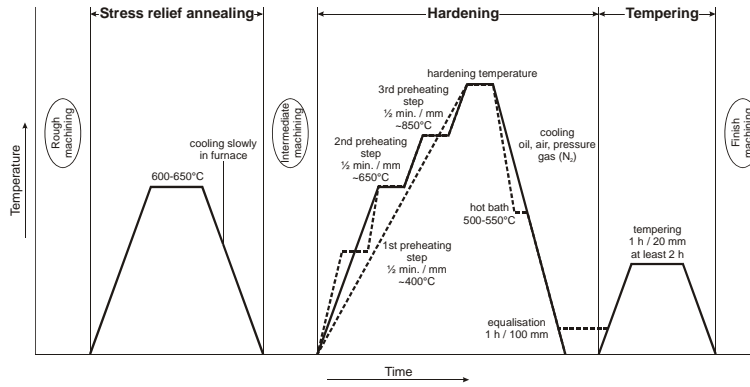
Physical properties:

| | | | | | |
|-------------------------------|---|---------------------------------------|---------------------------------------|---------------------------------------|---------------------------------------|
| Thermal expansion coefficient | $\left[\frac{10^{-6} \cdot \text{m}}{\text{m} \cdot \text{K}} \right]$ | $\frac{20-100^{\circ}\text{C}}{10,3}$ | $\frac{20-200^{\circ}\text{C}}{10,8}$ | $\frac{20-300^{\circ}\text{C}}{11,2}$ | $\frac{20-400^{\circ}\text{C}}{11,6}$ |
| Thermal conductivity | $\left[\frac{\text{W}}{\text{m} \cdot \text{K}} \right]$ | $\frac{20^{\circ}\text{C}}{15,9}$ | $\frac{350^{\circ}\text{C}}{20,6}$ | | |

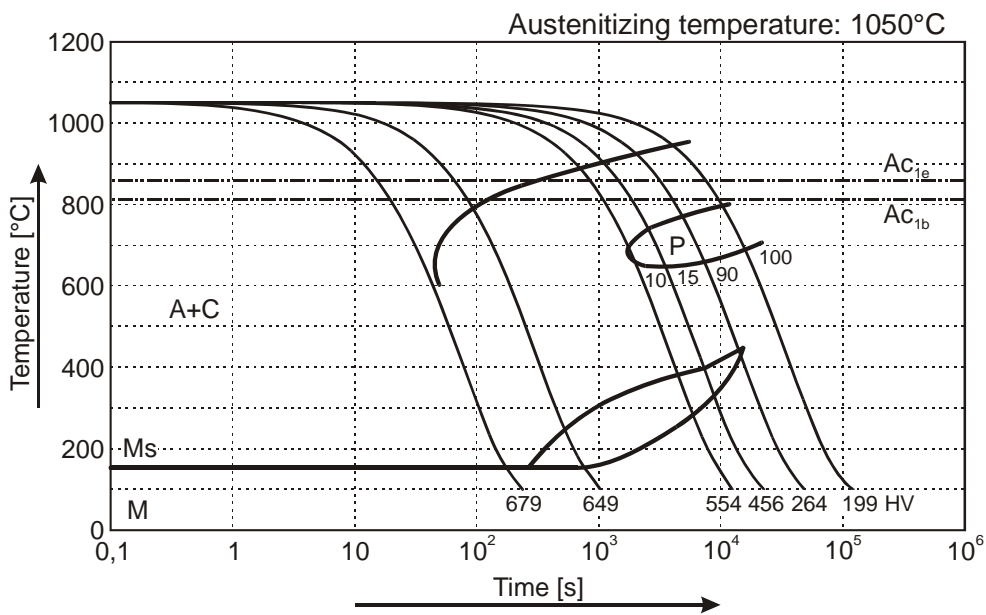
Heat treatment:

| Soft annealing | <table border="1"><thead><tr><th>Temperature</th><th>Cooling</th><th>Hardness</th></tr></thead><tbody><tr><td>780 - 840°C</td><td>furnace</td><td>max. 265 HB</td></tr></tbody></table> | Temperature | Cooling | Hardness | 780 - 840°C | furnace | max. 265 HB |
|-------------------------|---|--------------------------|---------|-----------|---------------|--|--------------------------|
| Temperature | Cooling | Hardness | | | | | |
| 780 - 840°C | furnace | max. 265 HB | | | | | |
| Stress relief annealing | <table border="1"><thead><tr><th>Temperature</th><th>Cooling</th><th></th></tr></thead><tbody><tr><td>600 - 650°C</td><td>furnace</td><td></td></tr></tbody></table> | Temperature | Cooling | | 600 - 650°C | furnace | |
| Temperature | Cooling | | | | | | |
| 600 - 650°C | furnace | | | | | | |
| Hardening | <table border="1"><thead><tr><th>Temperature</th><th>Cooling</th><th>Tempering</th></tr></thead><tbody><tr><td>1000 - 1050°C</td><td>oil, pressure gas (N₂), air or hot bath 500 - 550°C</td><td>see tempering diagram</td></tr></tbody></table> | Temperature | Cooling | Tempering | 1000 - 1050°C | oil, pressure gas (N ₂), air or hot bath 500 - 550°C | see tempering diagram |
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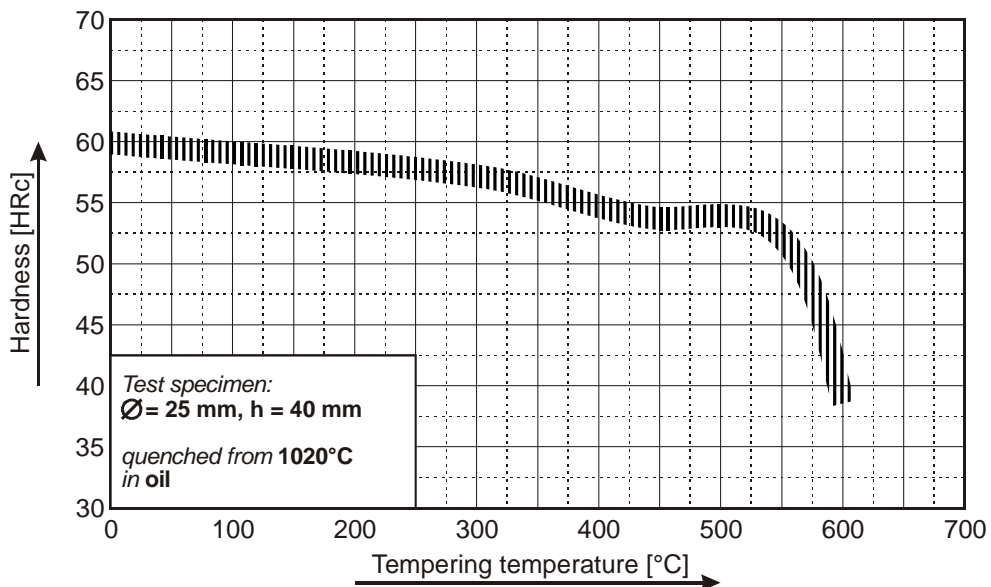
(1.4112) Thermal Cycle Diagram



Continuous Cooling Transformation Diagram (CCT)



Tempering Diagram



Remarks: All technical information is for reference only.