



DE - Brand:

Special Steel

PMD10

Chemical composition: (Typical analysis in %)

C	Cr	Mo	V				
2,45	5,25	1,20	9,75				

Steel properties:

Powder-metallurgical cold work tool steel with high V-content, very fine carbide distribution, homogenous microstructure within whole cross-section, increased wear resistance compared to PMD9.

Applications:

Stamping, cutting and deep drawing tools, screws and screw parts, cold extrusion tools.

Condition of delivery:

Soft annealed to max. 280 HB

Physical properties:

Thermal expansion coefficient	$\left[\frac{10^{-6} \cdot \text{m}}{\text{m} \cdot \text{K}} \right]$	20-100°C	20-200°C	20-300°C	20-400°C
		11,0	11,1	11,3	11,5
Thermal conductivity	$\left[\frac{\text{W}}{\text{m} \cdot \text{K}} \right]$				

Heat treatment:

Soft annealing
Annealing only in neutral atmosphere

Temperature	Cooling	Hardness
870 - 900°C	furnace	max. 280 HB

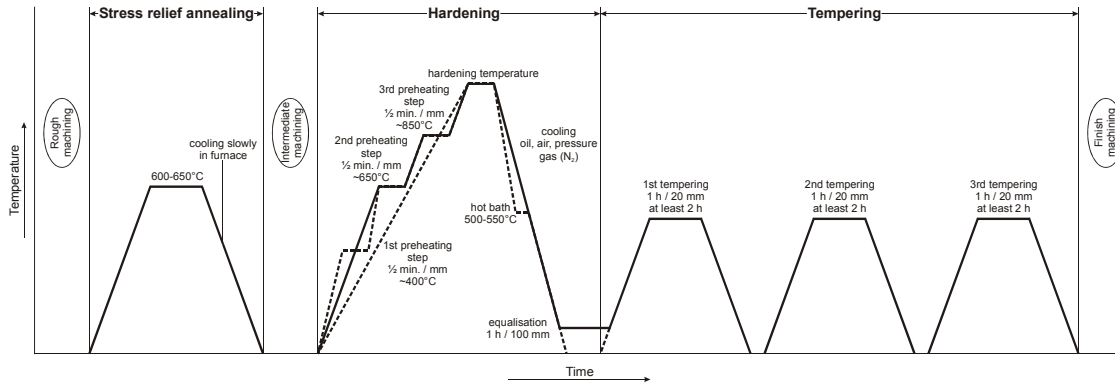
Stress relief annealing

Temperature	Cooling	
600 - 650°C	furnace	

Hardening

Temperature	Cooling	Tempering
1050 - 1170°C	oil, pressure gas (N ₂), air or hot bath 500 - 550°C	see tempering table

(PMD10) Thermal Cycle Diagram



DE-Brand PMD10 has to be tempered minimum three times in any case.

Reference values for hardness after tempering three times, according to the austenitizing temperature (all datas ± 1 HRC).

Tempering temperature	Austenitizing temperature				
	1050°C	1080°C	1110°C	1140°C	1170°C
470°C	59,5 HRC	60,5 HRC	61,5 HRC	62,5 HRC	63,5 HRC
490°C	61,5 HRC	62,0 HRC	63,0 HRC	64,0 HRC	65,0 HRC
510°C	62,0 HRC	63,0 HRC	63,5 HRC	64,4 HRC	65,0 HRC
530°C	60,0 HRC	61,0 HRC	62,0 HRC	63,0 HRC	64,0 HRC
550°C	56,0 HRC	57,5 HRC	59,0 HRC	60,0 HRC	61,0 HRC
570°C	50,5 HRC	51,0 HRC	55,0 HRC	57,0 HRC	57,5 HRC

Remarks: All technical information is for reference only.