

Identification		
Material number	Reference number	AISI
1.2357	(50CrMoV13-15)	S7

Chemical composition Typical analysis in %						
C	Si	Mn	Cr	Mo	V	
0.50	0.30	0.70	3.35	1.60	0.25	

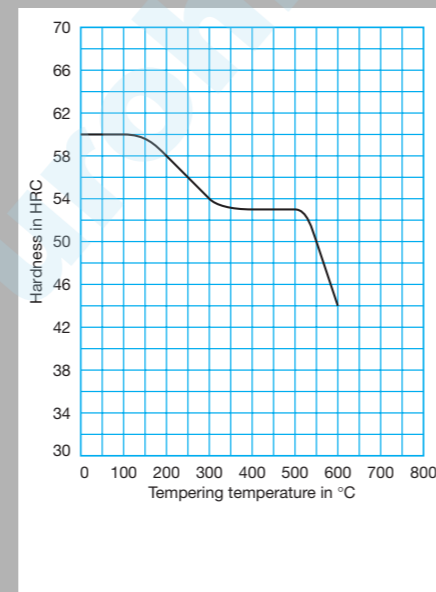
Steel properties
High toughness and wear resistance, high compression strength combined with dimensional stability and good polishability.

Physical properties			
Coefficient of thermal expansion $10^{-6} \text{ m}/(\text{m} \cdot \text{K})$	20 – 200 °C		20 – 400 °C
		12.2	
Thermal conductivity $\text{W}/(\text{m} \cdot \text{K})$	20 °C		200 °C
	28.9		30.0
			400 °C
			31.0

Applications
Cold-work tool steel for punching tools, moulds, scrap shears, piercing dies, hobbers, coining dies, deburring tools, plastic moulds and pelleters.

Heat treatment							
Soft annealing °C	Cooling			Hardness HB			
610 – 650	Furnace			approx. 220			
Hardening °C	Quenching			Hardness after quenching HRC			
920 – 970	Air or oil			60 – 62			
Stress-relief annealing °C	Cooling						
approx. 600	Furnace						
Tempering °C	100	200	300	400	500	550	600
	HRC	60	58	54	53	53	50

Tempering diagram



Reference numbers in brackets are not standardized in EN ISO 4957.

Identification		
Material number	Reference number	AISI
~1.2360	(~X48CrMoV8-1-1)	

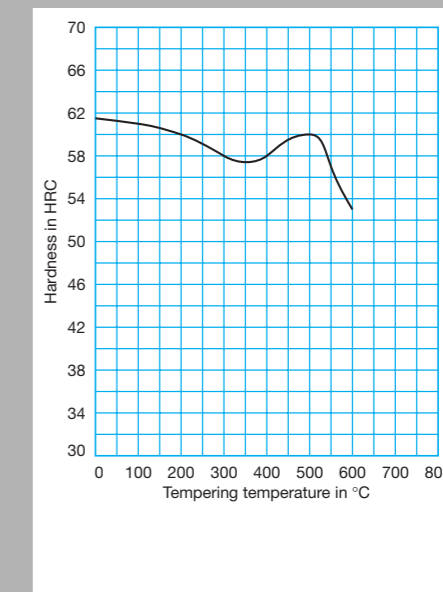
Chemical composition Typical analysis in %						
C	Si	Mn	Cr	Mo	V	
0.50	1.20	0.35	7.30	1.50	0.50	

Steel properties
THYRODUR® 2360 is a 7 % chromium steel that derives its high wear resistance from a balanced combination of the alloying elements. The medium V concentration of 0.5 % generates a sufficiently high hardenability combined with high toughness, even at comparatively low operating temperatures below RT.

Applications
This grade is especially suitable for use with chipper knives, blade holders, veneer slicing blades, blade inserts, billet-shear blades and reinforcements. All require a combination of high hardness and toughness as do large cold extrusion tools of complex geometry.

Heat treatment							
Soft annealing °C	Cooling			Hardness HB			
830 – 860	Furnace			max. 240			
Stress-relief annealing °C	Cooling						
approx. 650	Furnace						
Hardening °C	Quenching			Hardness after quenching HRC			
1030 – 1070	Air, oil or saltbath (550 °C)			60 – 61			
Tempering °C	100	200	300	400	500	550	600
	HRC	61	60	58	58	60	57

Tempering diagram



Reference numbers in brackets are not standardized in EN ISO 4957.