WLV/1.2365/32CRMOV12-28

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NAZWA GATUNKU: WLV/1.2365/32CRMOV12-28

NAZWA: HOT WORK TOOL STEEL

NORM: ISO 4957

APPLICATION

Steel susceptible to die inserts for heavy metals, forging dies and small dies for presses and upsetting machines, extrusion tools, elements of moulds for pressure die casting of alloys, mandrels.

CHEMICAL COMPOSITION:

C	Si	Mn	P	S	Cr	Mo	W	V	Co	Ni
0,28-0,35	0,10-0,40	0,15-0,45	Max 0,030	Max 0,030	2,70-3,20	2,50-3,00	–	0,40-0,70	–	–

MECHANICAL PROPERTIES:

Hardness after	Tempering ºC	Symbol	Value
Soft annealing	–	HB	≤229
Quenching with 1040 ºC in oil	–	HRC	53
Quenching with 1040 ºC in oil and tempering (cooling during quenching can be performed gradually in the salt bath at around 550 ºC and then cooled in the air)	550	HRC	≥46
	350	HRC	51
	400	HRC	51.5
	450	HRC	51.5
	500	HRC	50.5
	550	HRC	49
	600	HRC	46.5
	650	HRC	40

PHYSICAL PROPERTIES:

Property	Unit	Value
Density, ρ	$g*cm^{-3}$	7.82
Thermal expansion, $\alpha_{20\text{-}100^{\circ}C)}$	K^{-1}	$12.4*10^{-6}$
Thermal conductivity, $\lambda_{20^{\circ}C)}$	$W*m^{-1}*K^{-1}$	36

TECHNOLOGICAL TREATMENT PROCESSES:

Technological treatment processes			Possible application	Temperature, °C
Hot forming	Forging		+	1100-850
	Rolling		+	1100-850
Treatment	Heat treatment	Quenching	+	1030-1050
		Tempering	+	450-570
	Precipitation strengthening	Supersaturation	–	–
		Ageing	–	–
	Annealing	Soft annealing	+	740-770
		Stress relieving	+	600-680
Thermochemical treatment	Nitriding		+	470-520
	Other		–	–

INTERNATIONAL STEEL GRADES:

ISO		EN		Russia	
32CrMoV12-28	ISO 4957:2004	32CrMoV12-28	ISO 4957:2004	3H3M3F	GOST 5950-73
US		Japan		China	
H10	ASTM A 681-91	SKD 7	JIS G 4404-1983	~4Cr3Mo3SiV	GB 1299-85