



+48 801 00 31 31

akrostal@akrostal.pl

**Nazwa gatunku: 40HM/1.7225/42CrMo4**

**Nazwa: TOUGHENING STEEL**

**NORM: PN/EN 10083-3**

## **APPLICATION**

Steel susceptible to very loaded axles, shafts, crankshafts. Also subject to variable bending and torsional loads, gears, , etc.

## **TECHNOLOGICAL INFORMATION**

After soft annealing steel becomes machinable ( by improved shearability) and adjusted for the mechanical cutting.

## **SEMI-FINISHED PRODUCTS**

After soft annealing steel becomes machinable ( by improved shearability) and adjusted for the mechanical cutting.

## **CHEMICAL COMPOSITION:**

<b>C</b>	<b>Mn</b>	<b>Si</b>	<b>P</b>	<b>S</b>	<b>Cr</b>	<b>Ni</b>	<b>Mo</b>	<b>V</b>	<b>W</b>	<b>Ti</b>	<b>Cu</b>	<b>Inne</b>
0,38 - 0,45	0,60 - 0,90	Max 0,40	Max 0,025	Max 0,035	0,90 - 1,20	-	0,15 - 0,30	-	-	-	-	-

## MECHANICAL PROPERTIES:

Mechanical properties of a product with diameter $d \leq 16$ mm				
Property	Designation	Unit	After heat treatment	
Ultimate tensile strength	$R_m$	MPa	1100-1300	
Yield stress	$R_e (R_{p0.2})$	MPa	$\geq 900$	
Elongation	A	%	$\geq 10$	
Reduction of area	Z	%	$\geq 40$	
Impact energy	KV	J	$\geq 30$	
Effect of the cross-section on mechanical properties				
Diameter $d$ , mm	16 - 40	40 - 100	100 - 160	160 - 250
Thickness of the flat bar $t$ , mm	8 - 20	20 - 60	60 - 100	100 - 160
$R_m$ , MPa	1000 - 1200	900 - 1100	800 - 950	750 - 900
$R_e (R_{p0.2})$ , MPa	$\geq 750$	$\geq 650$	$\geq 550$	$\geq 500$
A, %	$\geq 11$	$\geq 12$	$\geq 13$	$\geq 14$
Z, %	$\geq 45$	$\geq 50$	$\geq 50$	$\geq 55$
KV, J	$\geq 35$	$\geq 35$	$\geq 35$	$\geq 35$

## Technological treatment processes:

Technological treatment processes		Possible application	Temperature, °C	
Hot forming	Forging	+	(1050 - 850)	
	Rolling	+	(1180 - 850)	
Treatment	Heat treatment	Quenching	+	82-860/w,o
		Tempering	+	540 - 680
	Precipitation strengthening	Supersaturation	-	-
		Ageing	-	-
	Annealing	Normalising	+	(840 - 880)
		Soft annealing	+	(680 - 720)
Thermochemical treatment	Carburising	-	-	
	Other	-	-	

## INTERNATIONAL STEEL GRADES:

ISO		European Union		Russia	
42CrMo4	ISO 683-1 1987	42CrMo4	EN 10083-1 1996	~ 38ChM	GOST 4543 1971
US		Japan		China	
~ 4140 H	ASTM A 193-96	~SCM4	JIS G 4105 1979	~ 42CrMo	GB 3077-88