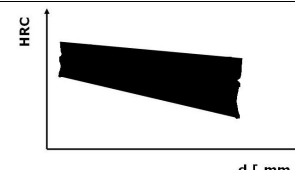


Alphanumeric designation	Numerical designation	Standard reference	Correspondences				Rev	Date		
			Germany	-	United Kingdom	-	01	12-02-07		
<b>36NiCrMo16</b>	1.6773	EN 10083-3:2006	France	35NCD16	Spain	-	<b>GRANIT</b> ENGINEERING graniteng.com			
			Italy	-	United States	-				
<b>Chemical composition</b> ( % mass )	C	Si max	Mn	P max	S max	Cr	Mo	Ni	V	B
<b>heat</b>	0,32-0,39	0,4	0,3-0,6	0,035	0,025	1,6-2	0,25-0,45	3,6-4,1	-	-
<b>product</b>	0,3-0,41	0,43	0,26-0,64	0,04	0,03	1,55-2,05	0,22-0,49	3,53-4,17	-	-
<b>PHYSICAL CHARACTERISTICS ( T=20°C if not differently stated )</b>										
<b>Young modulus</b> [ N/mm <sup>2</sup> ]	<b>Poisson modulus</b>	<b>Bulk modulus</b> [ N/mm <sup>2</sup> ]	<b>Density</b> [ kg/dm <sup>3</sup> ]	<b>Linear thermal expansion coefficient</b> [ μm/m ° C ]						
205000	0,29	140000	7,85	T=20°C	T=250°C	T=500°C	T=1000°C			
				-	-	-	-			
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<b>MECHANICAL CHARACTERISTICS ( T=20°C if not differently stated )</b>										
<b>Heat treatment state</b>	<b>Rod diameter</b> [ mm ]	<b>Rm</b> [ N/mm <sup>2</sup> ]	<b>Rp0.2</b> [ N/mm <sup>2</sup> ]	<b>A5</b> [ % ]	<b>KCU</b> [ J ]	<b>HB</b> [ N/mm <sup>2</sup> ]				
SOFT ANNEALED		912 max				269 max				
ISOTHERMAL ANNEALED		-				-				
QUENCHED AND TEMPERED	≤16	1250-1450	1050 min	9 min	-	368-424				
	16 < d ≤40	1250-1450	1050 min	9 min	30 min	368-424				
	40 < d ≤100	1100-1300	900 min	10 min	35 min	324-382				
	100 < d ≤160	1000-1200	800 min	11 min	45 min	295-353				
	160 < d ≤250	1000-1200	800 min	11 min	45 min	295-353				
<b>DESCRIPTION/APPLICATIONS</b>				<b>HARDENABILITY: HIGH; steel available in the classes H; HH; HL</b>						
<p>Quench and tempering special NiCrMo steel, almost equivalent to 34NiCrMo16 steel standardized according to UNI 7874/7845, characterized by very high tensile strength together with good toughness. It is usable in the hardened and stress relieved state. It can harden in the air up to thicknesses equal to 90 mm. It is suitable to the manufacture of components of maximum thickness equal to <b>300 mm</b> strongly stressed and even with a complicated geometry (shafts, torsion shafts, axles, levers, connecting rods, rocker arms). To improve the workability at the machines tools it can be booked with the addition of Ca or re-sulphurized (S≤0,1%). The use of re-sulphurized steels involves a worsening of the tensile strength characteristics along the transversal of the impact strength and of the fatigue strength. Advised austenitic grain dimension &gt; 5 according to UNI 3245 (similar to ASTM E 112-82)</p> <p style="text-align: center;"><b>Surface hardening according to INDUCTIONHARDNESS 1.x and LASERHARDNESS 1.x</b> <b>Thermochemically manageable according to CASEHARDENING 1.x</b> <b>Sizing and checking of effective hardening thickness according to DEEPHARDNESS 1.x and DEEPHARDNESS 2.x</b></p>				 <p style="text-align: center;"><b>WELDABILITY : LOW</b></p> <p><b>ADVISED WELDING PROCESSES</b> SMAW B (basic); GMAW; GTAW; PAW; LBW*; EBW* ( *on vacuum-sealed outgased steels )</p> <p><b>ADVISED WELDING PROCEEDINGS</b></p> <ol style="list-style-type: none"> <li>f.m. at low C + Tp** + TB or PWHT</li> <li>austenitic f.m. + Tp ( 150 ° C )</li> <li>f.m. Ni base alloy + Tp ( 150 ° C ) + PWHT</li> </ol> <p><b>GENERAL PRECAUTIONS</b></p> <ul style="list-style-type: none"> <li>multipass welding</li> <li>HD reduction ( ≤ 5 ); reconditioning of electrodes</li> <li>edges cleaning</li> <li>reduction of the degree of the joint constraint</li> <li>Rd reduction</li> <li>single layer buttering technique advised</li> </ul> <p><b>LEGEND</b> Tp : preheat minimum temperature[ ° C ] ; HD : diffusible hydrogen [ ml/100g ] ; Rd : dilution rapport [ % ] ; d : combined thickness [ mm ] ; Q :heat input[ kJ/mm ] ; f.m. : filler metal; TB : temper beads ; PWHT : post-welding heat treatment</p> <p style="text-align: center;"><b>WARNING</b> <b>critical weldability for re-sulphurized grades</b></p>						
<b>HEAT TREATMENT AND HOT PLASTIC DEFORMATION TEMPERATURES</b>										
	TEMPERATURE °C	Cooling medium								
Hot plastic deformation	850-1100									
Normalization	850-880	air								
Soft annealing	640-690	air								
Isothermal annealing	-	-								
	-	-								
Hardening	865-885	air/oil	d [ mm ]	Tp** [ ° C ]	d [ mm ]	Tp** [ ° C ]				
Tempering	550-650	air	6	120	25	250				
			12	200	50	280				