

EN36A Case hardening steel

Typical Analysis (Ave. values %)	C	Si	Mn	Ni	Cr	Mo	S	P	
	0.13	0.20	0.45	3.50	0.80	-	0.025	0.025	
NEAREST STANDARD	AS		DIN		BS 970		AISI		
	X3312		1.5752 14NiCr14		655 M 13 EN36A		E9315		

DESCRIPTION	Chromium, Nickel Case Hardening steel for applications requiring excellent wear surface and high toughness and core strength. In particular medium to large cross sections.
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APPLICATIONS	Highly stressed large and medium components for Motor vehicle and general engineering purposes where surface hardness combined with good core strength is required, eg. Gear wheels, King pins, Crankshafts and Gear shafts.
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HEAT TREATMENT	Forge	850-1050°C. Cool in furnace.
	Normalize	850-880°C. Air cool.
	Anneal	650-700°C. Cool slowly in controlled furnace.
	Carburize	900-950°C. Furnace or Air cool
	Core Refine	850-880°C. Oil quench or Air cool.
	Harden	760-780°C Oil quench.
	Temper	180-210°C air cool
	Annealed hardness	229 HB max.

WELDING	Parts should be welded before Carburizing and Hardening. Preheat to 250-350°C. Filler metals:-Bohler FOX DCMS-KB or FOX 2.5 Ni electrodes. DCMS-IG wire.
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MECHANICAL PROPERTIES Blank Carburized	Diameter	Tensile Strength MPa	Yield Strength MPa	Elong %	Red. of Area %
	11	980-1280	785	8	35
	30	880-1180	765	9	40
	63	780-1080	635	10	40

PHYSICAL PROPERTIES	Density (kg/dm ³)	7.85				
	Modulus of elasticity 10 ³ N/mm ²	210				
	Thermal conductivity W/(m.K)	34				
	Electric resistivity Ohm.mm ² /m	0.20				
	Specific heat capacity J/(kg.K)	460				
	Modulus of elasticity 10 ³ N/mm ²	100°C	200°C	300°C	400°C	500°C
		205	195	185	175	165
Thermal expansion 10 ⁶ m/(m.K)	100°C	200°C	300°C	400°C	500°C	
	11.1	12.9	12.9	13.5	13.9	

SIZE RANGE	Round	6.35-450 mm
	Square	30-300 mm
	Flat	25x12 to 600x250 mm

LOCATIONS

Bohler Uddeholm Australia Pty Ltd ABN 15000013052

Sydney	129-135 McCredie Rd Guildford	2161	Ph (02) 8724 5554	Fax (02) 8724 5555
Newcastle	3 Pavilion Pl Cardiff	2285	Ph (02) 4954 6611	Fax (02) 4956 5773
Albury	1 Eames St Albury	2640	Ph (02) 6041 3399	Fax (02) 6041 1820
Wollongong	40 Doyle Ave Unanderra	2526	Ph (02) 4272 6544	Fax (02) 4272 7563
Marayong	1/21 Binney Rd Marayong	2148	Ph (02) 9831 4431	Fax (02) 9671 1682
Melbourne	282-290 Greens Rd Dandenong	3175	Ph (03) 9767 5554	Fax (03) 9767 5555
Bayswater	4 Amsted Rd Bayswater	3153	Ph (03) 9739 8022	Fax (03) 9739 8033
Adelaide	1 Williams Cir Pooraka	5095	Ph (08) 8368 4554	Fax (08) 8368 4555
Brisbane	12-18 Limestone St Darra	4076	Ph (07) 3712 9554	Fax (07) 3712 9555
Townsville	9-11 Caldwell St Garbutt	4814	Ph (07) 4479 4800	Fax (07) 4725 1316
Perth	29-33 Gauge Cir Canningvale	6155	Ph (08) 9455 8672	Fax (08) 9455 8673
Kewdale	5 Beete St Welshpool	6106	Ph (08) 9350 9582	Fax (08) 9350 9683
Launceston	20 Murphy St Invermay	7248	Ph (03) 6334 3542	Fax (03) 6331 4001

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