

Ø 8 MM - Ø 50 MM PLAIN & DEFORMED REINFORCING STEEL BARS / Ø 6 MM - Ø 16 MM DEBAR IN COILS' (QTR PROCESS)

COUNTRY	STANDARD	GRADE	CHEMICAL FEATURES max (%)									MECHANICAL FEATURES min				QTR process for deformed rods	
			C	Mn	Si	P	S	N	CU	CE	YIELD POINT Re _N (N/mm ² kg/mm ²)	TENSILE STRENGTH Rm (N/mm ² kg/mm ²)	(RATIO) Rm/Re	ELONGATION %			
TURKIYE	TS 708 (1996) (1998)	I-Ia II-Ia* III-Ia*/Sismik IV-Ia	0.25			0.050	0.050						220 (22.4)	340 (34.7)	1.20	18 (Lo=10x d)	
			0.40			0.050	0.050					400 (42.8)	500 (51.0)	1.10	8-28 (mm): 12		
			0.22			0.050	0.050	0.012		0.50	500 (51.0)	500 (51.0)	1.15	8-28 (mm): 12			
TURKIYE	TS 708/2010	S 220 (plain)	0.25			0.050	0.050						220 (22.4)	340 (34.68)	1.20	18 (Lo=5d)	
		S 420	0.45			0.050	0.050						420 (42.8)	500 (51.0)		10 (Lo=5d)	
		B 420B	0.22	0.05		0.050	0.050	0.012	0.80	0.50	420 (42.8)	Re x 1.08	≥1.15, <1.35	12 (Lo=5d) // %Agt Min, 5			
		B 500B	0.22	0.05		0.050	0.050	0.012	0.80	0.50	420 (42.8)	Re x 1.15	≥1.15, <1.35	12 (Lo=5d) // %Agt Min, 7.5			
		B 500C	0.22	0.05		0.050	0.050	0.012	0.80	0.50	500 (51.0) - 650 (66.3)	Re x 1.08	≥1.15, <1.35	12 (Lo=5d) // %Agt Min, 7.5			
ENGLAND	BS 4482:2005 BS 4449:1997 BS 4449:1997 BS 4449:2005 BS 4449:2005	GR 250	0.22			0.050	0.050	0.012	0.80	0.42		250 (25.5)	Re x 1.15	1.15	Agt %: 5 (min)		
		GR 250	0.25			0.060	0.060	0.012	0.42	0.42		250 (25.5)	Re x 1.15	1.15	22 (Lo=5Xd)		
		GR 460	0.25			0.050	0.050	0.012	0.51	0.51		460 (46.92)	Re x 1.08	1.08	14 (Lo=5Xd)		
		B500B	0.22			0.050	0.050	0.012	0.80	0.50		500 (51.0) - 650 (66.3)	Re x 1.08	1.08	Agt %: 5 (min)		
		B500C	0.22			0.050	0.050	0.012	0.80	0.50		500 (51.0) - 650 (66.3)	Re x 1.15	≥1.15, <1.35	Agt %: 7.5 (min)		
SINGAPORE	SS 2 : PART 1 : 1999 SS 2 : PART 2 :	PB 300	0.22	1.60	0.60	0.060	0.060	0.012		0.50		300 (30.6)	330 (33.7)	1.10	16 (Lo=5Xd)		
		RB 500W	0.22	1.60	0.60	0.050	0.050	0.012		0.50		500 (51)	550 (56.1)	1.05	14 Agt %: 2.5 (min)		
JAPAIN	JIS G 3112 (1987-90) 1997	SR 24				0.050	0.050					235 (24)	382-520 (39-53)		d < 25 d > 25		
		SR 30				0.050	0.050					294 (30)	441-598 (45-61)		20 24		
		SD 30A				0.050	0.050					294 (30)	441-598 (45-61)		18 20		
		SD 30B	0.27	1.50	0.55	0.040	0.040					294-392 (35-40)	441 (45)		16 18		
		SD 35	0.27	1.60	0.55	0.040	0.040			0.55		343-441 (35-45)	490 (50)		18 20		
		SD 40	0.29	1.80	0.55	0.040	0.040			0.55		392-510 (40-52)	559 (57)		16 18		
USA	ASTM A 615/09b A 615M/09b	GR 40				0.060	0.050					(40,000)Psi 280 (28.6)	(60,000)Psi 420 (42.84)		Bar No % 3 11		
		GR 60				0.060	0.050					(60,000)Psi 420 (42.8)	(90,000)Psi 620 (63.3)		4, 5, 6, 7, 8 3, 4, 5, 6 7, 8 9, 10, 11 7		
		GR 75				0.060	0.050					(75,000)Psi 520 (53.04)	(100,000)Psi 690 (70.38)		3, 4, 5, 6, 7, 8 9, 10, 11, 14 6		
		GR 80				0.060	0.050					(80,000)Psi 550 (56.1)	(105,000)Psi 725 (73.95)		3, 4, 5, 6, 7, 8 9, 10, 11, 14 6		
		GR 60	0.30	1.50	0.50	0.035	0.045			0.55		(60000)Psi 420 (42.8) (78000)Psi 540 (55.08)	(80000) Psi 550 (56.1)	1.25	BAR NO % 3, 4, 5, 6 7, 8, 9, 10, 11 12 14, 18 10		
USA	ASTM A 706/09b A 706M/09b	GR 80	0.30	1.50	0.50	0.035	0.045			0.55		(80000)Psi 550 (56.06) (98000)Psi 675 (68.8)	(100000)Psi 690 (70.3)	1.25	BAR NO % 3, 4, 5, 6 7, 8, 9, 10, 11 12 14, 18 10		
		FRANCE	NF A35-016 (1986) NF A 35-016 (2009)	FeE 400	0.22			0.050	0.050	0.012		0.50	400 (40.8)	440 (44.9)	1.05	14 Agt %: 5 (min)	
GERMANY	DIN 488 (1986)	Bst 220/340	0.22		0.60	0.050	0.050	0.012				220 (22.4)	340 (34.7)	1.05	18		
		Bst 420 S	0.22			0.050	0.050	0.012				420 (42.8)	500 (51.0)	1.05	10 (Lo=10 x d)		
GERMANY-NEW	DIN 488 (2009)	B500B	0.22			0.050	0.050	0.012	0.60		(%Ceq (d<28)) 0.47 (%Ceq (d>28))	500 (51.0) - 650 (66.3)	Re x 1.08	1.08	Agt %: 5 (min)		
		GREECE	ELOT 971 S 500S ELOT 971 S 220 ELOT 1421-3 TS 10081-8500C Seismic Standard	S 400S S 500S S 220 B500C	0.22 0.22 0.22		0.60	0.050 0.050 0.050	0.050 0.050 0.050	0.012 0.012 0.012		0.50	400 (40.8) 500 (51.0) 220 (22.4) 500 (51.0)	440 (44.9) 550 (56.1) 340 (34.7) 575 (58.65)	1.10 1.10 1.10 ≥1.15 ≤1.35	14 (Lo=5 x d) 12 (Lo=5 x d) 24 (Lo=5 x d) 8 (8.8) Agt %: 7.5 (min)	
SPAIN	UNE 36 068-94 (1996) UNE 36 065-2000 SISMK	B 400 S	0.22			0.050	0.050	0.012		0.50		400 (40.8)	440 (44.9)	1.05	14 (Lo=5 x d)		
		B 500 S	0.22			0.050	0.050	0.012		0.50		500 (51.0)	550 (56.1)	1.05	12 (Lo=5 x d)/Agt%5		
		B 500 SD	0.22			0.050	0.050	0.012		0.50		500 (51.0)	575 (58.65)	≥1.15 ≤1.35	16 (Lo=5 x d) Agt %: 8 (min)		
PORTUGAL	E449-2010 LNEC E450-2010 LNEC E455 LNEC/SISMK E460 LNEC/SISMK	A 400 NR	0.22			0.050	0.050	0.012		0.50		400 (40.8)	460 (46.92)	1.08	Agt %: 5 (min)		
		A 500 NR	0.22			0.050	0.050	0.012		0.50		500 (51.0)	550 (56.1)	1.08	Agt %: 5 (min)		
		A 400 NR SD	0.22			0.050	0.050	0.012		0.50		400 (40.8) - 480 (48.96)	Rm/Re: 1.15 - 1.35	1.08	Agt %: 8 (min)		
		A 500 NR SD	0.22			0.050	0.050	0.012		0.50		500 (51.0) - 600 (61.2)	Rm/Re: 1.15 - 1.35	1.08	Agt %: 8 (min)		

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COUNTRY	STANDARD	GRADE	CHEMICAL FEATURES max (%)									MECHANICAL FEATURES min				QTR process for deformed rods	
			C	Mn	Si	P	S	N	CU	CE	YIELD POINT Re _N (N/mm ² kg/mm ²)	TENSILE STRENGTH Rm (N/mm ² kg/mm ²)	(RATIO) Rm/Re	ELONGATION %			
NORWAY	NS 3576-3/97	B500C	0.22	1.60	0.60	0.050	0.050	0.012		0.50		500 (51.0)	575 (58.7)	1.15	Agt %: 8 (min)		
SWITZERLAND	SS-ENV 10080	B500BT	0.22	d ≥ 20mm		0.050	0.050	0.012		0.50		500 (51.0)		1.08	Agt %: 5 (min)		
			0.20	d² 25mm		0.050	0.050	0.012		0.50		500 (51.0)		1.08	Agt %: 5 (min)		
SWISS	slo 2628/262/1(03)	B500B	0.22			0.050	0.050	0.012		0.50		500 (51.0)	500 x 1.08	1.08	Agt %: 5 (min)		
ITALY	UNI (D.M. 14.01.2008)	B450C	0.22			0.050	0.050	0.012	0.80	0.50		450 (43.9) - 562.5 (57.3)	540 (55.1)	≥1.15, <1.35	Agt %: 7.5 (min)		
ROMANIA	STAS-438/1-89	PC 52	0.22	1.60	0.55	0.045	0.045					8-14MM 355(36.21) // 16-28 345(35.19) // 32-40MM 335(34.17)	510 (52.02)		20 (Lo=5 x d)		
		PC 60	0.27	1.60	0.55	0.045	0.045			0.50		8-12MM 420(42.84) // 14-28 405(41.31) // 32-40MM 395(40.29)	590 (60.18)		16 (Lo=5 x d)		
		OB 37	0.23	0.75	0.07	0.045	0.045					8-12MM 255(26.01) // 14-40MM 235(23.97)	360 (36.72)		25 (Lo=5 x d)		
POLAND	PN-ISO 6935-2:1998 (ACC.TO DIN 488)	Bst 500 S	0.22			0.050	0.050	0.012		0.50		500 (51.0)	550 (56.1)	1.05	10		
BULGARIA	BDS 9252:2007 and EN 10080:2005	B500B	0.22			0.050	0.050	0.012		0.50		500 (51.0) - 625 (63.7)	550 (56.1)	1.08	Agt %: 5 (min)		
HOLLAND	NEN 6008	FEB 500 HWL	0.22			0.050	0.050	0.012	0.80	0.50		500 (51.0) Yield and Tensile Max.Deviation Øk ≤ 8 : 50N/mm2 Yield and Tensile Max.Deviation Øk > 8 : 35N/mm2	550 (56.1)		Agt %: 3.5 (min) Deviation 2.5		
BRAZIL	NBR 7480:2008	CA-50										500 (51.0)	Re x 1.08	1.10	8 (Lo=10d) // %Agt Min, 5		
PARAGUAY	PNA 4 007 99	AP 420 DN	0.35	1.50	0.50	0.050	0.050			0.55		420 (42.84)	462 (47.1)	1.10	10 (Lo=10xd)		
		AP 500 DN	0.35	1.50	0.50	0.050	0.050			0.55		500 (51.0)	550 (56.1)	1.10	8 (Lo=10xd)		
SOUTH KOREA	KS D 3504:2009	SD 400				0.050	0.050					400 (40.8)	560 (57.1)		18 (Lo=2.5xd)		
		SD 500				0.050	0.050					500 (51.0)	620 (63.24)		12 (Lo=2.5xd ≤25mm) 14 (Lo=3xd >25mm)		
ISRAEL	SI 4466 PART 3	S 400	0.38			0.050	0.050			0.60		400 (40.8) - 520 (53.1)	500 (51)	1.25	12 (Lo=10xd)		
		S 400W	0.24			0.050	0.050			0.55		400 (40.8) - 520 (53.1)	500 (51)	1.25	12 (Lo=10xd)		
CHILI	Nch 204-2006	A440-280H										280 (28.5)	440,000	1.25	16		
		A560-380H										350,000	560,000	1.25	8		
PERU	NTP 341.031/2008	A630-420H										420-680	630,000	1.25	8		
		Grade 280				0.060	0.050					280 (28.6)	420 (42.8)		10mm= 11 // 13,16,19mm= 12		
		Grade 420				0.060	0.050					420 (42.8)	620 (63.2)		13,16,19mm= 9 // 22,25mm= 8 29,32,36,43mm= 7 19,22,25 = 7 29,32,36,43mm= 6		
Grade 520				0.060	0.050						520 (53.0)	690 (70.4)					