

# DELI

## Besi ULIR kualitas SNI

SNI 2052 : 2017



Kelas baja tulangan	UJI TARIK			UJI LENGKUNG		Rasio TS/YS (hasil uji)
	Kuat luluh/leleh (YS)	Kuat Tarik (TS)	Regangan dalam 200 mm Min.	Sudut lengkung	Diameter pelengkung	
	Mpa	Mpa	%			
BjTS 420A	Min. 420 Maks. 545	Min. 525	9 ( $d \leq 19$ mm)	180°	3.5d ( $d \leq 16$ mm)	Min. 1,25
			8 ( $22 \leq d \leq 25$ mm)	180°	5d ( $19 \leq d \leq 25$ mm)	
			7 ( $d \geq 29$ mm)	180° 90°	7d ( $29 \leq d \leq 36$ mm) 9d ( $d > 36$ mm)	
BjTS 420B	Min. 420 Maks. 545	Min. 525	14 ( $d \leq 19$ mm)	180°	3.5d ( $d \leq 16$ mm)	Min. 1,25
			12 ( $22 \leq d \leq 36$ mm)	180°	5d ( $19 \leq d \leq 25$ mm)	
			10 ( $d > 36$ mm)	180° 90°	7d ( $29 \leq d \leq 36$ mm) 9d ( $d > 36$ mm)	
BjTS 520	Min. 520 Maks. 645	Min. 650	7 ( $d \leq 25$ mm)	180°	5d ( $d \leq 25$ mm)	Min. 1,25
			6 ( $d \geq 29$ mm)	180° 90°	7d ( $29 \leq d \leq 36$ mm) 9d ( $d > 36$ mm)	
			7 ( $d \leq 25$ mm)	180°	5d ( $d \leq 25$ mm)	
BjTS 550	Min. 550 Maks. 675	Min. 687,5	7 ( $d \leq 25$ mm)	180°	5d ( $d \leq 25$ mm)	Min. 1,25
			6 ( $d \geq 29$ mm)	180° 90°	7d ( $29 \leq d \leq 36$ mm) 9d ( $d > 36$ mm)	
			7 ( $d \leq 25$ mm)	180°	5d ( $d \leq 25$ mm)	



**PUTRA BAJA DELI**  
WORLD CLASS STEEL MILL

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**MECHANICAL PROPERTIES OF ROUND BAR / DEFORMED BAR ACCORDING TO MS 146:2014**

Bars	Grade	Yield Strength (N/mm <sup>2</sup> )	Tensile Strength (N/mm <sup>2</sup> )	Minimum Elongation on Gauge Length $5.65 \sqrt{S_0} \times d^a$	Bend Test	Rebend Test
Round Bar	250	250	Min. 5% greater than Yield Strength	22	Former 2d of Bar (Bend Angle 180°)	Former 2d of Bar (Bend Angle 45° bend back 23°)
Deformed Bar	460	460		12	Former 3d of Bar (Bend Angle 180°)	Former 5d of Bar (Bend Angle 45° bend back 23°)
	500	500		12		

<sup>a</sup> d is the nominal size of the test piece

**MECHANICAL PROPERTIES DEFORMED BAR ACCORDING TO BS 4449:2005**

Grade	Yield Strength, $R_e$ (Mpa)	Tensile/Yield Strength ratio, $R_m/R_e$	Total Elongation at Maximum Force, $A_{gt}$ (%)	Bend Test	
				Bend Angle	Mandrel Diameters
B500A	500	1.05a	2.5b	Bend 90° and bend back at least 20°	d ≤ 16 = 4d d > 16 = 7d
B500B	500	1.08	5.0		
B500C	500	≥ 1.15, < 1.35	7.5		

<sup>a</sup>  $R_m/R_e$  characteristic is 1.02 for sizes below 8 mm.  
<sup>b</sup>  $A_{gt}$  characteristic is 1.0 % for sizes below 8 mm.  
 Values of  $R_e$  specified are characteristic with  $p = 0.95$ .  
 Values of  $R_m/R_e$  and  $A_{gt}$  specified are characteristic with  $p = 0.90$ .  
 Calculate the values of  $R_m$  and  $R_e$  using the nominal cross sectional.

**MECHANICAL PROPERTIES OF ROUND BAR / DEFORMED BAR ACCORDING TO AS/NZS 4671:2001**

Property	250N (Note 1)	500L (Note 2)	500N	300E (Seismic)	500E (Seismic)	Mandrel Diameter for Bend and Rebend Test					
						Nominal diameter (mm)	Mandrel for Class			Bend angle	Bend angle after 90° initial bend
							L	N	E		
Yield stress (MPa) $R_{ek,L}$ $R_{ek,U}$	≥ 250 -	≥ 500 ≤ 750	≥ 500 ≤ 650	≥ 300 ≤ 380	≥ 500 ≤ 600	d ≤ 16	3d	-	-	90°	20°
Ratio $R_m/R_e$	≥ 1.08 -	≥ 1.03 -	≥ 1.08 -	≥ 1.15 ≤ 1.50	≥ 1.15 ≤ 1.40		-	4d	4d		90°
Uniform elongation $A_{gt}$ (%)	≥ 5.0	≥ 1.5	≥ 5.0	≥ 15.0	≥ 10.0	d ≥ 20	-	4d	4d	180°	NA

Notes:  
 1. Grade 250N may be supplied as plain round reinforcing steel complying with AS 3679.1, except that the tolerance on the diameter and roundness does not apply.  
 2. For 500L steels, the only requirement for d < 5.0 mm is  $R_{ek,L} \geq 500$  MPa.

**MECHANICAL PROPERTIES DEFORMED BAR ACCORDING TO ASTM A706/ A706M- 14**

	Grade 60 [420]	Grade 80 [550]
Tensile Strength, min, psi [MPa]	80.000 [550] <sup>a</sup>	100.000 [690] <sup>a</sup>
Yield Strength, min, psi [MPa]	60.000 [420]	80.000 [550]
Yield Strength, max, psi [MPa]	78.000 [540]	98.000 [675]
Elongation in 8 in. [200 mm], min, %: Bar designation No. 3, 4, 5, 6 [10, 13, 16, 19] 7, 8, 9, 10, 11 [22, 25, 29, 32, 36] 14, 18 [43, 57]	14 12 10	12 12 10

<sup>a</sup> Tensile strength shall not be less than 1,25 times the actual yield strength.