

## AS 1548 - PT460NRA (LO, L20)

AS 1548 - PT460NRA, AS 1548 - PT460NRALO, AS 1548 - PT460NRAL20

### XLERPLATE® steel

**DATE:** AUGUST 2009

#### PRODUCT DESCRIPTION

- A fully killed, fine grained, carbon-manganese steel for boiler and pressure vessel applications
- Produced by normalised rolling - tested in the normalised and stress relieved condition
- Guaranteed minimum tensile strength of 460 MPa

#### SUPPLY CONDITIONS

- Size and Availability: Refer to XLERPLATE® Size Schedule 4  
460NRALO is available by enquiry only
- Edge Condition: Trimmed
- Tolerances: Thickness - AS 1548, others - AS/NZS 1365
- Ultrasonic Inspection: AS 1710 available
- Surface Inspection: BlueScope Steel (third party available)
- Certification: BlueScope Steel (third party endorsed available)

#### FEATURES & BENEFITS

- Guaranteed tensile strength levels
- Grades with elevated temperature properties available
- Grades with guaranteed low temperature properties available
- Excellent weldability and formability

#### WARNINGS

- This material should be used in conjunction with the appropriate structural design and welding standards.
- Guidelines for cold bending, where fracture toughness is important are given in AS 4100 and AS 1210.
- This grade is not recognised in the ASME material code and does not carry the 'SA' prefix.
- This material must be normalised and/or hot formed by the customer to ensure the properties of the plate meet the requirements of the standard.

#### NEAREST OVERSEAS SPECIFICATIONS

JISG 3118-SGV450    ASTM A662-Gr. B    ISO 9328.2-P290    EN 10028-3-P275N    EN 10028-2-P295GH

#### AS 1548 - 1995 EQUIVALENT

SA/AS 1548 - 7 - 460A (LO)

#### For more information contact:

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CHEMICAL COMPOSITION			
Element	Guaranteed Maximum % <sup>(2)</sup>	Typical % / Thickness (mm)	
		8 ≤ t ≤ 80	80 < t ≤ 100
Carbon	0.20	0.15	0.15
Silicon	0.60	0.35	0.35
Manganese	0.90 - 1.70	1.35	1.35
Phosphorus	0.040	0.020	0.020
Sulfur	0.030	0.010	0.003
Aluminium	0.100	0.035	0.035
Niobium	0.010 <sup>(3)</sup>	-	-
CEQ (IIW) <sup>(1)</sup>	0.43	0.39	0.39

$$(1) \text{CEQ (IIW)} = C + \frac{\text{Mn}}{6} + \frac{(\text{Cr} + \text{Mo} + \text{V})}{5} + \frac{(\text{Cu} + \text{Ni})}{15}$$

(2) All values shown refer to the relevant Australian Standard unless stated otherwise

(3) Niobium (up to 0.030%) may be added for L20, L40, L50 grades

MECHANICAL PROPERTIES					
Tensile Properties (Transverse)		Thickness Range (mm)			
		t ≤ 16	16 < t ≤ 40	40 < t ≤ 80	80 < t ≤ 100
Guaranteed Min.	Yield Strength (MPa)	305	295	275	265
	Tensile Strength (MPa)	460 - 580	460 - 580	460 - 580	460 - 580
	Elong. on 5.65 √ So (%)	21	21	21	21
Typical	Yield Strength (MPa)	330 - 430	315 - 415	290 - 370	290 - 350
	Tensile Strength (MPa)	470 - 530	470 - 530	470 - 530	470 - 530
	Elong. on 5.65 √ So (%)	24 - 35	23 - 35	24 - 32	24 - 33

Charpy Impact Properties	Longitudinal on 10 x 10mm specimen	Test Temp. °C	Absorbed Energy (joules)	
			Ave. of 3	Ind.
Guaranteed Min.	PT460NRA	0	31	23
Typical			40 - 110	30 - 140
Guaranteed Min.	PT460NRALO	0	51	38
Typical			55 - 110	40 - 140
Guaranteed Min.	PT460NRAL20	-20	47	35
Typical			55 - 110	40 - 140

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MECHANICAL PROPERTIES									
PT460NRAH - Elevated Temp. Tensile Properties - Guaranteed Min. 0.2% Proof Stress (MPa)									
Thickness	50°C	100°C	150°C	200°C	250°C	300°C	350°C	400°C	450°C
t ≤ 16	295	277	257	236	216	199	184	173	163
16 < t ≤ 40	285	268	249	228	209	192	178	167	157
40 < t ≤ 80	266	250	232	213	195	179	166	156	145
80 < t ≤ 100	256	241	223	206	188	173	160	150	141

Values correspond to the lower trend curve determined according to EN10314 with a confidence limit of around 98% (2 standard deviations below the mean)

FORMABILITY (recommended min. inside radii)		HARDNESS	WELDABILITY
t < 20mm	Long 1.5T, Trans 1.0T	Typical	Group 4 <sup>(4)</sup>
20 ≤ t ≤ 50mm	Long 6.0T, Trans 4.0T	130 - 170 BHN	
t > 50mm	Hot form		

(4) Refer to WTIA Technical Note 1 or AS/NZS 1554.1

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