

AS 1548 - PT490NRA (L20, L40, L50)

AS 1548 - PT490NRA, AS 1548 - PT490NRAL20, AS 1548 - PT490NRAL40, AS 1548 - PT490NRAL50

XLERPLATE® steel

DATE: AUGUST 2009

PRODUCT DESCRIPTION

- This grade may be used in situations where subsequent hot forming processes are carried out in a manner to replicate normalising (refer to AS 1548)
- A fully killed, micro-alloyed, fine grained steel for boiler and pressure vessel applications
- Produced by normalised rolling, with normalised and stress relieved test pieces
- Guaranteed minimum tensile strength of 490 MPa

SUPPLY CONDITIONS

- Thickness Range: 10mm – 100mm
- Availability: 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 mechanical properties after hot forming in accordance with AS 1548
- Grades with elevated temperature and low temperature properties available
- Good weldability and formability
- This grade is designed for use when material is to be hot formed

WARNINGS

- This material should be used in conjunction with the appropriate pressure vessel design and welding standards.
- It is the responsibility of the customer to normalise this material through the hot forming process or by normalising the plate or fabricated vessel. Toughness properties may not be achieved if used in the as supplied condition.
- Customers should satisfy themselves through their own quality systems that the heat treatment process employed for hot forming produces the mechanical properties described.
- Guidelines for cold bending, where fracture toughness is important, are given in AS4100 and AS1210.
- This grade is not recognised in the ASME material code and does not carry the "SA" prefix.

NEAREST OVERSEAS SPECIFICATIONS

EN 10028-3-P355

AS 1548 - 1995 EQUIVALENT

AS 1548 - 5 - 490A (L20, L40, L50) AS 1548 - 7 - 490A (L0)

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CHEMICAL COMPOSITION		
Element	Guaranteed Maximum % ⁽²⁾	Typical % / Thickness (mm)
		10 ≤ t ≤ 100 ⁽³⁾
Carbon	0.20	0.13
Silicon	0.60	0.45
Manganese	0.90 - 1.70	1.50
Phosphorus	0.040	0.020
Sulfur	0.030	0.003
Niobium	0.050	0.015
Aluminium	0.100	0.035
Titanium	0.040	0.018
CEQ (IIW) ⁽¹⁾	0.46	0.41

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

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

(3) Additional alloys 0.2 Ni, 0.3 Cu.

MECHANICAL PROPERTIES					
Tensile Properties (Transverse)		Thickness Range (mm)			
		≤ 16	> 16 ≤ 40	> 40 ≤ t ≤ 80	> 80 ≤ 100
Guaranteed Min.	Yield Strength (MPa)	360	340	330	320
	Tensile Strength (MPa)	490 - 610	490 - 610	490 - 610	490 - 610
	Elong. on 5.65 √ So (%)	20	20	20	20
Typical	Yield Strength (MPa)	385 - 445	380 - 440	380 - 430	370 - 420
	Tensile Strength (MPa)	500 - 540	500 - 540	500 - 540	500 - 540
	Elong. on 5.65 √ So (%)	26 - 35	26 - 35	24 - 32	24 - 32
Charpy Impact Properties	Longitudinal on 10 x 10mm specimen	Test Temp. °C	Absorbed Energy (joules)		
			Ave. of 3	Ind.	
Guaranteed Min.	PT490NRA	-20	55	43	
			80 - 180	60 - 200	
Typical	PT490NRAL20	-20	55	43	
			80 - 180	60 - 200	
Guaranteed Min.	PT490NRAL40	-40	45	33	
			60 - 160	50 - 180	
Typical	PT490NRAL50	-50	42	31	
			60 - 160	50 - 180	

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MECHANICAL PROPERTIES									
PT490NH - 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	348	327	303	278	255	236	217	204	192
16 < t ≤ 40	329	310	287	263	242	222	205	193	182
40 < t ≤ 80	319	300	278	255	234	216	199	187	176
80 < t ≤ 100	310	291	269	248	227	210	193	182	172

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 < 16mm	Long 3.0T, Trans 2.0T	Typical	Group 5 ⁽⁴⁾
20 ≤ t ≤ 40mm	Long 6.0T, Trans 4.0T	140 - 180 BHN	
t > 40mm	Hot form		

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

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