SA/SA 1548 - PT490N (L20, L40, L50) XLERPLATE® steel

Revision 2 January 2015

This literature supersedes all previous issues

Plate – PL **Pressure Vessel - PV**

GENERAL DESCRIPTION

A fully killed, micro-alloyed, fine grained steel for boiler and pressure vessel applications, with a guaranteed minimum tensile strength of 490MPa. Produced by normalising, with stress relieved test pieces

AUSTRALIAN STANDARDS

AS 1548: 2008
AS/NZS 1365: 1996

FEATURES & BENEFITS

- Grades with elevated temperature properties available
- Grades with low temperature properties available
- Good weldability
- Good formability
- This grade is recognised in the ASME material code

WARNINGS

- This material should be used in conjunction with the appropriate pressure vessel design and welding standards
- Guidelines for cold bending, where fracture toughness is important are given in AS 4100 and AS1210

NORMAL / OPTIONAL SUPPLY CONDITIONS

	Normal	Optional
Thickness Range	PT490N: thicknesses between 10mm – 100mm PT490NL20: thicknesses between 10mm – 100mm PT490NL40: thicknesses between 10mm – 80mm PT490NL50: thicknesses between 10mm – 80mm	
Availability	By enquiry only	
Edge Condition	Trimmed	
Tolerances	Thickness: AS1548: 2008 Others: AS/NZS 1365: 1996	
Ultrasonic Inspection		AS 1710: 2007
Surface Inspection	BlueScope Steel	Third party
Certification	BlueScope Steel	Third party endorsed

Optional supply conditions may be subject to dimensional restrictions

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CHEMICAL COMPOSITION

Element	Guaranteed Maximum %	Typical % Thickness (mm)
		10 ≤ t ≤ 100
Carbon	0.20	0.13
Silicon	0.60	0.45
Manganese	1.70	1.50
Phosphorus	0.040	0.020
Sulfur	0.030	0.003
Chrome	0.25	0.023
Nickel	0.50	0.20
Copper	0.40	0.30
Molybdenum	0.10	0.002
Aluminium	0.100	0.035
Titanium	0.040	0.018
Niobium	0.050	0.015
CEQ (IIW)	0.46	0.42

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

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

Copper + Chrome + Molybdenum ≤ 0.45 %

MECHANICAL PROPERTIES

Tensile Properties (Transverse)		Thickness (mm)			
		t ≤ 16	16 < t ≤ 40	40 < t ≤ 80	80 < t ≤ 100
Yield Strength (MPa)	Guaranteed Min	360	340	330	320
	Typical	385 - 445	380 - 440	330 - 480	330 – 400
Tensile Strength (MPa)	Required	490 – 610	490 – 610	490 – 610	490 – 610
	Typical	500 - 550	500 - 550	500 - 550	500 – 550
Elong. On $5.65\sqrt{S_0}$ (%)	Guaranteed Min	20	20	20	20
	Typical	26 - 35	26 - 35	24 - 35	24 - 34

Charpy Impact Properties	Longitudinal on 10 x 10mm specimen	Test Temperature °C	Absorbed Energy (joules)	
			Av. Of 3	Ind.
Guaranteed Min	PT490N	-20	55	43
Typical			80 – 180	63 – 200
Guaranteed Min	PT490NL20	-20	55	43
Typical			80 - 260	60 – 200
Guaranteed Min	PT490NL40	-40	45	33
Typical			60 – 200	50 – 150
Guaranteed Min	PT490NL50	-50	42	31
Typical			60 - 200	50 - 180

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PT490NH– Elevated Temp. Tensile Properties - Guaranteed Min 0.2% Proof Stress (MPa)									
Thickness (mm)	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

Thickness (mm)	Long	Trans
t ≤ 16	3.0t	2.0t
16 < t ≤ 40	6.0t	4.0t
t > 40	Hot form	

Recommended min. inside radii

HARDNESS

Typical
140 – 180 BHN

WELDABILITY

Group
5

Refer to WTIA Technical Note 1 or AS/NZS 1554.1.