AS 1548 - PT460T (L0, L20, L40, L50) XLERPLATE® steel

Revision 1 September 2013

This literature supersedes all previous issues

Plate – PL **Pressure Vessel - PV**

GENERAL DESCRIPTION

A fully killed, fine grained, carbon-manganese steel for boiler and pressure vessel applications, with a guaranteed minimum tensile strength of 460MPa. Produced by thermo-mechanical controlled rolling

AUSTRALIAN STANDARDS

AS 1548: 2008
AS/NZS 1365: 1996

FEATURES & BENEFITS

- Guaranteed design strength as per AS 1210
- Grades available with guaranteed low temperature properties
- Excellent weldability and formability
- Alternative to normalised grades where good toughness is required.

WARNINGS

- This material should be used in conjunction with the appropriate pressure vessel design and welding standards
- This grade is not suitable for hot forming above 620°C. Where hot forming is required use AS 1548 – PT490NR/NRA/N
- Guidelines for cold bending, where fracture toughness is important are given in AS 4100 and AS1210
- This grade is not recognised in the ASME material code and does not carry the 'SA' prefix

NORMAL / OPTIONAL SUPPLY CONDITIONS

	Normal	Optional
Thickness Range	PT460T: 6mm – 80mm PT460TL0: 6mm – 80mm PT460TL20: 6mm – 40mm PT460TL40: 10mm – 40mm PT460TL50: 10mm – 40mm	
Edge Condition	Trimmed	
Tolerances	Thickness: AS1548: 2008 Others: AS/NZS 1365: 1996	
Ultrasonic Inspection		AS 1710: 2007 available
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)		
		T,TL20 (6 ≤ t < 8)	T,TL20 (8 ≤ t ≤ 80)	TL40, TL50 (10 ≤ t < 40)
Carbon	0.20	0.14	0.15	0.09
Silicon	0.60	0.2	0.35	0.35
Manganese	1.70	1.10	1.35	1.50
Phosphorus	0.040	0.020	0.020	0.020
Sulfur	0.030	0.012	0.010	0.012
Chrome	0.25	0.023	0.017	0.027
Nickel	0.50	0.021	0.023	0.027
Copper	0.40	0.017	0.010	0.010
Molybdenum	0.10	0.002	0.002	0.003
Aluminium	0.100	0.035	0.035	0.035
Titanium	0.040	0.018	0.018	0.018
Niobium	0.010*	-	-	0.024
CEQ (IIW)	0.43	0.38	0.39	0.34

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

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

* Niobium (up to 0.030%) may be added for L20, L40, L50 designations

MECHANICAL PROPERTIES

Tensile Properties (Transverse)		Thickness (mm)		
		t ≤ 16	16 < t ≤ 40	40 < t ≤ 80
Yield Strength (MPa)	Guaranteed Min	305	295	275
	Typical	360 - 520	370 – 470	290 – 420
Tensile Strength (MPa)	Required	460 – 580	460 – 580	460 – 580
	Typical	490 - 550	460 - 550	480 – 530
Elong. On 5.65√S_0 (%)	Guaranteed Min	21	21	21
	Typical	22 - 34	22 - 33	22 - 31

Charpy Impact Properties	Longitudinal on 10 x 10mm specimen	Test Temperature °C	Absorbed Energy (joules)	
			Av. Of 3	Ind.
Guaranteed Min	PT460T	0	31	23
Typical			50 - 150	40 – 180
Guaranteed Min	PT460TL0	0	51	38
Typical			60 – 150	40 – 180
Guaranteed Min	PT460TL20	-20	47	35
Typical			50 – 150	40 – 180
Guaranteed Min	PT460TL40	-40	45	33
Typical			80 – 120	60 – 150
Guaranteed Min	PT460TL50	-50	42	31
Typical			45 - 100	35 - 120

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PT460NTH– 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	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

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 ≤ 20	2.5t	2.0t
20 < t ≤ 40	6.0t	4.0t

Recommended min. inside radii

HARDNESS

Typical
130 – 170BHN

WELDABILITY

Group
4

Refer to WTIA Technical Note 1 or AS/NZS 1554.1