
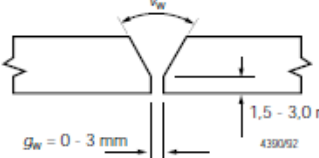


Typical joint preparation for TIG welding of aluminium alloys

Thickness (mm)	Joint design	Welding position/comments
2,5 – 3,0		Flat Horizontal Vertical Overhead
3,0 – 10,0		Flat and Vertical V = 60° Horizontal and Overhead V = 90° – 110°
Symbols and definitions		
g_w = weld gap, in mm V_w = weld preparation angle, in degrees		

Where stiffening members are attached by continuous fillet welds and cross completely finished butt or seam welds, these welds are to be made flush in way of the faying surface. Similarly, for butt welds in webs of stiffening members, the butt weld is to be completed and generally made flush with the stiffening member before the fillet weld is made. The ends of the flush portion are to run out smoothly without notches or sudden change of section. Where these conditions cannot be complied with, a scallop is to be arranged in the web of the stiffening member. Scallops are to be of such size, and in such a position, that a satisfactory weld can be made.

Fillet welds T-connections are generally to be made by fillet welds on both sides of the abutting plate, the dimensions and spacing of which are shown in attaché Fig. Where the connection is highly stressed full penetration welding may be required. Where full penetration welding is required, the abutting plate may need to be bevelled.

The throat thickness of fillet welds is to be determined

$$\text{Throat thickness} = t_p \times \text{Weld factor} \times \left(\frac{d}{s}\right) \text{ mm}$$

where s = the length of correctly proportioned weld fillet, clear of end craters, in mm, and is to be 10 x plate thickness, t_p , or 75 mm, whichever is the lesser, but in no case to be taken less than 40 mm
 d = the distance between successive weld fillets, in mm
 t_p = plate thickness, in mm, on which weld fillet size is based,

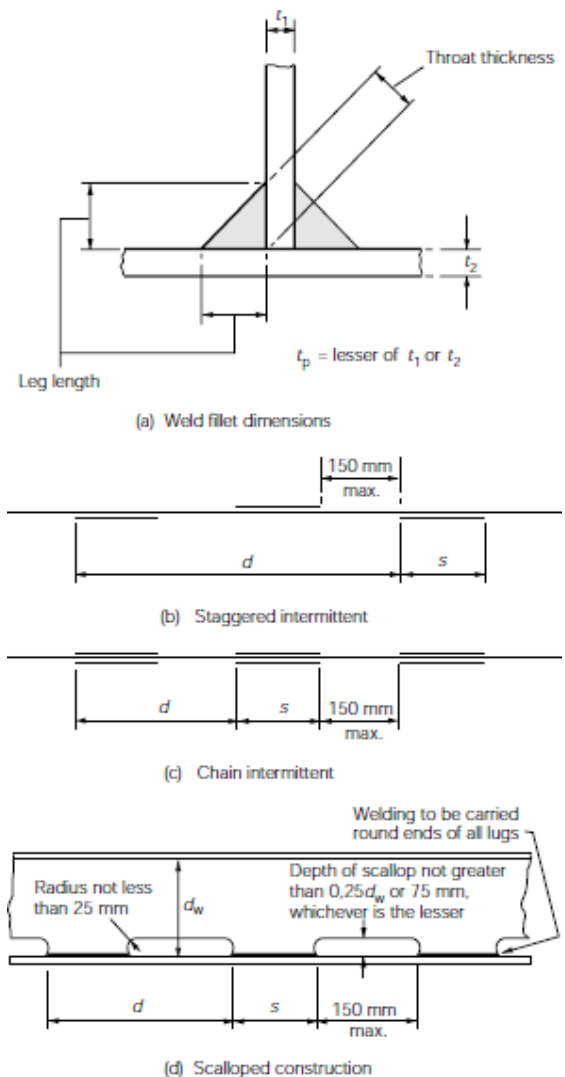
Weld factors are contained in Table 2.4.3.

Note: for double continuous fillet welding $\left(\frac{d}{s}\right)$ is to be taken from: as 1

For ease of welding, it is recommended that the ratio of the web height to the flange breadth be greater than or equal to 1,5

Where an approved automatic deep penetration procedure is used, the weld factors given in Table 2.4.3 may generally be reduced by 15 per cent.

The leg length of the weld is to be not less than 2 times the specified throat thickness.



Throat thickness.

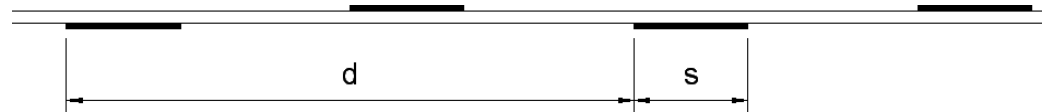
Table 1

Item	Thickness tp mm	Type of welding	d	s	Vw	b	Weld factor	Throat thickness mm				REMARKS
			mm	mm	°	mm		Calculated F.1	minimum	maximum	adopted	
Central Girder to bottom	7	s.i.w.	480	120	--	--	0.27	8	1.9	3.15	8	See pic. 1
Central girder flange	5	s.i.w.	480	120	--	--	0.10	4	1.35	2.25	4	See pic. 1
Lateral girders to bottom	5	s.i.w.	480	120	--	--	0,21	5	1.35	2.25	5	See pic. 1
Lateral girders flange	5	s.i.w.	480	120	--	--	0.10	4	1.35	2.25	4	See pic. 1
Watertight lateral girders in fuel tanks	5	d.c.w.	--	-- --		--	0.44	2,2	1.05	2.2	2.2	
Floors to bottom	5	s.i.w.	480	120	--	--	0.21	1.1	1.35	2.25	2	See pic. 1
Floors flange	5	s.i.w.	480	120	--	--	0.10	2	1.35	2.25	2	See pic. 1
Watertight floors to bottom	5	d.c.w.	--	-- --		--	0.34	1.7	1.05	2.2	2.2	
Watertight floors to bottom in fuel tanks	5	d.c.w.	--	-- --		--	0.44	2.2	1.05	2.2	2.2	
Watertight floors flange	5	d.c.w.	--	--	--	--	0.10	0.5	1.05	2.2	2.2	
Floors to long. girders	5	d.c.w.	--	--	--	--	0.27	1.35	1.05	2.2	2.2	

Side plates vs side plates	5-5	b.w.	--	--	90	0	--	--	--	--		See pic. 2
	5-9	b.w.	--	--	90	12	--	--	--	--		See pic. 2
	5-12	b.w.	--	--	90	21	--	--	--	--		See pic. 2
	12-9	b.w.	--	--	90	--	--	--	--	--		See pic. 2
	12-12	b.w.	--	--	90	--	--	--	--	--		See pic. 2
Bottom Plates vs bottom plates	12-12	b.w.	--	--	110	--	--	--	--	--		See pic. 2
	12-14	b.w.	--	--	110	--	--	--	--	--		See pic. 2
	12-15	b.w.	--	--	110	--	--	--	--	--		See pic. 2
	14-14	b.w.	--	--	110	--	--	--	--	--		See pic. 2
	14-15	b.w.	--	--	110	--	--	--	--	--		See pic. 2
	15-15	b.w.	--	--	110	--	--	--	--	--		See pic. 2
Bottom plates vs Side plates	9-12	d.c.w.	--	-- --		--	0.27	2.43	1.9	3.96	4	
	12-12	d.c.w.	--	-- --		--	0.27	3.24	2.52	5.28	5.5	
	12-15	d.c.w.	--	-- --		--	0.27	3.24	2.52	5.28	5.5	
Stiffeners		s.i.w.	480	120	--	--	0.1	1.8	1.2	2.02	2	See pic. 1
Gunwale (flat bulb)		s.i.w.	480	120	--	--	0.1	2.2	1.45	2.43	2.5	See pic. 1

NOTES :

d.c.w. double continuous welding



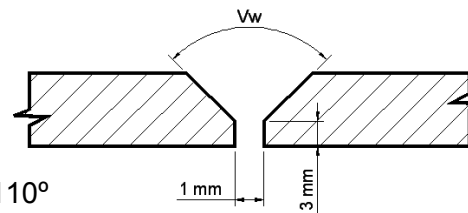
s.i.w. staggered intermittent welding

b.w. butt weld

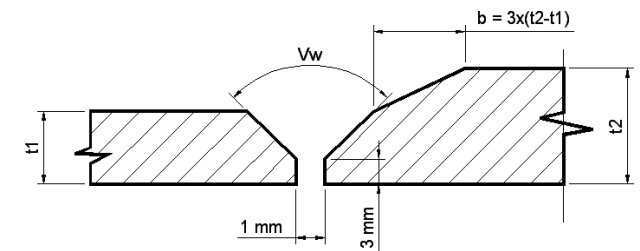
flat and vertical $V = 90^\circ$

horizontal

$V = 90^\circ - 110^\circ$



picture 1



picture 2