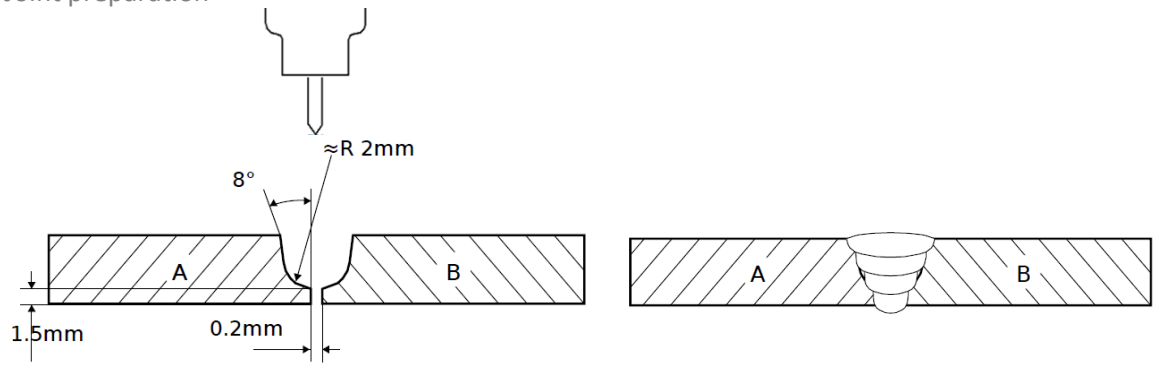
The test weld, that is closest to the selected simulation, is this *multi pass weld in a U joint in 11 mm plate thickness*

Base material	Thickness mm	Joint	Joint preparation	Welding process	Filler metal	Shielding gas	Backing gas
SDX 2507 EN 1.4410	11	U	Bevel angle 8° Radius 2 mm Face 1.5 mm Gap 0.2 mm	GTAW (TIG) Ø3.2 mm	25 9 4 NL Ø0.8 mm	MISON H2*	Nitrogen

*MISON H2 (Ar +2%H_2+0.03%NO), normally MISON N2 is recommended

Joint preparation

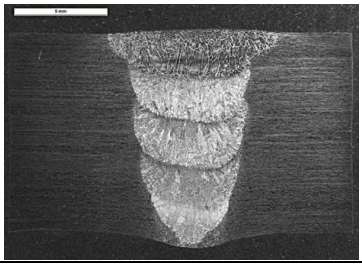


The bevel angle was 8°and bottom radius was 2 mm, the root face was 15 mm and the root gap 0.2 mm.

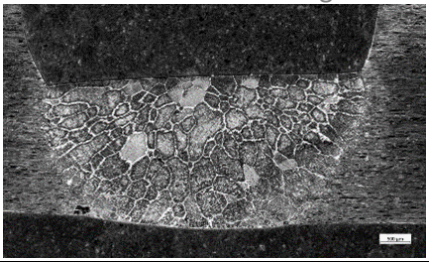
The test weld was a complete multi pass weld (5 passes).
All passes were welded with pulsed GTAW (TIG). Welding position PA.

	Welding current A	Voltage V	Heat input kJ/mm	Wire feed speed m/min	Welding speed cm/min	Pass number
Root	60	8.2	0.6-0.8	0.15	2.5	1
Fill	95	9.4	0.6-0.7	1.0	5.0	2
Fill and cap	120	9.6	0.7-0.8	1.0	5.5	3-5

Cross section of the weld



Root bead before reheating



Measured ferrite fraction in the weld (the rest is assumed to be austenite), and the ferrite fraction more in detail in different regions of the weld, are shown in the table below. The fraction is measured using image analysis.

Ferrite measurements are made in the final weld. All passes but the last cap-pass are reheated by following weld passes. The ferrite fraction is an average value based on several measurements using image analysis in each location and the standard deviation in average values were around 8-13%.

Pass	Heat input kJ/mm	Average of the pass	Top of the pass	Middle of the pass	Bottom of the pass
Root Reheated	0.6 – 0.8	55%	-	-	-
Fill Reheated	0.6 – 0.7	46%	-	-	-
Fill Reheated	0.7 – 0.8	44%	-	-	-
Fill Reheated	0.7 – 0.8	46%	-	-	-
Cap As-welded	0.7 – 0.8	744%	-	-	-

The as-welded root bead (before reheating by following weld filling passes) consisted of very large ferrite grains with grain boundary austenite and some nitrides (highest in the bottom). After reheating secondary austenite was formed in the root. Secondary austenite and grain boundary austenite was found in the filling beads and nitrides in the cap bead.

No sigma phase was found in the weld.