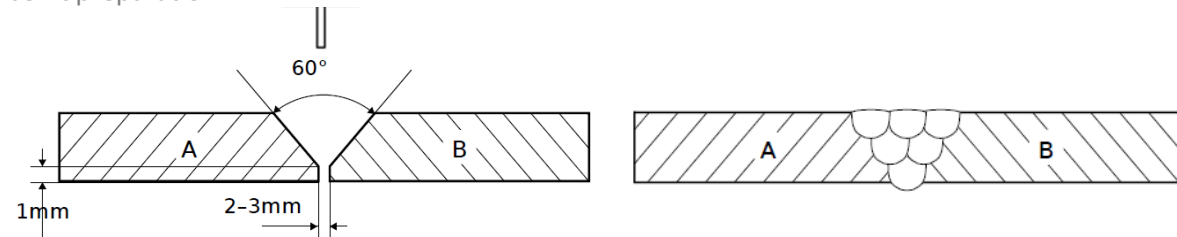


The test weld, that is closest to the selected simulation, is this *multi pass weld in a V joint in 15 mm plate thickness*

Base material	Thickness mm	Joint	Joint preparation	Welding process	Filler metal	Shielding gas	Backing gas
SDX 2507 EN 1.4410	15	V	Joint angle 60° Face 1 mm Gap 2-3 mm	SMAW (MMA)	25 9 4 NL Ø2.5 mm (root) Ø3.2 mm (fill)	-	-

Joint preparation

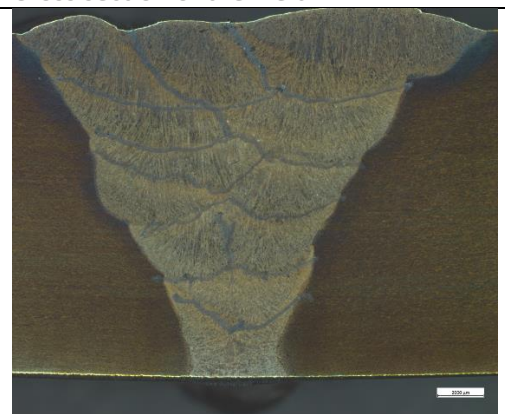


The joint angle was 60° (bevel angles 30°), the root face was 1 mm and the root gap 2-3 mm .

The test weld was a complete multi pass weld (12 passes).  
All passes were welded with SMAW (MMA). Welding position PA.

	Welding current A	Voltage V	Heat input kJ/mm	Wire feed speed m/min	Welding speed cm/min	Pass number
Root	60-70	22-22.5	0.4-0.5		15.8-16.2	1
Fill	100-110	22.5-23.5	0.6-0.7		18.8-19.2	2
Fill	100-110	22.5-23.5	0.6-0.8		16.6-17	3
Fill and cap	100-110	22.5-24	0.5-0.7		19-22	4-12

Cross section of the weld



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 2-4%.

Pass	Heat input kJ/mm	Average of the pass	Top of the pass	Middle of the pass	Bottom of the pass
Root Reheated	0.4 – 0.5	45±4%	43±4%	50%	47%
Fill Reheated	0.6 – 0.7	46±2%	45±1%	48%	48%
Fill Reheated	0.6 – 0.8	46±1%	46±1%	46%	44%
Fill Reheated	0.5 – 0.7	50±4%	49±3%	50%	57%
Fill Reheated	0.5 – 0.7	55±3%	54±2%	57%	59%
Fill Reheated	0.5 – 0.7	47±4%	45%	47%	55%
Fill* Reheated	0.5 – 0.7	48±1%	48±1%	-	-
Fill* Reheated	0.5 – 0.7	51±3%	51±3%	-	-
Fill Reheated	0.5 – 0.7	50±2%	51±2%	51%	49%
Cap/Fill Reheated	0.5 – 0.7	56±3%	57±3%	53%	54%
Cap/Fill Reheated	0.5 – 0.7	56±2%	58±1%	54%	54%
Cap As-welded	0.5 – 0.7	54±4%	56±2%	56%	46%

\*Pass 7 and 8 were too thin for ferrite measurement using the top, middle and bottom concept

In this test nitrides and sigma phase were not analysed.