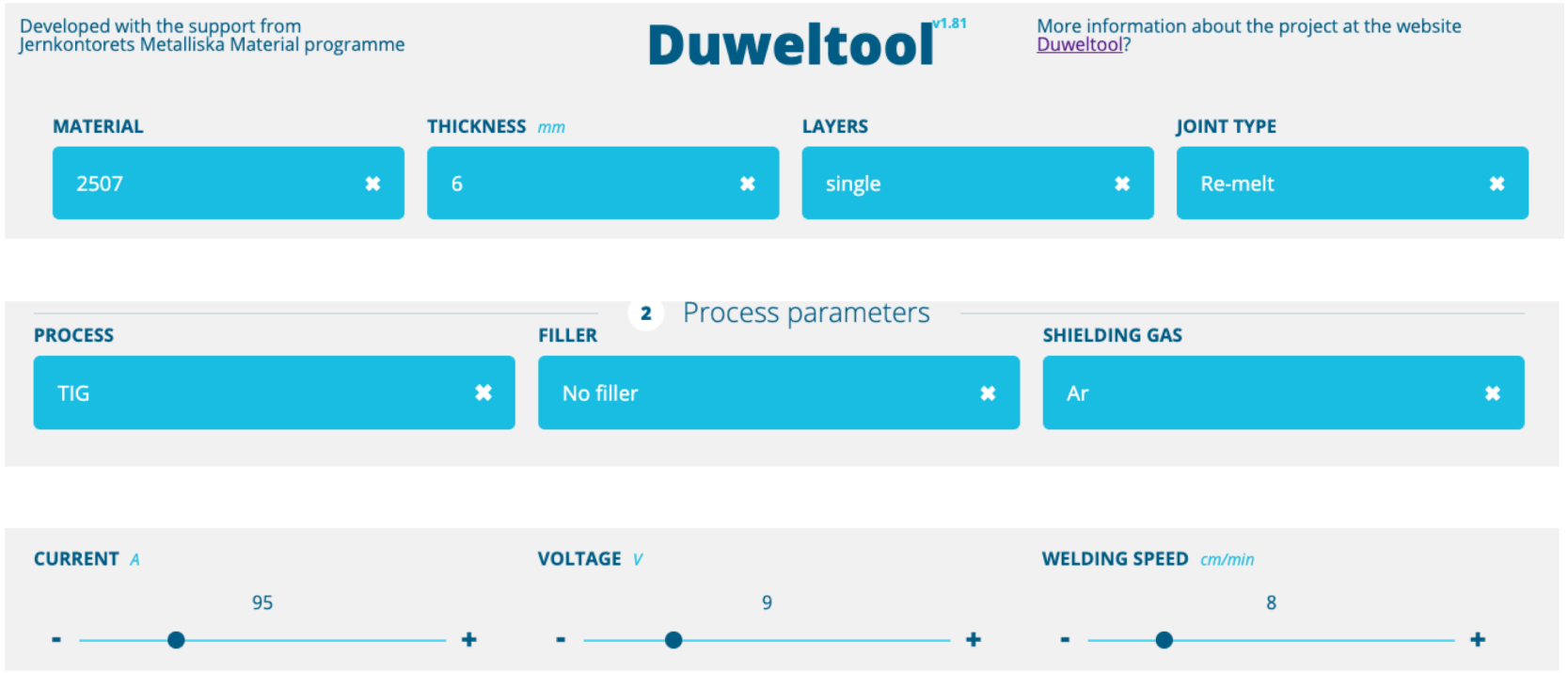
DUWELTOOL

A web based tool

1. Pre study in Duplexweld
2. Developed with same company as i pre study
3. Easy access and updateable
4. No signed agreement with web hotel yet, therefore only local access.
5. When online participants here will get a notice
6. Public on Metallic material conference 11-12/3

Tool layout


Developed with the support from
Jernkontorets Metalliska Material programme
Duweltool v1.81
More information about the project at the website
Duweltool?
MATERIAL
2507
THICKNESS mm
6
LAYERS
single
JOINT TYPE
Re-melt
2 Process parameters
PROCESS
TIG
FILLER
No filler
SHIELDING GAS
Ar
CURRENT A
95
VOLTAGE V
9
WELDING SPEED cm/min
8

Tips and standards

Suitable fillers

- 25 9 4 N L

Before welding

- A slightly wider root gap and joint angle than those applied for standard stainless steel should be used to obtain good penetration
- The joint and the adjacent base metal should be thoroughly cleaned
- Only stainless brushes should be used for cleaning
- Preheating is not recommended
- Dry electrodes should always be used

During welding

- The heat input should be related to the plate thickness and welding method to achieve a good balance between ferrite and austenite in the weld. Maximum heat input for welding this steel should be 1,5kJ/mm
- The material should be allowed to cool between passes. Recommended inter-pass temperature is maximum 100°C

Requirements on Charpy impact toughness and hardness

EN ISO 17781:2017

- Charpy impact toughness (weld) in SDSS 2507 (Quality level 1): 50J at -46°C
- Charpy impact toughness (weld) in SDSS 2507 (Quality level 2): 35J at -46°C

NORSOK M-601:2016

- Charpy impact toughness (weld + HAZ): 27J at -46°C

ISO 15156-3:2015

- Hardness: < 36HRC

API 938C:2011

- Hardness in SDSS 2507: < 340 HV10

DNV-OS-F101:2013

- Hardness: < 350 HV10

SVETS KOMMISSIONEN

Results

Heat input	Arc energy	Average Ferrite %	EN ISO 17781:2017	EN 13445-4: 2014	EN ISO 1011-3:2018	ISO 15156-3:2015	API 938C:2011	M-630:2013	M-601:2016	Sigma phase	Nitride	Verified	PDF
2.00 kJ/mm		28%	✖	✖	✖	✖	✖	✖	✖			✖	
1.90 kJ/mm		29%	✖	✖	✖	✖	✖	✖	✖			✖	
1.80 kJ/mm		33%	✖	✖	✖	✖	✖	✖	✖			✖	
1.70 kJ/mm		35%	✖	✖	✖	✖	✖	✖	✖			✖	
1.60 kJ/mm		37%	✖	✖	✖	✖	✖	✖	✖			✖	
1.50 kJ/mm		40%	✖	✖	✖	✖	✖	✖	✖			✖	
1.40 kJ/mm		42%	✖	✖	✖	✖	✖	✖	✖			✖	
1.30 kJ/mm		43%	✖	✖	✖	✖	✖	✖	✖			✖	
1.20 kJ/mm		45%	✖	✖	✖	✖	✖	✖	✖			✖	
1.10 kJ/mm		47%	✖	✖	✖	✖	✖	✖	✖			✖	
1.00 kJ/mm	**1.25 kJ/mm**	**48%**	✖	✖	✖	✖	✖	✖	✖			✖	

Results

Heat input	Arc energy	Average Ferrite %	EN ISO 17781:2017	EN 13445-4: 2014	EN ISO 1011-3:2018	ISO 15156-3:2015	API 938C:2011	M-630:2013	M-601:2016	Sigma phase	Nitride	Verified	PDF
2.22 kJ/mm		63%	✔	✔	✔	✔	✖	✔	✔	Low risk		✖	
1.62 kJ/mm		64%	✔	✔	✔	✔	✖	✔	✔	Low risk		✖	
1.35 kJ/mm		64%	✔	✔	✔	✔	✖	✔	✔	Low risk		✖	
1.28 kJ/mm		64%	✔	✔	✔	✔	✖	✔	✔	Low risk		✖	
0.99 kJ/mm		63%	✔	✔	✔	✔	✖	✔	✔	Low risk		✖	
0.81 kJ/mm		63%	✔	✔	✔	✔	✖	✔	✔	Low risk		✖	
0.78 kJ/mm		63%	✔	✔	✔	✔	✖	✔	✔	Low risk		✖	
0.59 kJ/mm		63%	✔	✔	✔	✔	✖	✔	✔	Low risk		✖	
0.46 kJ/mm		63%	✔	✔	✔	✔	✖	✔	✔	Low risk		✖	
0.34 kJ/mm	**0.42 kJ/mm**		✖	✖	✖	✖	✖	✖	✖			✖	