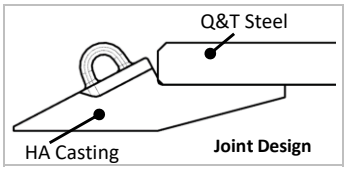
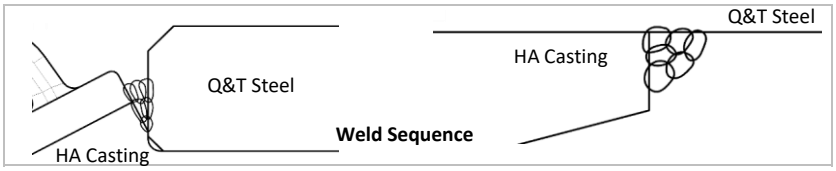
Weld Procedure Specification(WPS)

Half Arrow Blades to suit 50 & 32mm lip plates

Weld Procedure Specification			
Company Name/Fabricator	SANDVIK	**Date**	18-May-23
Welding Procedure Specification	WPS: SS-011	**Base Ref No**	WPS: SS-011 Initial release
Reference Code Standard	AWS D1.1:2020, ISO 9606-1:2012, AS/NZS 1554.4:2015	**Issued by**	J.J
		WPQR No	-
Material/Specification	Sandvik HA (SS 2300 & SS2000),Hardox 450 or equivalent(50 & 32mm plates)		
Process	F.C.A.W	**WPQR Date**	7/03/2023
Joint Type	Multi-run fillet	**Position**	1F/2F/Flat
Target Pre Heat Temperature	160ºC -190ºC	**Version No**	1.0
Max. Inter -pass temp	230ºC	**Reviewed on**	18/05/23
Post weld Heat Treatment	**Stabilise for 2Hrs & Max Cooling rate 50ºC/hr**		





Welding Consumables			
Specification - Root:	AWS A5.20	**Remainder:**	AWS A5.20
Classification - Root:	E71T-1 M H4 (AWS A5.20)	**Remainder:**	E71T-1 M H4 (AWS A5.20)
Shielding Gas:	Argon 75%+CO2 20-25%	**Flow Rate:**	16-24L/minute
Purge Gas:	N/A	**Flow Rate:**	Not Applicable

Weld Run Details				Welding Parameters					
Pass No	Weld Process	Electrode **Dia mm**	Classification **AWS 5.29**	Amperage Range **Amps**	Voltage Range **Volts**	Current and Polarity	Recommended Travel Speed **mm/min**	Recommended Heat Input **kJ/min**	Weld Position
Root Single	FCAW	1.6/1.2	E71T-1 M H4	260-300	26-30	DCEP	180-250	1.6-2.0	1F/2F
Root Multi	FCAW	1.6/1.2	E71T-1 M H4	260-300	26-30	DCEP	200-270	1.6-2.0	1F/2F
Fill Cap	FCAW	1.6/1.2	E71T-1 M H4	260-300	26-30	DCEP	260-350	1.0-1.8	1F/2F

** Adjust based on the Welding machine manufacturers limits

Welding Process			
Single Run/Multi Run	Multi run	**Stringer or Weave**	Stringer
Technique	Drag	**Stick out**	15mm to 20mm
Initial Cleaning	Remove rust & Carbon residue by Grinding	**Back gouge**	N/A
Inter-pass Cleaning	Needle gun /Grind/Wire brush	**Back gouge Check**	N/A

Additional Notes:

- Inspect the welding area (& 100mm on each side) for any cracks before starting the welding.
- Carbon rich layer must be completely removed if Arc gouging is used for Crack removal or Cutting.
- Use gas shielding to prevent risk of Cracking.
- Remove all traces of slag before laying down the next weld run.
- Welds are cooled at not more than 50C per hour. This would give enough time to relieve stresses/less cracking.
- Welding consumable must have elongation >25% and toughness over 100J @ -20ºC
- Welding consumable must be stored in dry environment as per manufacturers recommendations.
- Over welding should be avoided , and proper blending of welds is essential to minimise stress raisers.
- Crack test after 48/72 Hrs for any HAZ cracks/Hydrogen cracks(MPI or Dye Penetrant test).
- Wind and draft free welding environment is essential to avoid cracking.
- Reduce humidity by heating the work area.
- Certified welders & supervisors with experience in meeting the requirement of AWS D1.1 or ISO9606 or AS/NZS 1554.4 steel welding is required.

Approved By: Signed: