

SUGGESTED QUALITY ASSURANCE PLAN FOR BATCH TESTING OF ER316L BARE WIRE FOR TUBE TO TUBESHEET WELDING USING GTAW PROCESS

SCOPE AND PURPOSE

The purpose of this Quality Assurance Plan (QAP) is to describe general practices, resources and sequence of activities to be performed during batch testing of ER316L bare wire for Tube to Tube sheet welding using GTAW process. This QAP is a generic document and should be tailored by suitable addition, deletions or modifications for specific contract keeping in mind the capabilities of the manufacturer and the requirement of BHEL/ NPCIL.

Specification	AWS Classification – ER316L SFA-5.9, ASME, Sec-II, Part-C, 2017.
Firm Brand Name	
Ref. Document	TPS No. BHEL/NPCIL/30447/FBM/WD&T/NU13

S. No.	Component & Operation	Characteristics	Class	Type of Check	Quantum of check	Reference Document	Acceptance Norms	Format of Record	Inspection Agency				Remarks
									P	W	R	H	
1	Raw material verification	Checking of raw material for manufacturing process	Major	Review of documents	For batches	SFA-5.01 of ASME Sec-II C 2017 & Approved TPS	SFA-5.01 of ASME Sec-II C 2017 & Approved TPS	IR	3	-	1 2	-	
2	Size & Shape	Dimensions	Major	Measurement of dimension	4 Nos/ Batch	SFA 5.9 of ASME Sec-II C 2017 & Approved TPS	Table 2 of SFA 5.9 of ASME Sec-II C 2017 & Approved TPS	TC IR	3	1 2	-	-	
3	Wire Chemistry	Chemical composition	Major	Chemical Analysis	Each Batch Sample	SFA 5.9 of ASME Sec-II C 2017 & Approved TPS	Table 1 of SFA 5.9 of ASME Sec II C 2017 & S. No 4.2 of Approved TPS	TC IR	3	1 2	-	1	
4	Welding of All Weld Assembly	Welding of All Weld Assembly	Major	Welding	Each Batch Sample	SFA 5.9 of ASME Sec-II C 2017 & Approved TPS	SFA 5.9 of ASME Sec-II C 2017 & Approved TPS	TC IR	3	1 2	-	-	
5	IGC Test	For checking corrosion resistance	Major	Corrosion Test	Each Batch Sample	ASTM A 262 , practice E	ASTM A 262 , practice E	TC IR	3	1 2	-	1	-
6	Delta Ferrite Test	To check delta ferrite content in weld metal	Major	Ferrite No. checking	Each Batch Sample	NB-2433 of ASME SEC III NB & Approved TPS	NB-2433.2 of ASME SEC III NB & Approved TPS	TC IR	3	1 2	-	1	-

7	All Weld metal Tension test	To check mechanical properties	Major	UTS, Yield strength & elongation	Each Batch Sample	Approved TPS	Approved TPS	TC IR	3	1 2	-	1	-
8	Non Destructive Tests	NDE	Major	Radiographic Test	Each Batch Sample	Approved TPS	Approved TPS	TC IR	3	1 2	-	1	-
7	Finish Uniformity	Finish & Uniformity	Major	Finish & Uniformity	10Nos/ Batch	SFA 5.9 of ASME Sec II C 2017	As per Clause 12 of SFA 5.9 of ASME Sec-II C 2017	TC IR	3	1 2	-	-	-
8	Winding Requirements	Winding Requirements	Major	Type of Winding, dimension & tolerances (if applicable)	10Nos/ Batch	SFA 5.9 of ASME Sec II C 2017	As per Clause 14 of SFA 5.9 of ASME Sec-II C 2017	TC IR	3	1 2	-	-	-
9	Identification	Filler metal Identification	Major	Lot, batch, size, wire detail	10Nos/ Batch	SFA 5.9 of ASME Sec II C 2017 & Approved TPS	As per Clause 15 of SFA 5.9 of ASME Sec-II C 2017 & Approved TPS	TC IR	3	1 2	-	-	-
10	Packing & Marking	Workmanship	Major	Marking and packing	Each Batch Sample	Clause 16&17 of SFA 5.9 of ASME Sec II C 2017 & Approved TPS	As per Clause 16 & 17 of SFA 5.9 of ASME Sec-II C 2017 & Approved TPS	IR	3	1 2	-	-	-
11	Standard package forms	Package dimensions/ weight	Major	Packing sealability	Each Batch Sample	SFA 5.9 of ASME Sec-II C 2017 & Approved TPS	As per Clause 13 of ASME Sec-II C 2017 & Approved TPS	IR	3	1 2	-	-	-
12	Shipping Release	Verification of document & preparation of history docket	Major	Documentation and Issue of SRN	Each batch	As per approved TPS	As per approved TPS	SRN & History docket	3	1 2	-	1	-

Abbreviations

- 1 NPCIL QS or NPCIL Authorized Representative
- 2 BHEL
- 3 Consumable Manufacturer/External Lab as per Sr. No 3.4 of TPS
- P Performed by
- H Hold point: This activity shall be kept under hold till Report is signed off or written waiver is obtained from the agency responsible for this stage. (NPCIL QS / its Authorised Representative).
- W Witness point: Witness points are critical steps in manufacturing and examination / inspection / testing. Where the supplier is obliged to notify in sufficient advance of the start of the operation / test so that it may be witnessed. The Supplier may proceed with the work past a witness point, if the NPCIL-QS or its authorised representative is not available at the appointed time.
- R Document Review: Review / Verification of documents carried out by agency for compliance and acceptance.
- TPS Technical Purchase Specification (**BHEL/NPCIL/30447/FBM/WD&T/NU13**)
- TC Test Certificate
- IR Inspection Report

Notes:

- 1) Welding Consumable to be drawn from verified LOT after batch verification.
- 2) All testing shall be carried out as per Sr. No 3.4 of approved TPS.
- 3) Lot Class: S2 as per ASME section II C SFA 5.01 (Edition 2017)
- 4) Before proceeding to next step of inspection, previous steps must be cleared and all concerned agencies must sign there.
- 5) Vendor to submit detailed Material sampling & Testing Plan along with QAP for batch testing.
- 6) Batch testing to be done for each size of bare wire.

Definition

Critical The characteristic of a component, process or operation failure of which will surely cause operating failure.

Major The characteristic of a component, process or operation whose failure may cause operating failure which cannot be readily corrected at site or cause Substandard performance, increased erection and maintenance cost, reduced life or seriously affect the aesthetics.

Minor The characteristic of a component, process or operation whose failure neither materially reduce the usability of the product in operation, nor does it affect the aesthetics.