

Plant MRPL Mangalore	Client MRPL	Contract Code WSS for PFCC Flue Gas	Document ID 6723-IEX-G00-EC-0001-A205	Contract No. 66-6723	
	Indicative Inspection and Test Plan(IITP) for Fasteners				
				Rev	00

The tests indicated are general minimum requirements of tkIS India. All Tests, as applicable, have to be performed as specified in the Order, Order Attachments, Codes, tkIS India Specifications, Licensor's Specifications and Standards. In case of discrepancies between the Indicative Inspection Test Plan and the workshop documents Approved / Reviewed by LSTK Contractor, the latter shall apply. The Manufacturer shall be responsible for the required Tests to be performed and for the Inspector to be invited in due time to witness the Tests. The Manufacturer shall try to perform as many individual Tests as possible on same day, provided that the fabrication process permits such a procedure

Sr. No.	Inspection / Test Stage	Checks	Type of Inspection	Frequency of Check	Reference Document	Acceptance Norm	Format of Record	Inspection By			
								Vendor	LSTK Contractor	TPIA	PMC / Owner

A	Quality Assurance Plan							Endorse	Preparation	A	A
B	Receiving Inspection										
1	Raw material inspection for Fasteners	Chemical Properties	Review of Chemical properties	One sample per Heat	Applicable Material & Order Specifications	Conformance to Codes & Order Specification	Material Test Certificates / Check test report	P	R	R	--
C	In-Process Inspection										
1	Cutting, chamfering, marking etc.	In process	Visual	100%	Purchase Order	Purchase Order	Inspection report	P	NA	NA	--
2	Thread Rolling (Studs)	In process	Visual	100%	Purchase Order & Order Specification	Purchase Order & Order Specification	Inspection report	P	NA	NA	--
3	Hot forging of bolts, nuts	In process	Visual	100%	Purchase Order & Order Specification	Purchase Order & Order Specification	Inspection report	P	NA	NA	--
4	Heat Treatment	In process	Review of Heat Treatment Chart	100%	Applicable Material & Order Specifications	Conformance to Codes & Order Specification	Heat Treatment Chart	P	R	R	--
5	Thread Tapping	In process	Visual	100%	Applicable Material & Order Specifications	Conformance to Codes & Order Specification	Inspection report	P	NA	NA	--

PIN-IEX-LEP-201-A205

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6	Final Inspection by vendor	Measurements	Visual & Dimensions	100%	Applicable Material & Order Specifications	Conformance to Codes & Order Specification	Inspection report	H	NA	NA	--
D	Product testing										
1	Test piece Identification by LSTK Contractor & TPIA per heat per heat treatment per size	1. Chemical Analysis	Review of Chemical properties	As per Code / Order Specification	Applicable Material & Order Specifications	Conformance to Codes & Order Specification	Lab test certificate	P	R	R	--
		2. YS, UTS ,EL, R.A, Proof Load, macro etch test	Visual & Dimensions					P	W	W	--
		3. Hardness									
		4. Impact Test (if Applicable)									
		5. IGC E and micro test (as Applicable)									
E	Final inspection	1. Surface Condition	Visual	100%	Applicable Material Specification, Order Specifications,	Conformance to Codes & Order Specification	Inspection report				
		2. Marking as per Material Spec.& Tag No.	Visual	100%				P	100%H	100%H	--
		3. Dimension including threads	Measurement & check	100% by Vendor				P	10%H per size per visit.	10% H per size / Visit	--

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F	Positive Material Identification(PMI) as specified in Technical requirements.	Alloying Elements	As per Specification	As per Order requirement /Specification	Applicable Material & Order Specifications	Conformance to Codes & Order Specification	PMI Report	P	H – 10%	H – 10%	--
G	Final Stamping by TPIA	Surface Protection, pickling and passivation & Colour Coding	Visual	100%	Applicable Material & Order Specifications	Conformance to Codes & Order Specification	Material Test Certificate	P	H	H	--
H	Inspection documentation & Issue of Inspection Release Note	Material Test Certificate	Review of Documents	100%	As per Applicable Material & Order Specifications	Conformance to Codes & Order Specification	IRN, Material Test Certificate with back up reports	P	H	H	R
I	Final documentation & Issue of Despatch Clearance	Manufacturer Test certificate & Release note	Review of Documents	100%	As per Order & Order Specification	Conformance to Order & Order Specification	--	P	H	-	H

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Notes

- LSTK contractor to prepare final QAP based on this IITP, Applicable specifications, standards and codes and submit to PMC for final approval
- In addition to the requirements of IITP, all requirements of Purchase order, material specification, Order specification and Order Technical requirements (Document ID: EDB-0006) for raw material and final product shall be fulfilled. In addition, Material in Hydrogen Service shall comply with the requirements of Annexure F of document EDB-0006. Material in Sour service shall comply with the requirements of NACE MR0103 & MR0175 & EDB-0006
- Where ever % of inspection is mentioned, it is per Tag , Per Size, Per heat, Per visit
- Cut threads not permitted. Threads shall be rolled or formed. Threading shall be done only after heat treatment of bolts.
- Threads shall be as per Technical Requirements.
- For galvanized fasteners physical properties shall be checked after galvanizing.
- For galvanizing of fasteners only hot dip galvanizing process to be used.
- Any other tests if specified in order, order specifications, order attachments etc. shall be tested and test witnessed by LSTK Contractor and TPIA
- Statutory requirement and inspection by Statutory Authority, if applicable, the same shall be met. IBR requirements for EDB-0006 shall be met
- LSTK Contractor may increase percentage of inspection up to 100% if any rejection or non- conformity is observed during sampling inspection or past experience with Vendor.
- All items shall be marked (stamped/etched) in accordance with the applicable code/standard/specification.
- Client and its authorized representative reserve the right to vet and suggest changes in vendor's procedures

Legends: W - Witness, R - Review, H - Hold, P – Perform, A - Approval

Devesh Sharma	Abhi Thomas / TV Sundar	Syam N.S.
Prepared by: LE	Checked by: SSP / DQAR	Approved by: HDP

