

Plant MRPL Mangalore	Client MRPL	Contract Code WSS for PFCC Flue Gas	Document ID 6723-IEX-G00-EC-0001-A203	Contract No. 66-6723
	Indicative Inspection and Test Plan(IITP) for Plate & Forged flanges			 ONGC एम आर पी एल MRPL
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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

	QAP of LSTK contractor							Endorse	P	H	A
A	Receiving Inspection										
1	Raw material inspection for Forgings	Steel making process, Chemical Properties	Review of Chemical properties, Steel making process	One sample per Heat	As per Applicable Material & Order Specifications	Conformance to Codes & Order Specification	MTC	P	R	R	--
2	Raw material inspection for Plates	Steel making process, Mechanical & Chemical Properties, NDT-UT, compliance to material code requirements	Review of Steel making process, Mechanical & Chemical Properties	One sample per Heat / Coil	As per Applicable Material & Order Specifications	Conformance to Codes & Order Specification	MTC	P	R	R	--
B	In-Process Inspection										
1	In-Process Inspection	Heat treatment for Forgings & Plates as applicable.	Review of HT Chart	100%	As per Applicable Material & Order Specifications	Conformance to Codes & Order Specification	Heat Treatment Chart	P	R	R	--

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C	Product Testing										
1	Test piece Identification by LSTK Contractor/ TPIA -Sample selection as per code, per heat / heat treatment lot / size	(1). Chemical Analysis (2) Max. Carbon Equivalent	Review of Chemical properties	As per Code / Order Specification	As per Applicable Material & Order Specifications	Conformance to Codes & Order Specification.	Lab test certificate	P	R	R	--
		2. YS,UTS,EL,R.A	ASTM A370					P	H	H	--
		3. Hardness (as applicable)	ASTM A370								
		4. Impact Test (if Applicable)	ASTM A370								
		5. IGC E with micro test (as applicable)	ASTM A262								
D	Proof Machined Condition	Ultrasonic Testing before drilling	As per Code / Order Specification	If specified, as per Code / Order Specification	As per Applicable Material & Order Specifications	Conformance to Codes & Order Specification	UT Report	P	R	R	--

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E	Final inspection	1. Surface Condition	Visual	100%	As per Applicable Material & Order Specifications	Conformance to Codes & Order Specification	Inspection report	P	100%H	100% H	--
		2. Marking as per Material Specification, Order Specification and Tag No., Vent hole for Slip on flanges more than 4"NB as applicable.	Visual	100%				P	100%H	100% H	
		3. Dimension including gasket seating surface finish	Measurement & check	100% by Mfr				P	10%H	10%H	
		4. End Finish Bevel Ends / SW Ends - For Forged Flanges	Dye Penetrant Test	20%				P	10%H	10%H	
		5. Hardness Test for Flanges	Portable Hardness Tester (Avoid Poldi Testing)	20%				P	10%H	10%H	
		6. Galvanizing for Galvanized Flanges	Applicable Specification/ Order Specification	100% for Coating Thickness. Other tests				P	10%H Coating thk	10%H Coating thk	

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F	PMI as specified in Technical requirements	Alloying Elements	As per Specification	100%	As per applicable Material & Order specification	Conformance to Codes & Order Specification	PMI Report	P	10%H	10%H	
G	100% Final Stamping by LSTK Contractor & TPIA and Issue of IRN	Surface Protection & Colour Coding, Pickling/Passivation , Tag no:	Visual & Review of Documents	100%	As per Applicable Material & Order Specifications	Conformance to Codes & Order Specification	MTC with back up certificates	P	100%H	100% H	R
H	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

Notes -

- LSTK contractor to prepare a 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.
- Any other tests if specified in order, order specifications, order attachments, like IGCE etc. shall be tested and test witnessed by LSTK Contractor & 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 % of inspection up to 100% if any rejection or non-conformity is observed during sampling inspection or based on past experience with vendor.
- Statutory requirement and inspection by Statutory Authority, if applicable, the same shall be met. IBR requirements for EDB-0006 shall be met. Original IBR Forms certified by IBR inspector shall be submitted.
- Minimum and maximum hardness requirements for all forgings shall be met. For RTJ flanges, the hardness difference of 20 BHN on gasket shall be met.

Legends: W - Witness, R - Review, H – Hold- do not proceed unless completed. P- Performance, A- Approval

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

