

Plant MRPL Mangalore	Client MRPL	Contract Code WSS for PFCC Flue Gas	Document ID 6723-LEX-G00-EC-0001-A212	Contract No. 66-6723	
		Indicative Inspection and Test Plan(IITP) for Cast / Forged Gate, Globe & Check Valves			

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	Component / Operation	Stage Description	Characteristics	Reference Std.	Acceptance Std.	Format of Record	Inspection			
							Vendor	LSTK Contractor	TPIA	PMC/ Owner

QAP Approval											
Endorse											
Prepare											
1	Raw material	Forgings, Castings for Body/Cover/Disc	Visual	MSS-SP-55, ASME B16.34Material Specification	MSS-SP-55, ASME B16.34Material Specification	Inspection report	H	--	--	A	A
			Dimensions	Drawing	Drawing	Inspection report	H	--	--	--	--
			Steel making process, Heat treatment, Chemical, mechanical properties, Bend test, NDE (RT, DP, MT, Hardness as applicable) etc. IGC B (for casting) & E with micro test for SS material	Order Specification, Relevant ASTM Std. & Approved drawing	Order Specification, Relevant ASTM Std. & Approved drawing	Foundry test certificate RT – Film review	R	R	R	R	--
2	In process	Fasteners	Heat treatment, Chemical, mechanical properties, etc.	Order Specification, Relevant ASTM Std. & Approved drawing	Order Specification, Relevant ASTM Std. & Approved drawing	Manufacturer's test certificate	R	R	R	R	--
			Visual & dimension	Drawing	Drawing	Inspection report	H	--	--	--	--
			Visual, measurement & smooth operation	Drawing & MSS-SP-55	Drawing & MSS-SP-55	Inspection report	H	--	--	--	--

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3	Final inspection	Visual	Workmanship / Finish	MSS-SP-55, ASME B16.34, Material Specification	MSS-SP-55, ASME B16.34, Material Specification	Inspection report	H	100% - H	100% H	----
		Dimensions	Measurement	Approved drg. & specification	Approved drg. & specification	Inspection report	H	H*	H*	--
		D.P. / MT test on butt weld & socket weld ends / welds	Visual	ASTM E 165 Order specification	ASME Sec. VIII Div. 1, appendix 8, with no indication Order specification	Inspection report	H	H*	H*	--
		Radiography (if applicable)	Defects	ASME B 16.34, ASTM E 446	ASME B 16.34, Appendix I, ASTM E 446	Radiography report	R	R (Review of films)	R (RT Film review)	--
		Radiography of Butt weld for end connections (if applicable)	weld Defects	ASME Sec V, ASME VIII Div. 1,	ASME Sec V, ASME VIII Div. 1, UW51.	Radiography report	R	R (Review of films)	R (RT Film review)	--
		PMI test, as applicable	Conformance to requirements for materials and welds	Drawing, order specification	Drawing, order specification	Test report	H	H-10% (Per tag, per size, per visit)	H-10% Per tag/size / visit)	--
	Helium and cryogenic test as applicable	Conformance to requirements	Drawing, order specification	Drawing, order specification	H	H - 100%	H - 100%	--		

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4	Inspection before despatch	Gate, Globe Valves- Pressure test (shell hydro test, high & low pressure Closure tests) Back set, and Functional test	Leak tightness	Applicable testing std./approved drg.	Applicable testing std./approved drg.	Inspection report	H	H*	H*	--
		Check Valves-, Shell Hydro, High Pressure Closure Test and and Seat opening test at 0.2 Kg f/ sq cm from inlet side	Leak tightness & Seat opening	Order specification	Order specification	Inspection report	H	H*	H*	--
		Strip test (1% of offered qty.)	Visual	Drawing, order specification	Drawing, order specification	Inspection report	H	H	H	--
		Marking details	Visual	Approved drg.	Approved drg.	Inspection report	H	100% -H	100% -H	--
4	Inspection before despatch	Surface preparation & painting, marking, pickling and passivation	Paint DFT, shade, etc.	Applicable std., Order specification	Applicable std., Order specification	Inspection report	H	H	H	--
		100% Stamping by LSTK Contractor & TPIA	Review of Documents	Drawings & order specification	Drawings & order specification	Inspection report & test certificates	H	H	H	--
		Packing	Visual	Order specification, manufacturer's std.	Order specification, manufacturer's std.	Internal records, packing slip	H	W	R	--

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5	Inspection documentation & Issue of Inspection of Release Note	Valve Test reports, Material Test Certificate	Review of Documents	100%	As per Applicable Material & Order Specifications	Conformance to Codes & Order Specification	IRN, MTC With back up reports	P	H	R
6	Final documentation & Despatch Clearance	Compilation of final documents	Verification for completeness	Purchase Order	Purchase Order, Order specification	Dossier	R	H	--	R

Notes -

- LSTK contractor to prepare final QAP based on this IITP, Applicable specifications, standards and codes and submit to PMC for final approval
- Testing/acceptance standard shall be as per Order Specification, approved drawing. Applicable testing standards, viz. EN 12266 part 1 or 2, API 598, etc.
- For C.S. valves with butt weld or socket weld ends. Carbon equivalent shall not be greater than that specified in Order specification.
- Vendor shall weld end nipples at both the ends before assembly. WPS/PQR shall be submitted for LSTK Contractor & TPIA review for all welds including Bypass welds. Bypass valve shall be tested as per the requirements of main valve.
- *Quantity of check shall be 100% by Vendor & 10% (per Tag, per size, per visit) by LSTK Contractor and TPIA.
- Helium test for valves shall be in line with EDB-0006. Hydro test Water quality shall be as potable for CS and LAS. For SS material Chloride shall be 20 ppm max
- Seat tests are to be carried out from both directions (Exception-unidirectional valves)
- Statutory requirement and inspection by Statutory Authority, if applicable, the same shall be fulfilled.
- LSTK Contractor may increase percentage of inspection up to 100% if any rejection or non-conformity is observed during sampling inspection or based on past experience with Vendor.
- Fire safe valves shall be as per Process requirement.
- Seat Low Pressure Seat Hydro test, if specified for Check valves.
- 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.
- 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 shall be submitted.

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

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

