

VENDOR'S NAME & ADDRESS:			TYPICAL MANUFACTURING QUALITY PLAN							QAP. NO				
			CUSTOMER: BHEL, HYDERABAD –32. PROJECT: PRODUCT: CI Gate Valve			BHEL P.O.NO.: P.O.DATE: BHEL SPEC:REV:				REV NO:		DATE:		
SL NO	COMPONENTS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD	* D	AGENCY			REMARKS	
			P	W	V									
1.0	RAW MATERIALS & BOUGHT OUT ITEMS													
1.1	Body, Cover Bonnet / Yoke	Chemical & Mech. properties	Major	Chem. & Mech. Analysis	One per Heat	BHEL Specification / Approved Drawing / Data sheet	MTC	✓	2		1&3			
1.2		Hardness & Transverse Test	Major	Destructive test	One per Heat		TC	✓	2	2	1&3			
1.3	Trim (Stem, Seat, body seat ring, disc seat, Back seat bushing, Wedge, Spindle, back seat as applicable)	Chemical & Mech. properties	Major	Chem. & Mech. Analysis	One per Heat		MTC	✓	2		1&3			
1.4		MPI*, RT / UT	Major	NDT	100% 10%		TC	✓	2	2	1&3	*Other than SS material Note :6		
1.5		Hardness value	Major	Hardness Test	100%		TC	✓	2	2	1&3			
1.6		IGC	Major	IGC Test	One per Heat		TC	✓	2	2	1&3	Note :7		
1.7	Gaskets	Chemical & Mech. properties	Major	Chem. & Mech. Analysis	One per Heat		MTC	✓	2		1&3			
1.8		Visual, Dimensions, Type, Compressibility test etc.	Major	Visual & Measurement	100%		TC	✓	2	2	1&3			
1.9	FASTENERS (Bolt, Nut, Stud, Eye Bolt etc.)	Chemical & Mechanical Properties	Major	Chem. & Mech. Analysis	One per Heat		MTC	✓	2		1&3			
1.10		Visual, Dimensions, Heat Treatment, Type, Hardness etc.	Major	Visual & Measure. Hardness Test	100%		TC	✓	2	2	1&3			
1.11	Accessories Like Gear /	Chemical & Mech. properties	Major	Chem. & Mech. Analysis	One per Heat		MTC	✓	2		1&3	Note: 9		
1.12	Hand Wheel / Actuator	Make, Model & Operation	Major	Visual & Functional	100%		TC	✓	2	2	1&3			

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1.13	Gland Packing	Chemical & Mech. properties	Major	Chem. & Mech. Analysis	One per Heat	BHEL Specification / Approved Drawing / Data sheet		MTC	✓	2		1&3	
2.0	INPROCESS INSPECTION												
2.1	Bonnet/bonnet/ wedge/ seat ring/trim	Surface finish of Machining	Major	Visual	100%	BHEL Specification / Approved Drawing / Data sheet		IIR	✓	2	2	1&3	
2.2		LPI For Seating Surfaces, Butt Welding Ends of Valves	Major	NDE	100%	BHEL Specification / Approved Drawing / Data sheet		NDE Report, TC	✓	2	2	1&3	
2.3		Dimensions	Major	Measurements	100%								
2.4	SS & AS PARTS	PMI	Major	NDE	100%	ASTM 572 / BHEL Specification / Approved Drawing / Data sheet		IR	✓	2	2	1&3	
3.0	FINAL INSPECTION & TESTING												
3.1	Valve Assembly	Visual Inspection, Dimensional check	Critical	Visual & measurement	100%	MSS SP55/BHEL Specification / Approved Drawing / Data sheet		IIR	✓	2	1,2 &3		10% witness by 1&3
3.2		Hydro test for - a) body and bonnet b) seat c) back seat d) Air leak test	Critical	Pr. Testing	100%	API 598 / BHEL Specification / Approved Drawing / Data sheet		TC	✓	2	1,2 &3		10% witness by 1&3 Note :8 & 9
3.3		Gear Operation Check	Critical	Testing	100%	BHEL Specification / Approved Drawing / Data sheet		TC	✓	2	1,2 &3		
3.4		PMI Test	Critical	Testing	100%	ASTM 572 / BHEL Specification / Approved Drawing / Data sheet		IR	✓	2	1,2 &3		Accessible SS & AS parts

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3.5	Valve Assembly	Name Plate Check / Tag No.	Critical	Visual & Doc Verification	100%	BHEL Specification / Approved Drawing / Data sheet		IR	✓	2	1,2 &3		10% witnessed by 1&3
3.6	SPARES FOR VALVE	BOM & TC	Major	Visual & TC review	100%			TC	✓	2	1&3		
4.0 PRESERVATION & PACKING													
4.1	Valve Assembly	Surface Preparation (Blast Cleaning)	Major	Visual & Match Card	100%	BHEL Specification / Approved Drawing / Data sheet		Log Book	✓	2	2	1&3	SA 2.5 Copper Grit
4.2		Painting (Shade, DFT etc.) Marking	Major	Visual & DFT Measurement	Random			IR	✓	2	1,2 &3		
4.3		Preservation and End Protection	Major	Visual	100%			ITR	✓	2	1,2 &3		10% witnessed by 1&3
4.4		Packing*	Major	Visual	Random			Packing list	✓	2	1,2 &3		*witnessing of seaworthy packing for export orders
4.5	Quality Documentation & Certification	QAP clause no. wise with page numbers on each page	Major	Verification	100%	All relevant documents as per this QAP (✓ in column D)		Index format	✓	2		1&3	Refer Note: 3

Notes:-

1. This QAP should be read along with specification (latest revision), approved drawings & approved data sheet.
2. Specification/drawing/data sheet shall prevail over quality plan for contradiction if any between Quality plan and drawing/specification.

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3. All test certificates/reports reviewed and certified by TPI/BHEL shall be submitted (QAP clause no. wise with page numbers on each page) to BHEL as documentation package.
4. Any project/customer specific requirements, which shall be notified, have to be fulfilled by the vendor at the time of execution of order.
5. Material test certificate shall include tensile, impact, hardness, bend, IGC, hot tensile, grain size, chemical analysis etc. as required by applicable material code / approved drawing /data sheet.
6. Radiography Test (min 2 shots in diff. directions) for Castings and Ultrasonic Test for Forgings as per ASME B 16.34.
7. IGC test as per ASTM A262 Practice B/E and Microscopic Structure Examination at 250X Magnification for SS Material.
8. Hydro test shall be done in un-painted condition as per approved procedure/relevant code.
9. Accessories requirements as per BHEL Spec.52127 Sr. No. 5.
10. All lab reports shall be from NABL accredited lab.

Abbreviations:-

MTC – Material Test certificate,
 ITR – Inspection Test Report,
 IIR – Internal Inspection Report
 NDE – Non Destructive Examination

TC – Test Certificate,
 IR – Inspection Report,
 DFT – Dry Film Thickness

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