

VENDOR'S NAME & ADDRESS:		TYPICAL MANUFACTURING QUALITY PLAN							QAP. NO.:					
		CUSTOMER: BHEL, HYDERABAD –32.				BHEL P.O.NO.:			REV NO:		DATE:			
		PROJECT: PRODUCT: CI BUTTERFLY VALVE				P.O.DATE: BHEL SPEC:			REV:					
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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	Chemical & Mechanical Properties	Major	Chem. & Mech. Analysis	One per Melt / Heat	BHEL Spec / Appd Drawing / Appd Datasheet	MTC	✓	2		1&3		
1.2		Hardness, Transverse & Visual	Major	Hardness test	One per Melt / Heat & 100%		TC	✓	2		1&3		
1.3	Disc	Chemical & Mechanical Properties	Major	Chem. & Mech. Analysis	One per Melt / Heat		MTC	✓	2		1&3		
1.4		NDE	Critical	RT & LPT	As per Spec		NDE Report	✓	2		1&3		
1.5		Heat treatment, IGC	Major	Heat treatment	per Heat		TC	✓	2		1&3		
1.6	Shaft & Body seat ring, disc retaining ring	Chemical & Mechanical Properties	Major	Chem. & Mech. Analysis	One per Melt / Heat		MTC	✓	2		1&3		
1.7		Heat treatment, IGC	Major	Heat treatment	per Heat		MTC	✓	2		1&3		
1.8		Hardness	Major	Hardness test	One per Melt / Heat		TC	✓	2		1&3		
1.9		Internal defects	Critical	UT & LPT	100%		NDE Report	✓	2		1&3	UT for Dia ≥ 40mm	
1.10	Fasteners (Bolt, Nut, Stud, Eye Bolt etc.)	Chemical & Mechanical Properties	Major	Chem. & Mech. Analysis	One per Heat		MTC	✓	2		1&3		
1.11		Visual, Dimensions, Heat Treatment, Type, Hardness etc.	Major	Visual & Measure. Hardness Test	100% & One per Heat		TC	✓	2		1&3		
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				VENDOR'S SIGNATURE & STAMP			BHEL QA SIGNATURE & STAMP			CUSTOMER'S SIGNATURE & STAMP			

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1.12	Accessories Like Gear / Hand Wheel / Actuator	Chemical & Mechanical Properties	Major	Chem. & Mech. Analysis	One per Melt / Heat	BHEL Spec / Appd Drawing / Appd Datasheet		MTC	✓	2		1&3	
1.13		Make, Model & Operation	Major	Visual & Functional	100%			TC	✓	2		1&3	
1.14	Actuator#	Type test, Routine test	Major	Test	100%			TC	✓	2		1&3	# if applicable
1.15	Actuator#	Ingress Protection, CCOE approval, Ex. proof	Critical	Type Test	100%			TC	✓	2		1,3	# if applicable
1.16	GASKETS#	Chemical & Mechanical Properties	Major	Chem. & Mech. Analysis	One per Melt / Heat			MTC	✓	2		1&3	# if applicable
1.17		Dimensions, Rating, Type etc.	Major	Visual	100%			MTC/TC	✓	2		1&3	
1.18	BEARING	Chemical & Mechanical Properties	Major	Chem. & Mech. Analysis	One per Melt / Heat			MTC	✓	2		1&3	
1.19	RUBBER LINER	Visual	Major	Visual	100%			IR	✓	2		1&3	
1.20		Ozone Resistance Test	Major	Test	1 per batch			TC	✓	2		1&3	
1.21		Volume Expansion Test	Major	Test	1 per batch			TC	✓	2		1&3	
1.22		Spark test	Major	Test	100%			TC	✓	2		1&3	

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2.0 INPROCESS INSPECTION															
2.1	Valve	LPT on Seating Surfaces, Butt Welding Ends of Valves	Major	LPT	100%	BHEL Spec / Appd Drawing / Appd Datasheet		ITR	✓	2	2	1&3			
2.2	Machining of Body, Disc, Shaft	Surfaces finish, Dimension	Major	Visual, Measurement	100%			IR	✓	2	2	1&3			
2.3		NDE	Critical	LPT-Other	100%			NDE Report	✓	2	2	1&3	ASME E165		
3.0 FINAL INSPECTION & TESTING															
3.1	VALVE	Visual, Dimensions, BOM	Major	Visual, Measurement	100%	BHEL Spec / Appd Drawing / Appd Datasheet / IBR		IR	✓	2	1&3		10% shall be witnessed by 1&3 Refer Note: 8		
3.2		Hydro Test on Body, Seat	Major	Hydro test	100%			IR	✓	2	1&3				
3.3		Functional Test with Actuator [#]	Major	Functional	100%			ITR	✓	2	1&3		# if applicable		
3.4		Name Plate check/Tag No	Critical	Visual & Doc.Verify	100%			IR	✓	2	1&3				
3.5		Fire Safe Test [#]	Critical	Fire Safe test	100%			TC	✓	2		1&3	# if applicable		
3.6		IBR Certificate [#]	Critical	Doc. Verify	100%			IBR Certificate	✓	2		1&3	# if applicable		
3.7	SPARES FOR VALVE	BOM & TC	Major	Visual & TC review	100%			TC	✓	2	1&3	-			
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4.0	PRESERVATION & PACKING														
4.1	VALVE ASSEMBLY	Surface Preparation	Major	Visual & Match Card	100%	BHEL Spec / Appd Drawing / Appd Datasheet		Log Book	✓	2	2	1&3	Flow Direction etc.		
4.2		Painting (Shade, DFT), Markings	Major	Visual, Measurement	Random			IR	✓	2	1&3	-			
4.3		Preservation	Major	Visual	100%			ITR	✓	2	2	1&3			
4.4		Packing	Major	Visual	100%			Packing List	✓	2	2				
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: 8		

Notes:-

1. This Standard MQP should be read along with specification (Latest revision as per PO), approved drawings & approved datasheet (as applicable).
2. Any project/customer specific requirements which shall be notified have to be fulfilled by the vendor at the time of execution of order.
3. Approved drawing/datasheet & specification shall prevail over quality plan in case contradiction if any.
4. 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.
5. Hydro test shall be done in un-painted condition as per approved procedure/relevant code.
6. Any other tests/ checks indicated in specification, P.O., or drawing/data sheet & any additional checks envisaged by BHEL/Customer as part of correspondence to ensure workmanship, finish, aesthetics, etc. shall also be conducted and witnessed/verified by BHEL /TPIA /Customer as per project requirement.
7. All documents issued by statutory authorities such as CCOE, IBR, CMRI, ATEX etc., shall be submitted during inspection.
8. All the relevant test reports /certificates shall be submitted during inspection. The reviewed and certified documents by BHEL/TPIA/Customer shall be submitted (QAP clause no. wise with page numbers on each page) to BHEL as documentation package.
9. All sub-ordered items, bought out items, electrical & instrumentation Items as applicable shall be procured from approved / agreed vendor list with BHEL/BHEL's Customer.
10. All lab reports shall be from NABL accredited lab.

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Abbreviations:-

MTC	–	Mill Test certificate	TC	–	Test Certificate	IR	-	Inspection Report
ITR	-	Internal Test Report	NDE	-	Non Destructive Examination	IGC	-	Inter Granular Corrosion
LPT	-	Liquid Penetrant Test	IBR	-	Indian Boiler Regulations	DFT	-	Dry Film Thickness

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