BHEL/CQX/ 007/0006	BHARAT HEAVY ELECTRICALS LIMITED, JHANSI		
	STANDARD QAP FOR FRP PANELS	**MATERIAL TESTING / INSPECTION / IN-PROCESS INSPECTION / FINAL INSPECTION**	**BHEL QP.No .QP/LOCO/1023 REV.No.00 DATE: 20.02.13**

SL. No.	Characteristic	Standard/ Parameters for inspection	Unit	Specified Value	Frequency of Testing
1.0	**MATERIALS:**				
1.1	Fire retardant thermosetting polyester resin and e-glass fiber.	conformity with the properties given in BS:994/1973 or latest		as specified in BS:994/1973 or latest	Once/ Incoming Batch
1.2	Glass reinforcement materials.	Manufacturer's test certificate		Manufacturer's test certificate	Once/ Incoming Batch
1.3	Heat restoration temperature of resin.			100 deg C (min)	Once/ Incoming Batch
1.4	Elongation of the resin.			3% (min)	Once/ Incoming Batch
2.0	**GEOMETRY:**				
2.1	Dimension of FRP panels/ parts.	As per drawings	-	as per checklists	100%
2.2	Extended flanges are to be provided on the FRP laminates/panels.		-	Suitable flanges to be provided on every component	100%
2.3	Minimum reinforcement layers for given thickness of FRP panel.	RDSO/2008/EL/SPEC/0058 (Rev-‘0’) March 2008	-	As per clause 3.2.2 of RDSO/2008/EL/SPEC/0058 (Rev-‘0’) March 2008	100%
2.4	Resin transfer moulding.	Resin pressure, air pressure, number of strokes, flow of resin from vent, leakages if any	-	The resin should fill the mould completely.	100%
2.5	GEL Coat thickness.		mm	0.5 to 0.8 mm	100%
3.0	**TYPE TEST:**				
3.1	Elongation at break.	IS: 1998	%	1% max.	1 no.
3.2	Water/ humidity absorption.	ASTM D - 570 or IS:1998 latest	%	0.5% max.	1 no.
3.3	Critical oxygen index.	ASTM D - 2863	%	28% min.	1 no.

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3.4	Resistance to boiling water.	RDSO specn. no. C-8409 Annex-4	-	To pass test	1 no.
3.5	Resistance to impact charpy shock.	As per spec no.- ICF/MD/ Spec-107 rev-2 annexure-A	KJ/M^2	40 (max)	1 no.
3.6	Smoke Density.	UIC-564-2	-	Class A or B	1 no./ cabin
3.7	Toxicity.	NCD-1409	-	1.5 (max)	1 no./ cabin
4.0	**ROUTINE TEST:**				
4.1	Tensile strength.	IS: 1998	N/mm^2	80 min.	1 no./ cabin
4.2	Specific Gravity.	ASTM D-792	gm/cm^3	1.5 - 1.75	1 no./ cabin
4.3	Fibre Glass Content (w/w).	IS:13411	%	35% (+5%, -2%)	2 nos./ cabin
4.4	Barcol Hardness	ASTM D-2583	-	40 min	5 nos./ cabin
4.5	Surface finish (by 60 deg gloss meter).	As per spec no.- ICF/MD/ Spec-107 rev-2	-	40 min	5 nos./ cabin
4.6	Crack and blister test (ink test).	As per spec no.- ICF/MD/ Spec-107 of 2001 or latest annexure-B	-	shall not show any crack in surface coat	100%
4.7	Visual Examination.	As per clause no. 4.2 of RDSO/2008/EL/SPEC/0058 (Rev-'0') March 2008	-	Free from any type of defects specified in clause no. 4.2 of RDSO/2008/EL/SPEC/0058 (Rev-'0') March 2008	100%
5.0	**FINAL INSPECTION:**				
5.1	Dimensional Inspection.	As per drawings	-	as per checklists	100%
5.2	Marking.	Firm's name, date of manufacturing & consignee shall be marked		Marking shall be provided on all the components	100%

Note- Test pieces shall be tested on GEL coat side