

FORM IR A1 840 x 600 mm

229960202023ED/CB/MD/001gn/DMW/PTA

SPECIFICATION No. : ICF/ELEC/862

NO. OF PAGES : 1

SPECIFICATION FOR
FIBRE GLASS REINFORCED PLASTIC
MANUFACTURED FROM
SHEET MOULDING COMPOUND (SMC) PROCESS

ISSUED BY
INTEGRAL COACH FACTORY, CHENNAI - 38

CORRECTION SLIP NO.	-					
REVISION	01					
PREPARED BY :	SMSR SSE/D					
APPROVED BY :	SPV CDE/E					
DATE :	10.4.14					

Subject; Specification for Fibre glass reinforced plastic manufactured from sheet moulding compound (SMC) process

Date: 10. 4.14

Page 1 of 1

The mechanical and electrical properties of fibre glass reinforced plastics manufactured from sheet moulding compound (SMC) with 25% TO 35% glass content and self extinguishing grade shall conform to following requirements:

SN	Property	Units	Specific values	Method of test	Prototype test	Acceptance Test	Routine test
1	Specific gravity		1.75 to 2	BS:2782(OR) IS: 1998-1962	Y/N	Y/N	Y/N
2	Tensile strength	Mpa	60(min)	-do-	Y	N	N
3	Cross breaking strength(flexural strength)	-do-	150(min)	-do-	Y	N	N
4	Compressive strength	-do-	150 (min)	-do-	Y	N	N
5	Izod impact strength	Joules per meter	450 (min)	-do-	Y	N	N
6	Water absorption	%	0.2 (max)	-do-	Y	N	N
7	Dielectric strength	KV/mm	11	-do-	Y	Y	N
8	Tracking index	Volts	>1000	IEC: 112	Y	N	N
9	Arc resistance	Sec.	180	ASTM-D-495	Y	N	N
10	Visual test			As per drg.	Y	Y	Y
11	Dimensional verification			As per drg.	Y	Y	Y
12	Flammability	Sec.	Self extinguishing	as given below	Y	Y	N

The material shall be tested for resistance to spread of flame in the manner given below:

The piece of material measuring about 150 x 25mm shall be subjected to the luminous bat swing flame, preferably supplied by Bunsen burner. The specimen shall be held with the flat side up at an angle of 45 deg. to the horizontal. The flame shall be 25mm in width across the tips.

The flame shall be applied to the specimen at the lower end for 30 seconds and removed for a similar period and then applied again to the same and for a second period of 30 seconds and then again removed. This test shall be carried out with the decorative surface facing upward as also the decorative surface facing downwards.

Should the specimen get ignited, it shall not continue to burn for more than 50 seconds after the flame has been finally removed.

		
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INTEGRAL COACH FACTORY, CHENNAI-38.	ICF/MD/SPEC-091 ISSUE STATUS:01 REV. No.02 Date : 21-08-2009
SPECIFICATION FOR POWDER COATED ITEMS/COMPONENTS USED IN RAILWAY PASSENGER COACHES	
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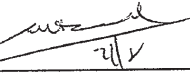
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1.0 SCOPE:

This standard stipulates general requirements of powder coated items used in Railway passenger coaches .

2.0 TYPE OF FINISH:

2.1 The components shall have smooth and semi glossy finish as per IS:101-1987 Part-3/Sec.4.

2.2 COLOUR:

Colour shade shall be as stipulated in the drawing.

3.0 TECHNICAL REQUIREMENTS:

3.1 Powder coating shall be Thermosetting type and shall be of Polyester based as per drawing requirements

4.0 PROCESS:**4.1 PRETREATMENT:**

The following Pretreatment processes are to be followed prior to Powder coating.


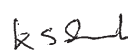

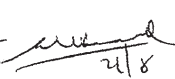
- 1) Degreasing
- 2) Derusting
- 3) Phosphating (Grade B of IS:3618/1966)
- 4) Passivation in Hot Chromic acid.

4.2 POWDER COATING:

The pretreated components are powder coated by electrostatic spray and baked suitably to meet the requirements laid down in this specification.

5.0 INSPECTION:

In case of any conflict between the concerned drawing and the ICF/MD/Spec.091 the contents of the specification will prevail.


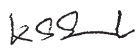

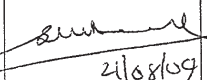
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6.0 TYPE TEST:

- 6.1 In cases where tenderer not having in house Powder coating processing unit, a MOU between the tenderer and the valid/legal authority of the unit that possess the facility must be available and MOU must be valid for the period during currency of the tender. Such agency with ISO certification must have seven tank phosphating process unit along with all infrastructure to carry out the powder coating and in possession of valid Environment clearance in the form of consents from PCB.
- 6.2 The following are the requirement of type test. The currency and validity of the type test will be for atleast two years from date of issue of type test certificate. ICF reserves the right to repeat/decide the frequency of the type test. The firm need to submit the test results in respect of characteristics shown below:

S.No	CHARACTERISTICS	REQUIREMENTS	METHOD OF TEST
1.	Protection against corrosion	100 Hrs exposure and free from corrosion	IS:101 (Part-6-Sec.1)
2	Protection against humidity	No blistering No Rusting No loss of adhesion	IS:101 (Part 6/Sec1)
3	Resistance to Heat double-bake schedule	16 Hrs exposure. No appreciable change in colour or deterioration of mechanical properties	IS:101 (Part-7/Sec.3) as per Clause 8 and 8.1.1 restricted to 250°C
4.	Colour Fastness to light	100 Hrs exposure. The film shall have a minimum colour rating of 8. The film shall have a minimum gloss retention of 60% of original value.	As per clause D 3.2.3 of IS:8662 & IS:133 Sl.No.VII Table.1 Apparatus: Xenon Arc/ QUV accelerated weatherometer in the region of 280-315nm

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6.3 ACCEPTANCE TEST (ROUTINE TEST)

Acceptance Test will be conducted for the different lots covered in the P.O. for which 5 test panels of size 1.25 X 100 X 150mm need to be supplied marking P.O. No. with date and representing quantity. The above test panels will be subjected to scratch hardness and cupping test as per IS:101 (Part.5/Sec.2)

S.No	CHARACTERISTICS	REQUIREMENTS	METHOD OF TEST
1	Dry Film Thickness	50 Microns (Min.)	IS:101 (Part.3/Sec.2)
2	Semi Gloss	31-50	IS:101 (Part.4/Sec.4)
3	Finish	Free from porosity and / other surface blemishes	Using 10X magnifying Lens
4	Scratch Hardness, (3 kg load)	No scratch, revealing the base metal	IS:101 (Part.5/Sec.2)
5	Cupping Test, 8mm indentation (Min)	Film shall not detach/crack	IS:101 (Part.5/Sec.2)

6.4 The above details will be verified by inspection prior to final acceptance of the lot


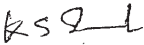

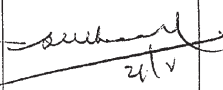
6.5 The representative test samples of the components should be made from the same batch of the regular production. The test panels shall be coated on both sides. ICF reserves the right to witness the test samples preparation.

7.0 MARKING:

The manufacturer Logo with batch number, ID mark, etc. date of manufacture shall be embossed/riveted at a location INSIDE the coach component for traceability.

7.0 WARRANTY:

The firm shall give a replacement warranty for any manufacturing defects, for a period of 36 months from the date of supply.

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