

INTEGRAL COACH FACTORY, CHENNAI-38	ICF/MD/SPEC.-253 ISSUE STATUS : 01 REV. No: 00 DATE : 12-07-2013
SCHEDULE OF TECHNICAL REQUIREMENTS FOR MANUFACTURE AND SUPPLY OF PHOTOSENSITIVE ANODIZED ALUMINUM STICKERS / PLATE FOR EXTERIOR AND INTERIOR NOTICES ON RAILWAY COACHES	
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1. Scope

This specification covers general, technical and special requirements of Photo sensitive anodized aluminum Stickers and plates to be used as signage for persons with impaired vision and normal vision. These stickers will be provided onto interior and exterior of coaches.

2. General Requirement

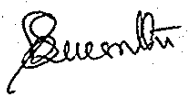
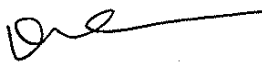
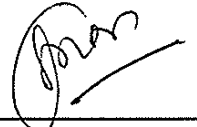

- 2.1 The intended use of these stickers is for both interior and exterior application in coach. It integrates the requirements of persons with impaired vision and normal vision.
- 2.2 The physical properties, text and colour of the stickers shall be as per the following drawings with latest alterations and specifications indicated in the respective drawings.

	Drawing Numbers.
For Exterior lettering	ICF/STD-8-3-011
	ICF/STD-8-3-012
	ICF/STD-8-3-013
For Interior lettering	ICF/STD-6-4-008
	ICF/SK3-6-4-038
	ICF/SK3-6-4-039

- 2.3 The tenderer shall submit the following documents along with offer, at the time of prototype sample approval and also along with bulk supply.

- 2.3.1 The Braille text printed on the stickers shall be certified by the National Association for the Blind (NAB) or equivalent or competent agency / organization of national or international repute and certificate enclosed.

- 2.3.2 Clause-wise compliance on the specification without which ICF / Railways reserves the right to summarily reject the offer.

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2.3.3 Deviation Statements with respect to specifications, if any should be indicated against the relevant clause.

2.3.4 Supply Credentials, performance reports and where used in Railways applications.


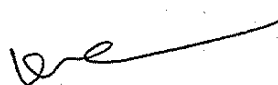


2.3.5 Material Safety Data Sheet and test result from NABL accredited lab or OEM test certificate.

2.4 Operating Conditions for stickers

2.4.1 Ambient conditions.

On fitment in the coaches, the stickers will be subjected to the following climatic conditions.

1. Ambient temperature - -4°C to 50°C
2. Altitude - Sea level upto 2500m
3. Max. Sun temperature - 70°C
4. Relative humidity - Maximum up to 100%
5. The rainfall - Fairly heavy.
6. During dry weather, the atmosphere is likely to be dusty.
7. Temperature variation can be quite high in the same journey for different durations of time.
8. Coaches may operate in coastal areas with continued exposure to salt laden air.

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2.4.2 Maintenance Conditions

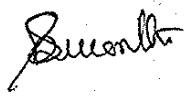
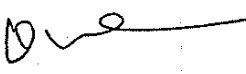


The coach exteriors are cleaned with liquid cleaning agent to RDSO Spec. No. M&C/PCN/101/2007 using brushes with nonmetallic bristles or in automatic car washing plants. The interiors are cleaned by Wet/Dry wiping.

3 Technical requirements

- 3.1 The sticker shall be manufactured from photosensitive anodized alloy 1100A series aluminum as per ASTM B209-10 standard, in accordance with GG-P-455b (Federal Specification) with characters, text, image etc integrated into the anodized layer and sealed within the anodic layer. The sticker shall be homogenous and non porous. It shall be free from dents and other defects. No top coating layer should be used as protection to the top surface. Acids, Chemicals, cleaning agents to RDSO Spec. No. M&C/PCN/101/2007 must not damage the stickers. The stickers shall not include any materials having harmful effects on human beings, painted surfaces or environment. To make it tamper proof the Sticker / Labels should be integrated either with the high strength transfer tape of 3M 467 or equivalent to the base plate. In addition holes have to be provided for pop riveting as per drawings.

The thickness of finished sticker without adhesive and backing shall be between 0.08mm to 0.2mm or as per the drawing. The test procedure for measuring thickness is ASTM-D- 3652.

- 3.2 The base material of the sticker should be of anodized alloy 1100A Series aluminum as per ASTM B209-10 standard and dimensions as per drawing specified.
- 3.3 The thickness of the sticker with base plate should be as per drawing specified.

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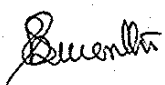



4 Properties and performance characteristics.

4.1 Acceptance tests:

S. No	Performance Characteristics	Method & Result
1	Abrasion Resistance	As per Federal specification GG-P-455b, Clause No. 3.7.1 & 4.6
2	Acid Corrosion	As per Federal specification GG-P-455B, clause no. 3.7.1.1 & 4.7
3	Heat Resistance	As per Federal specification GG-P-455B clause no. 3.7.1.2 & 4.8)
4	Accelerated Oxygen Aging	As per Federal specification GG-P-455B clause no. 3.7.1.5 & 4.11)
5	Stain Resistance	As per Federal specification clause no. 3.7.1.7 & 4.13)
6	Cleaning Resistance	As per Federal specification clause no. 3.7.1.8 & 4.14)
7	Low Temperature resistance	As per Federal specification clause no. 3.7.1.9 & 4.15)
8	Organic Solvent Resistance	As per Federal specification clause no. 3.7.1.10 & 4.16

4.2 Type tests (to be conducted once in two years or as required)

S. No	Performance Characteristics	Method & Result
4	Salt Spray Corrosion test	As per Federal specification GG-P-455B clause no. 3.7.1.3 & 4.9)
5	Accelerated Light & Weather Resistance test	As per Federal specification GG-P-455B clause no. 3.7.1.4 & 4.10

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- 4.3 The Performance Characteristics, test methods and results mentioned above should either be certified by NABL accredited lab or should form part of OEM test certificate. These should be submitted along with the offer. These shall also be submitted while seeking prototype approval and along with bulk supply.

5 Prototype Approval





- 5.1 The supplier shall supply a sample sticker as per the properties and performance characteristics mentioned above. (Clause 4)
- 5.2 The prototype sample shall be examined and tested as per the tests specified at clause 4. Suppliers shall incorporate changes suggested by Railway in the prototype as well as in the bulk supply. The bulk manufacturing shall be undertaken only after approval of prototype. This clause of prototype approval is applicable for first supply of the supplier. However, Railway shall have right to repeat prototype approval in subsequent orders also. The decision of Railway in this regard shall be final.

6 Marking

- 6.1 Unless otherwise specified in the Purchase order every sticker / label must have a logo of Indian Railways either appearing as a water mark or as a separate logo on the front of sticker sheet.
- 6.2 Each sticker should have identification number as given in the respective drawings printed on the back of the sticker. The sticker shall also contain manufacture's code, month and year of manufacture.

7 Colour Scheme

Colour scheme of the sticker should be as per drawing.

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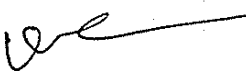


8 Requirement of Self Adhesive

The self adhesive should be able to withstand washing and cleaning of the coach with cleaning agents to RDSO Spec. No. M&C/PCN/101/2007, adverse weather, operating conditions and vandalism.

- 8.1 Sticker should have high adhesion to low surface energy substances like PU painted FRP, Colour Coated aluminum, PU painted metal surface, Polycarbonate panels, Aluminum panels, LP sheet etc.
- 8.2 Release paper shall be used to protect the adhesive against dirt and to prevent the film from unintended agglutination.
- 8.3 The release paper of the adhesive shall be easy to remove from the finished stickers/labels. The release paper shall be resistant to climatic changes.
- 8.4 The release paper shall not wrap or distort into tunnel formation within a period of one year. In addition the adhesive power of the release paper shall not be so strong to damage the sticker while removal for application.
- 8.5 After removal of stickers, there should be no stain or marks.

9 Printing of stickers

- 9.1 If multi colour printing is called for in the drawing print has to be sub surface, sealed and non destructible by abrasion, solvents and acids.
- 9.2. The shine (finish) of the sheet shall not change under any normal weather conditions and upto a temperature of 350 ° Fahrenheit.
- 9.3. Instructions in Braille should be embossed. The text, text size, distance between two text and word embossed on the sticker should be as per the Braille standard only.

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9.4 Considering space limitation Braille printing may be done over the text or image without affecting the text and image for clear vision to normal persons. In case sufficient space is available, it is advisable to have a separate Braille printing on the same sticker plate without infringing the text or image.

10 Warranty

10.1 The Photosensitive anodized aluminum Stickers / plate (multiple colour) supplied shall be deemed to bear warranty against defective material and performance for a minimum period of 3 years for interior application and one and half year(Up to P.O.H for exterior application.





10.2 In case the material shows any defect / fades or fails to perform within the warranty period, it shall be replaced free of cost by the supplier.

11. Installation

11.1 The installation involves pasting and pop riveting and shall be tamper proof.

11.2 In case of pasting the material with the help of self adhesive, the surface should be cleaned for better adhesion.

11.3. Supplier shall carry out the installation if required and the same shall be quoted separately.

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