सत्यमेव जयते

INDIAN RAILWAY STANDARD SPECIFICATION FOR 120/160/200 WAY TAG BLOCKS FOR SIGNALLING INSTALLATIONS

(TENTATIVE)

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Abstract **This document specifies Technical specification for 120/160/200 Way Tag Blocks for signalling installations.**			

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TABLE OF CONTENTS

GOVERNMENT OF INDIA
(MINISTRY OF RAILWAYS)
RESEARCH DESIGNS & STANDARDS ORGANISATION

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INDIAN RAILWAY STANDARD SPECIFICATION
for
120/160/200 WAY TAG BLOCKS
FOR SIGNALLING INSTALLATIONS

(TENTATIVE)

0. FOREWORD

0.1 This specification is issued under fixed serial No. S 77, the final number indicates the year of original adoption as standard, or in case of revision, the year of last revision.

0.2 This specification requires reference to the following Indian Railway Standard and Indian Standard specifications:

IRS: S23	Electrical Signalling and Interlocking equipment
IRS: S34	Testing of Railway Signalling relays (General)
IRS: S 7/1992	Roundels and lenses
IRS: S 97/2000	Glass Fiber Reinforced Nylon-6 signalling components
IS: 9000	Basic environmental testing procedures for Electronic and Electrical items
IS: 410	Cold rolled brass sheets, strips and foils.
IS: 10192	Synthetic Resin Bonded Glass Fibre (SRBGF) sheets for electrical purposes
IS: 1998	Methods of test for thermosetting synthetic resin bonded laminated sheets

0.3 Wherever in this specification any of the above specifications is referred to by number only without mentioning the year of issue, the latest issue of that specification is implied; otherwise the particular issue referred to is meant.

0.4 This specification is intended chiefly to lay down the technical provision and it does not include all the necessary provisions of a contract.

1. SCOPE

1.1 This specification relates to technical requirements and test for tag blocks for use in wiring of colour light signalling and relay interlocking installations, etc.

2. TERMINOLOGY

2.1 For the purpose of this specification, the definitions given in IRS: S 23 and IRS: S 34 shall apply.

2.2 The terms referred to in this specification but not covered by IRS: S 23 and IRS: S 34 are given below.

2.2.1 TAG PINS

Brass strips/lugs used for soldering two or more wires intended for connecting. These strips/lugs are insulated with each other.

3. GENERAL REQUIREMENTS

3.1 Tag Blocks shall be robust in construction and capable of withstanding handling in transit, storage, installation and service.

3.2 A surface leakage distance of not less than 6 mm shall be provided between current carrying metallic parts and other metallic parts insulated therefrom.

3.3 The distance between tag pins shall not be less than 7 mm.

3.4 The thickness of tag pins shall not be less than 1mm.

3.5 The length and end of tag pins shall be designed in such a manner that wire can be soldered easily.

3.6 The tag pins shall be so designed that they may be used with wire wraps, if so required.

3.7 The tag block shall be provided with an unbreakable transparent cover to prevent ingress of dust and foreign material.

3.8 Tag pins shall be suitably numbered and shall be clearly and indelibly marked for the same.

4. MATERIALS

4.1 The tag block plate shall be made from Synthetic Resin Bonded Glass Fibre (SRBGF) sheet of EP 3 Grade as per IS: 10192.

4.2 The cover shall be manufactured using polycarbonate material. Raw material used for manufacture shall conform to the requirements as per Appendix 'D' of IRS: S 7/1992. Polycarbonate cover shall be annealed after moulding at 125° C temperature for 2 hours.

4.3 Tag pins shall be manufactured from Cu Zn 37 alloy, Spring Hard to IS: 410. Vickers hardness shall not be less than 185.

4.4 The tag pins shall be tinned all over.

4.5 All materials used in manufacture of tag blocks shall be free from corrosion. Holding down screws, washers and nuts shall be of stainless steel.

4.6 All metallic parts shall be provided with a coating for protection against corrosion and fungus.

4.7 Wire comb shall be manufactured from Nylon-6 material. Raw material shall pass chemical test as per clause 4.8 of IRS: S 97/2000. After manufacture, this shall be duly conditioned for water absorption.

5. DRAWINGS AND DIMENSIONS

5.1 Tag blocks shall be manufactured to drawing No. SA 24751 for 200 pins, drawing No. SA 24752 for 160 pins and drawing No. SA 24753 for 120 pins.

6. MARKING

6.1 A name plate giving the following information shall be attached to the tag blocks :

i) Manufacturer's name or trade mark.
ii) Specification No.
iii) Drawing No.
iv) Serial No. of tag block.
v) Year of manufacture.

6.2 Manufacturer's name or trade mark shall be engraved/embossed in cover, wire comb and tag block plate at a conspicuous location.

7. INSPECTION AND TESTING

7.1 **Type test**: Three no. of 120 or 160 or 200 way tag blocks as per RDSO drawings alongwith three no. of every type of dumb-bells/test specimens as specified for following type tests, shall be submitted for type tests. Following tests shall be carried out-

i)	Dimensional check	(Clause 7.4)
ii)	Visual Examination	(Clause 7.5)
iii)	High voltage Test	(Clause 7.6)
iv)	Insulation Resistance Test	(Clause 7.7)
v)	Climatic Test –	
	a) Dry heat test	(Clause 7.8)
	b) Damp heat test	(Clause 7.9)
	c) Cold test	(Clause 7.10)
	d) Damp heat cyclic test	(Clause 7.11)
	e) Mould growth test	(Clause 7.12)
	f) Salt mist test	(Clause 7.13)
vi)	Test for raw materials	(Clause 7.14)
vii)	Annealing test	(Clause 7.15)

7.2 **Acceptance Test**: The following shall constitute the acceptance test:-

i)	Dimensional check	(Clause 7.4)
ii)	Visual examination	(Clause 7.5)
iii)	High voltage test	(Clause 7.6)
iv)	Insulation Resistance test	(Clause 7.7)
v)	Annealing test	(Clause 7.15)

7.2.1 Visual examination shall be carried out on 20% of tag blocks.

7.2.2 Annealing test shall be conducted on 3 samples.

7.2.3 The sampling plan for acceptance tests other than visual examination and annealing test shall be as per Appendix ‘A’.

7.3 **Routine test**:

7.3.1 Following routine tests besides other tests, as deemed fit to ensure quality, reliability and compliance of this specification, shall be conducted by the manufacturer:

i)	Visual Examination	(Clause 7.5)
ii)	Dimensional check	(Clause 7.4)
iii)	Routine tests for tag block plate	(Clause 7.3.2)
iv)	Chemical composition and hardness test for tag pins	(Clause 4.3)
v)	Chemical test for wire comb	(Clause 4.7)

vi) Annealing test (Clause 7.15)
vii) High voltage test (Clause 7.6)
viii) Insulation Resistance Test (Clause 7.7)

7.3.2 Routine tests for tag block plate shall comprise of specific gravity, water absorption and insulation resistance tests for SRBGF sheets as per IS: 10192.

7.3.3 Dimensional check shall be performed on tag blocks as per sampling plan given in Appendix 'A'. Routine tests for tag block plate, hardness and chemical composition tests for tag pins and chemical test for wire comb shall be conducted on every lot of raw material. Rest tests shall be conducted on all samples.

7.3.4 Proper test record having traceability to respective tag block / lot shall be maintained by the manufacturer.

7.4 Dimensional check: The tag block shall be examined for compliance with clause 5.1.

7.5 Visual Examination: Tag blocks shall be visually examined to check finish, cracks or damage and compliance of clause 6.

7.6 High voltage test: A test voltage of 2000 volts AC (r.m.s.) of approximately sine wave form at a frequency between 25 and 100 cycles per second shall be applied for one minute between tag pins and other metallic parts insulated therefrom in the following manner. The tag blocks shall withstand this test without puncture and arcing.

a) All tag pins shorted together against body.
b) All even number tag pins of odd number rows and all odd number tag pins of even number rows shorted together, against all other pins shorted together.

7.7 Insulation resistance test: immediately after high Voltage test as per clause 7.6, insulation resistance between-

a) All tag pins shorted together against body and
b) All even number tag pins of odd numbers rows and all odd number tag pins of even number rows shorted together, against all other pins shorted together shall be measured at a potential of not less than 500 V.DC. The insulation resistance value shall not be less than one gega ohm at room temperature.

7.8 Dry heat test: This test shall be conducted as per IS: 9000 Part-III section 2 for non heat dissipating items with sudden change of temperature at 85º c ± 2º c. The tag block shall be exposed to the high temperature condition for 16 hours. After the test, the tag block shall be visually inspected to see that no part is damaged or cracked and after recovery, the tag block shall be tested for insulation resistance test as per clause 7.7 and the insulation resistance shall not be less than 500 mega ohms.

7.9 Damp heat test (steady state) : The test shall be conducted as per IS: 9000 Part IV. The tag block shall be exposed to severities as specified therein for 4 days. After recovery, the tag block shall be tested for insulation resistance as per clause 7.7 and the insulation resistance shall not be less than 100 mega ohms.

7.10 Cold test: This test shall be conducted as per IS: 9000 Part-II section 2 for non heat dissipation items with sudden change of temperature at - 25ºC ± 3º C. The tag block shall be exposed to cold condition for 16 hours. After the test, the tag block shall be visually examined to see that no part is damaged or cracked and after recovery, the tag block shall be tested for insulation resistance test as per clause 7.7 and the insulation resistance shall not be less than 100 mega ohms..

7.11 Damp heat cycle test: This test shall be conducted as per IS: 9000 Part V, Sec.2 (12+12 H cycle) Variant 2. The tag block shall be exposed to 55º C for six cycles. The insulation resistance of tag block shall be tested in each cycle, one hour before the next cycle starts while tag block is maintained inside the chamber, at 500 V.DC and it shall not be less than 100 mega ohms. After the last cycle, tag block shall be allowed to recover under standard conditions for recovery as specified therein and than the following tests shall be carried out:

i) Visual examination (Clause 7.5)
ii) High voltage test (Clause 7.6)
iii) Insulation resistance test (Clause 7.7)

7.12 Mould growth test: This test shall be conducted as per IS: 9000 Part X for short exposure (Severity 1). After the test, the tag block shall be tested for visual examination. No mould growth shall be observed and the insulation resistance value shall not fall below 100 mega ohms when tested as per clause 7.7 after wiping and cleaning the samples.

7.13 Salt mist Test: This test shall be conducted as per IS: 9000 Part XI as per procedure 2. After the test, the tag block shall be tested for visual inspection. No corrosion or appearent deterioration shall be observed and the insulation resistance values shall not fall below 100 mega ohms when tested as per clause 7.7 after wiping and cleaning the samples.

7.14 The raw materials used in the construction of tag block shall be tested in accordance with the relevant specification*/requirements* as described in clause 4.

7.15 Annealing Test:

To ensure that the annealing has been properly done, the annealed polycarbonate covers shall be tested as follows:

a) The sample shall be immersed completely for 15 secs. In carbon tetra-chloride.
b) The sample shall then be removed and allowed to dry for 3 to 5 minutes at room temperature.
c) The samples after drying shall be visually examined and there shall be no crack apparent. In case any crack is found on visual examination, the samples shall be re-annealed.

8. REJECTION

The tag block or any part thereof that does not comply with any of the requirements of this specification and/or any other specification and/or drawing as approved by the purchaser shall be rejected.

9. PACKING

The tag blocks shall be so packed as to permit convenient handling and to protect against loss or damage during transit or storage.

10. WARRANTY

Warranty of the product shall be in accordance with IRS: S 23.

11. INFORMATION TO BE SUPPLIED BY THE PURCHASER

Information regarding number of pins should be given.

APPENDIX 'A'

SAMPLING PLAN FOR ACCEPTANCE TEST (Clause 7.2.3)

All the tag blocks of the same type manufactured by the same factory during the same period shall constitute a lot.
The actual number of tag blocks to be selected from a lot shall be in accordance with the following table:

TABLE

Lot size	**Number of samples to be drawn**
(1)	(2)
0 - 100	10
101- 300	25
301- 500	35
501- 1000	60

None of the samples shall fail, otherwise the lot shall be considered as not conforming to the requirement of the specification and rejected.
