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Insulating materials of insulated rail joint—Test methods

ICS 45.080

Descriptors : railway fixed equipment, railway signals, railway rails, electrical
insulating materials, plastics, vulcanized fibre, water-resistance tests

Reference number : JIS E 3023 : 1992 (E)

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Foreword

This translation has been made based on the original Japanese Industrial Standard revised by the Minister of Transportation through deliberations at the Japanese Industrial Standards Committee in accordance with the Industrial Standardization Law:

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In the event of any doubts arising as to the contents,
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Insulating materials of insulated rail joint—Test methods

1 Scope This Japanese Industrial Standard specifies performance testing methods of insulating materials made of plastics and vulcanized fibres used for the rail insulating of the railway signaling equipment.

Remarks 1 Normative references of this Standard are shown as follows.

JIS B 7724 *Brinell hardness testing machines*

JIS B 7726 *Rockwell and Rockwell superficial hardness testing machines*

JIS C 1302 *Insulation resistance testers*

JIS K 6900 *Plastics—Vocabulary*

JIS K 6902 *Testing method for laminated thermosetting decorative sheets*

JIS K 6911 *Testing methods for thermosetting plastics*

JIS K 7110 *Method of izod impact test for rigid plastics*

JIS K 7112 *Methods for determining the density and specific gravity of plastics*

JIS R 6252 *Abrasive papers*

JIS Z 2243 *Method of Brinell hardness test*

JIS Z 8703 *Standard atmospheric conditions for testing*

2 The units and numerical values given in { } in this Standard are based on the traditional units and are appended for information.

2 Definitions For the purposes of this Standard, the definitions given in **JIS K 6900** and the following definitions apply.

- (1) **insulation plate** The insulating materials, whose shape is the same as to that of the rail section, and inserted into the gap between the front and rear rails at the rail joint to insulate both rails.
- (2) **plate** The plate type insulating materials, inserted into the gap between the rail side surface and rail joint board to insulate both.
- (3) **tube** The tubular type insulating materials, attached to the joint board bolt to insulate the bolt, rail and the joint board.
- (4) **washer** The plain washer type insulating materials, attached to the joint board bolt to insulate the bolt, nut and the joint board.

3 Test conditions

3.1 Atmospheric conditions for testing The atmospheric conditions for testing shall be the room of normal temperature and normal humidity specified in **JIS Z 8703** unless otherwise specified.

3.2 Testing water The water used for immersion test shall be distilled water.

4 Test items The test items shall be as follows.

- (1) Water absorption
- (2) Volume resistivity
- (3) Tensile strength and elongation
- (4) Compressive strength and compressive strain
- (5) Impact strength
- (6) Hardness
- (7) Abrasion resistance

5 Size of test specimen and testing times The test specimen shall be taken directly from the products. However, if it is impossible to take the specimen of the appointed size, the specimen shall be taken from the plate produced from the same material.

The size of test specimen and testing times for each test item shall be shown as in Table 1.

Table 1 Size of test specimen and testing times

Unit: mm

Test item	Size of test specimen												Testing times (times)
	Insulation plate			Plate			Tube			Washer			
Length	Width	Thick-ness	Length	Width	Thick-ness	Length	Width	Thick-ness	Length	Width	Thick-ness		
Water absorption	Dimension of product		6^{+1}_0 or 8^{+1}_0	50 ± 1	50 ± 1	$3^{+0.8}_0$	50 ± 1	50 ± 1	3 ± 0.5	50 ± 1	50 ± 1	$4^{+0.8}_0$ or $6^{+0.8}_0$	3
Volume resistivity	Dimension of product		6^{+1}_0 or 8^{+1}_0	50 ± 1	50 ± 1	$3^{+0.8}_0$	50 ± 1	50 ± 1	3 ± 0.5	50 ± 1	50 ± 1	$4^{+0.8}_0$ or $6^{+0.8}_0$	3
Tensile strength and elongation	Fig. 1		6^{+1}_0 or 8^{+1}_0	Fig. 1			Fig. 1			Fig. 1			5
Compressive strength and compressive strain	7 ± 0.5	7 ± 0.5	6^{+1}_0 or 8^{+1}_0	7 ± 0.5	7 ± 0.5	$3^{+0.8}_0$	7 ± 0.5	7 ± 0.5	3 ± 0.5	7 ± 0.5	7 ± 0.5	$4^{+0.8}_0$ or $6^{+0.8}_0$	5
Impact strength	Clause 6 of JIS K 7110		3.5 ± 1	Clause 6 of JIS K 7110			Clause 6 of JIS K 7110			Clause 6 of JIS K 7110			5
Hardness	Rockwell	12 min.	6 min.	12 min.	12 min.	6 min.	12 min.	12 min.	6 min.	12 min.	12 min.	6 min.	5
	Brinell	20 min.	20 min.	—	—	—	—	—	—	20 min.	20 min.	20 min.	
Abrasion resistance	Diameter about 120		6^{+1}_0 or 8^{+1}_0	Diameter about 120			Diameter about 120			Diameter about 120			3