



TME/2010

BHARAT HEAVY ELECTRICALS LIMITED, BHOPAL
TRACTION MACHINES ENGINEERING DIVISION**PRODUCT STANDARD****CONCURRENT SHEET**

GENERAL INFORMATION

DATE : 14.01.2002

PRODUCT STANDARD NO. : 97246

DESCRIPTION : BRUSH HOLDER INSULATOR PINS FOR
TRACTION MACHINES.

REVISION NO.

DETAILS OF REVISION

08

1. Changes made as per MOM TME/708 dated 12.01.2002
2. Clause 1.0, 6.1, 6.2, 6.3, 7.1 & 7.2 revised
Clause 2.2 & 8.0 added.

NAME

SIGNATURE

DATE

PREPARED BY

S.P.SINGH

14.01.2002

AGREED BY

REMARK DEPTT./SEC.

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BRUSH HOLDER INSULATOR PINS FOR TRACTION MACHINES

1.0 GENERAL

This standard details the process to be followed for the manufacture of the brush holder insulator pins for traction machines. This standard also covers brush holder arm, support and other similar items.

2.0 INSULATION MOULDING PROCEDURE

2.1 Epoxy resin bonded woven glass cloth moulding

- Step 1 - Steel pins are machined as specified in drawing.
- Step 2 - Machined pins are cleaned with acetone/toluene to remove any physical contamination such as dust/dirt particles, grease etc. which may be present on the pin surface.
- Step 3 - Fix a sealing insulation of epoxy glass as per drg., centrally at the non-threaded end of the pin with epoxy compound.
- Step 4 - Pins are then wrapped with preheated (100-110 deg.C) Silane treated woven glass cloth (AA-25601) layers of 0.18 mm thk thoroughly soaked in unmodified Epoxy resin to build up insulation. The Epoxy resin shall be CIBA Geigy resin type CY 205, hardner HY 905, plasticizer DY 040 & Accelerator DY 061 or equivalent epoxy resin formulation with the approval of BHEL.
- Step 5 - After this the pin is clamped in the mould and cured at a temperature of 80-90 deg.C for 2 hours followed by curing at 150-160 deg.C for 1½ to 2 hours (time to be reckoned after the required temperature is attained).
- Step 6 - The pins are to be removed from the mould & post cured at 150-160 deg.C for 4 hours.
- Step 7 - Moulded pins are to be machined to obtain the final dimension specified on drg.
- Step 8 - Heating of pins is done at 80-100 deg.C for 2 hours to remove moisture. Apply a coat of Epoxy Red Gel to BP27476.
- Step 9 - Preheat the pins at 40 deg.C for 10 hours followed by post curing at 80-100 deg.C for 4 hours.
- Step 10 - Uninsulated portion of steel pins to be electroplated.

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Revision : 08

Date : 14.01.02

Distribution

Qty

Approved :

TME

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TXM

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TAM

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Prepared

Checked

14.01.2002
Date

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Step 11 - Heat shrink PTFE bush as per drg. on the pin by heating the bush at 190-200 deg.C.

2.2 Mycalex insulated moulding

The two part components are to be moulded with Micalex (glass bonded mica with suitable binder) insulation between the two parts under required pressure and temperature, as per thickness of insulation shown in drawing.

Testing to be done after removing PTFE bush.

For mech-test - see drg.

3.0 DIMENSIONS AND TOLERANCES

Shall be as stated on the order or the drawing accompanying the order.

4.0 IDENTIFICATION ON INSULATED PINS

Suppliers identification mark should be punched / engraved on steel pin at bottom face (threaded side) of the steel pin before insulation moulding. Also identification mark at top face (Insulation portion) is also essential with suitable sticker or paint. Identification mark should be legible.

5.0 FINISH

Moulded insulation portion shall have a reasonably smooth surface finish. The surface shall be even, free from visible defects like blisters, cracks, loose fibres, wrinkles, local deformation, foreign inclusions and dents etc.

6.0 ROUTINE TEST

6.1 HV Test to be conducted as follows :

- For Traction machines with 1500 V insulation level : 9 KV for 1 Min.

TM4906, TM4907, TM4601, TM4603, TM5002, TM4501, TM4605, MG51(M), TM3701, MA3501, MA3505, HS15250, TAO659, TM4303, TG10931, TG10919

- For Traction machines with 1000 V insulation level : 6 KV for 1 Min.

TM3603
- For Traction machines with 600 V insulation level : 4 KV for 1 Min.

TA10102/10106, AG3101, AG3102, AG2702, AG51, AG2513, AG2501, MG51(G), BM2101, DY3423



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6.2 Check insulation resistance by 1 KV Meggar the value should be 500 Mcg. at ambient temperature.

6.3 On every lot of 100, select 2 pins at random & clamp insulator pins in suitably to cover full length of insulation and measure IR. Then heat to $100 \pm 5^\circ\text{C}$ for 1 hour and measure hot insulation resistance. It should be minimum 60 M.ohms.

7.0 TYPE TEST

To be done once in every 2 years at TSD BHEL, Bhopal.

7.1 Conduct BDV on 2 pins in as received condition, which should be $> 3.0 \text{ KV/mm}$ insulation thickness to be taken from individual component drawing to find the BDV value.

7.2 Subject 2 pins to boiling water at 100°C for 4 hours. Dry the pins in oven at $100 \pm 5^\circ\text{C}$ for 4 hours. After conducting 3 cycles check IR in hot condition (i.e. $100 \pm 5^\circ\text{C}$) should be 60 M.ohms min. Also conduct BDV at room temperature which should be $> 3.0 \text{ KV/mm}$. Insulation thickness to be taken from individual component drawing to find BDV value.

7.3 One pin should be cut across insulation portion for checking consolidation.

8.0 MECHANICAL TEST

Refer individual component drawings.

9.0 TEST CERTIFICATE

3 Copies of the routine test certificate shall be supplied with each consignment

10.0 PACKING

Individual pins should be packed in a polythene bag and placed in cardboard box sealed to avoid transit/handling damages.