

METRO-NORTH COMMUTER RAILROAD

POWER DEPARTMENT

SPECIFICATION NO. PD-805, REVISION 4

SUPPORT INSULATORS FOR 150-POUND THIRD
RAILS AND 7'-6" END APPROACHES

PART 1 – SCOPE

- 1.1 This Specification applies to three types of insulator: Type 150-1 for support of third rail, and Types 150-2A and 150-3A for support of 7'-6" end approach.
- 1.2 The insulators will be installed utilizing a modified "J" hook to a cast-iron or fiberglass support bracket.
- 1.3 The insulators will be subject to temperature ranges from -30 degrees C to 50 degrees C (-22 degrees F to 122 degrees F).
- 1.4 Insulator dimensional characteristics shall be as shown on Standard Plans SP-212 and SP-213. Tolerances not shown shall be +1/32 inch, unless specified otherwise.
- 1.5 Maximum load (vertical) at a line normal to rail at insulator centerline shall be 2000 pounds.
- 1.6 The insulator, when assembled with bracket, rail and "J" hook shall be rated as follows:

Normal Voltage: 1,000-volt DC
Minimum Electrical Creep Path (Rail to Bracket
Along Insulator Surface): 2-inch minimum

- 1.7 Insulators shall be embossed with the insulator type number. The manufacturer's identification, date of manufacture, and batch code shall be stamped on each insulator with indelible ink, placed so as not to lessen the electrical creep path.

PART 2 – MATERIALS AND WORKMANSHIP

- 2.1 Third rail and end approach insulators shall be compression molded, using a polyester resin based sheet molding compound incorporating glass fiber and inert hydrated filler (fiber reinforced plastic-FRP). Insulator surfaces shall be symmetrical in design; resistant to moisture, weathering or sudden changes in temperature over the atmospheric range -30 degrees C (-22 degrees F) to 50

degrees C (122 degrees F); capable of accommodating both mechanical loads encountered during installation and normal revenue operation; and maintaining electrical isolation.

2.2 The insulator material shall comply with the following requirements (Test Panel Evaluation):

<u>Property</u>	<u>Test Method</u>	<u>Value</u>
Impact, Izod Type Ft-Lb/Inch	ASTM D256 Method A	Minimum 14
Flexural Strength; Psi	ASTM D790	Minimum 24,000
Tensile Strength; Psi	ASTM D638	Minimum 12,000
Arc Resistance; Seconds	ASTM D495	Minimum 180
Compressive Strength; Psi	ASTM D695	Minimum 12,000
Flame Resistance: Ignition Time; Sec. Burning Time; Sec.	ASTM D229 Method II	Minimum 80 Maximum 60
Heat Distortion Temp; Degree F @ 264 Psi	ASTM D648	Minimum 390
Water Absorption (24 Hrs @ 23 C) Increase In Weight; Percent	ASTM D570	Maximum 0.3
Track Resistance; Minutes	ASTM C2303	Minimum 600
Flammability	ASTM D635 UL Std. 94	Self-Extinguishing 94-V-0

PART 3 – TEST REQUIREMENTS

3.1 Sampling and Rejection

Testing shall be based on material “lots” (material batches). Testing shall be on randomly selected pairs of insulators from each “lot” and shall consist of not more than 1 percent of the insulators from a given lot but not less than five pairs. Laboratory test results shall be reported as the average for five tested pairs.

All insulators from lots represented by components which are damaged, out of dimensional conformance or for which test results do not conform to Specification, shall be rejected.

3.2 Tests Required

The following tests shall be accomplished with insulators assembled in support bracket and a short rail section in place. A minimum of five pairs per lot shall be subjected to functional testing.

3.2.1 Voltage Withstand Test (Short Term):

The insulators shall withstand a minimum of 1500 VDC for 3 minutes between rail section and bracket.

3.2.2 Resistance Test:

The insulators shall have a minimum resistance of 8 megohms measured between rail and bracket using a 1000-volt direct current megohm meter. Resistance measurements shall be made immediately following immersion of insulator bodies in distilled water (at room temperature) for 72 hours. Body surfaces shall be carefully dried without heating prior to test.

PART 4 – SUBMITTALS AND TEST REPORTS

4.1 In advance of quantity manufacture, the vendor shall submit for approval of dimensions by the Railroad, a pre-production sample consisting of at least three pairs of each type of insulator.

4.2 In advance of shipment of each lot of insulators, the Vendor shall submit, for approval of the Railroad, certified test reports of tests performed on the lot, including reports of tests performed on lots rejected in the factory accompanied by statement that the latter lots were destroyed. The test reports shall include the number of insulators in each lot and the number of insulators tested.