



**OBJY2.E209256**  
**Systems, Electrical Insulation - Component**

[Page Bottom](#)

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**Systems, Electrical Insulation - Component**

[See General Information for Systems, Electrical Insulation - Component](#)

**TOYOZUMI DENGENKIKI CO LTD**  
4-16-1 KOISHIKAWA  
BUNKYO-KU, TOKYO 112-0002 JAPAN

E209256

**Class 155 (F) insulation system**, designated 20.

Marking: Company name or file number "E209256" and system component designation.

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[Print this page](#)

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[Page Top](#)

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**OBJY2.GuideInfo**  
**Systems, Electrical Insulation - Component**

[View Listings](#)

[Page Bottom](#)

**[Insulating Devices and Materials - Component] (Plastic Materials and Electrical Insulation Systems - Component) Systems, Electrical Insulation - Component**

[See General Information for Plastic Materials and Electrical Insulation Systems - Component](#)

The devices covered under this category are incomplete in certain constructional features or restricted in performance capabilities and are intended for use as components of complete equipment submitted for investigation rather than for direct separate installation in the field. THE FINAL ACCEPTANCE OF THE COMPONENT IS DEPENDENT UPON ITS INSTALLATION AND USE IN COMPLETE EQUIPMENT SUBMITTED TO UNDERWRITERS LABORATORIES INC.

**USE**

This category covers combinations of insulating materials arranged to form an insulation system such as that used in magnetic devices, such as motors, transformers, generators, solenoids, etc. Also included are coated core (integral ground) insulation constructions.

Insulation systems rated greater than 105 ° C (A) have been tested to demonstrate their acceptability for use at a specified temperature class by either the thermal aging programs of Underwriters Laboratories Inc. or an equivalent consideration.

Coated core constructions are additionally examined and tested to determine the insulating qualities of the coating and that the coating can be applied with uniform thickness and has the ability to adhere to the substrate.

Unless otherwise specified in the individual Recognitions, the insulation system has been investigated for connection to the low-voltage side of the distribution network where the voltage is limited to 1000 V or less and where transient overvoltages and partial discharge are not likely to contribute to the degradation of the insulation system. This use is consistent with systems extending from the service point or source of power operating at not more than 600 V nominal according to ANSI/NFPA 70, "National Electrical Code." This application is also consistent with systems extending from the consumer's service in low-voltage or extra-low voltage applications at not more than 750 V according to the CAN/CSA-C22.1, "Canadian Electrical Code, Part I," and low-voltage mains of 1000 V ac or less in overvoltage category IV installations according to IEC 60364, "Electrical Installation of Buildings."

**CONDITIONS OF ACCEPTABILITY**

Unless specified otherwise in the individual Recognitions, consideration is to be given to the following Conditions of Acceptability when these components are employed in the end-use equipment:

1. End-product constructional details and test performance are not covered under this category; such investigations are found in the end-product standards under which the products are examined and tested.
2. Special chemical environments, such as refrigerants, oils, soaps, x-rays, ultraviolet light, etc., are not covered under this category.
3. The acceptability of construction features of the transformer, motor or coil assemblies produced with these insulation systems, such as spacings, insulation thicknesses (greater than those specified under "Construction Details" in the individual Reports for the insulation systems), thickness and voltage rating of lead insulation (if applicable), etc., shall be determined in the end-use application.

Additional Conditions of Acceptability may be specified in the individual Recognitions.

**REQUIREMENTS**

The basic standard used to investigate products in this category is [UL 1446](#), "Systems of Insulating Materials - General."

Other standards which may be used, where appropriate, are as follows:

ANSI/IEEE C57.12.56-1986, "Standard Test Procedure for Thermal Evaluation of Insulation Systems for Ventilated Dry-Type Power and Distribution Transformers"

IEEE C57.12.60-1992, "Guide for Test Procedures for Thermal Evaluation of Insulation Systems for Solid-Cast and Resin-Encapsulated Power and Distribution Transformers"

IEEE 275-1992, "Recommended Practice for Thermal Evaluation of Insulation Systems for Alternating-Current Electric Machinery Employing Form-Wound Preinsulated Stator Coils for Machines Rated 6900 V and Below"

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[Page Top](#)

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**Plastic Materials and Electrical Insulation Systems - Component**

[View Listings](#)

[Page Bottom](#)

---

**[Insulating Devices and Materials - Component] Plastic Materials and Electrical Insulation Systems - Component**

[See General Information for Insulating Devices and Materials - Component](#)

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[Page Top](#)

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## NYYV2.GuideInfo Insulating Devices and Materials - Component

[View Listings](#)

[Page Bottom](#)

---

## Insulating Devices and Materials - Component

[Last Updated](#) on 1983-03-26

---

[Questions?](#)

[Print this page](#)

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[Page Top](#)

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