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(formerly known as LI 6-1993)

Relative Temperature Indices of Industrial Thermosetting Laminates

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Foreword

The Insulating Materials Section of the National Electrical Manufacturers Association represents the major manufacturers of industrial laminated plastics. It is an industry group that conducts activities of interest not only to customers and manufacturers, but also to the general public, that ultimately result in benefits in safety, economy, and convenience, through such programs as standardization, safety and engineering, statistics and marketing, and other projects of mutual interest.

Industrial laminates consist of fibrous materials such as cellulose paper, cotton, glass, or asbestos fabrics; or a mat of random-laid glass or other fibers impregnated or coated with a thermosetting resin binder and laminated under pressure and high temperature into hard, solid products. These products have useful properties of high mechanical strength, good electrical insulating properties, and serviceability at elevated temperatures when used within the range of temperatures indicated in Table 4-1 of this publication.

The Insulating Materials Section has supported applied research and development at Johns Hopkins University, the University of Delaware, and the University of Cincinnati for the following reasons:

a. The need for an unbiased source of professional quality work on test method development
b. The testing of industry offerings of industrial laminates for the purpose of guiding NEMA standards for these products
c. Special studies of technology related to industrial laminates

Much of the work at these university laboratories has been directed at obtaining data for industrial laminates under the special environmental and test conditions of the Underwriters Laboratories Inc. Representatives of UL have cooperated with these NEMA-sponsored laboratories through interlaboratory correlations of test methods, and, as in the case of the publication at hand, have developed Relative Temperature Indices of the laminates.

These efforts culminated in the publication of NEMA LI 6 in 1993; the standard was subsequently reaffirmed in 2005 and 2013. In 2022, the consensus body of the Insulating Materials Section agreed to review and revise this standard and publish it as ANSI/NEMA IM 60001-2022.

Comments and suggested revisions should be sent to:

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This standard was developed by the NEMA Insulating Materials Section, which is composed of the following members:

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Solomon	Chiang	The Gund Company, Inc.
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With the 2022 edition, because of a change in software used to published this standard, page numbering and other formatting details might differ from the original UL 6-1993 or the reaffirmations in 2005 and 2013.

Section 1
REFERENCED STANDARDS

The following publications form a part of this document to the extent specified herein. The applicable issue of publications shall be the issue in effect on the date of the purchase order. In the event of conflict between the text of this document and references cited herein, the text of this document takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

International Electrotechnical Commission (IEC)
Geneva, Switzerland

IEC 60216	Various parts with various titles
IEC 61857	Electrical insulation systems - Procedures for thermal evaluation - Various parts
IEC 60893	Insulating materials - Industrial rigid laminated sheets based on thermosetting resins for electrical purposes - Various parts

Institute of Electrical and Electronics Engineers (IEEE)
Piscataway, NJ 08854

IEEE 1	IEEE Recommended Practice - General Principles for Temperature Limits in the Rating of Electrical Equipment and for the Evaluation of Electrical Insulation
IEEE 98	IEEE Standard for the Preparation of Test Procedures for the Thermal Evaluation of Solid Electrical Insulating Materials
IEEE 99	IEEE Recommended Practice for the Preparation of Test Procedures for the Thermal Evaluation of Insulation Systems for Electrical Equipment
IEEE 101	IEEE Guide for the Statistical Analysis of Thermal Life Test Data
IEEE 259	IEEE Standard Test Procedure for Evaluation of Systems of Insulation for Dry-Type Specialty and General-Purpose Transformers (withdrawn but under revision in 2022)
IEEE C57.12.60	IEEE Standard for Thermal Evaluation of Insulation Systems for Dry-Type Power and Distribution Transformers

ASTM International
West Conshohocken, PA 19428

ASTM D149	Standard Test Method for Dielectric Breakdown Voltage and Dielectric Strength of Solid Electrical Insulating Materials at Commercial Power Frequencies
ASTM D229	Standard Test Methods for Rigid Sheet and Plate Materials Used for Electrical Insulation
ASTM D790	Standard Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials