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An American National Standard

IEEE Standard Test Specifications for Varistor Surge-Protective Devices

Sponsor

**Surge Protective Devices Committee
of the
IEEE Power Engineering Society**

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Foreword

(This Foreword is not a part of IEEE C62.33-1982, IEEE Standard Test Specifications for Varistor Surge-Protective Devices.)

This test specification has been developed for the purpose of testing and comparing varistor type surge protective devices.

The varistor device is a surge diverter used for limiting transient overvoltages in power and communications circuits. Two types of material have been used for many years, silicon carbide, primarily in high voltage arresters, and metal oxide varistors.

The interest in low voltage varistors has grown with the trend to highly sophisticated electrical and electronic devices which are exposed to surges from the environment. Initially, there were no standard terms or tests to define or compare these devices. The IEEE Surge Protection Devices Committee formed its Low Voltage Surge Protection Devices Working Group in 1970 to define these parameters.

Experts were drawn from many fields in communications and power utilities, electronic manufacturers and users, test equipment manufacturers and laboratories, and producers of varistors themselves. The requirements, experiences and vocabularies of these representatives were melded to produce this document as a guide to potential users of varistor surge protective devices.

At the time this standard was published it was under consideration for approval as an American National Standard. The American National Standards Committee C62 Surge Arresters had the following members at the time this document was sent to letter ballot.

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IEEE Standard Test Specifications for Varistor Surge-Protective Devices

1. Scope

1.1

This standard applies to varistors for surge protective applications on systems with dc to 420 Hz frequency and voltages equal to or less than 1000 V rms, or 1200 V dc. This standard contains definitions, service conditions and a series of test criteria for determining the electrical characteristics of these varistors. If the characteristics differ with the direction of conduction, then the tests determine characteristics for both polarities. Arresters covered by ANSI/IEEE C62.1-1984 [1]¹ are excluded from this standard.

1.2

The tests in this standard are intended as design tests as defined in ANSI/IEEE Std 100-1984 [3] and provide a means of comparison among various surge-protective devices.

1.3

Varistor surge-protective devices are used to provide transient overvoltage protection in electrical circuits. Varistors, as defined in ANSI/IEEE Std 100-1984 [3], are devices exhibiting a nonlinear volt-ampere characteristic. More specifically, this standard applies to such devices having a monotonic increase in voltage with increasing current flow. Because the impedance of the device decreases with increasing voltage, it provides a relatively low impedance path for surge voltages and a relatively high impedance at normal system voltage, before and after the occurrence of the surge.

Test criteria and definitions in this standard provide a common engineering language beneficial to user and manufacturer of surge-protective varistor devices.

1.4

Due to the voltage and energy levels employed in the majority of tests described herein, all tests should be considered hazardous and appropriate caution should be taken in their performance.

¹The numbers in brackets correspond to the standards listed in the Bibliography, Section 7. of this standard.