NEMA Standards Publication

ANSI C119.4-2016

American National Standard for Electric Connectors—Connectors for Use between Aluminum-to-Aluminum and Aluminum-to-Copper Conductors Designed for Normal Operation at or Below 93°C and Copper-to-Copper Conductors Designed for Normal Operation at or Below 100°C

National Electrical Manufacturers Association

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Secretariat:

National Electrical Manufacturers Association

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CONTENTS

Annexes

Tables

Worksheet

Foreword (Neither this foreword nor any of the informative annexes is a part of American National Standard C119.4-2016)

The standard covers electrical and mechanical requirements for connectors used in tests to establish performance characteristics of connectors used to join aluminum-to-aluminum, aluminum-to-copper, or copper-to-copper bare and insulated conductors.

It is the responsibility of the user to determine the proper connector for any particular application. The user may request the manufacturer to perform any additional desired testing beyond that required by the C119.4 standard performance tests.

Extensive editorial changes have been made in the C119.4-2016 version of the standard. The editorial changes to the standard are as follows:

1. Testing methods and equipment requirements were removed since all testing methods and equipment are now addressed in the new ANSI C119.0-2015, Testing Methods and Equipment Common to the ANSI C119 Family of Standards document.
2. The remaining performance standards and requirements unique to the C119.4 standard have been reorganized under a new numbering format.

This revision includes the addition of one optional set of performances requirements: Shunt Class Connector Devices (Annex E). These performance requirements are not a part of the required C119.4 standard performance requirements. The subcommittee has provided these optional performance requirements as a reference in response to users who have requested guidance for testing of shunt devices. The user may request that the manufacturer perform any additional tests that are not a part of the required C119.4 standard performance requirements.

This standard was initially developed under the direction of the Transmission and Distribution Committee of the Edison Electric Institute (EEI). Tentative performance-type specifications for electrical characteristics were issued in joint report form in 1958 by a steering committee of EEI and an advisory committee of manufacturers on the aluminum conductor research project (EEI Pub. No. 59-70 *Tentative Specifications for Connectors for Aluminum Conductors*).

Experience gained from extensive trial use further confirmed the performance criteria and test conditions of the tentative specifications and led to the development of Standard TDJ 162 in October 1962 by a joint committee of EEI and the National Electrical Manufacturers Association (NEMA). TDJ 162 was subsequently superseded by this document.

The C119.4 Subcommittee of the Accredited Standards Committee on Connectors for Electric Utility Applications, C119, in its constant review of the publication, continues to seek out the views of responsible users that will contribute to the development of better standards. Suggestions for improvement of this standard are welcome.

Send to:

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This standard was processed and approved for submittal to ANSI by the Accredited Standards Committee on Connectors for Electrical Utility Applications, C119. Committee approval of this standard does not necessarily imply that all committee members voted for its approval. At the time it approved this standard, the C119 Main Committee had the following members:

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1 Scope and Purpose

1.1 Scope

This standard covers connectors used for making electrical connections between aluminum-to-aluminum or aluminum-to-copper or copper-to-copper conductors used on distribution and transmission lines for electric utilities.

This standard establishes the electrical and mechanical test requirements for electrical connectors. Additional optional tests are shown in the annexes. This standard is not intended to recommend operating conditions or temperatures.

1.2 Purpose

The purpose of this standard is to give reasonable assurance to the user that connectors meeting the requirements of this standard will perform in a satisfactory manner, provided they have been properly selected for the intended application and are installed in accordance with the manufacturer's recommendations. The service operating conditions and the selection of the connector class is the responsibility of the user.

2 Referenced Standards

This standard is intended to be used in conjunction with, but not limited to, the following standards in their latest edition:

ANSI C119.0 *American National Standard for Electric Connectors—Testing Methods and Equipment Common to the ANSI C119 Family of Standards.*

3 Definitions

bolted-type connector: A connector that makes an electrical connection utilizing bolting (or a bolt and nut combination) to apply and maintain contact pressure to the conductor.

conductor: Conducting material used as a carrier of electric current.

connector: A device joining two or more conductors to provide a continuous electrical path.

connector current class: Nomenclature categorizing a connector’s electrical performance by current cycle test duration.

Class AA (Extra Heavy duty)—High current cycle test duration
Class A (Heavy duty)—High current cycle test duration
Class B (Medium duty)—Moderate current cycle test duration
Class C (Light duty)—Low current cycle test duration

connector tension class: Nomenclature categorizing a connector’s mechanical performance by tension test level.

Class 1—Full tension, 95% rated conductor strength
Class 1A—Normal tension, 60% rated conductor strength
Class 2—Partial tension, 40% rated conductor strength
Class 3—Minimum tension, 5% rated conductor strength

control conductor: A conductor in the current cycle loop that serves as a reference for setting test current and monitoring temperature.

equalizer: A device installed in the test loop to ensure a point of equipotential in a stranded conductor.