

IEEE Standards Interpretation for IEEE Std 515.1™-1995 IEEE Recommended Practice for the Testing, Design, Installation, and Maintenance of Electrical Resistance Heat Tracing for Commercial Applications

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Interpretation Request #1

Topic: Division by Zero **Relevant Clause:** Subclause 4.2.15 Strain relief test for fittings "Fittings designed to terminate exposed heating cables directly to an exposed enclosure shall be subjected to strain relief testing. One sample of each strain relief fitting will be subjected to the test. The specimens will consist of at least 300 mm of heating cable attached to the subject fitting according to the manufacturer's instructions. A steady load of 9 kg for conductors smaller than 0.81 mm² and 16 kg for all other cases is to be gradually applied between the heating cable and fitting. The load shall be maintained for a period of 1 min. As a result of this test, the heating cable shall not loosen or separate by more than 1 mm from the fitting, and there shall be no damage to the conductors, insulation, or fitting."

1. The phrase "exposed" in this subsection: If a heating cable is under pipe insulation or inside a connection box, is it considered exposed?
2. What is the "fitting" that is referred to? Is it the grommet/gland that the cable passes through going into the connection box or is it the electrical connection itself inside the enclosure?

Interpretation Response

The purpose of this type test was to verify that an exposed heating cable could not accidentally be pulled out of an exposed connection box.

Exposed heating cable and/or an exposed enclosure are intended to mean ones that are visible and accessible in their installed condition. The most common example would be a roof and gutter de-icing cable, and its associated terminations. Any heating cable cov-

ered in it's installed condition (under thermal pipe insulation or in concrete for example) would not be required to pass this test. The first sentence defines specifically which installations must be tested. (The use of the word "termination" in this sentence can cloud the understanding of the definition.) There is no intent to test the electrical connection that is inside the exposed enclosure. The intent is to test gripping power of the gland/grommet fitting that the exposed heating cable passes through as it directly enters an exposed enclosure.

The requirement for "shall not loosen or separate by more than 1 mm from the fitting" means that the cable shall not move by more than 1 mm in the fitting/gland or separate from the fitting/gland as a result of the test.

The statement that "there shall be no damage to the conductors, insulation, or fitting" refers to the heating cable and fitting at the point it passes thru the fitting/gland.

There is no requirement in this test to evaluate the electrical connections inside the enclosure, just to verify that the fitting/gland will hold the heating cable securely.