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Subject 2049
Outline of Investigation
For
Residential Pipe Heating Cable
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FOREWORD

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INTRODUCTION

1 Scope

1.1 This outline covers residential pipe heating cable intended to reduce the likelihood of water freezing in exposed pipes of residences. These devices are considered appliances in accordance with Article 422 of the National Electrical Code, NFPA 70.

1.2 Cable units employing different heating conductors, insulation, or other forms of construction may be examined and tested in accordance with the intent of this outline, and if found to be substantially equivalent, may be covered.

1.3 Residential pipe heating cables may be installed on metal or rigid plastic pipes. Plastic pipes are considered to have a maximum long-term thermal exposure limit of 50°C absolute.

1.4 These heating cables are limited to applications where they are not exposed to weather unless additionally evaluated for outdoor use.

CONSTRUCTION

2 Heating Conductors

2.1 The heating conductors shall be insulated with a suitable insulating compound acceptable for use at 75°C (167°F) or higher in wet locations. The minimum thickness of the insulation shall not be less than 1/32 inch (0.8 mm) when not provided with a nylon jacket and not less than 1/64 inch (0.4 mm) when provided with a 4 mil or thicker nylon jacket.

2.2 Heating cables which utilize "self-regulating" positive temperature coefficient (PTC) materials shall be evaluated in accordance with the requirements for such materials. Reference is made to the Appendix to the Subject 1434 bulletin dated February 9, 1978, or to more current PTC requirements as appropriate.

3 Grounding Component

3.1 The heating section shall be provided with a grounding component that consists of a metallic sheath or braid. If the heating section consists of more than one conductor, the grounding component may be incorporated on each conductor or all conductors may be enclosed with a common sheath or braid. If the grounding component consists of the braid, it shall provide at least 80 percent coverage and shall employ material that is corrosion resistant. The grounding component shall have a current-carrying capacity equal to or greater than that of the unit but not less than that of a No. 18 AWG (0.82 mm²) copper conductor. The grounding braid shall be connected to the grounding lead of the non-heating leads.

4 Jacket

4.1 An optional insulating jacket may be employed over the grounding component.

5 Nonheating Leads

5.1 The heating section shall be connected to nonheating leads consisting of Type SJ or heavier flexible cord acceptable for outdoor use that are at least 2 feet (0.61 m) in length. The flexible cord shall not be more than 6 feet (1.8 m) in length and shall be terminated by a grounding type attachment plug.