

Approval Standard for Heat Responsive Links for Fire Protection

Class Number 2031

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Foreword

FM Approvals are intended to verify that the products and services described will meet stated conditions of performance, safety and quality useful to the ends of property conservation. The purpose of FM Approval Standards is to present the criteria for FM Approval of various types of products and services, as guidance for FM Approvals personnel, manufacturers, users and authorities having jurisdiction.

Products submitted for Approval shall demonstrate that they meet the intent of the Approval Standard, and that quality control in manufacturing and/or applications shall ensure a consistently uniform and reliable product or service. FM Approval Standards strive to be performance-oriented and to facilitate technological development.

For examining equipment, materials and services, FM Approval Standards:

- a) must be useful to the ends of property conservation by preventing, limiting or not causing damage under the conditions stated by the Approval listing; and
- b) must be readily identifiable.

Continuance of Approval and Listing depends on compliance with the Approval agreement, satisfactory performance in the field, on successful re-examinations of equipment, materials, and services as appropriate, and on periodic follow-up audits of the manufacturing facility or service/application.

FM Approvals LLC reserves the right in its sole judgement to change or revise its standards, criteria, methods, or procedures.

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1. INTRODUCTION

1.1 Purpose

- 1.1.1 This standard states FM Approval criteria for heat responsive links for fire protection service.
- 1.1.2 FM Approval criteria may include, but are not limited to, performance requirements, marking requirements, examination of manufacturing facility(ies), audit of quality assurance procedures, and a follow-up program.

1.2 Scope

- 1.2.1 This standard sets performance requirements for heat responsive links for use in a variety of applications, including automatic operation of fire doors, heat and explosion vents, wet chemical extinguishing systems and dry chemical extinguishing systems.
- 1.2.2 Other types of heat responsive links may be Approved if they meet the requirements and intent of this standard. Heat responsive links of unusual design may be subjected to special tests to determine their suitability.
- 1.2.3 FM Approval standards are intended to verify that the product described will meet stated conditions of performance, safety and quality useful to the ends of property conservation.

1.3 Basis for Requirements

- 1.3.1 The requirements of this standard are based on experience, research and testing, and/or the standards of other organizations. The advice of manufacturers, users, trade associations, jurisdictions and/or loss control specialists was also considered.
- 1.3.2 The requirements of this standard reflect tests and practices used to examine characteristics of heat responsive links for the purpose of obtaining FM Approval. Heat responsive links having characteristics not anticipated by this standard may be Approved if performance equal, or superior, to that required by this standard is demonstrated, or if the intent of the standard is met. Alternatively, heat responsive links which meet all of the requirements identified in this standard may not be Approved if other conditions which adversely affect performance exist or if the intent of this standard is not met.

1.4 Basis for FM Approval

FM Approval is based upon satisfactory evaluation of the product and the manufacturer in the following major areas:

- 1.4.1 Examination and tests on production samples shall be performed to evaluate:
- the suitability of the product;
 - the performance of the product as specified by the manufacturer and required by FM Approvals; and, as far as practical,
 - the durability and reliability of the product.

- 1.4.2 An examination of the manufacturing facility(ies) and audit of quality control procedures shall be made to evaluate the manufacturer's ability to consistently produce the product which was examined and tested, and the marking procedures used to identify the product. These examinations are repeated as part of FM Approvals' product follow-up program.

1.5 Basis for Continued Approval

Continued Approval is based upon:

- production or availability of the product as currently Approved;
- the continued use of acceptable quality assurance procedures;
- satisfactory field experience;
- compliance with the terms stipulated in the Approval Agreement;
- satisfactory re-examination of production samples for continued conformity to requirements; and
- satisfactory Facilities and Procedures Audits (F&PAs) conducted as part of FM Approvals' product follow-up program.

Also, as a condition of retaining Approval, manufacturers may not change a product or service without prior authorization by FM Approvals.

1.6 Effective Date

The effective date of an Approval standard mandates that all products tested for Approval after the effective date shall satisfy the requirements of that standard. Products Approved under a previous edition shall comply with the new version by the effective date or forfeit Approval.

The effective date of this standard is **December 31, 2002** for compliance with all requirements.

1.7 System of Units

Units of measurement used in this standard are United States (U.S.) customary units. These are followed by their arithmetic equivalents in International System (SI) units, enclosed in parentheses. The first value stated shall be regarded as the requirement. The converted equivalent value may be approximate. Appendix A lists the selected units and conversions to SI units for measures appearing in this standard. Conversion of U.S. customary units is in accordance with the American National Standards Institute (ANSI)/Institute of Electrical and Electronics Engineers (IEEE)/American Society for Testing Materials (ASTM) SI 10-97, "*Standard for Use of the International System of Units (SI): The Modern Metric System.*"

1.8 Applicable Documents

The following standards, test methods, and practices are referenced in this standard:

- ANSI/IEEE/ASTM SI 10 — 1997, *Standard for Use of the International System of Units (SI): The Modern Metric System*
- ASTM B-117 — 1990, *Method of Salt Spray (Fog) Testing*
- ASTM E-1 — 1991, *Standard Specification for ASTM Thermometers*
- FM Global Property Loss Prevention Data Sheets

1.9 Definitions

For purposes of this standard, the following terms apply:

Accepted

This term refers to installations acceptable to the authority enforcing the applicable installation rules. When the authority is FM Global, such locations are termed “FM Global Accepted.” Acceptance is based upon an overall evaluation of the installation. Factors other than the use of Approved equipment impact upon the decision to accept, or not to accept. Acceptance is not a characteristic of a product. It is installation specific. A product accepted for one installation may not be acceptable elsewhere. (Contrast with Approved.)

Approval Mark

The FM Approval Mark is detailed in Appendix B. Its use is mandatory on all units of Approved heat responsive links. These registered marks cannot be used except as authorized by FM Approvals via the granting of Approval to a specific product.

Approved

This term refers to products Approved by FM Approvals. Such products are listed in the FM Approval Guide, issued annually, or one of the supplements. All products so listed have been successfully examined by FM Approvals, and their manufacturers have signed and returned an Approval Agreement to FM Approvals. This form obligates the manufacturer to allow re-examination of the product and audit of facilities and procedures at FM Approvals discretion. It further requires the manufacturer not to deviate from the as-Approved configuration of the product without review by and agreement of FM Approvals. Approval is product specific.

Assembly Load

The force which is applied to the heat responsive link frame due to assembly of the operating parts plus the maximum design load acting on the operating element.

Bulb Element

An operating element that opens under the influence of heat by bursting of a glass bulb through pressure resulting from expansion of the enclosed fluid.

Element Design Load

The load actually applied on the operating element (heat responsive link).

Fusible Element

An operating element that opens under the influence of heat by the melting of a component.

Heat Responsive Link

A thermo-sensitive device designed to react at a predetermined temperature.

Operating Temperature

The temperature in degrees Fahrenheit (°F) or Celsius (°C) at which the heat responsive element operates when subjected to a controlled rate-of-temperature-rise liquid bath.