

Approval Standard for Explosion Suppression Systems

Class Number 5700

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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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I. INTRODUCTION

1.1 Purpose

- 1.1.1 An Explosion Suppression System is designed to detect an incipient deflagration and suppress it in order to prevent the full impact of the deflagration from developing. Typically these systems consist of four basic components: the detector(s), a control unit, suppressant containers, and suppressant dispersers. Some systems may also include high speed isolation valves.
- 1.1.2 An explosion is detected in the incipient stage, either by a rise in pressure or the presence of flame within the protected enclosure. The control unit then actuates the suppressant dispersers to envelop and arrest the explosion.

1.2 Scope

- 1.2.1 This standard shall apply to the design, construction, operation, maintenance, and testing of a system for the suppression of a deflagration by introduction of a suppression medium.
- 1.2.2 This standard does not apply to devices or systems designed to protect against over-pressure due to phenomena other than internal explosions.
- 1.2.3 This standard only applies to systems designed to limit the pressure developed in the protected enclosure to a level that does not exceed the design strength of the enclosure.
- 1.2.4 This standard does not apply to systems for isolation or suppression of detonations.

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 explosion suppression systems for the purpose of obtaining FM Approval. Systems 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, systems 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 facilities and audit of quality control procedures is made to evaluate the manufacturer's ability to produce the product which was examined and tested, and the marking procedures used to identify the product. These examinations are repeated as part of the 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 the 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 October 1, 2000 for full 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 ANSI/IEEE/ASTM SI 10-1997, "*Standard for Use of the International System of Units (SI): The Modern Metric System.*"

1.8 Approval Application Requirements

To apply for an Approval examination the manufacturer, or its authorized representative, should submit a request to the Hydraulics Group Manager at FM Approvals, Hydraulics Laboratory, 743A Reynolds Road, West Glocester, Rhode Island (RI) 02814, U.S.A.

1.9 Reference Documents

1.9.1 NFPA 68, Guide for Venting of Deflagrations.

1.9.2 NFPA 69, Standard on Explosion Prevention Systems.