



*Member of the FM Global Group*

# **Approval Standard for Sight Drains for Automatic Sprinkler Systems**

**Class Number 1056**

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# Foreword

The FM Approvals certification mark is intended to verify that the products and services described will meet FM Approvals' stated conditions of performance, safety and quality useful to the ends of property conservation. The purpose of 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 certification by FM Approvals shall demonstrate that they meet the intent of the Approval Standard, and that quality control in manufacturing shall ensure a consistently uniform and reliable product. Approval Standards strive to be performance-oriented. They are intended to facilitate technological development.

For examining equipment, materials and services, 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.

FM Approvals LLC reserves the right in its sole judgment 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 Approvals criteria for sight drains for use in automatic sprinkler systems. They are used to allow visual verification that water is flowing through a pipe. Typical installations include main drain lines and in close proximity to inspector's test devices when discharge flow is not readily visible.
- 1.1.2 Approval criteria may include, but are not limited to, performance requirements, marking requirements, typical installations, examination of manufacturing facility(ies), audit of quality assurance procedures, and a follow-up program.

### 1.2 Scope

- 1.2.1 This standard encompasses the design and performance requirements for sight drains. In cases where metric sized products are to be examined for Approval, test criteria comparable to the equivalent or nearest nominal inch size shall be used.
- 1.2.2 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 may also be considered.
- 1.3.2 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. The requirements of this standard reflect tests and practices used to examine characteristics of sight drains for the purpose of obtaining Approval. Sight drains having characteristics not anticipated by this standard may be FM Approved if performance equal, or superior, to that required by this standard is demonstrated, or if the intent of the standard is met. Conversely, sight drains which meet all of the requirements identified in this standard may not be FM Approved if other conditions which adversely affect performance exist or if the intent of this standard is not met.

### 1.4 Basis for Approval

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 initial Facilities and Procedures Audit (F&PA) shall be conducted to evaluate the manufacturer's ability to consistently produce the product that was examined and tested as part of the Approval project. The audit shall review the facility and in-place quality control procedures used in the manufacturing of the product. Typically, areas of review are incoming inspection, work in progress, production testing, final quality control, marking, calibration of equipment, shipping procedures, and document and drawing control. These examinations are repeated periodically as part of the FM Approvals product follow-up program. (Refer to Section 5.2, Facility and Procedures Audit.).

## 1.5 Basis for Continued Approval

### 1.5.1 Continued Approval is based upon:

- Production or availability of the product as currently FM Approved;
- The continued use of acceptable quality assurance procedures;
- Satisfactory field experience;
- Compliance with the terms stipulated in the Master Agreement;
- Satisfactory re-examination of production samples for continued conformity to requirements; and
- Satisfactory Facilities and Procedures Audits conducted as part of FM Approvals' Product Follow-up Program.

### 1.5.2 Also, as a condition of retaining Approval, manufacturers shall not change an FM Approved product or service without prior written authorization by FM Approvals. (Refer to Section 5.1.3 for further details regarding changes.)

## 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 FM 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 **November 30, 2011** 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 measurements appearing in this standard. Conversion of U.S. customary units is in accordance with the Institute of Electrical and Electronics Engineers (IEEE)/ASTM International (ASTM) SI 10-02, "Use of the International System of Units (SI): The Modern Metric System."

## 1.8 Applicable Documents

The latest versions of the following standards, test methods, and practices are referenced in this standard:

American National Standards Institute (ANSI)/American Society of Mechanical Engineers (ASME) B1.20.1-1983 (R2006), *Pipe Threads, General Purpose (Inch)*  
 ANSI/American Water Works Association (AWWA) C606-2006, *Grooved and Shouldered Joints*  
 British Standards (BS) 21 - 2007, *Pipe Threads for Tubes and Fittings Where Pressure-Tight Joints Are Made On the Threads (Metric Dimensions)*  
 British Standards / European Norm (BS EN) 10226-1 – 2004, *Pipe Threads Where Pressure Tight Joints Are Made on the Threads - Part 1: Taper External Threads and Parallel Internal Threads - Dimensions, Tolerances and Designation*  
 BS EN 10226-2 – 2006, *Pipe Threads Where Pressure-Tight Joints are Made on the Threads - Part 2: Taper External Threads and Taper Internal Threads - Dimensions, Tolerances and Designation*  
 BS EN 10226-3 – 2005, *Pipe Threads Where Pressure-Tight Joints are Made on the Threads - Part 3: Verification By Means Of Limit Gauges*  
 FM Global Property Loss Prevention Data Sheet 2-0, *Installation Guidelines for Automatic Sprinklers*, March 2010  
 FM Global Property Loss Prevention Data Sheet 3-7, *Fire Protection Pumps*, September 2010  
 IEEE/ASTM SI 10 - 2002, *Use of the International System of Units (SI): The Modern Metric System*

International Organization for Standardization (ISO) 65 – 1981, *Carbon Steel Tube Suitable for Screwing in Accordance with ISO 7-1*

ISO 7-1 - 2007, *Pipe Threads Where Pressure-Tight Joints are made on the Threads Part 1: Dimensions, Tolerances and Designation*

ISO/International Electrotechnical Commission (IEC) 17025 - 2006, *General Requirements for the Competence of Testing and Calibration Laboratories*

Japanese Industrial Standard (JIS) G3454 – 2007, *Carbon Steel Pipes for Pressure Service*

## 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 FM Approved equipment impact upon the decision whether to accept the product. 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 FM Approved.)

### **Cut Groove**

A groove that is machined in the outside diameter of a pipe, valve, or fitting near the end to allow joining by means of a gasketed grooved pipe coupling.

### **End Connections**

The term “End Connections” refers to the method of connecting components of a fire protection system. Typical end connections in a fire protection service are grooved, threaded, plain end, flanged and welded end.

### **Flange Fittings**

The term flanged fittings refers to any style of pipe fitting covered in the scope of this Approval Standard with integral flanged end connections.

### **FM Approvals Certification Marks**

The FM Approvals Certification Marks are detailed in Appendix B. Their use is mandatory on all units of FM Approved products. These registered marks cannot be used except as authorized by FM Approvals via the granting of Approval to a specific product.

### **FM Approved**

This term refers to products FM Approved by FM Approvals. Such products are listed in the *Approval Guide*, an on-line resource of FM Approvals. See Appendix D for a sample listing. All products so listed have been successfully examined by FM Approvals, and their manufacturers have signed and returned a Master 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 prohibits the manufacturer from deviating from the as-FM Approved configuration of the product without review by and agreement of FM Approvals. Approval is product specific.

### **Grooved Coupling, Flexible**

A grooved coupling is an assembly that is used to join grooved ends together. The flexible grooved coupling is characterized by its ability to allow for angular or rotational differences between the components being joined after assembly. These products may provide greater system reliability in situations involving excessive vibration, difficult alignment, or seismic activity. They may also provide greater system flexibility than historic use of rigid systems of flanged pipe and fittings.