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# **Examination Standard for Flexible Sprinkler Hose with Threaded End Fittings**

**Class Number 1637**

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# Foreword

This standard is 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 this standard is to present the criteria for examination of various types of products and services.

Examination in accordance with this standard shall demonstrate compliance and verify that quality control in manufacturing shall ensure a consistent and reliable product.

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# 1. INTRODUCTION

## 1.1 Purpose

- 1.1.1 This standard states testing and certification requirements for flexible sprinkler hose with threaded end fittings for use in clean rooms, commercial suspended ceilings, and ducts. Other applications shall be evaluated on a case-by-case basis.
- 1.1.2 Testing and certification criteria may include performance requirements, marking requirements, examination of manufacturing facility(ies), audit of quality assurance procedures, and a surveillance program.

## 1.2 Scope

- 1.2.1 This standard encompasses the design and performance requirements for flexible sprinkler hose with threaded end fittings for their intended application of connecting the sprinklers in a clean room, commercial suspended ceiling, or duct to the sprinkler piping.
- 1.2.2 A commercial suspended ceiling is a type of ceiling used predominately in Light Hazard Occupancies. It is also used less frequently in Ordinary Hazard Occupancies. A typical commercial suspended ceiling system is a "T-Bar Grid". In a T-Bar Grid ceiling, a metal component with an inverted "T" cross-section is used to secure and support acoustical lay-in panels.
- 1.2.3 Rigid furring channel is another type of commercial ceiling system.
- 1.2.4 Other applications shall be evaluated on a case-by-case basis. In cases where metric sized flexible sprinkler hose with threaded end fittings are to be examined for certification, test criteria comparable to the equivalent or nearest nominal inch size shall be used.

## 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 flexible sprinkler hose with threaded end fittings for the purpose of obtaining certification. Flexible sprinkler hose with threaded end fittings having characteristics not anticipated by this standard may be certified if performance equal, or superior, to that required by this standard is demonstrated.

## 1.4 Basis for Certification

Certification 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 for certification;
  - the durability and reliability of the product.
- 1.4.2 An examination of the manufacturing facilities and audit of quality control procedures may be conducted to evaluate the manufacturer's ability to consistently produce the product which is examined and tested, and the marking procedures used to identify the product. Subsequent surveillance may be required by the certification agency in accordance with the certification scheme

to ensure ongoing compliance.

### 1.5 Basis for Continued Certification

The basis for continual certification may include the following based upon the certification scheme and requirements of the certification agency:

- production or availability of the product as currently certified;
- the continued use of acceptable quality assurance procedures;
- satisfactory field experience;
- compliance with the terms stipulated by the certification;
- satisfactory re-examination of production samples for continued conformity to requirements; and
- satisfactory surveillance audits conducted as part of the certification agencies product surveillance program.

### 1.6 Effective Date

The effective date of this examination standard mandates that all products tested for certification after the effective date shall satisfy the requirements of this standard.

The effective date of this standard is eighteen (18) months after the publication date of the standard 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. Conversion of U.S. customary units is in accordance with ANSI/IEEE/ASTM SI 10.

Two units (liter and bar), outside of but recognized by SI, are commonly used in international fire protection and are used in this standard.

### 1.8 Normative References

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the cited edition applies.:

ANSI/ASME B1.20.1, *Pipe Threads, General Purpose (Inch)*  
ANSI/IEEE/ASTM SI 10, *American National Standard for Metric Practice*  
ISO 10380, *Pipework -- Corrugated Metal Hoses and Hose Assemblies*

### 1.9 Terms and 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 (Authority Having Jurisdiction). Acceptance is based upon an overall evaluation of the installation. Acceptance is not a characteristic of a product, it is installation specific. A product accepted for one installation may thus not be acceptable elsewhere.

**Attachment**

Method of joining end fittings to a flexible metal hose.

**Braid**

Tubular woven stocking of metal wires used to provide pressure strength and/or external protection.

**Clean Rooms**

A clean room is an enclosed space in which airborne particulates, contaminants, and pollutants are kept within strict limits.

**Corrosion Resistant**

Flexible sprinkler hose with threaded end fittings shall be termed corrosion resistant if its interior surface exhibits equivalent resistance to aqueous corrosion as steel pipe which is internally coated with zinc.

**Corrugated Metal Hose**

Pressure-tight hose with corrugations, helicoidally (formed or arranged in a spiral) or annular (formed in a ring) to the axis of the hose. Made by deforming the metal, the corrugations provide flexibility.

**Discharge Coefficient (K-Factor)**

The coefficient of discharge as expressed in the equation:

$$K = \frac{Q}{P^{1/2}}$$

Where Q is the flow in gallons per minute (gal/min), and P is the pressure in pounds per square inch (psi). Expressed in SI units: Q is the flow in liters per minute (l/min) and P is the pressure in bar.

**End Connection**

The fitting/component used to connect components of a pipe system or an individual sprinkler to the flexible sprinkler hose with threaded end fittings.

**End Fitting**

Permanently attached fitting which allows metal hose to be connected to other components.

**Flexibility**

The capability of a metal hose to be repeatedly bent elastically during operation.

**Light Hazard Occupancy**

An occupancy in which the quantity and/or combustibility of contents is low and fires with relatively low rates of heat release are expected. Light Hazard Occupancies include occupancies having conditions similar to: apartments, churches, clubs, eaves and overhangs (if combustible construction with no combustibles beneath), educational facilities, hospitals, institutional facilities, libraries (except large stack rooms), museums, nursing or convalescent homes, office (including data processing), residential facilities, restaurant seating areas, theaters and auditoriums (excluding stages and prosceniums), and unused attics.

**Minimum Bend Radius**

The minimum radius [expressed in inches (mm)], specified by the manufacturer, at which a hose is designed to operate.

**Metal Hose Assembly**

Assembly of a metal hose with its end fittings.

**Ordinary Hazard Occupancy**

An occupancy where the quantity and combustibility of contents is greater than that of a Light Hazard Occupancy.

***Pendent Sprinkler***

An automatic sprinkler designed such that the water exiting its orifice is directed downward against the deflector.

***Rated Working Pressure***

The maximum sustained pressure at which the flexible sprinkler hose with threaded end fittings may operate.

***Sidewall Sprinkler***

An automatic sprinkler intended for installation near a wall and ceiling interface and designed to discharge water horizontally outward and onto adjacent walls.

***Suspended Ceiling***

A ceiling in which the main runners and cross furring are suspended below the structural members of the building.

## 2. GENERAL INFORMATION

### 2.1 Product Information

In order to meet the intent of this standard, flexible sprinkler hose with threaded end fittings shall be examined on a model-by-model, type-by-type, manufacturer-by-manufacturer, and plant-by-plant basis. This is predicated on the basis that identical designs, fabricated using identical materials by different manufacturers or, even by different plants of the same manufacturer, have sometimes been shown to perform differently in testing. Sample hoses, selected in conformance to this criterion, shall satisfy all of the requirements of this standard.

### 2.2 Certification Application Requirements

The manufacturer shall provide the following preliminary information with any request for certification consideration:

- a complete list of all models, types, sizes, and options for the products or services being submitted for certification consideration;
- the minimum bend radius of the flexible sprinkler hose;
- the type of application for the flexible sprinkler hose: clean room, commercial suspended ceiling or duct;
- general assembly drawings, one complete set of manufacturing drawings, materials list(s), anticipated marking format, brochures, sales literature, specification sheets, installation, operation and maintenance procedures;
- The number and location(s) of manufacturing facilities.

All documents shall identify the manufacturer's name, document number or other form of reference, title, date of last revision, and revision level. All documents shall be provided with English translation..

### 2.3 Requirements for Samples for Examination

2.3.1 Following authorization of a certification examination, the manufacturer shall submit samples for examination and testing based on the following:

- Sample requirements to be determined by the certification agency

2.3.2 Requirements for samples may vary depending on design features, results of prior or similar testing, and results of any foregoing tests.

2.3.3 The manufacturer shall submit samples representative of production. Any decision to use data generated using prototypes is at the discretion of the certification agency

2.3.4 It is the manufacturer's responsibility to provide any special test fixtures which may be required to evaluate the flexible sprinkler hose with threaded end fittings.

2.3.5 If there are failures encountered during the examination testing, the certification agency will provide the manufacturer with information regarding what testing will need to be repeated and any additional sample requirements.