Approval Standard for Open Shelving for Racks

Class Number 6914

August 2010

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.

TABLE OF CONTENTS

1 INTRODUCTION

1.1 Purpose

This standard states Approval requirements for open shelving for racks. Rack storage of combustible commodities creates a substantial hazard and potential for large fires should ignition occur in the storage area due to several issues such as large amounts of fuel that can be concentrated in racks, uninhibited airflow throughout a stable rack array and the potential for shielding of commodity from overhead sprinklers. While solid shelves may inhibit vertical fire growth they, at the same time, promote horizontal fire spread and can prevent sprinkler water from penetrating down through a rack to the fire area. They also limit the pre-wetting of combustibles. Once the fire breaks out of the area of origin, it may be too large in intensity for the sprinkler systems to be effective. Shelving not Approved by FM Approvals may be considered a fire hazard and, if not properly addressed, may require special protection such as in-rack sprinklers.

1.2 Scope

1.2.1 This standard sets the performance requirements of open shelving for racks. Specifically it addresses their ability to allow a sprinkler water flow penetration rate equivalent to rack shelving having 70% (or greater) open area. All requirements in this standard shall be met in order for these products to be eligible to receive FM Approvals certification.

1.2.2 This standard is intended to evaluate only those hazards investigated and is not intended to determine the suitability for all end use conditions of these products. Conditions under which these products are used vary widely. For example, these materials may be subjected to environments, storage arrangements and fuel loadings not anticipated by this standard.

1.2.3 This standard does not address the issue of open shelving for racks during natural hazard events such as seismic occurrences.

1.2.4 Approval criteria shall include, but are not limited to, performance requirements, marking requirements, an examination of manufacturing facilities, an audit of quality assurance procedures and a follow-up program.

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 FM Approvals and other organizations. The advice of manufacturers, users, trade associations and loss control specialists was also considered.

1.3.2 The requirements of this standard reflect tests and practices used to examine characteristics of open shelving for rack for the purpose of obtaining FM Approval. These requirements are intended primarily as guides and strict conformity is not always mandatory. Open shelving for racks 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. Alternatively, open shelving for racks that meet all the requirements identified in this standard may not be FM Approved if other conditions that 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 for its intended use;
- the proper operation and 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 to evaluate the manufacturer's ability to consistently produce the product as examined and tested and the marking procedures used to identify the product. These examinations are repeated as part of the FM Approvals' quality control follow-up program.

1.5 Basis for Continued Approval

Continued Approval is based upon:

- production or availability of the product as FM Approved;
- the continued use of acceptable quality assurance procedures;
- satisfactory field experience;
- compliance with the terms stipulated in the Approval report;
- satisfactory re-examination, if deemed necessary, of production samples for continued conformity to requirements; and
- satisfactory Facilities and Procedures Audits (F&PA's) 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

1.6.1 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 else forfeit Approval. The effective date shall apply to the entire Approval Standard, or, where so indicated, only to specific paragraphs of the standard.

1.6.2 This standard will be effective immediately upon publication for compliance with all requirements.

1.7 System of Units

Units of measurement 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 value may be the 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 are standards, test methods and practices referenced in this standard:

FM Approvals Standard for Automatic Control Mode Sprinklers, Class Number 2000.

FM Approvals Standard for Suppression Mode [Early Suppression – Fast Response (ESFR)] Automatic Sprinklers, Class Number 2008.

FM Global Property Loss Prevention Data Sheet 8-9, *Storage of Class 1, 2, 3, 4, and Plastic Commodities*.

FM Approvals Test Procedure, *Actual Delivered Density (ADD) Testing of Open Shelving for Racks.*

1.9 Definitions

Actual Delivered Density (ADD) — The rate at which water is actually deposited from an operating sprinkler onto the top horizontal surface of a burning combustible array.

Discharge Coefficient(K-Factor) — The coefficient of discharge, K, 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. The discharge coefficient, therefore, has units of gal/min/$(psi)^{1/2}$ or L/min/$(bar)^{1/2}$.

Flue Spaces — The spaces between rows of storage are called flue spaces. In rack storage, the longitudinal flue spaces are perpendicular to the direction of loading, and transverse flue spaces are parallel to the direction of loading (See Figures 1 and 2 below).

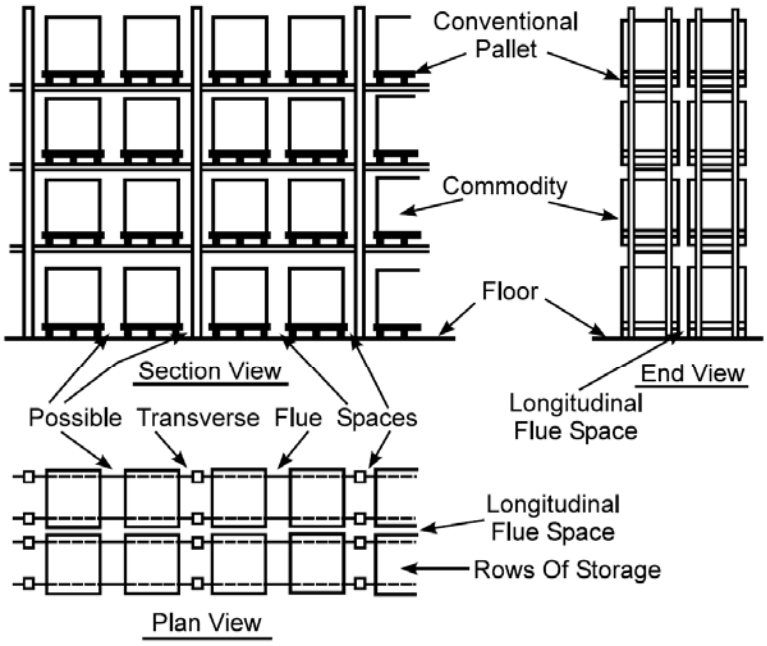
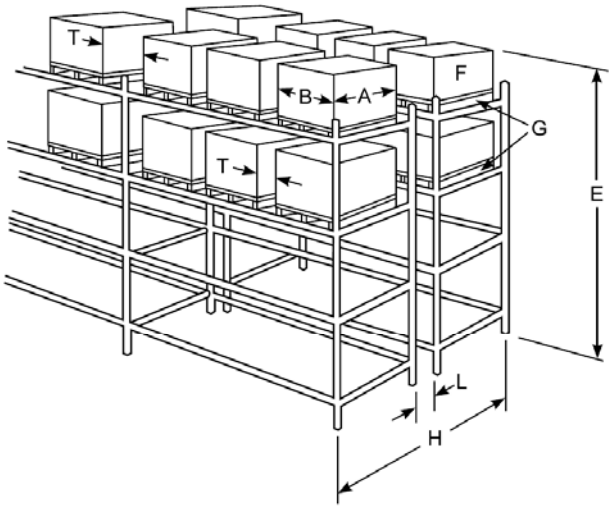


Fig. 1
Typical Double-Row (Back-To-Back) Rack Arrangement



A - Load depth
B - Load width
T - Transverse flue space
L - Longitudinal flue space
E - Storage height
F - Commodity
G - Pallet
H - Rack depth

Fig. 2
Open Frame (No Shelving) Double-Row Rack

Pendent Storage Sprinkler	An automatic sprinkler with a pendent orientation that is acceptable for the protection of storage and other high heat release type fires. Such a sprinkler discharges roughly half of its water directly below the sprinkler as well as in an umbrella shaped pattern away from the sprinkler.
Pre-Wetting	Water discharge from an operating sprinkler that deposits onto unburned combustibles, preventing ignition.
Rack Storage	Storage in racks that use a combination of vertical, horizontal and diagonal members to support stored material. Racks can be either open or solid shelved, and may be fixed in place or portable. The most commonly encountered forms of rack storage are: • Single-row racks have no longitudinal flue spaces • Double-row racks are two single-row racks placed back to back separated by a longitudinal flue space. • Multiple-row racks are racks greater than 12 ft (3.6m) wide. • Portable • Movable
Solid Shelving	Solid shelving is fixed, in-place solid, slatted (fixed or non-fixed), grated (less than 70% open), or other types of shelves located within racks that negatively impact the amount of sprinkler water that can reach the entire vertical length of the rack. Solid shelves in racks promote horizontal fire spread and obstruct sprinkler water penetration down through the racks.
Tier	Each vertical segment of storage within a rack is called a tier.
Upright Storage Sprinkler	An automatic sprinkler with an upright orientation that is acceptable for the protection of storage and other high heat release type fires. Although such a sprinkler discharges some of its water directly below the sprinkler, the large majority of the water is discharged in an umbrella shaped pattern.

2 GENERAL INFORMATION

2.1 Product Information

2.1.1 Rack storage fires are generally more severe than palletized or solid-piled storage fires because of better air flow around the commodity and greater stability of the burning material. While solid shelves may inhibit the vertical growth of the fire, they simultaneously impede the penetration of sprinkler water down through the rack storage arrangement, allowing the fire to spread horizontally. Potentially, in this scenario, many sprinklers may open and the fire protection water supply may become overtaxed to a point where the fire becomes uncontrolled.

2.1.2 Slatted, grated, wire mesh or other type shelves may present the same fire hazard as solid shelves, especially if commodities are stored in the racks are not palletized, creating smooth shelf-like surfaces with essentially no openings.

2.1.3 Open-frame rack storage is void of any solid shelves within the storage array and has adequate flue spaces to allow the fire to vent vertically as well as allow sprinkler water penetration throughout the height of the rack. Open-frame rack storage allows water discharge to reach all vertical surfaces of a commodity that can burn. For rack storage to qualify as open-framed it must have adequate transverse flue spaces throughout the height of the rack at least every 8 ft (2.4 m) horizontally and be void of blocked transverse flue spaces. The racks can be equipped with solid shelves provided they are fixed-in-place, are no larger than 20 ft^2 (2.0 m^2) in area and do not block transverse flue spaces. The racks can also be provided with grated shelves as long as the grating is at least 70% uniformly open, or they can be provided with fixed-in-place solid slats as long as adequate transverse flue spaces are provided between all pallet loads.

2.2 Approval Application Requirements

To apply for an Approval examination the manufacturer, or its authorized representative, should submit a request to:

Materials Director
FM Approvals
1151 Boston-Providence Turnpike
PO Box 9102
Norwood, MA 02062
U.S.A.

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

- A complete list of all models, types, sizes, and options for the products or services being submitted for Approval consideration;
- general assembly drawings, complete set of manufacturing drawings, materials list, anticipated marking format, brochures, sales literature, specification sheets, installation, operation, and any maintenance procedures;
- the number and location 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 Examination

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

- Sample requirements to be determined by FM Approvals following review of the preliminary information.

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 FM Approvals.

3 GENERAL REQUIREMENTS

3.1 Review of Documentation

3.1.1 During the initial investigation and prior to physical testing, the manufacturer's specifications and details shall be reviewed to assess the ease and practicality of installation and use. The Approval investigation shall define the limits of the Approval.

3.2 Markings

3.2.1 Marking on the product or, if not possible due to size, on its packaging or label accompanying the product, shall include:

- Name and address of the manufacturer or marking traceable to the manufacturer;
- Date of manufacture or code traceable to date of manufacture or lot identification;
- Model number, size, rating, capacity, etc. as appropriate.

3.2.2 The model or type identification shall correspond with the manufacturer's catalog designation and shall uniquely identify the product as FM Approved. The manufacturer shall not place this model or type identification on any other product unless covered by a separate agreement.

3.2.3 The Approval Mark (see Appendix B) shall be displayed visibly and permanently on the product and/or packaging as appropriate. The manufacturer shall not use this Mark on any other product unless such product is covered by a separate report.

3.2.4 All markings shall be legible and durable.

3.3 Manufacturer's Installation Instructions

The manufacturer shall supply the user with:

- Instructions for the installation, maintenance, and operation of the product;
- Facilities for repair of the product and supply replacement parts; and
- Services to ensure proper installation, inspection, or maintenance for products of such nature that it would not be reasonable to expect the average user to be able to provide such installation, inspection or maintenance.

3.4 Calibration

All examinations and tests performed in evaluation to this Standard shall use calibrated measuring instruments traceable and certified to acceptable national standards.

4 PERFORMANCE REQUIREMENTS

4.1 Actual Delivered Density (ADD) Testing of Open Shelving for Racks

The requirements of this standard shall be used to measure and describe the performance of open shelving for racks when subjected to *ADD Testing of Open Shelving for Racks*. All open shelving for racks submitted for Approval shall be tested to determine the amount of sprinkler discharge that passes through the openings of the candidate shelving during simulated fire conditions.

4.1.1 All open shelving for racks submitted for Approval shall be made of non-combustible materials.

4.1.1.1 For each open shelving design submitted for examination, the following product information shall be provided:

- product trade name or designation,
- general description,
- limitations under which product is permitted to be used,
- % openings,
- intended usage,
- complete list of all detail drawings, components, raw material suppliers, material specifications, additives if applicable, formulations if applicable, manufacturing procedures, equipment and production requirements, and
- Material Safety Data Sheets, if applicable

4.1.1.2 Production of all samples, and at the sole discretion of FM Approvals, the raw materials used to produce the samples, submitted for testing shall be witnessed by a representative of FM Approvals.

4.1.2 All open shelving for racks submitted for Approval having less than 70% openings shall be evaluated for their ability to allow a sprinkler water flow penetration rate equivalent to rack shelving having 70% (or greater) open area when subjected to the sprinkler water flow discharge at the convective heat release rates as described in the tables below. The tests shall consist of installing test specimen(s) in the shelving support rack of the ADD open shelving test apparatus. Five series of tests (each shelving sample – subjected to each convective heat release rate/sprinkler discharge rate combination shown in the tables below) shall be conducted. Tests shall be conducted in accordance with the FM Approvals *ADD Test for Open Shelving for Racks* test procedure. Sprinkler water discharge collected during each of these 10 minute duration tests shall be compared to a corresponding baseline test conducted with the empty shelving support rack as outlined in the tables below.

TABLE 1 **Minimum ADD Requirements for Candidate Shelving Under an Upright Storage Sprinkler**				
Test Sprinkler, Upright K11.2 (K160)	**Sprinkler Flow, gpm (L/min)**	**HRR, MW (kBtu/min)**	**Deck Configuration**	**Test Results[1] gpm/ft^2 (L/min/m^2)**
Upright Storage Sprinkler	56 (211.0)	2.0 (113.6)	Open Frame – No Shelving Installed	Baseline **Upright Storage Sprinkler-1**
			Candidate Shelving Installed	Upright Storage Sprinkler-1
	79 (299.0)	2.0 (113.6)	Baseline – Open Frame	Baseline **Upright Storage Sprinkler-2**
			Candidate Shelving Installed	Upright Storage Sprinkler-2
	97 (367.2)	2.0 (113.6)	Baseline – Open Frame	Baseline **Upright Storage Sprinkler-3**
			Candidate Shelving Installed	Upright Storage Sprinkler-3
[1]Sum of Weighted Averages of Discharge to 22 Pre-Wetting Water Collection Pans and The 20 Center Core Water Collection Pans of the ADD Apparatus				

TABLE 2 **Minimum ADD Requirements for Candidate Shelving Under a Pendent Storage Sprinkler**				
Test Sprinkler, Pendent K16.8 (K240)	**Sprinkler Flow gpm (L/min)**	**HRR, MW (kBtu/min)**	**Deck Configuration**	**Test Results[2], gpm/ft^2 (L/min/m^2)**
Pendent Storage Sprinkler	100 (378.5)	1.32 (74.9)	Open Frame – No Shelving Installed	Baseline **Pendent Storage Sprinkler-1**
			Candidate Shelving Installed	**Pendent** Storage Sprinkler -1
		2.6 (149.8)	Open Frame – No Shelving Installed	Baseline **Pendent, Storage Sprinkler -2**
			Candidate Shelving Installed	Pendent Storage Sprinkler-2
[2]Average Discharge to 20 Center Core Water Collection Pans of the ADD Apparatus				

4.1.3 Test/Verification

Performance shall be considered satisfactory if all samples meet all of the following conditions:

4.1.3.1 *ADD Testing of Open Shelving for Racks* - Upright Storage Sprinkler

- The sum of the weighted averages of the density of sprinkler waterflow discharged to the 22 pre-wetting water collection pans and the 20 center core water collection pans of the ADD Apparatus shall be greater than, or equal to, 92.5% of the recorded baseline

delivered density (i.e. sum of the weighted averages of sprinkler waterflow discharged to the 22 pre-wetting pans and the 20 center core water collection pans of the ADD Apparatus run with the Shelving Support Rack having no shelving installed in it)*:

*Storage Sprinkler-1 $\geq$ 0.925 x *Baseline $_{\textbf{Upright Storage Sprinkler-1}}$

*Storage Sprinkler-2 $\geq$ 0.925 x *Baseline $_{\textbf{Upright Storage Sprinkler-2}}$

*Storage Sprinkler-3 $\geq$ 0.925 x *Baseline $_{\textbf{Upright Storage Sprinkler-3}}$

***Upright Storage Sprinkler-X** =(Avg. Discharge to 20 Center Core Pans x 20%) + (Avg. Discharge to 20 Pre-Wetting Pans x 80%)*

***Baseline** $_{\textit{Upright}\ \textbf{Storage Sprinkler-X}}$ = (Avg. Discharge to 20 Center Core Pans x 20%) + (Avg. Discharge to 20 Pre-Wetting Pans x 80%)*

4.1.3.2 *ADD Testing of Open Shelving for Racks* - Pendent Storage Sprinkler

- The delivered density of sprinkler waterflow discharged to the 20 pan center core water collection pans of the ADD Apparatus shall be greater than or equal to 95% of the recorded baseline delivered density (i.e. sprinkler waterflow discharged to the 20 center core water collection pans of the ADD Apparatus run with the Shelving Support Rack having no shelving installed in it).

  Pendent Storage Sprinkler-1 $\geq$ 0.95 x Baseline $_{\textbf{Pendent Storage Sprinkler -1}}$

  Pendent Storage Sprinkler -2 $\geq$ 0.95 x Baseline $_{\textbf{Pendent Storage Sprinkler -2}}$

4.1.4 For details of the test equipment, test set-up and conduct of the test, refer to the FM Approvals *ADD Test for Open Shelving for Racks* Test Procedure.

5 OPERATIONS REQUIREMENTS

A quality assurance program is required to assure that subsequent open shelving for racks produced by the manufacturer shall present the same quality and reliability as the specific sample(s) examined. Design quality, conformance to design and performance are the areas of primary concern.

- Design quality is determined during the examination and tests, and is documented in the Approval Report.
- Continued conformance to this Standard is verified by the Facilities and Procedures Audit (F&PA).
- Quality of performance is determined by field performance and by periodic re-examination and testing.

5.1 Demonstrated Quality Control Program

5.1.1 The manufacturer shall demonstrate a quality assurance program which specifies controls for at least the following areas:

- existence of corporate quality control guidelines
- incoming assurance, including testing
- in-process assurance, including testing
- final inspection and tests
- equipment calibration

- drawing and change control
- packaging and shipping
- handling and disposition of discrepant materials

5.1.2 Documentation/Manual

There should be an authoritative collection of procedures/policies. It should provide an accurate description of the quality management system while serving as a permanent reference for implementation and maintenance of that system. The system should require that sufficient records are maintained to demonstrate achievement of the required quality and verify operation of the quality system.

5.1.3 Records

To assure adequate traceability of materials and products, the manufacturer shall maintain a record of all quality assurance tests performed, for a minimum period of two years from the date of manufacture.

5.1.4 Drawing and Change Control

- The manufacturer shall establish a system of product configuration control that shall allow not unauthorized changes to the product. Changes to critical documents, identified in the Approval Report, must be reported to, and authorized by, FM Approvals prior to implementation for production.

- The manufacturer shall assign an appropriate person or group to be responsible for, and require that, proposed changes to FM Approved or Listed products be reported to FM Approvals before implementation. The manufacturer shall notify FM Approvals of changes in the product or of persons responsible for keeping FM Approvals advised by means of FM Approvals' Form 797, Approved Product/Specification-Tested Revision Report or Address/Main Contact Change Report.

- Records of all revisions to all FM Approved products shall be maintained.

5.2 Facilities and Procedures Audit (F&PA)

5.2.1 An audit of the product manufacturing facility shall be part of the Approval investigation to verify implementation of the quality assurance program. Its purpose is to determine that the manufacturer's equipment, procedures, and quality program are maintained to ensure a uniform product consistent with that which was tested and FM Approved.

5.2.2 These audits shall be conducted periodically but at least annually by FM Approvals or its representatives.

5.2.3 FM Approved products or services shall be produced or provided at or from the location(s) audited by FM Approvals and as specified in the Approval Report. Manufacture of products bearing the Approval Mark is not permitted at any other location without prior written authorization by FM Approvals.

5.3 Installation Inspections

Field inspections may be conducted to review an installation. The inspections are conducted to assess the ease of application, and conformance to written specifications. When more than one application technique is used, one or all, may be inspected at the sole discretion of FM Approvals.

5.4 Manufacturer's Responsibilities

The manufacturer shall notify FM Approvals of changes in product construction, material components, raw materials, physical characteristics, coatings, component formulation, or quality assurance procedures prior to implementation.

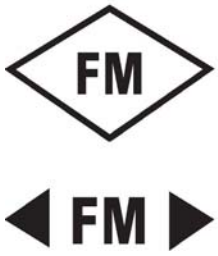
APPENDIX A: UNITS OF MEASUREMENT

Length:	in. –‘‘inches’’ (mm –‘‘millimeters’’) mm = in. × 25.4 ft –‘‘feet’’ (m –‘‘meters’’) m = ft × 0.3048
Mass	lb = “pounds” (kg –‘‘kilograms’’) kg = lb × 0.454
Pressure	psi = “pounds per square inch” (bar –‘‘bar’’) bar = psi × 0.06895 psi = “pounds per square inch” (kPa –‘‘kilospascals’’) kPa = psi × 6.895 bar = “bar” (kPa –‘‘kilospascals’’) kPa = bar × 100
Liquid Volume	gal - “gallons” (L –‘‘litre’’) L = gal × 3.7854
Area	in^2 –‘‘square inches’’ (mm^2 –‘‘square millimeters’’) $mm^2 = in^2 \times 6.4516 \times 100$ ft^2 –‘‘square feet’’ (m^2 –‘‘square meters’’) $m^2 = ft^2 \times 0.0929$
Flow	gal/min – “gallons per minute” (L/m – “liters per minute’’) L/min = gal/min x 3.7854
Temperature:	°F –‘‘degrees Fahrenheit’’ (°C –‘‘degrees Celsius’’) °C = (°F – 32) × 5/9
Heat Release Rate:	Btu/min –‘‘British thermal units’’ (kW - ‘‘kilowatts’’) kW = Btu/min × 0.0176 Btu/min –‘‘British thermal units’’ (MW - ‘‘megawatts’’) MW = Btu/min × 0.0000176 kBtu/min = Btu/min x 1000 MW = kBtu/min x 0.0176
Heat Flux:	Btu/ft^2 hr –‘‘British thermal units per square foot hour (kW/m^2 - ‘‘kilowatts per square meter’’) Btu/ft^2 hr = $kW/m^2 \times 0.0032$
Discharge Coefficient (K-Factor):	$K = Q/P^{1/2}$ 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/m) and P is the pressure in bar. The discharge coefficient, therefore, has units of $gal/min/(psi)^{1/2}$ or $L/min/(bar)^{1/2}$

APPENDIX B: FM APPROVALS CERTIFICATION MARKS

FM Approvals certifications marks are to be used only in conjunction with products or services that have been Approved by FM Approvals and in adherence with usage guidelines.

FM APPROVED mark:
Authorized by FM Approvals as a certification mark for any product that has been FM Approved. There is no minimum size requirement for the mark, but it must be large enough to be readily identifiable. The mark should be produced in black on a light background, or in reverse on a dark background.



Cast-On FM Approvals marks:
Where reproduction of the FM Approved mark described above is impossible because of production restrictions, use these modified versions of the FM Approved mark. There is no minimum size requirement for the mark, but it must be large enough to be readily identifiable.

FM Approved Mark with ‘‘C’’ only:
Authorized by FM Approvals as a certification mark for any product that has been evaluated by FM Approvals in accordance with Canadian codes and standards. There is no minimum size requirement for the mark, but it must be large enough to be readily identifiable. The mark should be produced in black on a light background, or in reverse on a dark background.

FM Approved mark with ‘‘C’’ and ‘‘US’’:
Authorized by FM Approvals as a certification mark for any product that has been evaluated by FM Approvals in accordance with US and Canadian codes and standards. There is no minimum size requirement for the mark, but it must be large enough to be readily identifiable. The mark should be produced in black on a light background, or in reverse on a dark background.

FM Approvals Certification Marks

USAGE GUIDELINES

All FM Approvals certification marks are the sole property of FM Approvals LLC ("FM Approvals") and are registered or the subject of applications for registration in the United States and many other countries. They are for use only according to these guidelines.

FM Approvals certification marks may be used only on FM Approved products and related product packaging, in advertising material, catalogs and news releases. Use of FM Approvals certification marks on such material is not a substitute for use of the complete FM Approvals certification mark on FM Approved products and/or product packaging.

No FM Approvals certification mark or aspect thereof may be incorporated as part of a business name, Internet domain name, or brand name/trademark for products/ product lines. This includes both design aspects (the FM Approvals "diamond," etc.) and word aspects ("FM," "Approved," etc.). The use of any FM Approvals certification mark as a trademark is strictly prohibited.

The Approval Standard number or class number may not be incorporated as part of a business name, Internet domain name, or brand name/trademark for products/ product lines. For example, a company may not say "ABC Company's 4100 Fire Door is FM Approved"; the proper terminology is, "ABC Company's Fire Door is FM Approved per Approval Standard 4100."

FM Approvals certification marks, except for the FM Approvals Quality System Registration mark, may not be used on business stationery/cards/signage because this could mischaracterize the relationship with FM Approvals. Additionally, these items should not reference any FM Approvals certification mark.

Products or services may not be marketed under any mark or name similar to "FM Global," "FM Approvals" or any of the FM Approvals certification marks. Further, products or services may not be marketed to imply a relationship beyond the scope of any Approval made by FM Approvals.

When an FM Approvals certification mark is used in advertising material or on product packaging, all material must reflect the specific circumstances under which the product was FM Approved. The material must clearly differentiate between products that are FM Approved and those that are not, and may not, in any way, imply a more substantial relationship with FM Approvals.

A company may not reference the intent to submit a product for Approval or the expectation that a company will have a certain product FM Approved in the future. For example, a company may not state, "Approval by FM Approvals pending" or "Approval by FM Approvals applied for."

FM Approvals certification marks should not be preceded or followed by a qualifier that indicates a degree of certification or acceptability. For example, "exceeds," "first" or "only" may not be used to qualify any FM Approvals certification mark.

Only original artwork issued by FM Approvals should be used. The FM Approvals certification marks should not be altered in any way other than to resize the artwork proportionately. Unacceptable uses of the marks include, but are not limited to, adding/deleting wording or artwork, reducing the artwork to an illegible size, animation or distortion.

The text of the FM Approvals certification marks may not be translated into any language other than English.

FM Approvals certification marks must appear in a size and location that is readily identifiable, but less prominent than the name of the owner of the certification or the manufacturer/seller/distributor of the certified products.