

# **Approval Standard**

## **for**

### **Class 1**

# **Conveyor Belting**

**Class Number 4998**

August 1995



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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

This standard states FM Approval requirements for Class 1 conveyor belting. The establishment of such a classification is used in determining acceptable fire protection requirements applicable to specific installations.

### 1.2 Scope

- 1.2.1 This standard sets performance requirements for establishing a classification for horizontal, inclined, and vertical conveyor belts made from plastics, fibers, and natural and synthetic rubbers used to transport materials in commercial or industrial applications.
- 1.2.2 This standard examines the ability of conveyor belting to limit fire spread by measuring its resistance of self-sustaining fire propagation. This standard also examines surface buildup of static electricity, friction, and the adverse effects on fire performance caused by ultraviolet (UV) and/or water exposure and mechanical wear.
- 1.2.3 This standard is not intended to determine the suitability for all end-use conditions of this product. Conditions such as strength, elongation, durability, impact resistance, operating temperature range, corrosion resistance, etc., are not evaluated as part of this Approval examination.
- 1.2.4 This standard provides a means for determining the sprinkler protection requirements needed strictly due to the flammability characteristics of the conveyor belting. The effect of conveying combustible materials, enclosure housings constructed of combustible material or the presence of ordinary combustibles near or under the conveyor belt have not been considered. The sprinkler protection requirements when these conditions exist are not included or determined by this standard.

### 1.3 Basis For FM Approval

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

- 1.3.1 Examination and tests on production samples to evaluate:
  - the ability to resist self-sustaining fire propagation;
  - the ability to retain its fire performance properties after accelerated weathering (UV and/or water) exposure and mechanical wear;
  - the ability to develop sufficient conductance to prevent the buildup of static electricity;
  - the temperature on a drum's surface created from friction between a spinning drum and a "locked" belt; and
  - the suitability and reliability of the product, as far as practical.
- 1.3.2 Examination of the manufacturing facilities and audit of quality control to evaluate the manufacturer's ability to produce the product as 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.

## 1.4 Basis For Continued Approval

Continued Approval is based upon:

- production or availability of the product as currently Approved;
- the continued use of acceptable quality control procedures;
- satisfactory field experience;
- compliance with the terms stipulated in the Approval agreement; and
- re-examination of production samples for continued conformity to requirements.

## 1.5 Basis For Requirements

- 1.5.1 The requirements of this standard are based on experience, research, testing and/or the standards of FM Approvals, and other national and international organizations. The advice of manufacturers, users, trade associations and loss control specialists was also considered.
- 1.5.2 Meeting these requirements qualifies a product as Approved Class 1 conveyor belting. Requirements prohibit component substitution or modification without prior authorization by FM Approvals.
- 1.5.3 The requirements of this standard reflect tests and practices used to examine characteristics of conveyor belting for the purpose of obtaining FM Approval. These requirements are intended primarily as guides, and strict conformity is not always mandatory. Conveyor belting 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, conveyor belting which does meet all 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.

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

The effective date of this standard is for full compliance with all requirements is the date of issue.

## 1.7 System Of Units

Units of measurements are U.S. customary units. These are followed by their arithmetic equivalents in International System (SI) units, enclosed in parentheses. Appendix A lists the selected units for quantities dealt with in testing these products; conversions to SI units are included. Conversion of U.S. customary units is in accordance with ASTM E380.

## II GENERAL INFORMATION

### 2.1 Product Information

Conveyor belts, typically manufactured in laminated layers from plastics, fibers, and natural and synthetic rubbers, are used to transport a wide variety of materials. Past experience has shown that they are capable of providing a sufficient combustible loading, in and of themselves, which allows for fire to spread from one area to another, even in cases where the conveyed product and enclosing structure, if provided, are noncombustible.

### 2.2 Requirements

- 2.2.1 In order to qualify as a Class 1 Conveyor Belt, each conveyor belt shall satisfy all of the following performance criteria.
- 2.2.2 The Approval examination includes 1) observation of test sample manufacture, 2) flammability characterization of the conveyor belt 3) electrical conductance test, 4) testing to determine the effects of mechanical wear on flammability characterization, 5) testing to determine the effects of UV and/or water exposure on flammability characterization, 6) drum friction test, and 7) other tests as noted. A complete review of installation specifications and, at the discretion of FM Approvals, inspection of one or more field installations shall be conducted to assure, as far as possible, the practicality and reliability of product installation.
- 2.2.3 When different materials or polymers are used in the construction of the top and bottom surfaces, the above tests may be required for both surfaces to verify that both surfaces meet the requirements of this standards.

### 2.3 Recognition

Conveyor belting meeting the requirements specified in this standard shall receive a listing in the Approval Guide as Class 1 Conveyor Belting. Limitations for use will be designated within parentheses following the Class designation. Any such limitations are based on the ability of the material to maintain its non-fire propagating characteristics after extended exposure to simulated natural and mechanical elements. See Section 3.2 for designations and limitations on their use.

## III APPLICABLE DOCUMENTS AND GLOSSARY

### 3.1 Applicable Documents

The following standards or reports are referenced in this document:

ASTM G53-93, "Standard Practice for Operating Light-and-Water Exposure Apparatus (Fluorescent UV — Condensation Type) for Exposure of Nonmetallic Materials"

ASTM E380-93, "Practice for Use of the International System of Units (SI)"

BSI BS 871:1981(1988), "Specification for Abrasive Papers and Cloths"