INTERNATIONAL STANDARD

ISO 6182-1

Fourth edition
2021-05

Corrected version
2021-08

Fire protection — Automatic sprinkler systems —

Part 1: Requirements and test methods for sprinklers

Protection contre l'incendie — Systèmes d'extinction automatiques du type sprinkler —

Partie 1: Prescriptions et méthodes d'essai des sprinklers

Reference number
ISO 6182-1:2021(E)

COPYRIGHT PROTECTED DOCUMENT

ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Email: copyright@iso.org
Website: www.iso.org

Published in Switzerland

Contents

Page

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 21, *Equipment for fire protection and fire fighting*, Subcommittee SC 5, Fixed firefighting systems using water.

This fourth edition cancels and replaces the third edition (ISO 6182-1:2014) which has been technically revised.

The main changes compared to the previous edition are as follows:

— Consolidation of the requirements for early suppression fast response (ESFR) sprinklers (ISO 6182-7:2020), domestic sprinklers (ISO 6182-10:2014) and extended coverage sprinklers (ISO 6182-13:2017) into a single document.

— Increased harmonization of test methods and requirements for the different types of sprinklers.

— Expanded scope to include extended coverage sprinklers for ordinary hazard occupancies and large flow constant, *K*, storage type sprinklers.

— New water distribution and fire test methods as well as requirements for the additional sprinkler technologies.

— New requirements for electrically operated style sprinklers.

A list of all parts in the ISO 6182 series can be found on the ISO website.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

This corrected version of ISO 6182-1:2021 incorporates the following corrections:

— Correction of error in column 1, second row of Table 11 and column 1, final row of Table 12.

— First column heading in Table 22 and Table 23 changed from "Flow constant, *K*" to "Nominal flow constant, *K*".

— Corrections to key elements [a] and [b] in Figure 27 (addition of the phrase "divided by 2").

— Correction to key element [a] in Figure 28 (addition of the phrase "divided by 2").

— Figure 32 and Figure 42 reduced in size for formatting purposes.

— Two subfigures added to Figure 46 and key corrected.

— Corrections to whole key of Figure D.1.

— The term "K-factor" replaced by "flow constant, *K*," throughout.

Introduction

This document includes requirements for conventional, spray, flat spray, sidewall, extended coverage, domestic and storage sprinklers, including early suppression fast response (ESFR) sprinklers, electrically activated sprinklers (EAS) and sprinklers with monitoring of activation (SMA).

Conventional sprinklers are the oldest of the fire sprinkler technologies. These sprinklers discharge water in a spherical discharge pattern such that 40 % to 60 % of the total water flow is initially discharged in the downward direction. In general, the use of this sprinkler technology is limited to applications where this discharge characteristic has been determined to be more effective than the spray sprinkler.

Spray sprinklers were developed in the 1950s and are used to provide fire protection for a wide range of fire risks, including those found in light hazard, ordinary hazard and extra hazard occupancies, as well as storage facilities.

Flat spray sprinklers have a wider spray angle than spray sprinklers and are generally limited to use in spaces with low clearances and storage racks in specific geographic regions.

Domestic sprinklers are intended to provide control of fires in domestic occupancies, to prevent flashover (total involvement) in the room of fire origin and to improve the probability for successful escape or evacuation of the occupants.

Extended coverage light hazard sprinklers are intended to provide control of fires in occupancies or portions of occupancies where quantity and/or combustibility of contents is low, such as office spaces.

Extended coverage ordinary hazard sprinklers are intended to provide control of fires in occupancies or portions of occupancies where quantity and/or combustibility of contents is moderate to high, such as mercantile areas.

Storage sprinklers, including ESFR sprinklers, are primarily intended to be used to provide fire protection for storage facilities.

Electrically activated sprinklers make it possible to activate more than one sprinkler simultaneously.

Sprinklers with monitoring of activation make it possible to detect the location of an actuated sprinkler.

Fire protection — Automatic sprinkler systems —

Part 1:
Requirements and test methods for sprinklers

1 Scope

This document specifies performance and marking requirements and test methods for conventional, spray, flat spray, sidewall, extended coverage, domestic and storage sprinklers, including early suppression fast response (ESFR), electrically activated sprinklers (EAS) and sprinklers with monitoring of activation (SMA) for use in water-based fire protection systems. This document is not applicable to sprinklers with multiple orifices.

2 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 edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 7-1, *Pipe threads where pressure-tight joints are made on the threads — Part 1: Dimensions, tolerances and designation*

ISO 5660-1, *Reaction-to-fire tests — Heat release, smoke production and mass loss rate — Part 1: Heat release rate (cone calorimeter method) and smoke production rate (dynamic measurement)*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at http://www.electropedia.org/

3.1 General

3.1.1
actual delivered density
ADD
rate at which water is deposited from an operating *sprinkler* (3.1.13) onto the top horizontal surface of a simulated burning combustible array

3.1.2
assembly load
force exerted on the sprinkler body excluding hydrostatic pressure

3.1.3
average design strength
glass bulb supplier's specified and assured lowest average axial design strength of any batch of 50 bulbs