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Determination of the resistance to gas explosions of passive fire protection materials —

Part 1: General requirements

Détermination de la résistance aux explosions de gaz des matériaux de protection passive contre l'incendie —

Partie 1: Exigences générales

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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).

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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 92, *Fire safety*, Subcommittee SC 2, *Fire containment*.

A list of all parts in the ISO 23693 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.

Determination of the resistance to gas explosions of passive fire protection materials —

Part 1: General requirements

1 Scope

This document aims to simulate the mechanical loads that could be imparted to passive fire protection (PFP) materials and systems by explosions resulting from releases of flammable gas, pressurised liquefied gas or flashing liquid fuels that may precede a fire. This document can also be applicable to dust explosions. Gas explosions can give rise to pressure and drag forces. Damage to PFP materials in a gas explosion can be caused by the direct effects of pressure and drag loadings and by the deflection of the substrate supporting the PFP material. Other parts of the ISO 23693 series will deal with a range of common types of specimen that could be tested against the mechanical loads generated.

2 Normative references

There are no normative references in this document.

3 Terms and definitions

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

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

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

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

3.1
drag load
load on items resulting from the flow of gas generated by a venting gas explosion

3.2
impulse
area under a pressure-time history curve

3.3
overpressure
difference between actual pressure and ambient pressure

3.4
rise time
time for the pressure in a blast wave to rise to the peak overpressure

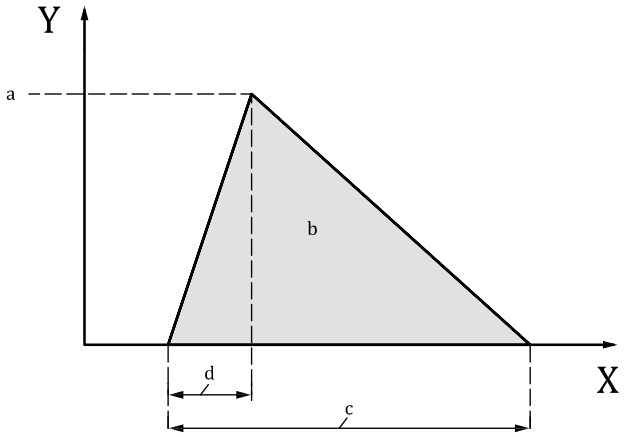
4 Explosion loading

4.1 Overpressure loading

Overpressure loadings shall be characterised as one of two idealised overpressure-time histories that can occur.

4.1.1 Finite rise time

The type of loading that would occur to items close to or inside a gas cloud has a finite rise time. Its characteristics are defined by a peak overpressure, minimum rise time and impulse, as shown in Figure 1.



Key

X time
Y overpressure
a Peak overpressure.
b Impulse.
c Duration.
d Rise time.

Figure 1 — Example of overpressure-time plot for a finite rise time

4.1.2 Instantaneous rise time

Shock loading that can occur in the far field of a gas explosion has an instantaneous rise time. Its characteristics are defined by peak overpressure and impulse, see Figure 2.