
**Determination of the resistance
to hydrocarbon pool fires of fire
protection materials and systems for
pressure vessels**

*Détermination de la résistance aux feux de nappe d'hydrocarbure
des matériaux et systèmes de protection incendie des récipients sous
pression*



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

This second edition cancels and replaces the first edition (ISO 21843:2018), which has been technically revised.

The main changes are as follows:

- the calibration conditions have been modified;
- an alternative method for confirming test conditions has been provided.

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.

Introduction

This document describes a test procedure for assessing the protection afforded by fire protection materials and systems to pressure vessels. It gives an indication of how fire protection materials perform when exposed to a set of specified fire conditions. Actual vessels can vary in construction from that tested and can utilize additional protection systems. The test conditions have been shown to be representative of the severity of unconfined pool fires fuelled by light and medium oil distillates such as liquefied petroleum gas (LPG) and petroleum products.

Determination of the resistance to hydrocarbon pool fires of fire protection materials and systems for pressure vessels

1 Scope

This document specifies a test method for determining the fire resistance of pressure vessels with a fire protection system when subjected to standard fire exposure conditions. It does not address vessels cooled by water deluge or water monitor. The test data thus obtained permits subsequent classification on the basis of the duration for which the performance of the pressure vessel under these conditions satisfies specified criteria. The design of the pressure vessel is not covered in this document.

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

blowdown valve

BDV

blowdown device

valve or device that opens to depressurize a pressure vessel

EXAMPLE Fusible plug.

3.2

burner arrangement

configuration of the equipment designed to engulf the test specimen in fire, with specific reference to the size, orientation, frequency and spacing of burner heads, and the design of fuel supply piping

3.3

burst pressure

calculated burst pressure

<vessel> pressure at which the vessel is expected to fail based on the known vessel and material properties and the peak wall temperatures

Note 1 to entry: The burst pressure depends on how quickly and severely the vessel is heated. One approximate estimate of the burst pressure is that pressure that gives a hoop stress equal to the yield strength of the vessel material at the specific wall temperature of interest.

Note 2 to entry: Other failure criteria can be more appropriate. For long duration tests, high temperature stress rupture analysis is also considered a realistic failure mode.