



SLOVENSKI STANDARD

SIST EN 1363-2:1999

01-december-1999

Preskusi požarne odpornosti – 2. del: Alternativni in dodatni postopki

Fire resistance tests - Part 2: Alternative and additional procedures

Feuerwiderstandsprüfungen - Teil 2: Alternative und ergänzende Verfahren

Essais de résistance au feu - Partie 2: Modes opératoires de substitution ou additionnels

Ta slovenski standard je istoveten z: **EN 1363-2:1999**

[SIST EN 1363-2:1999](https://standards.iteh.ai/catalog/standards/sist/ae652500-6554-4562-a3c2-9f939cb3c933/sist-en-1363-2-1999)

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ICS:

13.220.50	Požarna odpornost gradbenih materialov in elementov	Fire-resistance of building materials and elements
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EUROPEAN STANDARD
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EN 1363-2

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English version

Fire resistance tests - Part 2: Alternative and additional procedures

Essais de résistance au feu - Partie 2: Modes opératoires de substitution ou additionnels

Feuerwiderstandsprüfungen - Teil 2: Alternative und ergänzende Verfahren

This European Standard was approved by CEN on 18 February 1999.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the Central Secretariat has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

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Contents

	Page
Foreword	3
Introduction	4
1 Scope	5
2 Normative references	5
3 Definitions	5
4 Hydrocarbon curve	5
5 External fire exposure curve	7
6 Slow heating curve	9
7 Impact test	10
8 Measurement of radiation	12

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[SIST EN 1363-2:1999](https://standards.iteh.ai/catalog/standards/sist/ae652500-6554-4562-a3c2-9f939cb3c933/sist-en-1363-2-1999)

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Foreword

This European Standard has been prepared by Technical Committee CEN/TC 127 "Fire safety in buildings", the secretariat of which is held by BSI.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by February 2000, and conflicting national standards shall be withdrawn at the latest by February 2000.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

This European Standard has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of the Construction Products Directive.

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EN 1363 'Fire resistance tests' consists of the following **(standards.iteh.ai)**

Part 1: General requirements

[SIST EN 1363-2:1999](#)

<https://standards.iteh.ai/catalog/standards/sist/ae652500-6554-4562-a3c2->

Part 2: Alternative and additional procedures [33/sist-en-1363-2-1999](#)

Part 3: Verification of furnace performance (published as an ENV)

Introduction

The general requirements for fire resistance testing are given in EN 1363-1. However, in practice it is possible to identify conditions or scenarios where the standard conditions, given in EN 1363-1, are inappropriate or where additional factors need to be considered. This may be because of the nature of a product, construction or assembly, together with its intended use; or because of a regulatory requirement in a particular member state.

This Part of EN 1363 addresses those additional, supplementary or alternative procedures that may need to be employed.

Three areas are addressed in this document, alternative heating regimes, an impact test and the measurement of radiation from the unexposed face of separating elements.

Caution

The attention of all persons concerned with managing and carrying out alternative and additional procedures in conjunction with the fire resistance test, EN 1363-1 and EN 1363-2 is drawn to the fact that fire testing may be hazardous and that there is a possibility that toxic and/or harmful smoke and gases may be evolved during the test. Mechanical and operational hazards may also arise during the construction of the test elements or structures, their testing and disposal of test residues.

An assessment of all potential hazards and risks to health shall be made and safety precautions shall be identified and provided. Written safety instructions shall be issued. Appropriate training shall be given to relevant personnel. Laboratory personnel shall ensure that they follow written safety instructions at all times.

1 Scope

This part of EN 1363 specifies alternative heating conditions and other procedures that may need to be adopted under special circumstances. This standard shall be read in conjunction with EN 1363-1.

Details of the alternative hydrocarbon, slow heating and external fire exposure heating curves and the additional impact test and measurement of radiation procedures are included within this standard. Within the appropriate clause for each procedure is given an explanation as to why it may be necessary.

Unless one of the alternative heating regimes is specifically required, the standard temperature-time curve given in EN 1363-1 shall be used. Similarly, the impact test and measurement of radiation shall only be undertaken when they are specifically requested.

2 Normative references

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

EN 1363-1	Fire resistance tests Part 1 General requirements
EN 1364-1	Fire resistance tests for non loadbearing elements Part 1 Walls
EN 1365-1	Fire resistance tests for loadbearing elements Part 1 Walls
prEN ISO 13943	Fire safety - Vocabulary (ISO/DIS 13943:1998)

3 Definitions

For the purposes of this Part of EN1363, the definitions given in EN 1363-1 and prEN ISO 13943, together with the following, apply.

3.1 heat flux: The quantity of heat energy per unit area incident on the target of the measuring device. It includes heat transferred by convection as well as that due to radiation.

4 Hydrocarbon curve

4.1 General

EN 1363-1 defines the heating conditions, in terms of a specified temperature-time relationship, for the determination of fire resistance.

It is recognised that, whilst the heating conditions specified are related to those occurring in real fires, it is not the intent to define an 'average' fire for universal application. In some practical cases it is possible to identify scenarios where significant variation from the standard conditions could exist.

One such example is in the petrochemical and offshore oil industries where there is a threat of exposure to very intense fires such as liquid pool fires. Such fires are characterized by higher temperatures and a rapid rate of growth.

Where there is an identified requirement for such a fire exposure, the following hydrocarbon curve shall be used.

4.2 Expression of temperature-time curve

A temperature-time curve to be designated as the hydrocarbon curve shall be defined by the following expression

$$T = 1080 [1 - 0,325 e^{-0,167t} - 0,675 e^{-2,5t}] + 20$$

where t is the time from start of test in minutes;

T is the average required furnace temperature in °C

See figure 1.

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4.3 Tolerances

The percentage deviation (d_e) in the area of the curve of the average temperature recorded by the specified furnace thermocouples versus time from the area of the specified temperature-time curve shall be within

- | | | | |
|----|------------------------|-----|------------------|
| a) | 15% | for | $5 < t \leq 10$ |
| b) | $(15 - 0,5 (t-10))\%$ | for | $10 < t \leq 30$ |
| c) | $(5 - 0,083 (t-30))\%$ | for | $30 < t \leq 60$ |
| d) | 2.5% | for | $t > 60$ |

where

$$d_e = \frac{A - A_s}{A_s} \times 100$$

d_e is the percentage deviation

A is the area under the actual furnace temperature-time curve

A_s is the area under the specified temperature-time curve

t is the time in minutes

All areas shall be computed by the same method, i.e. by the summation of areas at intervals not exceeding one minute and shall be calculated from time zero.

At any time after the first 10 min of test, the temperature recorded by any thermocouple in the furnace shall not differ from the corresponding temperature of the specified temperature-time curve by more than 100 °C.

For test specimens which burn rapidly, a deviation in excess of 100 °C above the specified temperature/time curve may be exceeded for a period not in excess of 10 min provided that such excess deviation is clearly identified as being associated with the sudden ignition of significant quantities of combustible materials increasing the gas temperature in the furnace.

5 External fire exposure curve

5.1 General

EN 1363-1 defines the heating conditions, in terms of a specified temperature-time relationship, for the determination of fire resistance.

In some cases elements may be exposed to conditions which are less severe than when the element or structure is exposed to a compartment fire. Examples of this are walls at the perimeter of a building which may be exposed to an external fire or flames coming out of windows. There is also a need to ensure that the nature of fire protection is such that the re-entry of the fire into the building is prevented. Because of the nature of external fire with the additional possibilities for heat dissipation, a lower level of heat exposure is given.

This exposure condition is only relevant to the assessment of the fire resistance of separating elements. Other evaluation techniques exist for the evaluation of beams and columns and for measuring external fire spread.

Where there is an identified requirement for such a fire exposure, the following external fire exposure curve shall be used.

5.2 Expression of temperature-time curve

A temperature-time curve to be designated as the external fire exposure curve shall be defined by the following expression.

$$T = 660 [1 - 0,687 e^{-0,32 t} - 0,313 e^{-3,8 t}] + 20$$