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BS ISO 30021:2013



BSI Standards Publication

Plastics — Burning behaviour — Intermediate-scale fire- resistance testing of fibre- reinforced polymer composites

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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. 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. 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.

The committee responsible for this document is ISO/TC 61, *Plastics*, Subcommittee SC 4, *Burning behaviour* in collaboration with ISO/TC 92, *Fire safety*, Subcommittee SC 2, *Fire containment*.

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Introduction

Small ships, which are normally made of fibre reinforced plastics (FRP), are required to have fire resistance under international regulations such as *The Torremolinos International Convention for the Safety of Fishing Vessels*, superseded by *The 1993 Torremolinos Protocol*^[4] and other national regulations. Therefore, development of a test method to prove the fire resistance of FRP construction of such ships is required. The construction panel of FRP in such ships would not have a height greater than 2 m.

Structures of railway passenger cars and other mass-transport media are, in many cases, made of FRP and should have fire-resistance performance to prevent fire propagation within the car. A fire-resistance test will be required for such structural members. In such applications, the structural dimensions are, in many cases, smaller than the size of the test specimen specified for the full-scale fire-resistance test in ISO 834-1.

This International Standard specifies a smaller test specimen than that specified in ISO 834-1. It has been developed as a method for determination of the fire resistance of FRP in various intermediate-scale non-loading applications, mainly in transport media, such as barriers and partitions in water crafts and vessels, railway vehicles, aircraft and road vehicles.

This International Standard has been developed by ISO/TC 61/SC 4 in close cooperation with ISO/TC 92/SC 2 and provides specific test procedures for FRP using ISO 834-12 as the basis of the intermediate-scale fire-resistance test.

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1 Scope

This International Standard specifies a method of determining the fire resistance of non-load-bearing separating elements made of fibre reinforced plastics (FRP) when exposed to heating on one face.

It is applicable to FRP products for which the end-use application is smaller than the full-scale fire test specimen specified in ISO 834-1. Fire barriers in transportation applications are a common example, since the end-use dimensions of the barrier products are often smaller than those specified in ISO 834-1.

This test is, in general, applicable to FRP products which have an essentially flat surface and can have stiffening members. This includes sandwich-panel-type structures in which the skins consist of FRP.

CAUTION — The attention of all persons concerned with managing and carrying out this fire-resistance test is drawn to the fact that fire testing is hazardous and there is a possibility of toxic and/or harmful smoke and gases being evolved during the test. Mechanical and operational hazards can also arise during the construction of the test elements or structures, their testing and disposal of test residues.

It is essential that an assessment of all potential hazards and risks to health is made and safety precautions are identified and provided. It is also essential that written safety instructions are issued, that appropriate training is given to relevant personnel and that laboratory personnel ensure that they follow written safety instructions at all times.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 472, *Plastics — Vocabulary*

ISO 834-1, *Fire-resistance tests — Elements of building construction — Part 1: General requirements*

ISO 834-12, *Fire resistance tests — Elements of building construction — Part 12: Specific requirements for separating elements evaluated on less than full scale furnaces*

ISO 13943, *Fire safety — Vocabulary*

EN 1363-2, *Fire resistance tests — Part 2: Alternative and additional procedures*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 472, ISO 834-12 and ISO 13943 apply.

4 Principle

The fire resistance of a vertically or horizontally oriented intermediate-scale specimen is determined by exposing one of its surfaces to the conditions specified in ISO 834-12. Alternatively, time-temperature curves as specified in EN 1363-2 can be used when their use is relevant to the end-use condition of the product to be tested.