

Paints and varnishes - Reactive coatings for fire protection of metallic substrates - Definitions, requirements, characteristics and marking

## EESTI STANDARDI EESSÕNA

## NATIONAL FOREWORD

See Eesti standard EVS-EN 16623:2015 sisaldab Euroopa standardi EN 16623:2015 ingliskeelset teksti.	This Estonian standard EVS-EN 16623:2015 consists of the English text of the European standard EN 16623:2015.
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ICS 13.220.50; 87.040

English Version

## Paints and varnishes - Reactive coatings for fire protection of metallic substrates - Definitions, requirements, characteristics and marking

Peintures et vernis - Revêtements réactifs pour la protection contre l'incendie des subjectiles métalliques - Définitions, classification, caractéristiques et marquage

Beschichtungsstoffe - Reaktive Beschichtungen für den Brandschutz metallischer Substrate - Begriffe, Einteilung, Eigenschaften und Bezeichnung

This European Standard was approved by CEN on 12 December 2014.

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COMITÉ EUROPÉEN DE NORMALISATION  
EUROPÄISCHES KOMITEE FÜR NORMUNG

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## Foreword

This document (EN 16623:2015) has been prepared by Technical Committee CEN/TC 139 "Paints and vanishes", the secretariat of which is held by DIN.

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of an identical text or by endorsement, at the latest by August 2015, and conflicting national standards shall be withdrawn at the latest by August 2015.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

## Introduction

This European Standard applies to reactive coatings intended for the fire protection of steel and other ferrous substrates used as structural elements such as beams and columns, beams supporting composite steel deck floors and concrete filled hollow steel sections. The reactive coating can be applied directly to the substrate or over a priming system. The reactive coating may require a protective top-coat depending on the end service conditions.

Throughout this European Standard, steel and other ferrous substrates are referred to as steel.

Currently, under the requirements of the Construction Products Regulation 2011 (CPR), which superseded the requirements of the Construction Products Directive (CPD), each reactive coating product used to provide fire protection to structural members is required to be subject to a European Technical Assessment (ETA). These are elaborated and issued by a European Technical Assessment Body (TAB) on the basis of guidance given in a European Assessment Document (EAD) produced by the European Organisation for Technical Approvals (EOTA). Previously, under the requirements of the CPD, the relevant equivalent guidance for the issue of ETAs (then termed European Technical Approvals) for reactive coatings was documented in the EOTA Technical Specification ETAG018-2. At the time of ratification of this standard, ETAG018-2 is being edited into an EAD but all existing ETAs issued against ETAG018-2 remain valid until their expiry date. The ETA forms the basis of the voluntary CE marking of the product by the manufacturer based on a 'certificate of conformity' provided by a 'notified certification body' endorsing ongoing compliance of the product with its ETA.

This standard is intended to be supportive to the above mandatory process, reflecting agreed best practice within the industry and for adoption by manufacturers on a voluntary basis. Requirements of this standard do not conflict with requirements of ETAG018-2 or its superseding EAD. They may elaborate on the detail of essential production processes and procedures necessary to provide consistency of reactive products. Approaches are specified to assess the consequences to a products fire protection performance caused by variation or changes in product specification (e.g. changes in raw material) and/or production process (e.g. a process temperature). As such, it provides support to 'notified certification bodies', especially in relation to 'factory production controls' that should be exercised by product manufacturers.

This standard also provides a common basis for non-mandatory product characteristics that a manufacturer may wish to claim for a product, that fall beyond the scope of a product's ETA.

## 1 Scope

This European Standard relates to reactive coating systems intended to provide fire protection to metallic based structural members, including various grades and types of steel. Reactive coating systems may comprise the reactive coating component alone and/or that component used in conjunction with associated primers, topcoats and, if applicable, reinforcement. It covers the characterization of such systems in end use conditions.

**NOTE** Fundamental to proving the suitability of any reactive coating system to provide fire protection to any metallic substrate is its fire resistance performance determined in accordance with CEN fire resistance test methods, which are currently EN 13381-6, EN 13381-8 and prEN 13381-9. Consequently, the scope of application and fire performance of any reactive protection system is limited by the scope of available and applicable published CEN fire test methods.

The European Standard sets out the performance criteria, the verification methods used to examine the various aspects of performance, the assessment criteria used to judge the performance for the intended use and the presumed conditions for the design and execution of the reactive coating system in the works.

It deals with the compatibility of the reactive coating component with various primers and topcoats, and a reactive coating system's durability in a number of different service and end use conditions. Specifically, it provides a process for establishing 'generic' primer compatibility and acceptable topcoats for use with a given reactive component layer without prejudicing the reactive coating systems fire performance.

The European Standard also provides guidelines for the manufacture, storage, application, maintenance and repair of the reactive coating system and the final inspection of its installation in end use.

This European Standard does not specify the required performance level or classification <sup>1)</sup> of a given property to be achieved by a product to demonstrate fitness for purpose in a particular application. This European Standard establishes the route for generic primer approval and the use of specific top-coats with which the reactive coating may carry the CE mark.

This European Standard provides guidelines for the manufacture, storage, application, maintenance and repair of the reactive coating system and final inspection of works.

## 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.

EN 1363-1:2012, *Fire resistance tests — Part 1: General Requirements*

EN 13238, *Reaction to fire tests for building products — Conditioning procedures and general rules for selection of substrates*

EN 13381-6, *Test methods for determining the contribution to the fire resistance of structural members — Part 6: Applied protection to concrete filled hollow steel columns*

EN 13381-8:2013, *Test methods for determining the contribution to the fire resistance of structural members — Part 8: Applied reactive protection to steel members*

prEN 13381-9, *Test methods for determining the contribution to the fire resistance of structural members — Part 9: Contribution of fire resistance to steel beams with web opening*

EN 13501-1, *Fire classification of construction products and building elements — Part 1: Classification using data from reaction to fire tests*

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1) The performance levels or classes required for a given application can be found in regulations.



EN 13501-2:2007+A1:2009, *Fire classification of construction products and building elements — Part 2: Classification using data from fire resistance tests, excluding ventilation services*

EN 13823, *Reaction to fire tests for building products — Building products excluding floorings exposed to the thermal attack by a single burning item*

EN ISO 1182, *Reaction to fire tests for products — Non-combustibility test (ISO 1182)*

EN ISO 1716, *Reaction to fire tests for products — Determination of the gross heat of combustion (calorific value) (ISO 1716)*

EN ISO 4618:2014, *Paints and varnishes — Terms and definitions (ISO 4618:2014)*

EN ISO 11664-4, *Colorimetry — Part 4: CIE 1976 L\*a\*b\* Colour space (ISO 11664-4)*

EN ISO 11925-2, *Reaction to fire tests - Ignitability of products subjected to direct impingement of flame — Part 2: Single-flame source test (ISO 11925-2)*

EN ISO 13788, *Hygrothermal performance of building components and building elements — Internal surface temperature to avoid critical surface humidity and interstitial condensation — Calculation methods (ISO 13788)*

EN ISO 16474-3:2013, *Paints and varnishes — Methods of exposure to laboratory light sources — Part 3: Fluorescent UV lamps (ISO 16474-3:2013)*

EN ISO/IEC 17025, *General requirements for the competence of testing and calibration laboratories (ISO/IEC 17025)*

### 3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN ISO 4618:2014 and the following apply.

#### 3.1

##### **reactive coating**

reactive materials which are specifically formulated to provide a chemical reaction upon heating such that their physical form changes and in so doing provide fire protection by thermal insulative and cooling effects

#### 3.2

##### **reactive coating system**

reactive coating layer together with a specified, blast primer, primer, tie-coat and topcoat if applicable

Note 1 to entry: The reactive coating system can contain reinforcing mesh.

#### 3.3

##### **test specimen**

substrate, plus the reactive coating system under test

#### 3.4

##### **reactive coating thickness**

mean dry film thickness (DFT) of the reactive coating only

#### 3.5

##### **section factor**

ratio of the fire exposed outer perimeter area of the steel structural member itself, per unit length, to its cross sectional volume per unit length