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**GUIDELINE FOR EUROPEAN TECHNICAL APPROVAL
OF**

FIRE PROTECTIVE PRODUCTS

Part 1 : G E N E R A L

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FOLLOWING PARTS CONCERNING DIFFERENT PRODUCT FAMILIES AND USE CATEGORIES

Part 2 : Reactive Coatings for Fire protection of Steel elements

Part 3 : Renderings and Rendering kits intended for Fire Resisting Applications

Part 4 : Fire Protective Board, Slab and mat products and Kits

FOREWORD

Background of the ETAG

This Guideline has been drawn up by the EOTA Working Group 11.01/04 *Fire Protective Products*.

The WG consisted of members from nine EU-countries (Austria, Finland, Sweden, France, Germany (Convenor), Spain, Belgium, the Netherlands and the United Kingdom) and three European industrial organisations (CEPMC (Council of European Producers of Materials for Construction), EAPFP (European Association for Passive Fire Protection), and EURIMA (European Insulation Manufacturers Association)).

The Guideline sets out the performance requirements, 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 Fire Protective Products in the works. Since the Fire Protective Products are based on different materials, which necessitate additional specific verification and/or assessment, the Fire Protective Products are divided into 3 families of products and kits, dealt with in sub-parts.

This ETA Guideline Part 1: General shall be used in conjunction with one of the sub-parts for a family of products.

The general assessment approach of the Guideline is based on relevant existing knowledge and testing experience.

Reference documents

Reference documents are referred to within the body of the ETAG and are subject to the specific conditions mentioned therein.

The **list of reference** documents (mentioning the year of issue) for this ETAG is given in ANNEX B. When additional parts for this ETAG are written afterwards, they may comprise modifications to the list of reference documents applicable to that part.

Updating conditions

The edition of a reference document given in this list is that which has been adopted by EOTA for its specific use.

When a new edition becomes available, this supersedes the edition mentioned in the list only when EOTA has verified or re-established (possibly with appropriate links) its compatibility with the Guideline.

EOTA Technical Reports go into detail in some aspects and as such are not part of the ETAG but express the common understanding of existing knowledge and experience of the EOTA-bodies at that moment. When knowledge and experience is developing, especially through approval work, these reports can be amended and supplemented.

EOTA Comprehension Documents permanently take on board all useful information on the general understanding of this ETAG as developed when delivering ETA's in consensus by the EOTA members. Readers and users of this ETAG are advised to check the current status of these documents with an EOTA member.

EOTA may need to make alterations/corrections to the ETAG during its life. These changes will be incorporated into the official version on the EOTA web-site www.eota.be and the actions catalogued and dated in the associated **Progress File**.

Readers and users of this ETAG are advised to check the current status of the content of this document with that on the EOTA web-site. The front cover will indicate if and when amendment has taken place.

Section one : INTRODUCTION

1. PRELIMINARIES

1.1 LEGAL BASIS

Common clause (variable)

This ETAG has been established in compliance with the provisions of the Council Directive 89/106/EEC (CPD) and has been established taking into account the following steps:

the final mandate issued by the EC:	1998-09-11
- the final mandate issued by the EFTA:	1998-09-11
- adoption of the Guideline by the Executive Commission of EOTA	2004-02-27
- opinion of the Standing Committee for Construction	2004-04-02
- endorsement by the EC	2004-09-21

This document is published by the Member States in their official language or languages according to art. 11.3 of the CPD.

No existing ETAG is superseded.

1.2 STATUS OF ETAGs

- (a.) **An ETA is one of the two types of technical specifications** in the sense of the EEC Construction Products Directive (89/106/EEC). This means that Member States shall presume that the approved products are fit for their intended use, i.e. they enable works in which they are employed to satisfy the Essential Requirements during an economically reasonable Working life, provided that:

- the works are properly designed and built;
- the conformity of the products with the ETA has been properly attested.

- (b.) **This ETAG is a basis for ETAs**, i.e. a basis for technical assessment of the fitness for use of a product for an intended use. An ETAG itself is not a technical specification in the sense of the CPD.

This ETAG expresses the common understanding of the approval bodies, acting together within EOTA, as to the provisions of the Construction Products Directive 89/106/EEC and of the Interpretative Documents, in relation to the products and uses concerned, and is written within the framework of a mandate given by the Commission and the EFTA Secretariat, after consulting the Standing Committee for Construction.

- (c.) When accepted by the European Commission after consultation with the Standing Committee on Construction this **ETAG is binding** for the issuing of ETAs for the products for the defined intended uses.

The application and satisfaction of the provisions of an ETAG (examinations, tests and evaluation methods) leads to an ETA and a presumption of fitness of a product for the defined use only through an evaluation and approval process and decision, followed by the corresponding attestation of conformity. This distinguishes an ETAG from a harmonised European standard which is the direct basis for attestation of conformity.

Where appropriate, products which are outside of the precise scope of this ETAG may be considered through the approval procedure without guidelines according to art. 9.2 of the CPD.

The requirements in this ETAG are set out in terms of objectives and of relevant actions to be taken into account. It specifies values and characteristics, the conformity with which gives the presumption that the requirements set out are satisfied, wherever the state of art permits and after having been confirmed as appropriate for the particular product by the ETA.

2. SCOPE

2.1 SCOPE

This ETA Guideline deals with Fire Protective Products.

These products are intended to improve fire performance or to provide fire protection and include intumescent or non-intumescent coatings, sprayed or otherwise applied (e.g. paints, coatings) and other products (passive and reactive), often in the form of a kit, made for the same purpose.

This ETA Guideline does not cover the use of Fire Protective Products in construction works where special extreme fire scenario apply (e.g. traffic tunnels, nuclear plants etc.).

Products used for the protection of services are included.

The ETAG does not cover:

- Cables with applied fire protective coatings
- Products (e.g. impregnations) that improve fire reaction behaviour of other construction products (Flame Retardant Products).

This ETA Guideline is divided into the following sub-parts:

- Part 1: General
- Part 2: Reactive Coatings
- Part 3: Renderings and kits based on Renderings intended to fire resisting applications
- Part 4: Fire Protective Board, Slab and Mat Products and Kits

2.2 USE CATEGORIES, PRODUCT FAMILIES, KITS AND SYSTEMS

2.2.1 Use categories related to climatic conditions

The wide variation in European climatic conditions and in the user stresses imposed on structures depending upon the type of structure and use intensity will make it necessary to restrict the use of fire protective products to defined situations allowing them to achieve the predicted Working life.

In general fire protective products will be influenced with regard to their working lives and durability by different degradation factors which shall be taken into account within the scope of special requirements for the Fire Protective Products, if relevant – see the relevant sub-parts of this ETA Guideline:

- temperature
- freeze/thaw
- humidity (water vapour)
- liquid water
- rain
- UV exposure
- pollution (e.g. for industrial regions: high SO₂, H₂S, NO_x; for coastal regions: high chloride levels)
- biological attack.

These possible degradation factors that affect the true Working life and/or durability of Fire Protective Products shall be defined by use categories given in the EOTA GUIDANCE DOCUMENT 003 – "Assessment of working life of products".

In general the following use categories are defined for the Fire Protective Products whereby – for the outdoor use - the climatic sub-divisions of Europe - given in the EOTA GUIDANCE DOCUMENT 003 - shall be used to provide a basis for assessment.

OUTDOOR USE

- EXPOSED TO RAIN AND UV
- NOT EXPOSED TO RAIN AND UV

INDOOR USE

It depends on the different products (described in the relevant sub-parts of this ETA Guideline) whether further sub-divisions - as referred to in the EOTA GUIDANCE DOCUMENT 003 - of the internal and external use categories are necessary or not. The subparts will deal with detailed methods of durability assessment.

Whether the Fire protective product is assessed for indoor and/or outdoor use or for more than one of the use categories depends on the applicant.

2.2.2 Use category related to the element(s) intended to be protected

Fire Protective Products have been divided into product families related to the element they are intended to protect¹:

- Type 1: Fire Protective Products as a horizontal membrane protection
- Type 2: Fire Protective Products as a vertical membrane protection
- Type 3: Fire Protective Products to protect load-bearing concrete elements
- Type 4: Fire Protective Products to protect load-bearing steel elements
- Type 5: Fire Protective Products to protect load-bearing flat concrete profiled sheet composite elements
- Type 6: Fire Protective Products to protect load-bearing concrete filled hollow steel columns
- Type 7: Fire Protective Products to protect load-bearing timber elements
- Type 8: Fire Protective Products that contribute to the fire resistance of fire separating assemblies with no load bearing requirements
- Type 9: Fire Protective Products that contribute to the fire resistance of technical services assemblies in buildings
- Type 10: Further intended uses, related to fire compartmentation or protection of fire performance, not covered by types 1 to 9

2.3 ASSUMPTIONS

The state of the Art does not enable the development, within a reasonable time, of full and detailed verification methods and corresponding technical criteria/guidance for acceptance for some particular aspects or products. This ETAG contains assumptions taking account of the state of art and makes provisions for appropriate, additional **case by case approaches** when examining ETA-applications, within the general framework of the ETAG and under the CPD consensus procedure between EOTA members.

The guidance remains valid for other cases which do not deviate significantly. The general approach of the ETAG remains valid but the provisions then need to be used case by case in an appropriate way. This use of the ETAG is the responsibility of the ETA-body which receives the special application, and subject to consensus within EOTA. Experience in this respect is collected, after endorsement in EOTA-TB, in the ETAG-Format-Comprehension document.

Components in KITS

With an interchange of a component of a Fire Protective Product, it shall be ensured that the new component does not have a negative influence on the performance level and/or the Working life of that product.

¹ This list could be enlarged if there is the necessity to introduce other kinds of intended uses in future

3. TERMINOLOGY

3.1 COMMON TERMINOLOGY AND ABBREVIATIONS

See annex A

3.2 TERMINOLOGY AND ABBREVIATIONS SPECIFIC TO THIS ETAG

Reactive coating system

A fire protective system normally comprises the primer for the corrosion protection or as bonding agent, the reactive component and the finish coat. The reactive component of these fire protective systems can be an insulation-forming (intumescent) material, an ablative material, or a combination of these products. These reactive materials are placed in one or in several layers.

Rendering (spray applied fire resistant coating)

A spray-applied material for fire protection of structural steelwork, concrete or timber with the major proportion consisting of either:

(i) a gypsum or cement binder mixed with one or more aggregates and/or fibres. The composition is mixed with water to produce a slurry and sprayed wet.

or

(ii) mineral fibre mixed with a binder and/or aggregates. The composition is sprayed dry and mixed with water at the nozzle.

When dry, these products will provide fire resistance to building elements consisting of structural steelwork, concrete or timber as demonstrated by testing to the relevant CEN standards.

Boards/ Panels

Rigid product of rectangular shape and cross section in which the thickness is uniform and substantially smaller than the other dimensions.

Slab

Semi-rigid product of rectangular shape and cross section, in which the thickness is uniform and substantially smaller than the other dimensions.

The definition of *Fire Protective Boards/Panels and Slabs* includes small, square or rectangular products, often referred to, in English, as 'tiles'. A number of such products would normally be attached to a surface edge to edge, in order to provide fire protection.

Mat

Flexible fibrous (insulation) product supplied rolled or flat, which may be faced.

Fire protective boards/panels, mats and slabs

These products consisting essentially of mineral fibres, vermiculite, calcium silicate, cement or gypsum or other suitable materials, intended to be used in constructions for fire compartmentation and/or for protection of fire performance.

Section two :

GUIDANCE FOR THE ASSESSMENT OF THE FITNESS FOR USE

GENERAL NOTES

(a) Application of the ETAG in the approval procedure

This ETAG provides guidance on the assessment of a family of products or kits and their intended uses. It is the manufacturer or producer who defines the product for which he is seeking ETA and how it is to be used in the works, and consequently the scale of the assessment.

It is therefore possible that for some products, which are fairly conventional, only some of the tests and corresponding criteria are sufficient to establish fitness for use. In other cases, e. g. special or innovative products or materials, or where there is a range of uses, the whole package of tests and assessment may be applicable.

(b) General lay out of this section

The assessment of the fitness of products with regard to their fitness for intended use in construction works is a process with three main steps:

- Chapter 4: clarifies **the specific requirements for the works** relevant to the products and uses concerned, beginning with the Essential Requirements for works (CPD art. 11.2) and then listing the corresponding relevant characteristics of products.
- Chapter 5: extends the list in chapter 4 into more precise definitions and the **methods available to verify** product characteristics and to indicate how the requirements and the relevant product characteristics are described. This is done by test procedures, methods of calculation and of proof, etc. (selection of the appropriate methods)
- Chapter 6: provides guidance on **the assessing and judging methods** to confirm fitness for the intended use of the products.
- Chapter 7: **assumptions and recommendations** are only relevant as far as they concern the basis upon which the assessment of the product is made concerning their fitness for the intended use.

(c) Levels or classes related to the essential requirements and to the product performance (see ID2 clause 1.2 and EC Guidance Paper E)

According to the CPD "Classes" this ETAG refers only to mandatory levels or classes laid down, in the EC-mandate.

This ETAG indicates however the compulsory way of expressing relevant performance characteristics for the product. If, for some uses at least one Member state has no regulations, a manufacturer always has the right to opt out of one or more of them, in which case the ETA will state "no performance determined" against that aspect, except for those properties for which, when no determination has been made, the product doesn't any longer fall under the scope of the ETAG; such cases shall be indicated in the ETAG.

(d) Working life (durability) and serviceability

The provisions, test and assessment methods in this Guideline or referred to, have been written, based upon the assumed intended working life of the product for the intended use of 10 up to 25 years provided that the product is subject to appropriate use and maintenance cfr. Ch. 7.4. Further information is provided in the sub-parts of this ETA Guideline.

These provisions are based upon the current state of art and the available knowledge and experience.

An "assumed intended working life" means that it is expected that, when an assessment following the ETAG-provisions is made, and when this working life has elapsed, the real working life may be, in normal use conditions, considerably longer without major degradation affecting the essential requirements.

The indications given as to the working life of a product cannot be interpreted as a guarantee given by the producer or the approval body. They should only be regarded as a means for the specifiers to choose the appropriate criteria for products in relation to the expected, economically reasonable working life of the works (based upon ID. par. 5.2.2).

(e) Fitness for the intended use

According to the CPD it has to be understood that within the terms of this ETAG, products shall "have such characteristics that the works in which they are to be incorporated, assembled, applied or installed, can, if properly designed and built, satisfy the Essential Requirements" (CPD, art. 2.1).

Hence, the products must be suitable for construction works which, (as a whole and in their separate parts) are fit for their intended use, account being taken of economy, and in this connection satisfy the following Essential Requirements. Such requirements must, subject to normal maintenance, be satisfied for an economically reasonable working life. The requirements generally concern actions which are foreseeable. "(CPD Annex I, preamble).

4. REQUIREMENTS FOR WORKS, AND THEIR RELATIONSHIP TO THE PRODUCTS CHARACTERISTICS

4.0 GENERAL

This chapter sets out the aspects of performance to be examined in order to satisfy the relevant Essential Requirements, by:

- expressing in more detail, within the scope of the ETAG, the relevant Essential Requirements of the CPD in the Interpretative Documents and in the mandate), for works or parts of the works, taking into account the actions to be considered, as well as the expected durability and serviceability of the works.
- applying them to the scope of the ETAG (Fire Protective Products and where appropriate their constituents, components and intended uses), and providing a list of relevant Fire Protective Products characteristics and other applicable properties.

When a product characteristic or other applicable property is specific to one of the Essential Requirements, it is dealt with in the appropriate place. If, however, the characteristic or property is relevant to more than one Essential Requirement, it is addressed under the most important one with cross reference to the other(s). This is especially important where a manufacturer claims "No performance determined" for a characteristic or property under one Essential Requirement and it is critical for the assessing and judging under another Essential Requirement. Similarly, characteristics or properties which have a bearing on durability assessments may be dealt with under ER 1 to ER 6, with reference under 4.7. Where there is a characteristic which only relates to durability, this is dealt with in 4.7

This chapter also takes into account further requirements, if any (e.g. resulting from other EC Directives) and identifies aspects of serviceability including specifying characteristics needed to identify the products. (cfr ETA-format par. II.2).

The relevant Essential Requirements, the relevant paragraphs of the corresponding IDs and the related requirements to product performance are indicated in the following table 4.1:

Table 4.1 Relationship between ID paragraph for the works, ID paragraph for product performance and ETAG paragraph on product performance

ER	Corresponding ID paragraph for works	Corresponding ID paragraph for product performance	Product characteristics from the Mandate	ETAG paragraph on product performance
1	Not relevant to these products			
2	4.2.2 Load bearing capacity of the construction 4.2.3 Limitation of generation and spread of fire and smoke within construction works	4.3.1.1 Products subject to reaction to fire requirements 4.3.1.3 Products subject to resistance to fire requirements	Reaction to fire Resistance to fire	4.2.1 Reaction to fire 4.2.2 Resistance to fire
3	3.3.1.1 Air quality	3.3.1.1.3.2 a) Building materials 3.3.1.1.3.2 d) Construction products (category B): Barriers and sealants	Air and/or water permeability Release of dangerous substances	4.3.1 Air and/or water permeability 4.3.2 Release of dangerous substances
4	3.3.2.2 Performance of the works	3.3.2.3 Essential characteristics of products Mechanical resistance and stability. Products without a structural intended use	Mechanical resistance and stability Resistance to impact/movement Adhesion	4.4.1 Mechanical resistance and stability 4.4.2 Resistance to impact/ movement 4.4.3 Adhesion
5	4.2 Provisions concerning works or parts of them	4.3.2.1 Acoustic properties of building products	Acoustic properties	4.5.1 Airborne sound insulation 4.5.2 Sound absorption 4.5.3 Impact sound insulation
6	4.2 Provisions concerning works or parts of them	4.3 Provisions concerning products 4.3.2.2 Fabric components	Thermal properties	4.6.1 Thermal insulation 4.6.2 Water vapour permeability
Aspects of durability, serviceability, identification				4.7.1 Durability and Serviceability 4.7.2 Identification

4.1 MECHANICAL RESISTANCE AND STABILITY

This Essential Requirement is not relevant to Fire Protective Products.

4.2 SAFETY IN THE CASE OF FIRE

The Essential Requirement laid down in the Council Directive 89/106/EEC is as follows:

The construction works must be designed and built in such a way that in the event of an outbreak of fire:

- *the load bearing capacity of the construction can be assumed for a specific period of time*
- *the generation and spread of fire and smoke within the works are limited*
- *the spread of fire to neighbouring construction works is limited*
- *occupants can leave the works or be rescued by other means*
- *the safety of rescue teams is taken into consideration*

The following aspects of performance are relevant to this Essential Requirement for Fire Protective Products:

4.2.1 Reaction to fire

The reaction to fire performance of the Fire Protective Product and/or components of a kit as appropriate shall be in accordance with laws, regulations and administrative provisions, applicable to the Fire Protective Products and/or component of the kit as appropriate in its intended end use application. This performance shall be expressed in the form of a classification specified in accordance with the relevant EC decision and the appropriate CEN classification standards.

4.2.2 Resistance to fire

The resistance to fire performance of the element of which the Fire Protective Product may form part shall be in accordance with laws, regulations and administrative provisions applicable to its intended end use application. This performance shall be expressed in the form of a classification specified in accordance with the relevant EC decision and the appropriate CEN classification standards.

4.3 HYGIENE, HEALTH AND ENVIRONMENT

The Essential Requirement laid down in the Council Directive 89/106/EEC is as follows:

The construction work must be designed and built in such a way that it will not be a threat to the hygiene or health of the occupants or neighbours, in particular as a result of any of the following:

- *the giving-off of toxic gas*
- *the presence of dangerous particles or gases in the air*
- *the emission of dangerous radiation*
- *pollution or poisoning of the water or soil*
- *faulty elimination of waste water, smoke, solid or liquid wastes*
- *the presence of damp in parts of the works or on surfaces within the works.*

The following aspects of performance are relevant to this Essential Requirement for Fire Protective Products:

4.3.1 Air and / or water permeability

If relevant, the design of the Fire Protective Product shall be in accordance with laws, regulations and administrative provisions, where the product is incorporated in the works.

4.3.2 Release of dangerous substances

The Fire Protective Product must be such that, when installed according to the appropriate provisions of the Member States, it allows for the satisfaction of the ER3 of the CPD as expressed by the national provisions of the Member States and in particular does not cause harmful emission of toxic gases, dangerous particles or radiation to the indoor environment nor contamination of the outdoor environment (air, soil or water).

4.4 SAFETY IN USE

The Essential Requirement laid down in the COUNCIL DIRECTIVE 89/106/EEC is as follows:

The construction work must be designed and built in such a way that it does not present unacceptable risks of accidents in service or in operation such as slipping, falling, collision, burns, electrocution, injury from explosion.

The characteristics of the Fire Protective Product affecting the level of risk include:

- Geometry
- Existence of sharp or cutting edges
- Nature of surfaces / Surface texture

The following aspects of performance are relevant to this Essential Requirement for Fire Protective Products:

4.4.1 Mechanical resistance and stability

The Fire Protective Product shall have sufficient mechanical resistance to sustain static and/or dynamic loads that can be expected under normal conditions of handling, during installation and its end use conditions (incl. maintenance, if relevant), these loads can be self weight, dimensional variations due to changes in temperatures or humidity conditions or variations thereof, wind and snow loads, etc., but also loads exercised on the product through a supporting or retaining system.

4.4.2 Resistance to impact / movement

The Fire Protective Product in its end use condition shall have sufficient mechanical resistance and stability to withstand accidentally large static or dynamic loads, from the action of persons or objects, without full or partial collapse causing dangerous (sharp or cutting) fragments, giving risk of falling through, particularly at a change of level, or endangering the safety of other people.

4.4.3 Adhesion

For Fire Protective Products adhered to the substrate, movements which are to be expected under normal use shall not lead to loss of adhesion in the system. Adhered Fire Protective Products shall withstand movements due to temperature and stress variations. For structural joints special precautions should be taken (see also Chapter 7).

Regardless of any performance requirements under ER4, the intended use of Fire Protective Products requires that their resistance to adhesion shall be examined in relation to their continuing performance under ER2.

4.5 PROTECTION AGAINST NOISE

The Essential Requirement laid down in the Council Directive 89/106/EEC is as follows:

The construction works must be designed and built in such a way that noise perceived by the occupants or people nearby is kept down to a level that will not threaten their health and will allow them to sleep, rest and work in satisfactory conditions.

4.5.1 Airborne sound insulation

Transmission of airborne sound across Fire Protective Products in their end use condition shall be reduced in accordance with laws, regulations and administrative provisions, applicable for the location where the product is incorporated in the works.

4.5.2 Sound absorption

Sound absorption by Fire Protective Products in their end use condition shall be in accordance with laws, regulations and administrative provisions, applicable for the location where the product is incorporated in the works.

4.5.3 Impact sound insulation

Impact sound insulation by Fire Protective Products in their end use condition shall be in accordance with laws, regulations and administrative provisions, applicable for the location where the product is incorporated in the works.

4.6 ENERGY ECONOMY AND HEAT RETENTION

The Essential Requirement laid down in the Council Directive 89/106/EEC is as follows:

The construction works and its heating, cooling and ventilation installations must be designed and built in such a way that the amount of energy required in use shall be low, having regard to the climatic conditions of the location and of the occupants.

The following aspects of performance are relevant to this Essential Requirement for Fire Protective Products:

4.6.1 Thermal insulation

The thermal transmittance / resistance of the Fire Protective Product shall be used to establish that it is in accordance with laws, regulations and administrative provisions, applicable for the location where the product is incorporated in the works.

If there is any discontinuity in the assembled system, e.g. a supporting frame or a fixing system, then the effect of thermal bridging shall be considered.

4.6.2 Water vapour permeability

The Fire Protective Product shall be designed, constructed and installed in such a way that moisture transfer does not cause excessive water vapour condensation within the works or on its internal surfaces (*this aspect is also relevant for ER3*)

4.7 ASPECTS OF DURABILITY, SERVICEABILITY AND IDENTIFICATION

4.7.1 Durability and serviceability

Durability of the Fire Protective Product needs to be assessed. These requirements are related to the Essential Requirements considered in the following paragraphs, but not to one requirement in particular. Consequently, failure to meet these requirements means that one or more of the Essential Requirements may no longer be met.

Serviceability requirements relate to those properties, which are not covered by any performance characteristics under ER2 to ER 6, but which Fire Protective Products should have so that they are suited for the intended use of the products.

4.7.2 Identification

All constituents of the Fire Protective Product and/or components of the kit shall be fully identified. Where possible, reference shall be made to harmonised European standards or European Technical Specifications. If harmonised European Technical Specifications are not available, they shall be clearly defined by reference to physical and/or chemical characteristics.

Detailed information is specified in the relevant sub-parts of this ETA Guideline.

5. METHODS OF VERIFICATION

5.0 GENERAL

This chapter refers to the verification methods used to determine the various aspects of performance of the products in relation to the requirements for the works (calculations, tests, engineering knowledge, site experience, etc.) as set out in chapter 4.

If relevant, the test procedures in general follow the relevant EN standards for tests on components and materials. If EN standards are not available, special test procedures are described in the sub-parts of this ETA Guideline.

Table 5.1 Relationship between ETAG paragraph on product performance, product characteristics and ETAG paragraph on verification method

ER	ETAG paragraph on product performance	Product characteristics	ETAG paragraph on verification method
1	Not relevant to these Products		
2	4.2.1 Reaction to fire 4.2.2 Resistance to fire	Reaction to fire Resistance to fire	5.2.1 Reaction to fire 5.2.2 Resistance to fire
3	4.3.1 Air and/or water permeability 4.3.2 Release of dangerous substances	Air and/or water permeability Release of dangerous substances	5.3.1 Air and/or water permeability 5.3.2 Release of dangerous substances
4	4.4.1 Mechanical resistance and stability 4.4.2 Resistance to impact/movement	Mechanical resistance and stability (e.g. of fixings) Resistance to impact / movement Adhesion	5.4.1 Mechanical resistance and stability 5.4.2 Resistance to impact/movement 5.4.3 Adhesion
5	4.5.1 Airborne sound insulation 4.5.2 Sound absorption 4.5.3 Impact sound insulation	Acoustic properties	5.5.1 Airborne Sound insulation 5.5.2 Sound absorption 5.5.3 Impact sound insulation
6	4.6.1 Thermal insulation 4.6.2 Water vapour permeability	Thermal properties	5.6.1 Thermal insulation 5.6.2 Water vapour permeability
Aspects of durability, serviceability and identification			5.7.1 Durability and Serviceability 5.7.2 Identification

5.1 MECHANICAL RESISTANCE AND STABILITY

This essential requirement is not relevant to these products

5.2 SAFETY IN CASE OF FIRE

5.2.1 Reaction to fire

Option 1: The Fire Protective Product and/or individual kit components, as appropriate shall be tested, using the test method(s) relevant for the corresponding reaction to fire class, in order to be classified according to EN 13501-1.

Mounting and fixing provisions that are considered to be appropriate for the testing of the fire protective product and that are representative of the fire protective product's intended end use application are specified in the sub -parts of this ETA Guideline, where relevant.

Option 2: The Fire Protective Product and/or individual kit components, as appropriate, is considered to satisfy the requirements for performance class A1 of the characteristics reaction to fire, in accordance with the provisions of EC decision 96/603/EC (as amended) without the need for testing on the basis of its listing in that Decision.

If relevant, further information is given in sub-parts of this ETA Guideline.

5.2.2 Resistance to fire

The assembled system incorporating the Fire Protective Product shall be tested, using the test method relevant for the corresponding fire resistance class, in order to be classified according to the appropriate Part of EN 13501.²

Detailed information is given in the relevant sub-parts of this ETA Guideline.

5.3 HYGIENE, HEALTH AND ENVIRONMENT

5.3.1 Air and water permeability

For some Fire Protective Products it will be relevant to determine air and water permeability.

5.3.1.1 Air permeability

Air permeability of the Fire Protective Product shall be assessed by comparing the ETA-applicant's design solutions with standard construction details and available technical experience.

If the air permeability cannot be assessed by the use of existing knowledge, e.g. because of unfamiliar solutions for the relevant construction details, the approval body shall carry out tests.

5.3.1.2 Water permeability

Water permeability (liquid water penetration) for Fire Protective Products intended to be used externally or internally, shall be assessed by comparing the ETA-applicant's design solutions with standard construction details and available technical experience. If the water permeability cannot be assessed by the use of existing knowledge, e.g. because of unfamiliar solutions for the relevant construction details, the approval body shall carry out tests.

Detailed test methods, if appropriate, are given in the relevant sub-parts of this ETA Guideline.

² Presently EN 13501-3 and –4 are draft standards. They can only be used in accordance with the relevant EC Decisions, once the standards have been published.

5.3.2 Release of dangerous substances

5.3.2.1 Presence of dangerous substances

The applicant shall submit a written declaration stating whether or not the product/kit contains dangerous substances according to European and national regulations, when and where relevant in the Member States of destination, and shall list these substances.

5.3.2.2 Compliance with the applicable regulations

If the product/kit contains dangerous substances as declared above, the ETA will provide the method(s) which has been used for demonstrating compliance with the applicable regulations in the Member States of destination, according to the dated EU data-base (method(s) of content or release, as appropriate).

5.3.2.3 Application of the precautionary principle

An EOTA member has the possibility to provide to the other members, through the Secretary General, warning about substances which, according to health authorities of its country, are considered to be dangerous under sound scientific evidence, but are not yet regulated. Complete references about this evidence will be provided.

This information once agreed upon, will be kept in an EOTA data base, and will be transferred to the Commission Services.

The information contained in this EOTA data base will also be communicated to any ETA applicant.

On the basis of this information, a protocol of assessment of the product, regarding this substance, could be established on request of a manufacturer with the participation of the approval body that raised the issue.

5.4 SAFETY IN USE

5.4.1 Mechanical resistance and stability

For specific Fire Protective Products, mechanical resistance and stability shall be verified in accordance with the test methods as specified in the relevant sub-parts of this ETA Guideline.

5.4.2 Resistance to impact / movement

For specific Fire Protective Products, impact resistance shall be verified in accordance with the test methods as specified in the relevant sub-parts of this ETA Guideline.

5.4.3 Adhesion

For specific Fire Protective Products, adhesion shall be verified in accordance with the test methods as specified in the relevant sub-parts of this ETA Guideline.

5.5 PROTECTION AGAINST NOISE

Where a manufacturer claims acoustic performance the approval body shall determine the required verification method although this may need to be adapted to the particularities of the product under consideration. The following standards are relevant:

5.5.1 Airborne sound insulation

Airborne sound insulation shall be verified in accordance with EN ISO 140-3 or EN 20140-10.

5.5.2 Sound absorption

The sound absorption coefficient of the product shall be verified in accordance with EN ISO 354.

5.5.3 Impact sound insulation

Impact sound insulation shall be verified in accordance with EN ISO 140-6.

5.6 ENERGY ECONOMY AND HEAT RETENTION

5.6.1 Thermal insulation

The thermal conductivity shall be determined based on tabulated values as declared in either:

- European harmonised product standards or European technical approvals;
- or
- tabulated values in conformity with EN 12524

Where the applicant claims specific thermal conductivity values, these should be tested in accordance with either EN 12664, EN 12667 or EN 12939.

Alternatively, the thermal resistance and global thermal transmittance (U-value) may be verified by testing according to EN ISO 8990.

If necessary, the thermal resistance shall be calculated on the basis of EN ISO 6946.

In principle, thermal bridges should be prevented. However, if such bridges do occur, their effect on the overall thermal performance shall be incorporated in the above mentioned thermal resistance calculations, taking into account results of thermal bridges calculation methods as described in prEN ISO 14683, EN ISO 10211-1 and EN ISO 10211-2.

Note: EN 12524 can be used, as far as applicable for the product concerned.

5.6.2 Water vapour permeability

Where relevant, water vapour transmission coefficient shall be determined on the basis of tabulated values as declared in either:

European harmonised product standards or European technical approvals;

or

Tabulated values in conformity with EN 12524.

Where the applicant claims specific water vapour transmission coefficient values, these shall be tested in accordance with EN ISO 12572 or EN 12086 or similar European standards which are based on the same principle.

Note: EN 12524 can be used, as far as applicable for the product concerned.

5.7 ASPECTS OF DURABILITY AND SERVICEABILITY

5.7.1 Durability and serviceability

Fire Protective Products shall be assessed, taking into account the following agents:

- physical agents
- chemical agents
- biological agents

The possible influence of elevated temperatures should be part of the assessment.

The test methods - if relevant with respect to the use categories, described in chapter 2.2 - are described in the relevant sub-parts of this ETA Guideline.

5.7.2 Identification

Depending upon the nature and type of the Fire Protective Product the different identification techniques and procedures have to be considered (either individually or in combination).

Whichever methods are used it is necessary to recognise practical tolerances in relation to results/data collected. Detailed information about the test methods relevant for identification of the Fire Protective Product is given in the relevant sub-parts of this ETA Guideline.

Example techniques and procedures to be considered either individually or in combination (not exhaustive):

- Fingerprinting (e.g. infrared, gas chromatography,)
- Formulation (e.g. chemical constitution, recipes, composition of raw materials, amounts, components specified by characteristics, compliance with other specifications eg. ENs or by weight, volume, percentage)
- Manufacturing process parameters (e.g. temperature, pressure, time; product/production codes)
- Testing of physical characteristics - data (e.g. geometry, density, mechanical strength)
- Calculations, detailing, drawings

6. ASSESSING AND JUDGING THE FITNESS OF PRODUCTS FOR AN INTENDED USE

6.0 GENERAL

This chapter details the performance requirements to be met by Fire Protective Products (chapter 4) in precise and measurable (as far as possible and proportional to the importance of the risk) or qualitative terms, related to the product and its intended use, using the outcome of the verification methods (chapter 5).

In general, the ETA shall either indicate the result of these assessments or state "No performance determined". This statement does not mean that the products perform badly but merely that this specific performance property has not been tested and assessed.

Chapter 9.2 gives additional information about the use of ENV 13381-... with respect to the use of EUROCODES. It is up to the manufacturer whether this information is included in the ETA.

Table 6.1: Relationship between product performance to be assessed and expressions of classification, categorisation and declaration

The following table gives information about the relationship between product performance to be assessed and expressions of classification, categorisation and declaration.

For the various Fire Protective Products see the relevant sub-parts of the ETA Guideline.

ER	ETAG paragraph on product performance to be assessed	Class Use category Numeric value
1	This Essential Requirement is not relevant to these products	
2	6.2.1 Reaction to fire	Euroclass A1-F
	6.2.2 Resistance to fire	Classification according to EC Decision 2000/367/EC, as amended (NPD option not allowed)
3	6.3.1 Air and water permeability	Declared values, levels, etc. as appropriate (NPD option allowed)
	6.3.2 Release of dangerous substances	Indication of harmful materials "No harmful materials" (NPD option allowed)
4	6.4.1 Mechanical resistance and stability	declared values, levels, etc. as appropriate (NPD option allowed)
	6.4.2 Resistance to impact/movement	declared values, levels, etc. as appropriate (NPD option allowed)
	6.4.3 Adhesion	declared values, levels, etc. as appropriate (NPD option allowed)
5	6.5.1 Airborne sound insulation	Single number rating (NPD option allowed)
	6.5.2 Sound absorption	Single number rating (NPD option allowed)
	6.5.3 Impact sound insulation	Single number rating (NPD option allowed)
6	6.6.1 Thermal properties	declared values, levels, etc. as appropriate (NPD option allowed)
	6.6.2 Water vapour permeability	declared values, levels, etc. as appropriate (NPD option allowed)

Aspects of durability, serviceability and identification	6.7.1 Durability and serviceability	Specific requirements and assessments are described in the sub-parts of this ETA Guideline
	6.7.2 Identification	Specific requirements and assessments are described in the sub-parts of this ETA Guideline

6.1 MECHANICAL RESISTANCE AND STABILITY

No requirements/Not relevant

6.2 SAFETY IN CASE OF FIRE

6.2.1 Reaction to fire

The Fire Protective Product/kit and/or components shall be classified according to EN 13501 –1.

6.2.2 Resistance to fire

The assembled system incorporating the Fire Protective Product shall be classified according to the appropriate part of EN 13501.³

6.3 HYGIENE, HEALTH AND ENVIRONMENT

6.3.1 Air and water permeability

The air and water permeability of the Fire Protective Product shall be given in qualitative or quantitative terms depending on the type of assessment.

For some Fire Protective Products the value will be valid for the assembled system, subjected to testing, and this information will be provided in the ETA.

6.3.2 Release of dangerous substances

The Fire Protective Product shall comply with all relevant European and national provisions applicable for the uses for which it is brought to the market.

The attention of the applicant should be drawn to the fact that for other uses or other Member States of destination there may be other requirements which would have to be respected. For dangerous substances contained in the product but not covered by the ETA, the NPD option (no performance determined) is applicable.

6.4 SAFETY IN USE

6.4.1 Mechanical resistance and stability

The criteria and the way of expressing the results of the verification methods as included in chapter 5, will be specified in the relevant sub-parts of this ETA Guideline.

6.4.2 Impact resistance

The criteria and the way of expressing the results of the verification methods as included in chapter 5, will be specified in the relevant sub-parts of this ETA Guideline and shall be declared be –if possible- in accordance with existing standards or other published specifications.

6.4.3 Adhesion

The criteria and the way of expressing the results of the verification methods as included in chapter 5, will be specified in the relevant sub-parts of this ETA Guideline.

6.5 PROTECTION AGAINST NOISE

The following standards for acoustic properties are used to determine single number ratings, dependent on the test standard employed (see clause 5.5)

6.5.1 Airborne sound insulation

The measured airborne sound insulation is expressed as a single number rating, R_w , in accordance with:

EN ISO 717-1.

³ Presently EN 13501-3 and –4 are draft standards. They can only be used in accordance with the relevant EC Decisions, once the standards have been published.

6.5.2 Sound absorption

The measured sound absorption is expressed as a single number rating, α_w in accordance with:
EN ISO 11 654.

6.5.3 Impact sound insulation

The measured impact sound insulation is expressed as a single number rating, L_n, w ,in accordance with:
EN ISO 717-2.

6.6 ENERGY ECONOMY AND HEAT RETENTION

6.6.1 Thermal insulation

On the basis of the verification method used, the corresponding tabulated or measured λ -value (in W/mK), the thermal resistance value, R (in m² K/W), or the thermal transmittance coefficient, U (in W/m²K), calculated in accordance with EN ISO 6946, shall be declared.

6.6.2 Water vapour permeability

The tabulated or measured values of the water vapour transmission coefficient (μ -value) shall be declared.

6.7 ASPECTS OF DURABILITY, SERVICEABILITY AND IDENTIFICATION

6.7.1 Durability and Serviceability

The Approval Body shall assess the possible effects (for example):

- physical
- chemical
- biological

on the performance of the assembled system due to the declared limits.

The ETA shall contain the results, expressed in quantitative or qualitative terms, of the verification methods used to verify the durability and serviceability aspects of the Fire Protective Product, related to one or more essential requirements.

6.7.2 Identification

The Fire Protective Product shall be clearly identified. Where possible, reference to European standards shall be made.

All components shall be specified either by weight or volume percentage, with appropriate tolerances and trade names of raw materials as far as they represent their chemical and physical properties.

The ETA is issued for the Fire Protective Product/kit on the basis of agreed data/information, deposited with the Approval Body which issued the ETA, which identifies the product/kit that has been assessed and judged. Changes to the Fire Protective Product/kit production process, which could result in this deposited data/information being incorrect, should be notified to the Approval Body which issued the ETA before the changes are introduced. The Approval Body which issued the ETA will decide whether or not such changes affect the ETA and consequently the validity of the CE marking on the basis of the ETA and if so whether further assessment/alterations to the ETA, shall be necessary.

7. ASSUMPTIONS AND RECOMMENDATIONS UNDER WHICH THE FITNESS FOR USE OF THE PRODUCTS IS ASSESSED

7.0 GENERAL

This chapter sets out the assumptions and recommendations for design, installation and execution, packaging, transport and storage, use, maintenance and repair under which the assessment of the fitness for use, according to the ETAG, can be made (only when necessary and in so far as they have a bearing on the assessment or on the products).

7.1 DESIGN OF WORKS

The Fire Protective Product shall be assessed on the assumption that the element to which it is attached or the assembly into which it is inserted in the works allows for correct fixing and does not apply excessive stress, in a manner for which the product was not designed. Such stress could arise, for example, due to thermal movement or structural settlement. The sub-parts of this ETAG will give guidance where possible but, ultimately, it is for the user to ensure that the product characteristics set out in the ETA can be realised in particular installations.

7.2 PACKAGING, TRANSPORT AND STORAGE

The approval body shall check that the manufacturer takes suitable precautions to limit the risk of damage or deterioration during transport and storage.

Specific requirements are given in the relevant sub-parts of this ETA Guideline.

7.3 EXECUTION OF THE WORKS

Installation of the Fire Protective Product shall be practicable under normal site conditions and is assumed to be performed by adequately trained installers.

The manufacturer shall provide an installation guide for his product. Attention shall be drawn, in the ETA, to any particular precautions necessary when installing the product, taking account of the degree of training of installers.

Specific aspects for various products are given in the relevant sub-parts of this ETA Guideline.

7.4 MAINTENANCE AND REPAIR

The assessment of the fitness for use is based on the assumption that minor damage, for example that caused by impact, is repaired. It is further assumed that replacement of components in Fire Protective Products/kits during maintenance will be undertaken using materials covered by the ETA.

Specific requirements are given in the relevant sub-parts of this ETA Guideline.

7.5 AUXILIARY COMPONENTS

In many cases it is necessary to include auxiliary components, such as fixings, adhesives etc in an assembled system, for the purpose of testing a particular manufacturer's Fire Protective Product. This is particularly relevant in tests to determine resistance to fire, where most products cannot be tested in isolation.

The results of such tests will only be valid for the product in service, if it is used with auxiliary components having the same performance characteristics. It is therefore crucial that the auxiliary components are clearly specified as such in the ETA.

This can be achieved in two ways; by a specific or generic reference.

A 'specific' reference means a reference to a particular manufacturer's product by name, type number etc, while a 'generic' reference means a reference to a standard or other specification that completely defines that product. It is for the approval body to determine which procedure is to be used in order to ensure that correct auxiliary components can be fully described. It is then the responsibility of the user/installer to ensure that the correct auxiliary components are obtained and used in the Works.

The inclusion, in an ETA, of a reference to auxiliary components, is not to be taken as any guarantee or assurance of the components durability or ongoing consistency of production.

Section three :

ATTESTATION OF CONFORMITY (AC)

8. EVALUATION OF CONFORMITY

8.1 EC DECISION

8.1.1 For fire compartmentation and/or fire protection of fire performance

The system of attestation of conformity specified by the European Commission in mandate Construct 98/311, Annex 3 is system 1 described in Council Directive (89/106/EEC) Annex III.

For the initial type testing of the product (see Annex III.1.a of the CPD) the tasks for the approved body will be limited to the following characteristics, where relevant:

- Resistance to fire
- Mechanical resistance and stability
- Adhesion
- Resistance to impact/movement
- Release of dangerous substances

For the initial inspection of the factory and of the factory production control (see Annex III.1.f) of the CPD), and for the continuous surveillance, judgement and assessment of the factory production control (see Annex III.1 g) of the CPD), parameters related to the following characteristics shall be of interest to the approved body, where relevant:

- Resistance to fire
- Mechanical resistance and stability
- Adhesion
- Resistance to impact/movement

8.1.2 Uses subject to reaction to fire regulations

The systems of attestation of conformity specified by the European Commission in mandate Construct 98/311, Annex 3 (taking into account decision 1999/454/EC of the Commission) is system 1, 3 or 4 described in Council Directive (89/106/EEC) Annex III, depending on the classes declared:

Product	Intended use	Level/s or class/es (reaction to fire)	Attestation of conformity system (s)
Fire Protective Products (including coatings)	For uses subject to reaction to fire regulations	A1*, A2*,B*,C*	1
	 A1**, A2**, B**, C**, D, E	3
	 (A1-E)***, F	4
System 1: See CPD Annex III.2. (i), without audit-testing of samples System 3: See CPD Annex III.2. (ii), second possibility System 4: See CPD Annex III.2. (ii), third possibility * Products/materials for which a clearly identifiable stage in the product process results in an improvement of the reaction to fire classification (e.g. in an addition of fire retardants or a limiting of organic material) ** Products/materials not covered by footnote (*) *** Product/materials that do not require to be tested for reaction to fire (e.g. products/materials of class A1 according to the Commission Decision 96/603/EC, as amended)			

For Fire protective Products under systems 1 and 3, regarding the initial type testing of the product [see Annex III.1.a) of the CPD], the task for the approved laboratory will be limited to the assessment of the Euroclass characteristics for reaction to fire, as indicated in the Commission Decision 94/611/EC.

For Fire Protective Products under system 1, for the initial inspection of the factory and of the factory production control [see Annex III.1.f) of the CPD], and for the continuous surveillance, assessment and approval of the factory production control [see Annex III.1.g) of the Construction Products Directive], parameters related to the Euroclass characteristics for reaction to fire, as indicated in the Commission Decision 94/611/EC shall be of the interest of the approved body.

8.1.3 Clarification of the AoC systems

For Fire Protective Products having more than one of the intended uses specified in the product families, the tasks for the approved body, derived from the relevant systems of attestation of conformity, are cumulative.

The systems are described in Construction Products Directive (89/106/EEC) Annex III, 2(i) without audit testing of samples, 2(ii) Second possibility and 2(ii) Third possibility, respectively, and are detailed as follows:

System 1:

(a) tasks for the manufacturer

- factory production control
- further testing of samples taken at the factory by the manufacturer in accordance with a prescribed test plan

(b) tasks for the approved body

- initial type- testing of the product
- initial inspection of the factory and factory production control
- continuous surveillance, assessment and approval of factory production control

System 3

(a) tasks for the manufacturer

- factory production control

(b) tasks for the approved body

- initial type- testing of the product

System 4

(a) tasks for the manufacturer

- initial type- testing of the product
- factory production control

(b) tasks for the approved body

-none-

8.2 RESPONSIBILITIES

8.2.1 Tasks for the manufacturer

8.2.1.1 Factory production control (all systems of A/C)

8.2.1.1.1 General

The manufacturer shall exercise permanent internal control of production. All the elements, requirements and provisions adopted by the manufacturer shall be documented in a systematic manner in the form of written policies and procedures, incl. records of results performed in accordance with the test plan. This production control system shall ensure that the product is in conformity with the European Technical Approval (ETA).

Manufacturers having a quality management system which complies with EN ISO 9001 and which addresses the requirements of the ETA are recognised as satisfying the FPC requirements of the Directive.

8.2.1.1.2 Personnel and equipment

The personnel involved in the production process shall be identified, sufficiently qualified and trained to operate and maintain the production equipment. Machinery and equipment shall be regularly maintained and this shall be documented. All processes and procedures of production shall be recorded at regular intervals.

8.2.1.1.3 Traceability of processes

The manufacturer shall maintain a traceable documentation of the production process from purchasing or delivery of raw or basic raw materials up to the storage and delivery of finished products.

8.2.1.1.4 Non-conforming products

Products that do not comply with requirements as specified in the ETA shall be separated from the conforming products and marked as such. The manufacturer shall register non-compliant production and action(-s) taken to prevent further non-conformities. External complaints shall also be documented, as well as actions taken.

8.2.1.1.5 Materials/components in products/kits

The characteristics of materials/components in products/kits which comply with a harmonised European technical specification, having met the corresponding A/C-system shall be considered satisfactory and need, except in justified doubt, no further checking, if the A/C system is appropriate for the product's use as a component of the kit.

If relevant the ETA may include additional characteristics as a part of the attestation of conformity of the materials/components in products/kits provided that it is necessary to achieve fitness of the assembled system for the intended use.

For CE Marked products, the CE Certificate of conformity shall be verified at each delivery. Likewise, if relevant other conformity certificates are available, they shall be checked regularly.

8.2.1.1.6 Control of monitoring and measuring devices

Where necessary, measuring equipment shall be

- calibrated or verified at specific intervals, or prior to use, against measurement standards traceable to international or national measurement standards; where no such standards exists, the basis used for calibration shall be recorded;
- be adjusted or re-adjusted as necessary;
- be identified to enable calibration standard to be determined;

When the equipment is found not to conform to requirements the validity of previous measuring results shall be assessed and recorded. Appropriate action shall be taken on the equipment and any product affected.

8.2.1.2 Testing of samples taken at the factory - Prescribed test plan (A/C System 1)

The tests shall only be carried out on the final product or samples which are representative of the final product.

8.2.1.3 Declaration of conformity (A/C –systems 1,3, and 4)

When all the criteria of the conformity attestation are satisfied the manufacturer shall make a declaration of conformity.

8.2.2 Tasks for the manufacturer or the approved body

8.2.2.1 Initial type testing (A/C system 1,3 and 4)

Approval tests will have been conducted by the approval body or under its responsibility (which may include a proportion conducted by an indicated laboratory or by the manufacturer, witnessed by the approval body) in accordance with section 5 of this ETAG, unless the ETA-holder has opted to make use of the possibility not to declare the product's performance (NPD). The approval body will have assessed the results of these tests in accordance with section 6 of this ETAG, as part of the ETA issuing procedure.

These tests should be used for the purposes of Initial Type- Testing.

System 1:

This work should be validated by the approved body for certificate of conformity purposes.

System 3:

This work should be validated by an approved laboratory for declaration of conformity purposes by the manufacturer.

System 4:

This work should be taken over by the manufacturer for declaration of conformity purposes.

8.2.3 Tasks for the approved body

8.2.3.1 Assessment of the factory production control system - initial inspection and continuous surveillance.

Assessment of the factory production control is the responsibility of the approved body.

An assessment must be carried out of each production unit to demonstrate that the factory production control is in conformity with the ETA and any subsidiary information. This assessment shall be based on an initial inspection of the factory.

Subsequently continuous surveillance of factory production control is necessary to ensure continuing conformity with the ETA.

Special aspects for the surveillance inspections are given in the sub-parts of this ETA Guideline.

8.2.3.2 Certification of conformity

The approved body shall issue a certificate of conformity of the product (System 1).

8.2.4 Components in kits

For Fire Protective Products supplied as kits, the ETA-holder has the following options regarding the specification of components and these options will have been taken into account by the approval body issuing the ETA:

The incorporation of **specific components**; that is, components from a particular supplier that have been accepted by the approval body on the basis of their performance in the application.

The incorporation of **generic components**; that is, components that have been accepted by the Approval Body on the basis of conformity to a relevant standard that fully covers the product in the application.

A kit could include *specific and/or generic* types of specifications for components. Furthermore, it is likely that during the lifetime of an ETA, the holder will wish to change the specifications and/or supplier of some components.

Interchanging of a component and/or supplier is to be reported, by the ETA-holder, to the approval body issuing the ETA, and to the approved body responsible for attestation of conformity. It is the responsibility of the approval body to ensure the adequacy of the components and reference to their specification is to be included in the ETA.

Where a component has been defined in terms of a specific manufacturer's product or where a generic specification does not fully cover the fitness of a component for use in a Fire Protective Product, any change can only be approved by the approval body issuing the ETA, on completion of additional verification as is deemed necessary.

Generally, in such cases, issuing a modified ETA will be necessary, with the consequent amendment of the instructions to the approved body.

Where a component of a Fire Protective Product is specified generically, eg by reference to a standard, and the approval body has confirmed, in the ETA the full adequacy of that specification to prove the fitness for use of the component in the Fire Protective Product, then a change of supplier will be acceptable.

The approved body checks the documentation as deemed necessary by the approval body issuing the ETA. In case of doubt reference shall be made to the approval body.

With an interchange of a component of Fire Protective Product, it shall be ensured that the new component does not have a negative influence on the performance level or the life of that product.

8.3 DOCUMENTATION

The approval body issuing the ETA shall supply the information detailed below. The information given below together with the requirements given in EC Guidance Paper B will:

- generally form the basis on which the factory production control (FPC) and the product is assessed **(System 1)** or
- generally form the basis of factory production control (FPC) **(System 3 and 4)**

This information shall initially be prepared or collected by the approval body and shall be agreed with the manufacturer. The following gives guidance on the type of information required:

(1) The ETA

See section 9 of this Guideline.

The nature of any additional (confidential) information shall be declared in the ETA.

(2) Basic manufacturing process

The basic manufacturing process shall be described in sufficient detail to support the proposed FPC methods.

(3) Product and materials specifications

These may include:

- detailed drawings (including manufacturing tolerances)
- incoming (raw) materials specifications and declarations
- references to European and/or international standards or appropriate specifications
- manufacturers data sheets

Detailed information is given in the sub-parts of this ETA Guideline.

(4) FPC Test plan

The manufacturer and the approval body issuing the ETA shall agree a FPC test plan.

An agreed FPC test plan is necessary as current standards relating to quality management systems (Guidance Paper B, EN ISO 9001, etc), do not ensure that the product specification remains unchanged and they cannot address the technical validity of the type or frequency of checks/tests.

The validity of the type and frequency of checks/tests conducted during production and on the final product shall be considered. This will include the checks conducted during manufacture on properties that cannot be inspected at a later stage and checks on the final product.

The characteristics to be addressed as described in the mandate are resistance/reaction to fire. These will be controlled at least twice per year by analysis/measurements of the relevant characteristics of the Fire Protective Products from the following list:

- composition
- dimensions
- physical properties
- mechanical properties
- construction.

Where materials/components are not manufactured and tested by the supplier in accordance with agreed methods, then where appropriate they must be subject to suitable checks/tests by the manufacturer before acceptance.

Detailed information is given in the sub-parts of this ETA Guideline.

8.4 CE MARKING AND INFORMATION

8.4.1 General

The ETA shall indicate the information to accompany the CE marking and the placement of CE marking and the accompanying information (the kit/components itself/themselves, an attached label, the packaging, or the accompanying commercial documents).

According to the EC Guidance Paper D on CE marking, the required information to accompany the letters "CE" is:

- identification number of the notified body **(System 1)**
- name or identifying mark of the producer
- last two digits of the year in which the marking was affixed
- number of the EC certificate of conformity **(System 1)**
- number of the ETA
- number of the ETAG used
- Relevant performance characteristics*
- Use category

*Notes:

- If the ETA provides all the information regarding the performance characteristics, then reference to the ETA is sufficient.
- If the ETA covers more than one type of a Fire protective product, and the type designation provides all the information regarding the performance characteristics, then reference to the ETA and the relevant type is sufficient.
- Only when the above two options do not provide all the necessary information regarding the mandated performance characteristics (table 4.1), then additional information regarding the performance characteristics needs to accompany the CE Marking.

8.4.2 Example

 XXXX
Any Company Rue du Producteur, 50 Country xx xxxx-CPD-xxxx
ETA N° XX/XXXX ETAG "Fire Protective Products, Part 1: GeneralXXXXXX Fire Protective Product Types 2, 3 and 4 ...

"CE"-symbol

Number of notified body

Name and address of the manufacturer or his representative established in the EEA and of the plant where the product was manufactured

Two last digits of year of affixing CE marking
 Number of EC certificate of conformity (where relevant)

ETA number
 ETAG reference

Relevant performance characteristics and/or designation code

Section four : ETA CONTENT

9. THE ETA CONTENT

9.1 THE ETA CONTENT

9.1.1 Model ETA

The format of the ETA shall be based on the Commission Decision of 1997-07-22, EC Official Journal L236 of 1997-08-27.

In section II.2 “characteristics of products and methods of verification“ the ETA shall include the following note:

“In addition to the specific clauses relating to dangerous substances contained in this European Technical Approval, there may be other requirements applicable to the products falling within its scope (e.g. transposed European legislation and national laws, regulations and administrative provisions). In order to meet the provisions of the EU Construction Products Directive, these requirements need also to be complied with, when and where they apply.”

The ETA is issued for the Fire Protective Product/kit on the basis of agreed data/information, deposited with the Approval Body which issued the ETA, which identifies the product/kit that has been assessed and judged. Changes to the Fire Protective Product/kit production process, which could result in this deposited data/information being incorrect, should be notified to the Approval Body which issued the ETA before the changes are introduced. The Approval Body which issued the ETA will decide whether or not such changes affect the ETA and consequently the validity of the CE marking on the basis of the ETA and if so whether further assessment/alterations to the ETA, shall be necessary.

9.1.2 Checklist for the issuing body

The ETA Format states the content in general.

9.1.2.1 Scope

Scope of the ETA, description of the Fire Protective Product, specification of components and the intended use. Clear distinction shall be made between components that are covered by the ETA and those that have not been assessed (e.g. identified as a part of a tested assembly only). It shall be stated in the ETA for which uses the kit has been assessed (see paragraph 2.2.2 in this ETA Guideline).

The ETA shall include the following note:

"The user of the product must ensure, that the durability assessment that has been made, is relevant to the local conditions of use."

9.1.2.2 Working life

Indication of the assumed Working life

9.1.2.3 Identification of materials

The ETA shall contain information and/or references allowing for, where there is a need eg. attestation of conformity [See Chapter 8 clause 8.2.3.2. certification, evaluation of conformity system 1] market surveillance, complaints or accidents, to determine that the products on the market, or intended to be put on the market are in compliance with the approved product as described in the ETA.

When such information/references are of a confidential nature it/they shall exist on the ETA file managed by the approval body and as necessary on the relevant file of any notified body involved.

This information/references shall also be of assistance in any renewal of the ETA.

The type, scale, range of information will be based on the identification clauses in chapter 5 of this ETAG.

9.1.2.4 Performance

The technical part of the ETA shall contain information on the items as specified in the relevant sub-parts of this ETA Guideline, in the order and with reference to the relevant Essential Requirements.

For each of the listed items, the ETA shall either give the mentioned indication / classification / statement / description or state that the verification / assessment of this item has not been carried out.

9.1.2.5 Drawings

The ETA shall include section drawings of the Fire Protective Product, including all necessary dimensions and tolerances.

The purpose of the drawings is to illustrate the general build-up of the kit; i.e.

- general composition of the assembled product/kit
- detailed drawings of the following details:
 - ...
 - ...

Material specifications may also be shown directly in these drawings of the kit.

If required by the manufacturer some design details may be kept confidential by using neutral parts in the drawings, provided that the approval body does not find this in contradiction to necessary information related to the correct application of the kit and the evaluation of conformity performed by the approved body.

9.1.2.6 Installation

The ETA shall also contain details of the installation which the approval body considers worthy to note, as described in chapter 7 of this Guideline, details of the maximum acceptable deflection in the supporting structure and details of any particular risks identified during the assessment.

These may be requirements related to the substructure, mounting of the elements, joints on site, including fixing to the substructure, anchoring, etc., see also clause 7.3. The latter could include such aspects as the need to avoid contact with other materials.

9.1.2.7 Maintenance and repair

Basic maintenance and repair of the product/kit which is necessary to obtain the minimum estimated working life and performance shall be specified, see also clause 7.4.

9.2 ADDITIONAL INFORMATION

9.2.0 General

It shall be stated in the ETA whether or not any additional (possibly confidential) information shall be supplied to the approved body for the evaluation of conformity purposes.

It is up to the manufacturer whether he will give this data within the ETA.

9.2.1 Additional information with respect to the use of EUROCODES

9.2.1.1 Horizontal membrane (from ENV 13381-1)

The reference time-temperature relationship within the cavity between the horizontal membrane and the supporting floor,

Type and thickness of the supporting floor,

the graph of the mean of all four individual thermocouples located on the steel plates.

or

the graph of the mean of all four individual plate thermometers located adjacent to the steel plates.

9.2.1.2 Vertical membrane (from ENV 13381-2)

The reference time-temperature relationship within the cavity between the vertical membrane and the external membrane,

Type and thickness of external membrane,
the graph of the mean of all four individual thermocouples located on the steel plates
or
the graph of the mean of all four individual plate thermometers located adjacent to the steel plates.

9.2.1.3 Protection of concrete structures (from ENV 13381-3)

For either or both concrete slab and concrete beam:

- the relationship between concrete temperature, time and thickness of fire protection. From this information the depth d_{θ} at which a series of limiting temperatures, θ_{crit} , of 300, 350, 400, 450, 500, 550, 600 and 650 °C is observed, shall be recorded at 30 min intervals.
- the equivalent thickness of concrete, related to thermal insulation criteria, as a function of the fire duration and the thickness of the fire protection system.
- if relevant, time when there is a loss of adhesion.

9.2.1.4 Protection of steel structures (from ENV 13381-4)

For assessment of experimental results with the differential equation method:

- the variation of effective thermal conductivity as a function of temperature, together with the values of c_p and $\rho_{protection}$ used as a basis for the calculation of effective thermal conductivity. Values are either relative to the modification coefficient (variable λ method) or to modified values of λ (constant λ method) used to satisfy the criteria for acceptability.

For assessment of experimental results with the numerical regression analysis method:

- values of any simple linear modification factor(s) used to satisfy the criteria for acceptability.

For assessment of experimental results with the graphical presentation:

- for a given design temperature, the time to reach the design temperature as a function of section factor and for alternative thicknesses of fire protection material.
- for specified periods of fire resistance, the design temperature as a function of section factor and for alternative thicknesses of fire protection material.

A series of tables and graphical presentations relating to fire resistance periods as listed in EN 13501-2⁴ shall be given. Each table or graphical presentation shall show the minimum thicknesses of fire protection material required to ensure that design temperatures of 350°C, 400°C, 450°C, 500°C, 550°C, 600°C, 650°C, 700°C, 750°C and higher if necessary are not exceeded on steel members with section factors (A_m/V values) at intervals of 20m⁻¹.

Limits of direct application of the assessment procedure, especially with regard to the range of section factors, design temperatures, thicknesses, fire resistance periods, three or four sided protection.

9.2.1.5 Protection of composite slabs with profiled steel sheets (from ENV 13381-5)

- The measured time for the characteristic temperature of the profiled steel sheet to rise to 350°C for each thickness of fire protection material tested.
- The values and the plot of equivalent thickness h_{eq} of concrete for each thickness of fire protection material.
- The values and the plot of limiting exposure time for each thickness of the fire protection material.

9.2.1.6 Protection of composite steel columns filled with concrete (from ENV 13381-6)

- The measured time for the characteristic temperature of the steel surface of the concrete filled hollow steel column surface to rise to 350°C up to 650°C or more, for each thickness of fire protection system tested.

⁴ Presently EN 13501-2 is a draft standard. It can only be used in accordance with the relevant EC Decision, once the standard has been published.

9.2.1.7 Protection of timber structures (from ENV 13381-7)

- For small and large scale tests the times $t_{300,\text{unprot}}$ and $t_{300,\text{prot}}$ at which the characteristic temperature reaches 300°C at the surface and throughout the depth of the timber member, for each thickness of fire protection system tested.
- The values of t_{pr} , β^2 , β' and $[\beta^2 / \beta']$ versus time for each thickness of the fire protection system tested.

Annex A

COMMON TERMINOLOGY

(definitions, clarifications, abbreviations)



This common terminology is intended to be introduced as such and to be used consistently in all ETA-guidelines. It is based upon the EC Construction Products Directive 89/106/EEC and the Interpretative documents as published in the Official Journal of the EC on 28.2.1994. It is limited to items and aspects which are relevant for approval work. They are partly definitions, partly clarifications.

1. WORKS AND PRODUCTS

- 1.1 Construction works (and parts of works)** (often simply referred to as "works") (ID 1.3.1)
Everything that is constructed or results from construction operations and is fixed to the ground. (This covers both building and civil engineering works, and both structural and non structural elements).
- 1.2 Construction products** (often simply referred to as "products") (ID 1.3.2)
Products which are produced for incorporation in a permanent manner in the works and placed as such on the market.
(The term includes materials, elements, components and prefabricated systems or installations)
- 1.3 Incorporation** (of products in works) (ID 1.3.2)
Incorporation of a product in a permanent manner in the works means that:
 - its removal reduces the performance capabilities of the works, and
 - that the dismantling or the replacement of the product are operations which involve construction activities.
- 1.4 Intended use** (ID 1.3.4)
Role(s) that the product is intended to play in the fulfilment of the essential requirements.
(*N.B. This definition covers only the intended use as far as relevant for the CPD*)
- 1.5 Execution** (ETAG-format)
Used in this document to cover all types of incorporation techniques such as installation, assembling, incorporation, etc.
- 1.6 System** (EOTA/TB guidance)
Part of the works realised by
 - particular combination of a set of defined products, and
 - particular design methods for the system, and/or
 - particular execution procedures.

2. PERFORMANCES

- 2.1 Fitness for intended use** (of products) (CPD 2.1)
Means that the products have such characteristics that the works in which they are intended to be incorporated, assembled, applied or installed, can, if properly designed and built, satisfy the essential requirements.
(*N.B. This definition covers only the intended fitness for intended use as far as relevant for the CPD*)
- 2.2 Serviceability** (of works)
Ability of the works to fulfil their intended use and in particular the essential requirements relevant for this use.

The products must be suitable for construction works which (as a whole and in their separate parts) are fit for their intended use, subject to normal maintenance, be satisfied for an economically reasonable working life. The requirements generally concern actions which are foreseeable (CPD Annex I, Preamble).

2.3 Essential requirements (for works): requirements applicable to works, which may influence the technical characteristics of a product, and are set out in objectives in the CPD, Annex I (CPD, art. 3.1).

2.4 Performance (of works, parts of works or products) (ID 1.3.7)
The quantitative expression (value, grade, class or level) of the behaviour of the works, parts of works or of the products, for an action to which it is subject or which it generates under the intended service conditions (works or parts of works) or intended use conditions (products).

As far as practicable the characteristics of products, or groups of products, should be described in measurable performance terms in the technical specifications and guidelines for ETA. Methods of calculation, measurement, testing (where possible), evaluation of site experience and verification, together with compliance criteria shall be given either in the relevant technical specifications or in references called up in such specifications.

2.5 Actions (on works or parts of the works) (ID 1.3.6)
Service conditions of the works which may affect the compliance of the works with the essential requirements of the Directive and which are brought about by agents (mechanical, chemical, biological, thermal or electro-mechanical) acting on the works or parts of the works.
Interactions between various products within a work are considered as "actions".

2.6 Classes or levels (for essential requirements and for related product performances) (ID 1.2.1)
A classification of product performance(s) expressed as a range of requirement levels of the works, determined in the ID's or according to the procedure provided for in art. 20.2a of the CPD.

3. ETAG - FORMAT

3.1 Requirements (for works) (ETAG-format 4.)
Expression and application, in more detail and in terms applicable to the scope of the guideline, of the relevant requirements of the CPD (given concrete form in the ID's and further specified in the mandate, for works or parts of the works, taking into account the durability and serviceability of the works.

3.2 Methods of verification (for products) (ETAG-format 5.)
Verification methods used to determine the performance of the products in relation to the requirements for the works (calculations, tests, engineering knowledge, evaluation of site experience, etc.).

These verification methods are related only to the assessment of, and for judging the fitness for use. Verification methods for particular designs of works are called here "project testing", for identification of products are called "identification testing", for surveillance of execution or executed works are called "surveillance testing", and for attestation of conformity are called "AC-testing".

3.3 Specifications (for products) (ETAG-format 6.)
Transposition of the requirements into precise and measurable (as far as possible and proportional to the importance of the risk) or qualitative terms, related to the products and their intended use. *The satisfaction of the specifications is deemed to satisfy the fitness for use of the products concerned.*

Specifications may also be formulated with regard to the verification of particular designs, for identification of products, for surveillance of execution or executed works and for attestation of conformity, when relevant.

4. WORKING LIFE

4.1 Working life (of works or parts of the works) (ID 1.3.5(1))

The period of time during which the performance will be maintained at a level compatible with the fulfilment of the essential requirements.

4.2 Working life (of products)

Period of time during which the performances of the product are maintained - under the corresponding service conditions - at a level compatible with the intended use conditions.

4.3 Economically reasonable working life: (ID 1.3.5(2))

Working life which takes into account all relevant aspects, such as costs of design, construction and use, costs arising from hindrance of use, risks and consequences of failure of the works during its working life and cost of insurance covering these risks, planned partial renewal, costs of inspections, maintenance, care and repair, costs of operation and administration, of disposal and environmental aspects.

4.4 Maintenance (of works) (ID 1.3.3(1))

A set of preventive and other measures which are applied to the works in order to enable the works to fulfil all its functions during its working life. These measures include cleaning, servicing, repainting, repairing, replacing parts of the works where needed, etc.

4.5 Normal maintenance (of works) (ID 1.3.3(2))

Maintenance, normally including inspections, which occurs at a time when the cost of the intervention which has to be made is not disproportionate to the value of the part of the work concerned, consequential costs (e.g. exploitation) being taken into account.

4.6 Durability (of products)

Ability of the product to contribute to the working life of the work by maintaining its performances, under the corresponding service conditions, at a level compatible with the fulfilment of the essential requirements by the works.

5. CONFORMITY

5.1 Attestation of conformity (of products)

Provisions and procedures as laid down in the CPD and fixed according to the directive, aiming to ensure that, with acceptable probability, the specified performance of the product is achieved by the ongoing production.

5.2 Identification (of a product)

Product characteristics and methods for their verification, allowing to compare a given product with the one that is described in the technical specification.

6. APPROVAL AND APPROVED BODIES

6.1 Approval Body

Body notified in accordance with Article 10 of the CPD, by an EU Member State or by an EFTA State (contracting party to the EEA Agreement), to issue European Technical Approvals in (a) specific construction product area(s). All such bodies are required to be members of the European Organisation for Technical Approvals (EOTA), set up in accordance with Annex II.2 of the CPD.

6.2 Approved Body(*)

Body nominated in accordance with Article 18 of the CPD, by an EU Member State or by an EFTA State (contracting party to the EEA Agreement), to perform specific tasks in the framework of the Attestation of Conformity decision for specific construction products (certification, inspection or testing). All such bodies are automatically members of the Group of Notified Bodies.

(*) also known as Notified Body

ABBREVIATIONS

Concerning the Construction Products Directive:

AC:	Attestation of conformity
CEC:	Commission of the European Communities
CEN:	Comité Européen de Normalisation / European Committee for Standardisation
CPD:	Construction Products Directive
EC:	European commission
EFTA:	European Free Trade Association
EN:	European standard
FPC:	Factory production control
ID:	Interpretative documents of the CPD
ISO:	International Standardisation Organisation
SCC:	Standing Committee on Construction of the EC

Concerning approval:

EOTA:	European Organisation for Technical Approvals
ETA:	European technical approval
ETAG:	Guideline for European Technical Approval
TB:	Technical Board (EOTA)
UEAtc:	Union Européenne pour l'Agrément technique dans la construction/ European Union of Agrément

General:

TC:	Technical Committee
WG:	Working Group

ANNEX B

Standards quoted:

EN ISO 140-3:1995	Acoustics; Measurement of sound insulation in buildings and of building elements – Part 3: Laboratory measurement of airborne sound insulation
EN ISO 354:2003	Acoustics; Measurement of sound absorption in a reverberation room
EN 20140-10:1992	Acoustics; Measurement of sound insulation in buildings and of building elements – Part 10: Laboratory measurement of airborne sound insulation of small building elements
EN ISO 717-1:1996	Acoustics - Rating of sound insulation of buildings and of building elements - Part 1: Airborne sound insulation
EN ISO 717-2:1997	Acoustics - Rating of sound insulation of buildings and of building elements - Part 2: Impact sound insulation
EN ISO 140-6:1998	Acoustics – Measurement of sound insulation of buildings and of building elements - Part 6: Laboratory measurements of impact sound insulation in floors
EN ISO 8990: 1996	Thermal insulation - Determination of steady-state thermal transmission properties - Calibrated and guarded hot box
EN ISO 10211-1: 1995	Thermal bridges in building construction - Heat flows and surface temperatures - Part 1: General calculation methods
EN ISO 10211-2: 2001	Thermal bridges in building construction - Calculation of heat flows and surface temperatures - Part 2: Linear thermal bridges
EN ISO 11654:1997	Acoustics: Sound absorbers for use in buildings- Rating of Sound absorption
EN ISO 6946:1996	Building components and building elements – Thermal resistance and thermal transmittance – Calculation method
EN ISO 9001: 2000	Quality management systems - Requirements
EN 12086:1997	Thermal insulating materials for building application - Determination of water vapour transmission properties
EN 12524:2000	Building materials and products – Hygrothermal properties
EN 12664:2001	Building materials – Determination of thermal resistance – dry and moist products with medium and low thermal resistance
EN 12667:2001	Building materials – Determination of thermal resistance – dry and moist products with high and medium thermal resistance
EN 12939:2001	Building materials – Determination of thermal resistance –thick products of high and medium and thermal resistance
EN ISO 12572:2001	Building materials – Determination of water vapour transmission properties
EN 13501-1: 2002	Fire classification of construction products and building elements, part 1: Classification using test data from reaction to fire tests
ENV 13381-2: 2002	Test methods for determining the contribution to the fire resistance of structural members - Part 2: Vertical protective membranes
ENV 13381-3: 2002	Test methods for determining the contribution to the fire resistance of structural members - Part 3: Applied protection to concrete members
ENV 13381-4: 2002	Test methods for determining the contribution to the fire resistance of structural members - Part 4: Applied protection to steel members
ENV 13381-5: 2002	Test methods for determining the contribution to the fire resistance of structural members - Part 5: Applied protection to concrete/profiled sheet steel composite
ENV 13381-6: 2002	Test methods for determining the contribution to the fire resistance of structural members - Part 6: Applied protection to concrete filled hollow steel columns
ENV 13381-7: 2002	Test methods for determining the contribution to the fire resistance of structural members - Part 7: Applied protection to timber members

Draft Standards quoted:

prEN ISO 14683: 1999	Thermal bridges in building construction - Linear thermal transmittance - Simplified methods and default values
prENV 13381-1	Test methods for determining the contribution to fire resistance of structural members- Part 1: Membrane protection- vertical
prEN 13501	Fire classification of construction products and building elements, part 2: Requirements and test methods