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THE EUROPEAN CLASSIFICATION SYSTEM FOR THE REACTION TO FIRE PERFORMANCE OF CONSTRUCTION PRODUCTS

(Revision May 03)

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Preface

Article 20 of the Construction Products Directive (89/106/EEC) states that the Standing Committee may, "at the request of its Chairman or a Member State, examine any question posed by the implementation and the practical application of this Directive".

*In order to ensure as far as possible a common understanding between the Commission and the Member States as well as among the Member States themselves as to how the Directive will operate, the competent services of the Commission, assuming the chair and secretariat of the Standing Committee, may issue a series of **Guidance Papers** dealing with specific matters related to the implementation, practical implementation and application of the Directive.*

These papers are not legal interpretations of the Directive.

They are not judicially binding and they do not modify or amend the Directive in any way. Where procedures are dealt with, this does not in principle exclude other procedures that may equally satisfy the Directive.

They will be primarily of interest and use to those involved in giving effect to the Directive, from a legal, technical and administrative standpoint.

They may be further elaborated, amended or withdrawn by the same procedure leading to their issue.

THE EUROPEAN CLASSIFICATION SYSTEM FOR THE REACTION TO FIRE PERFORMANCE OF CONSTRUCTION PRODUCTS

1. Scope

This Guidance Paper addresses issues relating to the functioning of the European system for the classification of the reaction to fire performance of construction products (Euroclasses), within the context of the implementation of Council Directive 89/106/EEC (OJ L40 11.2.1989) (hereafter referred to as the Construction Products Directive or CPD), as amended by Council Directive 93/68/EC (OJ L220 30.8.1993). Arrangements for the transition from existing national classifications for fire performance to the new European systems are dealt with in Guidance Paper J – Transitional arrangements under the CPD. This can be found at <http://europa.eu.int/comm/enterprise/construction/internal/guidpap/guidpap.htm>.

The Guidance Paper is intended for technical specification writers (CEN/CENELEC and EOTA members), regulators and enforcement authorities within the European Economic Area (EEA) and industry. References to Member States in the document also apply to the EEA/EFTA States.

2. Definitions

<i>Product family</i>	Refers to a set of generic products having a similar intended use (e.g. internal wall finishes, roof coverings).
<i>Product sub-family</i>	Refers to a subset of a product family, grouping together products having a similar nature (e.g. wall panels, flat and profiled roof sheets) or behaviour (e.g. products that melt or shrink under flame attack).
<i>Generic product</i>	Refers to a set of products, grouping together the whole European market (e.g. plasterboard, fibre cement sheets).
<i>Product</i>	Refers to a construction product, as defined by the CPD, from an individual producer (i.e. the item to which the CE marking applies).
<i>Product type</i>	A “type” may cover several versions of a product provided that the differences between the versions do not affect the level of safety and the other requirements concerning the performance of the product (c.f. initial type test). The direct field of application of a fire test will effectively define the type for fire safety purposes (e.g. products of a different colour will normally be of the same type).
<i>Product range</i>	Refers to a set of similar products that a producer places on the market, comprising one or more product types with different performance (e.g. a range of products with varying thickness and/or density).
<i>Intended use</i>	Refers to the role(s) that a product is intended to play in the fulfilment of the essential requirements of the CPD (<i>definition in the IDs</i>). The intended use is thus related to the function of a product in a construction works.
<i>End-use application</i>	Refers to the typical conditions in which a product would be incorporated into a construction works. It thus concerns a real application of a product, in relation to all aspects that influence the behaviour of that product under different fire situations. It covers aspects such as its quantity, its orientation, its position in relation to other adjacent products and its method of fixing.
<i>Field of application of a classification</i>	Refers to the range of end-use applications for which a given classification is considered to be valid.

3. Introduction - current state of play

The Euroclasses system for reaction to fire is described in Commission Decision 2000/147/EC (OJ L50 23.02.2000). This Commission Decision became fully operational with the publication of the Single Burning Item (SBI) test method (EN13823) and the classification standard for reaction to fire (EN13501-1) in February 2002.

The decision covers all construction products, as defined by the CPD, with its Table 2 applying to floorings and Table 1 to all other products.

The EC Fire Regulators Group (FRG) has thus far defined a single reference fire scenario for the Euroclasses system (fire in a room) and a single large-scale reference test to represent this scenario (the Room Corner test – ISO 9705). The initial role of this reference test was to facilitate the development of the classification system described in Table 1 of the Decision.

The classification system foreseen in the Euroclasses decision can be considered to be complete and directly applicable to all products. The only exceptions to this principle are where the classification based on the small-scale tests is not appropriate (Article 1.2 of the decision) or where a review of the treatment of some families of products indicates that an amendment to the decision is necessary (footnote to Table 1 of the decision “*The treatment of some families of products, e.g. linear products (pipes, ducts, cables etc) is still under review and may necessitate an amendment to this decision*”).

4. Further development of the classification system

As mentioned above, it may be necessary to further develop the Euroclasses system to accommodate intended uses that present hazards not sufficiently well covered by the existing system (*e.g. the current reference scenario/ test, and hence the classification system, is not appropriate to the fire hazard*) or to deal with products whose test behaviour presents particular difficulties (*i.e. where the classification on the basis of the small-scale tests referred to in Tables 1 and 2 of the decision is not appropriate*).

a) The definition of additional reference scenarios

A number of reference fire scenarios can be envisaged to represent real fire hazards, of which the “*fire in a (small) room*” is one. Other potential scenarios include “*fire in linear products*”, “*façade fire*” etc. If the reference scenario (fire development in a room) selected as the basis for Table 1 of the Euroclasses decision is not considered to be appropriate for products in certain intended uses, then there may be a deficiency in the current classification system for these products. Any such deficiency would need to be addressed, using the procedure described below and shown diagrammatically in Annex 1. However, as a rule, new reference scenarios should only be considered if the determining factors in relation to the development of fire are significantly different and the regulatory authorities in the Member States cannot satisfactorily adapt their regulations to the currently defined system.

Table 1 : Procedure for defining a new reference scenario

Applies to :	Product families, product sub-families and generic products for particular intended uses ¹ .
At the initiative of :	Member States (e.g. fire regulators), CEN/ CENELEC/ EOTA, European Industry Federations or the Fire Sector Group of notified bodies.
Addressed to :	European Commission, who will then consult the EC Fire Regulators Group and, if a proposal is agreed, the Standing Committee on Construction.
Procedure :	<p>The inappropriateness of an existing reference scenario has to be demonstrated and an alternative proposed. The fire hazard condition and its relevance shall also be indicated, together with a suitable large scale test that can be shown to be representative of the proposed new hazard scenario.</p> <p>If the FRG considers the proposal to be well founded, it will then determine (either itself or on the basis of recommendations) the functional performance criteria upon which a product is to be judged in the new reference test (e.g. no flashover in a room, extent of fire spread from storey to storey via a façade etc) and, if required, any parameters that need to be measured or observed to express these criteria (e.g. time to flashover, heat release, flame spread, smoke production, occurrence of flaming droplets etc).</p> <p>At this point, assuming the proposal receives a positive opinion of the Standing Committee on Construction and is adopted by the Commission in an appropriate form, enough information is available to allow the declaration of the reaction to fire performance of a given product on the basis of the new large scale test and the functional criteria. In theory, the process could therefore terminate here.</p> <p>However, given the expense of large-scale tests, industry (and Member States) may prefer to take the process further. In this case, a suitable small-scale test (or tests) that can be shown to correlate with the new reference test has to be defined. The existing small-scale tests, modified or not, should be the starting point and only if a correlation cannot be established should other tests be investigated.</p> <p>Once the small-scale test (or tests) has been defined, then a new classification system covering the families of products for the given intended use can be established and a revision to the Euroclasses decision proposed.</p> <p>Any new classification system, or declaration of performance on the basis of functional performance criteria, will need to be clearly distinguishable from the currently defined classifications.</p>
Outcome :	Normally, a revision of the Euroclasses decision, with the addition of a new table to cover the hazard condition. A new reference scenario will usually lead to the use of a new subscript to differentiate the classification.

b) Dealing with the inappropriateness of classification based on small-scale tests

For certain products the classification based on (e.g.) the SBI test might not be considered to give a true reflection of the reaction to fire performance (i.e. it does not represent real fire behaviour well enough). Use of the reference test(s) could then be envisaged to give a truer reflection of reality. Any such problems would be addressed using the procedure described below and shown diagrammatically Annex 1.

¹ It could also be considered that the reference test defined for a given reference fire scenario does not adequately represent all of the associated hazards for all types of products for a given intended use. In this case the same procedure would be followed.

Table 2 : Procedure relating to inappropriate classifications

Applies to :	Product families, product sub-families and generic products.
At the initiative of :	Member States (e.g. fire regulators), CEN/ CENELEC/ EOTA, European Industry Federations or the Fire Sector Group of notified bodies.
Addressed to:	European Commission, who will then consult the EC Fire Regulators Group and, if a proposal is agreed, the Standing Committee on Construction.
Procedure :	<p>The inappropriateness of the current test(s) has to be demonstrated, based on a lack of correlation with the underlying reference test for the products or application under consideration, e.g. due to physical behaviour in the test (e.g. melting, shrinking, de-lamination, deformation etc). It should also be demonstrated that the reference test itself is able to deal adequately with the family of products concerned.</p> <p>If the FRG considers the proposal to be well founded, it can agree that the reaction to fire performance of the products in question shall be determined on the basis of the satisfaction of the functional performance criteria defined for the reference test (e.g. no flashover, limited smoke production, no flaming droplets etc), using any relevant parameters considered necessary (e.g. time to flashover, heat release etc). The resulting declaration of performance for the product will be the same as that for the small-scale tests correlated to this reference test.</p> <p>Alternatively, a new small-scale test, correlated to the existing reference test could be developed, although this procedure would take rather longer to put into place. Adaptation of another existing test is another possibility.</p> <p><i>Note :</i> the problem may be identified as relating to the current description of the test method in question rather than its inappropriateness (e.g. mounting/ fixing rules in the SBI test, the description of the test sample as having a particular form etc). In this case, instructions would be given to CEN/EOTA to modify the test conditions, either within the test EN or through a derogation within a product EN, ETAG or CUAP instead of authorising the use of the reference test.</p>
Outcome :	The Commission will determine on a case by case basis the most appropriate means to implement the proposal, which may necessitate an amendment to the underlying decision.

5. Appeals by producers against a given classification

The classification of the reaction to fire performance of construction products shall be on the basis of the tests described in the current “Euroclasses” decision or any future developments of it as described above. Recourse to, and classification on the basis of, large-scale reference tests is not permitted unless specific provisions have been made according to the above procedures.

Unless a product is genuinely unique, any problems arising in the testing and classification of construction products (e.g. unsatisfactory test completion) will be generic and hence applicable to all manufacturers of products having the same character. To ensure consistent classification and a level playing field, any such problems shall be dealt with according to the procedures described in section 6. For unique products presenting particular difficulties, a process to agree specific testing protocols, possibly involving the Group of Notified Bodies (see below), will need to be developed.

In some Member States, the national Fire Regulations on works foresee the possibility for producers or designers to demonstrate compliance with those regulations in a number of ways, including fire safety engineering techniques and the use of large-scale tests. Such procedures

fall outside the scope of the CE marking and Euro-classification systems, but may continue to operate at the national level in addition to the European system ². However, they must not constitute a means of arbitrary discrimination or a disguised restriction on trade between the Member States (e.g. procedures must be open and transparent and must not specify national fire laboratories as the only route to compliance etc).

Examples of the latter include the use of a large-scale façade test to demonstrate compliance with a Member State's fire regulations (e.g. in the case where requirements on façades are expressed in terms of the existing Euroclasses) and the use of functional regulations that do not refer specifically to classes. It is up to the Member State with such regulations to determine which solutions are acceptable in that country.

6. How should products be classified?

In order that the European system can work in an efficient and transparent manner, it is important that all parties have a common understanding as to the meaning and use of product classifications. Products shall therefore be classified according to the following principles :

The basis and field of application of a given classification shall be readily identifiable in the information accompanying the CE marking, as well as in the classification report. Details given with the CE marking should however be brief, with a reference made to the classification report for further information.

Generic products shall be tested and classified in a consistent manner throughout Europe (e.g. in relation to mounting and fixing the test specimens).

A product shall be tested so that, as far as possible, the classification relates to its performance in end-use application ³. Where the end-use application is known with some certainty (e.g. kits supplied complete with fixings and installation instructions), the product shall be tested accordingly. Where the end-use application is not known, the product shall be tested in standardised conditions (e.g. using standard substrates and representative mounting conditions). Non-standard configurations may be tested at the request of the producer, although the applicability of such a classification is likely to be limited.

As the potential contribution of a product to a fire can vary as a function of end-use application, a single product may have different classes corresponding to the test configuration adopted (e.g. tested on combustible and non-combustible substrates).

In order that the above principles can be respected, it is important that the European standards, ETAGs or CUAPs provide clear instructions to producers and test laboratories. As far as possible, generic standardised solutions should be described in the fire test and classifications standards. If necessary, further specific provisions could be incorporated into product specifications (European standards and European technical approvals), on condition that they do not distort the market in favour of a particular type of product or material.

Product standards, ETAGs or CUAPs could thus contain two levels of instruction with regard to reaction to fire testing :

² This does not, of course, include the continuation of national classification systems after the co-existence period. Nor would the results of such procedures affect the CE marking or Euro-classification of the products themselves.

³ This does not exclude the possibility to request tests for products incorporated within building elements, which are also covered by the decision (as in the 1994 version).

A simple statement such as “The product shall be tested in a configuration representative of its end-use application, respecting the general test conditions laid down in the European test standard. If a producer provides installation instructions, these shall be followed as regards mounting and fixing. The test conditions shall be indicated with the CE marking, where relevant.”

Alternatively, specific rules for the mounting and fixing of products for fire testing can be incorporated into the hENs, ETAGs or CUAPs themselves, on condition that they respect the general test conditions laid down in the European test standard. To ensure this and to maximise the field of application of the tests, CEN TC127 shall be consulted. Cases of disagreement will be dealt with by the Commission, in consultation with the FRG.

The Member States have a responsibility not to create new barriers to trade through the imposition of national test configuration rules (e.g. in relation to the mounting and fixing of products). Thus, their regulations must be adapted to accommodate the solutions proposed in the European standards and European technical approvals.

The issue of the field of application of a particular classification is of great concern to industry, as it has an impact of the amount of testing required for a given product. Rules for both the direct and extended application of classifications will need to evolve on a continuous basis as a result of experience gained with the European test methods. Initially, information collected by the Group of Notified Bodies will enable provisional rules to be developed, leading naturally over time to established rules that can be incorporated into standards and other technical specifications.

7. Role of the Group of Notified Bodies

The Group of Notified Bodies (GNB) has been set up by the Commission to ensure that close co-operation is maintained between the Notified Bodies. The aims and objectives of the GNB are :

to promote mutual confidence and transparency between all approved bodies and the enforcement authorities within the EU;

to achieve a consistent application of the conformity requirements by all approved bodies;

to ensure that full information is available to all interested parties, on the scope and competence of approved bodies and the services provided;

to advise in the development of the technical specifications for products.

The GNB includes an Advisory Group and a number of Sector Groups. The Advisory Group is primarily responsible for policy and procedural matters common to all the Sector Groups and for communication of appropriate advice to the Standing Committee on matters appropriate to implementation of attestation of conformity procedures. The various Sector Groups have been set up to deal with specific types of products. In addition there are two ‘horizontal’ Sector Groups, one dealing with *dangerous substances* and the other with *fire safety*. The horizontal Fire Sector Group (FSG) is charged with ensuring that matters relating to fire safety are dealt with in a consistent manner across the various product Sector Groups.

The FSG thus represents a valuable European resource that can be harnessed to help resolve difficult issues in an efficient manner. Its role is to help implement the European system on the basis of the defined classification procedures as set out in the various Commission Decisions.

The role and responsibilities of the FSG include:

documenting agreed interpretations of fire test methods, where the CEN standard may be ambiguous or incomplete in its specification;

developing ad-hoc testing protocols for products whose behaviour is such that the conventional test procedures produce misleading results;

developing ad-hoc conventions relating to the extended application of test results for both reaction to fire and resistance to fire (i.e. complementary to the work of CEN in this area).

All of these activities are considered important in order to facilitate products to be CE marked effectively and meaningfully for their fire performance and with the broadest scope of end use applications within the context of parts of works. With respect to the latter, the work on extended application is particularly important.

The Commission, in consultation with the Member States, will ensure that the boundaries of the FSG's work are well defined and not in conflict with the advisory status of the GNB. The FSG will maintain close relations with the EC Fire Regulators' Group and present a report to each meeting.

The FSG group works and disseminates information exclusively using CIRCA (an internet based communication tool).

8. Systems of attestation of conformity

In most Commission Decisions laying down the systems of attestation of conformity (AoC) for construction products, aspects related to reaction to fire are treated in a similar manner, as illustrated by the example in Table 3 below. Thus, the system of AoC normally varies according to both the Euro-classification and the susceptibility of the reaction to fire performance to change during production.

Further guidance in relation to the application of the asterisks is given in Annex 2.

Table 3 : Example of an AoC decision for reaction to fire ⁴

Product(s)	Intended use(s)	Level(s) or class(es) (reaction to fire)	Attestation of conformity system(s)
Thermal insulating products (factory-made products and products intended to be formed in-situ)	For uses subject to regulations on reaction to fire	A1*, A2*, B*, C*	1
		----- A1**, A2**, B**, C**, D, E	3
		----- (A1 to E)***, F	4

⁴ Table (2/2) from Commission Decision 99/91/EC, published in OJ L29, 3.2.1999 as amended by 2001/596/EC

<p>System 1: See CPD Annex III.2.(i), without audit-testing of samples</p> <p>System 3: See CPD Annex III.2.(ii), Second possibility</p> <p>System 4: See CPD Annex III.2.(ii), Third possibility</p> <p>* Products/ materials for which a clearly identifiable stage in the production process results in an improvement of the reaction to fire classification (e.g. an addition of fire retardants or a limiting of organic material)</p> <p>** Products/ materials not covered by footnote (*)</p> <p>*** Products/ materials that do not require to be tested for reaction to fire (e.g. Products/ materials of classes A1 according to Commission Decision 96/603/EC, as amended).</p>
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9. Who provides the classification?

- (a) Fire classification is an integral part of the CE marking placed upon the product and, therefore, it is for the Notified Body involved (under systems 1 or 3) to provide the classification. The classification will be part of a classification report, delivered by the Notified Body, based upon one or more test reports and possibly an extended application (EXAP) report. If a product is subject to attestation of conformity system 2 or 4 then it is for the manufacturer to give the classification⁵. However, a manufacturer may seek the advice of a Notified Body in this area. In any case the requirements of the fire classification standards will have to be fulfilled as they are called up in the harmonised product standards.
- (b) Once a product is CE marked with the fire class then no Member State can ask for additional information in relation to the classification other than that available in the supporting reports (classification, test, extended application).
- (c) If a Member State considers that its Notified Bodies are not able to give the classification and requires the involvement of a committee or Ministry to determine the class, then this should form part of the notification requirements for that Notified Body. There are no implications for the product manufacturer. The classification will be part of the classification report and his only contact point will be the Notified Body⁵.
- (d) However, that Member State must accept CE marked products arriving on its territory from another Member State, and will not be able to demand that the test reports are subject to any committee to determine the class, as the class will already be given in the CE marking, and must be respected.
- (e) The situation for products using ETAs for CE marking is slightly different. The ETA document will include the fire classification and where appropriate the EXAP rules for the product. If the approval body completing the ETA is not a Notified Body competent for fire, then they will sub-contract this task to a Notified Body competent for fire testing and classification. Once the ETA is completed a Notified Body may become involved in the evaluation of conformity process. The Notified Body involved has only to ensure the conformity of the product with that described in the ETA.

⁵ for products covered by ETAs see paragraph 9.5

ANNEX 1: Summary of principles underlying the development of the Euroclasses system – for information

The fundamental principles described in this Guidance Paper, and embodied in the existing Euroclasses system for reaction to fire, may be summarised as follows :

- The FRG, on the basis of real or perceived fire hazards, may decide upon appropriate reference fire scenarios. *[The current Euroclasses system for the reaction to fire performance of all products other than floorings is based upon fire development within a room]*
- The perceived hazard condition(s) associated with any reference fire scenario should be defined by the FRG in functional terms. *[The current Euroclasses system for the reaction to fire performance of all products other than floorings uses the time to flashover as the behavioural reference]*
- A large scale (reference) test representative of a particular reference fire scenario shall be agreed by the FRG as the fundamental basis for the evaluation of the fire performance of products in relation to their potential fire behaviour. *[The current Euroclasses system for the reaction to fire performance of all products other than floorings uses the ISO 9705 Room Corner test. The time to flashover (and related parameters) in that test is identified as the underlying basis of the main classification]*
- In the absence of any small scale test with correlated performance against the large scale test, products will be evaluated on the basis of their performance in the large scale test, against the agreed functional performance criteria. *[Not applicable to the current Euroclasses system]*
- If a small scale test(s) with correlated performance against the large scale test is available, the FRG may endorse this and an associated classification system, as being appropriate for regulatory purposes within the EU. If this is the case, all products concerned shall be evaluated using the small scale test(s) and the related classification system. *[The current Euroclasses system for the reaction to fire performance of all products is based on small-scale tests]*
- Subject to certain conditions (as indicated in this paper), where the small scale test and related classification, is considered to be deficient, products may be submitted to the large scale test and their performance level evaluated against the functional criteria defined for that test. Any resulting classification will be expressed in the same manner as for the small-scale tests, unless there is a change in reference scenario. Where relevant, the results of the small scale test shall always be reported in conjunction with the results of the large scale test.

Finally, Table 1 of the current Euroclasses decision is, in principle, applicable to all construction products other than floorings. Deviations from this defined system, either relating to the reference scenario or recourse to the reference test, should only be considered where absolutely necessary.

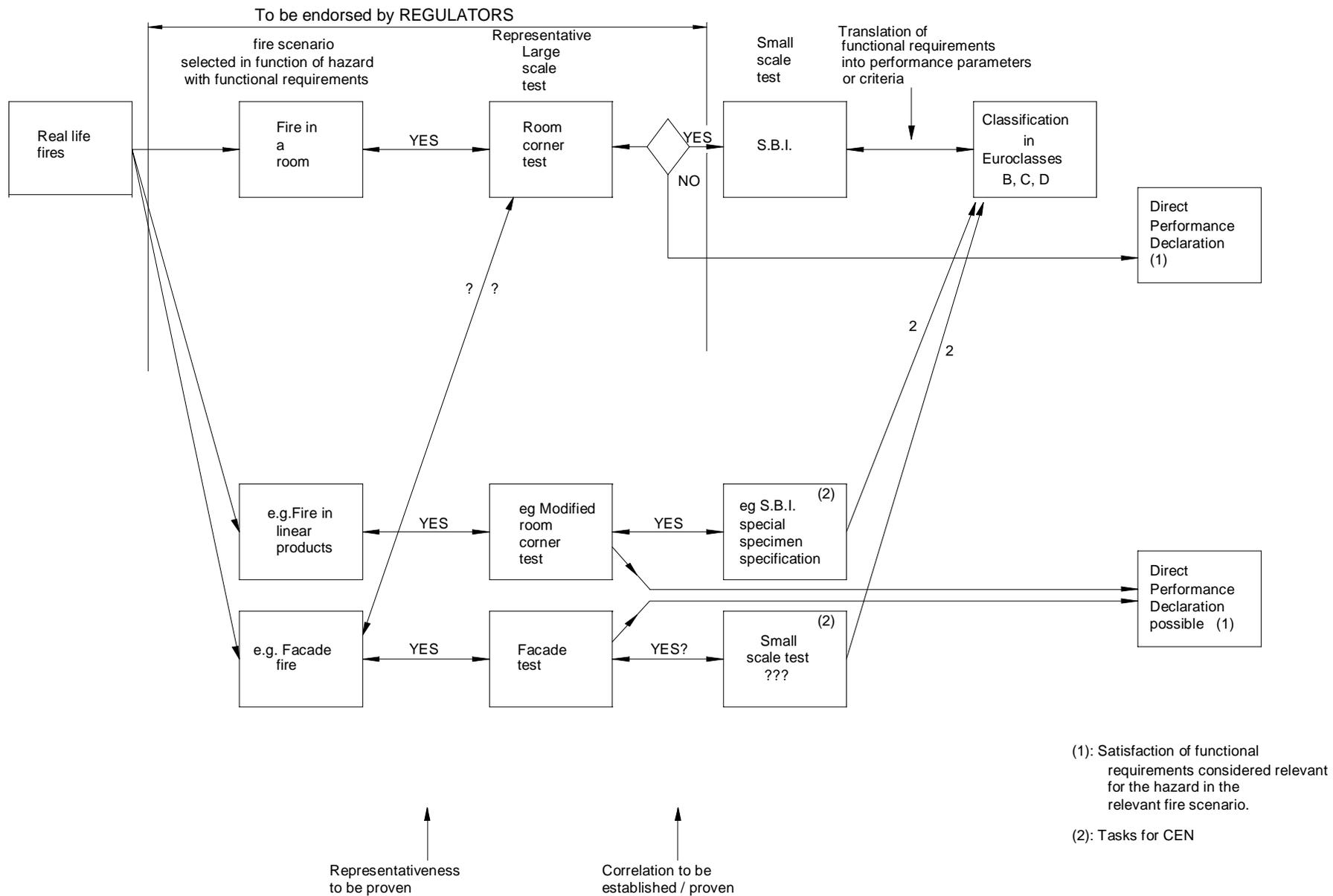
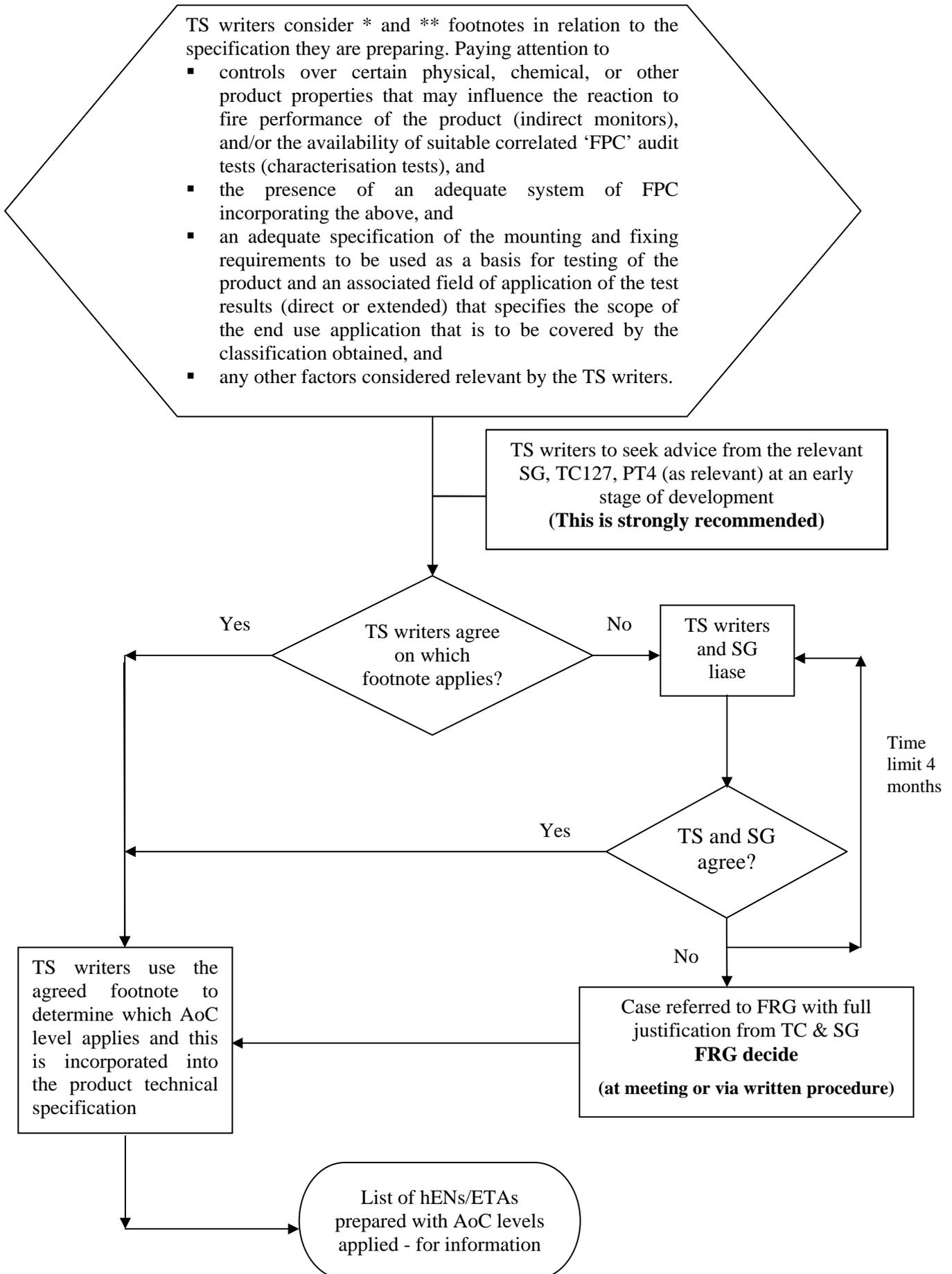


Figure 1 – diagrammatic representation of the development of the Euroclasses system – for illustration only

ANNEX 2: Application of * and ** footnotes.



TS = Technical specification - includes harmonised product standards (CEN) and European Technical Approvals (EOTA)
 SG = Sector Group of Notified Bodies