



————— *guide to* —————

DEMONSTRATING THE PERFORMANCE
OF PASSIVE FIRE PROTECTION PRODUCTS

The Passive Fire Protection Federation (PFPF)

Passive fire protection is the primary measure integrated within the constructional fabric of a building to provide inherent fire safety and protection by responding against flame heat and smoke to maintain the fundamental requirements of building compartmentation, structural stability, fire separation and safe means of escape.

The PFPF represents the passive fire protection industry within the UK and provides both a focal point and forum for developing and advancing best practice in the critical area of passive fire protection. As a single industry contact point on all passive fire protection matters it avoids the need for multiple consultations on fire safety issues.

The Federation aims to promote the interests of the industry by providing solutions within the context of cost-effective fire safety design; and ensuring the reliability and quality of passive fire protection materials and systems are maintained. It encourages the safe use of passive fire protection through third party certification and accreditation schemes for the manufacture and installation of products and systems.

Association House, 99 West Street, Farnham, Surrey GU9 7EN

Tel: 01252 739142

Fax: 01252 739140

E-mail info@associationhouse.org.uk

Web: www.pfpf.org.uk

Membership of PFPF includes:

Industry Members: Architectural and Specialist Door Manufacturers Association, Association of Builders Hardware Manufacturers, Association of Interior Specialists, Association for Specialist Fire Protection, British Woodworking Federation, Construction Products Association, Door & Shutter Manufacturers Association, Glass & Glazing Federation, Guild of Architectural Ironmongers, Gypsum Products Development Association, Industry Committee for Emergency Lighting Limited, Intumescent Fire Seals Association **Certification Bodies/Test Laboratories:** BM TRADA BRE Certification, Certifire Limited, FIRAS, Fire Test Study Group, IFC Certification Limited **Liaison Members:** Office of the Deputy Prime Minister, Royal Institute of Chartered Surveyors, Trading Standards Institute, Association of Building Engineers, Chief and Assistant Chief Fire Officers' Association.

About this guide

This document has been produced by the Industry Enforcement Authority Liaison Group (IEALG) a body constituted within the PFPF to discuss the needs of the various enforcement authorities regarding the level and quality of products, installations and related documents used to support products in the market. The Group is constituted from representatives of industry and the enforcement authorities with the aim of developing ways of alleviating product misuse and misleading claims regarding product performance.

Members of IEALG include:

- Association of Building Engineers (ABE)
- BRE Certification (incorporating LPCB)
- Chief and Assistant Chief Fire Officers Association
- Construction Products Association
- Fire Test Study Group
- Office of the Deputy Prime Minister (incorporating Home Office)
- Passive Fire Protection Federation
- Royal Institute of Chartered Surveyors (RICS)
- Trading Standards Institute
- Warrington Certification Ltd (incorporating Certifire and FIRAS)



DEMONSTRATING THE PERFORMANCE
OF PASSIVE FIRE
PROTECTION PRODUCTS



DEMONSTRATING THE PERFORMANCE OF PASSIVE FIRE PROTECTION PRODUCTS

A guide to documents to be used following implementation of Construction Products Directive

SUMMARY

Recent amendments to the Building Regulations allow the use of European fire tests & classes for products claiming fire performance. There are now three routes to demonstrate product performance:

1. **Using existing British Standard tests and assessments** to satisfy the existing performance recommendations in terms of test results to British Standards i.e. the conventional AD-B route. The relevant supporting documents are **test reports** and **assessment reports**.
2. **Using European Standard tests and classes** to satisfy equivalent performance recommendations expressed in terms of classes based on European Standards tests i.e. the conventional AD-B route but with European classes. As with route 1, assessments may be used to support product variation. **However an assessment cannot confer a European classification on a product.** Using this route does not allow the product to be CE marked. The relevant supporting documents are **classification report** and, if needed, **expert judgement reports**.
3. **Using CE marking supported by a European classification** which gives the fire performance based on European Standard tests and/or an extended application. Where the classification does not cover the product variation or end use application, route 2 may be used, but this would be outside of the product's CE marking. The relevant supporting documents are **manufacturer's declaration of conformity** and **classification report**.

There is no timetable set for the transition from route 1 to route 2 or 3. This depends on whether the product can be CE marked and this depends upon the relevant European product standard being available. For some products CE marking is a reality now whilst for others it will not be possible for several years. This document gives guidance to enforcement authorities as to which documents will be used to support products in the market, what they contain and which ones should be examined. A brief description of the documents and what to look for in each is given below.

Route 1 - Using British Standard tests and assessments

Test Reports to British Standards - These give a full account of the British Standard fire test performed and include: a description of the test specimen, the test procedure and the results. These relate only to what was tested i.e. no variations in the product.

Assessment/Expert Judgement reports - These give a detailed **opinion** on the performance of the product if it were tested and are used to support variations in the product. Assessments include: a description of the construction being assessed, an opinion on the performance of the product if tested and a reference to all test reports used in formulating the opinion.

Route 2 - using European standard tests and classifications

Classification reports - These give the classification of fire performance for the product derived from test reports of European fire tests and include: a detailed description of the product, the classification in accordance with the European classification system e.g. REI 30 (fire resistance), or Euroclass D-s3, d2 (reaction to fire) and a statement of the extent to which the classification is applicable to variations of the product.

The classification report will be the main document to support products in the European system

Assessment/Expert Judgement reports - As above except these are only used in route 2 when the scope of the classification of the product does not cover the particular end use application.

Route 3 - using CE marking supported by a European classification

Classification reports - as above.

Declaration of Conformity - These are produced by the manufacturer to show that his product meets the requirement of the relevant European Technical Specification. They are of little value to enforcement authorities unless supported by the classification report.



CONTENTS

Page No

Summary

1.	Introduction	1
2.	Demonstrating conformity using British standard tests	2
3.	Demonstrating conformity using European standard tests	3
4.	CE marked products	5
Appendix 1	Glossary of Terms	6
Appendix 2	Timescale for implementation of CPD	7
Appendix 3	Background to the 2002 amendment to AD-B	8
Appendix 4	What to look for in documents used to support products in the market	10
Appendix 5	Direct Application, Extended Application and Expert Judgement	13



1. INTRODUCTION

This guidance is aimed to provide enforcement authorities, and other end-users, with advice on the documents that are, and will be, used to support passive fire protection products in the UK market.

It is considered that such guidance is appropriate at this time since the way that the fire performance of products is demonstrated is changing, as are the associated types of documents, as a consequence of the progressive implementation of the Construction Products Directive (CPD). During a period of transition as the new elements of the CPD are brought into force, there will be parallel use of the 'existing' (used within the UK) and the 'new' (used throughout Europe) systems.

This document indicates the nature and value of the 'existing' and the 'new' documents that manufacturers may provide to enforcement authorities, or other end users, in support of their products' fire performance. It indicates the types of documents that may be provided or asked for, when it is appropriate to provide or to ask for them, and how to evaluate their value. A glossary of European terms is given in Appendix 1.

Timetable

Since 1 March 2003, manufacturers in England, Wales and Scotland have been able to use British Standard (BS) standardised fire tests or European (EN) standardised fire tests to demonstrate the performance of their products placed on to the market.

The traditional BS476 series of standard tests, that have been the cornerstone of support to UK fire safety legislation, will gradually be replaced by a whole series of new EN standards. The decision as to which tests to use will be taken by the manufacturer who will consider a number of factors appropriate to his product including the costs and relative performance in the different tests.

National or European system?

Essentially, the choice is between using the existing national system or the new European system which has been introduced to harmonise the fire performance classifications of products throughout Europe. This new system has been implemented by European Commission Decisions and has to be implemented into national regulations by all fire safety regulators of the EU as soon as possible. In support of CE marking of construction products under the CPD, it provides the only basis for claiming fire performance of a product. Whilst CE marking is not mandatory in the UK, it is compulsory (as a consequence of the Construction Products Regulations 1991 & 1997) that any construction product placed on the UK market satisfies the essential requirements of the CPD where the works are subject to regulation. The easiest way to do this is by CE marking once a European technical specification is available.

Currently, therefore, there is no compulsory requirement to use the European system for demonstrating the fire performance of any passive fire protection product placed on the UK market, since this compulsion only comes about as a consequence of CE marking. However, products arriving onto the UK market from elsewhere in Europe, where CE marking is mandatory, will have their claims of fire performance expressed against the new European system and these have to be recognised and accepted in the context of the enforcement of UK Regulations provided they meet the UK regulatory requirements for the specific end use.

Over the coming few years, more and more products will be CE marked, voluntarily or otherwise, depending upon their source of manufacture. CE making is only possible after there is an appropriate European product technical specification available.

Irrespective of any **compulsory** need to use the new European fire tests and classifications, the recently published amendment to Approved Document B (AD-B) to the Building Regulations, England and Wales (effective from 1 March 2003), as well as the Technical Standard D Scotland 2000, allows manufacturers to use them **voluntarily**. Many manufacturers will obviously choose this route if they consider it advantageous to their products acceptance in the UK, or elsewhere on the European market via CE marking.

Therefore, from 1 March 2003, there was nothing to stop a manufacturer testing his products to European fire test methods and using the resulting classifications to satisfy UK regulatory requirements. Many manufacturers will choose to do this to build up a portfolio of results which can be used in the UK now and which at sometime in the future may be used in support of CE marking.

Background to the amendments to AD-B, and information regarding the requirements of the Technical Standards Scotland can be found in Appendix 3.

2. DEMONSTRATING CONFORMITY USING BRITISH STANDARD TESTS

Under the existing national system, the fire performance of construction products is demonstrated by reference to **test reports** and/or **assessment reports** providing evidence of performance against British Standard fire test methods. The documents listed below are used to support products in the market and enforcement authorities should be familiar with them. Examples of the information that enforcement authorities should look for in these documents are given in Appendix 4. A diagram showing the routes to demonstrating the performance of the product under the existing British system is given in Figure 1.

Test reports

These documents give a full and comprehensive account of the **British Standard** fire test that has been performed upon the product. Test reports will include:

- a detailed description of the test specimen
- details of the test procedure
- comprehensive details of measurements made, and
- the results of the test

The results given in the test report relate only to the actual product, component or assembly that was tested and not to any variation thereof e.g. different thicknesses, densities or dimensions.

Greater confidence may be gained if test reports have been produced by a laboratory that has been accredited by the United Kingdom Accreditation Service (UKAS) for that specific test procedure.

Assessment/Expert Judgement reports

These documents give a detailed **opinion** on the likely performance of the product if it were to be tested to the appropriate **British Standard** fire test method. They are often used to support variations to the product from that which was actually tested or to support application of the product within the context of national regulations. Assessment reports will include:

- a detailed description of the construction being assessed or will refer to test reports that contain this information
- a detailed opinion on the likely performance of the product if it were tested to the appropriate fire test method. This opinion will be supported by a detailed argument which should be able to be followed by the end user and may include expert judgement
- a reference to all test reports used in formulating the opinion
- a prediction of the results of the test that might be achieved
- a statement of compliance with FTSG Resolution 64/64a if it was carried out by a UKAS accredited laboratory or the PFPF "Guide to undertaking assessments in lieu of fire tests", and
- a statement concerning the period of validity of the assessment

Assessment reports reflect opinion and should have been produced by competent authority/persons appropriate to the complexity of the evaluation undertaken. Advice is given in the PFPF "Guide to undertaking assessments in lieu of fire tests".

Classification

Other than reports of tests to BS476: Parts 4 & 7, classifications are not provided as a result of a test or assessment under the existing national system. The requirements for a specific fire classification or rating are set out in the supporting documents to the regulations and it is normally necessary to compare the results of the test given in the test report to the requirements of these regulatory guidance documents.

3. DEMONSTRATING CONFORMITY USING EUROPEAN STANDARD TESTS

An important distinction between satisfying regulations by use of British tests and satisfying them by use of European tests is that in the new European system, the product performances are expressed in terms of classifications. These give the performance of the product expressed in terms of common European classes which have been agreed by the European Commission. There are essentially two systems of classification: one for reaction to fire and another for fire resistance.

The system for reaction to fire provides for seven 'Euroclasses' (A1 to F with A1 being the best and F the worst) according to the performance of the product in a variety of reaction to fire tests. For most classifications more than one type of reaction to fire test is required. Regulators choose a 'Euroclass' appropriate to their needs and producers of passive fire protection products have them tested and classified in order to meet those requirements. There are additional classifications for the production of smoke (s1, s2, s3) and droplets (d0, d1, d2). It is mandatory to include these within any classification as part of the process embodied in the classification standard EN 13501-1 irrespective of the fact that these are not currently used by UK regulators.

The system for fire resistance expresses the performance of the tested element in terms of time to failure (in minutes) against three main criteria: loadbearing capacity - R, integrity - E and insulation - I. Regulators choose time periods they wish for elements to satisfy some or all of these three main criteria and producers of passive fire protection products have them tested and classified accordingly. As with reaction to fire, there are several other additional classifications including 'W' (radiation) and 'M' (impacts resistance). However, unlike reaction to fire, it is not mandatory to include these classes in every classification and they are not used in the UK.

The documents listed below are used to support products in the market. Enforcement authorities should become familiar with the most important documents which are the **classification report** and **assessment/expert judgement reports**. Examples of the information that enforcement authorities should look for in these documents are given in Appendix 4. A diagram showing the routes to demonstrating the performance of the product under the European system - outside of CE marking is given in Figure 2 and includes which type of organisation can produce these documents.

Classification reports

Classification reports are produced in accordance with requirements and procedures given in the appropriate part of the European Standard EN 13501. These documents give the classification of fire performance for the product that has been derived from **test reports** and/or **extended application reports** against **European Standard** fire test methods. Classification reports will include:

- a detailed description of the product or will make reference(s) to test reports where the product is described in detail.
- the classification obtained in accordance with the European classification system as prescribed by EC Decision e.g. REI 30 (for fire resistance), or Euroclass D-s3, d2 (for reaction to fire)
- will contain a statement that the classification was derived using the classification standard EN 13501:
 - Part 1 for reaction to fire
 - Part 2 for fire resistance (excluding service installations)
 - Part 3 for fire resistance (service installations)
 - Part 4 for smoke extraction systems
 - Part 5 for external fire exposure of roofs
- will include a statement of the extent to which the classification is applicable to variation(s) of the product from that which was actually tested on the basis of the test report(s) or extended application report(s).

EN 13501 Part 1 and 2 have already been published. Subsequent parts will be available over the next few years. It should be noted that a European classification cannot be claimed for a given product type until such time as the appropriate Part of EN13501 has been published.

Classification reports shall have been produced by a 'Notified Body', being a body that has been 'notified' by its own Member State (to the EC and to all other Member States) as being competent to fulfil prescribed functions in connection with attestation of conformity of products under the CPD. In this case the 'notified body' could be a laboratory or a certification body and in the UK, the qualification for notification is accreditation by UKAS.

The classification report will be the main vehicle for supporting products in the market under the European system and enforcement authorities should be aware of them, their contents and what they mean.

The documents described below which support the classification report are included for information but are not expected to be used in the market, although they should be available to enforcing authorities if required.

Test reports

These give a full and comprehensive account of the **European** based fire test and have the same nature and content as listed above for test reports against British Standards.

However, a significant difference is that the report may contain a statement of the **direct field of application** of the test result. This will give an indication of the extent to which the achieved test result may be automatically applied to a variation of the product from that which was tested.

If the attestation of conformity for the product is system 3, any test reports shall have been produced by a 'Notified Body', being a body that has been 'notified' by its own Member State (to the EC and to all other Member States) as being competent to fulfil prescribed functions in connection with attestation of conformity of products under the CPD. In this case the 'notified body' should be a laboratory. If the attestation of conformity for the product is system 1, there is no requirement for the test laboratory to be notified. However, greater confidence may be gained if a notified test laboratory is used as the criteria for notification in the UK are essentially the same as those for UKAS accreditation.

Extended application reports

Extended application reports contain the results of the application of defined rules (which may involve calculation methods) to the results of one or more test results, thereby predicting the results that would be achieved as a consequence of a change to one or more of the product properties. The procedures for extended application will given in European standards related to the product or product type or may be the consequence of agreements made between Notified Bodies within the **Fire Sector Group** of Notified Bodies. In this sense it is a different process to that which we associate with 'assessments'. These European standards and agreements are some way from being finalised.

Extended application reports shall have been produced by a 'Notified Body', being a body that has been 'notified' by its own Member State (to the EC and to all other Member States) as being competent to fulfil prescribed functions in connection with attestation of conformity of products under the CPD. In this case the 'notified body' should be a laboratory.

Extended application standards are still being prepared in CEN TC 127. However, it is envisaged that these are still some years away from completion.

Assessment/expert judgement reports on the basis of the European system

There will always be situations where a European classification report, based upon tests and/or extended application, will not cover a specific end-use application of the product. In these situations the product falls within the scope of the appropriate national regulations or administrative provisions of the Member State where it is to be used.

In the UK this means that an expert judgement or 'assessment' may still be required. Such expert judgements will only be valid for the particular end-use applications considered and cannot be used to widen the scope of the European classification of the product, whether for CE marking or not. Such expert judgements will not, therefore, be appropriate or acceptable beyond the boundaries of the Member State within which it is generated.

Such expert judgements documents have the same content, value and meaning as the current national use, as detailed above. More information on expert judgements is given in Appendix 5.

4. CE MARKED PRODUCTS

With the progressive introduction of **European technical specifications** (see Appendix 2) for products, CE marked products with their associated manufacturer's **declaration of conformity** will be introduced into the market. Accompanying any declaration of conformity that includes a fire performance claim there should always be a reference to the relevant classification report as referenced above.

A manufacturer's declaration of conformity for a product may be based on one of four different systems of attestation (systems of proof of conformity). The appropriate system in relation to a given product family is decided by the Commission in consultation with the Member States and has much to do with the confidence in the consistency of production of the product and its contribution to the achievement of the essential requirement (in this case – safety in case of fire). In practice, most passive fire protection products are at Attestation of Conformity system 1 or 3.

Manufacturers will be required to have their declaration of conformity, for any product for which they claim a fire performance, supported by a classification report from a 'notified' test laboratory.

For products that are designed (requiring a particular aspect of their manufacture to be specifically included) to achieve a higher fire performance, the manufacturer's declaration will need to be supported by a **certificate of conformity** provided by a certification body. In this case the appropriate classification report should be referenced by the certificate of conformity.

Therefore, even for products that bear an EC conformity mark, they should be supported by an appropriate classification report, and it is only by reference to this document that the scope of the claimed fire performance of the product can be determined.

A diagram showing the routes to demonstrating the performance of the product under the European system within CE marking is given in figure 3 and includes which type of organisation can produce these documents.

More information on CE marking is available from the ODPM Web-site
<http://www.safety.odpm.gov.uk/bregs/cpd/cemark/index.htm>

APPENDIX 1 - GLOSSARY OF TERMS

Attestation of conformity (AoC): The level of confidence, and accompanying procedures, required to provide evidence of product performance against a technical specification.

CE marking: Demonstration that the product complies with the relevant essential requirements, usually via compliance with a relevant hEN or ETA and that the appropriate attestation procedures have been carried out.

CEN: (Comité Européen de Normalisation) The European organisation under which European Standards (ENs) are prepared.

CEN/TC 127: CEN technical committee 127 responsible for preparing test methods for reaction to fire and fire resistance for construction products.

Certificate of conformity: Documentation provided by a Notified Certification Body in support of systems 1 and 1+ for product attestation.

Certification Body: A Notified Body which can provide Certification procedures under attestation system 1. The basis of proof of compliance is normally EN 45011 & EN 45012.

CPD (Construction Products Directive) - 89/106/EC: EU legislation to facilitate the free movement of construction products throughout the EU.

Declaration of conformity: A claim by a manufacturer, supported by the documentation appropriate to the attestation system, of product compliance, leading to CE marking.

EC (European Commission): The permanent administration of the EU responsible for drafting and implementing European legislation.

EEA (European Economic Area): The EU + EFTA countries (Iceland, Norway, Switzerland).

EGOLF (European Group of Official Laboratories for Fire): Organisation of over 40 official laboratories that exist throughout the EU and EEA.

EN: A European standard prepared by CEN. It can be a product standard, test method, classification standard etc. An EN must be implemented, unchanged, as a national standard by members of CEN regardless of their approval of the EN.

Essential requirements: The 6 identified areas, in the CPD, which cover all essential aspects of performance of construction products:

- Mechanical resistance and stability
- Safety in case of fire
- Hygiene, health and environment
- Safety in use
- Protection against noise
- Energy economy and heat retention

EU (European Union): The following countries:

Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Portugal, Sweden, Spain, Slovakia, Slovenia, UK.

Fire Sector Group (SH02): A group with a horizontal function, under the Group of Notified Bodies, consisting of representatives of Notified Bodies with a specific interest in fire performance of construction products.

Group of Notified Bodies (GNB): An advisory body (to the SCC) composed of Bodies notified under the CPD.

hEN (harmonised EN): A product EN which has been accepted by the EC as meeting the requirements of a particular mandate under the CPD and also setting out the necessary attestation procedures for CE marking.

Notified Body: An organisation, notified to the EC by a Member State (under article 18 of the CPD), which can provide the declared attestation procedures. These procedures are - certification, testing or inspection (see separate terms).

Passive fire protection: The primary measure integrated within the constructional fabric of a building to provide inherent fire safety and protection by responding against flame, heat and smoke to maintain the fundamental requirements of building compartmentation, structural stability, fire separation and safe means of escape.

Period of co-existence: The period during which existing national systems are still in place alongside the new European system. CE marking is optional. After this CE marking is mandatory and use of existing national systems is not permitted.

Technical specification: A hEN or ETA prepared in support of the CPD used as a basis for CE marking.

Testing Laboratory: A laboratory which can provide test facilities in support of attestation procedures. Testing laboratories must be notified if the attestation of conformity for the product is system 3. The basis of proof of compliance is normally EN 45001 or EN ISO/IEC 17025.

APPENDIX 2 - TIMESCALES FOR IMPLEMENTATION OF CPD

Currently, only a few passive fire protection construction products have to satisfy the Construction Products Directive e.g. by CE marking. However, enforcement authorities and other end-users will need to be aware of which stage products have reached in the implementation of the CPD so that they know which documents to look for when approving products.

As described at several places throughout this document, products may be put on the market using three routes:

1. tested to national standards and simply put on the market using existing national tests and assessments as supporting documents
or,
2. tested and classified to new European standards and simply put on the market using the new European classification standards as supporting documents,
or,
3. covered by CE marking, which calls up the new **European Technical Specifications** (see Appendix 3) in addition to a range of other requirements. These (and not AD-B) call up the new European classification standards as supporting documents which can be used to satisfy AD-B and any other set of regulations in Europe that recognise the new European tests and classes

Before any **period of co-existence** (see Appendix 1), products may be put on the market using only routes **1** and **2** above i.e. no manufacturer is able to CE mark his product.

During the product's period of coexistence, products may be put on the market using any of the options **1, 2** or **3** above i.e. manufacturer's may CE mark if they wish.

At the end of a product's period of coexistence, products may be put on the market using option **3** only i.e. manufacturers have to satisfy the provisions of the CPD e.g. by CE marking.

Several passive fire protection products are now in their period of co-existence between the existing national systems and the new European system. Once the period of co-existence ends, tests to national standards - although they might still satisfy AD-B - will have limited value because the product **cannot be placed on the whole European market** unless it satisfies the requirements of the CPD e.g. by CE marking, and that requires evaluating its performance using European test and classification standards. However, these products can still be placed on the UK market and any other Member State that has not made CE marking mandatory.

APPENDIX 3 - BACKGROUND TO THE 2002 AMENDMENT TO AD-B



Construction Products Directive (CPD) and CE Marking

The implementation of the CPD means that the way that products are put on the market will change fundamentally. Manufacturers currently test their products to British Standards and place them on the market using a test report or assessment report to justify their performance. Under the CPD, products will have to satisfy six essential requirements which are laid down in product specific form in harmonised European product standards (**hENs**) or European Technical Approval Guidelines (**ETAGs**). These **European Technical Specifications** call up European test and classification standards (including fire) which are used to evaluate the performance of the product.

On completion of satisfactory testing and attestation of conformity (the 'proof' that the product meets its essential requirements as given in the European Technical Specification) the manufacturer can CE mark the product which gives it access to all European markets.

Regulatory requirements – removing barriers to trade

All countries have regulations for the performance of the products contained within their buildings and these call up national test methods. However, these constitute technical barriers to trade because a manufacturer has to carry out the national fire test of every country in which the product is to be sold. Consequently, under the CPD, EU countries are **obliged** to adapt their regulations to allow the use of new European fire test and classification methods to satisfy their requirements.

In England and Wales, the relevant document is Approved Document B (Fire) and is published by the Office of the Deputy Prime Minister (ODPM) (formally DTLR). In Scotland, the equivalent document (Technical Standard D) has already been published by the Scottish Executive. The way in which ODPM has changed the England and Wales regulations is by way of an amendment to AD-B. This document complements the existing AD-B by detailing how the existing provisions of AD-B can also be satisfied by testing products to the new European fire test and classification methods. Currently, only the UK and some other countries have changed their regulations to 'provide visible recognition' to the new European fire tests and classification methods.

Period of Coexistence - European Technical Specifications

The implementation of the Construction Products Directive (CPD) will necessitate a time period during which national (British) Standards and European Technical Specifications for **products** within the European Economic Area (EEA) market will co-exist. This is the so called period of co-existence. The objective of this period is to provide for a gradual adaptation to the requirements of the CPD. It will enable producers, importers and distributors of construction products to sell stocks of products manufactured in line with the national rules previously in force and have new tests carried out.

In addition, the timetable for the introduction of European Technical Specifications precludes the setting of a single date when all products have to go down the 'European route'. Many product standards are years away from completion and consequently, these can only be placed on the market in the existing way for the time being. Consequently the vast majority of building products are still currently being placed on their national market via national 'approvals' although the situation is changing rapidly. It will be several years before all products are placed on the market in accordance with the CPD.

Period of Co-existence - Fire Test Methods

On the publication of a European **test** method, any conflicting national test standard has to be withdrawn within a certain time (usually 1 year). However, the need to test products to existing national standards will remain until the appropriate European **Technical Specification** (product standard) is ready. Consequently, this time period (1 year) is not realistic and so there is a period of co-existence for test methods as well as product standards.



In addition, some national test methods are used in industrial and commercial sectors that are not subject to the CPD e.g. railways, ships etc. For these reasons, the duration of co-existence in relation to the European fire test and classification standards has not yet been decided.

Period of Co-existence - significance to AD-B

The significance of the period of co-existence is that AD-B has to allow products to be placed on the market either by testing to the existing British Standards or the new European standards.

Deciding which route to take depends upon the manufacturer's preferences and the timescale of the implementation of the CPD for his product. Further information on this is given in Appendix 2.

APPENDIX 4 - WHAT TO LOOK FOR IN DOCUMENTS USED TO SUPPORT PRODUCTS IN THE MARKET

This appendix contains examples of what to look for in those documents that are used to demonstrate the product's fire performance.

USING EXISTING BRITISH STANDARD TESTS AND ASSESSMENTS - ROUTE 1

All test reports should contain a detailed description of the test specimen so that the enforcing authority can ensure that it relates to the installed construction.

Reaction to fire test reports should have results (and where appropriate classes) expressed as follows:

BS Test	BS 476: Part 4	BS 476: Part 6	BS 476: Part 7	BS 476: Part 11
Expression of results	not relevant - see 'class'	Indices of performance i_1 , i_2 , i_3 & I	not relevant - see 'class'	various temperature measurements, time of flaming
'Class' (if appropriate)	Non - combustible	not relevant	Class 1 (best) to Class 4 (worst)	not relevant
Comments		If i_1 not greater than 6 and I not greater than 12 and product is class 1 when test to BS 476: Part 7, then product is Class O as defined in AD-B & Tech Standard D		Definition of limited combustibility is given in AD-B & Tech Standard D

Fire Resistance Test Reports should have results expressed in terms of time in minutes to failure against the appropriate criteria and the appropriate test standard for the product/element being considered. The main performance criteria are as follows:

Loadbearing capacity - ability to support applied load/resist collapse

Integrity - ability to resist the passage of flames/hot gases

Insulation - ability to restrict the temperature rise on the unexposed face

The table below gives the appropriate test method and performance criteria for most common building elements.

	BS Test Ref	Loadbearing capacity	Integrity	Insulation	Comment
Fire doors	BS 476: Part 22	n/a	yes	yes	Insulation is measured but is not usually required by AD-B or Tech Standard D
Non load-bearing walls	BS 476: Part 22	n/a	yes	yes	Includes glazed screens
Load-bearing walls	BS 476: Part 21	yes	yes	yes	
Floors	BS 476: Part 21	yes	yes	yes	
Ceilings (membranes)	BS 476: Part 22	n/a	yes	yes	
Ceilings (beam protection)	BS 476: Part 23	yes*	n/a	n/a	*test can also be carried out unloaded when time of beams to reach 400°C is time of failure
Beams/ columns	BS 476: Part 21	yes	n/a	n/a	End-use application should be supported by in-depth assessment to cover alternative section sizes and shapes
Ducts	BS 476: Part 24	n/a	yes	yes	
Dampers	Ad-hoc to BS 476: Part 22 or BS ISO 10294/1	n/a	yes	yes	
Penetration seals & linear gap seals	Ad-hoc following BS 476: Part 22	n/a	yes	yes	There is no BS method for penetration seals or linear gap seals

Assessment reports

These documents give a detailed **opinion** on the likely performance of the product if it were to be tested to the appropriate fire test method. Consequently, they should contain a prediction of results giving the same information as those given for test reports above. Assessment reports should also include a detailed description of the test specimen or will refer to test reports that contain this information so that the enforcing authority can ensure that it relates to the installed construction.

Assessment reports reflect opinion and should have been produced by competent authority/persons appropriate to the complexity of the evaluation undertaken. Advice is given in the PFPF "Guide to undertaking assessments in lieu of fire tests".

USING EUROPEAN STANDARD TESTS AND CLASSIFICATIONS - ROUTE 2

Classification report

An important distinction between satisfying regulations by use of British tests and satisfying them by use of European tests is that in the new European system, the product performances are expressed in terms of classifications. Fire test reports are referred to in the classification report but are otherwise unused and should not concern enforcement authorities. Classification is an activity that is carried out separately from testing and has its own European Standard (EN 13501: Parts 1 - 5) for this purpose. Classification reports will include:

- a detailed description of the product (test specimen) or will make reference(s) to test reports where the product is described in detail so that the enforcing authority can ensure that it relates to the installed construction.
- the classification obtained in accordance with the European classification system (see below for differences between fire resistance and reaction to fire).
- a statement of the extent to which the classification is applicable to variation(s) of the product from that which was actually tested.

Reaction to Fire

The system for reaction to fire provides for seven 'Euroclasses' (A1 to F with A1 being the best and F the worst) according to the performance of the product in a variety of reaction to fire tests. Regulators choose a 'Euroclass' appropriate to their needs and manufacturer/producers of passive fire protection products have them tested and classified in order to meet those requirements. There are additional classifications for the production of smoke (s1, s2, s3) and droplets (d0, d1, d2) for most but not all classifications. It is mandatory to include these within any classification as part of the process embodied in the classification standard EN 13501-1 irrespective of the fact that these are not currently used by UK regulators.

Typical reaction to fire classes are:

for walls:	A2-s3,d2	(Euroclass A2, with smoke production s3 and flaming droplets d2)
	B-s2,d2	(Euroclass B, with smoke production s2 and flaming droplets d2)
	D-s1,d0	(Euroclass D, with smoke production s1 and flaming droplets d0)
for floors:	A2fl-s1	(Euroclass A2 (floors), with smoke production s1)
	Dfl-s1	(Euroclass D2 (floors), with smoke production s1)

Fire Resistance

The system for fire resistance expresses the performance of the tested element in terms of time to failure (in minutes) against three main criteria: loadbearing capacity - R, integrity - E and insulation - I. In this way it is similar to the existing UK system. Regulators choose time periods they wish for elements to satisfy some or all of these three main criteria and producers of passive fire protection products have them tested and classified accordingly. As with reaction to fire, there are several other additional classifications including 'W' (radiation) and 'M' (impact resistance). However, unlike reaction to fire, it is not mandatory to include these classes in every classification and they are not used in the UK.

Typical fire resistance classes are:

REI 120	(120 minutes loadbearing capacity, integrity and insulation)
RE 90	(90 minutes loadbearing capacity and integrity only)
R 45	(45 minutes loadbearing capacity only)
EI2 15-C2	(15 minutes integrity, insulation I2, self closing class 2 (doors only))
REI-M30	(30 minutes loadbearing capacity, integrity and insulation and impact resistance (separating walls only))

Note: The format of classification reports is still under discussion and development in EGOLF and the Fire Sector Group. Effort is being made to present the data and especially the detailed description of the product in tabular format and using diagrams.

Assessment/expert judgement reports

As under the existing British system, these documents give a detailed **opinion** on the likely performance of the product if it were to be tested to the appropriate fire test method for that particular end-use application. Consequently, they should contain a prediction of results giving the same information as those given for test reports above. However, in the European system, assessment reports cannot be used to confer or extend the scope of a European classification, only to cover an end-use application under the provisions of AD-B/Tech Standard D that is not contained within the scope of the existing European classification.

Assessment/expert judgement reports should also include a detailed description of the test specimen or will refer to test reports that contain this information so that the enforcing authority can ensure that it relates to the installed construction.

USING CE MARKING SUPPORTED BY A EUROPEAN CLASSIFICATION - ROUTE 3

Classification report

As Route 2 above.

Declaration of Conformity

With the progressive introduction of **European technical specifications** (see Appendix 2) for products, CE marked products supported by a manufacturer's **declaration of conformity** will start to appear on the market. This shows that the product meets the requirements of, and has undergone the relevant attestation procedures set out in, the relevant European Technical Specification. They are of little value to enforcement authorities unless supported by the classification report above.

APPENDIX 5 - DIRECT APPLICATION, EXTENDED APPLICATION AND EXPERT JUDGEMENTS

A.5.1 INTRODUCTION

Most passive fire protection products supplied by manufacturers are different from the specimens that were originally tested. Products are supplied in a wide variety of sizes, shapes and materials including finishes in order to satisfy the requirements of the market. It is impractical to test every variation of shape, size or material for each product. However, it is not acceptable, and it is often not permitted, for wide-sweeping variations of products to be supplied by the manufacturer without some form of recognised justification or approval. Consequently, there needs to be a mechanism by which variations from the tested specimen(s) can be accepted with a reasonable degree of confidence that such variants would perform equally well if they were subjected to the same test as the original test specimen.

Under the existing national system, variations in a product not covered by the test report are usually justified by reference to an **assessment** which is an **opinion** of the likely performance if the product were tested to that standard. Under the European system there are two ways of including variations within the classification: direct and extended application:

A.5.2 Direct application (DIAP)

The extent to which a tested product may or may not be changed under direct application is given in rules which limit the permitted variation away from the test specimen without further qualified evaluation or calculation. The variations are generally conservative as they are based on the minimum level of common (European) agreement that can be achieved.

Such rules allow building regulators and other bodies to accept the product without themselves having to make a judgement or request a professional opinion from a recognised authority. The variations that are permitted under direct application can be introduced **automatically** to manufactured products without additional third party involvement.

Examples of these rules are:

- Fire resistance: testing a timber fire door opening into the furnace covers the situation when it is opening away
- Reaction to fire: testing a product at its lowest density covers higher densities

Such rules are automatic and are applied to the test result when the classification is made. So in the examples given above the classification report would contain a statement that these variations are included in the classification.

For fire resistance, the rules for direct application are included in the test method and so are already published for most elements. For reaction to fire, the rules are still being developed.

A.5.3 Extended application (EXAP)

There may be changes to the test specimen that cannot be dealt with by direct application. In addition, the types of rules given in direct application have been developed on the basis of single test results and not on the concept of a series of tests on different sizes and/or variations of a product. Consequently, direct application does not cater for interpolation between results of different tests and will be of little use in extrapolation of a variable beyond the range of that tested.

Variations outside of the rules given in direct application and consideration of interpolation and extrapolation from a series of tests fall under the scope of extended application. This involves an in-depth review of the particular product design and performance in test(s) by a recognised authority who will produce a report on the assessed variation(s). The methodology adopted may be based on calculation methods or universally accepted rules of application as appropriate to the philosophies employed for the different products.

A.5.4 Implication on classifications

The rules for extended application are being developed in CEN TC 127 and in other bodies such as the Group of Notified Bodies - Fire Sector Group. Some sets of rules are well advanced but few are completed and it will be several years before all of them are.

Consequently no current classification can include for a range of products unless that range is already covered by direct application (automatic rules).

This has a major effect upon the ability to support products using the new European test and classification methods. Very few products are only made in only one colour/thickness/size etc and it realised that it is uneconomic to test them all. A classification that only covers one colour/thickness/size etc is almost worthless and in view of the need to expedite implementation of the CPD and free up the market for construction products and alternative needs to be developed - hence the use of assessment/judgement in route 2.

A.5.5 Expert judgement

Where a European classification report, based upon tests and/or extended application, will not cover a specific end-use application, the product falls within the scope of the appropriate national regulations or administrative provisions of the Member State where it is to be used.

In this case an expert judgement or 'assessment' may still be required. Such expert judgements may only be carried out by suitably qualified individuals and will only be valid for the particular end-use applications considered. They cannot be used to widen the scope of the European classification of the product, whether for CE marking or not. Such expert judgements may not, therefore, be appropriate or acceptable beyond the boundaries of the Member State within which it is generated.

FIGURE 1 - ROUTE TO DEMONSTRATE PRODUCT PERFORMANCE UNDER EXISTING BRITISH SYSTEM -ROUTE 1
 (Documents which give the fire performance of the product which should be examined are highlighted in red)

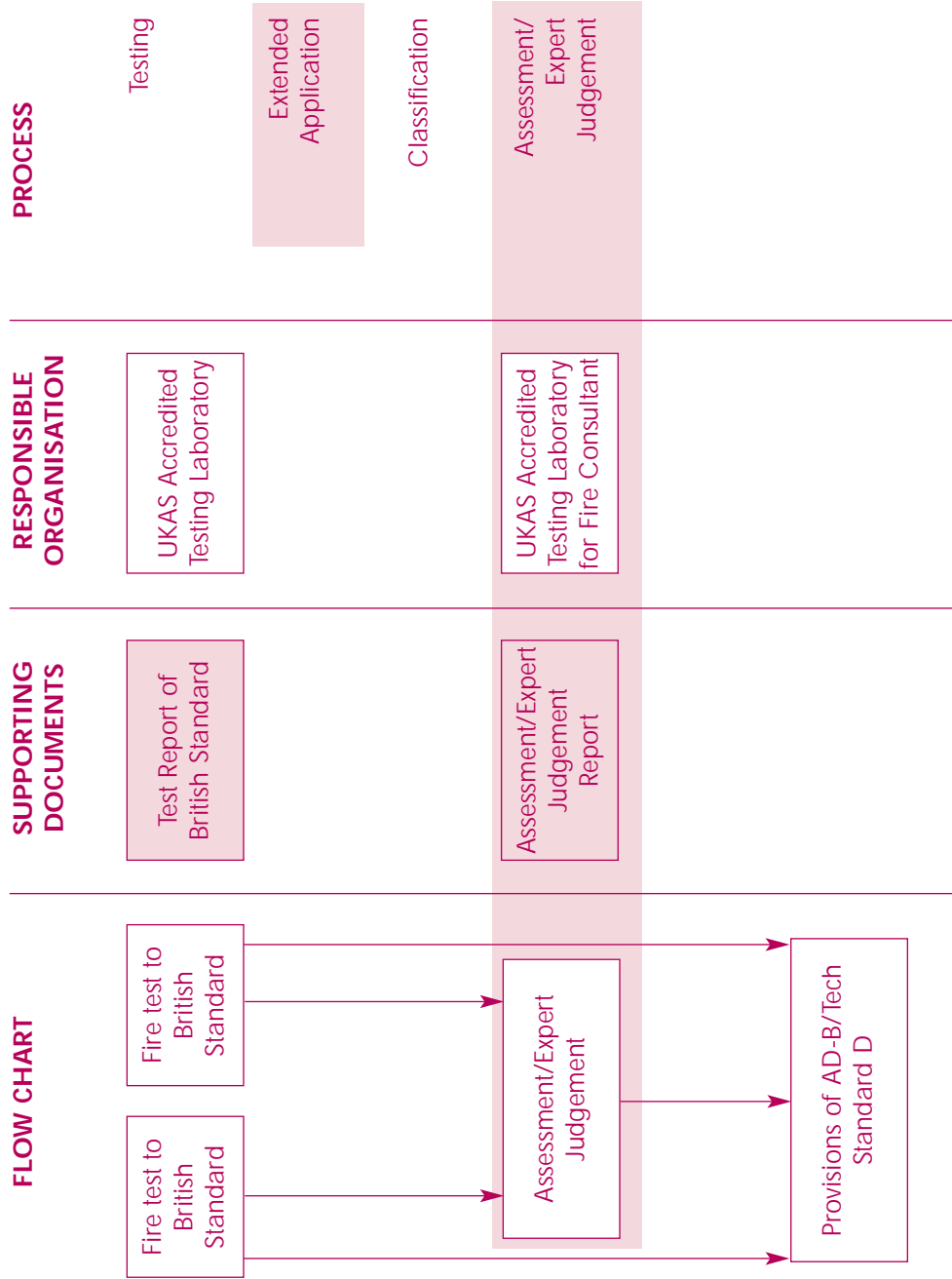
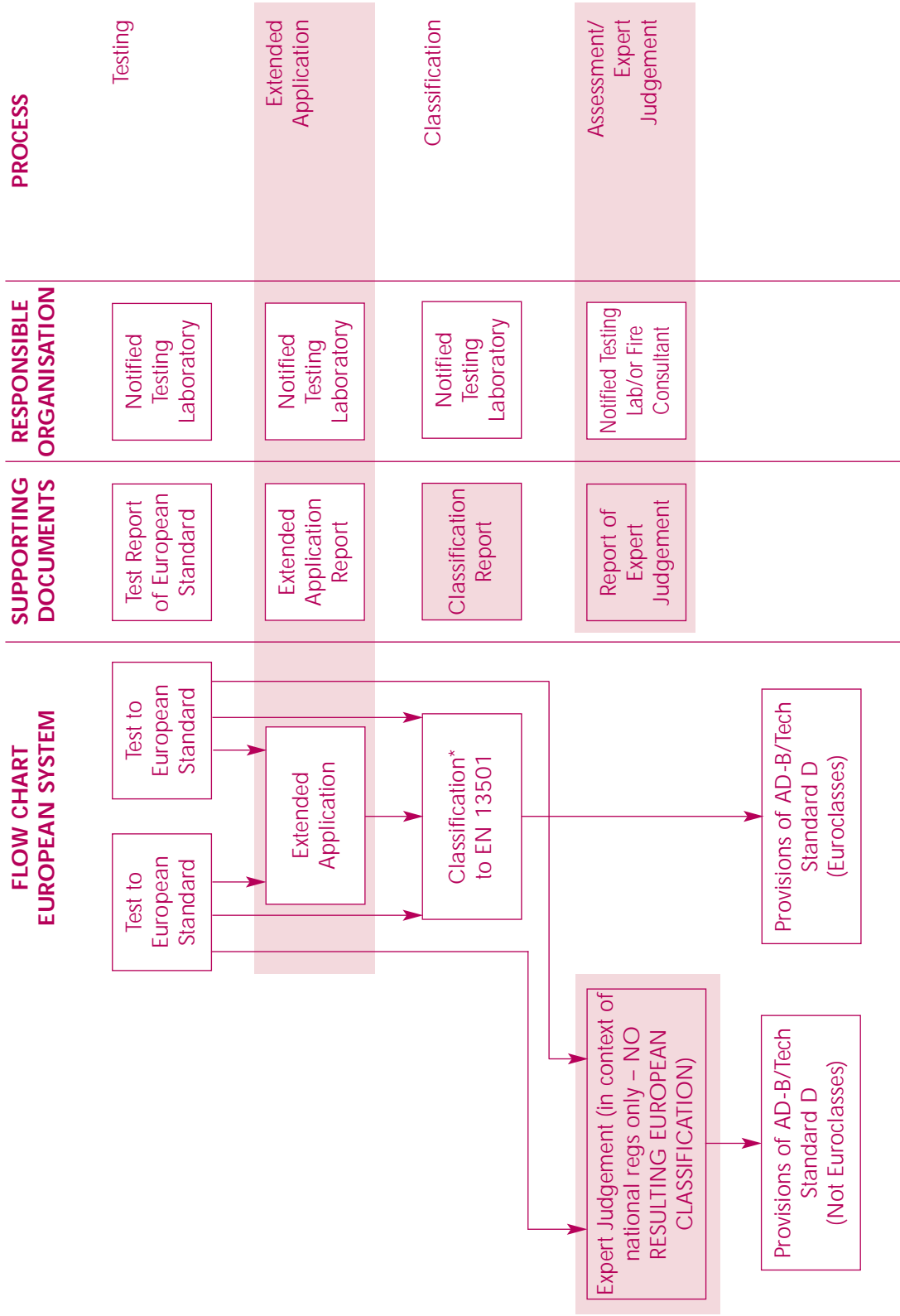


FIGURE 2 - ROUTE TO DEMONSTRATE PRODUCT PERFORMANCE UNDER NEW EUROPEAN SYSTEM OUTSIDE CE MARKING - ROUTE 2
 (Documents which give the fire performance of the product which should be examined are highlighted in red)



*For the purposes of CE marking, European Classification is only possible if relevant preconditioning procedures from harmonised technical specifications (product standards, ETAs) have been carried out

FIGURE 3 - ROUTE TO DEMONSTRATE PRODUCT PERFORMANCE UNDER THE NEW EUROPEAN SYSTEM WITHIN CE MARKING - ROUTE 3
 (Documents which give the fire performance of the product which should be examined are highlighted in red)

