

## Technical Guidance Note No. 95/103

# Evaluation of Fire Performance by Assessment, Analysis & Design Appraisal

### **0**     Preliminaries

- 0.1     The object of this note is to give guidance to regulatory and statutory bodies, building designers and other specifiers, construction teams, insurance brokers and companies, manufacturers and users, concerning technical problems which may be encountered in the specification, design / development, production, supply, installation, use, maintenance, re-instatement or upgrading of fire safety related products, components, assemblies or systems.

### **1**     Assessment Reports - Evidence of Fire Performance Evaluated by Assessment

- 1.1     For reasons of product development or end use suitability, it may be necessary, during the process of normal manufacture and/or incorporation of a fire safety related component or assembly in a building, to carry out minor modifications to the specimen composition, or prototype design, as originally fire tested.
- 1.2     An **assessment report** extends, or otherwise alters, the boundary of application of a fire test report in order to cover those modifications in size, detail or composition, or those variations in end use, which are not likely to have a significant effect on the fire performance or durability in use of a particular product, component or assembly; the cumulative effect of all such modifications and variations, which may be covered by one or more **assessment reports**, shall likewise not have a significant effect.
- 1.2.1   Modifications in size covered by an **assessment report** shall not, in any case, exceed  $\pm 20\%$  of the size actually fire tested.
- 1.3     An **assessment report** shall only be produced by a competent person, and shall contain a simple, clear, direct, and precise explanation of the basis for the assessment.
- 1.4     For an **assessment report** to be valid it shall be attached, as an appendix, to its 'parent' test report, i.e. the test report from which it is derived; if there are other existing **assessment reports** in the same 'family', i.e. derived from the same fire test report, each **assessment report** shall be arranged chronologically in order.
- 1.5     A valid **assessment report** shall only be reproduced in full by the test sponsor - without comment, abridgement, alteration or addition.
- 1.6     If for any reason there is doubt about the authenticity and/or accuracy of an **assessment report**, the original **assessment report** must be inspected. Confirmation of authenticity and accuracy shall be made by contacting the competent person who produced the **assessment report** in question and the fire test laboratory which issued the 'parent' test report.
- 1.7     An **assessment report** is not valid beyond the life span of the 'parent' fire test report.

## **2 Analysis Reports - Evidence of Fire Performance Evaluated by Analysis**

- 2.1 For reasons of impracticability or disproportionate cost, it may not be possible to fire test every individual item, or variation, in a range of fire safety related products, components or assemblies.
- 2.2 An **analysis report**, involving interpolative and, quite often, limited extrapolative analysis, extends or otherwise alters the boundaries of application of a representative series of fire test reports in order to cover a wider range of similar products, components or assemblies.
- 2.2.1 By interpolative analysis is meant the estimation, by analysis, of the likely value of fire test performance between those values, or results, actually determined by test.
- 2.2.2 By extrapolative analysis is meant the estimation, by analysis, of the likely value of fire test performance beyond those values, or results, actually determined by test. This form of analysis shall not, in any case, extend beyond 20% of the difference between the upper and lower limit values actually determined by test.
- 2.3 An **analysis report** shall only be produced by a competent person, and shall contain an explanation of the analysis which has been performed on specified fire test results. It shall also be shown in the **analysis report** that there has been adequate consideration of test method precision (see ISO 5725 : Precision of Test Methods), and durability in use of the particular products, components or assemblies which have been evaluated.
- 2.3.1 The style of presentation in an **analysis report** shall be simple, clear, direct, and precise.
- 2.4 For an **analysis report** to be valid :-
- (a) all relevant fire test reports shall be attached, as one appendix, to the **analysis report** and shall be arranged chronologically in order ;
- (b) relevant mechanical / durability test reports shall also be attached, as a separate appendix, to the **analysis report** and shall be arranged chronologically in order.
- 2.5 A valid **analysis report** shall only be reproduced in full by the sponsor of the fire tests - without comment, abridgement, alteration or addition.
- 2.6 If for any reason there is doubt about the authenticity and/or accuracy of an **analysis report**, the original **analysis report** must be inspected. Confirmation of authenticity and accuracy shall be made by contacting the competent person who produced the **analysis report** in question and the test laboratory / laboratories which issued the relevant test reports.
- 2.7 An **analysis report** is not valid beyond the life span of the earliest fire test report in the representative series of fire test reports.

## **3 Design Appraisal Reports - Evidence of Fire Performance Evaluated by Design Appraisal**

- 3.1 For reasons of impracticability or the inherent limitations of fire testing, i.e. exposure of a test specimen or prototype to 'test fire' conditions, it may be necessary to substantiate fire performance by means other than assessment reports and analysis reports.

- 3.2 A **design appraisal report**, containing a professional judgement based on relevant experience and a sufficient array of relevant test data and other information, is a technical appraisal of any significant aspect of fire safety design. A **design appraisal report** may cover the following, as examples of some specific applications :-
- (a) those modifications to a particular product, component or assembly in size, detail or composition, and / or those alterations in end use to the same product, component or assembly, which are likely to have a significant effect on its fire performance or durability in use ;
  - (b) the likely performance of a particular product, component or assembly when exposed to possible local 'real fire' conditions in a building ;
  - (c) the likely performance of an element of construction, or a significant part of a building, when exposed to 'test fire' conditions and / or possible local 'real fire' conditions in a building.
- 3.2.1 The cumulative effect of a number of different **design appraisal reports** produced for the same part, or separate parts, of the one building shall be evaluated in the fire defence plan at design / construction stage, or the annual fire safety audit during the working life of the building.
- 3.3 A **design appraisal report** shall only be produced by a competent person, and shall contain an explanation, accompanied by key drawings, of the basis for the appraisal. In each case, a statement concerning the purpose of the **design appraisal report** shall be included in an introductory section.
- 3.3.1 The style of presentation of a **design appraisal report** shall be simple, clear, direct and precise.
- 3.4 For a **design appraisal report** to be valid :-
- (a) relevant fire test reports shall be attached, as one appendix, to the **design appraisal report** and shall be arranged chronologically in order ;
  - (b) relevant mechanical / durability test reports shall also be attached, as a separate appendix, and shall be arranged chronologically in order ;
  - (c) other relevant data and information shall be attached, as a further separate appendix, to the **design appraisal report** and shall be arranged chronologically in order.
- 3.5 A valid **design appraisal report** shall only be reproduced in full by the design appraisal sponsor - without comment, abridgement, alteration or addition.
- 3.6 If for any reason there is doubt about the authenticity and/or the accuracy of a **design appraisal report**, the original **design appraisal report** must be inspected. Confirmation of authenticity and accuracy shall be made by contacting the competent person who produced the **design appraisal report** in question ; sufficient detail shall be contained in the appendices of the report to permit traceability to source of all supporting data and information.
- 3.7 For reasons of rapid technological change and our developing understanding of fire and mechanical / durability testing, the life span of a **design appraisal report** shall not exceed **3 years** .

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