

ADVISORY NOTE 32:

ASFP position on use of BS 476 based testing on Eurocode designed structures

At the time of writing this document the UK Government has been considering a transition from BS 476 based testing to European fire resistance classifications, and a consultation on this was recently conducted by DLUHC in Q1 2023. We are awaiting the outcome of this consultation.

In terms of standardisation, BSI remains a member of CEN, and is therefore committed to working towards a common series of standards between the UK and European member states. These standards include test and product standards, and some design standards.

However, Building Regulations remain a matter to be set by national regulators, and therefore Building Regulations and their underpinning advisory documents are written by individual Governmental departments.

The national positions, set by the Building Regulations in both UK and Ireland, are that BS 476 based testing and subsequent assessment is currently allowed as an alternative to a European Fire Resistance Classification. Within England and Wales Approved document B covers this in appendix B table B3. The Scottish Technical Handbook covers this in Annex 2D, table 2.19. Similar advice is also in Northern Ireland Technical Handbook E, Table 4.1, and in Ireland this is covered in Technical Guidance document B – Fire Safety, Annex A, table A1.

European design standards, such as the Steel Design Eurocode EN 1993 series, are written and developed through the CEN process, to enable common language and terminology to be used throughout the European Union. However, individual national requirements can amend or clarify these points. Such Non-Contradictory Complimentary Information (NCCI) for a particular Country is placed in a National Annex to a standard, such as can be found in the UK National Annex referenced within BS EN 1993-1-2:2005.

The Eurocode document for the design of steel structures EN 1993-1-2:2005 contains a series of calculations in clause 4.2 that would be used to determine the fire resistance of a structural steel member and in particular how the critical failure temperature should be determined.

The Eurocode further describes how the properties of fire protection materials should be determined, in clause 3.4.3:-

“The properties of fire protection materials used in design should have been assessed using the test procedures given in ENV 13381-1, ENV 13381-2 or ENV 13381-4 as appropriate.

NOTE: These standards include a requirement that the fire protection materials should remain coherent and cohesive to their supports throughout the relevant fire exposure.”

The above text is currently under revision as it has not been updated since 2005. For instance, the EN 13381 series has been on-developed beyond this now, as ENV 13381-4 has been superseded by EN 13381-4 for passive structural fire protection materials and EN 13381-8 for reactive (intumescent) coatings. The choice of language in this statement is unusual, as “should” is not a recognised term in standardisation activities.

In addition to Building regulations recognising BS 476 based testing and assessment, the UK’s own national standard code of practice covering fire safety in the design, management and use of buildings (BS 9999:2017) also permits the use of BS 476 based testing in Paragraph 1 of clause 30.2.1.

In addition, it is worth highlighting that products which are tested to the structural fire resistance requirements of BS 476-21, and then subsequently assessed in accordance with the current 5th Edition of the ASFP’s Yellow book – Fire Protection for Structural Steel in buildings, will have been assessed to show that they meet the requirement of the note text from Eurocode EN 1993-1-2 Clause 3.4.3 above. Materials tested and assessed in this way will have been shown to demonstrate that they *“remain coherent and cohesive to their supports throughout the relevant fire exposure.”*

Therefore, as there are currently several national codes and guidance that continue to allow the use of a BS 476 tested product on a Eurocode designed steel frame in the UK and Ireland it is the position of the ASFP that this is an entirely acceptable practice.

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