

Defining the Scope of Fire Door Designs by Global Assessment – Technical Appraisal – Field of Application Reports

Doorsets required in the specialist custom-made specifier sector are not commodity stock items. Products are made to order: to meet particularly specified and emphasized requirements, individual features and aspects of performance. Those can apply typically for only a small number of bespoke doors, for just a special use or a particularly prestigious project.

A wide range of variations is possible, concerning varied aspects of design and various door configurations. Fire testing is a major cost. It isn't feasible, routinely practicable and viable, to test every possible variation that can arise. That is especially so when changes are relatively minor modifications - within a known field of test experience - which do not significantly impact on the essential design and construction aspects that fundamentally determine performance. Not every required variation on basic designs can be anticipated in advance.

Established practice is to define a proprietary portfolio of approved designs and door configurations, using available test experience and knowledge. That leads in turn to product specifications including itemised listings of approved materials and components, together with drawings, installation instructions and guidelines on recommended best practice.

Essential processes to determine an approved product portfolio

- Base Test Data

Comprehensive fire resistance testing of doorset systems is carried out to provide as wide a base of test data as possible, including the wide variety of different door configurations required by the market. Evidence and accumulated expertise are typically developed with continuity, year-on-year, by carrying out both formal tests and progressive R&D work on individual features of door design and construction.

It is an understanding of system performance that matters most, not simply recording the outcomes of individual tests. That comes crucially from appreciation of the practical limits and sensitivities that apply, from analysis of deterioration mechanisms and detailed observations of the outcomes from many fire resistance tests.

- Tried and Tested Components

Components are used which themselves have a test track record of their own in doorsets, carried out and validated for use by the responsible specialist component manufacturers in each case. Included are various types of door hardware, seals, glass and glazing systems, and door cores – all essentially part of a fire door system.

- Technical Judgments

Evaluations are carried out by independent technical organisations to objectively define limits of direct and extended application aspects of designs, with reference to the available set of relevant evidence. Those judgments are made as technical assessments with reference to principles and trade rules established from a wider knowledge of door systems and in recognition of accumulated trade know-how and test-based knowledge.

- Scope of Doorset Design

Approved scope of application and design formal documents are prepared by the independent technical organisations. These are variously referred to by different terms, essentially for the same purpose: i.e. *Global Assessment, Field of Application Report or Technical Appraisal*.

- Independent Third-Party Certification (TPC)

Test evidence and approvals are embedded in Third Party Certification, which has been developed by the industry primarily to provide additional assurance of both levels of performance and product consistency. If identified deficiencies are not put right, then certification can be suspended, then withdrawn.

Test data used as input to TPC and the depth of test evidence in the industry is extensively from BS 476 testing.

Doorset designs from the specialist timber door sector are fundamentally based on accumulated test evidence – from individual doorset approvals and R&D system testing, carried out over several decades.

- Test data comes from door manufacturers working within a field of test evidence and from door core manufacturers, who provide evidence to demonstrate and validate the doorset applications, configurations and designs that are appropriate for the cores they supply. Component manufacturers also provide further evidence from their own testing, undertaken separately to validate the use of their products in doorset systems.
- The approach is a collaborative and cooperative trade sector approach. It includes interaction and feedback loops that have served over time to provide a great deal of shared expertise and proprietary product developments.

The number of variations on basic designs requested by specifiers is typically very large, and many of those cannot practically be tested in all the various modifications that may be necessary to meet the market needs.

- Market applications require a wide range of door configurations: e.g. single and double doors, single and double action opening, latched/unlatched options, vision panels, top lights or flush over panels, side panels and glazed screens. Fire resistance performance is commonly 30 minutes integrity, also 60 minutes and longer times for special applications.
- It is common for specifications to require a combination of different performances in addition to fire resistance and smoke control, which may require difficult design and technical solutions to reconcile and accommodate potentially conflicting objectives. That can include, typically, security, acoustics and safety in use, involving ease of access, door opening and closing. Such considerations also influence the choice of door core and internal door constructions.

Some applications require individual provisions according to the application, such as hold open and release hardware, electronic opening/closing, letter plates, sight holes, locking and latching combinations.

- There is a variety of choice in alternative components provided by the supply chains, normal in a commercial open market - for all main components, including door edge and glazing seals, glass types, door frame materials and all door hardware. That includes imported components (which may not be produced to the same rigour as UK items).
- Design features for a particular “look” can be significant – e.g. special door furniture, various glazing layouts (specific pane sizes and arrangements), different door leaf surface and edge finishes for a distinctive style or visual effect.

Third Party Certification (TPC) is an essential part of the whole integrated process. It provides confidence in product consistency and reliability, including importantly transparency, identification and traceability.

- TPC includes quality assurance involving some key elements which are not provided by other systems (e.g. not covered by CE Marking). That includes scrutiny of test evidence and of factory control processes whilst the product is in the market, factory auditing and review of product performance - with repeat sample testing (typically every three years) of already tested doorsets, as well as consideration of new evidence from new tests.
- TPC also includes a provision to take additional audit samples from the market where there is reason to do so. Deficiencies are recorded by non-conformance reports, with appropriate corrective action. There is also checking of marketing to ensure information is in line with certification and rules governing use of the certification mark.

Technical test-based assessments are essential for the specialist timber fire door sector. The sector could not function effectively in meeting market requirements if assessments were not possible as currently established.

- Assessments are technical evaluations involving informed judgments, carried out by experienced individuals with the appropriate competencies, and importantly made with reference to applicable, appropriate and relevant test evidence.
- Judgments are also made with reference to the state-of-art and the latest information, with reference to established principles derived from past testing, experience of doors in use and expertise from development testing work over many years. That knowledge is effectively absorbed as specialist core trade knowledge, skills and know-how.

If the scope of technical assessments were to be limited or only carried out according to rigid and inflexible prescribed rules then specifier options, commercial choice and technical solutions would be very much closed down. The wide range of doorset designs required by specifiers could not be satisfied economically, as they are now. Design answers for complex applications for special purposes would not be possible. Technical solutions would be severely restricted.