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SMOKE SEALS FOR DOOR ASSEMBLIES WITH APPENDIX FOR SERVICE PENETRATIONS

1. SCOPE AND DEFINITION

1.1 Scope

1.1.1 This document sets out the general operating procedures, system performance, quality assurance and training requirements for the Certifire Australia Scheme for smoke seals for door assemblies.

1.1.2 At the time of writing the current edition of the BCA specifies requirements for smoke doors in Specification C3.1 Section 3. The deemed to satisfy solution prescribes smoke seals but does not clearly nominate performance level.

1.1.3 The programmed release of a performance based BCA in 1996 will increase the need for the performance of smoke seals to be quantified for use in fire safety engineered designs under a range of conditions.

1.1.4 Test methods have been developed to assess the performance of smoke seals under ambient and medium temperature conditions which have been published as international standards or draft international standards. These have been adopted as appropriate.

1.1.5 The Certifire Scheme requirements enable the performance of smoke seals to be expressed in quantitative terms to enable designers and specifiers to select appropriate systems. Advice is presented in Certifire Design Note 001 on the selection and use of smoke seals.

1.1.6 Reference should also be made to the following:

a) Certifire Australia procedures & regulations CA001.

b) Certifire Australia Quality Assessment Schedule (QAS) for Manufacturers / Suppliers and Installers CA002.

c) International Standard ISO CD 5925-1.

1.2 Definitions

Ambient temperature – For the purpose of this schedule ambient temperature is an air temperature of (25 + 15)°C.

Appraisal - In the context of the Certifire Scheme an appraisal is an assessment of a system against the requirements of the appropriate Certifire Schedules.

BCA - The current edition of the Building Code of Australia.

Certifire Schedule - A document setting out requirements and procedures of the Certifire Australia Schemes.

Certifire Scheme - A third party certification scheme for the purpose of listing suppliers and contractors which comply with the relevant Certifire Schedules.

Certifire Specification - A form of words for nominating the Certifire Schemes for building project.

Door assembly - A door assembly is an assembly comprising a fixed part (the door frame), one or more movable parts (the door leaves) and its hardware. The purpose of the door assembly is to allow or prevent access of persons and/or goods. The term hardware includes such items as hinges, latches, door handles, locks, keyholes (excluding keys), letter plates, sliding gear, closing devices, electrical wiring and any other items which may influence the performance of the assembly being tested.

High temperature - For the purpose of this schedule high temperature refers to the temperature regime prescribed in fire resistance test standards (eg AS1530.4-1990) which is given by the following relationship:

$T = T_o + 345\log_{10}(8t + 1)$

where t is the time in minutes

T_o is the initial temperature

typically 20°C

for t = 30 minutes T = 842°C

for t = 60 minutes T = 945°C

Leakage rate - The leakage rate is the rate of air flow, in cubic metres per hour, under specified pressure differential across a closed door corrected to normal temperature and pressure conditions.

Medium temperature - For the purpose of this schedule medium temperature is an average air temperature of (200 + 15)°C.

Pressure difference – Static pressure difference across a closed door created in the test to measure leakage. It is written as D *p* and expressed in Pascals (1 Pa = 1 N/m²).

Smoke control door - A smoke control door is a door assembly which has the additional function of restricting the passage of smoke, when in a closed position, to prescribed limits.

Smoke seal - A seal fitted to a door or shutter assembly to enhance its ability to prevent the spread of smoke.

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2. GENERAL OPERATING PROCEDURES

2.1 Introduction

2.1.1 The ability of smoke seals fitted to door assemblies are dependent on many factors. Typically these include:

- The type, size and method of construction of the doorsets to which they are fitted
- The pressure differential across the doorset
- The temperature of the smoke
- Hardware fitted to the doorset
- The status of the doorset

2.1.2 The effectiveness of the systems can be reduced by inadequate durability, installation and maintenance and/or the selection of a system for unsuitable applications (eg ambient temperature smoke seals in applications are required to resist hot smoke).

2.1.3 The objective of the Certifire Australia Scheme is to increase the likelihood that smoke seals when installed in buildings would be capable of achieving the design objectives. This is to be achieved through:

- The independent appraisal of products in a consistent manner against clearly defined performance requirements
- The appraisal of the competency and capability of smoke door installation contractors to install smoke containment systems correctly against documented standards
- Establishing minimum quality assurance requirements for smoke seal manufacturers and smoke door installation contractors, and undertake independent audits of manufacturers and installation contractors to monitor on-going compliance with these requirements
- The preparation of certificates defining the performance of smoke containment systems and the capabilities of smoke door installation contractors
- Clear, unambiguous labelling requirements for systems supplied and installed in accordance with the scheme

2.1.4 It is recognised that the size and type of project and geographic location of a site can influence the selection of an appropriate Certifire specification.

2.1.5 For most major building projects in Australia the standard Certifire specification should be nominated which requires Certifire listed products to be installed and maintained by Certifire listed contractors. This provides coverage by the Certifire Scheme in the supply and installation phases in a cost-effective manner and enables the installation to carry a Certifire label. An example of the Certifire label for smoke seals is shown in Appendix 2.

2.1.6 Other options under the Certifire Scheme are:

- Product only certification, and
- Independent site inspection

It should be recognised that product only certification does not provide any control over site installations and therefore should only be specified when installation by a Certifire contractor is impractical. Independent site inspection, if used in conjunction with a Certifire contractor, can provide additional control but also adds significantly to costs with only a marginal increase in quality control during the installation phase since an inspector will be unlikely to be on site at all times and cannot verify all details.

Independent site inspection will not be cost-effective for most applications. See Appendix 3 for examples of typical specifications for the Certifire Scheme.

2.1.7 The methods for smoke are given in section 3, the quality assurance level requirements for the manufacturers and suppliers of the systems are given in section 4, the competency/ training levels required for key personnel of contracting organisations installing and maintaining smoke containment systems are given in section 5, and the quality assessment requirements for contractors are given in section 6.

2.2 Compliance with Building Regulations

2.2.1 It is the intention that the Certifire Scheme will complement relevant building regulations by ensuring systems are in place to demonstrate compliance with relevant regulations.

2.2.2.1 The Building Code of Australia 1996 (BCA 96) allows building solutions which comply with the deemed-to-satisfy provisions, are equivalent to the deemed-to-satisfy provisions, or comply with the nominated performance requirements.

The deemed-to-satisfy provisions prescribe, among other things, fire resistance levels (FRLs) and smoke resistance properties required by certain construction elements in buildings. Certifire certificates can be used to check compliance with those provisions. However, when a building solution is to be assessed for either equivalence to the deemed-to-satisfy provisions, or for compliance with the performance requirements, data from Certifire certificates will need to be considered on a case-by-case basis.

2.2.3 For consistency with a performance based BCA the Schedule allows for the performance of smoke seals to be evaluated under a range of temperature/ pressure conditions, enabling appropriate seals to be selected.

2.2.4 If the building regulations and Certifire Scheme documents conflict, the building regulations must take priority, but the manufacturer or smoke door installation contractor must notify Certifire in writing of any variations from the scope of their certification required by the regulations.

2.2.5 In some instances the regulatory authority having jurisdiction may permit the installation of systems which lie outside the scope of the current Certifire listing. Under these circumstances the contractor must:

a) Not attach a Certifire label, or

b) If a Certifire label is to be applied, supply written proof to Certifire from the relevant regulatory authorities that the installation of 'approved' together with an appropriate fee to Certifire. Certifire will then maintain a file on the project so that any queries in the future can be answered.

2.3 Labelling and Log Books

2.3.1 The use of Certifire labels is strictly controlled to enable the status of an installation to be clearly identified.

2.3.2 The packaging of component parts and materials that form part of a Certifire listed system can incorporate the Certifire logo as indicated in Appendix 2 providing the scope of the appropriate Certifire certificates is clearly defined in the instructions supplied. The components of a system cannot be labelled prior to installation.

2.3.3 An installation can be labelled with an Certifire label if the installation complies with a current Certifire certificate and it has been installed by a Certifire listed fire protection contractor within the scope of the contractor's certification.

2.3.4 The Certifire labels are available from Certifire Pty. Ltd. in numbered batches. The smoke door installation contractor shall keep a register of the location of all Certifire labels that have been attached to installations.

2.3.5 A log book listing all smoke door installations must be supplied by the smoke door installation contractor to the building owner or representative. A copy must be retained by the contractor for a minimum of ten years. The log book shall include all details required by AS1905.1 together with a listing of all Certifire labels applied.

2.3.6 Copies of the Certifire Schedules and certificates relevant to the installation shall be attached to the log book. Members of the Certifire Scheme are granted permission to copy Certifire schedules specifically for this purpose.

3. CERTIFIRE REQUIREMENTS FOR DOORSET SMOKE SEALS

3.1 Building Regulations and Standards

3.1.1 Smoke seals for doorsets are to be appraised against the requirements of the current version of the Building Code of Australia, but should also provide sufficient data for selection of appropriate seals for a performance-based fire safety design.

3.1.2 For prescriptive fire safety designs, the BCA defines the requirements for smoke doors in specification C3.4 clause 3. These requirements are reproduced at Appendix 3.

In summary, the leaves of smoke doors are required to be capable of resisting smoke at 200oC for 30 minutes, and the leaves must be fitted with smoke seals so that smoke will not pass from one side of the doorway to the other.

A literal interpretation of the general requirements would require no leakage around the seals which is impossible to achieve with an operational door in service.

No test method for this evaluation is defined.

3.1.3 The medium temperature smoke test defined in ISO CD 5925-1 nominates a temperature of 200°C and is therefore utilised herein.

3.1.4 The over pressure the seals have to resist is not specified in the BCA. The following default values have therefore been nominated and should be used unless alternative values are justified by calculation:

Max. effective height in metres:	Over pressure in Pa:
12	25
25	50
>25	75

3.1.5 Limiting leakage rates of 15m³/hour at 25Pa, of 30m³/hour at 50Pand 45m³/hour at 75 Pa have been selected.

3.1.6 Under a performance based fire safety engineering design the performance requirements for smoke seals will be derived during the design process. Seals may be required to be resistant to ambient temperature, medium temperature or high temperature smoke at various design pressures.

3.1.7 Certifire Certificates will provide data on the performance of smoke seals under various temperature and pressure conditions suitable for use by designers, specifiers, approval authorities, etc.

3.2 Testing

Test evidence

3.2.1 Appraisals will be based on tests carried out generally in accordance with ISO/CD 5925-1 "Fire tests – smoke control door and shutter assemblies – Part 1 : Ambient and medium temperature leakage test procedure", and AS 1530.4 as appropriate, with the additional performance criteria and testing requirements for integrity as listed in BS 476.20, that is, the cotton wool pad test. This test will be used to judge whether excessive flow of products of combustion is likely to occur at high temperatures.

3.2.2.1 The appraisals will be based on test data from a testing authority registered by the National Association of Testing Authorities (NATA) to test in the relevant field, or

an organisation outside Australia recognised by NATA through a mutual recognition agreement, or

other organisations defined as Registered Testing Authorities in the BCA, or

for smoke seals only, a laboratory acceptable to Certifire Australia.

3.2.3 Fire tests carried out to standards other than current editions of those nominated above will only be used if confirmatory data (an opinion from a Registered Testing Authority) is available to demonstrate the continued applicability of the data and if the test methodology is sufficiently similar to those specified in the current editions.

Note: It is not the intention that all tests are required to be repeated as new editions of the standards are released. In many cases it may be acceptable for evidence from tests used to extend the range of application to also provide confirmatory data. It is important that Certifire is notified during the planning stages of such a test to ensure the test data will be acceptable. Where significant changes to a test methodology occur which necessitate further testing of existing Certifire systems a 'grace period' of 12 months will be permitted which will only be extended if further delays are justifiable. The 'grace period' does not apply to systems which have been demonstrated not to comply with the current Certifire specifications.

3.3 Variations from Tested Prototype

3.3.1 The appraisal will define the field of application for the system based on a prototype test, and assessments/opinions issued by a Registered Testing Authority complying with the technical requirements of this Schedule.

3.3.2 The certificate will list all test data and assessments which were used in the appraisal.

3.3.3 A Certifire label/mark must not be applied to any system which does not comply with the requirements of a current Certifire Certificate unless written proof from the relevant regulatory authorities that the installation is approved is lodged with Certifire together with a lodgement fee, and the system is installed by a Certifire listed fire protection contractor.

3.3.4 Certifire will then maintain a file on the project for a minimum of ten years so that any queries in the future can be answered.

3.4 Appraisals

3.4.1 Three alternative methods are available for the preparation of an appraisal for each system. These are given in clauses 5.2 to 5.4.

The simplest appraisal will be that of a single system without variations based on one test. The test data, and a specification of the test assembly, manufacturers installation instructions, and physical test data is submitted to Certifire for appraisal and preparation of a Certificate.

A manufacturer may submit a range of tests and opinions/assessments for variations from the tested prototype from registered testing authorities meeting the requirements of this schedule. The assessments/opinions must comply with the technical requirements of this Schedule.

3.4.2 In addition, drawings and specifications of the prototypes and variations together with manufacturer's installation instructions must be submitted with supplementary test data if appropriate (e.g. elasticity tests).

3.4.3 Certifire will then prepare an appraisal and Certificate for each system.

3.4.4 A manufacturer may obtain an appraisal against the relevant Certifire standards by a registered testing authority as defined in clause 3.2 of this Schedule. The appraisal, together with all supporting data, must be submitted for review by Certifire and a Certificate for each system issued.

3.5 Serviceability

3.5.1 The Certificate may include data on the durability/serviceability of a system.

3.5.2 A statement will be included on each certificate that the system should be selected to suit the particular environment or application.

3.6 Testing Procedures

Test specimen

3.6.1 The performance of smoke seals shall be evaluated by mounting them in a representative full size doorset. Appendix 2 contains a list of four general categories.

3.6.2 For doorsets of typical cellulosic design (Type C in Appendix 2) the following default test specimen is recommended for **single** leaf doorsets.

3.6.3 The leaf shall be an all-cellulosic leaf (Type C) (see Appendix 1) of between 800mm and 950mm width by between 2000mm and 2100mm high and at least 35mm thick, consisting of either a solid laminated softwood strip core or a softwood framed chipboard core, faced with plywood, hardboard or chipboard.

3.6.4 The frame shall be softwood or hardwood with no unsealed, 'through' joints at the corners, or of folded steel construction. Timber frames shall be provided with a 12mm deep timber door stop screw fixed at 300mm nominal centres. Steel frames shall provide a 12 mm stop framed by the steel section.

3.6.5 The frame jambs shall be fixed back to the test surround with no less than 4 fixings per jamb, the upper and lower fixings being no more than 150mm from the jamb ends. The head shall be fixed with at least a single, central fixing.

3.6.6 The threshold gap (between bottom of leaf edge and test frame member or threshold if fitted) shall be sealed in a manner that permits the leaf to move sufficiently to permit the door to break contact with the seal without causing the permissible resistance to closing forces to be exceeded.

3.6.7 The leaf shall be hung on 3 Nos (1½ pairs) hinges such that with no smoke seals fitted, the resistance to closing is not more than 2Nm when the threshold is sealed as described above. These may be fitted conventionally or may be fitted as hinges fixed on the face. In the latter case, use of the seals may be restricted.

3.6.8 If the assembly is being tested unlatched the opening stile and jamb shall be tested in one of the following conditions:

a) With a representative cover plate and striker plate

b) With a cover plate fitted which is of the following minimum dimensions:

Height 175mm

Width 25mm

together with a representative striker plate.

c) With the seal fitted in a manner that simulates the fitting of such components; eg by leaving gaps in the seal where it would be interrupted by such hardware.

d) With plain stiles and jambs free from ironmongery but the area may be restricted.

Note: For doorsets required to resist high temperature smoke the doorset should be latched.

3.6.9 If the seal is only suitable for fitting to unlatched doors, due to the resistance to closing figures being too high to accommodate the additional resistance of the latch that is to be fitted, or due to the size or shape of the sealing system, then the need to incorporate or simulate the ironmongery may be omitted but the Certifire Certificate will restrict the use of the system.

3.6.10 For doorsets of typical cellulosic design the following default test specimen is recommended for **double** leaf doorsets.

3.6.11 The leaf shall be an all-cellulosic leaf (Type C) between 800mm and 950mm wide by between 2000mm and 2100 high and at least 43mm thick consisting of either a solid laminated softwood strip core or a softwood framed chipboard core, faced with plywood, hardboard or chipboard.

3.6.12 The frame shall be softwood or hardwood with no unsealed, 'through' joints at the corners, or of folded steel construction.

3.6.13 The frame jambs shall be fixed back to the test surround with no less than 4 fixings per jamb, the upper and lower fixings being no more than 150mm from the jamb ends. The head shall be fixed with at least a single, central fixing.

3.6.14 The threshold gap between bottom of the leaf edge and test frame member (or threshold, if fitted) shall be sealed in a manner that permits the leaf to move sufficiently to demonstrate the seal's ability to tolerate movement without causing the permissible resistance to closing forces to be exceeded.

The leaf shall be hung on an adjustable top centre and bottom pivot and strap such that with no smoke seals fitted the resistance to closing is not more than 2Nm when the threshold is sealed as described above.

3.6.15 Whilst the door is tested unlatched many double leaf single acting doors are fitted with bolts and latches and some double acting doors are fitted with bolts and/or locks for security purposes.

3.6.16 It is recommended that the door assembly above be tested in one of the following conditions:

a) With a cover plate and striker plate, box keep and flush bolts (not engaged) of the size and type specified in the manufacturer's product data sheet

b) With a cover plate fitted which is of the following minimum dimensions:

Height 155mm

Width 25mm

together with an appropriate striker plate and keep as defined or specified for the product, and 2 No. flush bolts of the following minimum dimensions:

Height 225mm

Width 25mm

c) With the seal fitted in a manner that simulates the fitting of such components; eg by leaving gaps in the seal where it would be interrupted by such hardware.

3.6.17 If none of the above items are fitted because the seals are only designed for use on unlatched doors, or unsecured double acting doors, this will clearly be stated in the Certifire Certificate.

3.7 Physical Test Requirements - Ambient and Medium Temperature Seals

3.7.1 The following cyclic tests shall be performed prior to testing the seals for smoke leakage.

An assembly of the appropriate design when fitted with the seals to be Certifire approved shall be subjected to the following opening and closing cycles:

i) Single swing doors - through a minimum of 10° of opening for 100,000 cycles,

ii) Double swing doors - through an arc of at least 10° about the centre line of the assembly for 50,000 cycles.

3.7.2 At the end of the series the force required to fully close and latch the doorset (if a latch is fitted) must not exceed 20Nm at a distance of 700mm from the pivot centre when measured following reasonable cleaning and refurbishment of the test rig or its accessories. A closer should not be fitted during this test.

3.8 Testing Regimes

3.8.1 When testing seals fitted to the head, jambs and meeting stiles which are of similar construction, the sill should be sealed.

3.8.2 Similarly when testing threshold seals, the clearances around the meeting stiles, head and jambs should be sealed.

3.8.3 Separate certificates shall be issued for threshold seals but a single certificate will be issued for a seal which can be fitted to the head, jamb or meeting stiles provided it is of the same construction.

3.8.4 At the time of writing test procedures for measuring leakage at temperatures above 200°C have not been standardised.

3.8.5 As an interim measure high temperature smoke seals are needed to satisfy the following criteria:

- The seals must be capable of meeting the appropriate performance criteria for low and medium temperature smoke seals and have demonstrated their ability to limit the spread of smoke from the perimeter of a door leaf when subjected to a fire resistance test in accordance with AS1530.4- 1990
- The ability of the seal to limit the spread of hot smoke can be judged by the application of a cotton pad during the test period. If the pad is charred or ignited the seal will be assumed to have failed to prevent the spread of hot smoke in that particular door seal
- Seals for 30 minute hot smoke doors should be tested in solid core doorsets as described Clauses 3.6.2 and 3.6.3 as appropriate
- Where seals are required to resist hot smoke for longer than a 30 minute equivalent fire resistance test, they should be tested in proprietary fire resistant doorsets having appropriate fire resistance ratings and additionally, the testing requirements of AS1905.1 shall be satisfied.

4. CERTIFIRE QUALITY ASSURANCE REQUIREMENTS FOR MANUFACTURE AND SUPPLY OF SMOKE SEALS FOR FIRE DOORSETS

4.1 General Requirements

4.1.1 In addition to the requirements of this schedule, the Manufacturer must operate a quality system which complies with either:

a) AS/NZS/ISO9002; or

b) Certifire - Quality Assessment Schedule CA002

Note: It will eventually become a requirement for all manufacturers to comply with AS/NZS/ISO9002 and the Certifire Quality Assessment schedule will be phased out. The time of the phase out will be determined by the relevant sub-committee and Certifire Advisory Panel.

4.1.2 The quality system will be initially audited by Certifire. Annual audits are to be carried out by Certifire or by a JASANZ accredited independent organisation that will exchange information with Certifire where an AS3902 quality system is in operation.

4.1.3 Additional audits required to investigate complaints against a manufacturer are to be carried out by Certifire.

4.2 Specific Requirements for Smoke Seals General

4.2.1 A quality system for a manufacturer or supplier must specifically address the requirements given in the remainder of this section.

4.2.2 The materials and components that are supplied as smoke seals include:

- Intumescent strips in protective casings
- Wiping and compression seals
- Drop seals for thresholds

Specifications and instructions for manufacture

4.2.3 The quality system shall include documented specifications and manufacturing instructions for each type of component and assembly.

4.2.4 These specifications must be clearly referenced to:

a) The tested prototype, and

b) Where relevant any permissible variations supported by assessments from registered testing authorities, and

c) The Certifire certificate

4.2.5 The specification must accurately describe:

a) All materials used in the manufacture of a component material or assembly including tolerances, source and any performance requirements

b) Ordering details

c) Methods of storage

d) Tests and inspections and procedures in case of non-compliance

4.2.6 It is preferred that all materials and components are supplied and manufactured by companies under third party quality assurance schemes. However it is realised that in many instances this may be impractical. Under these circumstances greater emphasis shall be placed on sampling and testing materials.

Manufacture by third parties

4.2.7 Many systems are manufactured from materials whose properties may vary considerably and significantly affect the fire resistance performance of a system. It is therefore important that the Quality system monitors the sources and critical parameters of all materials to ensure that raw materials when compounded will meet fully the requirements of the performance specification of each product.

4.2.8 In some instances components may be delivered direct to site. Documented procedures shall be provided for the inspection under these circumstances. This may be carried out by the installer.

4.2.9 The manufacturing instructions shall describe all processes in detail together with inspection procedures. Manufacturing tolerances must be specified together with corrective actions if appropriate and rejection criteria.

Record system

4.2.10 The quality system shall be such that each batch or unit is identified by a unique number. A record should be kept of the batch number of materials/ components supplied by third parties.

4.2.11 All material and components used in the manufacture of a batch and inspections and tests during manufacture shall be identified on a file relating to the batch. Where materials are manufactured by a third party to a specification, a certificate of conformance must be obtained and a sample of each batch should be checked and tested following documented procedures.

4.2.12 The file on each batch must be retained for a minimum of ten years and be readily identified from the batch numbers marked on the components.

Packaging and instruction

4.2.13 The product and/or the packaging must be clearly marked with the product designation, batch number and storage conditions. The Certifire mark may be included in accordance with section 2.3 of this document. Details of the packaging must be submitted to Certifire for approval.

4.2.14 Fully documented instructions for the correct installation and use of a product shall be included with each sale. These instructions must be submitted to Certifire and will be referenced in the Certifire certificate.

4.2.15 Certifire must be notified prior to any modifications of the packaging or installation instructions and details must be submitted to Certifire for verification prior to publication and that any modifications required by Certifire are incorporated.

Technical services

4.2.16 There shall be documented procedures for consulting with and providing advice to customers on the performance and appropriate use of products.

4.2.17 The documented procedures shall clearly define the minimum training/ competency level requirements for technical advisers and identify the staff members having satisfied these requirements.

Note: A technical adviser should be able to satisfy the competency levels nominated in Section 5 for an installation inspector.

5. CONTRACTING ORGANISATION

5.1 Scope

5.1.1 This section defines the minimum training required by personnel involved in the installation and maintenance of smoke seals.

5.1.2 Competency based training methods are adopted with provision to recognise prior learning.

Reference should be also be made to the following related Certifire documents:

a) Provisional Certifire procedures & regulations CA001

b) Certifire - Supplier/Manufacturer QA specification CA002

c) Certifire - Schedule for fire doors CA011

5.1.3 Methods for the assessment of the competencies are given together with training requirements where appropriate. It should be noted that a level of competency can be attained by:

a) Prior knowledge

b) On-the-job training/in-house training

c) Formal training seminars

d) A combination of any of the above

5.2 Requirements

5.2.1 Reference should be made to section 5 of CA011 the schedule for fire doors for the competency requirements required by contractors installing smoke seals since installation would normally be carried out by the installer of the doorset.

5.2.2 In addition to the competencies listed in CA011 the detailer and inspector shall be able to select the appropriate smoke seals from a specification of the maximum permitted leakage rate and specify/identify correct installation methods.

6. CERTIFIRE QUALITY ASSURANCE REQUIREMENTS FOR FIRE PROTECTION CONTRACTORS

6.1 General Requirements

6.1.1 The installer must operate a quality system which complies with:

a) AS/NZS 1S09002, or

b) Certifire Quality Assessment schedule CA002

Note: It may become a requirement for all installers to comply with AS/NZS 1509002. The timing and decision to phase out the Certifire schedule CA002 will be determined by the relevant Certifire technical sub-committee and Certifire Advisory Panel.

6.1.2 The quality system will be initially audited by Certifire. Annual audits are to be carried out by Certifire or by an independent JASANZ accredited organisation that will exchange information with Certifire where an AS/NZS 1509002 quality system is in operation.

6.1.3 Additional audits required to investigate complaints against a manufacturer are to be carried out by Certifire.

6.2 Specific Requirements for the Installation of Smoke Seals

6.2.1 A quality system for an installation contractor must specifically address the requirements given in the remainder of this section.

Review of tender specifications, enquires and orders

6.2.2 All tender documents and orders shall be reviewed by suitably trained and competent personnel for:

a) Compliance with Certifire certificates relevant to the installation,

b) cCompliance with the requirements of the BCA, this Schedule and a performance specification,

c) The ability of the manufacturer to construct the door and deliver the doorset on time or fit the smoke seals on time

6.2.3 The review should include but not necessarily be limited to checks on:

a) Door size (height, width and thickness)

b) Wall type

c) Frame details

d) Finishes (facings/edge strips)

e) Door functions

f) Hardware requirements and suitability

g) FRL if high temperature smoke seals

h) Delivery date/availability of materials

6.2.4 Written procedures shall be provided initiating for corrective actions when a non-compliance is identified.

Specifications and instructions

6.2.5 Where the installer is also the manufacturer/supplier of the doorset, refer to clause 4.3 of CA011 for requirements for the specification and instruction for manufacture.

6.2.6 Where the installer of smoke seals is a separate entity to the manufacturer and installer of the door, the following procedures shall be incorporated in the quality system.

6.2.7 The quality system shall include documented specifications/methods for identifying the type of doorset and seal requirements.

6.2.8 It is preferred that all components for fire doors and smoke doorset are supplied and manufactured by companies under third party quality assurance schemes. However it is realised that in many instances this may be impractical. Under these circumstances greater emphasis shall be placed on inspection.

6.2.9 Documented procedures shall be provided for the inspection of components when delivered to site.

6.2.10 Documented procedures shall be provided for the installation, final inspection and labelling of the doorset.

6.2.11 Documented procedures shall define appropriate actions if nonconformances are identified.

Record system

6.2.12 The quality system shall be such that each smoke door is identified by a unique number from installation through inspection and subsequent maintenance of the seals.

6.2.13 All component batches used in the installation phase shall be identified on a file relating to the doorset.

6.2.14 The Certifire label number and manufacturers tag number required by this Specification should be attached to the doorset and be cross-referenced to the file relating to the doorset.

6.2.15 The location of the doorset and the project shall also be identified on the file.

6.2.16 The file must be retained for a minimum of ten years and be readily identified from the tag numbers attached to the doorset, or the project.

APPENDIX 1

LABELLING AND USE OF THE CERTIFIRE LOGO

A1.1 General

In order for an installation to be labelled with a Certifire label the system must comply with a current Certifire certificate which was current at the time of installation and be installed by a Certifire-listed contractor within the scope of the contractor's Certifire certificate.

Note: Labels required by AS1905.1 must also be fitted as appropriate.

A1.2 Labelling format

Certifire labels shall be obtained from Certifire Pty. Ltd. An example label is illustrated below.

Example of a Certifire label for smoke seals

CERTIFIRE AUSTRALIA **Tel: +61 3 9865 8644**	**Label Batch No. 001** This label has been attached by the Installation contractor to certify that the smoke seals have been installed by a Certifire-listed contractor in accordance with a current Certifire product certificate at the time of installation. See the Log Book for further details.
Contact the building contractor immediately if this system is damaged	

The label size will be 75mm x 25mm. [See note to A1.3]

A1.3 Location

The label shall be fitted in accordance with the requirements of AS 1905.1-1996. A tag should only be fitted to the active leaf of pairs of doorsets.

A1.4 Labelling methods

Certifire labels shall be mechanically fixed or bonded in such a manner that accidental removal would be unlikely to occur.

A1.5 Packaging and Promotional literature

When a Certifire certificate has been issued to a company (manufacturer/supplier and installer) the company is entitled to use the Certifire mark shown below on packaging and/or promotional literature provided:

a) The company may only use the mark or claim or imply certification in respect of products or services complying with the relevant performance, training and quality assessment schedules within the scope and limitations given in the certificate(s), and

b) Copies of all material containing reference to certification and Certifire are submitted to Certifire for verification prior to publication and that any modifications required by Certifire are incorporated.

APPENDIX 2

Within the series of Performance Assessment Schedules relating to the components which make up a fire resisting door assembly, it is sometimes necessary to sub- divide fire doors into different categories. These categories are given below:

Type C — Door leaves where all parts of the construction are of timber or other cellulosic material, eg flaxboard, chipboard, fibreboard etc, or leaves where inorganic or mineral based materials are surrounded by softwood or hardwood framing. The mineral based material may be in the form of a solid slab or as sub-facings either side of a void, with or without intermediate rails. The timber framing must be unprotected for not less than 40mm which includes any lipping. The framing may be reinforced by additional timber or similar material at the head or at lock blocks to produce a larger frame to support ironmongery.

Type I-O — Door leaves constructed primarily of inorganic, or mineral based materials where the surrounding frame of timber is less than 40mm wide, including any lippings.

Type H — Door leaves where a type 'C' door leaf, normally of all cellulosic construction is faced on both sides with an inorganic board or a rigid intumescent sheet material not less than 2mm thick, either as a facing or a sub-facing. This material will extend from leaf edge to leaf edge, excluding any lippings.

Type M — Door leaves where the facings or sub-facings are of a steel construction and where the edges are metal (excluding any seals fitted), including primarily glazed leaves where the structural leaf framing consist of metal sections.

APPENDIX 3

CERTIFIRE REQUIREMENTS FOR THE APPRAISAL OF SMOKE SEALING SYSTEMS

A1.1 At the time of publication, there were no clearly defined performance criteria in Australian Standards or the Building Regulations for smoke sealing or smoke stopping of service penetrations. The following criteria have therefore been adopted as a means of measuring the performance of smoke sealing of service penetrations for the Certifire Scheme.

A1.2 The system should be capable of providing an effective seal with a 75Pa differential pressure applied across the seal at ambient temperatures.

A1.3 Effective sealing may be demonstrated by the following method. Alternative procedures may be acceptable. Reference should be made to Certifire Pty. Ltd. if an alternative system is proposed.

a) Mount an enclosure over one side of the system. The enclosure should have internal linear dimensions in any direction no greater than 50% longer than the longest dimension of the seal or 200mm.

b) The enclosure should be airtight and sealed against the separating element.

c) The air pressure in the enclosure should be increased to a maximum of 85Pa and then sealed.

d) The over-pressure in the enclosure should be monitored for 10 minutes.

e) If the pressure does not drop below 50Pa during the 10 minute period an effective seal may be assumed in accordance with this procedure.

f) The above procedure must be performed under constant temperature and pressure conditions.

A1.4 A smoke seal must also achieve FRLs of at least the greater of

a) -/30/-, or

b) the FRL nominated for a particular application

In addition, no significant smoke release from the non-fire side of the specimen should be observed during the first 30 minutes of the fire test except for smoke release from the open ends of services which would normally be expected to discharge outside the building.

A1.5 For smoke sealing applications where no FRLs are specifically nominated fire test results on a single copper pipe may be applied to all single metallic services and a fire test on a cable may be applied to all similar single cable penetrations.

APPENDIX 4

EXTRACT OF BUILDING CODE OF AUSTRALIA SPECIFICATION C3.4

FIRE DOORS, SMOKE DOORS, FIRE WINDOWS AND SHUTTERS

" 3. SMOKE DOORS

3.1 General requirements

Smoke doors must be constructed so that smoke will not pass from one side of the doorway to the other and, if they are glazed, there is minimal danger of a person being injured by accidentally walking into them.

3.2 Construction deemed-to-satisfy

A smoke door of one or two leaves satisfies 3.1 if it is constructed as follows:

(a) The leaves are side-hung to swing:

(i) in the direction of egress; or

(ii) in both directions

(b) (i) The leaves are capable of resisting smoke at 200°C for 30 minutes

(ii) Solid-core leaves at least 35mm thick satisfy (I).

(c) The leaves are fitted with smoke seals.

(d) (i) The leaves are normally in the closed position; or

(ii) (A) The leaves are closed automatically with the automatic closing operation initiated by smoke detectors, installed in accordance with the relevant provisions of AS1670, located on each side of the doorway not more than 1.5m horizontal distance from the opening; and

(B) in the event of power failure to the door, the leaves fail-safe in the closed position.

(e) The leaves return to the fully closed position after each manual opening.

(f) Any glazing incorporated in the door complies with AS1288.

(g) (i) If a glazed panel is capable of being mistaken for an unobstructed exit, the presence of the glass must be identified by opaque construction.

(ii) An opaque mid-height band, mid-rail or crash bar satisfies (i)."