



AS 1682:2015

Fire and smoke dampers

Currently out for Public Comment

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Presentation Content

- PURPOSE OF REVISION
- KEY CHANGES TO THE 1990 EDITION
- CHANGES IN MORE DETAIL



PURPOSE OF REVISION

- The Fire Damper Standard is 25 years old
- Recent improvements in performance of fire & smoke dampers are not required by regulation
- 2 fire resistance test Standards have been published since 1990 — with no need to comply
- AS/NZS 1668.1 Smoke Damper specification is grossly over-conservative



PURPOSE OF REVISION

- Air dampers for smoke control systems are very loosely defined in AS/NZS 1668.1
- Faulty installation of fire dampers adds significant costs to construction & maintenance of buildings as well as increasing fire safety risk
- Over zealous inspection of fire & smoke dampers leads to unnecessary re-installation
- Fire dampers less than 75mm from slab above or 200 mm from another fire damper are defective!



BUT, WHY DO WE NEED STANDARDS?



- To add red tape to building regulations?
- To protect an already over-protected society?
- So I can make an income training the HVAC industry?

OR PERHAPS BECAUSE

- Ours is a multi-disciplinary industry needing varied engineering skills, applied to vastly different projects
- These skills are often only used once or twice a year
- Re-inventing the wheel on every job is not efficient



STANDARDS

WHAT THEY ARE & HOW THEY'RE MADE?

Standards provide knowledge distilled from the whole industry, to guide, not stifle, individual practitioner's ideas, so the community's expectations are met in the most time & cost-effective manner

USE PUBLIC COMMENT TO ADD YOUR EXPERTISE

<https://sapc.standards.org.au/sapc/public/listOpenCommentingPublication.action>

THE IDEAL AS 1682?

Duct openings in fire-resistant walls/floors (building elements) breach their Fire Resistance Level (FRL) so some sorts of devices are required to restore the FRL. We call these devices Fire & Smoke Dampers



THE IDEAL AS 1682

3. Fire & Smoke dampers must be:

- a) made to withstand likely fire conditions.
- b) suitable for installing in fire-resistant building elements & reliably protecting those elements.
- c) tested in the building element to demonstrate FRL (i.e: the whole system of wall/floor/damper)
- d) installed in exactly same way they were tested
- e) installed so they are accessible for routine inspection/maintenance



KEY CHANGES FROM THE 1990 EDITION

- Addition of Smoke Dampers & Air Dampers
- FRL performance based on high temperature leakage instead of visual observation
- Performance requirements now listed in tables, with “additional” and “optional” criteria for compliance with special project features or fire-engineering needs.
- Ambient temperature leakage rates for Fire Dampers are half those allowed previously



KEY CHANGES FROM THE 1990 EDITION

- Smoke Dampers no longer required to be Fire Dampers with tip seals – Aluminium OK.
- Smoke dampers may be installed up to 600mm from the face of the wall being protected.
- Manufacturers must produce installation instructions for Fire Tests. Then these become site installation instructions
- Wider range of breakaway joints now permitted



KEY CHANGES FROM THE 1990 EDITION

- Baseline Data must now be provided to owner/builder at time of commissioning
- More commissioning data required to demonstrate satisfactory installation



MORE DETAILS OF THE CHANGES

AS 1682 Part 1: Specification



AS 1682.1 – Specification

Sections 1 & 2

- **Clause 1.7**
 - Information required on label must link model number with Fire Test report
 - Label to be visible after installation, but if not possible, Model No. to be on “Installation Label”
- **Clause 2.1.5**
 - Intumescent damper manufacturers shall keep raw material property test records for 10 years.
- **Clause 2.3.3**
 - Specific clause on Ceiling Fire Dampers plus performance requirements in Table 2.2



AS 1682.1 – Specification

Section 2

- **Clauses 2.3.6 & 2.3.7**
 - Specific clauses on Air Dampers (ambient air or smoke exhaust 200°C & 300°C) plus performance requirements in Table 2.5
- **Clause 2.3.8**
 - Specific clause on Smoke Dampers plus performance requirements in Table 2.4
 - Performance to comply with tests in AS 1530.7
i.e: Not more than 100L/s per m² at 200°C

TABLE 2.4
PERFORMANCE REQUIREMENTS FOR SMOKE DAMPER

Performance criteria	Requirements	Comments
Air leakage	<p>Tested at 200 C, not greater than 100 L/s/m² at 300 Pa when tested in accordance with AS 1530.7 and ISO 10294-1</p> <p>For dampers with face area less than 0.5 m², not greater than 50 L/s at 300 Pa.</p>	Where maximum leakage rate is lower than required by this table, actual leakage performance may be incorporated in manufacturer's product data
Operation time	Travel time in either direction not greater than 30 s. under all conditions	The installed actuator should be capable of operating the damper against the design airflow. See Clause 3.2.9

TABLE 2.5
PERFORMANCE REQUIREMENTS FOR AIR DAMPER (SMOKE EXHAUST)

Performance criteria	Ambient temperature operation	Smoke exhaust	Comments
Operation		Capable of opening and closing after being exposed to temperatures of 200°C for 2 h or 300°C for 30 min (as per project specification).	See Notes 1, 2 and 3
Leakage	The maximum leakage rate through an air damper when closed, shall be nominated by the designer to suit the requirements of the project	The maximum leakage rate through an air damper when closed, shall be nominated by the designer to suit the requirements of the project	See Note 4



AS 1682.1 – Specification

Section 2

- **Tables 2.1, 2.2, 2.3, 2.4 & 2.5**
 - Nominate required performance criteria for each of the 5 damper types specified in this Standard:
 - Fire Dampers
 - Ceiling Fire Dampers
 - Combined Fire & Smoke Dampers
 - Smoke Dampers
 - Air Dampers
 - Some of these performance criteria are Mandatory, some are Additional & some Optional



TABLE 2.1
PERFORMANCE REQUIREMENTS FOR FIRE DAMPERS

Performance criteria	Requirements	Comments
FRL (structural adequacy)	Refer to Clause 2.3.1(b)	
FRL (integrity)	Equal or exceeding the FRL of the penetrated element in accordance with AS 1530.4 for fire damper and air transfer grille assemblies in ducts	
Time to closure during the fire test	In accordance with AS 1503.4 for fire damper and air transfer grille assemblies in ducts	
FRL (insulation)	Equal or exceeding the FRL (insulation failure criteria) of the penetrated element in accordance with the requirements of AS 1530.4 for fire damper and air transfer grille assemblies in ducts	This is an additional performance criteria required under certain installation conditions by AS 1682.2 or AS 1668.1. FRL (insulation) performance to be included in test reports (if tested)
Ambient temperature air leakage	Tested at ambient temperature, not greater than 100 L/s/m ² at 300 Pa. For dampers with face area less than 0.5 m ² , not greater than 50 L/s at 300 Pa, see Clause 3.2.6	Tested in accordance with direction indication, refer to Clause 1.7.4(d). This is an optional performance criterion that may be required by a project specification. Ambient temperature Air leakage performance to be included in Test Reports (if tested), and may be quoted in product data
Maximum velocity at which the damper will close	Product data shall include the maximum velocity at which damper closed when tested in tested in accordance with Clause 3.2.9	This is an optional performance criterion that may be required by a project specification. Maximum velocity closure performance to be included in Test Reports (if tested), and may be quoted in product data. Fire dampers which have not been subject to the maximum velocity test should only be installed with airflow in the direction nominated on the label



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AS 1682.1 – Specification

Sections 2 & 3

- **Clause 2.3.9**
 - How to comply with AS 5601 (Gas code) for gas shut-off switch operation when fire damper closes
- **Clause 3.2.1**
 - Manufacturer **MUST** provide Testing Authority with installation instructions for Fire Test. These instructions **MUST** be used for site installation.
- **Clause 3.2.2**
 - Minimum requirements for Installation Instructions



AS 1682.1 – Specification

Section 3

- **Clause 3.2.6**
 - Leakage test at ambient temperature, now 50% less leakage than previous Standard
 - This is an OPTIONAL test
- **Clause 3.2.8**
 - Mandatory guidance to Testing Authorities for testing previously tested Fire Damper in different wall types
- **Clause 3.2.9**
 - Airflow velocity test to demonstrate maximum velocity at which fire damper will close.
 - This is an OPTIONAL test



MORE DETAILS OF THE CHANGES

AS 1682 Part 2: Installation



AS 1682.2 – Installation

Sections 4 & 6

- **Clause 4.2**
 - Mandatory requirements for FRL Structural Adequacy of wall when fire dampers are installed closer than 200 mm apart in ducts emerging from a shaft wall.
 - Mandatory requirement for fire test or opinion when fire dampers are installed closer than 75 mm to wall or slab
- **Clause 6**
 - The principal requirement for installation is compliance with the Manufacturers Instructions
 - Fire dampers in slab must have FRL Insulation OR insulated duct OR Shaft



AS 1682.2 – Installation

Section 7

- **Clause 7.5**
 - For initial certification or annual assessment, Baseline Data SHALL be provided after fire & smoke dampers are commissioned.
 - Commissioning sheets are required. (Example in Appendix E)
- **Clause 7.6**
 - Fire & Smoke Damper installation labels required to identify party responsible for installation
 - If manufacturer's label not visible, make & model shall be recorded on installation label



AS 1682.2 – Installation Appendices A, B & C

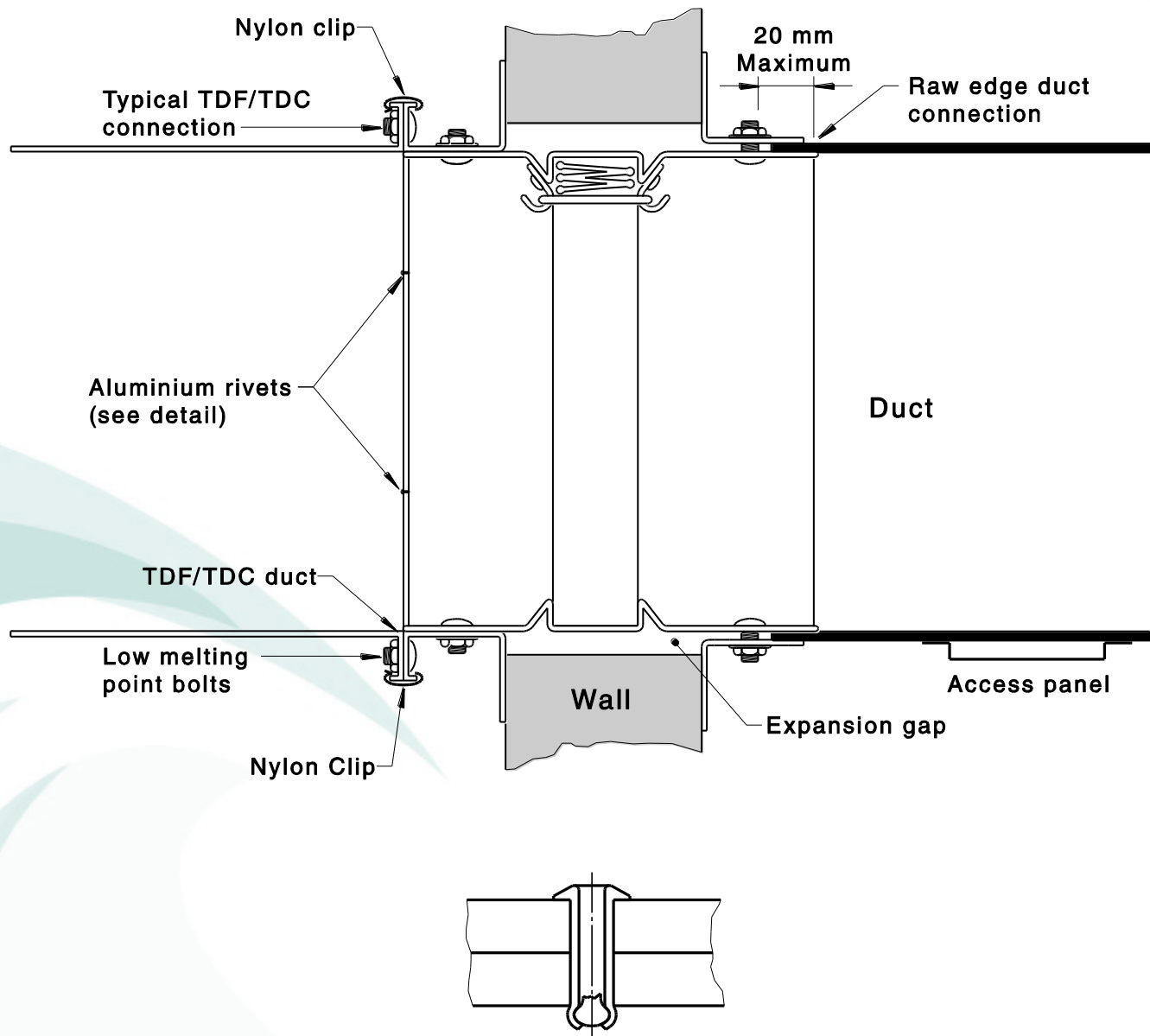
- **Appendix A**
 - Mandatory performance requirements for Fire Damper installation.
 - Allows reasoned judgement of installation compliance
- **Appendix B**
 - Mandatory performance requirements for Smoke Damper installation
 - Permits Smoke Damper installation not more than 600 mm from plane of wall



AS 1682.2 – Installation

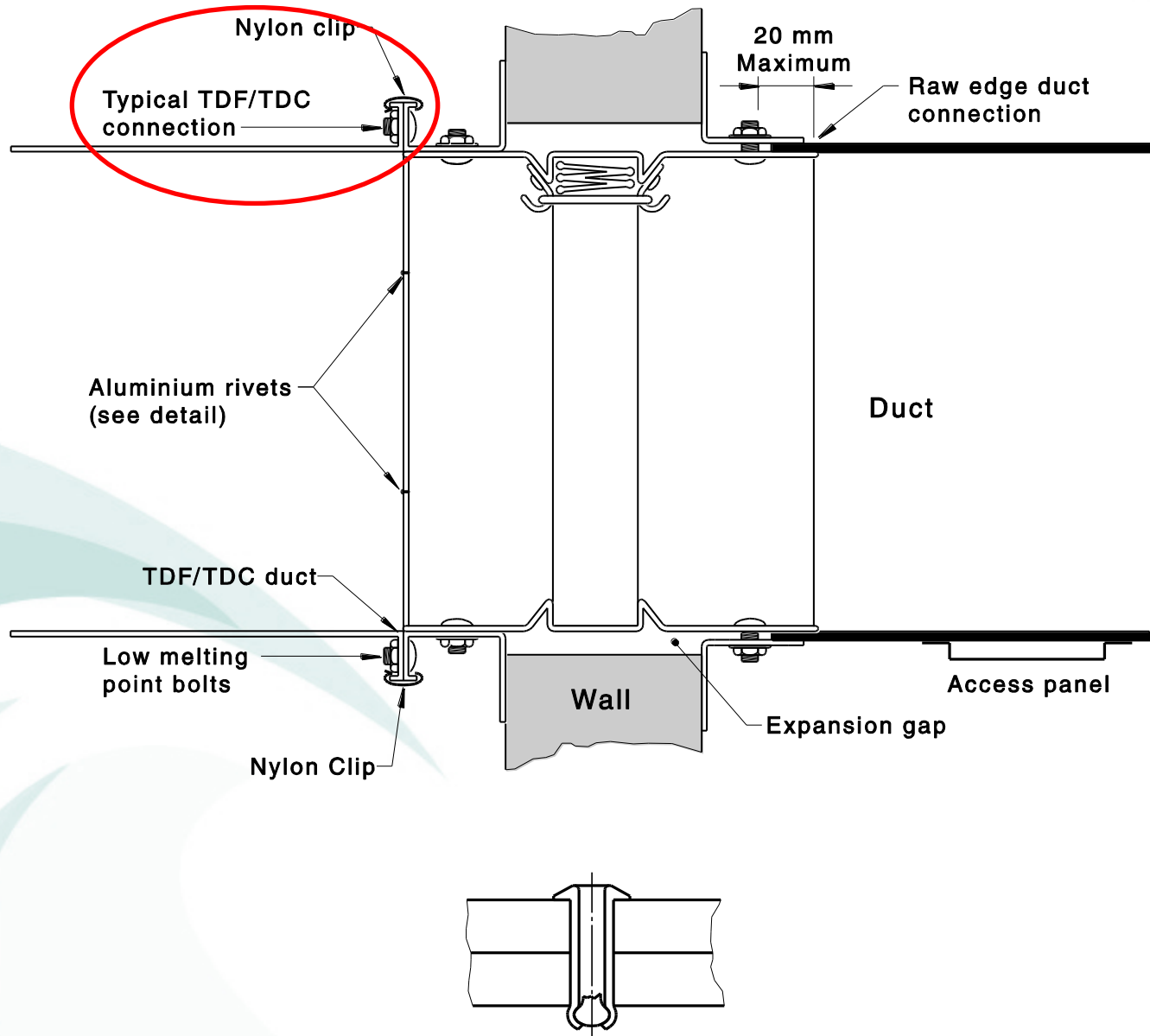
Appendix C

- **Appendix C**
 - Mandatory requirements for Breakaway Joints between duct and fire damper, expressed in both prescriptive and performance terms
 - Allows reasoned judgement of installation compliance
 - Notes that breakaway joint should also function at ambient temperature
 - Figure C1 shows examples of typical breakaway joints, including previously disallowed types:
 - Proprietary roll-formed flange connections w/- plastic cleats
 - Clamped raw edge (Not overtightened)



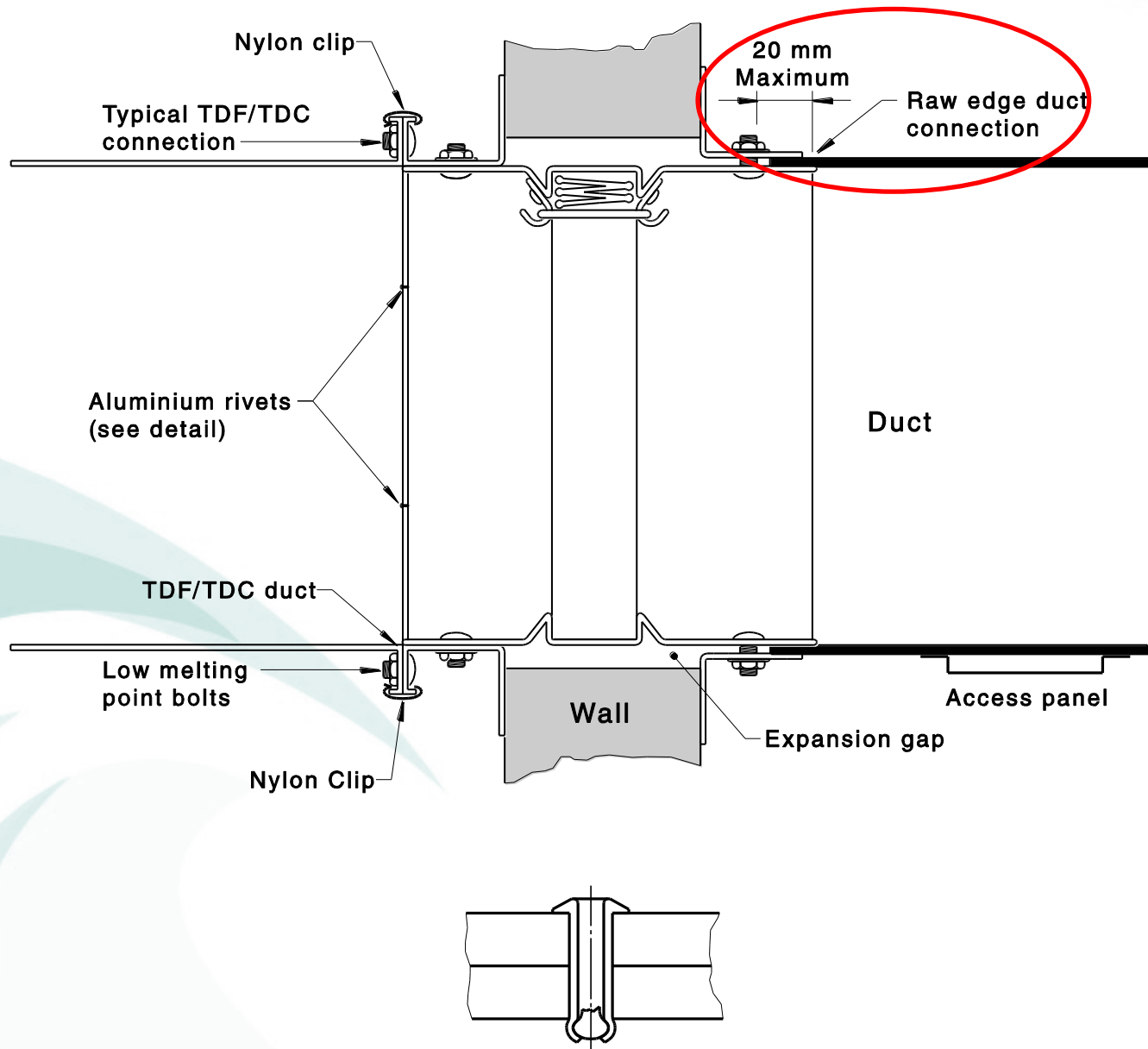
ALUMINIUM RIVET DETAIL

FIGURE C1 TYPICAL FIRE DAMPER BREAKAWAY CONNECTIONS



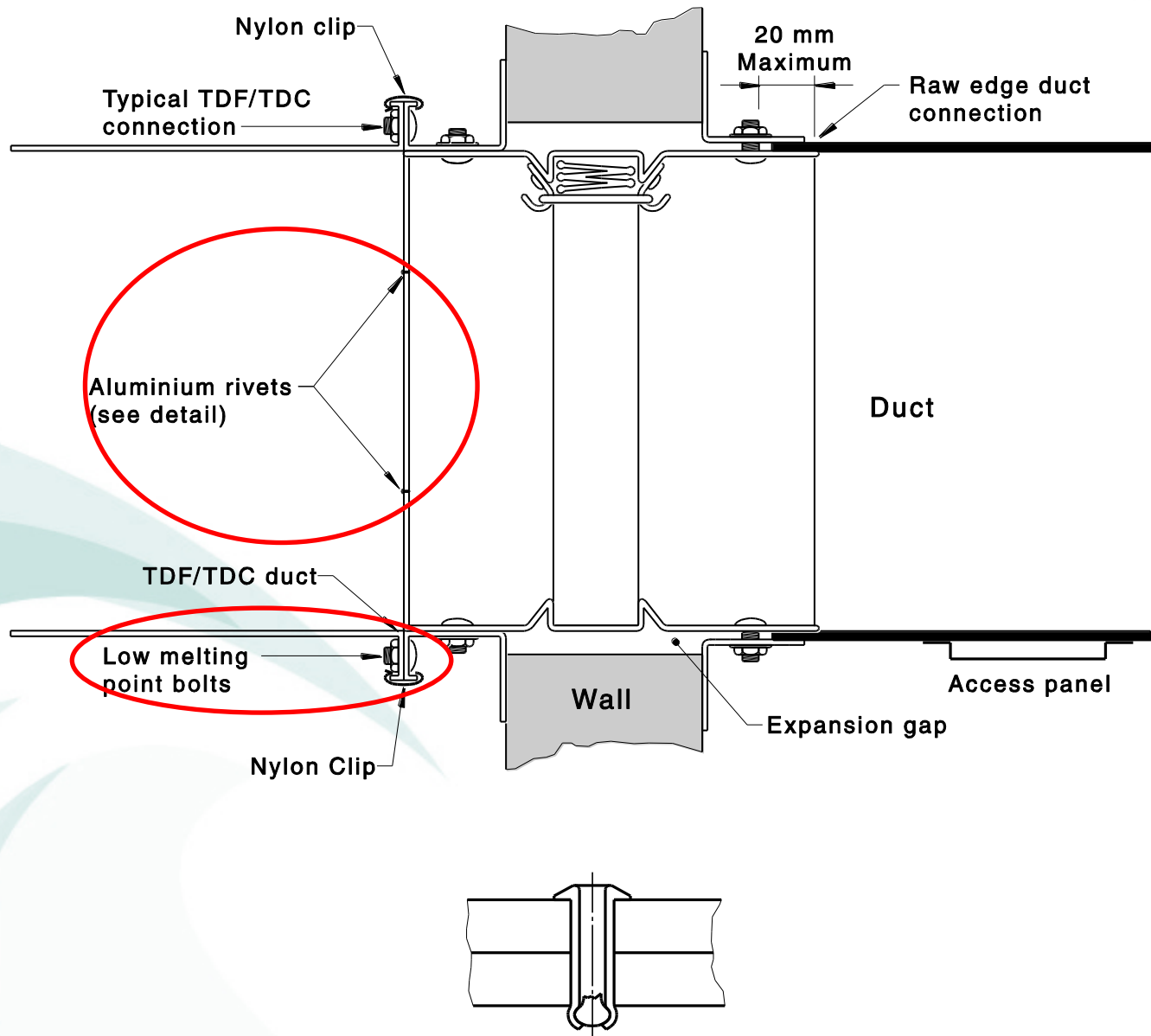
ALUMINIUM RIVET DETAIL

FIGURE C1 TYPICAL FIRE DAMPER BREAKAWAY CONNECTIONS



ALUMINIUM RIVET DETAIL

FIGURE C1 TYPICAL FIRE DAMPER BREAKAWAY CONNECTIONS



ALUMINIUM RIVET DETAIL

FIGURE C1 TYPICAL FIRE DAMPER BREAKAWAY CONNECTIONS



QUESTIONS ON THE FIRE & SMOKE DAMPER STANDARD?

**WHEN ALL PRESENTATIONS ARE
COMPLETED**