

**TECH BULLETIN 001
FRAME & FIRE DOOR
INSTALLATION AND
DEFECTS AVOIDANCE
GUIDE**

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INSTALLATION OF FIRE RESISTANT DOOR FRAMES

AS 1905.1 - 2015 covers the installation of a fire-resistant door set, including the door frame. Poor practices and lack of care can compromise fire resistance or necessitate expensive rectifications, indirectly increasing the overall cost of fire protection for the industry.

The frame shall be in wind (Example: 1)

Any frame that is out of wind is likely to compromise the fire door installation and may render the fire door set non-compliant.

The frame shall be backfilled to meet the requirements of AS 1530.4

AS 1530.4 requires the measurement of temperature rise on the fire door frame as well as the fire door itself when subject to the standard fire door test.

Consequently, the frame needs to be insulated to ensure it meets the temperature rise requirements.

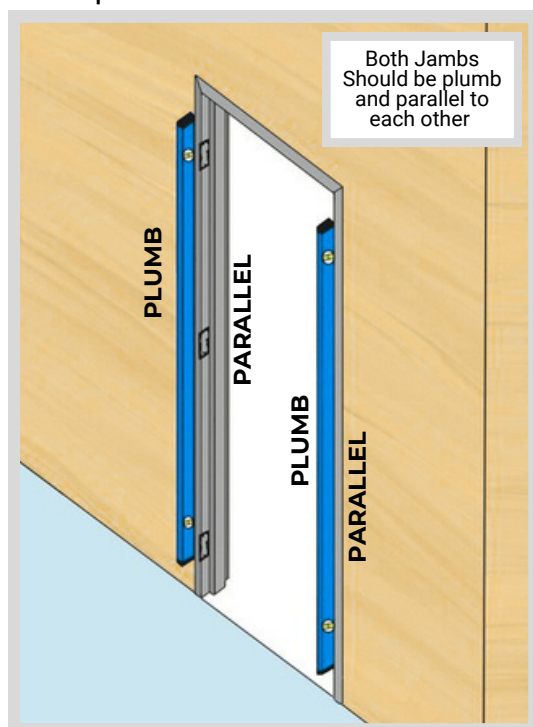
The frame shall be installed into an approved fire rated wall system

- Follow the frame back filling requirements
- Follow the installation instructions
- Follow the tested specimen fixing requirements
- Ensure your frame installer understands their responsibility

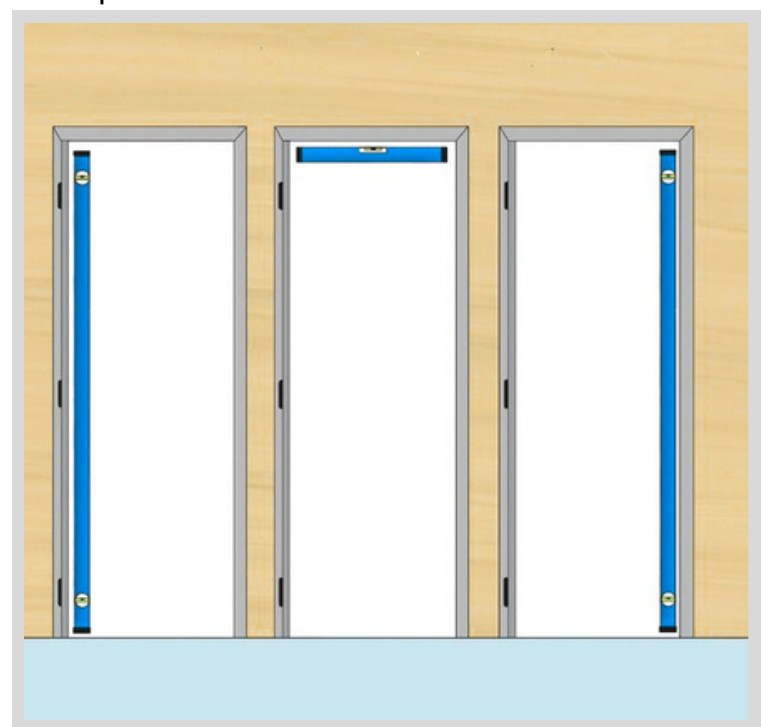
The frame jambs shall be installed plumb and parallel, the head of the frame shall be level and square (Example: 2)

The correct installation of a door frame is a critical part of ensuring compliance.

Example 1



Example 2



THE NON-COMBUSTIBLE THRESHOLD AROUND & UNDER FIRE RESISTANT DOOR SET

The Non-Combustible threshold under a Fire Resistant Door set

1) The floor surface, whether it is a non-combustible threshold or a floor covering, should be sufficiently flat and level. This ensures that when a fire-resistant door set is installed, it can operate without obstruction and maintain the required clearance when closed.

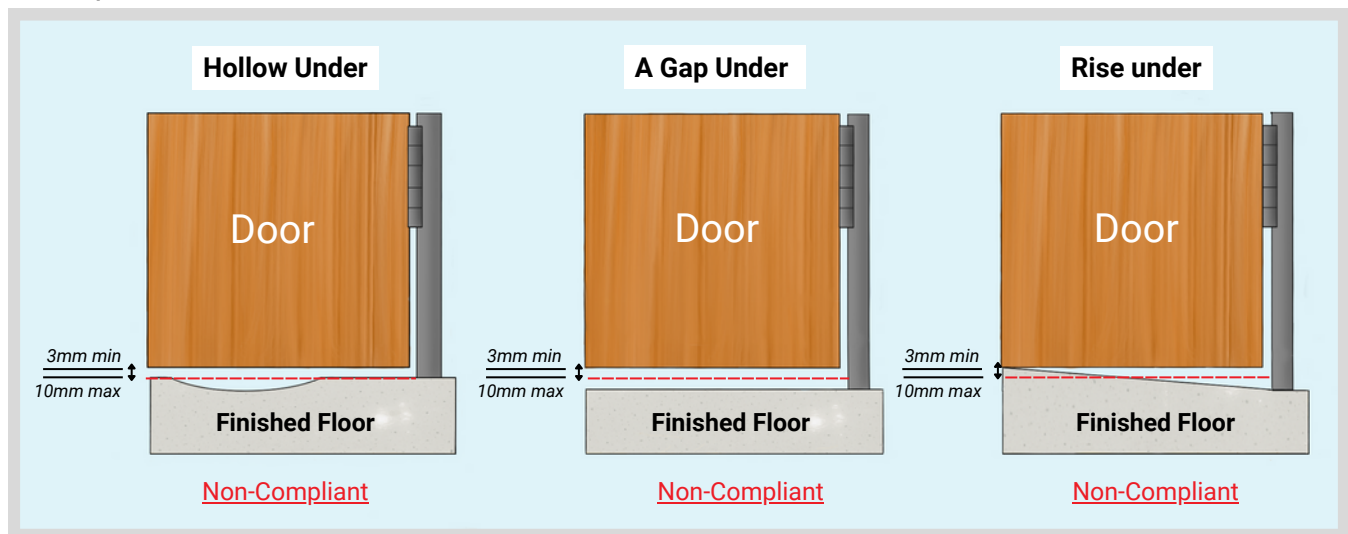
2) Lifting and levelling the top of fire rated door frames may leave a large gap under the door and frame jamb.

- Level the floor to enable compliance
- Consider the fire resistance required to be compliant

3) Any excessive hollows or bumps in the floor that could compromise the fire-resistant door set installation shall be rectified before certification.

- Level the hollow in the floor
- Level the floor between jambs
- Rectify the bump in the floor

Example 3



AUSTRALIAN STANDARD 1905.1: 2015 REQUIRES: SECTION 5 INSTALLATION: CLAUSE 5.5.1

Threshold and floor finish Clearances between the bottom of all door leaves and the floor shall be as follows:

- Between the leaf and the top surface of the floor including any floor covering - not less than **3 mm** and not more than **10 mm**.
- Between the leaf and the top of the non-combustible threshold - not more than **25 mm**.

NOTE: When the installed door set is inspected for compliance with Item (b), the clearance should not exceed **25 mm** for the purpose of certification unless a note providing information on clearances is made in the evidence of compliance.

CLEARANCE AS PER AS 1905.1-2015 AND AS1530.4-2014

The following extract from AS1905.1-2015 applies to certification of fire doors. (Example 1)

5.5.1 Threshold and floor finish

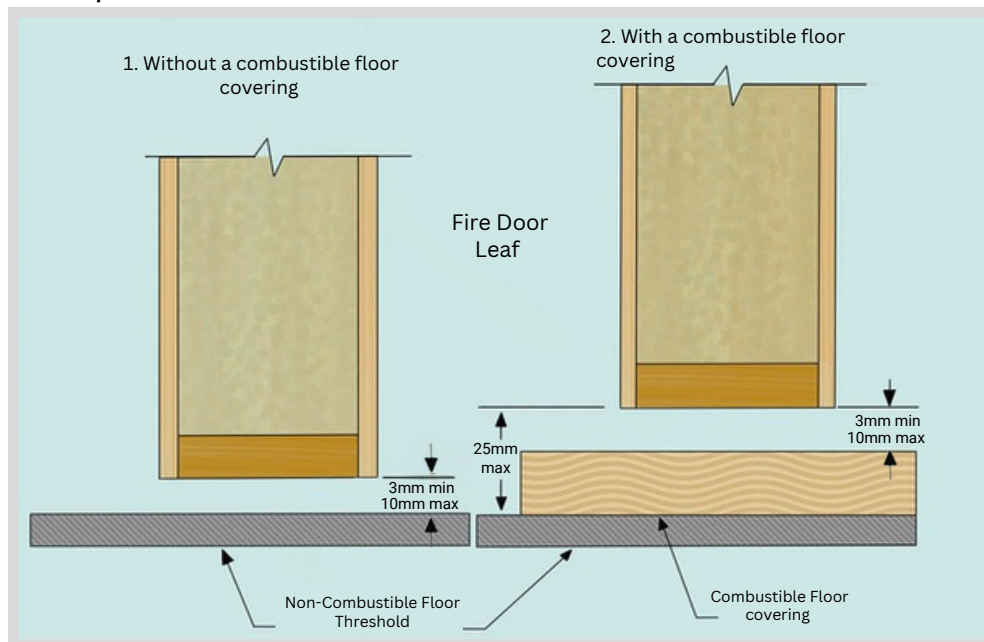
Clearances between the bottom of all door leaves and the floor shall be as follows:

A) Between the leaf and the top surface of the floor including any floor covering - not less than **3 mm** and not more than **10 mm**.

B) Between the leaf and the top of the non-combustible threshold - not more than **25 mm**.

NOTE: When the installed door set is inspected for compliance with Item (b), the clearance should not exceed **25 mm** for the purpose of certification unless a note providing information on clearances is made in the evidence of compliance.

Example 4



As per the following extract from AS1905.1-2015 the following applies to certification of fire doors.

5.5.2 Side-hung door, leaf-to-frame

Door leaves side-hung into rebated frames shall be installed to swing clear of the doorframe and shall have mean clearances, in the closed position, between the leaf and the head and between the leaf and each stile, of not more than **3 mm**.

NOTE: Measurements should be taken at intervals of not less than **750 mm** apart, and there should be a minimum of three measurements to each vertical edge of the leaf and two measurements on horizontal edge.

5.5.3 Side-hung door, leaf-to-doorstop

Door leaves side-hung into rebated frames shall be installed to swing clear of the door frame and shall have mean clearances, in the closed position, between the face of the leaf and the doorstop, not more than **3 mm**, and the maximum shall be not more than **5 mm** at any location.

It is imperative to enable the certification of fire doors, all frames must be no more than **1.5 mm** out of plumb if a batwing seal is used.

THE NON-COMBUSTIBLE THRESHOLD AROUND & UNDER FIRE RESISTANT DOORS

The Non-Combustible Threshold and floor finish within the door swing zone

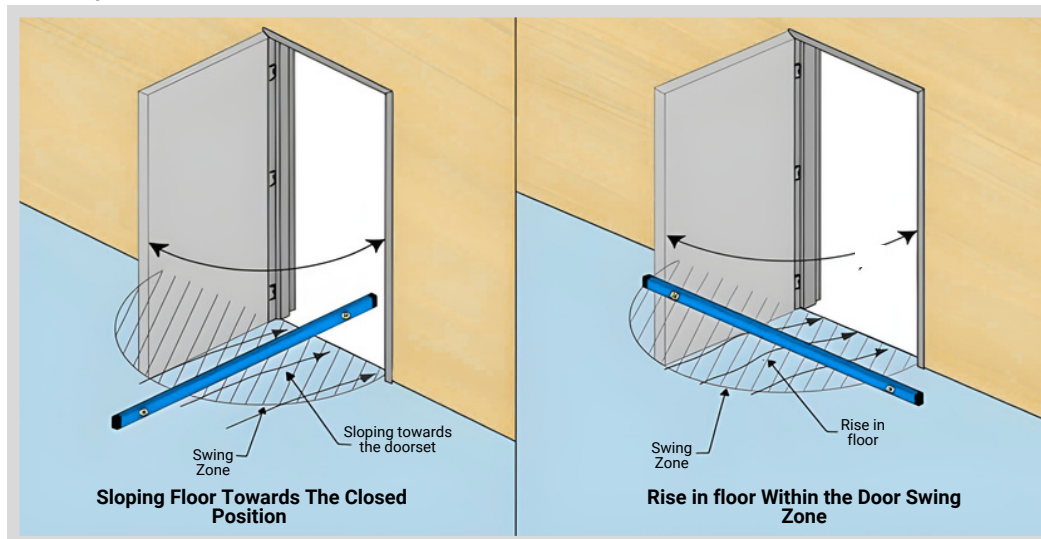
1) The floor surface, whether it is a non-combustible threshold or a floor covering, should be sufficiently flat and level. This ensures that a fire-resistant door set can operate smoothly without binding on any part of the floor within the door swing zone.

- Check for any bump or rise in the floor
- Check for any slope in the floor
- Uneven floors should be rectified by the trade responsible

2) Trimming the bottom of the door leaf to accommodate uneven floors could render the door non-compliant when in the closed position.

- Determine your options before you proceed

Example 5



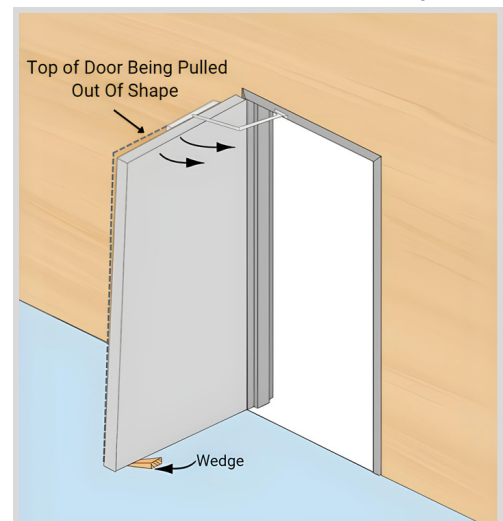
WEDGING OPEN A FIRE RESISTANT DOOR

Example 6

It is crucial to address poor practices that could compromise fire resistance or necessitate costly repairs, thereby indirectly increasing fire protection costs for the industry.

For example, wedging open a fire door with the door closer installed can cause damage to the fire door. In some cases, this damage cannot be repaired, necessitating the replacement of the door.

- Think about the protection of other trades works.
- Ensure everyone understands what damage could be caused



CHECKING FRAME FOR WIND

DOOR INSTALLATION

When installing a fire-rated door frame, it is critical to ensure the frame is "in wind." This means that both jambs of the frame must be aligned in the same plane, with no twist or distortion.

MAXIMUM ALLOWABLE DEVIATION:

The frame must not be more than **1.5 mm out of wind**. Any deviation beyond this limit can compromise the door set's performance and render the installation non-compliant.

HOW TO CHECK WIND:

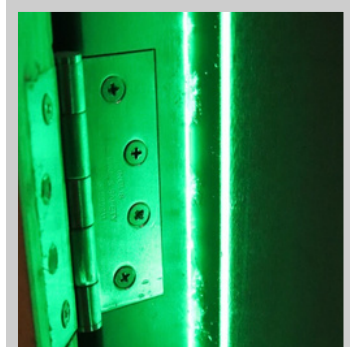
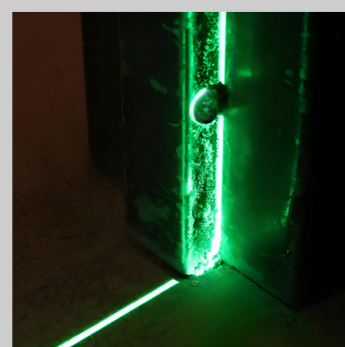
Laser Level:

Position a laser level so the laser line strikes both **25 mm door stops** on either jamb. Carefully observe the laser line from **top to bottom**—it must remain aligned with the door stops on both sides for the full height of the frame. Any variation or twist indicates the frame is out of wind. This method provides a precise and visual confirmation of alignment.

WHY IT MATTERS:

An out-of-wind frame may lead to:

- Face Gaps being non-compliant
- Certification failure



INSTALLATION INSTRUCTIONS

FIRE DOOR INSTALLATION

This following outlines the installation method to be used by door installers when installing Fire Doors.

PRE-INSTALLATION

- 1) Check that all hardware and fixings are on hand and compliant.
- 2) Ensure the latest revision of the door schedule is being used and the door is correct for the opening.
- 3) Measure your reveal height and width to check if the doors will fit into the opening.
- 4) Check if the frame is installed correctly and its installation will not cause the fire door to be non-compliant.
- 5) Check hinges are well secured and there is sufficient quantity.

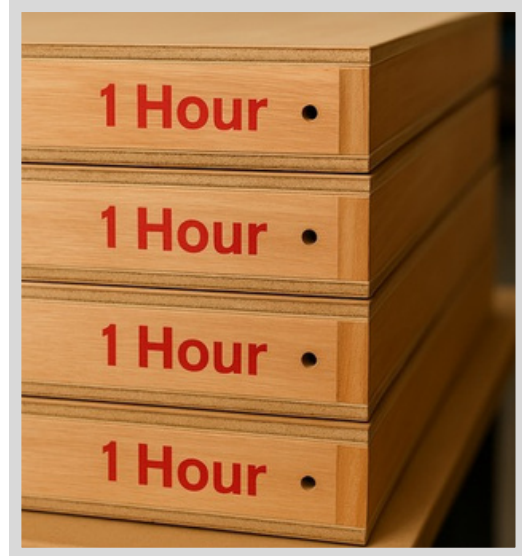
DOOR INSTALLATION

- 1) The door manufacturer's marking will identify the hinge and lock side (marked top hinge together with pilot hole identifier). Mark the doors on the top face hinge side. Mark 'top hinge corner' (**see Image 1**). You can also confirm by using a magnet to locate the steel reinforcing for hinges and closer. (**see Image 2**).
- 2) Open the hinges then place door leaf in the frame.
- 3) Scribe the door with a **2.5mm** spacer.
- 4) Machine door to scribed marks and finish by planing a minimum **2mm** splay or "Back edge". The back edge will ensure the closing door edge does not bind on the frame. (**Example: 1**)
- 5) Use a sharp chisel or trimmer to cut the check out for the door hinges. Remove the hinges from the frame and drill/screw them onto the door.
- 6) Turn door end on end and plane the lock side. The lock side will require a **2mm** splay or "Back edge".
- 7) Sand edges and paint top and bottom of the door.
- 8) Hang the door onto the door frame and check door swing.
- 9) Fit the nominated door hardware as per the manufacturer's installation instructions.
- 10) Installation clearances shall be as per AS1905.1-2015
- 11) Prime top and bottom of the door and under hardware in accordance with manufacturers requirements.

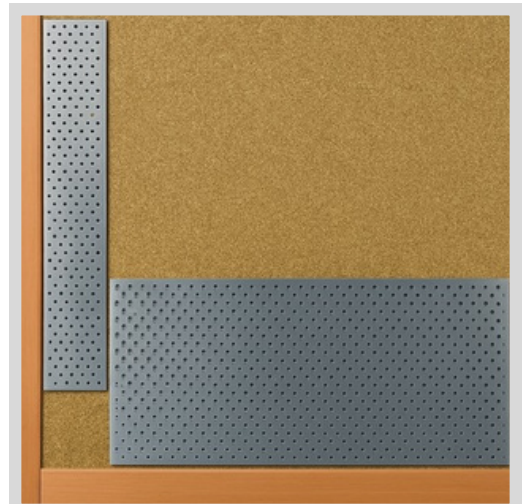
ADDITIONAL STEPS FOR PAIRS (DOUBLES)

- 1) Repeat process for second leaf ensuring correct gap for meeting stile.
- 2) Fit the nominated door hardware as per the manufacturers installation instructions.
- 3) Ensure intumescent seals are secured into the groove within the aluminum meeting stiles.
- 4) Fit aluminum meeting stiles with 10 gauge self drilling screws.
- 5) Where required, insert and secure smoke seals to each door leaf meeting stile.

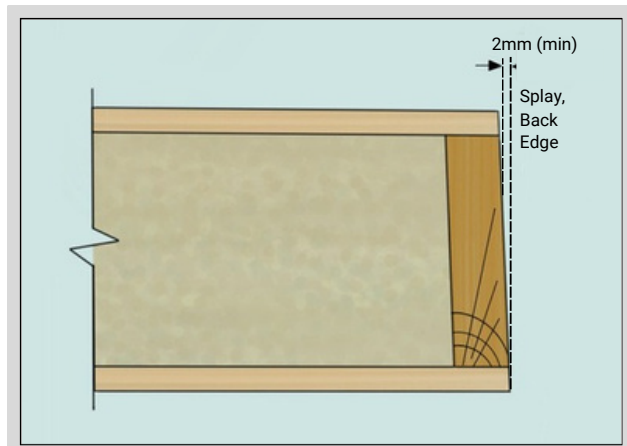
IMAGE 1: TOP HINGE CORNER



**IMAGE 2: STEEL
REINFORCING FOR HINGES
AND CLOSER.**

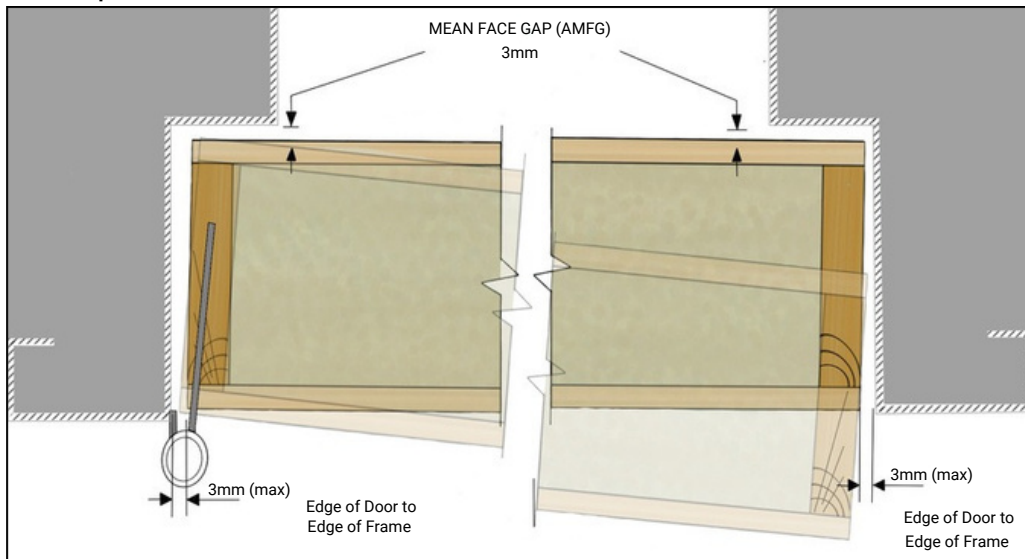


**EXAMPLE 7: 2MM SPLAY
OR "BACK EDGE"**



CLEARANCE AS PER AS 1905.1-2015 AND AS1530.4-2014

Example 8



SIDE-HUNG DOOR, LEAF-TO-DOORSTOP

Example 8

Door leaves side-hung into rebated frames shall be installed to swing clear of the door frame and shall have mean clearances, in the closed position, between the face of the leaf and the doorstop, not more than **3 mm**, and the maximum shall be not more than **5 mm** at any location.

SIDE-HUNG DOOR, LEAF-TO-FRAME

Example 8

Door leaves side-hung into rebated frames shall be installed to swing clear of the door frame and shall have mean clearances, in the closed position, between the leaf and the head and between the leaf and each stile, of not more than **3 mm**.

DOUBLE-ACTING DOOR SETS

Clearances between the edges of the door leaf and the wall, floor, head and frame shall not exceed the clearances as tested or assessed.

GAP CLEARANCES FOR CERTIFICATION WILL BE ASSESSED BY THE FOLLOWING METHODS:

SIDE- HUNG LEAF TO FRAME

Measurements shall be taken at intervals of not less than 750 mm apart, and there will be a minimum of three measurements to each vertical edge of the leaf and two measurements on horizontal edge to achieve a mean clearance.

SIDE - HUNG LEAF TO DOORSTOP

Measure the face gap at multiple points along the perimeter of the fire door. Common points to include the top, bottom and sides of the doors ensuring the measurements are at regular intervals to ensure a comprehensive data set to achieve a mean clearance.

FRAME INSTALLED ON UNEVEN FLOORS

The method of installation of any fire resistant door set (including fixing of metal doorframes) shall:

- a) be as the tested specimen; or
- b) be a permissible variation to the tested specimen as specified in 1530.4; or
- c) Be a permissible variation as specified in section 4 of this standard and:
- d) meet the requirements of this section

Due to the unevenness of concrete floor the frames are installed so the top of the frames are all at the same level. This can lead to frame sitting off the concrete up to **15 mm**.

This is not as per (a) in the above extract.

To rectify this please ensure all frames are correctly supported with non shrink structural grout installed under the frame.

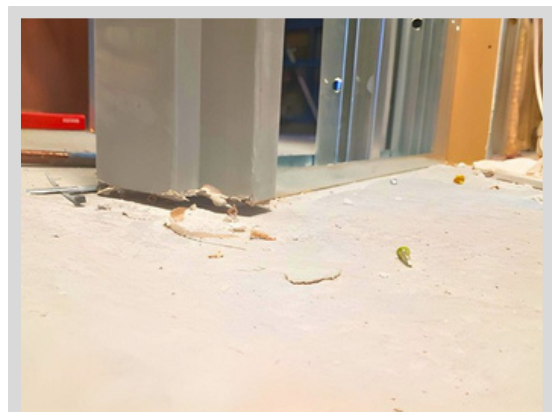
As observed on several building sites there is no support installed under the frame. They are held in position by the stud screwed to the metal straps in the back of the frame.

After the door is installed there is the potential for the frame to drop on the hinge side **2 mm** to **4 mm**. This in turn creates a **5mm** to **7mm** gap between the top of the door and the head of the frame on the lock side.

- The top margin on the hinge side of the door may close up to **2 mm**.
- The margins on the sides of the door remain at **3 mm**.

As per AS1905.1-2015 fire rated doors are only able to be certified with a **3 mm** margin.

This may also result in the lock falling below the striker and the door not latching. Any frame that has been identified on site without adequate support, will not have a door installed until it has been rectified.



RECOMMENDED FRAME INSTALLATION

The following extract from AS1905.1-2015 applies to certification of fire doors.

Step 1: Install Bottom Track

Bottom track is installed as one section through the door opening.



Step 2: Cut Track & Install Frame

Track is cut away and the frame is installed.



Step 3: Check Frame For Plumb

The frame is checked for plumb by the partition contractor and signed off as correctly installed. A Spirit, Digital or laser level is used.

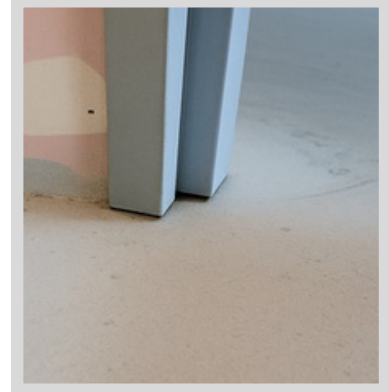


RECOMMENDED FRAME INSTALLATION

The following extract from AS1905.1-2015 applies to certification of fire doors.

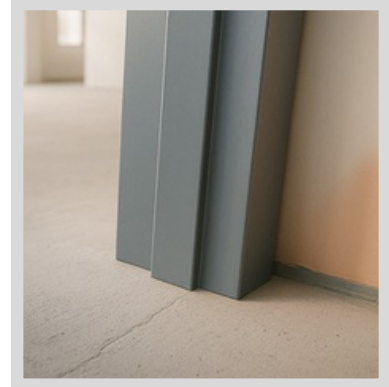
Step 4: Install Frame

The frames are installed with the head of the frames at the same level. This generally leaves a gap under the stile of the frame. The stiles need to be supported with packing.



Step 5: Apply Floor Compound

The threshold is topped with floor level compound around and under the stiles to lock the frame into position. This will also help prevent the frame from dropping when the door is installed. This should be done on the same day the frames are signed off.



Step 6: Measure Threshold

The Frame is now ready for measuring. The substrate level of the threshold allows a finished height to be calculated. The doors can be measured and ordered.

NOTES

This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.