



MEASURING DOOR CLEARANCES ON SIDE HUNG FIRE RATED DOOR SETS

Guidance Note GN 01

Measuring door clearances on Side Hung Fire Rated door sets

Purpose:	To provide guidance from industry on how to measure door gaps on hinged fire rated doors-sets.
Relevant Standards:	AS 1905.1
Audience:	Building managers, door inspectors, door installers, building surveyors, Building Certifiers, door frame installers.

Excessive door clearances are one of the most common causes of non-compliance of installed fire doors. Maintaining door gaps within the required limits specified by AS1905.1 is one of the most preventative measures you can do to ensure your fire door will perform as required.

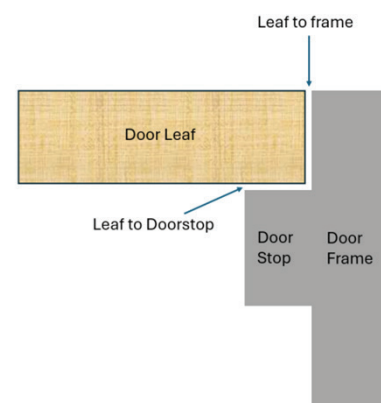
All doors require clearances between the door frame and the edge of the door to enable it to operate as a door. The gap between the edge of the door and the door frame is also one of the most prominent areas of failure in the event of a fire. By not maintaining clearances as per the limits specified in AS 1905.1, the door could fail prematurely allowing fire to spread from one compartment to another.

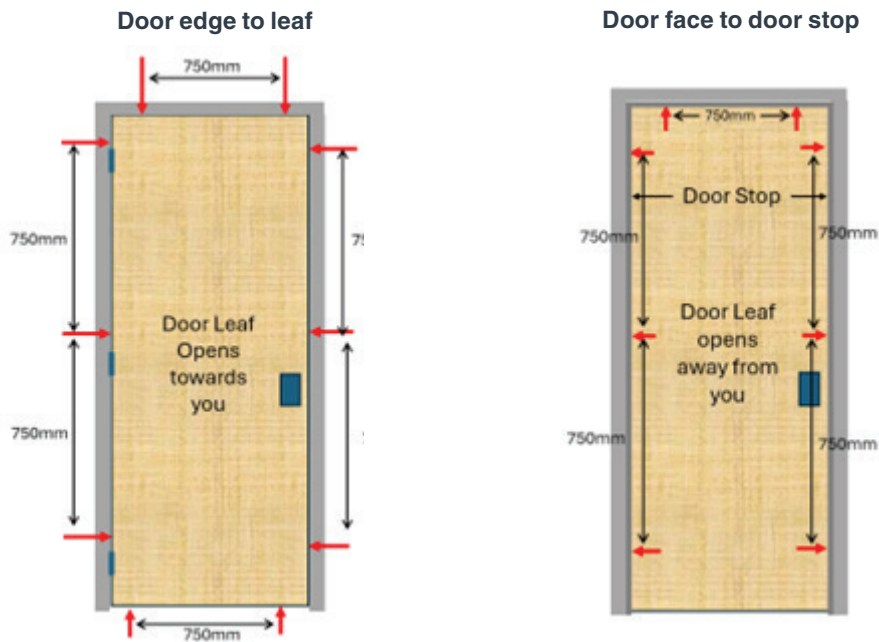
There are three types of clearances applicable to fire rated door sets that are required to be measured and maintained within prescribed limits.

CLEARANCES APPLICABLE TO FIRE RATED DOOR SETS			
Clearance Type	Relevant Clause AS 1905.1	Tolerances	Minimum number of equally spaced measurement points
Leaf to door frame	5.5.2	Average of not more than 3mm	3 per vertical edge 2 for top edge
Leaf to door stop	5.5.3	Average of not more than 3mm and not more than 5mm at any location	Recommended to be measured in one plane 3 per vertical edge 2 for top edge
Leaf to floor	5.5.1	Not less than 3mm and not more than 10mm	At any location

When taking measurements, it is important to measure the whole door. AS 1530.4 Methods for fire tests on building materials components and structures clause 7.2.6 requires sufficient measurements which shall be not less than 750mm apart and a minimum of 3 measurements to each vertical edge of the leaf.

It is recommended that for the horizontal edges, 2 measurements should be taken at the $\frac{1}{4}$ and $\frac{3}{4}$ positions as shown in the pictures below. For larger doors such as double door sets, more measurements should be taken at least 750mm apart.





Accuracy of measurement. Both AS 1530.4 and AS 1905.1 are consistent with the requirement to measure to an accuracy not exceeding +/- 0.5mm.

More than the minimum number of measurements can be taken, conditional upon the distance between the measurements is consistent and evenly spaced around the perimeter of the door to avoid a bias of results.

Calculating the mean: Total the clearance gaps and divide by the number of measurements taken. It is suggested to record the results in a table like this:

CLEARANCES APPLICABLE TO FIRE RATED DOOR SETS					
Measurement	Leaf edge to frame Hinge side	Leaf edge to frame Lock side	Leaf edge to frame Top	Leaf edge to frame Bottom	Leaf face to door stop
1					
2					
3					
4					
5					
6					
7					
8					
Average					
Requirement	Average is 3mm or less	Average is 3mm or less	Average is 3mm or less	Not less than 3mm and not more than 10mm	Average not more than 3mm and no measurement greater than 5mm
Compliant Yes or No					

Additional notes:

Door leaves are made to precision measurements and usually supplied to a predetermined size. At times, door leaves are trimmed to fit inside a door frame that has either moved or was not installed squarely and to the correct size.

Over time, a combination of both building element movement and door hinge deflection, can cause door clearances to change, requiring some remedial repair, such as installation of an aftermarket (and properly fire tested) intumescent gap sealer to the door frame.

It is recommended to door installers to take accurate measurements of the door frame to confirm its dimensional accuracy in four areas noted below:

1. Reveal height and width
2. Reveal squareness (are the angles of the door frame square [i.e. 90 degrees] or is it an oblong shape)
3. Frame being TRUE, i.e. it is square on both level and plumb to allow a door leaf to be installed so it touches the door stop equally on all three edges. If a frame is not true, then the door will need to be installed to best fit the opening and gaps between the doorstop and leaf face. A door leaf cannot be bent to accommodate an out of true frame.
4. Level of floor for the opening arc of the door leaf (floors are not always level and to open the door may require additional trimming to the door bottom to accommodate the arc of the door swing)

The availability of laser line marking makes the measurement of frame trueness and floor level relatively quick and easy, however it is important to read the same side of the laser line as these can be more than 1mm thick at times. The use of a plumb bob with a string line running the full height of the door frame is also a well proven method.

Installing doors in frames that are not TRUE is difficult. Most door manufacturers can image and supply a bespoke door to be installed in a door frame that is not square and with uneven frame jambs, however supplying a door to perfectly fit into a frame that twisted is not possible and this will directly translate to gaps between the door face and door stop, effecting longevity, acoustic and fire performance. During manufacture, transport and storage, every effort should be made to ensure that both door frames and leaves are fully supported and in a dry area to avoid bowing or twisting.

www.fdaa.au

