

**Acoustics**

This section includes a detailed guide to what sound attenuation is and how to attain the optimum performance.

Included are product brochures from the following **Strebord** partners:

**Norsound Ltd**

**Lorient Ltd**

**Sealed Tight Solutions Ltd**

**Fire and Acoustic Seals Ltd**

**Dixon International Group** - Consisting of  
**Sealmaster**

**Ventura**

**Intumescent Seals Ltd**



## Acoustics Explained:

This introduction attempts to simplify what is an extremely complex subject. Where acoustic considerations are critical, reference should be made to qualified Acoustic Engineers.

'Acoustic' is a term that is used loosely in connection with doorsets. When considering the 'acoustics' of a room or space, acoustics relates to a number of considerations.

When sound is generated, the 'loudness' refers to sound pressure which is expressed in decibels 'dB'. When striking a surface, some sound will be reflected, some will be absorbed (*converted to heat*) and some will pass through the structure. Sound will lose energy with distance in accordance with the inversed square law.

The time taken for the sound pressure to drop by 60dB is measured. This loss of sound pressure related to time is measured as a 'reverberation time'. If the time it takes for the sound pressure to reduced by 60dB is less than 0.3 seconds the room will sound 'dead' with hearing made difficult due to an apparent loss of bass. If the reverberation time is in excess of 5 seconds the reverberation (*or echos*) can give rise to confusion which again makes hearing difficult. The optimum reverberation times may vary according to the intended use of the space. A reverberation time of 1 second might be ideal for a lecture hall providing for clear speech but this might not be ideal for a concert hall where a reverberation time of up to 3.5 seconds would provide for fuller and richer musical sound. For 'general purpose' use Acoustic Engineers will generally try to 'tune' the space to provide for reverberation times between 1.5 ~ 2.5 seconds.

The reverberation times can be adjusted by the use of sound absorbers. i.e. by the use of materials that are less likely to reflect sound. Soft furnishings, carpet and curtains will provide for some sound absorbing properties. Mineral wool provides for a good example of a material that will readily convert sound energy into heat energy thus absorbing sound and consequently reducing the reflected sound. The performance of a sound absorber is measured by a 'coefficient of adsorption'.

The other issue of concern to Acoustic Engineers is the influence of sound created outside of the measured space and the ability of a structure to minimise the influence of an acoustic space by preventing or reducing the transfer of external sound through a structure. This is referred to as

'sound attenuation' and it is the measure that generally applies to structures between spaces. e.g. walls, windows and doorsets. Thus, when referring to 'acoustic' doors we generally mean 'sound attenuating' doorsets.

Sound is generated at different frequencies. The 'frequency' is the number of sound waves that pass through a given point in a second and described in 'Hertz' (Hz.) where 1 hertz = one wave per second. Differences in frequency can be identified by a change of pitch. An example of a high frequency sound might be a computer bleep (*approx. 2,500Hz.*) while a low frequency sound might be the hum of an electrical generator (*approx. 100Hz.*). Few sounds are made up of a pure single frequency. Sound is generally produced simultaneously over a range of frequencies. We might refer to the random structure of sound over a range of frequencies as noise, while sound produced over a range of frequencies in a structured manner might be referred to as speech or music. (*See Fig. 10.1 & 10.2.*)

The average human ear is not a perfect sound receiver. We cannot hear some very low frequency sounds e.g. at frequencies below (*about*) 20Hz. referred to as 'sub sonic'. However, we might feel low frequency sound as vibration. At the other end of the spectrum human hearing may not notice sound at frequencies in excess of (*about*) 20,000Hz. (*20kHz.*). This is referred to as the 'ultra sound region'. Bats navigate using sound in the ultra sound range and ultra sound can be used for medical purposes to create images. (*See Fig. 10.2.*)

Even within the audible range (*approx. 20Hz. ~ 20kHz.*) the human ear is less than perfect, being more sensitive to sound produced at frequencies of about 3,000 ~ 4,000Hz. (*3 ~ 4kHz.*) than sound produced at other frequencies. Thus, if sound is produced at the same amplitude (or loudness) at all frequencies, sound in the 3~4kHz. range will be perceived to be predominant. (*See Fig. 10.3.*)

ISO 140 sets out the range of frequencies used for the purpose of testing for acoustic performances. The test procedure for the measurement of sound attenuation is described by reference to BS EN ISO 140-3: 1995. This measures performances over a frequency range of 100Hz. (*Hertz*) to 3,150Hz.

**NOTE 1: A frequency range of 125Hz. ~ 4000Hz. is used for testing in the United States and Australia.**  
**NOTE 2: BS EN ISO 10140 Pt.2 : 2010 replaces BS EN ISO 140-3 : 1995 the test methods are identical and the BS EN ISO 140-3 data is still valid.**

## Acoustics Explained:

The basic principles associated with testing for sound attenuating performances are quite simple. The 'specimen' is located between a transmitting room and a receiving room. Sound is generated across the full frequency range determined by reference to the test standard in the transmitting room. The sound pressure levels on the receiving room side of the specimen are then measured. The sound pressure levels recorded in the receiving room can then be deducted from the sound pressure levels in the transmitting room with the resultant loss in sound pressure levels measured in decibels recorded at each of the measured frequencies.

For some purposes it is necessary to know the performances at particular frequencies but for most applications an average performance over the measured range is required. To determine this, the decibel reduction over the measured range could simply be averaged out. However, this would be misleading as this would not reflect human perception resulting from the imperfections of human hearing.

To relate to human perception, the average sound reduction is amended to provide for a 'weighted index' identified by the use of the prefix 'Rw'. The weighted index is calculated by reference to BS EN ISO 717-1 : 1997.

In the absence of a vacuum, most spaces will be subject to a background noise.

### Typical Background Noise Levels:

	dBA
Library or Museum	40
Private Office	45
Quiet Restaurant	50
General Office	55
General Store	60
Average Restaurant	65
Mechanised Office	70
Noisy Canteen	75
Factory Machine Shop	80
Main Street (at kerbside)	85
Plant Room	90

The sound attenuating performances determined by testing can be applied by deducting the measured performance weighted index (*Rw*.) from the source sound. Thus, a sound attenuating barrier providing for a performance of (say) *Rw*.30dB will reduce the sound pressure level generated in (say) a Plant Room from 90dBA to 60dBA. Conversely, to reduce the sound level in a Plant Room to the background sound level in (say) a Private Office, the sound attenuating barrier needs to provide for a performance of 90dBA - 45dBA = *Rw*.45dB.

**NOTE: The 'A' suffix indicates a 'weighted' measurement.**

On site, sound attenuating measurements relate to the complete barrier between the sound source and the receiving area and will measure the overall performance of the wall, doorset, window etc. that makes up the barrier. (See page 10.16).

### Other Acoustic Terms:

**Octave:** Expressed simply, one octave is a difference in frequency (*or pitch*) that can be discerned by the average human ear. i.e. The average human may notice the difference between sound produced at (say) 200Hz. and 400Hz. (*1 octave*) but may not notice a difference between sounds produced at (say) 200Hz. and 250Hz. (*1/3rd. octave*).

**STC:** By reference to European tests, the weighted index is expressed by the use of the prefix 'Rw'. For tests carried out in the United States over a slightly different frequency range (125Hz. ~ 4,000Hz. as opposed to the European 100Hz. ~ 3,150Hz.) the prefix 'STC' might be used. STC = Sound Transmission Class.

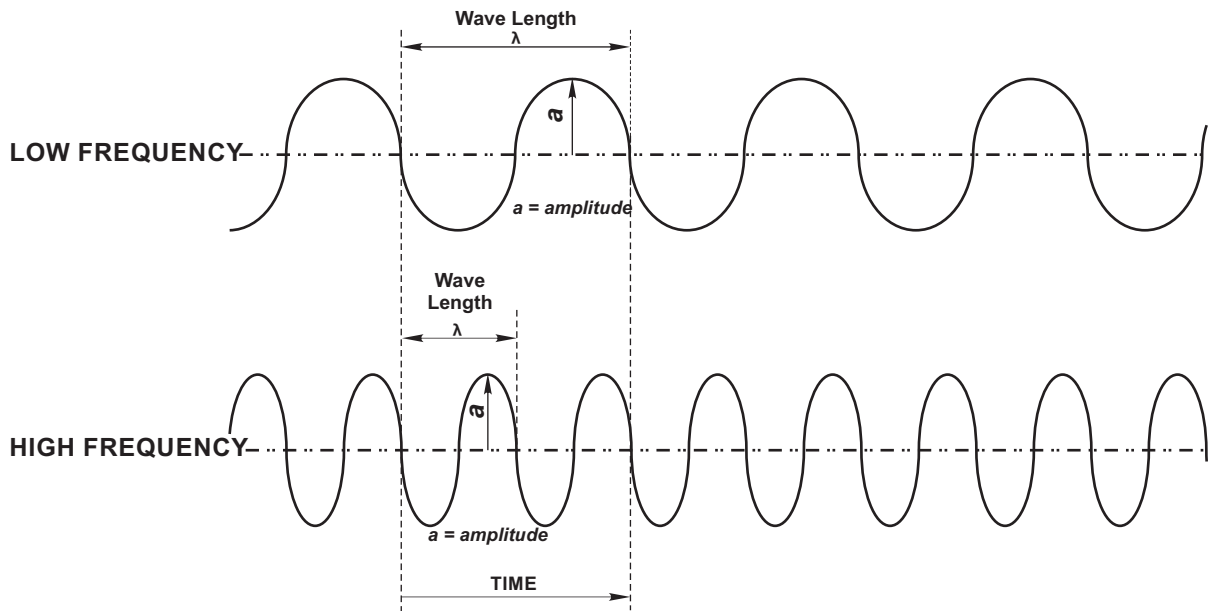
For all practical purposes *Rw*. & STC may be taken to be equal performances +/- 1dB.

### Rule of Thumb:

Sound attenuation is measured using a logarithmic scale. Within the range applicable to most doorsets, an *Rw*.3dB variation in performance may be taken to be a doubling or halving of performance. e.g. an *Rw*.36dB doorset provides for double the performance of an *Rw*.33dB doorset.

**Wavelength Amplitude & Frequency**

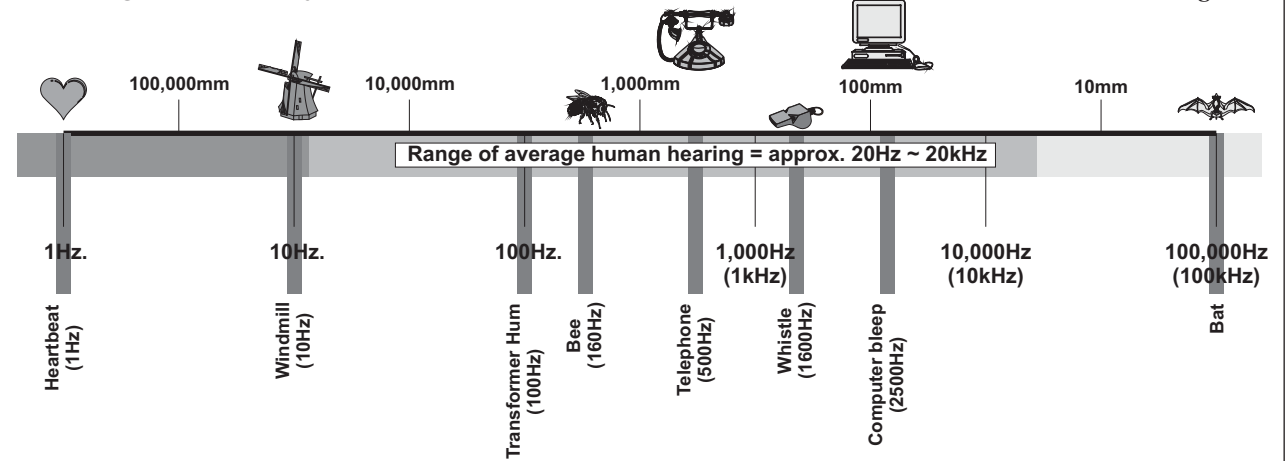
Fig. 10.1



**Wave Length** = The dimension from one point of a wave to the next corresponding point.  
**Amplitude** = The sound pressure or loudness.  
**Frequency** = The number of sound waves that pass a fixed point in a second. (Hz. = Hertz.)

**Wavelength & Frequency**

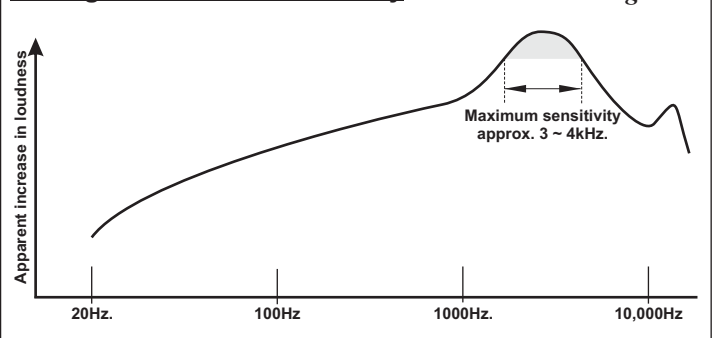
Fig. 10.2



Human sensitivity to sound is an individual thing and may vary from person to person for a number of reasons, including age. If sound is generated at the same sound pressure levels (*loudness*) over the full range of audible frequencies then sound in the region of 3 ~ 4kHz. would be perceived to be predominant. Standards for acoustic measurements relate to a frequency range between 100Hz. ~ 4,000Hz. being the most sensitive range for average human hearing.

**Average Human Ear Sensitivity**

Fig. 10.3



## Sound Attenuating Doorsets:

Generally any material will provide for a sound attenuating performance if used as a barrier between a sound source and a 'protected' area. Some materials provide for better performances than others.

Doorsets are essentially functional products with a primary purpose to provide for a means for 'traffic' to pass from one side of a wall to the other. For this purpose the door must be open. As the thing that we are trying to stop is the transfer of airborne sound then an open door will not provide for any performance. When the door is closed, the sound attenuating performance will be influenced by the residual airflow across the doorset. To minimise the airflow it is necessary to use sealing systems.

Some door constructions have been specifically developed to provide for excellent sound attenuating performances when used with suitable sealing systems. Some of these 'specialist' constructions rely on the mass law technology. i.e. generally increased mass provides for improved sound attenuating performances. However, there is not a direct relationship between mass and sound attenuating performances. Adding a dense material such as lead will generally improve performances but this will also change the characteristics of the doorset resulting in significant improvements at some frequencies with no improvement or even a loss of performance at other frequencies. Other 'specialist' door constructions rely on air gap technology in a similar manner to that used for glazed units. Essentially the air trapped in a gap will convert sound energy into heat energy with an improvement in sound attenuating performances. Use of facing materials that change the stiffness of the door or hardware fittings that bridge the door thickness can have an adverse influence on doors of this design.

To determine the precise performance of a sound attenuating doorset design it is necessary to carry out testing of a specimen that is identical in all respects to the design that is intended for use. The following factors can influence sound attenuating performances:

- Door size.**
- Door configuration.**
- Facing materials.**
- Glazing.**
- Choice of hardware.**
- Frame section dimensions.**
- Sealing systems.**
- Nature of the surround structure.**
- Method and quality of installation.**

The only method for determining the precise performance to be expected of a doorset design is to test a product that is identical in all respects to the product that is intended for use in the building with the specimen installed into a structure in a manner that replicates precisely the methods intended for use.

Strebord<sup>®</sup> is essentially a general purpose door core material and has not been designed as a 'dedicated' sound attenuating product. However, Falcon Panel Products Ltd. have carried out an extensive range of tests to determine potential sound attenuating performances and to develop the product to suit the demands of published regulations, specifically:

**Building Regulations - (England & Wales) - Approved Document 'E' = Rw.29dB for entrance doors to residential units.**

**Building Bulletin 93 - Educational Establishments - Classroom and Lecture areas = Rw.30dB.**

**Building Bulletin 93 - Educational Establishments - Music Rooms = Rw.35dB.**

To determine potential performances, tests were carried out using a 2040x926mm door leaf size, being the largest size single leaf dimension anticipated by reference to BS4787 Pt.1. The influence of meeting stiles was determined by use of smaller sized doors to create an unequal pair that would fit in the 'standard' frame used for the single leaf door tests.

When tested with glazing, the glass aperture dimensions were carefully calculated to provide for a clear glass area equal to 25% of the single leaf door area.

**NOTE: It is important to carefully seal around the glass using suitable mastic to minimise the risk of sound leakage through the beading system.**

The use of sealing systems is an essential requirement to provide for sound attenuating performances and these were carefully selected to provide for the following considerations:

- 1/ The sealing systems should have minimal influence on the operation of the door, with due regard to BS8300 and Building Regulations - (England & Wales) - Approved Document 'M'.**
- 2/ It should not be necessary to interrupt sound attenuating sealing systems to accommodate items of hardware. (i.e. provide for a minimal risk of conflict between seals and ironmongery).**
- 3/ Sealing systems used for sound attenuating purposes should also be able to provide for smoke sealing performances (BS476 : Section 31.1).**
- 4/ Sound attenuating sealing systems should not conflict with intumescent sealing systems.**

The following details show recommended fitting positions for Norsound acoustic sealing systems based upon extensive testing with Strebord<sup>®</sup> based doorsets. Sealing systems providing for similar performances are available from numerous sources.









Norsound Ltd  
Unit 5 Regents Drive  
Prudhoe  
Northumberland  
NE42 6PX

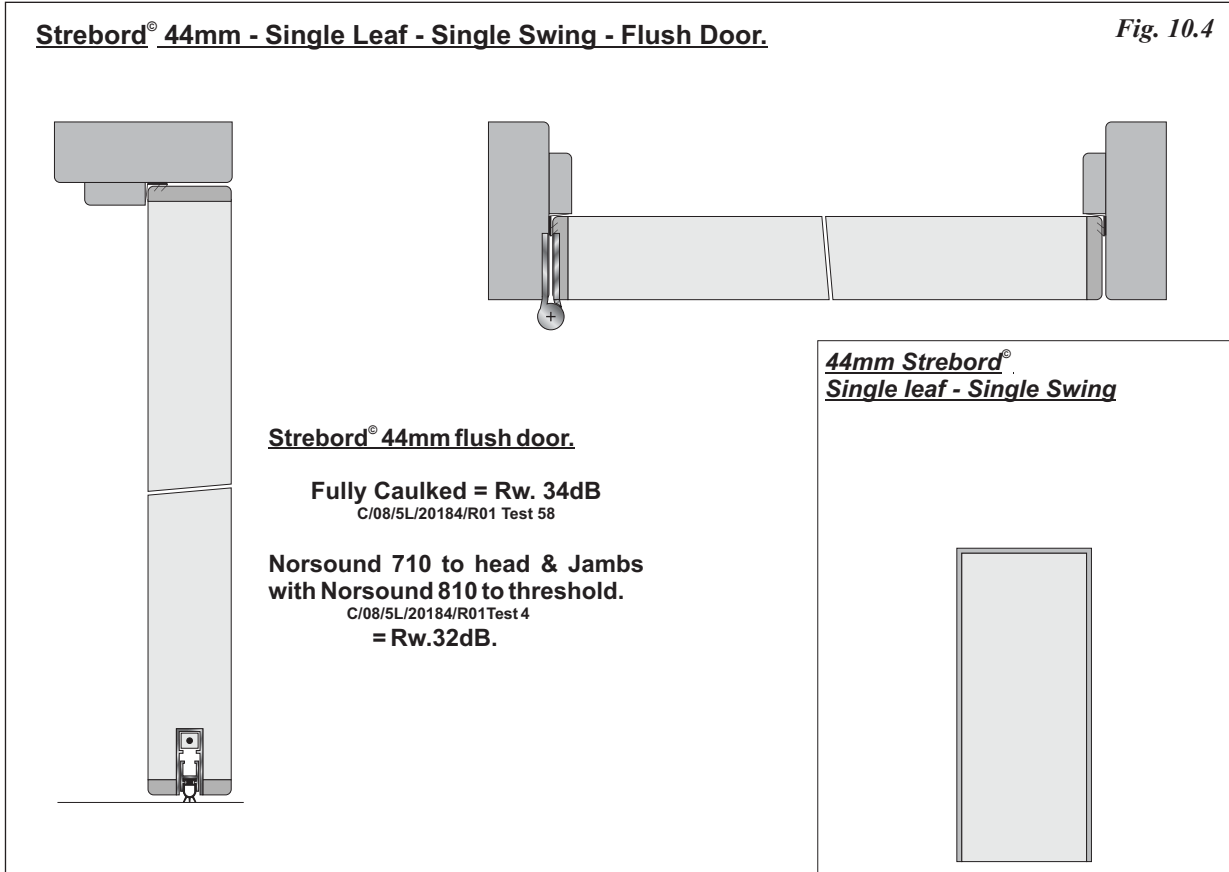
[www.norsound.com](http://www.norsound.com)

T: +44 (0)1661 831311

F: +44 (0)800 2984868



# Rw.29dB ~ Rw.33dB



**NOTE:** The 'fully caulked' performance relates to a door of the same construction and size as tested under operational condition but with all operating gaps between the door and the frame completely sealed using a heavy duty sealant with the door in an inoperable condition to determine the maximum potential performance of the particular door construction.

## **Streborb® 44mm - Flush Door - Single Leaf - Single Action.**

Hanging Jamb	Closing Jamb	Head	Threshold	Meeting Stiles	Glazing	Test Reference	Performance
Norsound 755	Norsound 755	Norsound 755	Norsound 815	N/A	N/A	C/08/5L/20184/R01 Test 62	Rw.31dB
Norsound 710	Norsound 710	Norsound 710	Norsound 810	N/A	N/A	C/08/5L/20184/R01 Test 4	Rw.32dB
Norsound 710	Norsound 710	Norsound 710	Norsound 815	N/A	N/A	C/08/5L/20184/R01 Test 61	Rw.32dB
Norsound 710	Norsound 710	Norsound 710	Norsound 810 + 615	N/A	N/A	C/08/5L/20184/R01 Test 63	Rw.32dB
Norsound 710	Norsound 710	Norsound 710	Norsound 850 + 615	N/A	N/A	C/08/5L/20184/R01 Test 64	Rw.32dB
Norsound 710	Norsound 710	Norsound 710	Norsound 2x720 + 615	N/A	N/A	C/08/5L/20184/R01 Test 65	Rw.32dB
Norsound 710	Norsound 710	Norsound 710	Norsound 810 + 650	N/A	N/A	C/08/5L/20184/R01 Test 66	Rw.33dB
Norsound 710	Norsound 710	Norsound 710	Norsound 2x720 + 650	N/A	N/A	C/08/5L/20184/R01 Test 59	Rw.33dB



# Rw.29dB ~ Rw.35dB

**Strebor<sup>®</sup> 44mm - Single Leaf - Single Swing - Glazed Door.** *Fig. 10.5*

**Strebor<sup>®</sup> 44mm glazed door.**

**Flush Door Fully Caulked**  
= Rw. 34dB  
C/08/5L/20184/R01 Test 58

**Norsound 710 to head & Jamb with Norsound 810 + 650 to threshold.**  
**Door glazed with 15mm Pilkington 'Pyrostop' glass with a 25% clear glass area.**  
C/08/5L/20184/R01 Test 128  
= Rw.35dB.

**44mm Strebor<sup>®</sup> Single leaf - Single Swing - Glazed**

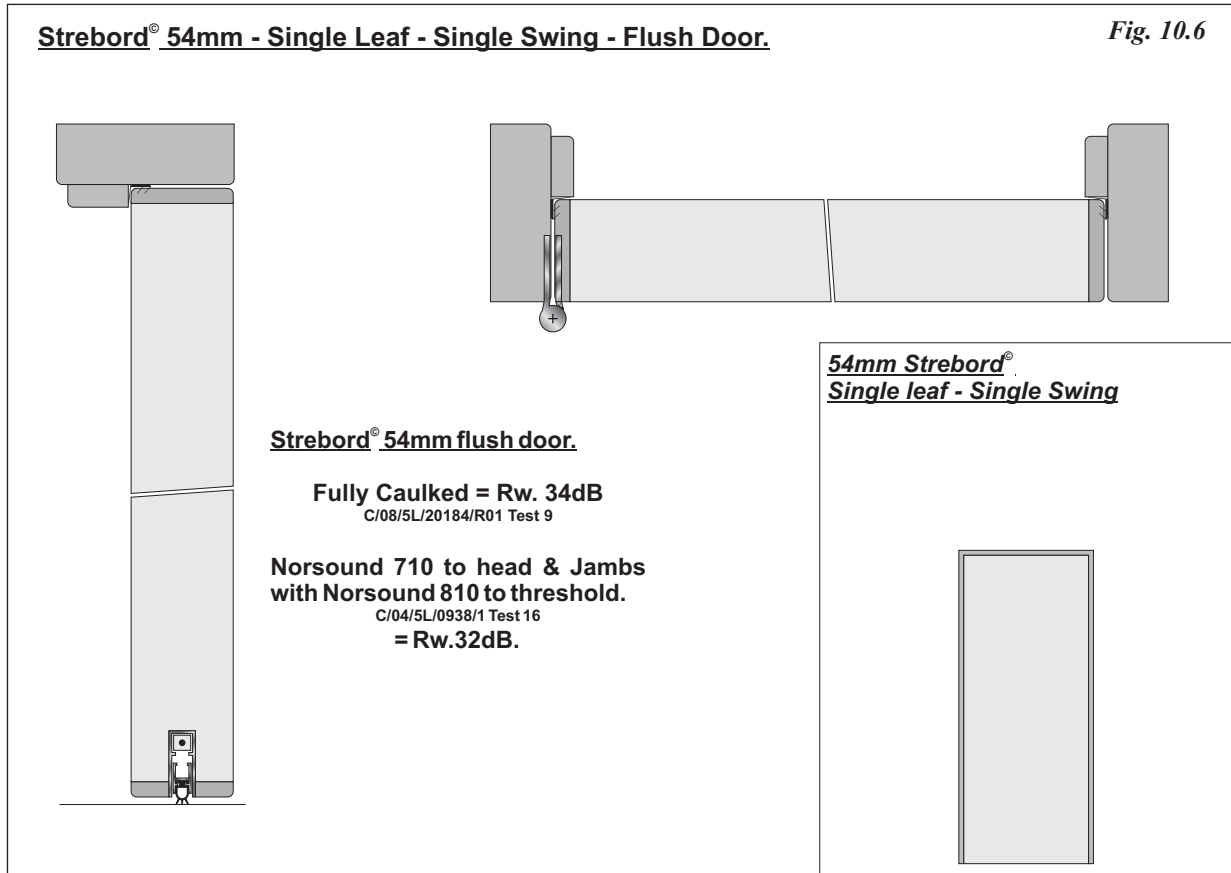
**NOTE:** The 'fully caulked' performance relates to a door of the same construction and size as tested under operational condition but with all operating gaps between the door and the frame completely sealed using a heavy duty sealant with the door in an inoperable condition to determine the maximum potential performance of the particular door construction.

**Strebor<sup>®</sup> 44mm - Flush Door - Single Leaf - Single Action - 25% Glazing.**

Hanging Jamb	Closing Jamb	Head	Threshold	Meeting Stiles	Glazing	Test Reference	Performance
Norsound 710	Norsound 710	Norsound 710	Norsound 810	N/A	6mm Pyroshield	C/08/5L/20184/R01 Test 125	Rw.33dB
Norsound 710	Norsound 710	Norsound 710	Norsound 810	N/A	7mm Pyrobelite	C/08/5L/20184/R01 Test 54	Rw.33dB
Norsound 710	Norsound 710	Norsound 710	Norsound 810	N/A	10mm Pyrodur	C/08/5L/20184/R01 Test 126	Rw.33dB
Norsound 710	Norsound 710	Norsound 710	Norsound 810 + 650	N/A	10mm Pyrodur	C/08/5L/20184/R01 Test 127	Rw.34dB
Norsound 710	Norsound 710	Norsound 710	Norsound 810	N/A	11.5mm 3 ply PA Res Glass	C/08/5L/20184/R01 Test 44	Rw.34dB
Norsound 710	Norsound 710	Norsound 710	Norsound 810	N/A	12mm Pyrobelite	C/08/5L/20184/R01 Test 45	Rw.34dB
Norsound 710	Norsound 710	Norsound 710	Norsound 810 + 650	N/A	15mm Pyrostop	C/08/5L/20184/R01 Test 128	Rw.35dB
Norsound 710	Norsound 710	Norsound 710	Norsound 810 + 650	N/A	16.5mm Optilam Phon	C/08/5L/20184/R01 Test 129	Rw.35dB



# Rw.29dB ~ Rw.35dB



**NOTE:** The 'fully caulked' performance relates to a door of the same construction and size as tested under operational condition but with all operating gaps between the door and the frame completely sealed using a heavy duty sealant with the door in an inoperable condition to determine the maximum potential performance of the particular door construction.

## Strebor<sup>®</sup> 54mm - Flush Door - Single Leaf - Single Action.

Hanging Jamb	Closing Jamb	Head	Threshold	Meeting Stiles	Glazing	Test Reference	Performance
Norsound 710	Norsound 710	Norsound 710	Norsound 850 + 615	N/A	N/A	C/08/5L/20184/R01 Test 19	Rw.31dB
Norsound 755	Norsound 755	Norsound 755	Norsound 850	N/A	N/A	C/08/5L/20184/R01 Test 4	Rw.31dB
Norsound 710	Norsound 710	Norsound 710	Norsound 810	N/A	N/A	C/04/5L/0938/1 Test 16	Rw.32dB
Norsound 710	Norsound 710	Norsound 710	Norsound 2x720 + 615	N/A	N/A	C/08/5L/20184/R01 Test 20	Rw.32dB
Norsound 710	Norsound 710	Norsound 710	Norsound 2x720 + 630	N/A	N/A	C/08/5L/20184/R01 Test 21	Rw.33dB
Norsound 710	Norsound 710	Norsound 710	Norsound 810 + 650	N/A	N/A	C/08/5L/20184/R01 Test 22	Rw.33dB
Norsound 710 + 720	Norsound 710 + 720	Norsound 710 + 720	Norsound 810 + 650	N/A	N/A	ASSESSED*	Rw.34dB

\* = The assessed performance of Rw.34dB is based upon this and other base test data showing improvements when the NOR720 seal is located towards the opening face of the door. The assessed performance of Rw.35dB is based upon this and other base test data showing improvements when the NOR720 seal is located towards the opening face of the door. The assessed performance of Rw.35dB is based upon this and other base test data showing improvements when the NOR720 seal is located towards the opening face of the door.

**Modified Strebor<sup>®</sup> 54mm Flush Door - Single Leaf - Single Action.**

Hanging Jamb	Closing Jamb	Head	Threshold	Meeting Stiles	Glazing	Test Reference	Performance
Norsound 710 + 720	Norsound 710 + 720	Norsound 710 + 720	Norsound 810 + 625	N/A	N/A	C/21096/R02 Test 8	Rw.35dB



# Rw.29dB ~ Rw.37dB

**Strebor<sup>®</sup> 54mm - Single Leaf - Single Swing - Glazed Door.** Fig. 10.7

**Strebor<sup>®</sup> 54mm glazed door.**

**Flush Door Fully Caulked**  
= Rw. 35dB  
C/08/5L/20184/R01 Test 9

**Norsound 710 to head & Jambs**  
**with Norsound 810 to threshold**  
**Door glazed with 7mm**  
**'Pyrobelite' glass with a 25% clear**  
**glass area.**  
C/08/5L/20184/R01 Test 42  
= Rw.35dB.

**54mm Strebor<sup>®</sup>**  
**Single leaf - Single Swing - Glazed**

**NOTE:** The 'fully caulked' performance relates to a door of the same construction and size as tested under operational condition but with all operating gaps between the door and the frame completely sealed using a heavy duty sealant with the door in an inoperable condition to determine the maximum potential performance of the particular door construction.

## **Strebor<sup>®</sup> 54mm - Flush Door - Single Leaf - Single Action - 25% Glazing.**

Hanging Jamb	Closing Jamb	Head	Threshold	Meeting Stiles	Glazing	Test Reference	Performance
Norsound 710	Norsound 710	Norsound 710	Norsound 810	N/A	6mm Pyroshield	C/08/5L/20184/R01 Test 30	Rw.34dB
Norsound 710	Norsound 710	Norsound 710	Norsound 810	N/A	7mm Pyrobelite	C/08/5L/20184/R01 Test 42	Rw.35dB
Norsound 710	Norsound 710	Norsound 710	Norsound 810	N/A	12mm Pyrobelite	C/08/5L/20184/R01 Test 41	Rw.35dB
Norsound 710	Norsound 710	Norsound 710	Norsound 810	N/A	16mm Pyrobel	C/08/5L/20184/R01 Test 37	Rw.35dB
Norsound 710	Norsound 710	Norsound 710	Norsound 810 + 650	N/A	6mm Pyroshield	C/08/5L/20184/R01 Test 32	Rw.35dB

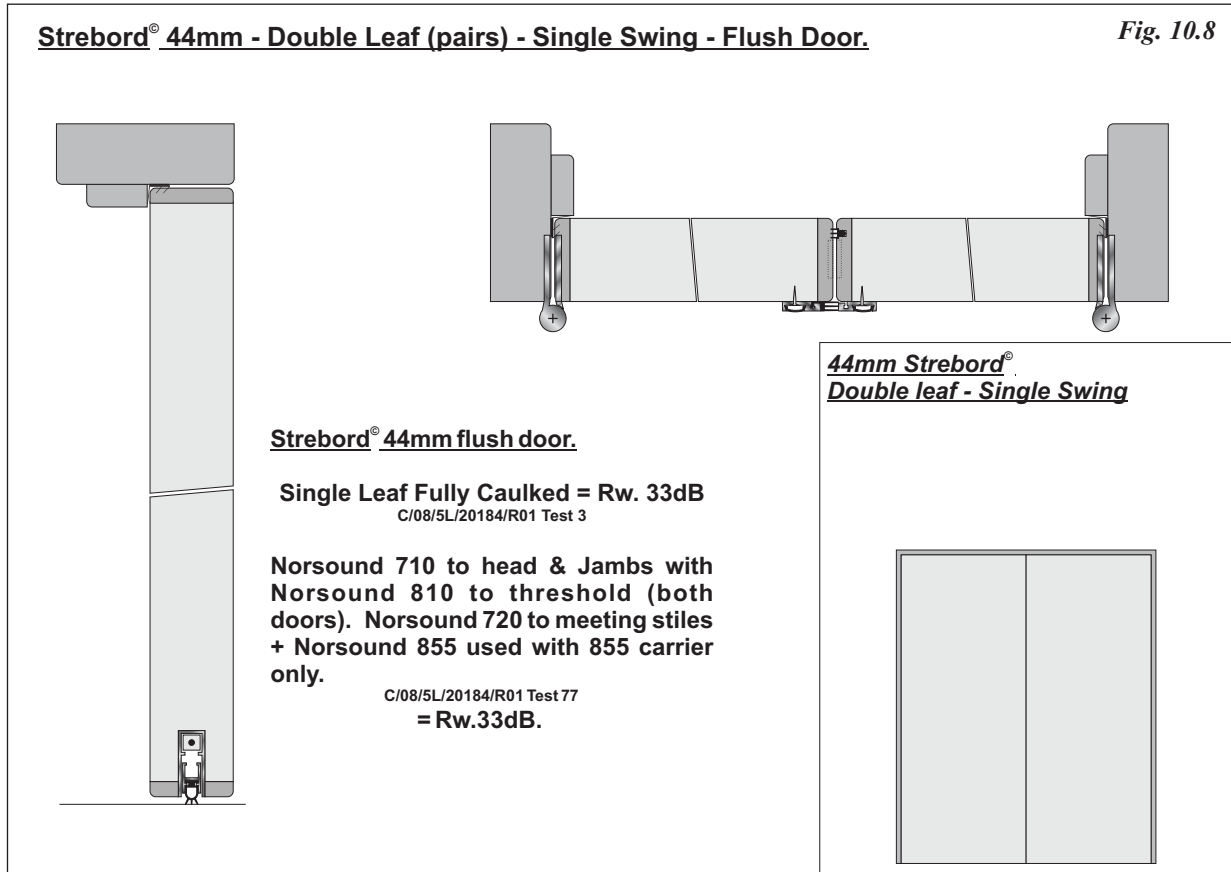
## **Modified Strebor<sup>44</sup><sup>®</sup> - 54mm Flush Door - Single Leaf - Single Action.**

44mm Strebor<sup>®</sup> faced both sides with 6mm MDF (medium density fibreboard) - Flush door Fully caulked = Rw.36dB C/21096/R02 Test 2

Hanging Jamb	Closing Jamb	Head	Threshold	Meeting Stiles	Glazing	Test Reference	Performance
Norsound 710 + 720	Norsound 710 + 720	Norsound 710 + 720	Norsound 810 + 625	N/A	10mm Pyrodur	ASSESSED	Rw.37dB



# Rw.29dB ~ Rw.33dB



**NOTE:** The 'fully caulked' performance relates to a door of the same construction and size as tested under operational condition but with all operating gaps between the door and the frame completely sealed using a heavy duty sealant with the door in an inoperable condition to determine the maximum potential performance of the particular door construction.

**Strebor<sup>®</sup> 44mm - Flush Door - Double Leaf (pairs) - Single Action.**

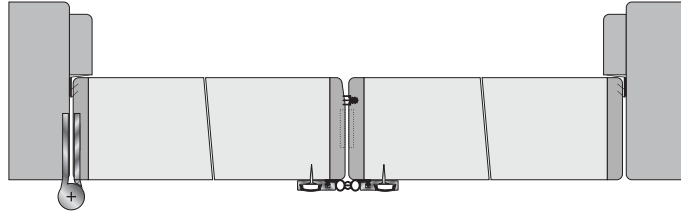
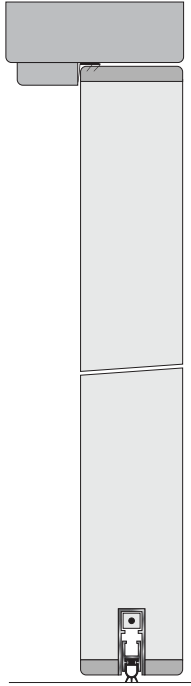
Hanging Jamb	Closing Jamb	Head	Threshold	Meeting Stiles	Glazing	Test Reference	Performance
Norsound 710	Norsound 710	Norsound 710	Norsound 810 (each leaf)	Norsound 720 / 510	N/A	C/08/5L/20184/R01 Test 74	Rw.32dB
Norsound 710	Norsound 710	Norsound 710	Norsound 810 (each leaf)	Norsound 755 / 755	N/A	C/08/5L/20184/R01 Test 76	Rw.32dB
Norsound 710	Norsound 710	Norsound 710	Norsound 810 (each leaf)	Norsound 2x755 + 720	N/A	C/08/5L/20184/R01 Test 75	Rw.33dB
Norsound 710	Norsound 710	Norsound 710	Norsound 810 (each leaf)	Norsound 855 + 855 Carrier only + 720	N/A	C/08/5L/20184/R01 Test 77	Rw.33dB



# Rw.29dB ~ Rw.35dB

**Strebor<sup>®</sup> 54mm - Double Leaf (pairs) - Single Swing - Flush Door.**

**Fig. 10.9**



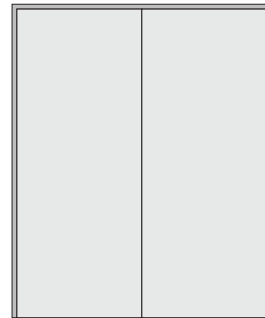
**Strebor<sup>®</sup> 54mm flush door.**

**Fully Caulked = Rw. 34dB**

**Norsound 710 to head & Jambs with Norsound 810 to threshold (both doors). Norsound 720 to meeting stiles + 2No. Norsound 755.**

**C/08/5L/20184/R01 Test 88  
= Rw.33dB.**

**54mm Strebor<sup>®</sup>  
Double leaf - Single Swing**



## **Strebor<sup>®</sup> 54mm - Flush Door - Double Leaf - Single Action.**

Hanging Jamb	Closing Jamb	Head	Threshold	Meeting Stiles	Glazing	Test Reference	Performance
Norsound 710	Norsound 710	Norsound 710	Norsound 810 (each leaf)	Norsound 710	N/A	C/08/5L/20184/R01 Test 90	Rw.31dB
Norsound 755	Norsound 755	Norsound 755	Norsound 810 (each leaf)	Norsound 710 + 720	N/A	C/08/5L/20184/R01 Test 89	Rw.32dB
Norsound 710	Norsound 710	Norsound 710	Norsound 810 (each leaf)	Norsound 720 + 510	N/A	C/04/5L/0938/1 Test 86	Rw.33dB
Norsound 710	Norsound 710	Norsound 710	Norsound 810 (each leaf)	Norsound 720 + 2x755	N/A	C/08/5L/20184/R01 Test 88	Rw.33dB
Norsound 710	Norsound 710	Norsound 710	Norsound 810 (each leaf)	Norsound 855 + 855 Carrier only + 720	N/A	C/08/5L/20184/R01 Test 87	Rw.33dB
Norsound 710 + 720	Norsound 710 + 720	Norsound 710 + 720	Norsound 810 + 625	Norsound 710 + 720	N/A	ASSESSED*	Rw.34dB

\* = Test C/08/5L/20184/R01 Test 11 provided for an Rw.33dB performance when used with Norsound 710 + 720 to jambs & head used with the Norsound 810 automatic door bottom. The assessed performance of Rw.34dB is based upon this and other base test data showing improvements when the 720 seal is located towards the opening face of the door leaf - See page 10a.33 Fig. 10a.34 - recommended seal positions.

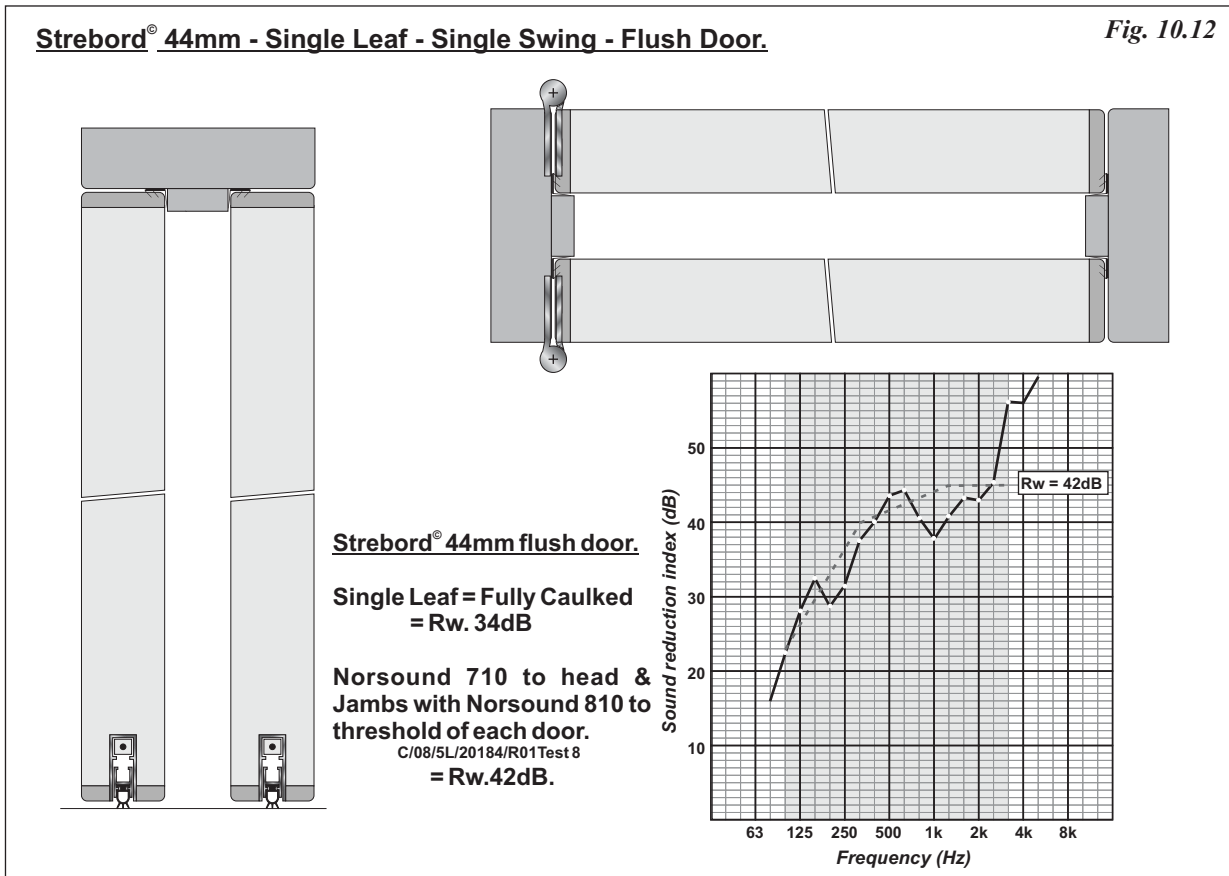
## **Modified Strebor<sup>44®</sup> - 54mm Flush Door - Double Leaf - Single Action.**

44mm Strebor<sup>®</sup> faced both sides with 6mm MDF (medium density fibreboard) - Flush door Fully caulked single leaf = Rw.36dB C/21096/R02 Test 2

Hanging Jamb	Closing Jamb	Head	Threshold	Meeting Stiles	Glazing	Test Reference	Performance
Norsound 710 + 720	Norsound 710 + 720	Norsound 710 + 720	Norsound 810 + 625	Norsound 710 + 720	N/A	ASSESSED	Rw.35dB



# Rw.40dB+



**2No. Strebor<sup>®</sup> 44mm - Flush Door - Single Leaf - Single Action (Back to Back).**

Hanging Jamb	Closing Jamb	Head	Threshold	Meeting Stiles	Glazing	Test Reference	Performance
Norsound 710 (each leaf)	Norsound 710 (each leaf)	Norsound 710 (each leaf)	Norsound 810 (each leaf)	N/A	N/A	C/08/5L/20184/R01 Test 8	<b>Rw.42dB</b>

**High Performance - Sound Attenuating Doorsets:**

For sound attenuating performance up to Rw.30dB using Strebor<sup>®</sup> based door constructions a performance of Rw.30dB can be achieved using simple sealing systems which have a minimal influence on door operating forces.

Whereas performances in excess of Rw.35dB can be achieved using a single door (e.g. when using door constructions based upon the Falcon Tri-Sound<sup>®</sup> - Series 3 door core) it may be necessary to increase the sealing provisions with a possible effect on operating forces.

Where operating forces are a matter for concern, e.g. to satisfy the requirements of Building Regulations - (England & Wales) - Approved Document 'M', it is recommended that consideration is given to the creation of 'acoustic lobbies'. i.e. the use of two low operating force doorsets either fitted to the same frame or separated by a suitable space that might also be lined with sound absorbing materials.

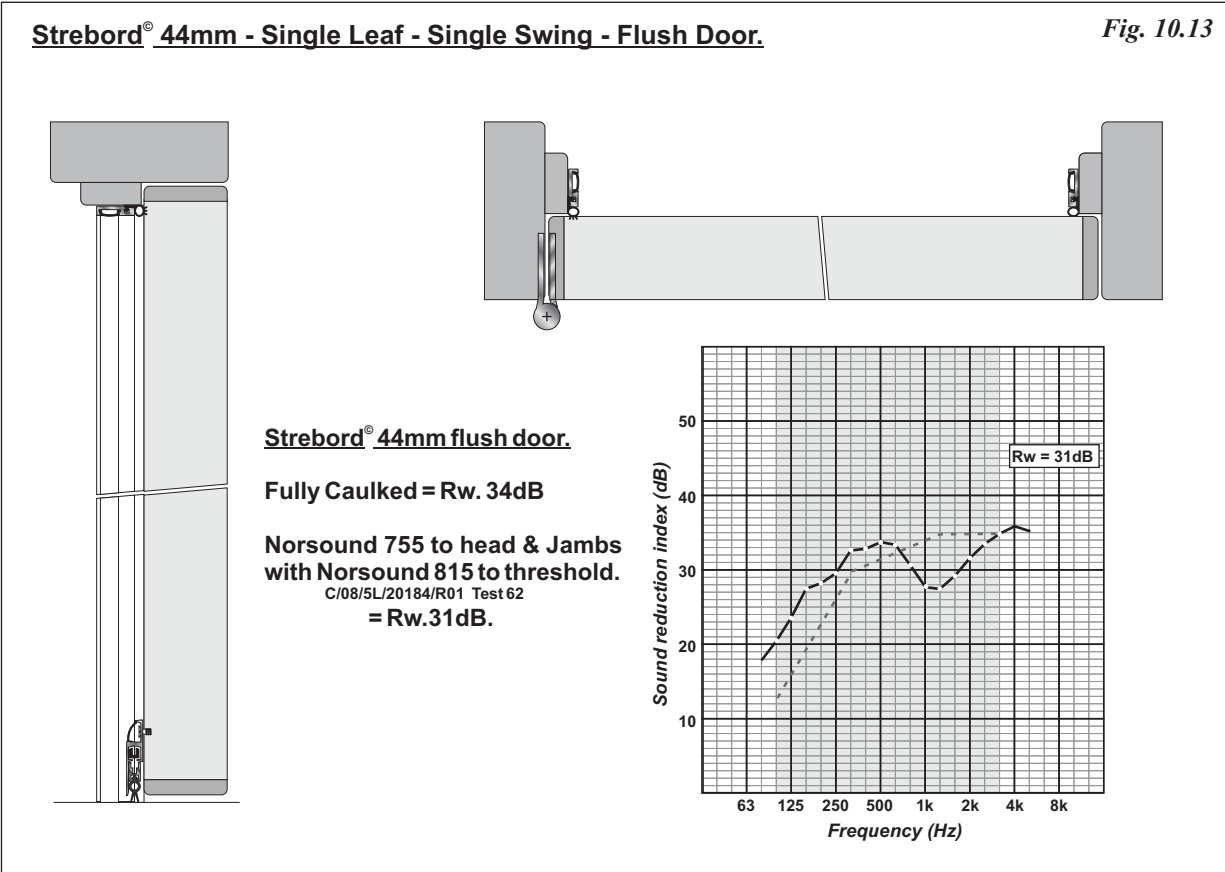
In anticipation of requirements of this nature, Falcon Panel products Ltd. have tested 2No. 44mm Strebor<sup>®</sup> core doors hung back to back from the same frame with a laboratory measured performance of Rw.42dB.

The illustrated arrangement might also be suitable for (say) Plant Room doorsets where a high sound attenuating performances may be required.





# Rw.29dB ~ Rw.31dB - Upgrade



**Strebor<sup>®</sup> 44mm - Flush Door - Single Leaf - Single Action.**

Hanging Jamb	Closing Jamb	Head	Threshold	Meeting Stiles	Glazing	Test Reference	Performance
Norsound 755	Norsound 755	Norsound 755	Norsound 815	N/A	N/A	C/08/5L/20184/R01 Test 62	Rw.31dB

**Improved sound attenuation by upgrading existing installations:**

Existing installations using Strebor<sup>®</sup> 44mm or 54mm based doorsets can be up graded to provide for sound attenuating performance up to Rw.31dB by the addition of perimeter and threshold seals.

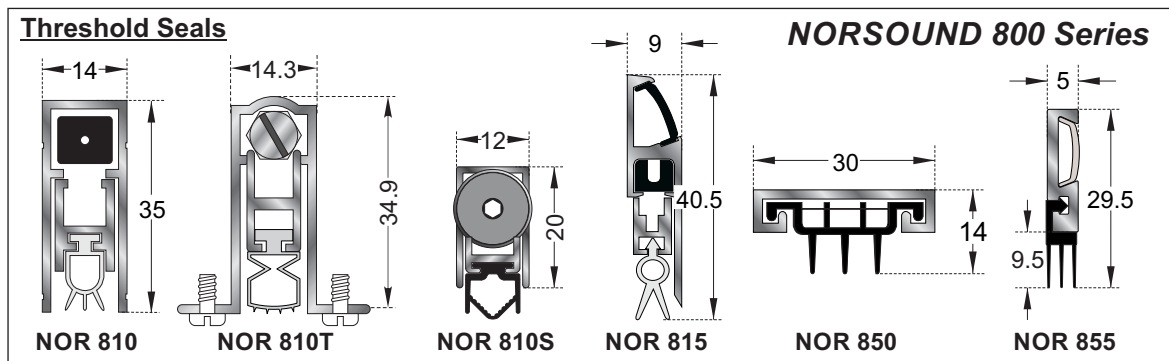
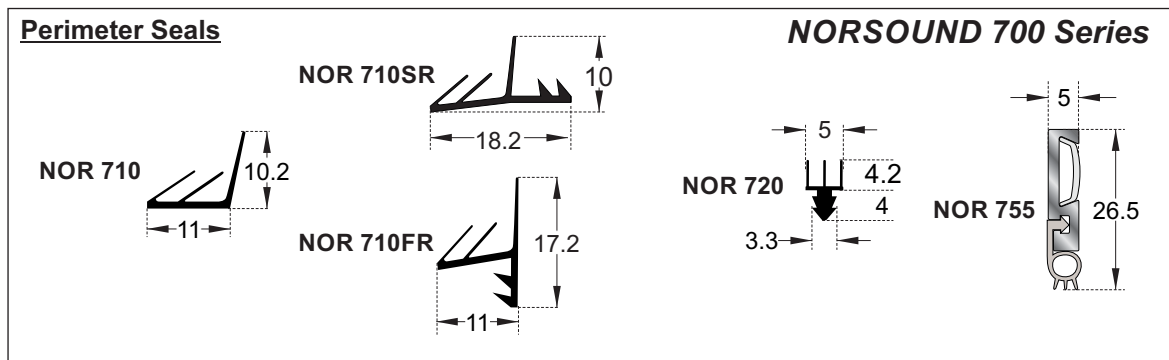
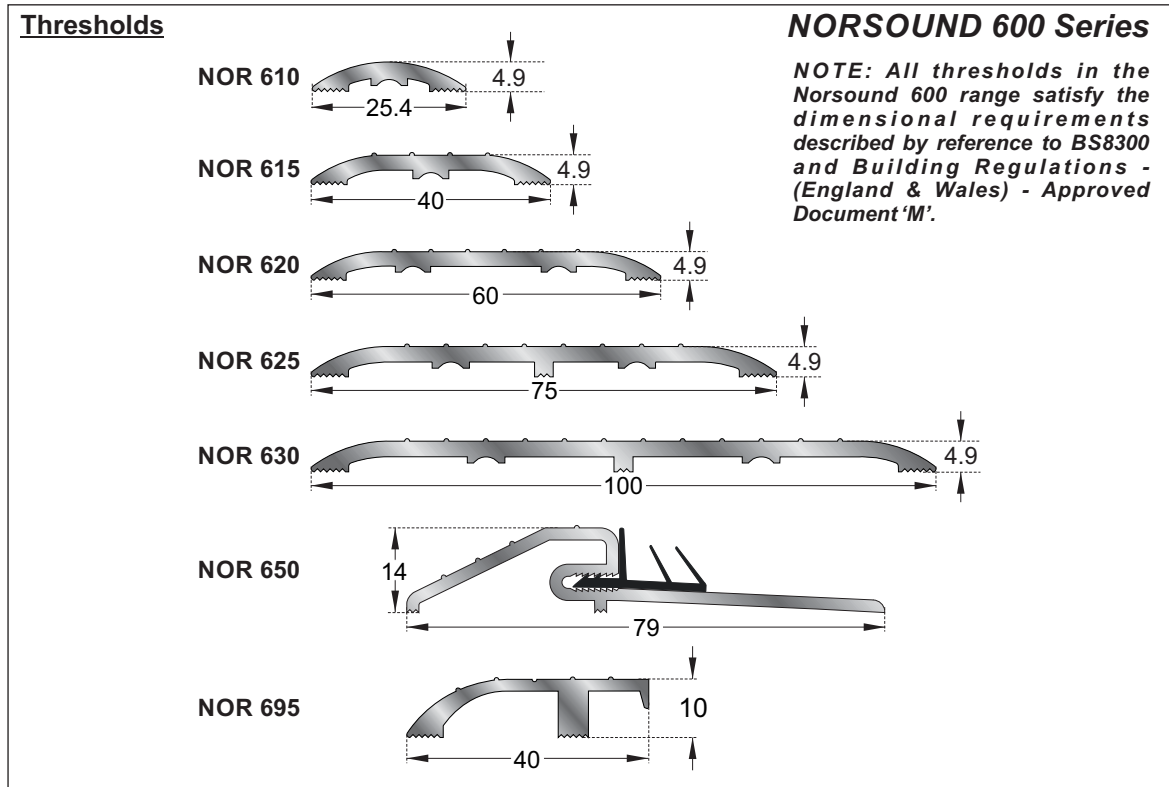
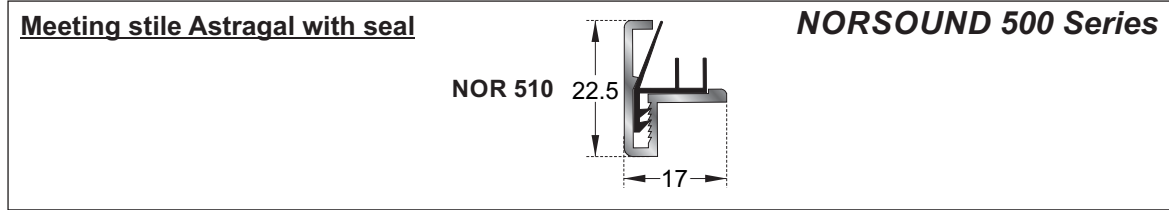
The perimeter and threshold seals can be of a type that can be added to the doorset with a minimal risk of conflict with other doorset components e.g. hardware or intumescent seals etc.



**Norsound Products tested with Strebord®**

(See Section 15 - Appendix - page 15.30 for further information).

Fig. 10.14

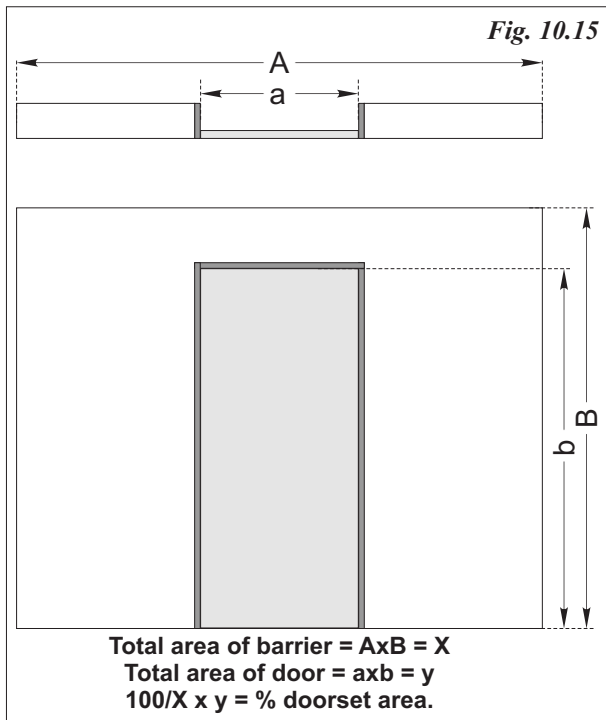




**Site Measurements:**

When measuring sound attenuating performance on site, it is the performance of the complete barrier between the sound source and the protected area that is important. i.e. the combined performance of the wall, doorset, window etc. This performance is measured in accordance with BS EN ISO 10140 Pt.2:2010.

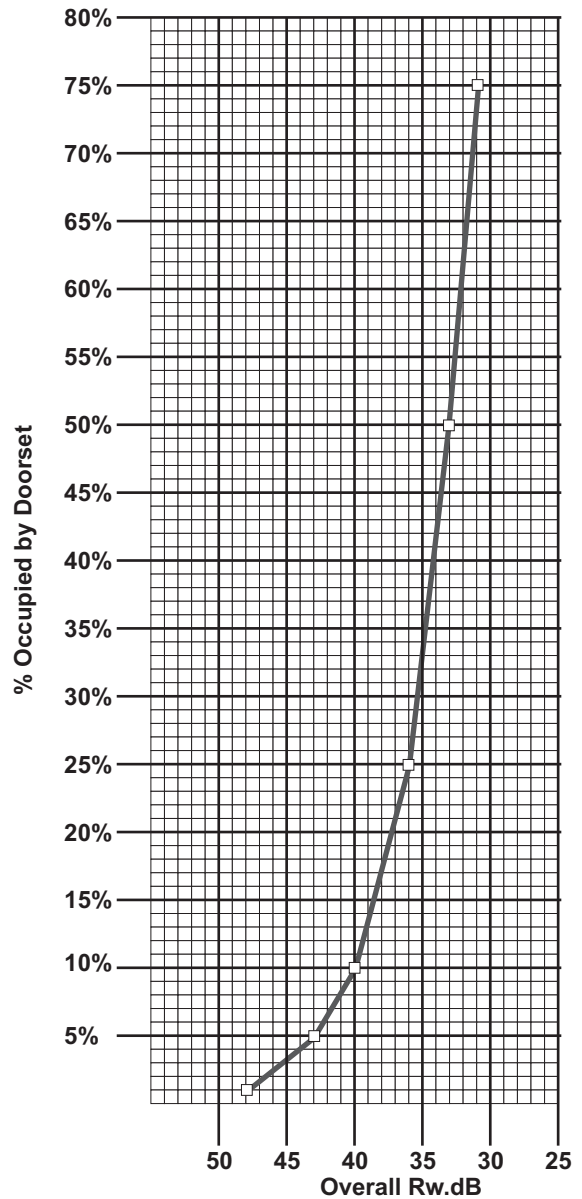
The performance of a doorset (*an operational product*) is likely to be less than the surrounding wall and the perceived performance of the total barrier (*wall & doorset*) will be less than the performance of the wall and better than the performance of the doorset. The total effect will vary, among other things, according to the percentage area that is occupied by the doorset.



Acoustic Engineers will need to know the sound attenuating performance of doorsets determined by laboratory testing to BS EN ISO 10140 Pt.2 for the purpose of calculating acoustic designs for particular projects.

Norsound Ltd. will supply base test evidence to Architects and Acoustic Engineers for this purpose, on request.

*Fig. 10.16*



This graph illustrates the total sound attenuating performance when using an Rw.30dB doorset in an Rw.53dB wall.

**Example:** The overall sound attenuating performance of a barrier where an Rw.30dB doorset occupies 25% of an Rw.53dB wall, the overall performance would be about Rw.36dB.

Further assistance in the calculation of total barrier performances is provided by reference to [www.norsound.co.uk](http://www.norsound.co.uk) 'Acoustic Calculator'





**LORIENT**

# 31-36dB

44MM & 54MM | FLUSH  
SLSA



Typical single leaf acoustic solution:  
1. LAS1212 Batwing® perimeter seal  
2. LP1504 perimeter seal  
3. LAS8001 si drop seal

## STREBORD - 44MM - FLUSH - SLSA

dB	Perimeter seals	Threshold seals	ID
35dB	Fully caulked		
33dB	LAS1212	LAS8001 si, LAS4012	
34dB	LAS1212, LP1504DS	LAS8001 si, LAS4012	
33dB	Fully caulked		
32dB	LAS1212, LP1504DS	LAS8001 si, LAS4012	
32dB	LAS1212	LAS8001 si, LAS4012	
32dB	LAS1212K	LAS8001 si	26
31dB	LP1504DS	LAS8001 si	16

## STREBORD - 54MM - FLUSH - SLSA

dB	Perimeter seals	Threshold seals	ID
36dB	Fully caulked		
35dB	LAS1212, LP1504DS	LAS8001 si, LAS4012	
34dB	LAS1212	LAS8001 si, LAS4012	
35dB	Fully caulked		
34dB	LAS1212	LAS8001 si, LAS4012	
35dB	LAS1212, LP1504DS	LAS8001 si, LAS4012	
35dB	LAS1212, LP1504DS	LAS8001 si	

# 34-36dB

44MM & 54MM | GLAZED

SLSA



Typical single leaf acoustic solution:  
 1. LAS1212K Batwing® perimeter seal  
 2. LP1504DS perimeter seal  
 2. LAS8001 si drop seal

## STREBORD - 44MM - GLAZED - SLSA

dB	Perimeter seals	Threshold seals	Glazing seals	Pane sizes	ID
<b>36dB</b>	Fully caulked		15mm Pyrostop®	1500mm x 300mm	
<b>35dB</b>	LAS1212K, LP1504DS	LAS8001 si, LAS4220 si	15mm Pyrostop®	1500mm x 300mm	69
<b>34dB</b>	LP1504DS	LAS8001 si, LAS4220 si	15mm Pyrostop®	1500mm x 300mm	48
<b>35dB</b>	LAS1212K	LAS8001 si, LAS4220 si	15mm Pyrostop®	1500mm x 300mm	71
<b>35dB</b>	LAS1212K	LAS8001 si	15mm Pyrostop®	1500mm x 300mm	70
<b>34dB</b>	LP1504DS	LAS8001 si	15mm Pyrostop®	1500mm x 300mm	47

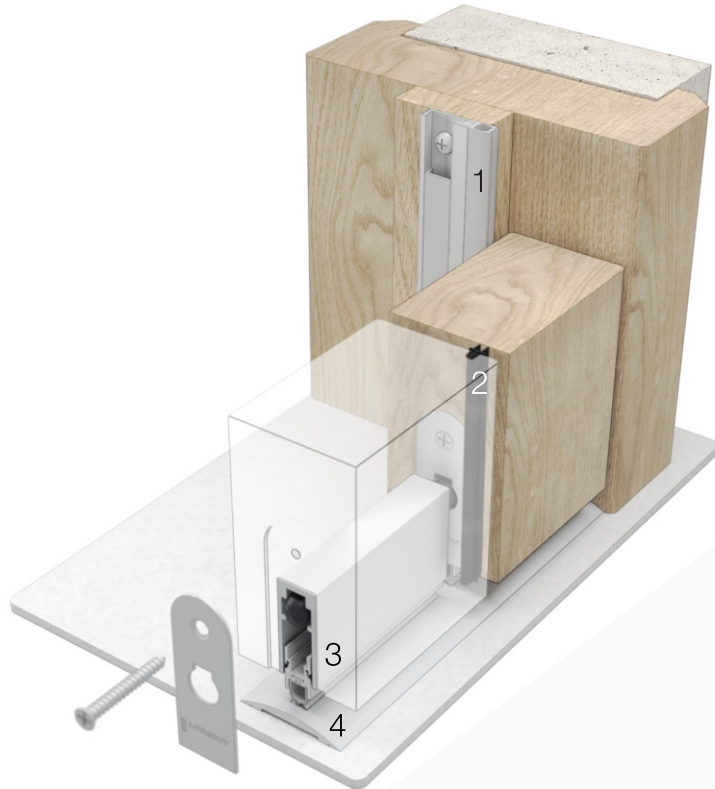
## STREBORD - 54MM - GLAZED - SLSA

dB	Perimeter seals	Threshold seals	Glazing seals	Pane sizes	ID
<b>35dB</b>	LAS1212K	LAS8001 si	15mm Pyrostop®	1500mm x 300mm	79
<b>35dB</b>	LP1504DS	LAS8001 si	15mm Pyrostop®	1500mm x 300mm	68

# 31-33dB

44MM | FLUSH

DLSA



Typical double leaf acoustic solution:

1. LAS7001 si perimeter seal
2. LAS1011 meeting stile seal
3. LAS8001 si drop seal
4. LAS4002 threshold plate

## STREBORD - 44MM - FLUSH - DLSA

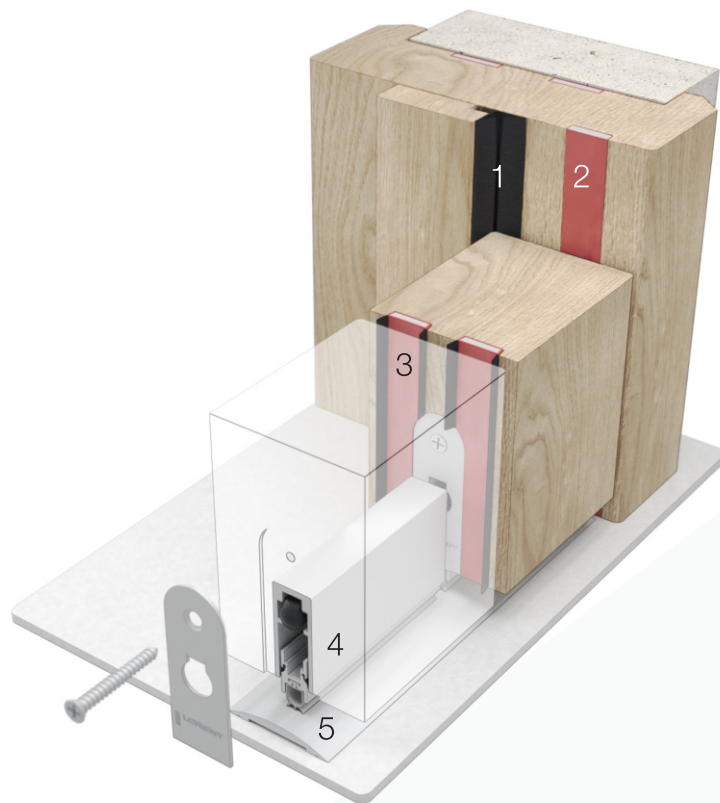
dB	Perimeter seals	Meeting stile seals	Threshold seals	ID
<b>33dB</b>	Fully caulked			
<b>31dB</b>	LAS1212	LP1004DS	LAS8001 si, LAS4011	430
<b>31dB</b>	LAS1212	LAS1011	LAS8001 si, LAS4011	431
<b>31dB</b>	LAS1011	LAS1011	LAS8001 si, LAS4011	432
<b>31dB</b>	LAS1011	LAS1011	LAS8001 si	433
<b>32dB</b>	LAS1011	2 x LAS1011	LAS8001 si, LAS4011	434
<b>32dB</b>	LAS1212, LP1504DS	2 x LP1004DS	LAS8001 si, LAS4011	435
<b>32dB</b>	LAS1212, LP1504DS	LP1004DS	LAS8001 si, LAS4011	436
<b>32dB</b>	LAS1212, LAS1011	2 x LAS1011	LAS8001 si, LAS4011	437
<b>32dB</b>	LAS1212, LAS1011	LAS1011	LAS8001 si, LAS4011	438
<b>32dB</b>	LAS1212, LAS1011	LAS1011	LAS8001 si	439



# 31-33dB

54MM | FLUSH

DLSA



- Typical double leaf acoustic solution:
1. LAS1212K Batwing® perimeter seal
  2. LP1504 perimeter seal
  3. LP1504DS x 2 meeting stile seals
  4. LAS8001 si drop seal
  5. LAS4002 threshold plate

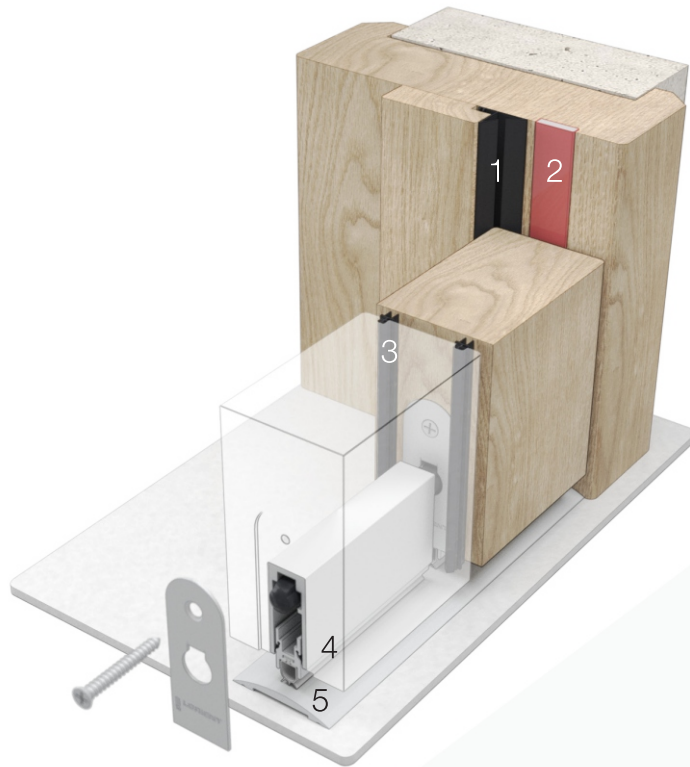
## STREBORD - 54MM - FLUSH - DLSA

dB	Perimeter seals	Meeting stile seals	Threshold seals	ID
<b>33dB</b>	Fully caulked			
<b>31dB</b>	LAS1212	LP1504DS	LAS8001 si, LAS4011	450
<b>31dB</b>	LAS1212	LAS1011	N/A	451
<b>31dB</b>	LAS1011	LAS1011	LAS8001 si, LAS4011	452
<b>31dB</b>	LAS1011	2 x LAS1011	LAS8001 si, LAS4011	453
<b>32dB</b>	LAS1212, LP1504DS	2 x LP1504DS	LAS8001 si, LAS4011	454
<b>32dB</b>	LAS1212, LP1504DS	LP1504DS	LAS8001 si, LAS4011	455
<b>32dB</b>	LAS1212, LAS1011	2 x LAS1011	LAS8001 si, LAS4011	456
<b>32dB</b>	LAS1212, LAS1011	LAS1011	LAS8001 si, LAS4011	457
<b>32dB</b>	LAS1212, LAS1011	LAS1011	LAS8001 si	458

# 32-35dB

44MM | GLAZED

DLSA



- Typical double leaf acoustic solution:
1. LAS1212K Batwing® perimeter seal
  2. LP1504 perimeter seal
  3. LAS1011 x 2 meeting stile seals
  4. LAS8001 si drop seal
  5. LAS4002 threshold plate

## STREBORD - 44MM - GLAZED - DLSA

dB	Perimeter seals	Meeting stile seals	Threshold seals	Glazing seals	Pane size	ID
<b>32dB</b>	LAS1212	2 x LAS1011	LAS8001 si, LAS4011	6.4mm Clear Laminate	1495mm x 295mm	440
<b>33dB</b>	LAS1212, LAS1011	2 x LAS1011	LAS8001 si, LAS4011	6.4mm Clear Laminate	1495mm x 295mm	441
<b>35dB</b>	Fully caulked			7mm Pyroguard	1495mm x 295mm	
<b>33dB</b>	LAS1212	2 x LAS1011	LAS8001 si, LAS4011	7mm Pyroguard	1495mm x 295mm	442
<b>33dB</b>	LAS1212	2 x LP1004DS	LAS8001 si, LAS4011	7mm Pyroguard	1495mm x 295mm	443
<b>34dB</b>	LAS1212, LP1504DS	2 x LP1004DS	LAS8001 si, LAS4011	7mm Pyroguard	1495mm x 295mm	444
<b>34dB</b>	LAS1212, LAS1011	2 x LAS1011	LAS8001 si, LAS4011	7mm Pyroguard	1495mm x 295mm	445
<b>35dB</b>	Fully caulked			11mm Pyroguard	1495mm x 295mm	
<b>35dB</b>	Fully caulked			15mm Pyroguard	1495mm x 295mm	
<b>35dB</b>	LAS1212, LP1504DS	2 x LP1004DS	LAS8001 si, LAS4014	15mm Pyroguard	1495mm x 295mm	446
<b>35dB</b>	LAS1212, LAS1011	2 x LAS1011	LAS8001 si, LAS4014	15mm Pyroguard	1495mm x 295mm	447
<b>35dB</b>	LAS1212, LAS1011	2 x LAS1011	2 x LAS1011, LAS4014	15mm Pyroguard	1495mm x 295mm	448
<b>35dB</b>	LAS1212, LP1504DS	2 x LP1004DS	2 x LAS1011, LAS4014	15mm Pyroguard	1495mm x 295mm	449

# 35-37dB

54MM | GLAZED

DLSA



## STREBORD - 54MM - GLAZED - DLSA

dB	Perimeter seals	Meeting stile seals	Threshold seals	Glazing seals	Pane size	ID
<b>35dB</b>	Fully caulked			6.4mm Clear Laminate	1495mm x 295mm	
<b>35dB</b>	LAS1212, LAS1011	2 x LAS1011	2 x LAS1011, LAS4011	6.4mm Clear Laminate	1495mm x 295mm	
<b>35dB</b>	LAS1212, LAS1011	2 x LAS1011	LAS8001 si, LAS4014	6.4mm Clear Laminate	1495mm x 295mm	
<b>35dB</b>	Fully caulked			7mm Pyroguard	1495mm x 295mm	
<b>35dB</b>	LAS1212, LP1504DS	2 x LP1504DS	LAS8001 si, LAS4014	7mm Pyroguard	1495mm x 295mm	
<b>35dB</b>	LAS1212, LP1504DS	2 x LP1504DS	2 x LAS1011, LAS4011	7mm Pyroguard	1495mm x 295mm	
<b>36dB</b>	Fully caulked			11mm Pyroguard	1495mm x 295mm	
<b>35dB</b>	LAS1212, LP1504DS	2 x LP504DS	2 x LAS1011, LAS4011	11mm Pyroguard	1495mm x 295mm	
<b>35dB</b>	2 x LP504DS	2 x LP504DS	2 x LAS1011, LAS4011	11mm Pyroguard	1495mm x 295mm	
<b>35dB</b>	2 x LP504DS	2 x LP504DS	LAS8001 si, LAS4014	11mm Pyroguard	1495mm x 295mm	465
<b>35dB</b>	Fully caulked			15mm Pyroguard	1495mm x 295mm	
<b>36dB</b>	2 x LP504DS	2 x LP504DS	2 x LAS1011, LAS4011	15mm Pyroguard	1495mm x 295mm	466
<b>36dB</b>	2 x LP504DS	2 x LP504DS	LAS8001 si, LAS4014	15mm Pyroguard	1495mm x 295mm	467
<b>36dB</b>	LAS1212, LP1504DS	2 x LP504DS	2 x LAS1011, LAS4011	15mm Pyroguard	1495mm x 295mm	468
<b>37dB</b>	Fully caulked			23mm Pyroguard	1495mm x 295mm	
<b>35dB</b>	LAS1212, LP1504DS	2 x LP504DS	2 x LAS1011, LAS4011	23mm Pyroguard	1495mm x 295mm	469
<b>35dB</b>	2 x LP504DS	2 x LP504DS	LAS8001 si, LAS4014	23mm Pyroguard	1495mm x 295mm	470
<b>35dB</b>	2 x LP504DS	2 x LP504DS	2 x LAS1011, LAS4011	23mm Pyroguard	1495mm x 295mm	471





**SEALED TIGHT SOLUTIONS**



**ACOUSTIC TEST DATA**

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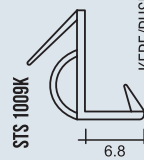
# SEALED TIGHT SOLUTIONS



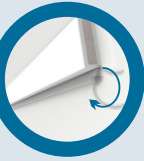
## STS PRODUCT COMBINATIONS - ACOUSTIC



CODE: STS 1009  
 DESCRIPTION: PERIMETER ACOUSTIC/SMOKE SEAL  
 LENGTH: 2100MM (OTHERS ON REQUEST)  
 COLOUR:



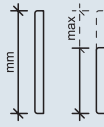
STS 1009K  
 KERF/PUSH-FIT ALTERNATIVE



NAME: FLAIR  
 CODE: STS "FLAIR"  
 DESCRIPTION: INTUMESCENT/SMOKE/ACOUSTIC SEAL  
 LENGTH: 2100MM (OTHERS ON REQUEST)  
 COLOUR:



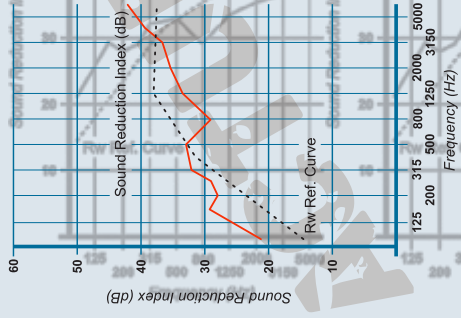
CODE: STS 422  
 DESCRIPTION: DOOR-BOTTOM ACOUSTIC SEAL  
 COLOUR: N/A  
 LENGTH: VARIOUS - SEE TABLE >>>



PRODUCT AVAILABLE IN THESE LENGTHS (mm):  
 330 430 530 630 730 830 930 1030 1130 1230 1330  
 50 70 200 200 200 200 200 200 200 200 200  
 MAXIMUM CUT-BACK (mm):

## ACOUSTIC TESTING

STS PRODUCTS ARE NOT ASSESSED.



ALL STS PRODUCTS ARE FULLY TESTED TO:  
**BS EN ISO 10140-2: 2010**

ALL STS PRODUCTS ARE FULLY TESTED IN  
 UKAS ACCREDITED LABORATORIES.

.....KEEPING IT SIMPLE

# STS

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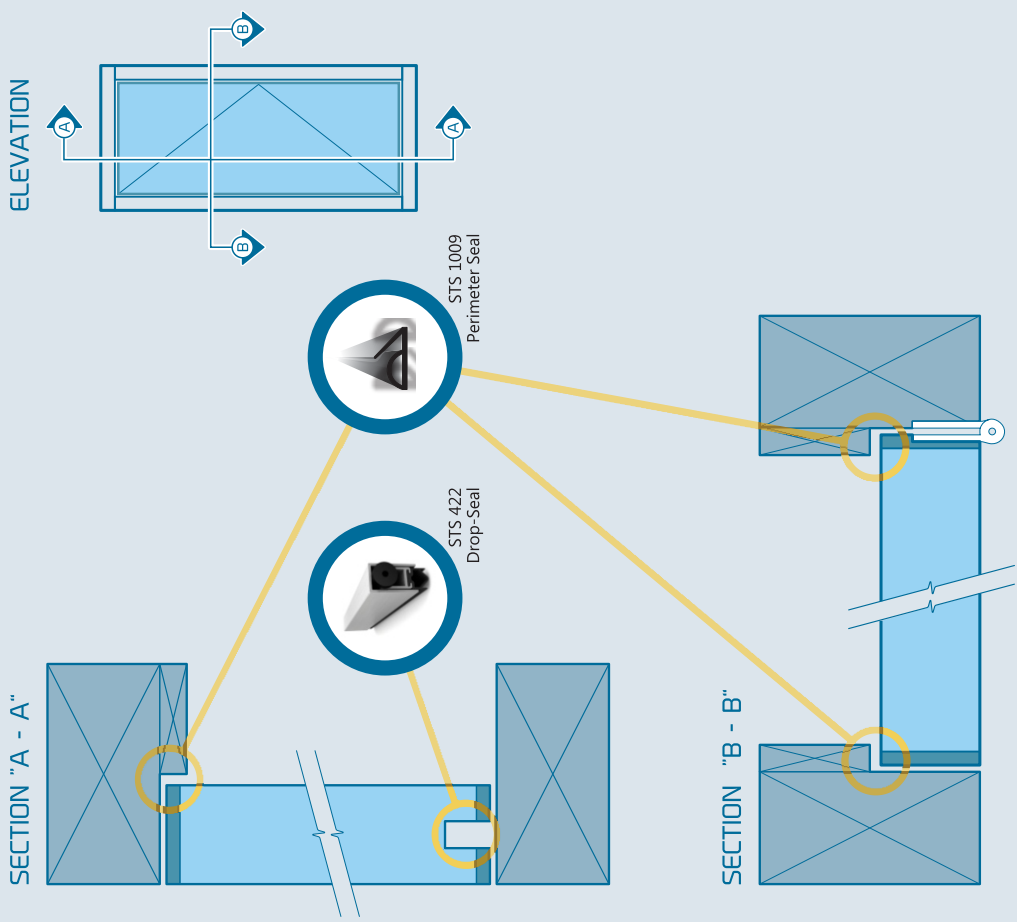
**STREBORD - 44MM FLUSH SINGLES**

HEAD/JAMBS	DOOR BOTTOM	PERFORMANCE
STS 1009	STS 422	33dBRw

**STREBORD - 54MM FLUSH SINGLES**

HEAD/JAMBS	DOOR BOTTOM	PERFORMANCE
STS 1009	STS 422	33dBRw
STS 1009	STS 422	35dBRw*

\*bond-up



**STS**



# SEALED TIGHT SOLUTIONS

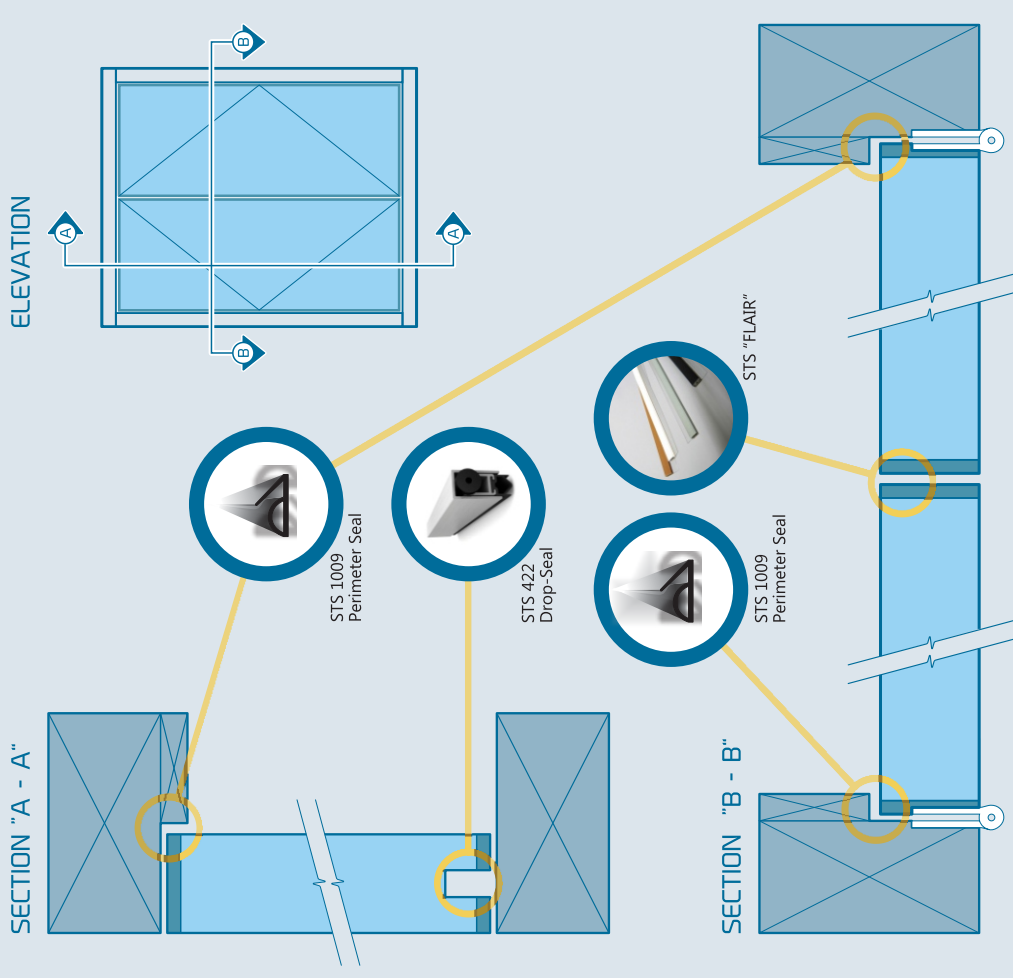
## STREBORD - 44MM FLUSH PAIRS

HEAD/JAMBS	DOOR BOTTOM	MEETING STILE	PERFORMANCE
STS 1009	STS 422	STS 104FL	31dB <sub>Rw</sub>

## STREBORD - 54MM FLUSH PAIRS

HEAD/JAMBS	DOOR BOTTOM	MEETING STILE	PERFORMANCE
STS 1009	STS 422	STS 154FL	32dB <sub>Rw</sub>
STS 1009	STS 422	STS 154FL	35dB <sub>Rw</sub> *

\*bond-up



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# STS





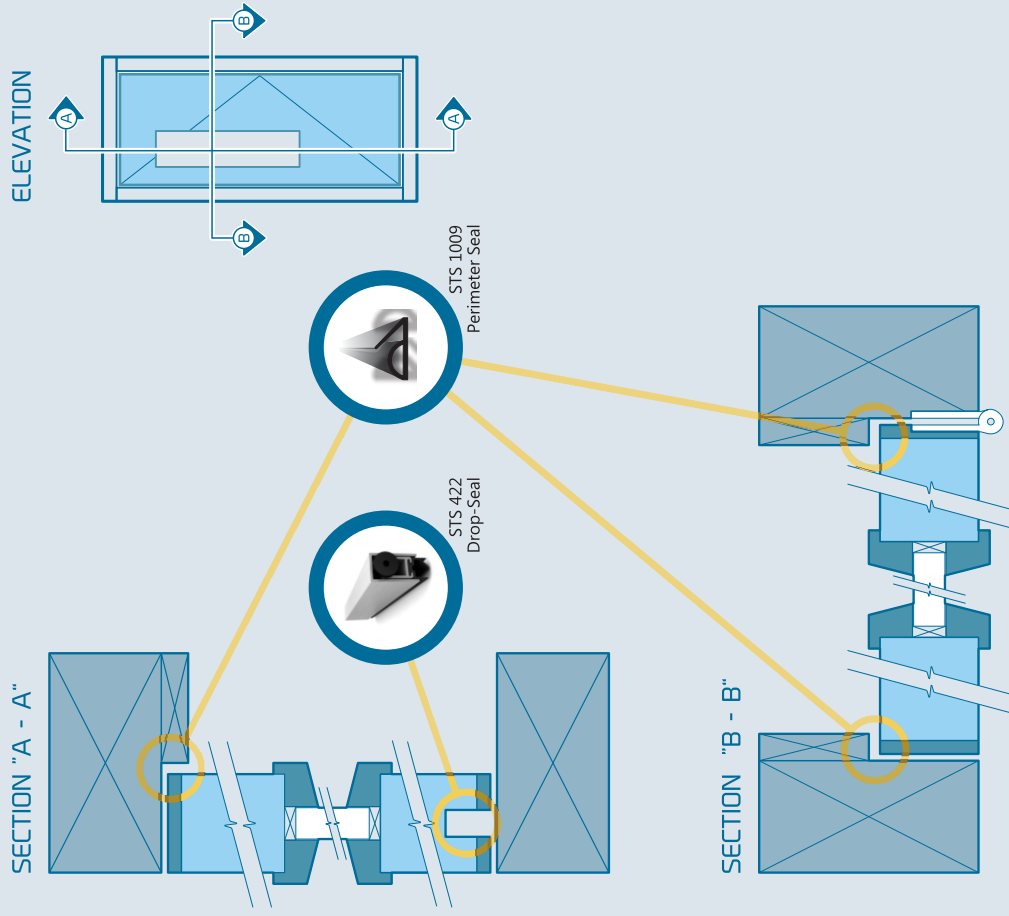
# SEALED TIGHT SOLUTIONS

## STREBORD - 44MM GLAZED SINGLES

HEAD/JAMBS	DOOR BOTTOM	GLASS	PERFORMANCE
STS 1009	STS 422	7mm	34dB Rw

## STREBORD - 54MM GLAZED SINGLES

HEAD/JAMBS	DOOR BOTTOM	MEETING STILE	GLASS	PERFORMANCE
STS 1009	STS 422	STS 154FL	11mm	34dB Rw
STS 1009	STS 422	STS 154FL	15mm	35dB Rw



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# STS

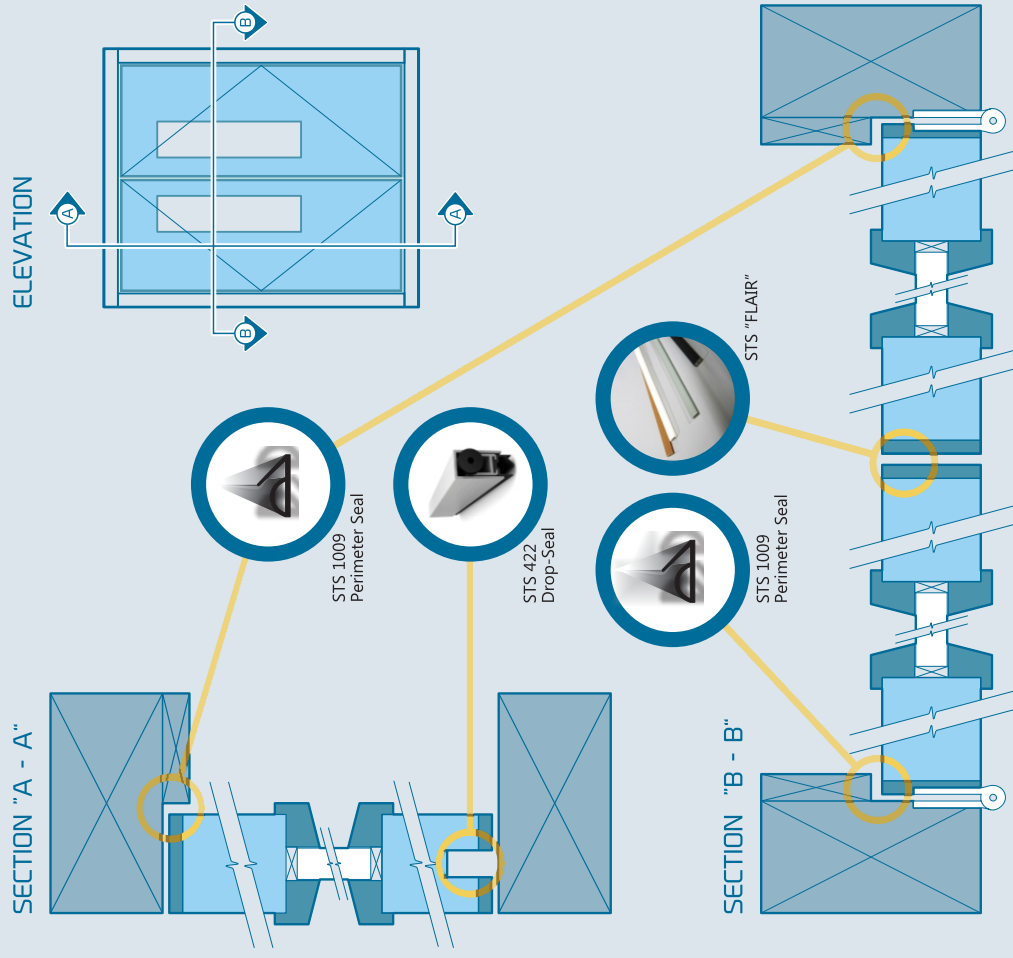


## STREBORD - 44MM GLAZED PAIRS

HEAD/JAMBS	DOOR BOTTOM	MEETING STILE	GLASS	PERFORMANCE
STS 1009	STS 422	STS 104FL	6mm	33dBRw
STS 1009	STS 422	STS 104FL	10mm	33dBRw

## STREBORD - 54MM GLAZED PAIRS

HEAD/JAMBS	DOOR BOTTOM	MEETING STILE	GLASS	PERFORMANCE
STS 1009	STS 422	STS 154FL	10mm	34dBRw
STS 1009	STS 422	STS 154FL	15mm	35dBRw



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## FIRE AND ACOUSTIC SEAL PRODUCT LIST

PROVEN SOUND REDUCTION PERFORMANCE

SIMPLE "TWO-SEAL" SYSTEMS

DESIGNED WITH THE MANUFACTURER IN MIND



Welcome to the Fire & Acoustic Seals Ltd range of acoustic sealing systems, products which have been designed and tested with the door and joinery manufacturer in mind. Our systems are based mainly on a “two-seal” solution, using a perimeter seal around the door frame and a single automatic drop threshold seal in the base of the door.

As independent Fire, Smoke and Acoustic sealing specialists, Fire & Acoustic Seals Ltd have a portfolio of high performance systems that enhance the Strebord range of door cores. Our products are specifically designed to reduce the passage of sound around the gaps of a door leaf, and have been tested to the highest standards for fire and smoke.

### NOISE POLLUTION

Gaps around the four sides of a door leaf are essential, so doors can open and close, but unfortunately these gaps allow sound to pass through. With constant low-level noise often as disruptive as louder sounds and confidentiality important in many businesses and organisations, it is essential acoustic performance is managed correctly.

Approved Document E of the Building Regulations gives specific acoustic performance requirements for doors in certain buildings, including schools, care homes and hotels.

Our systems adhere to the Approved Document E regulations.

The Fire & Acoustic Seals range of products are designed to fill the door gaps. For fire doors, many of our combined smoke and fire seals also provide acoustic protection. For non-fire rated doors, where intumescent protection isn't needed but acoustic protection is, you can choose seals such as our FAS35 or FAS Trident seals. These seals are fitted across the top of the door and on the vertical sides.

Sealing the threshold is vital.

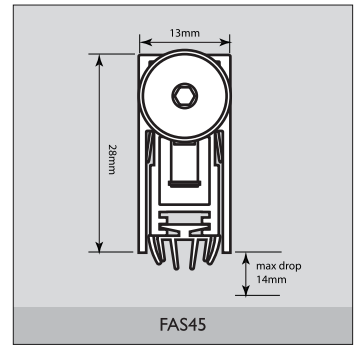
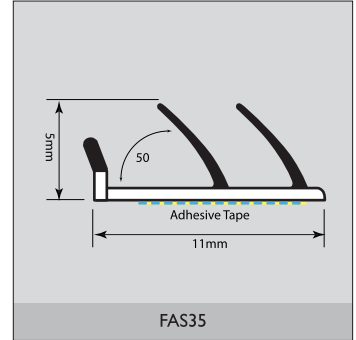
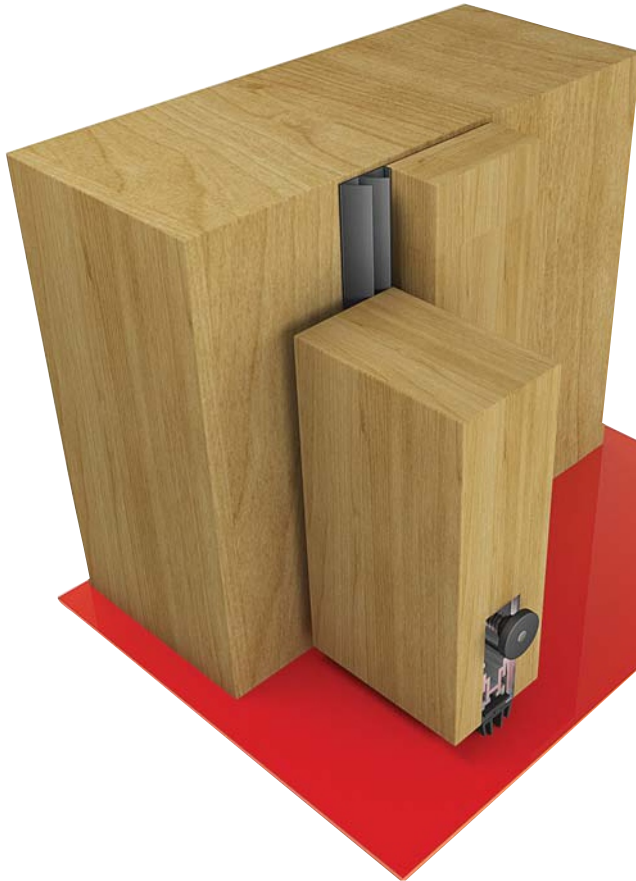
Our FAS45 automatic drop threshold seal is easily fitted into a routed groove in the base of the door, and as with all our seals it comes with proven acoustic performance.

### TESTED SOLUTIONS

We have tested and proven systems for 30 and 60 minute fire rated doors, non-fire doors, specialist acoustic doors, and double-leaf doors.

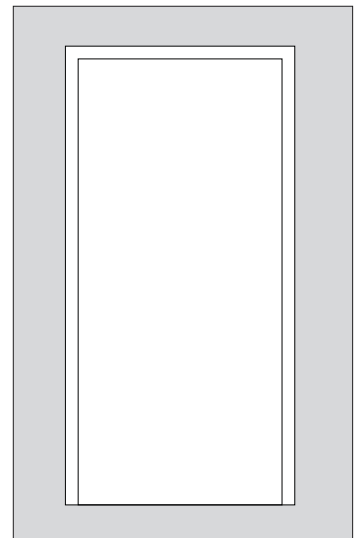
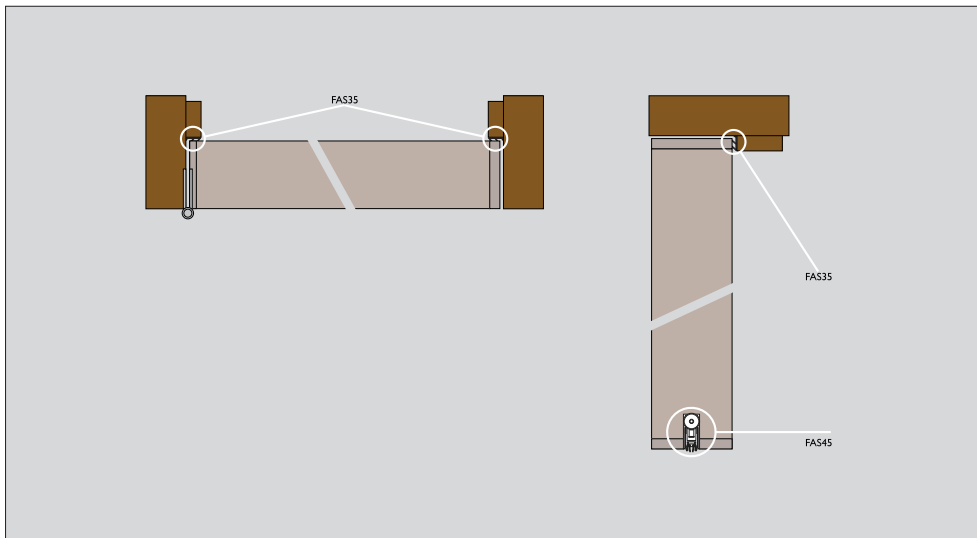
Ask our technical team for guidance and specific performance details.

## STREBORD 44MM SINGLE LEAF SINGLE ACTION



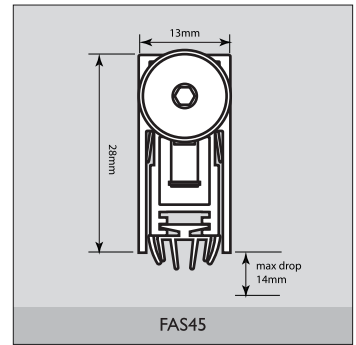
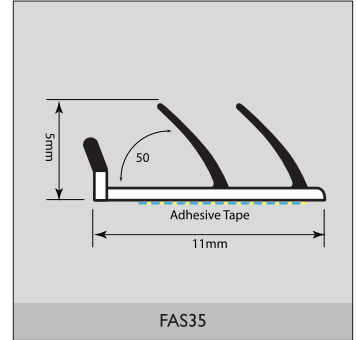
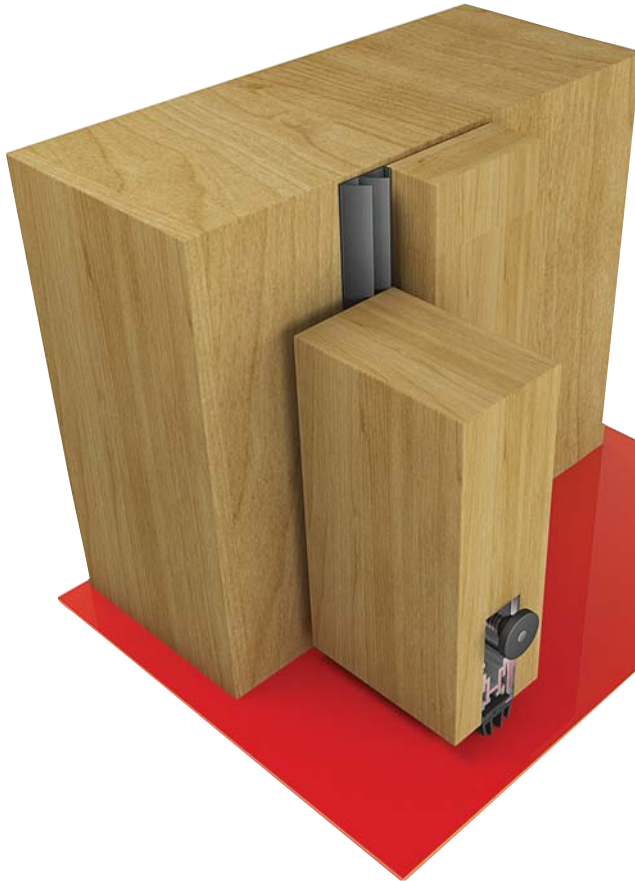
STREBORD 44MM SINGLE LEAF SINGLE ACTION

STREBORD 44MM FLUSH DOOR - SINGLE LEAF - SINGLE ACTION							
Hanging Jamb	Closing Jamb	Head	Threshold	Meeting Stiles	Glazing	Test Reference	Performance
FAS35	FAS35	FAS35	FAS45	n/a	n/a	C21290/R1 Test 44	Rw.33dB

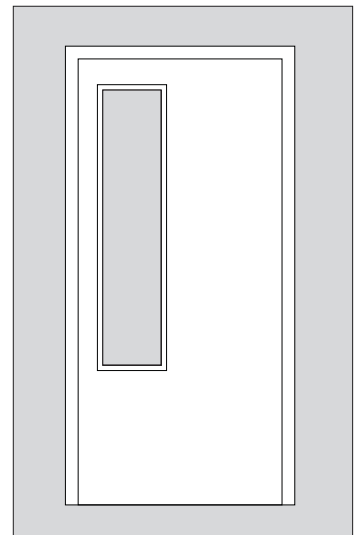
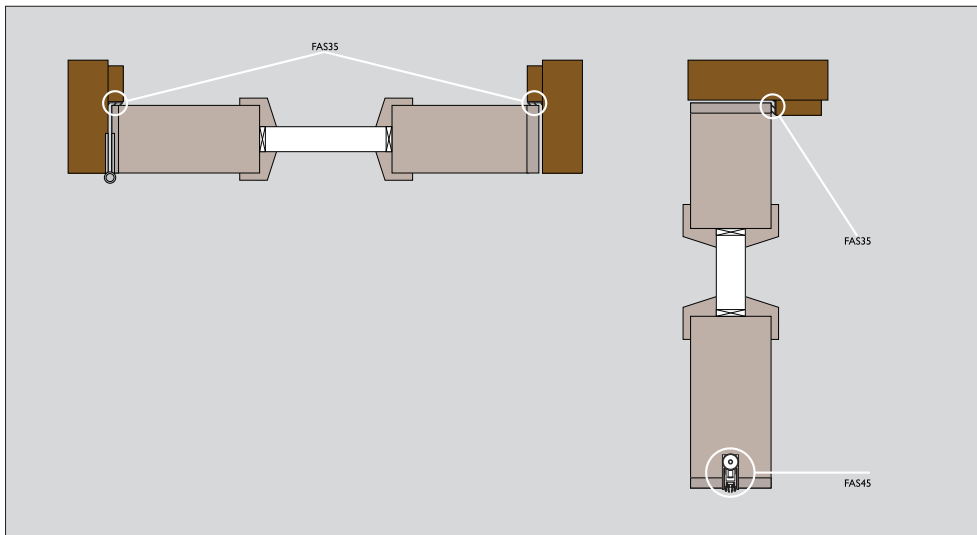


## STREBORD 44MM SINGLE LEAF SINGLE ACTION GLAZED

STREBORD 44MM SINGLE LEAF SINGLE ACTION GLAZED

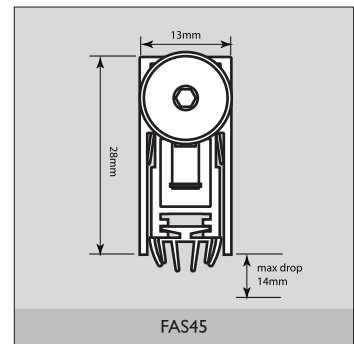
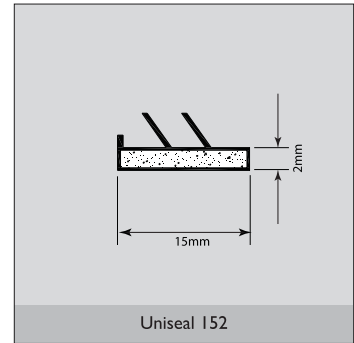


STREBORD 44MM GLAZED DOOR - SINGLE LEAF - SINGLE ACTION - 25% GLAZING							
Hanging Jamb	Closing Jamb	Head	Threshold	Meeting Stiles	Glazing	Test Reference	Performance
FAS35	FAS35	FAS35	FAS45	n/a	7mm Pyroguard	C21290/R1 Test 4	Rw.34dB
FAS35	FAS35	FAS35	FAS45	n/a	7mm Pyroguard	C/22478/T02 Test 83	Rw.35dB



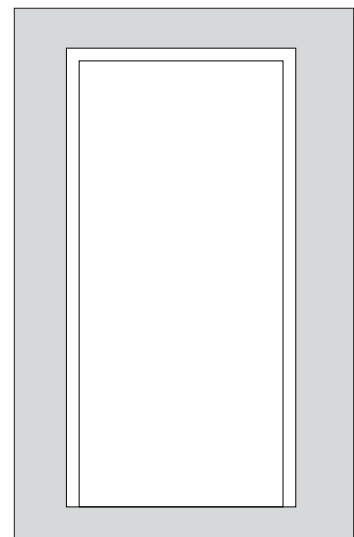
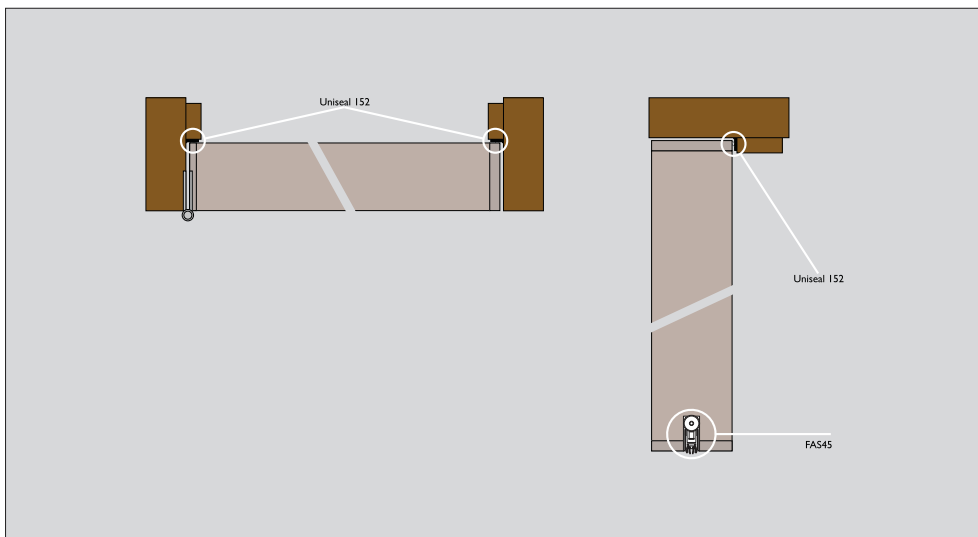


## STREBORD 44MM SINGLE LEAF SINGLE ACTION

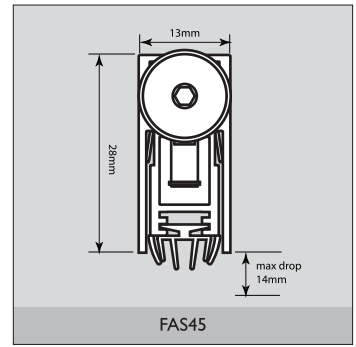
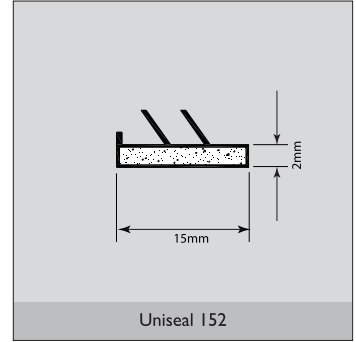


STREBORD 44MM SINGLE LEAF SINGLE ACTION

STREBORD 44MM FLUSH DOOR - SINGLE LEAF - SINGLE ACTION							
Hanging Jamb	Closing Jamb	Head	Threshold	Meeting Stiles	Glazing	Test Reference	Performance
UNISEAL 152	UNISEAL 152	UNISEAL 152	FAS45	n/a	n/a	N/A	Assess Rw.33dB

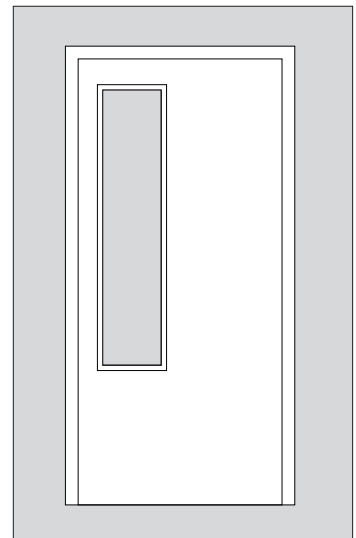
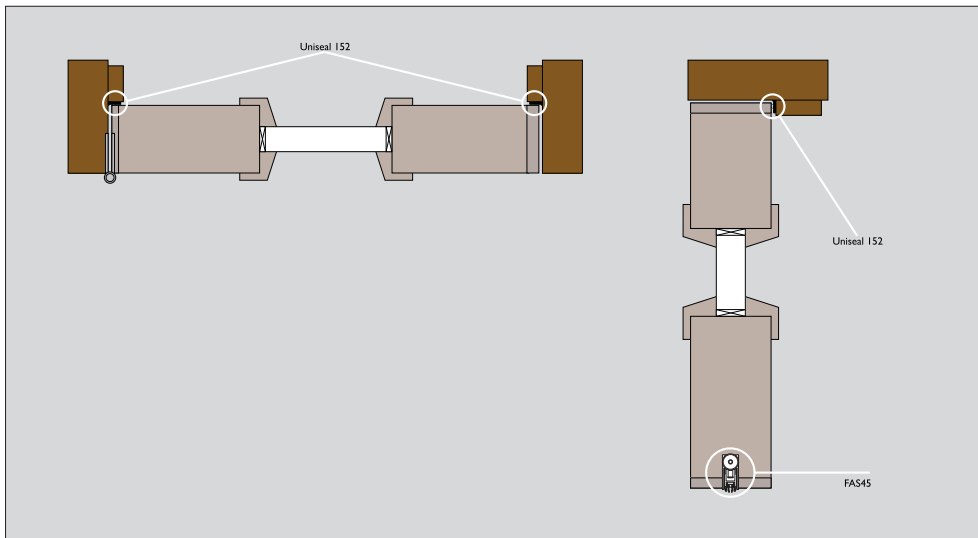


## STREBORD 44MM SINGLE LEAF SINGLE ACTION GLAZED

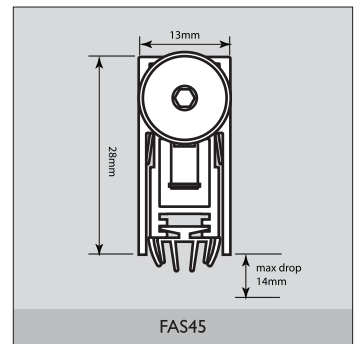
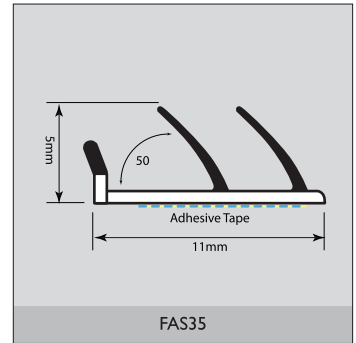
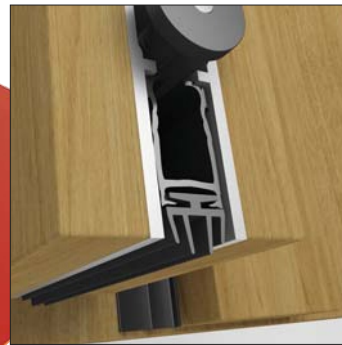
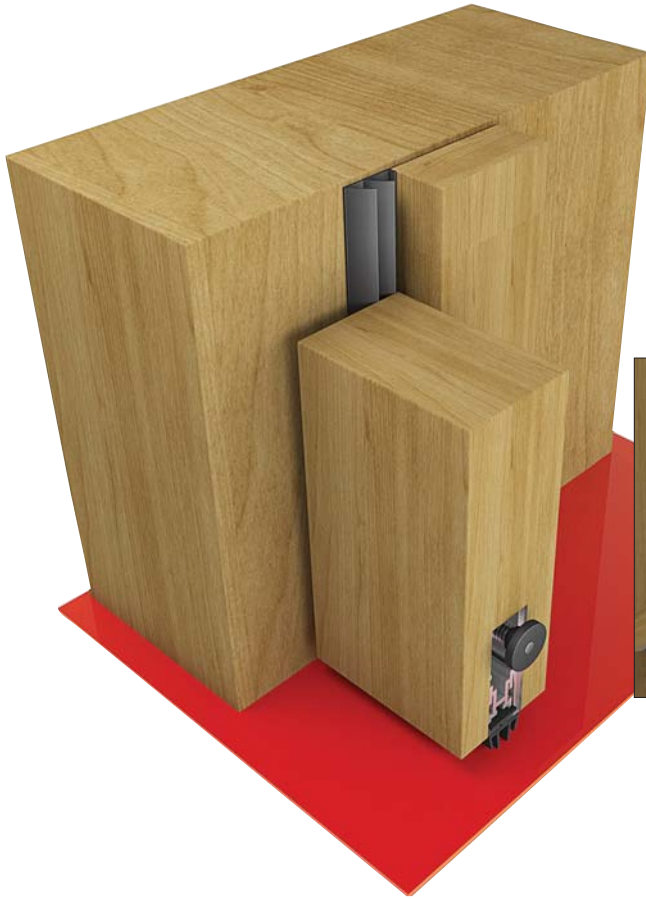


STREBORD 44MM SINGLE LEAF SINGLE ACTION GLAZED

STREBORD 44MM GLAZED DOOR - SINGLE LEAF - SINGLE ACTION - 25% GLAZING							
Hanging Jamb	Closing Jamb	Head	Threshold	Meeting Stiles	Glazing	Test Reference	Performance
UNISEAL 152	UNISEAL 152	UNISEAL 152	FAS45	n/a	7mm Glass*	N/A	Assess Rw.33dB

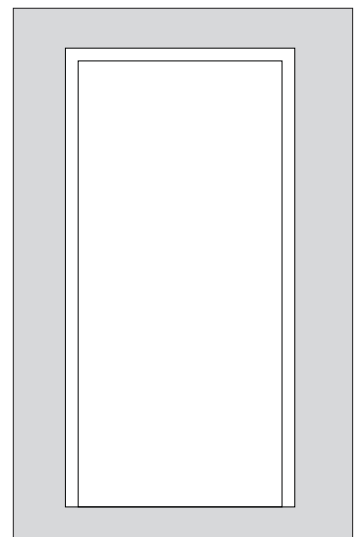
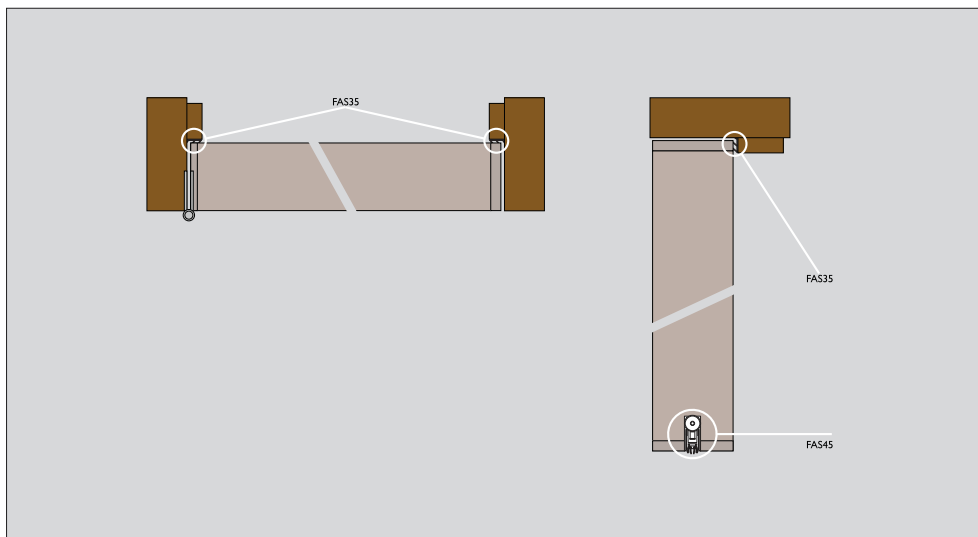


## STREBORD 54MM SINGLE LEAF SINGLE ACTION

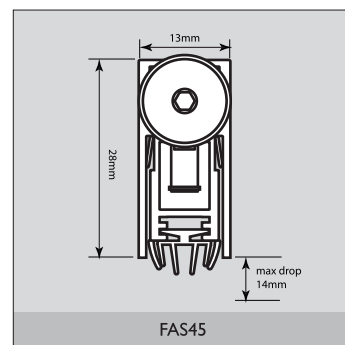
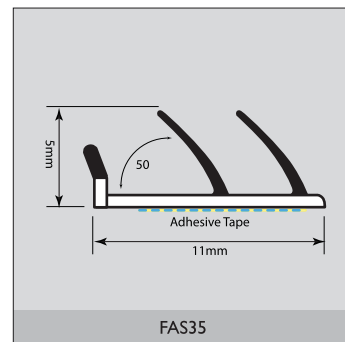
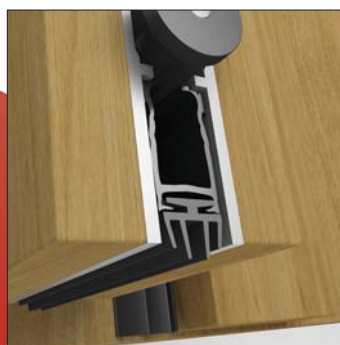
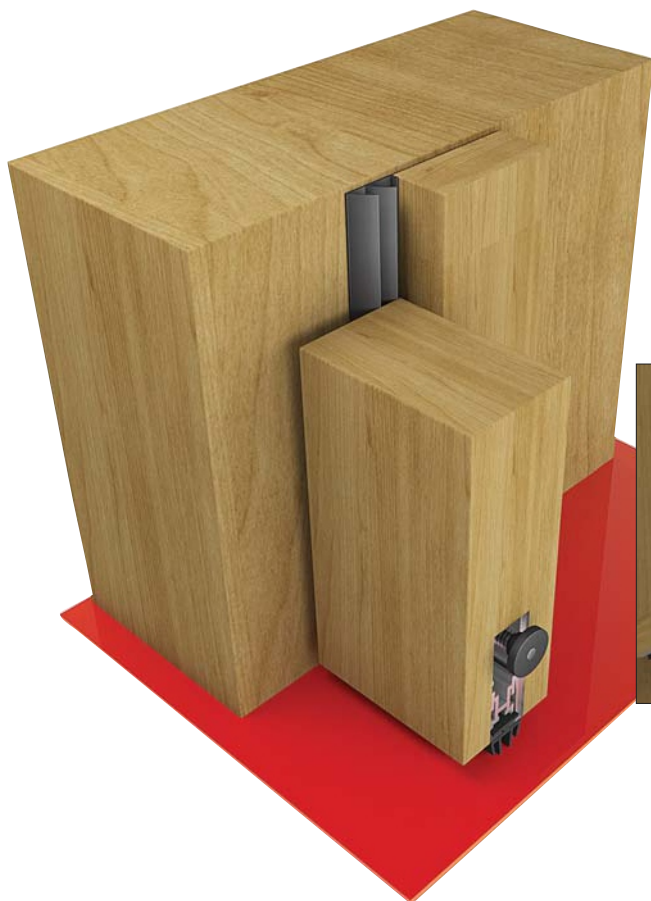


STREBORD 54MM SINGLE LEAF SINGLE ACTION

STREBORD 54MM FLUSH DOOR - SINGLE LEAF - SINGLE ACTION							
Hanging Jamb	Closing Jamb	Head	Threshold	Meeting Stiles	Glazing	Test Reference	Performance
FAS35	FAS35	FAS35	FAS45	n/a	n/a	C2I290/R1 Test 12	Rw.33dB

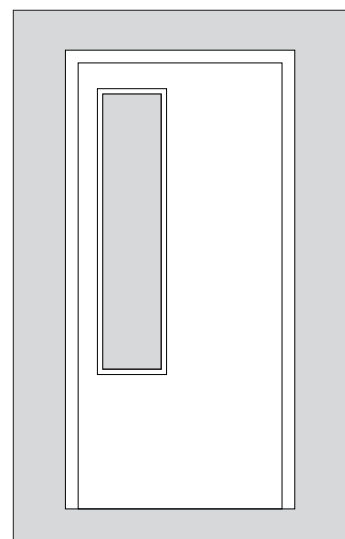
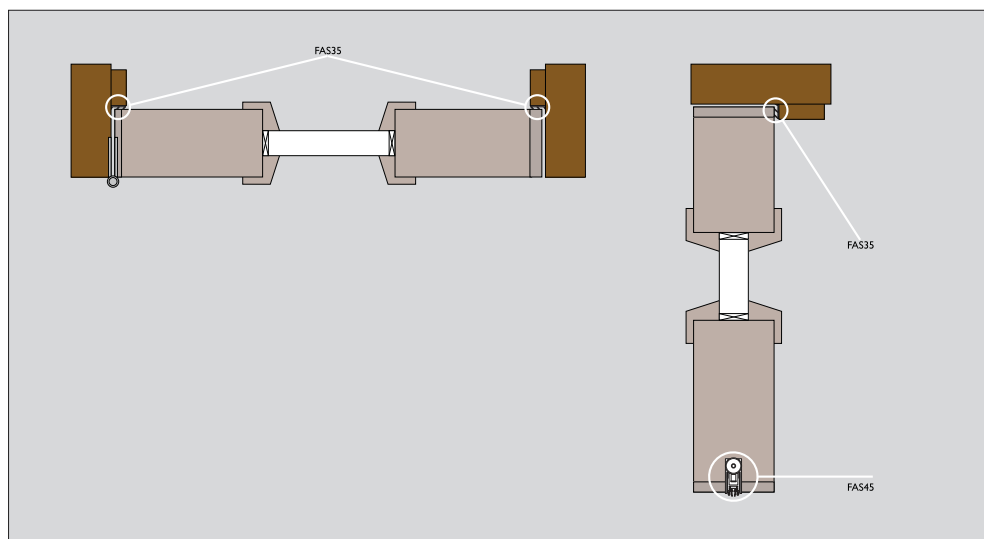


## STREBORD 54MM SINGLE LEAF SINGLE ACTION GLAZED



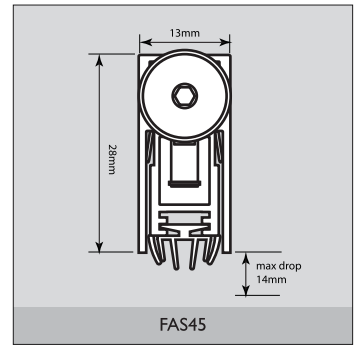
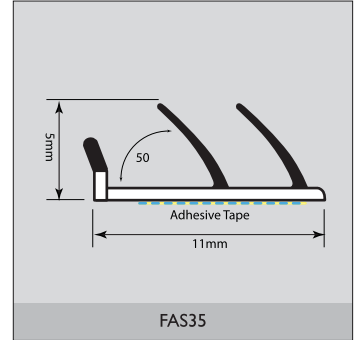
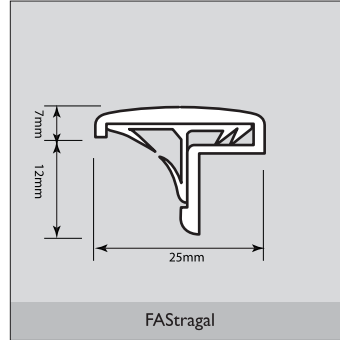
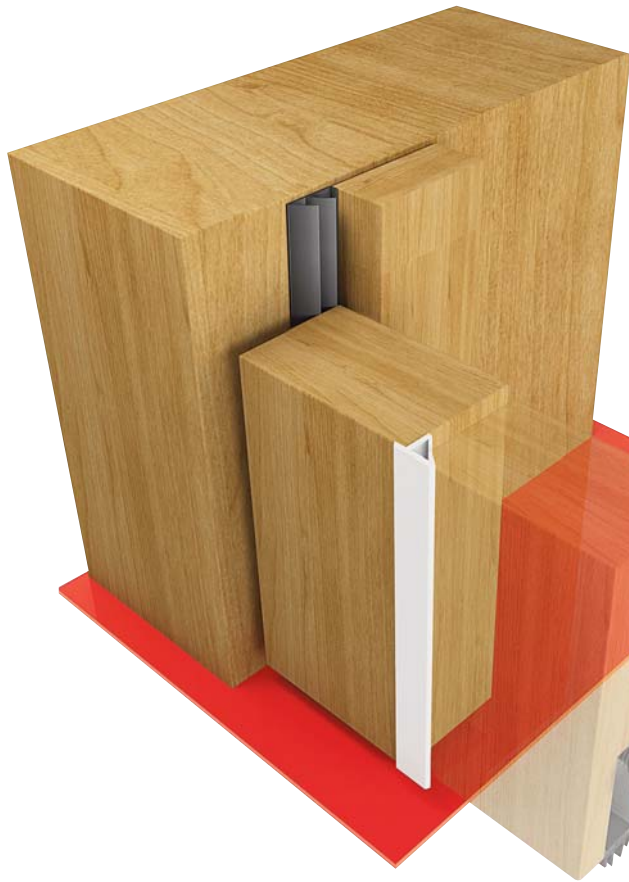
STREBORD 54MM SINGLE LEAF SINGLE ACTION GLAZED

STREBORD 54MM GLAZED DOOR - SINGLE LEAF - SINGLE ACTION - 25% GLAZING							
Hanging Jamb	Closing Jamb	Head	Threshold	Meeting Stiles	Glazing	Test Reference	Performance
FAS35	FAS35	FAS35	FAS45	n/a	7mm Glass*	C21290/R1 Test 14	Rw.36dB

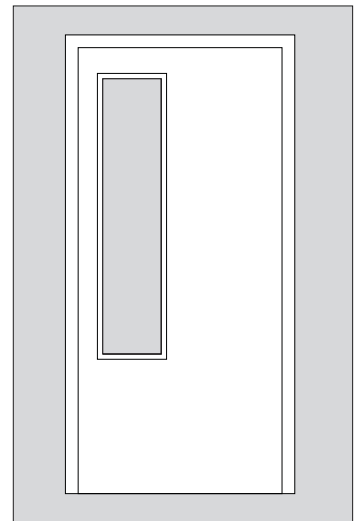
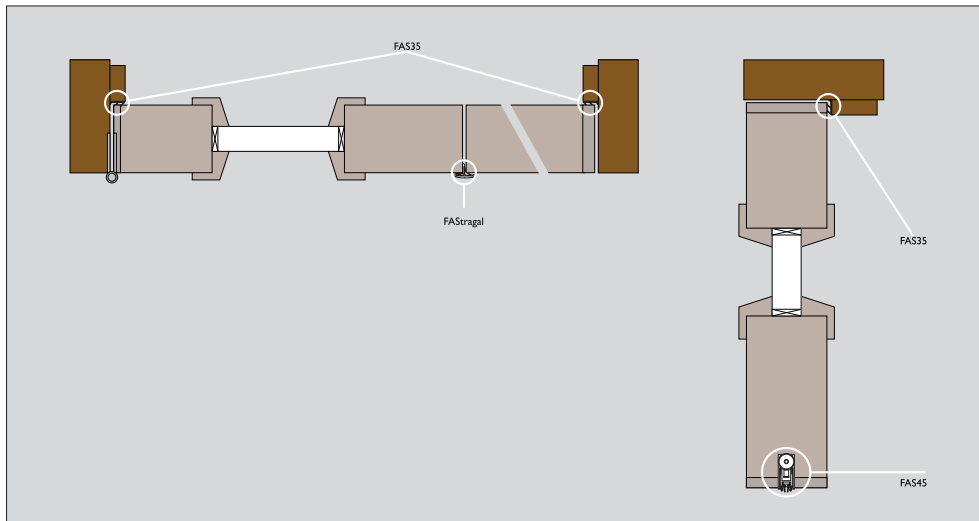


## STREBORD 44MM DOUBLE LEAF SINGLE ACTION GLAZED

STREBORD 44MM DOUBLE LEAF SINGLE ACTION GLAZED

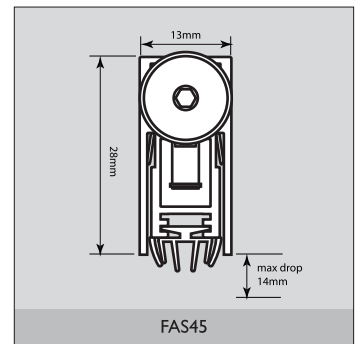
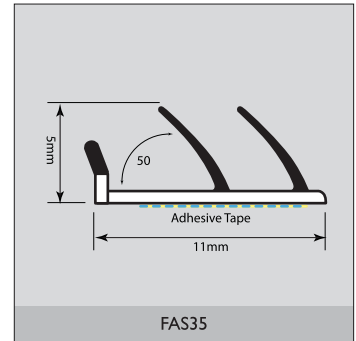
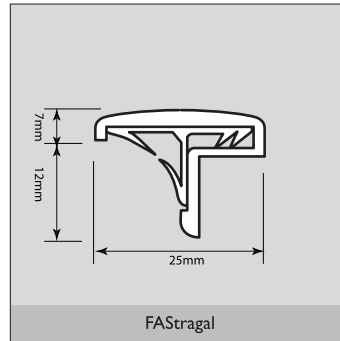
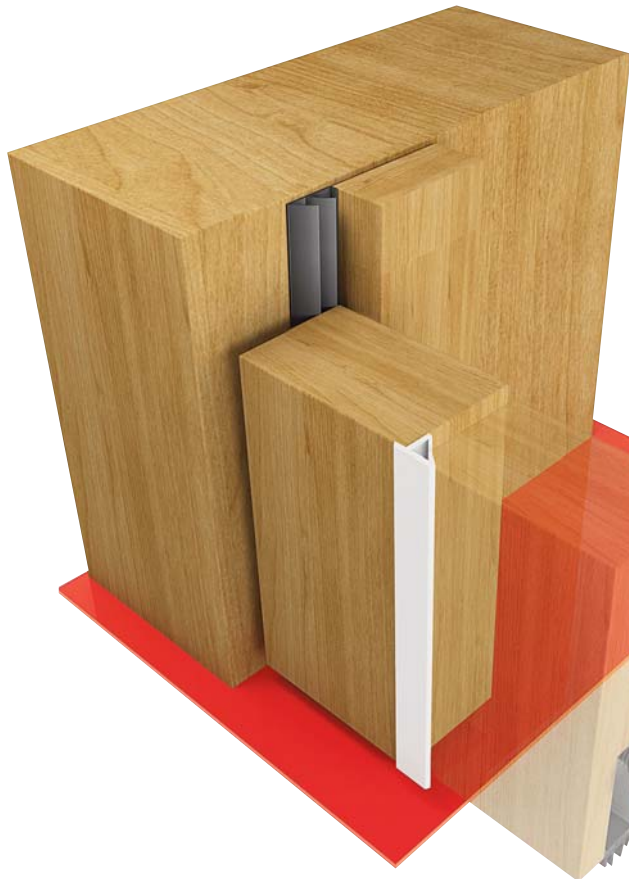


STREBORD 44MM GLAZED DOOR - DOUBLE LEAF - SINGLE ACTION - 25% GLAZING							
Hanging Jamb	Closing Jamb	Head	Threshold	Meeting Stiles	Glazing	Test Reference	Performance
FAS35	FAS35	FAS35	FAS45	FAS35	7mm Pyroguard	C21290/R1 Test 21	Rw.33B

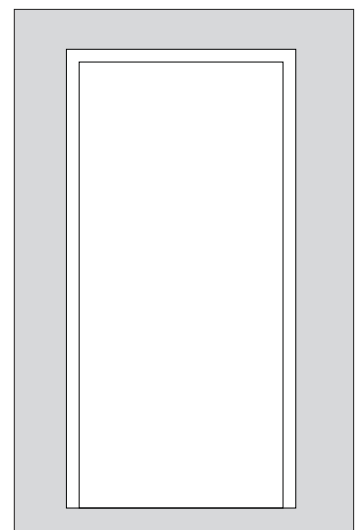
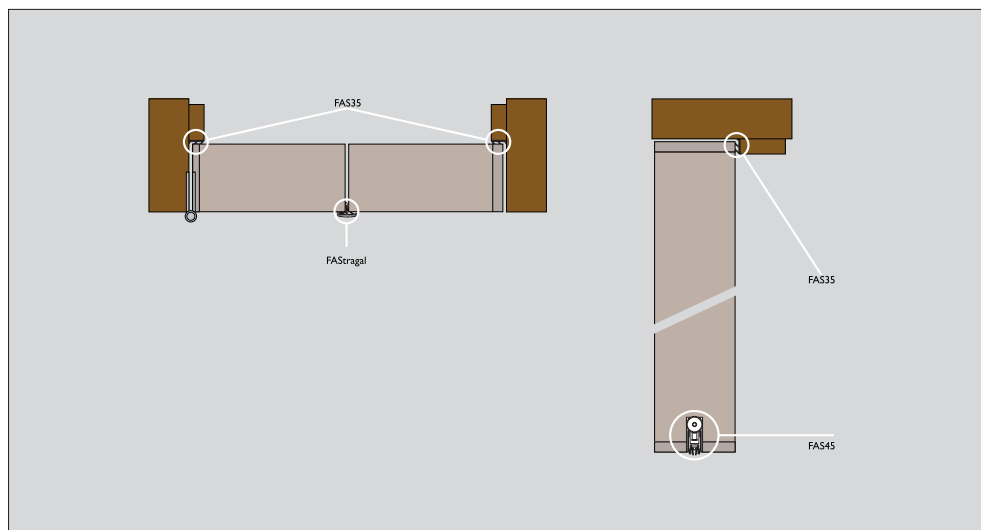


## STREBORD 54MM DOUBLE LEAF SINGLE ACTION

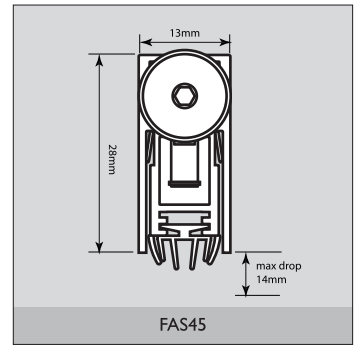
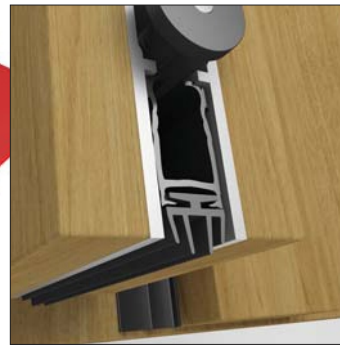
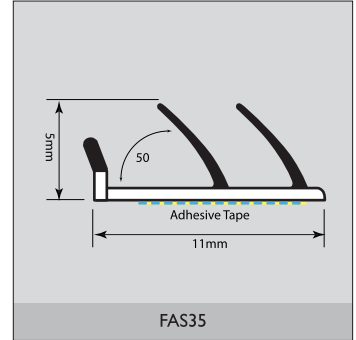
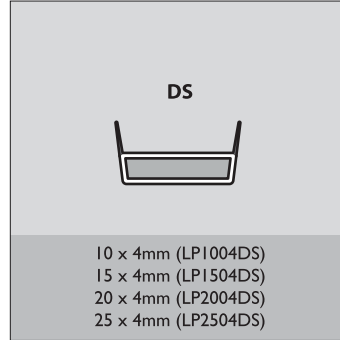
STREBORD 54MM DOUBLE LEAF SINGLE ACTION



STREBORD 54MM FLUSH DOOR - DOUBLE LEAF - SINGLE ACTION							
Hanging Jamb	Closing Jamb	Head	Threshold	Meeting Stiles	Glazing	Test Reference	Performance
FAS35	FAS35	FAS35	FAS45	FAS35	n/a	C21290/R1 Test 30	Rw.33B

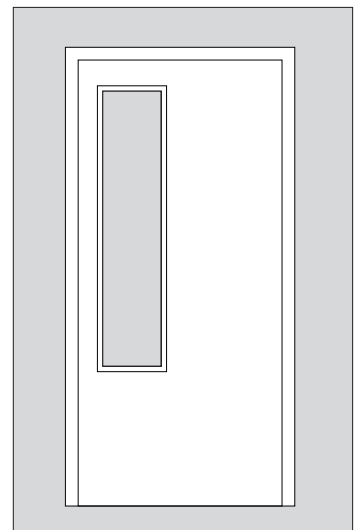
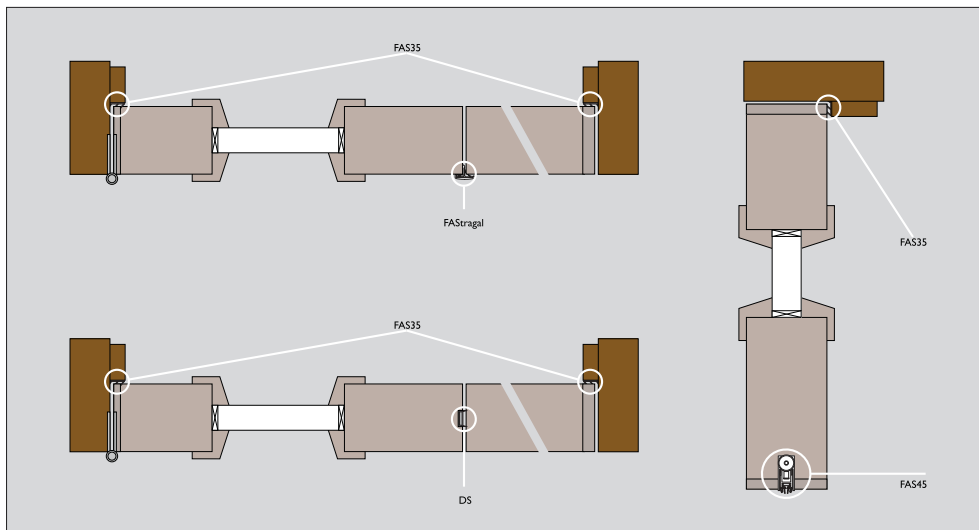


## STREBORD 54MM DOUBLE LEAF SINGLE ACTION GLAZED



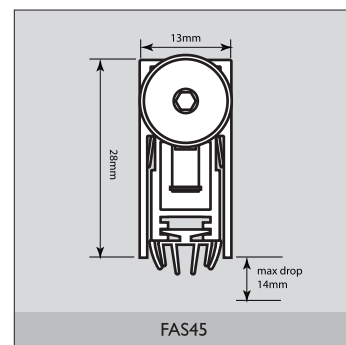
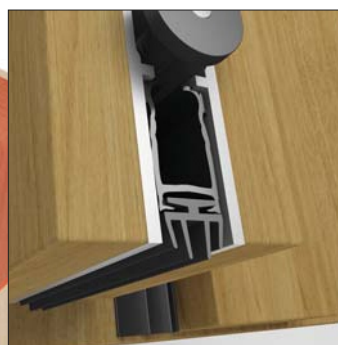
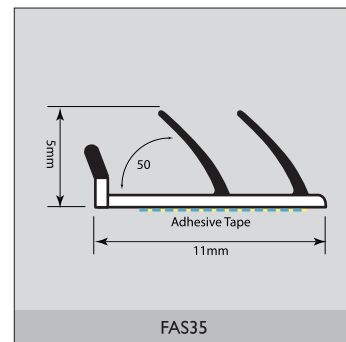
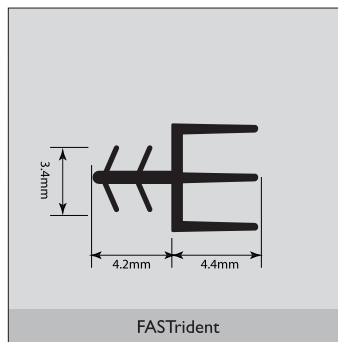
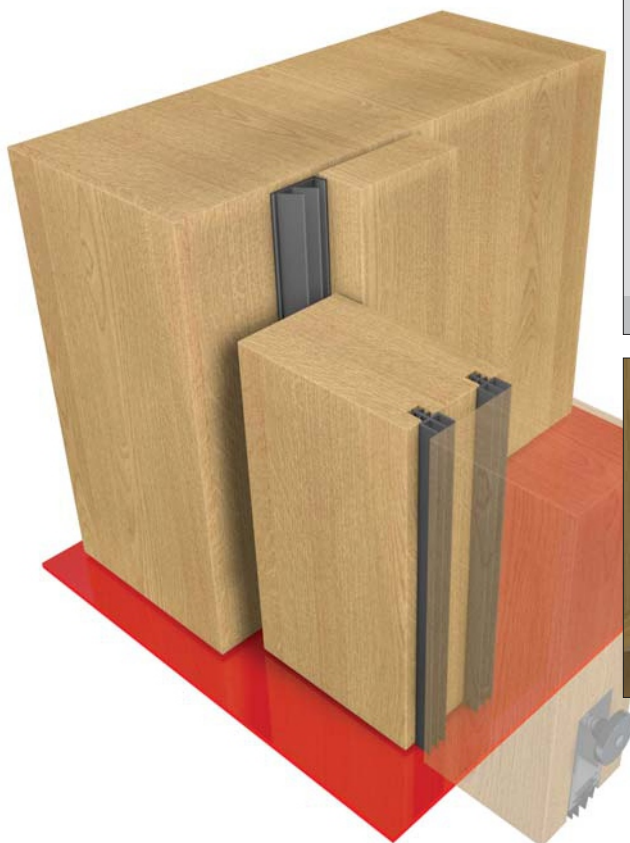
STREBORD 54MM DOUBLE LEAF SINGLE ACTION GLAZED

STREBORD 54MM GLAZED DOOR - DOUBLE LEAF - SINGLE ACTION - 25% GLAZING							
Hanging Jamb	Closing Jamb	Head	Threshold	Meeting Stiles	Glazing	Test Reference	Performance
FAS35	FAS35	FAS35	FAS45	FAStragal	11.4mm Pyroguard	C21290/R1 Test 29	Rw.36B
FAS35	FAS35	FAS35	FAS45	LP1504DS	12mm Pyrobelite	C/22478/T02 Test 64	Rw.36B
FAS35	FAS35	FAS35	FAS45	LP1504DS	7mm Glass*	C/22478/T01 Test 63	Rw.36B

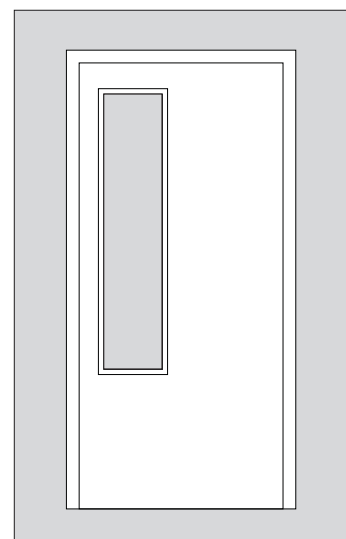
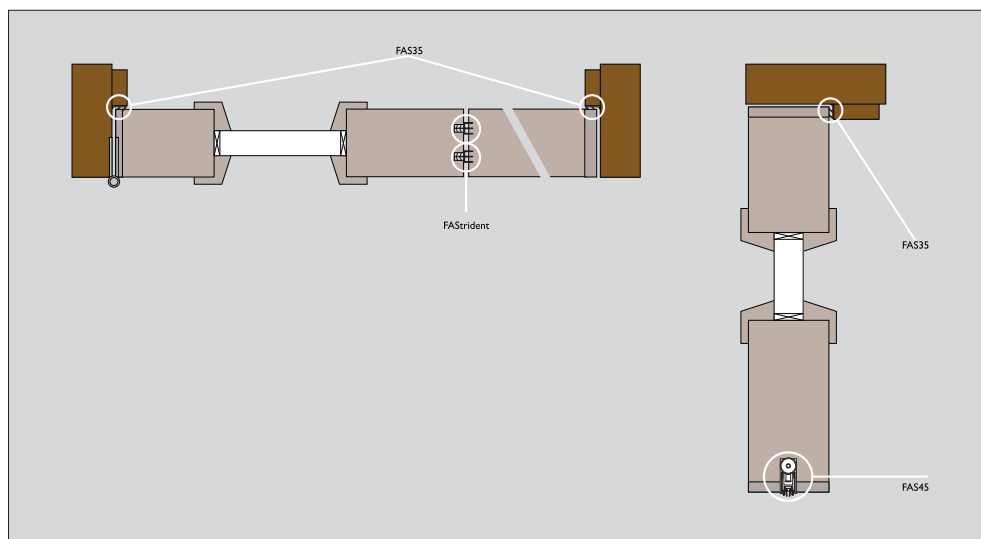


## STREBORD 54MM DOUBLE LEAF SINGLE ACTION GLAZED

STREBORD 54MM DOUBLE LEAF SINGLE ACTION GLAZED

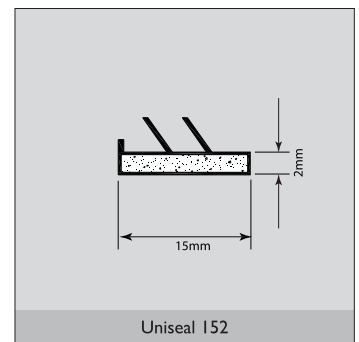
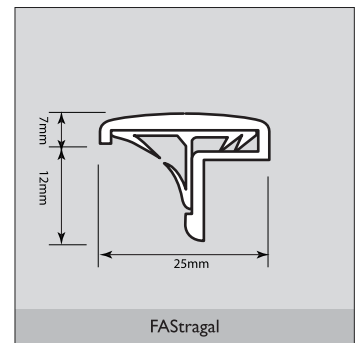
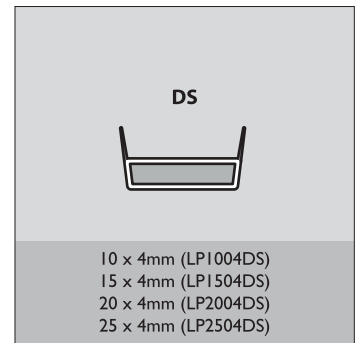
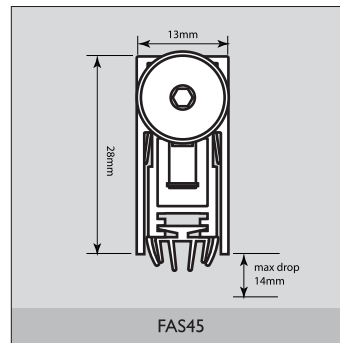
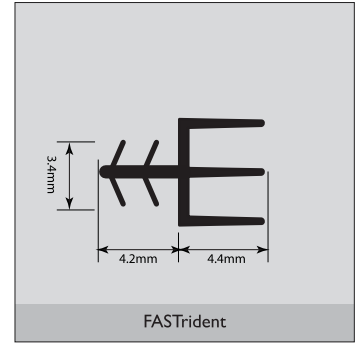
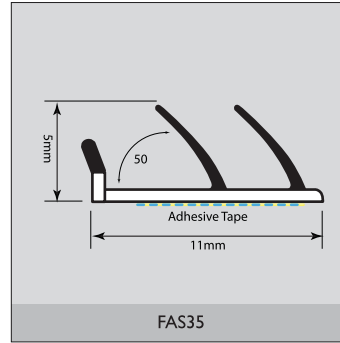


STREBORD 54MM FLUSH DOOR - DOUBLE LEAF - SINGLE ACTION							
Hanging Jamb	Closing Jamb	Head	Threshold	Meeting Stiles	Glazing	Test Reference	Performance
FAS35	FAS35	FAS35	FAS45	2 x FAS Trident	11.4mm Pyroguard	C/22478/T02 Test 65	Rw.36B



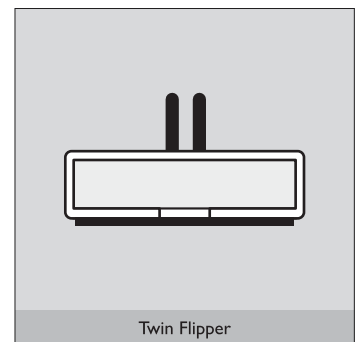
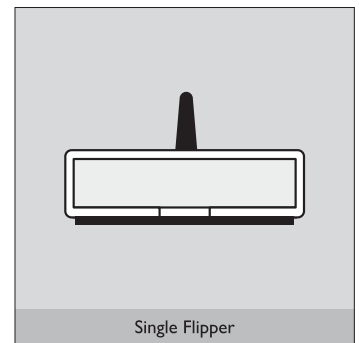
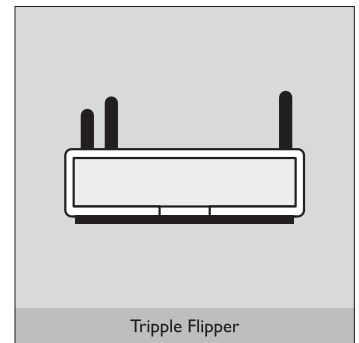
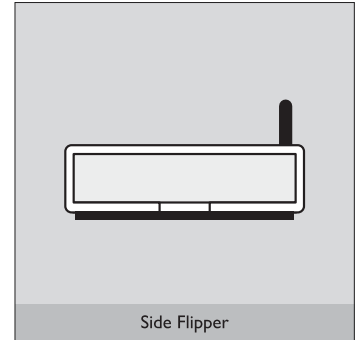
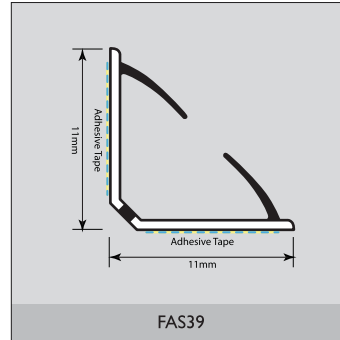


GLOSSARY



## ALSO AVAILABLE

The Fire & Acoustic Seals Flipper range provides fire, smoke and acoustic seals for timber door edges and frames. The flippers are thermally fused to the box section to ensure that under normal conditions of use they will not delaminate. This new technology ensures improved performance and appearance of the seal. The Integral Flipper range adds added security with an integral flipper that will remain uninterrupted when used with ironmongery.



ALSO AVAILABLE







# Sealmaster



## Intumescent Seals

# Ventura

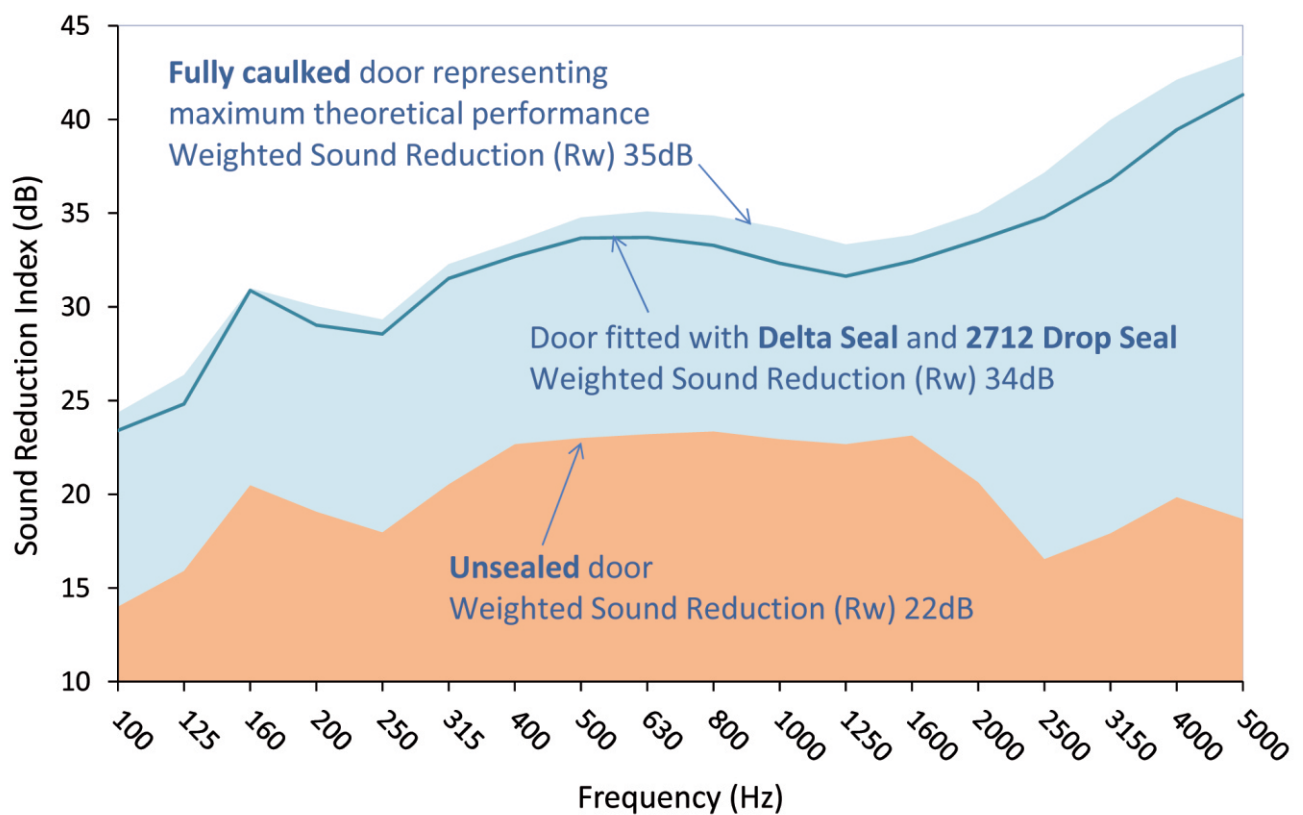
## ACOUSTIC SEAL SOLUTIONS MANUAL FOR STREBORD 44MM, 54MM AND 64MM DOORS

The Dixon International Group Ltd, with its portfolio of companies, including Sealmaster, Intumescent Seals and Ventura, has, for many years, worked on complimentary ranges of products, many of which are designed to reduce the flow of air from one side of a door or window to the other. It is this which has directly led to the products and accompanying test evidence available within this manual, ensuring the acoustic performance of doorsets is maximised whilst still maintaining their ability to be opened and closed easily. Along with the acoustic performance, the seals

will all help maintain a stable environment within a room or an area of a building and will also cut smoke leakage, in the event of a fire, to levels well below those required by legislation. Seals can often help prevent the slamming of doors and the causing of a noise nuisance in buildings, such as hotels and theatres, where this can cause serious problems. Along with durability and top quality materials, Dixon International Group Ltd offer free technical advice and site visits, if required.

**Email: [technical@dig.co.uk](mailto:technical@dig.co.uk). Tel: 01223 832851.**

### Acoustic Performance Graph Strebord 44mm 30-minute Fire Door



The graph demonstrates a typical case whereby a door without any acoustic seals fitted (achieving only  $R_w=22\text{dB}$ ) can be elevated in performance to obtain  $R_w=34\text{dB}$ , i.e. very close to the  $R_w=35\text{dB}$  theoretical maximum, when fully caulked. This high level of sound reduction can be achieved across a broad range of door types and with numerous seal combinations, as is shown on the following pages.

## Contents

<b>Section 1</b>	<b>Head/Jamb Seals</b>	<b>Threshold Seal</b>
	Sealmaster Delta	Sealmaster 2712 Dropseal
	Sealmaster Double Fin	
	Page 3	Product overview
	Page 4	Acoustic performance data – 44mm, 54mm and 64mm STREBORD doors and STREBORD glazed doors
	Pages 5-6	Product drawings and glazing details
<b>Section 2</b>	<b>Head/Jamb Seals</b>	<b>Threshold Seals</b>
	Sealmaster Deluge	Sealmaster Tornado
	Sealmaster Blizzard	Sealmaster Cyclone
	Sealmaster Hurricane	Sealmaster Thunder
	Ventura Self Adhesive	Sealmaster Typhoon
	Ventura Perimeter	Sealmaster Smartseal
	Intumescent Seals Therm-A-Blade	Sealmaster Watershed
		Ventura Automatic Door Bottoms
		Ventura Panic Exit Thresholds
	Page 7	Acoustic performance data – 44mm STREBORD doors
	Page 8	Acoustic performance data – 44mm STREBORD glazed doors
	Page 9	Acoustic performance data – 54mm STREBORD doors
	Page 10	Acoustic performance data – 54mm STREBORD glazed doors
	Page 11	Acoustic performance data – 64mm STREBORD doors
	Page 12	Acoustic performance data – 64mm STREBORD glazed doors
	Pages 13-17	Product drawings and glazing details

## SECTION 1

**Sealmaster Delta Acoustic Smoke Seal** provides a high quality, durable and maintenance-free acoustic seal with self-adhesive backing for easy fitting into the corner of door frames, against the stop. The seal can be applied in a continuous strip, so bypassing ironmongery. One fin seals against the leaf face and the other against the leaf edge, ensuring excellent sound reduction and the added benefit of cushioning against door slam. No special grooving of the door frame is required, which makes it ideal for retro fitting as well as on new doors. Delta Seal has been incorporated into successful fire tests to BS EN 1634-1 and has been acoustically tested to BS EN ISO 10140-2 up to  $R_w=40\text{dB}$ . Its size is 12 x 12mm and as standard is available in colours Black, Brown & White.



### **Sealmaster Double Fin Acoustic Smoke Seal**

provides a high quality, durable and maintenance-free acoustic seal with self-adhesive backing for easy fitting into the appropriate position on the door frame reveal. The seal can be applied in a continuous strip, so bypassing ironmongery. Its two flexible fins seal against the leaf edge, ensuring excellent sound reduction and ease of closing. No special grooving of the door frame is required, which makes it ideal for retro fitting as well as on new doors. Double Fin has been incorporated into successful fire tests to BS 476: Part 22 and has been acoustically tested to BS EN ISO 10140-2 up to  $R_w=39\text{dB}$ . Its size is 10.5 x 5.5mm and as standard is available in colours Black, Brown & White.



**Sealmaster Dropseal 2712** has been engineered to fill the gap between the door bottom and the floor or threshold plate. The seal is operated automatically by pressure against the door jamb on its adjustable plunger. The spring-loaded mechanism ensures a self-levelling seal along the entire door bottom length. The mechanism retracts into the aluminium case when the door is opened. The Dropseal is available in lengths of 535mm, 635mm, 735mm, 835mm, 935mm, 1035mm & 1135mm. All lengths are supplied with end clips, for easy fitting, or can be screwed directly into the bottom of the door. The Dropseal has been fire tested to BS EN 1634-1 & BS 476: Part 22, has been acoustically tested to BS EN ISO 10140-2 up to  $R_w=39\text{dB}$  and has been durability tested to over 1,000,000 cycles.





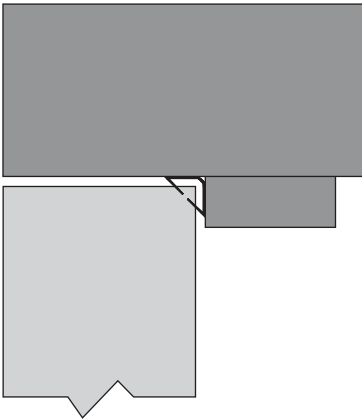
Door Leaf	Head/Jamb Seal(s)	Threshold Seal	Rw	Ref
Strebord 44mm	<b>Delta</b> against stop	<b>2712 Dropseal</b> offset towards stop	31 dB	N/A
Strebord 44mm	<b>Delta</b> against stop	Caulked	32 dB	
Strebord 44mm	<b>Double Fin</b> against stop	<b>2712 Dropseal</b> centre of leaf	31 dB	
Strebord 44mm	<b>Double Fin</b> against stop	<b>2712 Dropseal</b> offset towards stop	32 dB	
Strebord 44mm Glazed	<b>Delta</b> against stop	<b>2712 Dropseal</b> offset towards stop	34 dB	Fig A
Strebord 44mm Glazed	<b>Double Fin</b> against stop	<b>2712 Dropseal</b> centre of leaf	34 dB	
Strebord 44mm Glazed	<b>Double Fin</b> against stop	<b>2712 Dropseal</b> offset towards stop	34 dB	
Strebord 54mm	<b>Delta</b> against stop	<b>2712 Dropseal</b> centre of leaf	32 dB	N/A
Strebord 54mm	<b>Delta</b> against stop	<b>2712 Dropseal</b> offset towards stop	33 dB	
Strebord 54mm	<b>Double Fin</b> against stop	<b>2712 Dropseal</b> centre of leaf	32 dB	
Strebord 54mm Glazed	<b>Delta</b> against stop	<b>2712 Dropseal</b> centre of leaf	34 dB	Fig B
Strebord 54mm Glazed	<b>Delta</b> against stop	<b>2712 Dropseal</b> offset towards stop	35 dB	
Strebord 54mm Glazed	<b>Double Fin</b> against stop	<b>2712 Dropseal</b> centre of leaf	34 dB	
Strebord 64mm	<b>Delta</b> against stop	<b>2712 Dropseal</b> centre of leaf	33 dB	N/A
Strebord 64mm	<b>Delta</b> against stop	<b>2712 Dropseal</b> offset towards stop	34 dB	
Strebord 64mm	<b>Double Fin</b> against stop	<b>2712 Dropseal</b> centre of leaf	34 dB	
Strebord 64mm	<b>Double Fin</b> against stop	<b>2712 Dropseal</b> offset towards stop	35 dB	
Strebord 64mm Glazed	<b>Delta</b> against stop	<b>2712 Dropseal</b> centre of leaf	35 dB	Fig C
Strebord 64mm Glazed	<b>Delta</b> against stop	<b>2712 Dropseal</b> offset towards stop	37 dB	
Strebord 64mm Glazed	<b>Double Fin</b> against stop	<b>2712 Dropseal</b> centre of leaf	35 dB	
Strebord 64mm Glazed	<b>Double Fin</b> against stop	<b>2712 Dropseal</b> offset towards stop	36 dB	
Strebord 64mm Glazed	<b>Delta</b> against stop + <b>Double Fin</b> adjacent	<b>2712 Dropseal</b> centre of leaf	36 dB	
Strebord 64mm Glazed	<b>Delta</b> against stop + <b>Double Fin</b> adjacent	<b>2712 Dropseal</b> centre of leaf	36 dB	

Weighted Sound Reduction (Rw) in accordance with BS EN ISO 10140-2:2010.  
 Ref. Sound Research Laboratories report No. C/22875/T01b.  
 For further details please contact our technical department.

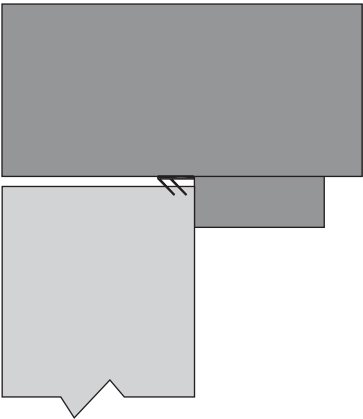
See following pages for Figures

## Head/Jamb Seals

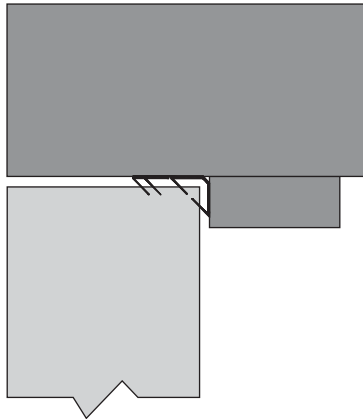
Sealmaster Delta



Sealmaster Double Fin

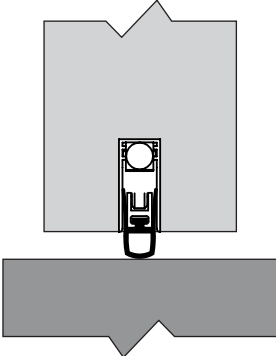


Sealmaster Delta and Double Fin



## Threshold Seal

Sealmaster 2712 Dropseal



## Glazing Details

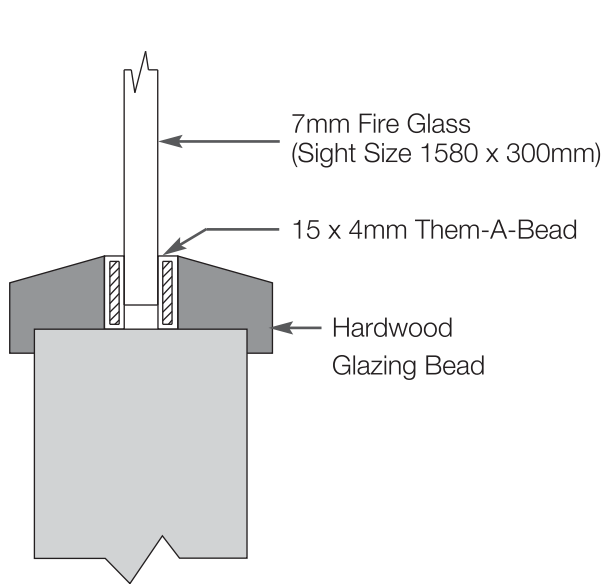


Figure A

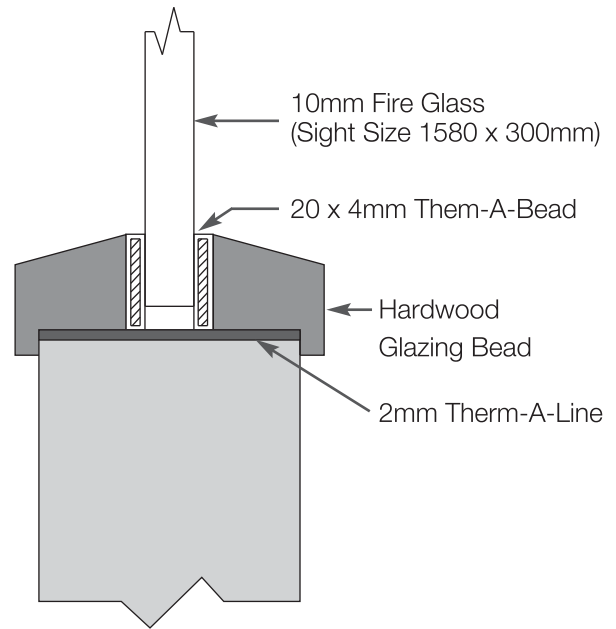


Figure B

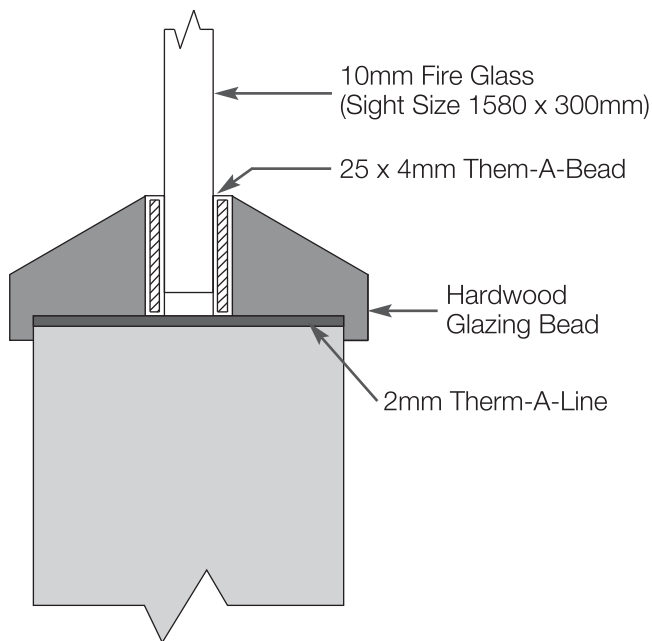


Figure C

Contact us  
 Email: [technical@dig.co.uk](mailto:technical@dig.co.uk)  
 Tel: 01223 832851

## SECTION 2

Weighted sound reduction Rw for 44mm STREBORD Single Doors with seal contact against the leaf edge <sup>(1)</sup>		Head/Jamb Seal Options		
		Sealmaster Deluge SE002 SE003 SE004	Ventura Self Adhesive VS44 (a) VS77 (a) VS88 (b)	Intumescent Seals Fire/Smoke Therm-A-Blade
Threshold Seal Options	<b>Sealmaster Tornado</b> Floor Component: TC Door Component: CC	30 dB	30 dB (a) 31 dB (b)	31 dB
	<b>Sealmaster Cyclone</b> Floor Component: TD, TE Door Component: CC	30 dB	30 dB (a) 31 dB (b)	31 dB
	<b>Sealmaster Thunder</b> Floor Component: TL, TM, TN Door Component: WG, WH (semi-morticed)	30 dB	30 dB (a) 31 dB (b)	31 dB
	<b>Sealmaster Typhoon</b> Floor Component: TL, TM, TN, solid floor finish Door Component: SM022, SM023	31 dB	31 dB (a) 32 dB (b)	32 dB
	<b>Ventura Automatic Door Bottoms</b> Floor Component: TL, TM, TN, wood Door Component: V411R/B, V434R/B	30 dB	30 dB (a) 31 dB (b)	31 dB

Weighted sound reduction Rw for 44mm STREBORD Single Doors seal with contact against the leaf face <sup>(2)</sup>		Head/Jamb Seal Options				
		Sealmaster Blizzard SA/SB089 (b) SC/SD093 (b) SC/SD094 (a) SA/SB097 (a)	Sealmaster Deluge SE000 (b) SE002 (a) SE003 (a) SE004 (a)	Sealmaster Hurricane SF/SG014 (a) SF/SG016 (b) SF/SG017 (c) SF/SG018 (b)	Ventura Perimeter V303S V316S	Ventura Self Adhesive VS44 (a) VS88 (b)
Threshold Seal Options	<b>Sealmaster Smartseal</b> Floor Component: TA, TB Door Component: CA, WA, WB, WC	31 dB (a) 32 dB (b)	31 dB (a) 32 dB (b)	31 dB (a) 32 dB (b) 32 dB (c)	32 dB	31 dB (a) 32 dB (b)
	<b>Sealmaster Tornado</b> Floor Component: TC Door Component: CB, CD	30 dB (a) 31 dB (b)	30 dB (a) 31 dB (b)	30 dB (a) 31 dB (b) 32 dB (c)	31 dB	30 dB (a) 31 dB (b)
	<b>Sealmaster Cyclone</b> Floor Component: TH, TJ, TK Door Component: CA, WA, WB, WC	30 dB (a) 31 dB (b)	30 dB (a) 31 dB (b)	30 dB (a) 31 dB (b) 32 dB (c)	31 dB	30 dB (a) 31 dB (b)
	<b>Sealmaster Watershed</b> Floor Component: TL, TM, TN Door Component: WG, WH (surface-mounted or semi-morticed)	31 dB (a) 32 dB (b)	31 dB (a) 32 dB (b)	31 dB (a) 32 dB (b) 32 dB (c)	32 dB	31 dB (a) 32 dB (b)
	<b>Sealmaster Thunder</b> Floor Component: TL, TM, TN Door Component: WG, WH (surface-mounted or semi-morticed)	30 dB (a) 31 dB (b)	30 dB (a) 31 dB (b)	30 dB (a) 31 dB (b) 32 dB (c)	31 dB	30 dB (a) 31 dB (b)
	<b>Ventura Panic Exit Thresholds</b> Floor: V2001S, V2005S, V179S, V177S, V252X226S, V254X226S	30 dB (a) 31 dB (b)	30 dB (a) 31 dB (b)	30 dB (a) 31 dB (b) 32 dB (c)	31 dB	30 dB (a) 31 dB (b)
	<b>Ventura Automatic Door Bottoms</b> Floor: TL, TM, TN, floor finish Door: V4131R/B, V4301R/B (surface-mounted or semi-morticed)	30 dB (a) 31 dB (b)	30 dB (a) 31 dB (b)	30 dB (a) 31 dB (b) 32 dB (c)	31 dB	30 dB (a) 31 dB (b)

Weighted sound reduction Rw for 44mm STREBORD Glazed Single Doors with seal contact against the leaf edge <sup>(1)</sup>		Head/Jamb Seal Options		
		Sealmaster Deluge SE002 SE003 SE004	Ventura Self Adhesive VS44 (a) VS77 (a) VS88 (b)	Intumescent Seals Fire/Smoke Therm-A-Blade
Threshold Seal Options	<b>Sealmaster Tornado</b> Floor Component: TC Door Component: CC	32 dB	32 dB (a) 33 dB (b)	33 dB
	<b>Sealmaster Cyclone</b> Floor Component: TD, TE Door Component: CC	32 dB	32 dB (a) 33 dB (b)	33 dB
	<b>Sealmaster Thunder</b> Floor Component: TL, TM, TN Door Component: WG, WH (semi-morticed)	32 dB	32 dB (a) 33 dB (b)	33 dB
	<b>Sealmaster Typhoon</b> Floor Component: TL, TM, TN, solid floor finish Door Component: SM022, SM023	33 dB	33 dB (a) 34 dB (b)	34 dB
	<b>Ventura Automatic Door Bottoms</b> Floor Component: TL, TM, TN, wood Door Component: V411R/B, V434R/B	32 dB	32 dB (a) 33 dB (b)	33 dB
Reference		Fig A		

Weighted sound reduction Rw for 44mm STREBORD Glazed Single Doors seal with contact against the leaf face <sup>(2)</sup>		Head/Jamb Seal Options				
		Sealmaster Blizzard SA/SB089 (b) SC/SD093 (b) SC/SD094 (a) SA/SB097 (a)	Sealmaster Deluge SE000 (b) SE002 (a) SE003 (a) SE004 (a)	Sealmaster Hurricane SF/SG014 (a) SF/SG016 (b) SF/SG017 (c) SF/SG018 (b)	Ventura Perimeter V303S V316S	Ventura Self Adhesive VS44 (a) VS88 (b)
Threshold Seal Options	<b>Sealmaster Smartseal</b> Floor Component: TA, TB Door Component: CA, WA, WB, WC	33 dB (a) 34 dB (b)	33 dB (a) 34 dB (b)	33 dB (a) 34 dB (b) 34 dB (c)	34 dB	33 dB (a) 34 dB (b)
	<b>Sealmaster Tornado</b> Floor Component: TC Door Component: CB, CD	32 dB (a) 33 dB (b)	32 dB (a) 33 dB (b)	32 dB (a) 33 dB (b) 34 dB (c)	33 dB	32 dB (a) 33 dB (b)
	<b>Sealmaster Cyclone</b> Floor Component: TH, TJ, TK Door Component: CA, WA, WB, WC	32 dB (a) 33 dB (b)	32 dB (a) 33 dB (b)	32 dB (a) 33 dB (b) 34 dB (c)	33 dB	32 dB (a) 33 dB (b)
	<b>Sealmaster Watershed</b> Floor Component: TL, TM, TN Door Component: WG, WH (surface-mounted or semi-morticed)	33 dB (a) 34 dB (b)	33 dB (a) 34 dB (b)	33 dB (a) 34 dB (b) 34 dB (c)	34 dB	33 dB (a) 34 dB (b)
	<b>Sealmaster Thunder</b> Floor Component: TL, TM, TN Door Component: WG, WH (surface-mounted or semi-morticed)	32 dB (a) 33 dB (b)	32 dB (a) 33 dB (b)	32 dB (a) 33 dB (b) 34 dB (c)	33 dB	32 dB (a) 33 dB (b)
	<b>Ventura Panic Exit Thresholds</b> Floor: V2001S, V2005S, V179S, V177S, V252X226S, V254X226S	32 dB (a) 33 dB (b)	32 dB (a) 33 dB (b)	32 dB (a) 33 dB (b) 34 dB (c)	33 dB	32 dB (a) 33 dB (b)
	<b>Ventura Automatic Door Bottoms</b> Floor: TL, TM, TN, floor finish Door: V4131R/B, V4301R/B (surface-mounted or semi-morticed)	32 dB (a) 33 dB (b)	32 dB (a) 33 dB (b)	32 dB (a) 33 dB (b) 34 dB (c)	33 dB	32 dB (a) 33 dB (b)
Reference		Fig A				

Weighted sound reduction Rw for 54mm STREBORD Single Doors with seal contact against the leaf edge <sup>(1)</sup>		Head/Jamb Seal Options		
		Sealmaster Deluge SE002 SE003 SE004	Ventura Self Adhesive VS44 (a) VS77 (a) VS88 (b)	Intumescent Seals Fire/Smoke Therm-A-Blade
Threshold Seal Options	<b>Sealmaster Tornado</b> Floor Component: TC Door Component: CC	31 dB	31 dB (a) 32 dB (b)	32 dB
	<b>Sealmaster Cyclone</b> Floor Component: TD, TE Door Component: CC	31 dB	31 dB (a) 32 dB (b)	32 dB
	<b>Sealmaster Thunder</b> Floor Component: TL, TM, TN Door Component: WG, WH (semi-morticed)	31 dB	31 dB (a) 32 dB (b)	32 dB
	<b>Sealmaster Typhoon</b> Floor Component: TL, TM, TN, solid floor finish Door Component: SM022, SM023	32 dB	32 dB (a) 33 dB (b)	33 dB
	<b>Ventura Automatic Door Bottoms</b> Floor Component: TL, TM, TN, wood Door Component: V411R/B, V434R/B	31 dB	31 dB (a) 32 dB (b)	32 dB

Weighted sound reduction Rw for 54mm STREBORD Single Doors seal with contact against the leaf face <sup>(2)</sup>		Head/Jamb Seal Options				
		Sealmaster Blizzard SA/SB089 (b) SC/SD093 (b) SC/SD094 (a) SA/SB097 (a)	Sealmaster Deluge SE000 (b) SE002 (a) SE003 (a) SE004 (a)	Sealmaster Hurricane SF/SG014 (a) SF/SG016 (b) SF/SG017 (c) SF/SG018 (b)	Ventura Perimeter V303S V316S	Ventura Self Adhesive VS44 (a) VS88 (b)
Threshold Seal Options	<b>Sealmaster Smartseal</b> Floor Component: TA, TB Door Component: CA, WA, WB, WC	32 dB (a) 33 dB (b)	32 dB (a) 33 dB (b)	32 dB (a) 33 dB (b) 33 dB (c)	33 dB	32 dB (a) 33 dB (b)
	<b>Sealmaster Tornado</b> Floor Component: TC Door Component: CB, CD	31 dB (a) 32 dB (b)	31 dB (a) 32 dB (b)	31 dB (a) 32 dB (b) 33 dB (c)	32 dB	31 dB (a) 32 dB (b)
	<b>Sealmaster Cyclone</b> Floor Component: TH, TJ, TK Door Component: CA, WA, WB, WC	31 dB (a) 32 dB (b)	31 dB (a) 32 dB (b)	31 dB (a) 32 dB (b) 33 dB (c)	32 dB	31 dB (a) 32 dB (b)
	<b>Sealmaster Watershed</b> Floor Component: TL, TM, TN Door Component: WG, WH (surface-mounted or semi-morticed)	32 dB (a) 33 dB (b)	32 dB (a) 33 dB (b)	32 dB (a) 33 dB (b) 33 dB (c)	33 dB	32 dB (a) 33 dB (b)
	<b>Sealmaster Thunder</b> Floor Component: TL, TM, TN Door Component: WG, WH (surface-mounted or semi-morticed)	31 dB (a) 32 dB (b)	31 dB (a) 32 dB (b)	31 dB (a) 32 dB (b) 33 dB (c)	32 dB	31 dB (a) 32 dB (b)
	<b>Ventura Panic Exit Thresholds</b> Floor: V2001S, V2005S, V179S, V177S, V252X226S, V254X226S	31 dB (a) 32 dB (b)	31 dB (a) 32 dB (b)	31 dB (a) 32 dB (b) 33 dB (c)	32 dB	31 dB (a) 32 dB (b)
	<b>Ventura Automatic Door Bottoms</b> Floor: TL, TM, TN, floor finish Door: V4131R/B, V4301R/B (surface-mounted or semi-morticed)	31 dB (a) 32 dB (b)	31 dB (a) 32 dB (b)	31 dB (a) 32 dB (b) 33 dB (c)	32 dB	31 dB (a) 32 dB (b)

Weighted sound reduction Rw for 54mm STREBORD Glazed Single Doors with seal contact against the leaf edge <sup>(1)</sup>		Head/Jamb Seal Options		
		Sealmaster Deluge SE002 SE003 SE004	Ventura Self Adhesive VS44 (a) VS77 (a) VS88 (b)	Intumescent Seals Fire/Smoke Therm-A-Blade
Threshold Seal Options	<b>Sealmaster Tornado</b> Floor Component: TC Door Component: CC	34 dB	34 dB (a) 35 dB (b)	35 dB
	<b>Sealmaster Cyclone</b> Floor Component: TD, TE Door Component: CC	34 dB	34 dB (a) 35 dB (b)	35 dB
	<b>Sealmaster Thunder</b> Floor Component: TL, TM, TN Door Component: WG, WH (semi-morticed)	34 dB	34 dB (a) 35 dB (b)	35 dB
	<b>Sealmaster Typhoon</b> Floor Component: TL, TM, TN, solid floor finish Door Component: SM022, SM023	35 dB	35 dB (a) 36 dB (b)	36 dB
	<b>Ventura Automatic Door Bottoms</b> Floor Component: TL, TM, TN, wood Door Component: V411R/B, V434R/B	34 dB	34 dB (a) 35 dB (b)	35 dB
Reference		Fig B		

Weighted sound reduction Rw for 54mm STREBORD Glazed Single Doors seal with contact against the leaf face <sup>(2)</sup>		Head/Jamb Seal Options				
		Sealmaster Blizzard SA/SB089 (b) SC/SD093 (b) SC/SD094 (a) SA/SB097 (a)	Sealmaster Deluge SE000 (b) SE002 (a) SE003 (a) SE004 (a)	Sealmaster Hurricane SF/SG014 (a) SF/SG016 (b) SF/SG017 (c) SF/SG018 (b)	Ventura Perimeter V303S V316S	Ventura Self Adhesive VS44 (a) VS88 (b)
Threshold Seal Options	<b>Sealmaster Smartseal</b> Floor Component: TA, TB Door Component: CA, WA, WB, WC	35 dB (a) 36 dB (b)	35 dB (a) 36 dB (b)	35 dB (a) 36 dB (b) 36 dB (c)	36 dB	35 dB (a) 36 dB (b)
	<b>Sealmaster Tornado</b> Floor Component: TC Door Component: CB, CD	34 dB (a) 35 dB (b)	34 dB (a) 35 dB (b)	34 dB (a) 35 dB (b) 36 dB (c)	35 dB	34 dB (a) 35 dB (b)
	<b>Sealmaster Cyclone</b> Floor Component: TH, TJ, TK Door Component: CA, WA, WB, WC	34 dB (a) 35 dB (b)	34 dB (a) 35 dB (b)	34 dB (a) 35 dB (b) 36 dB (c)	35 dB	34 dB (a) 35 dB (b)
	<b>Sealmaster Watershed</b> Floor Component: TL, TM, TN Door Component: WG, WH (surface-mounted or semi-morticed)	35 dB (a) 36 dB (b)	35 dB (a) 36 dB (b)	35 dB (a) 36 dB (b) 36 dB (c)	36 dB	35 dB (a) 36 dB (b)
	<b>Sealmaster Thunder</b> Floor Component: TL, TM, TN Door Component: WG, WH (surface-mounted or semi-morticed)	34 dB (a) 35 dB (b)	34 dB (a) 35 dB (b)	34 dB (a) 35 dB (b) 36 dB (c)	35 dB	34 dB (a) 35 dB (b)
	<b>Ventura Panic Exit Thresholds</b> Floor: V2001S, V2005S, V179S, V177S, V252X226S, V254X226S	34 dB (a) 35 dB (b)	34 dB (a) 35 dB (b)	34 dB (a) 35 dB (b) 36 dB (c)	35 dB	34 dB (a) 35 dB (b)
	<b>Ventura Automatic Door Bottoms</b> Floor: TL, TM, TN, floor finish Door: V4131R/B, V4301R/B (surface-mounted or semi-morticed)	34 dB (a) 35 dB (b)	34 dB (a) 35 dB (b)	34 dB (a) 35 dB (b) 36 dB (c)	35 dB	34 dB (a) 35 dB (b)
Reference		Fig B				

Weighted sound reduction Rw for 64mm STREBORD Single Doors with seal contact against the leaf edge <sup>(1)</sup>		Head/Jamb Seal Options		
		Sealmaster Deluge SE002 SE003 SE004	Ventura Self Adhesive VS44 (a) VS77 (a) VS88 (b)	Intumescent Seals Fire/Smoke Therm-A-Blade
Threshold Seal Options	<b>Sealmaster Tornado</b> Floor Component: TC Door Component: CC	34 dB	34 dB (a) 35 dB (b)	35 dB
	<b>Sealmaster Cyclone</b> Floor Component: TD, TE Door Component: CC	34 dB	34 dB (a) 35 dB (b)	35 dB
	<b>Sealmaster Thunder</b> Floor Component: TL, TM, TN Door Component: WG, WH (semi-morticed)	34 dB	34 dB (a) 35 dB (b)	35 dB
	<b>Sealmaster Typhoon</b> Floor Component: TL, TM, TN, solid floor finish Door Component: SM022, SM023	35 dB	35 dB (a) 36 dB (b)	36 dB
	<b>Ventura Automatic Door Bottoms</b> Floor Component: TL, TM, TN, wood Door Component: V411R/B, V434R/B	34 dB	34 dB (a) 35 dB (b)	35 dB

Weighted sound reduction Rw for 64mm STREBORD Single Doors seal with contact against the leaf face <sup>(2)</sup>		Head/Jamb Seal Options				
		Sealmaster Blizzard SA/SB089 (b) SC/SD093 (b) SC/SD094 (a) SA/SB097 (a)	Sealmaster Deluge SE000 (b) SE002 (a) SE003 (a) SE004 (a)	Sealmaster Hurricane SF/SG014 (a) SF/SG016 (b) SF/SG017 (c) SF/SG018 (b)	Ventura Perimeter V303S V316S	Ventura Self Adhesive VS44 (a) VS88 (b)
Threshold Seal Options	<b>Sealmaster Smartseal</b> Floor Component: TA, TB Door Component: CA, WA, WB, WC	35 dB (a) 36 dB (b)	35 dB (a) 36 dB (b)	35 dB (a) 36 dB (b) 36 dB (c)	36 dB	35 dB (a) 36 dB (b)
	<b>Sealmaster Tornado</b> Floor Component: TC Door Component: CB, CD	34 dB (a) 35 dB (b)	34 dB (a) 35 dB (b)	34 dB (a) 35 dB (b) 36 dB (c)	35 dB	34 dB (a) 35 dB (b)
	<b>Sealmaster Cyclone</b> Floor Component: TH, TJ, TK Door Component: CA, WA, WB, WC	34 dB (a) 35 dB (b)	34 dB (a) 35 dB (b)	34 dB (a) 35 dB (b) 36 dB (c)	35 dB	34 dB (a) 35 dB (b)
	<b>Sealmaster Watershed</b> Floor Component: TL, TM, TN Door Component: WG, WH (surface-mounted or semi-morticed)	35 dB (a) 36 dB (b)	35 dB (a) 36 dB (b)	35 dB (a) 36 dB (b) 36 dB (c)	36 dB	35 dB (a) 36 dB (b)
	<b>Sealmaster Thunder</b> Floor Component: TL, TM, TN Door Component WG, WH (surface-mounted or semi-morticed)	34 dB (a) 35 dB (b)	34 dB (a) 35 dB (b)	34 dB (a) 35 dB (b) 36 dB (c)	35 dB	34 dB (a) 35 dB (b)
	<b>Ventura Panic Exit Thresholds</b> Floor: V2001S, V2005S, V179S, V177S, V252X226S, V254X226S	34 dB (a) 35 dB (b)	34 dB (a) 35 dB (b)	34 dB (a) 35 dB (b) 36 dB (c)	35 dB	34 dB (a) 35 dB (b)
	<b>Ventura Automatic Door Bottoms</b> Floor: TL, TM, TN, floor finish Door: V4131R/B, V4301R/B (surface-mounted or semi-morticed)	34 dB (a) 35 dB (b)	34 dB (a) 35 dB (b)	34 dB (a) 35 dB (b) 36 dB (c)	35 dB	34 dB (a) 35 dB (b)



Weighted sound reduction Rw for 64mm STREBORD Glazed Single Doors with seal contact against the leaf edge <sup>(1)</sup>		Head/Jamb Seal Options		
		Sealmaster Deluge SE002 SE003 SE004	Ventura Self Adhesive VS44 (a) VS77 (a) VS88 (b)	Intumescent Seals Fire/Smoke Therm-A-Blade
Threshold Seal Options	<b>Sealmaster Tornado</b> Floor Component: TC Door Component: CC	35 dB	35 dB (a) 36 dB (b)	36 dB
	<b>Sealmaster Cyclone</b> Floor Component: TD, TE Door Component: CC	35 dB	35 dB (a) 36 dB (b)	36 dB
	<b>Sealmaster Thunder</b> Floor Component: TL, TM, TN Door Component: WG, WH (semi-morticed)	35 dB	35 dB (a) 36 dB (b)	36 dB
	<b>Sealmaster Typhoon</b> Floor Component: TL, TM, TN, solid floor finish Door Component: SM022, SM023	36 dB	36 dB (a) 37 dB (b)	37 dB
	<b>Ventura Automatic Door Bottoms</b> Floor Component: TL, TM, TN, wood Door Component: V411R/B, V434R/B	35 dB	35 dB (a) 36 dB (b)	36 dB
Reference		Fig C		

Weighted sound reduction Rw for 64mm STREBORD Glazed Single Doors seal with contact against the leaf face <sup>(2)</sup>		Head/Jamb Seal Options				
		Sealmaster Blizzard SA/SB089 (b) SC/SD093 (b) SC/SD094 (a) SA/SB097 (a)	Sealmaster Deluge SE000 (b) SE002 (a) SE003 (a) SE004 (a)	Sealmaster Hurricane SF/SG014 (a) SF/SG016 (b) SF/SG017 (c) SF/SG018 (b)	Ventura Perimeter V303S V316S	Ventura Self Adhesive VS44 (a) VS88 (b)
Threshold Seal Options	<b>Sealmaster Smartseal</b> Floor Component: TA, TB Door Component: CA, WA, WB, WC	36 dB (a) 37 dB (b)	36 dB (a) 37 dB (b)	36 dB (a) 37 dB (b) 37 dB (c)	37 dB	36 dB (a) 37 dB (b)
	<b>Sealmaster Tornado</b> Floor Component: TC Door Component: CB, CD	35 dB (a) 36 dB (b)	35 dB (a) 36 dB (b)	35 dB (a) 36 dB (b) 37 dB (c)	36 dB	35 dB (a) 36 dB (b)
	<b>Sealmaster Cyclone</b> Floor Component: TH, TJ, TK Door Component: CA, WA, WB, WC	35 dB (a) 36 dB (b)	35 dB (a) 36 dB (b)	35 dB (a) 36 dB (b) 37 dB (c)	36 dB	35 dB (a) 36 dB (b)
	<b>Sealmaster Watershed</b> Floor Component: TL, TM, TN Door Component: WG, WH (surface-mounted or semi-morticed)	36 dB (a) 37 dB (b)	36 dB (a) 37 dB (b)	36 dB (a) 37 dB (b) 37 dB (c)	37 dB	36 dB (a) 37 dB (b)
	<b>Sealmaster Thunder</b> Floor Component: TL, TM, TN Door Component: WG, WH (surface-mounted or semi-morticed)	35 dB (a) 36 dB (b)	35 dB (a) 36 dB (b)	35 dB (a) 36 dB (b) 37 dB (c)	36 dB	35 dB (a) 36 dB (b)
	<b>Ventura Panic Exit Thresholds</b> Floor: V2001S, V2005S, V179S, V177S, V252X226S, V254X226S	35 dB (a) 36 dB (b)	35 dB (a) 36 dB (b)	35 dB (a) 36 dB (b) 37 dB (c)	36 dB	35 dB (a) 36 dB (b)
	<b>Ventura Automatic Door Bottoms</b> Floor: TL, TM, TN, floor finish Door: V4131R/B, V4301R/B (surface-mounted or semi-morticed)	35 dB (a) 36 dB (b)	35 dB (a) 36 dB (b)	35 dB (a) 36 dB (b) 37 dB (c)	36 dB	35 dB (a) 36 dB (b)
Reference		Fig C				

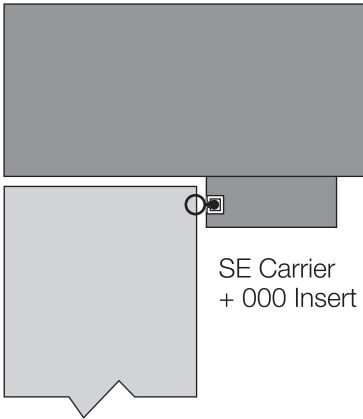
Weighted Sound Reduction (Rw) in accordance with BS EN ISO 140-3:1995. Ref. Taylor Woodrow Technology report Nos. 8243, 8330 and N950/L4515A. For further details please contact our technical department.

(1) All head/jamb seals to be located within the frame reveal. Jamb seals to be located so as to maintain the plane of sealing at the threshold – except for Ventura automatic door bottoms, where the jamb seals should be located directly adjacent to the door bottom on the stop side. Jamb seals may be interrupted at the hinges positions for sealed door performance in the range Rw=29-33dB.




(2) All head/jamb seals to be located on the stop. Jamb seals to contact the top of the floor element of the threshold seal.

### Head/Jamb Seals

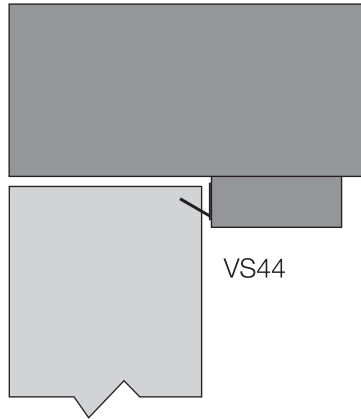
#### Sealmaster Deluge



**Options**

- SE + 002 
- SE + 003 
- SE + 004 

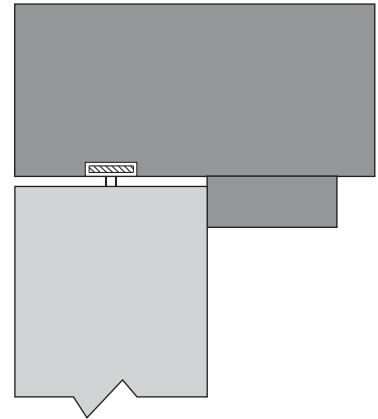
#### Ventura Self Adhesive



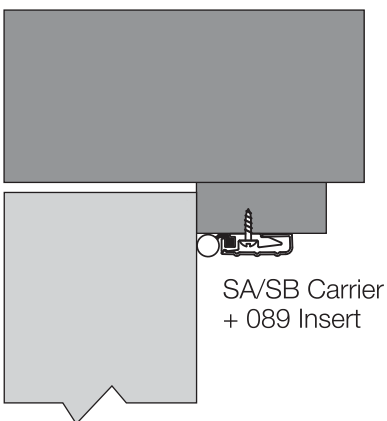
**Options**

- VS88 




#### Intumescent Seals Therm-A-Blade



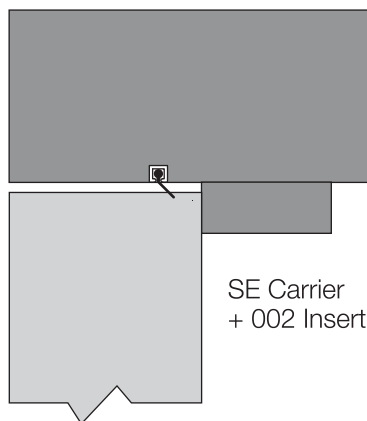
#### Sealmaster Blizzard





**Options**

- SA/SB + 097 
- SC/SD + 093 
- SC/SD + 094 

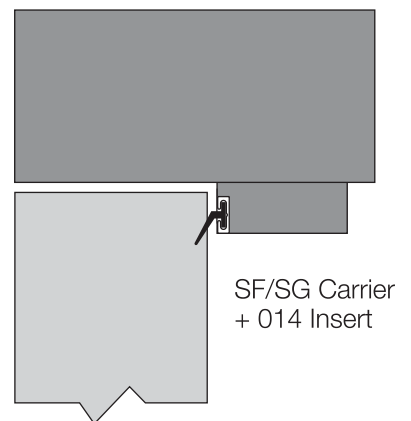
#### Sealmaster Deluge






**Options**

- SE + 003 
- SE + 004 

#### Sealmaster Hurricane

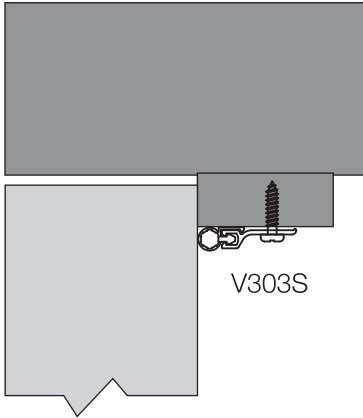


**Options**

- SF/SG + 016 
- SF/SG + 017 
- SF/SG + 018 

### Head/Jamb Seals (continued)

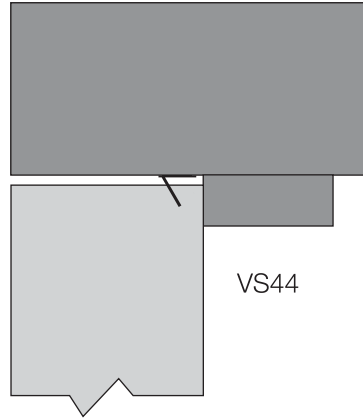
#### Ventura Perimeter



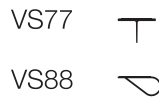
##### Options



#### Ventura Self Adhesive

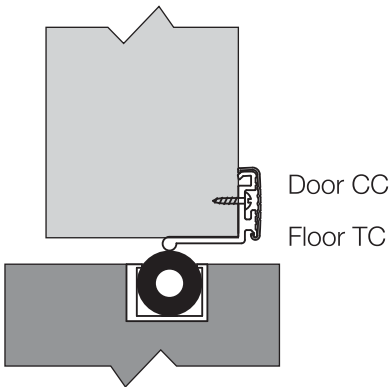


##### Options

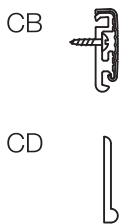


### Threshold Seals

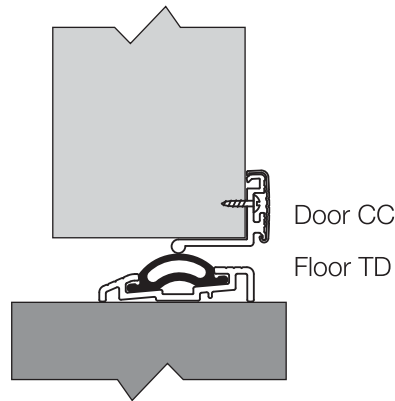
#### Sealmaster Tornado



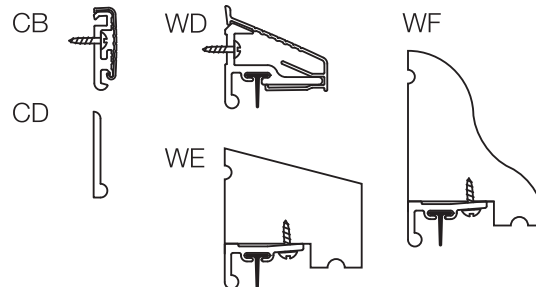
##### Door Options



#### Sealmaster Cyclone



##### Door Options

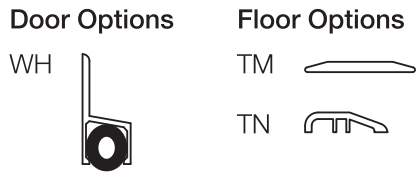
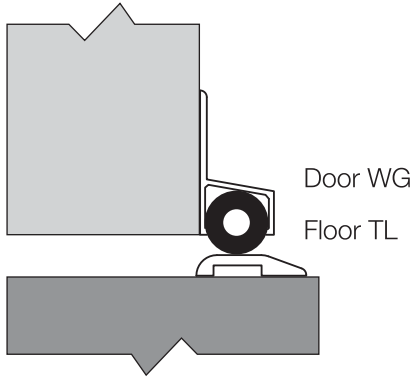


##### Floor Options

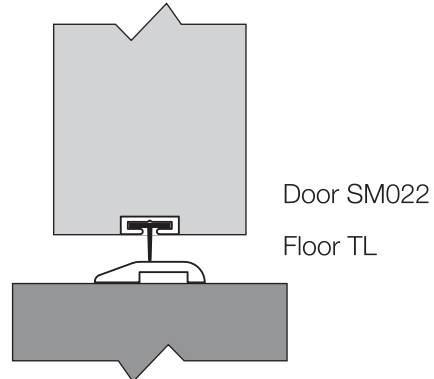


### Threshold Seals (continued)

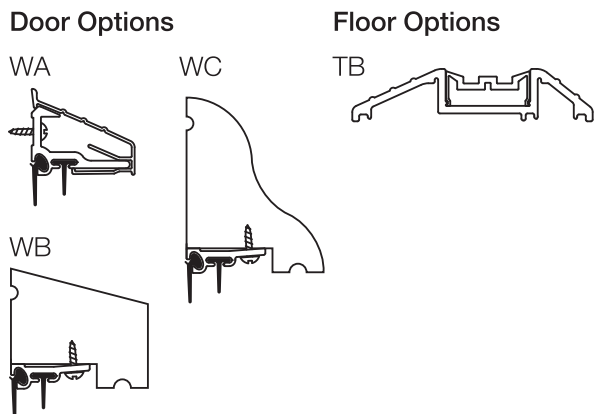
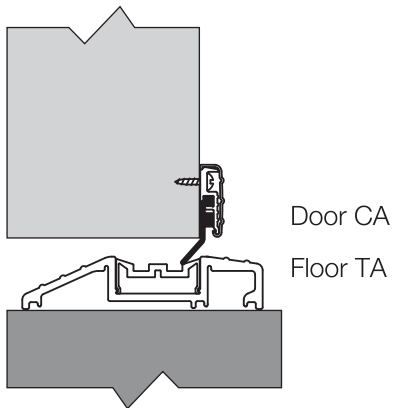
#### Sealmaster Thunder



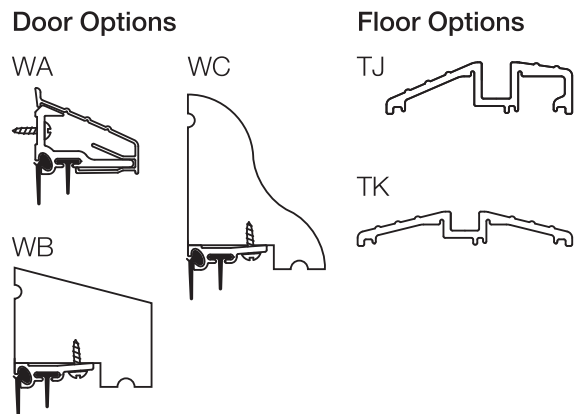
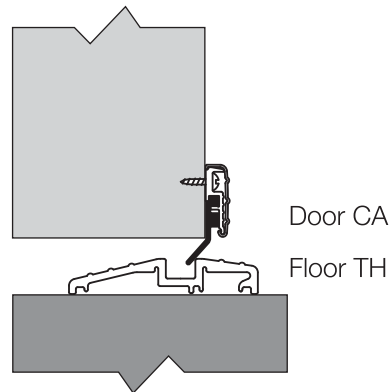
#### Sealmaster Typhoon



#### Sealmaster Smartseal

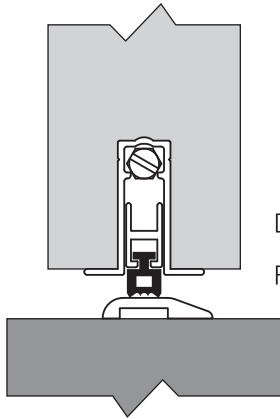


#### Sealmaster Watershed



## Threshold Seals (continued)

### Ventura Automatic Door Bottoms



Door V411R  
Floor TL

#### Door Options

V434R



V411B  
insert

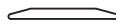


V434B  
insert



#### Floor Options

TM



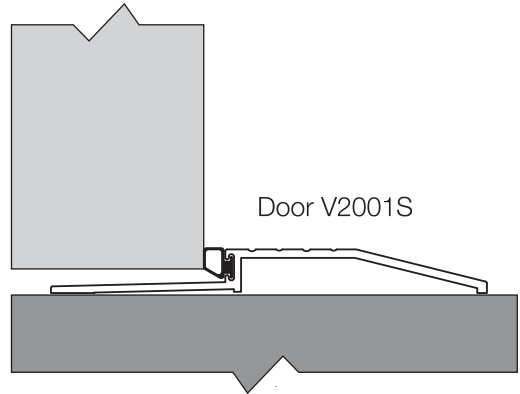
TN



Solid Wood



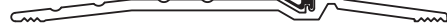
### Ventura Panic Exit Thresholds



Door V2001S

#### Options

V2005S



V179S



V177S



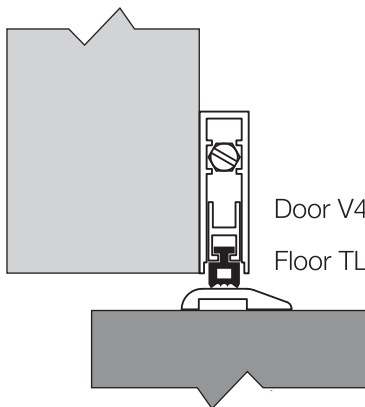
V252X226S



V254X226S



### Ventura Automatic Door Bottoms



Door V4131R  
Floor TL

#### Door Options

V4301R



V4131B  
insert

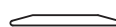


V4301B  
insert



#### Floor Options

TM



TN



Solid Floor



## Glazing Details

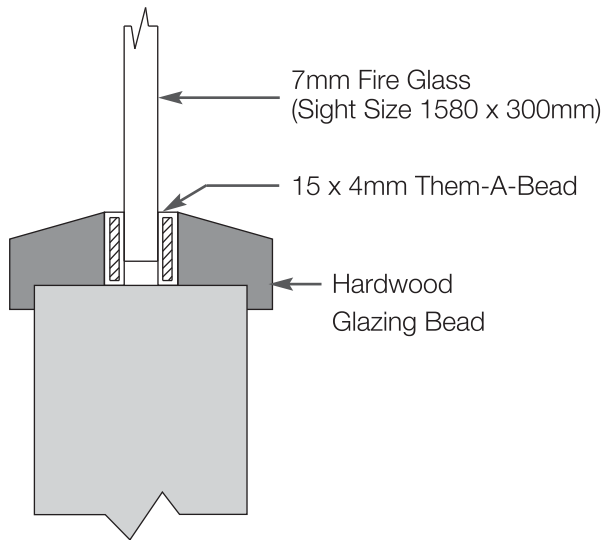


Figure A

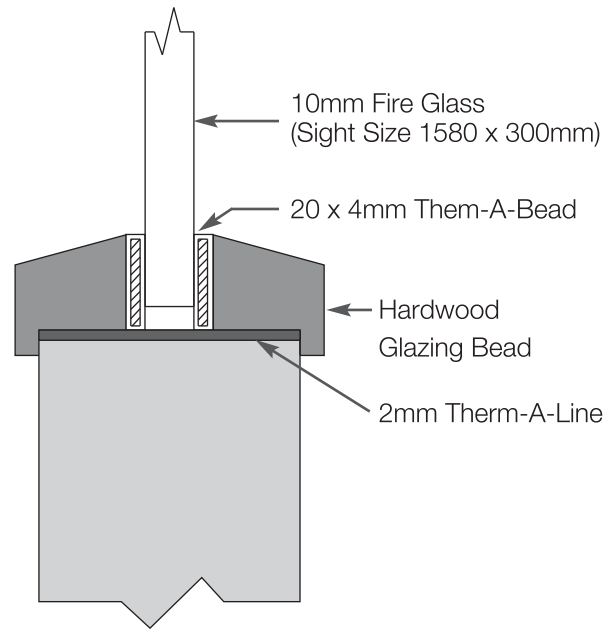


Figure B

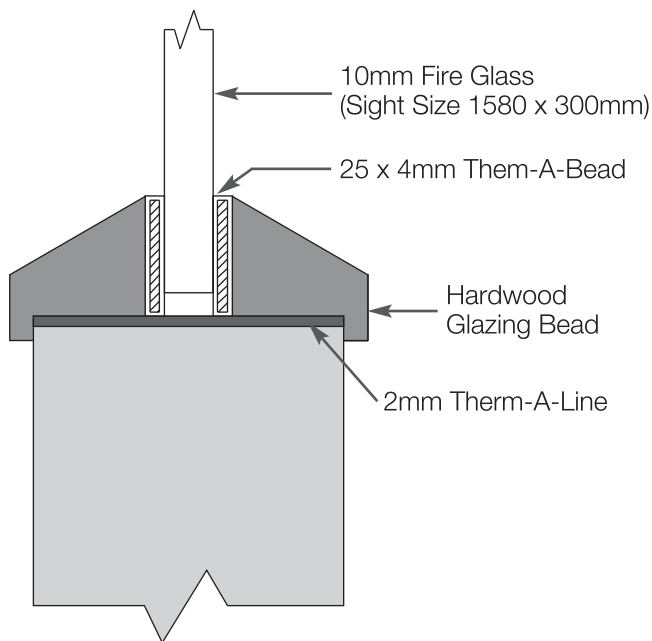


Figure C

Contact us  
Email: [technical@dig.co.uk](mailto:technical@dig.co.uk)  
Tel: 01223 832851

