Fleming
Door Products

ASSA ABLOY

Acoustical Door Systems

The Sound Choice for Acoustical Solutions

Experience a safer
and more open world

What is STC?

The Noise Problem

Noise can have significant affects on people's daily functions. Facilities need to shield common workspaces and office employees from the distractions of resident noise emanating from HVAC units and other heavy equipment rooms. Schools have to significantly reduce the sounds coming from band rooms and hallways. Virtually all types of buildings need rooms equipped for private conversation. Plus, the need for absolute confidentiality is increasing because of expanding national security operations.

Noise Solutions

The solution to unwanted noise is reducing level of sound produced. There are several methods of reducing noise levels but they mainly rely on two basic principles:

Sound Absorption - The process of removing sound energy from within a room. This is accomplished by using materials to soak up sound.

Sound Transmission - The movement of sound through a medium (wall or doorway).

Both sound absorption and sound insulation (the opposite of transmission) are used in controlling the broadcast of noise within and through buildings.

Evaluating Noise

The solution to a noise problem begins with evaluating the noise impact. Sound can be described as vibrations in the air moving in waves. The rate of sound vibrations measured in cycles per second is called frequency (Hertz). Sound pressure levels are measured in decibels (dB). (See chart below)

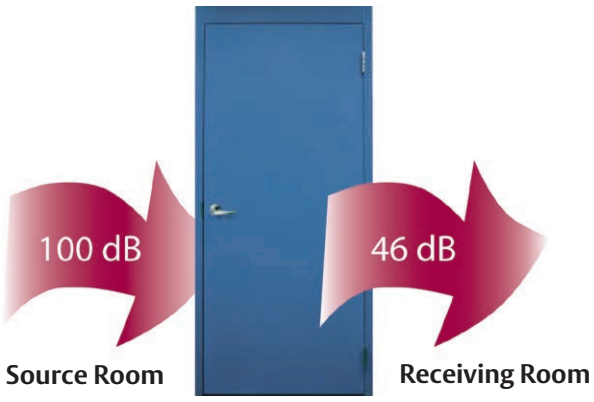
Examples of Sound Pressure Levels (Loudness):

Sound Level dB		
0	Threshold of hearing	Inaudible
20	Very rural environment	Extremely quiet
30	Quiet home	Faint
40	Quiet Office	Distant sounds audible
50	Background conversation	Moderate
60	Radio/Television in home	Moderate
70	Highway noise	Moderately loud
80	Background factory noise	Loud
90	Noisy factory	Very loud
105	Elevated train	Deafening
120	Bass drum at 3'	Physical pain
130	Jet aircraft at 100'	Physical pain

Sound Reduction Ratings

Transmission Loss (TL) - A door's ability to reduce noise is called its transmission loss (TL) effectiveness. TL is a value given in decibels, which is determined by measuring sound pressure levels at a certain frequency in the source and receiving rooms. The adjusted difference between the two levels is the TL of the door. The higher the TL, the better the result.

Sound Transmission Class (STC) - TL measurements for a door are taken across a range of frequencies, which makes it difficult to compare the effectiveness of different doors. Sound transmission class (STC) ratings solve that problem by giving a single value to acoustical performance for a door. STC is determined by a weighted average of TL values taken over16 frequencies, which are fitted to a curve in a method defined by the ASTM E413 Classification Standard for Rating Sound Insulation. The higher the STC value, the better the rating and the better the performance.



Acoustical Door STC 54 System

Sound Solutions

A Sound Choice

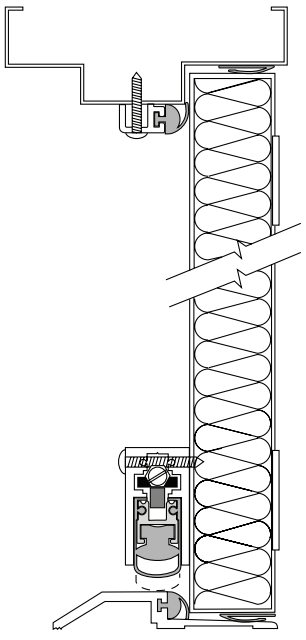
Using the latest patent pending technology in light weight sound absorbing techniques, FLEMING Door Products has developed acoustical assemblies to be the noise solution for any facility.

High STC ratings are typically needed to create sound resistant rooms for the government/military, airports, school band rooms and to isolate performance halls from exterior noise. Relatively lower STC ratings will usually suffice for less demanding applications, such as solving a noise problem in a hotel or office building. Acoustical Door Systems cover the low to high STC range allowing them to be the solution for almost any application.

Sound Transmission Class Table

Door Type	STC	Performance	Description
Typical Hollow Metal Door	20-25	Minimal	Speech clearly audible
	25-30	Average	Normal speech understood
FLEMING Acoustical Door Systems	30-35	Fair	Loud speech understood fairly well
	35-40	Good	Loud speech heard but hardly intelligible
	40-50	Very Good	Loud speech just detectable
	50-66	Excellent	Loud speech barely audible

Example of STC 54 System



Acoustical Door System Advantages

FLEMING Acoustical Door Systems have many advantages over other sound door products in the market.

- Wide range of operable STC ratings from 32 to 66 singles and pairs including factory glazed units (STC 33-48)
- 5 to 7 week standard leadtimes with 10 -15 day quick ship availability as units or frames first excluding SE Series
- Competitive pricing including door,installed glass (when required) frame and all sealing hardware
- Thresholds are Barrier Free compliant
- STC 46 - 66 door assemblies are 30% lighter than most sound doors in the market allowing standard weight hinges to be used (7.0-9.4 lbs per sq. ft.) excluding SE Series
- All door cores are lead and asbestos free excluding SE Series
- All doors are 1 3/4" thick up to STC 54 instead of 2 1/4" or larger like other sound doors in the market
- Cam-lift hinges are not required but optional excluding SE Series
- Door assemblies can be pre-wired with Electrolynx snap-together connectors make adding or upgrading electrified openings easy
- Most door assemblies are cULus or WH fire rated
- Whisper Core Doors Systems can help achieve LEED requirements for sound and recycled content

Product Features

Door Configurations

- Single flush door systems available from STC 32 to STC 66
- Single factory glazed doors available from STC 33 to STC 48
- Flush pairs available up to STC 49
- Pairs with glazing available from STC 33 to STC 44
- All doors tested in fully operable conditions
- Seals, thresholds and door bottoms (as required) will be drop shipped to designated address
- cULus or WH fire labeling up to 3 hours (varies per STC rating)

Frame Configurations (Frames must be grouted over STC 41)

- 16 or 14 gauge galvanneal steel
- 4-1/8" through 14" depths
- Welded Corners

Hardware Preps

Locks:

- 161 cylindrical locks (backset min. varies per STC rating)
- 86 edge mortise locks with escutcheon or sectional trims
- Military/government spin dial locks (STC 49 max)
- Rim panic and Surface mounted vertical rod exit devices
- Surface and flush bolts on inactive leaves (STC 41-49 pairs)

Hinges:

- Standard 4.5 x .134
- Heavy weight and 5" optional
- Cam-lift hinges and continuous hinges are optional excluding SE Series

Sound Product Charts

Single Hollow Metal Doors Flush

STC Rating Operable	Max. Fire Rating	Hinges	Locks
56-66 - Commincating	No	Cam Lift	Cylindrical
55 (2-1/4" thick)	No	Continuous	Cylindrical
54	No	Butt	Cylindrical
53	No	Butt	Cylindrical / Mortise
	No *	Cam Lift	Cyl / Rim / Mort
52	3 Hour	Butt	Cylindrical / Mortise
51	3 Hour	Butt	Cyl / Rim / Mort
50	3 Hour	Butt	Cyl / Rim / Mort / Military
	No *	Continuous	Cyl / Rim / Mort
49	3 Hour	Butt	Mort / Rim / Cyl / Military
48	3 Hour	Butt	Mort / Rim / Cyl / Military
47	3 Hour	Butt	Mort / Rim / Cyl / Military
	No *	Cam Lift	Cyl / Rim / Mort
46	90 Minute	Butt	Mortise / Cylindrical
	90 Minute	Butt	Mortise / Cylindrical
	No *	Butt	Cyl / Rim / Mort
45	90 Minute	Butt	Cyl / Rim / Mort
	No *	Butt	Cyl / Rim / Mort
44	90 Minute	Butt	Cyl / Rim / Mort
43	90 Minute	Butt	Cyl / Rim / Mort
	3 Hour	Butt	Mortise / Cylindrical
42	90 Minute	Butt	Cyl / Rim / Mort
41-39	90 Minute	Butt	Cylindrical / Mortise
38-32	3 Hour	Butt	Cylindrical / Mortise

* SE Series

Single Hollow Metal Doors Glazed

STC Rating Operable	Max. Fire Rating	Hinges	Locks	Glazing	Max. Visible Area
49	No *	Cam Lift	Cyl / Rim / Mort	Yes	150 sq in
48	3 Hour	Butt	Cylindrical	Yes	100 sq in
	No *	Cam Lift	Cyl / Rim / Mort	Yes	100 sq in
47	3 Hour	Butt	Mortise / Cylindrical	Yes	100 sq in
46	3 Hour	Butt	Cyl / Rim / Mort	Yes	100 sq in
	No *	Cam Lift	Cly / Rim / Mort	Yes	864 sq in
45	90 Minute	Butt	Cylindrical	Yes	288 sq in
44	90 Minute	Butt	Mortise / Cylindrical	Yes	288 sq in
43	90 Minute	Butt	Cyl / Rim / Mort	Yes	288 sq in
42	90 Minute	Butt	Cyl / Rim / Mort	Yes	288 sq in
41	90 Minute	Butt	Cyl / Rim / Mort	Yes	288 sq in
	90 Minute	Butt	Cylindrical	Yes	720 sq in
40	90 Minute	Butt	Mortise / Cylindrical	Yes	720 sq in
39	90 Minute	Butt	Cyl / Rim / Mort	Yes	720 sq in
38	90 Minute	Butt	Cyl / Rim / Mort	Yes	720 sq in
37	90 Minute	Butt	Cyl / Rim / Mort	Yes	720 sq in
36	90 Minute	Butt	Cyl / Rim / Mort	Yes	720 sq in
33	90 Minute	Butt	Cyl / Rim / Mort	Yes	720 sq in

* SE Series

Single Embossed Panel Steel Doors

STC Rating Operable	Max. Fire Rating	Hinges	Locks	Door Design
47	3/4 Hour	Butt	Cylindrical	6 Panel
46	3/4 Hour	Butt	Cylindrical / Mortise	6 Panel
	3/4 Hour	Butt	Cylindrical	2 Panel HD
45	3/4 Hour	Butt	Cylindrical / Mortise	2 Panel HD
40-45	3/4 Hour	Butt	Cyl / Rim / Mort	6 Panel
40-44	3/4 Hour	Butt	Cyl / Rim / Mort	2 Panel HD

Sound Product Charts

Pairs of Hollow Metal Doors Flush

STC Rating Operable	Max. Fire Rating	Hinges	Locks	Glazing
49	No	Butt	SVR / Cylindrical	No
48	No	Butt	SVR / Cylindrical / Mort	No
47	No	Butt	SVR / Cylindrical	No
46	No	Butt	Cylindrical / Mort	No
45	90 Minute	Butt	SVR / Cylindrical	No
44-42	90 Minute	Butt	SVR / Cylindrical / Mort	No
41-32	90 Minute	Butt	Cyl / Mort / Flush Bolt	No

If pair swing test reports are specified, consult factory

Pairs of Hollow Metal Doors Glazed

STC Rating Operable	Max. Fire Rating	Hinges	Locks	Glazing	Max. Visible Area
44	No	Butt	Cylindrical	Yes	100 sq in
	No	Butt	SVR	Yes	100 sq in
43	No	Butt	Cylindrical/Mortise	Yes	100 sq in
41	No	Butt	Cylindrical	Yes	288 sq in
	No	Butt	SVR	Yes	288 sq in
40	No	Butt	Cylindrical/Mortise	Yes	288 sq in
	90 Minute	Butt	Cylindrical	Yes	100 sq in
	90 Minute	Butt	SVR	Yes	100 sq in
39	90 Minute	Butt	Cylindrical/Mortise	Yes	100 sq in
38	No	Butt	Cylindrical	Yes	720 sq in
	No	Butt	SVR	Yes	720 sq in
37	90 Minute	Butt	Cylindrical	Yes	288 sq in
	90 Minute	Butt	SVR	Yes	288 sq in
	No	Butt	Cylindrical/Mortise	Yes	720 sq in
36	90 Minute	Butt	Cylindrical/Mortise	Yes	288 sq in
34	90 Minute	Butt	Cylindrical	Yes	720 sq in
	90 Minute	Butt	SVR	Yes	720 sq in
33	90 Minute	Butt	Cylindrical/Mortise	Yes	720 sq in

Single Wood Doors

STC Rating Operable	Max. Fire Rating	Hinges	Locks	Glazing	Max. Visible Area
50	No *	Cam Lift	Cyl / Rim / Mort	No	N/A
45	No *	Cam Lift	Cyl / Rim / Mort	Yes	370 sq in
	No *	Butt	Cyl / Rim / Mort	No	N/A

* SE Series

Hollow Metal Windows

STC Rating Operable	Max. Fire Rating	Glazing	Max. Visible Area
57	No *	3/8" & 1/2" Lam	21 ft^2
50	No *	1/4" & 1/2" Lam	16.5 ft^2
40	No *	1/2" Lam	16.5 ft^2
36	No *	1/2" Lam	16.5 ft^2

Fleming is capable of providing STC evaluations for products requiring other Acoustical performance requirements. Contact Fleming for job specific details.

* SE Series

Sound Product Charts

Single Hollow Metal Doors With Wood Veneer

STC Rating Operable	Max. Fire Rating	Hinges	Locks	Glazing	Max. Visible Area
53	No *	Cam Lift	Cyl / Rim / Mort	No	N/A
52	No *	Cam Lift	Cyl / Rim / Mort	No	N/A
51	No *	Cam Lift	Cyl / Rim / Mort	No	N/A
50	No *	Cam Lift	Cyl / Rim / Mort	No	N/A
49	No *	Cam Lift	Cyl / Rim / Mort	Yes	160 sq in
	No *	Cam Lift	Cyl / Rim / Mort	No	N/A
48	No *	Cam Lift	Cyl / Rim / Mort	Yes	100 sq in
	No *	Cam Lift	Cyl / Rim / Mort	No	N/A
47	No *	Cam Lift	Cyl / Rim / Mort	No	N/A
46	No *	Butt	Cyl / Rim / Mort	No	N/A
	No *	Cam Lift	Cyl / Rim / Mort	Yes	864 sq in
45	No *	Butt	Cyl / Rim / Mort	No	N/A
	No *	Cam Lift	Cyl / Rim / Mort	Yes	864 sq in
43	No *	Butt	Cyl / Rim / Mort	No	N/A
42	No *	Butt	Cyl / Rim / Mort	No	N/A
41	No *	Butt	Cyl / Rim / Mort	No	N/A
	No *	Butt	Cyl / Rim / Mort	No	N/A

* SE Series

Specifications

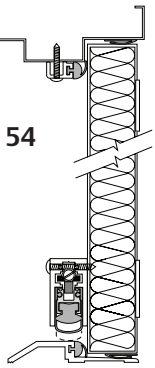
All Acoustical Doors Systems are in compliance with HMMA 865-03 and SDI 128 specifications.

Testing and Certification

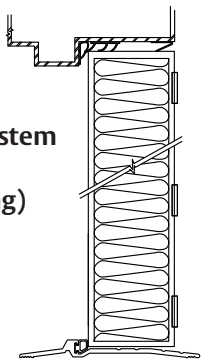
Whisper Core Door Systems are tested in accordance with:

- ASTM E90-04 and E 90-09, Standard test method for laboratory measurement of airborne sound transmission loss of building partitions
- ASTM E 413-04, Classification for rating sound insulation
- ASTM E 1332-90, (Re-approved 2003) Standard classification for determination of outdoor indoor transmission class
- ASTM E 2235-04, Standard test method for determination of decay rates for use in sound insulation test methods

Example of STC 54 Door System



Example of STC 48 Door System for Pairs (Seal Sets Vary Per Rating)



Sound

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