Established in 1924, ZERO INTERNATIONAL is recognized as a technological innovator in the design of integrated door sealing systems for demanding applications. We have more than 75 years of experience in designing, manufacturing and supporting high-performance acoustical gasketing for all types of facilities. Among those are performing arts centers, recording studios, commercial offices, hospitals, schools and apartment buildings, as well as industrial plants. The sum of our experience and expertise translates to sound advice and effective solutions you can count on.

ZERO acoustical gasketing has provided sound solutions for hundreds of facilities covering a full spectrum of functions and sound control needs. Here are just a few of our projects:

ABC Studios
New York City

Bristol Myers Squibb Corporate Headquarters
New Brunswick, New Jersey

Civic Center Music Hall
Tulsa, Oklahoma

CNN Studios
Atlanta, Georgia

Disney Animation
Anaheim, California

Disney Japan
Japan

FBI Laboratory
Quantico, Virginia

HBO Productions
New York City

L.A. City Hall
Los Angeles, CA

LDS Church
Salt Lake City

Lincoln Center
New York City

Maryland Center for Performing Arts, University of Maryland
College Park, Maryland

Merck & Company, Inc. Corporate Headquarters
Readington, New Jersey

New Jersey Devils Training Facility
West Orange, New Jersey

Performing Arts Center
Columbus, Geogia

Radio City Music Hall
New York City

Right Track Recording Studios
New York City

Rock & Roll Hall of Fame
Cleveland, Ohio

Silvercup Studios
Long Island City, New York

Smithsonian Institute, National Museum of American History
Washington, D.C.

University of Arizona KUAT Radio Station
Tucson, Arizona

University of North Carolina School of Music
Greensboro, North Carolina

U.S. Air Terminal, LaGuardia Airport
New York City

U.S. News & World Report
New York City

U.S. Dept. of Defense Pentagon Building,
Washington, D.C.

eNoise Control

297 North 9th Street, Noblesville, IN 46060
Toll Free Phone: 888.213.4711 Fax: 317.774.1911
eNoiseControl.com

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The Noise Problem

Loud noise hurts everyone—and it's especially bad for business. Continued exposure impairs hearing and undermines emotional well-being, exposing employers to potential liabilities. Even at relatively low levels, unwanted noise can be a costly drain on employee morale and productivity.

Some businesses by their nature demand isolation from the intrusive sounds of the outside world. Concert halls and theaters would forfeit their enchantment for audiences subjected to noisy reminders of the external world of lobby and street. Recording studios cannot function with even miniscule sound intrusions from the outside.

Other facilities need to shield common workspaces and office employees from the distractions of resident noise emanating from the HVAC plant and other heavy equipment rooms. Virtually all types of commercial buildings need offices equipped for private conversation. And the need for absolute confidentiality is a modern byproduct of expanding national security operations.

In fact, audible conversation is an inherent problem for all facilities where private communication is important–from doctors' offices and hospitals to counseling centers. Noise can be equally unwelcome in settings we don't usually associate with "business." Consider the impact of noisy disruptions on the tranquility of services and other functions at churches. Closer to home, where integrated home theater systems are becoming popular, even routine household noise can interfere with listening pleasure. And when you're on the road, hotel noise often causes a lot of irritation if rooms are not equipped with sound-rated entrance and/or communicating doors.

The solutions to the endless list of noise problems and challenges fall into two basic categories. The science of sound—*acoustics*—has yielded corresponding sound management techniques. Their application is determined by the nature of the particular noise problem:

- ***Absorption*** is the process of removing sound energy from within a room. Typically, that is accomplished using soft, porous materials exposed to soak up sound.
- ***Transmission*** is the movement of sound through a *medium*. Preventing the transfer of sound through door openings—specifically through clearances and gaps around doors—requires the specialized expertise and techniques discussed in the following pages.

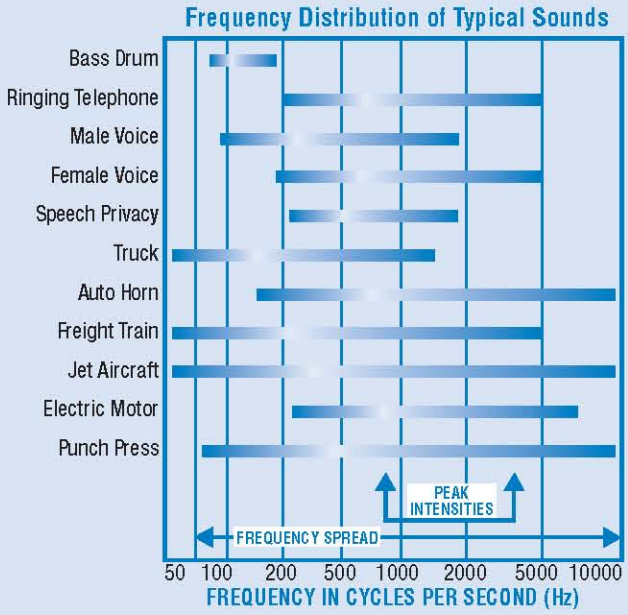
Defining Your Noise Problem: The First Step to Solving It

To define your specific problem, you need a basic understanding of how to quantify both your unwanted noise and the sound level that will be acceptable. The difference between those two values is the degree of sound control you need to achieve with your door opening. That understanding requires a brief overview of the science of sound and its measurement.

We begin with a few important definitions:

- ***Sound*** is vibrations in air moving in waves. The rate of sound pulsations measured in cycles per second is called ***frequency***—also known as ***hertz (Hz)***. The range of human hearing is considered to be 20 to 20,000 Hz.

FREQUENCY DISTRIBUTION CHART



- Sound pressure levels are measured in ***decibels***—or ***dB***. The scale of measurement used to simulate sound across the audible frequency range is denoted as ***dBA***. Figure 1 illustrates the impact of dramatic changes in dB levels. It is also important to note that the human ear perceives changes in loudness caused by even small changes in those levels. Each 10 dB increase doubles the sound reception—and the annoyance or discomfort that goes with it.

COMPARISON OF SOUND PRESSURE LEVELS AND LOUDNESS SENSATIONS

Sound Pressure Level (dBA)	Source	Sensation
130	Jet Aircraft at 100' Bass Drum at 3' Auto Horn at 3'	Physical Pain
120		
110	Thunder, Artillery Nearby Riveter Elevated Train Discotheque	Deafening
100		
90	Loud Street Noise Noisy Factory Truck Unmuffled Police Whistle	Very Loud
80		
70	Cocktail Party Noisy Office Average Street Noise Average Radio Average Factory	Loud
60		
50	Noisy Home Inside General Office Conversation Quiet Radio	Moderate
40		
30	Quiet Home Private Office Empty Auditorium Quiet Conversation	Faint
20		
10	Rustle of Leaves Whisper Soundproof Room	Very Faint
0	Threshold of Audibility	

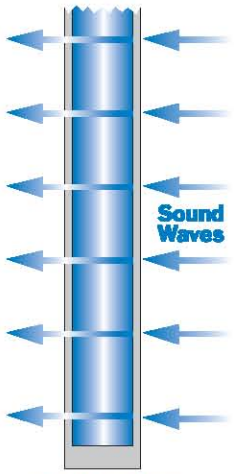
Figure 1

Federal (OSHA) **code prohibits exposure to noise levels which exceed these limits:**	Duration Hours Per Day	Sound Level in dBA
	8	90
	6	92
	4	95
	3	97
	2	100
	1-1/2	102
	1	105
	1/2	110
	1/4 or less	115

To go from definitions to practical applications, we first need to understand how sound is transmitted from its source through a barrier. Next we will explain how a barrier is rated for its ability to inhibit or block sound. That gives us the ability to compare different barriers. With that information, we can examine the role of gasketing systems in optimizing the performance of doors that function as sound barriers.

The Mechanics of Sound Transmission

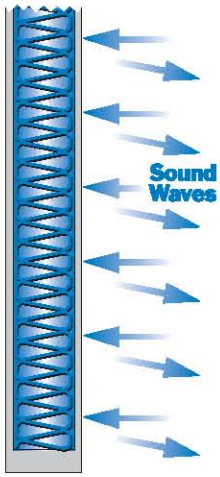
When sound comes in contact with a barrier, such as a door, some of the energy from the vibrations transfers to the door. The resulting vibrations in the door itself then set the air in motion on the other side of the door—creating more sound vibrations.



without sound core

The mass, damping and stiffness of the barrier determine its resistance to the passage of sound waves. The greater the ***mass***, the less sound is transmitted through the barrier. Mass is especially important for blocking sound at lower frequencies.

Sound vibrations can be reduced using ***damping*** materials, which are typically limp-mass materials. Damping material is sometimes used as core material in doors designed to provide the highest levels of sound control.

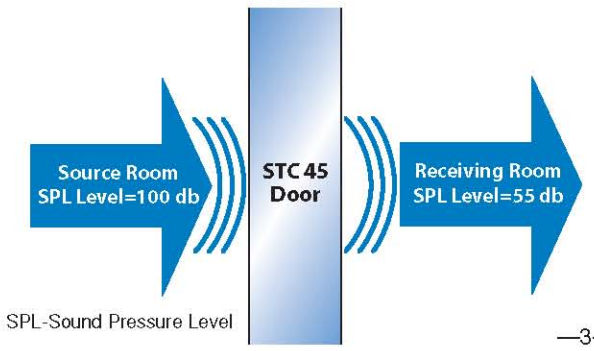


with sound core

The ***stiffness*** of the barrier is also a factor in sound transmission. Although more flexible barriers transmit less sound, for practical reasons sound-control doors are generally made from very dense, stiff materials. Unless they contain inner layers of damping material, some sound will inevitably be transmitted through the door. On the other hand, those dense, stiff materials also work well at reflecting sound back to its source. Most acoustical doors are constructed of wood or steel with stiffness and barrier batts added to any hollow cavity inside the door.

Naturally, the effectiveness of sound-control doors varies with different combinations of materials. With so many variables, how can we determine how well a particular door will block sound? And how can we compare the effectiveness of different doors?

Figure 3



Sound Transmission Loss (TL)

A door's ability to reduce noise is called its sound transmission loss (TL) effectiveness. TL is a value given in decibels, which is determined by measuring sound pressure levels at a given certain frequency in the source and receiving rooms. The calculation also factors in the area of the partition shared by the two rooms, and adjusts for the receiving room's acoustic "liveness" (known as "reverberation time"). The adjusted difference between the two levels is the TL of the door. The higher the TL, the better the result.

Leaving out the adjustments to illustrate using a simple example, if the source room measurement is 100 dB at 300 Hz and the receiving room measurement is 60 dB at 300 Hz, the TL of the barrier is 40 dB at 300 Hz.

TL is measured in test laboratories according to ASTM E90 "Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions."

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 over 16 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, as shown in Figure 2.

SOUND TRANSMISSION CLASS (STC) TABLE

STC	PERFORMANCE	DESCRIPTION
50 -60	Excellent	Loud sounds heard faintly or not at all.
40 - 50	Very Good but not understood.	Loud speech heard faintly
35 - 40	Good	Loud speech heard but hardly intelligible.
30 - 35	Fair	Loud speech understood fairly well.
25 - 30	Poor	Normal speech understood easily and distinctly.
20 - 25	Very Poor	Low speech audible.

Figure 2

STC values are used to define the performance requirements for achieving a specified reduction in sound transmission from a source room to a receiving room. The STC rating of an installed door also determines how much noise reduction is possible between a given source room and receiving room. (See Figure 3)

Figure 4 shows the maximum values that can typically be achieved with various types of doors used in commercial construction. It also shows the STC effects of using glass in door lite kits. In general industry practice, doors with STC values of 30 or higher qualify as acoustical doors.

There are two different scenarios for testing a door as a sound barrier to determine its STC value. When tested as a panel, the door is sealed into the test wall, and the resulting STC rating is actually the rating for the entire wall. Alternatively, the test can be conducted with the door operable, yielding an STC rating that is generally more representative of what can be expected when the door is installed. In practice, manufacturers test using either scenario–and sometimes both. It is important to note what kind of rating is published and be aware of the differences.

Because sound-control doors are tested under optimal laboratory conditions, it is equally important to understand that performance in the field will almost always be less than the door's published STC rating under either of those scenarios. The key to achieving an STC rating for the opening that is as close as possible to the published rating for the door is using appropriate acoustical gasketing. Without acoustical gasketing, even openings with high-rated doors perform very poorly at blocking sound. And results can be equally disappointing with acoustical gasketing that is poorly designed, constructed or installed.

STC TESTING FOR ZERO'S SOUND TRAP-52 SYSTEM

Band No.	1/3 Octave Band Center Frequency Hz	Sound Transmission Loss in dB Door Sealed	Door Operable
(1)	125	40	42
(2)	160	43	43
(3)	200	49	48
(4)	250	47	45
(5)	315	48	46
(6)	400	47	46
(7)	500	49	46
(8)	630	51	48
(9)	800	52	50
(10)	1000	55	52
(11)	1250	58	55
(12)	1600	61	57
(13)	2000	62	58
(14)	2500	64	58
(15)	3150	66	59
(16)	4000	62	59
SOUND TRANSMISSION CLASS		55	52

REPRESENTATIVE STC VALUES

The values shown are typically the best available ratings (tested as panels) for the type of door and glazing materials used. For comparison, 12 inches of reinforced concrete provides an STC of 56. On the other hand, if you have a standard mineral core 1 3/4" door without any sound absorption material, sound control performance will almost certainly be very poor.

Wood Doors	*STC*
Particle Core (1-3/4")	30-31
Particle Core (2-1/4")	33-34
Mineral Core (Fire-Rated)	35-37
Sound Core	36-45
Hollow Metal Doors	
Honeycomb Core	35-37
Styrene Core	34-35
Steel-Stiffened with Sound Core	46-55
Glass	
1/4" plate	29
1/4" laminate	34-36
3/8" plate	30
1/2" plate	33
5/8" plate	33

Figure 4

The values in the table at left show the derivation of Sound Transmission Class (STC) from testing a ZERO SOUND TRAP-52 system.

System Components:

- *#770 head and jamb seal,*
- *#119 head and jamb spring seal,*
- *#367 automatic door bottom,*
- *#564 saddle.*

*The acoustical system was installed on an **STC 55** door fitted in a standard 3' x 7' test opening between two reverberating rooms.*

The Vital Role of Acoustical Gasketing

Gasketing's importance derives from a fundamental property of sound: Sound waves travel through any opening with very little loss. While the amount of air flowing through a gap increases in proportion with the size of the gap, the size of the gap in a sound barrier does not matter. A tiny hole transmits almost as much sound as a much larger gap. (See Figures 5 and 6) For example, a one-square inch hole in 100 square feet of gypsum board partition can transmit as much sound as the rest of the partition.

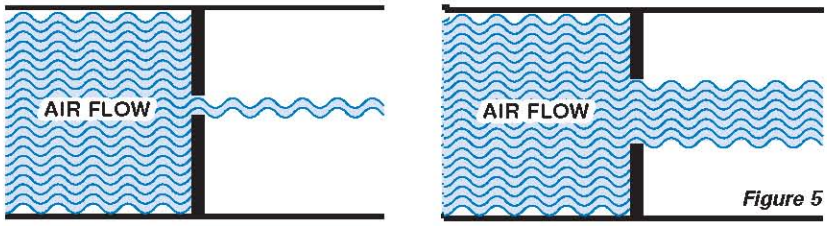


Figure 5

Because of this phenomenon, any unsealed gaps and clearances in door assemblies effectively cancel out the noise reduction benefits of sound doors. For example, one-eighth-inch clearances around the edges reduce the effective rating of an STC-52 door to 21–guaranteeing very poor acoustical performance and a great deal of discontent. The performance loss is especially serious at medium to high frequencies.

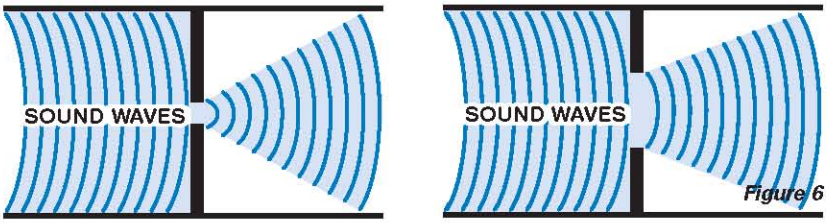
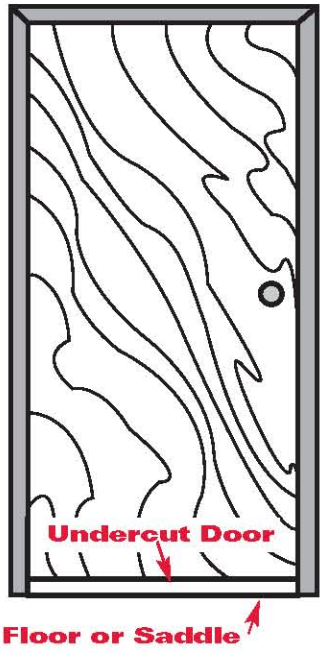


Figure 6



For acoustical gasketing to be effective at blocking sound, the seals around the head, jamb and sill must be complete, uninterrupted and air-tight throughout the service life of the door. For uninterrupted contact, the gasketing must be installed all on the same side of the door and frame. Performance also depends on good surface contact between the gasket and door edge or frame, which can usually be achieved using compression seals.

However, gaps caused by imperfect door alignment are a common problem in newly installed gasketing and can also surface later on as buildings shift and settle and doors cycle through changes in temperature and humidity. For consistent performance over time, the most advanced acoustical gasketing is designed with adjustable features to restore a sound-tight seal when clearances increase for any reason.

As with the door itself, the mass of the sealing material used in acoustical gasketing is a major factor in achieving a high STC rating. Combining complementary materials can also provide better performance. In addition, air trapped in a "sound lock" between a pair of doors, or between layered sets of seals in a gasket, is one of the best sound absorbers.

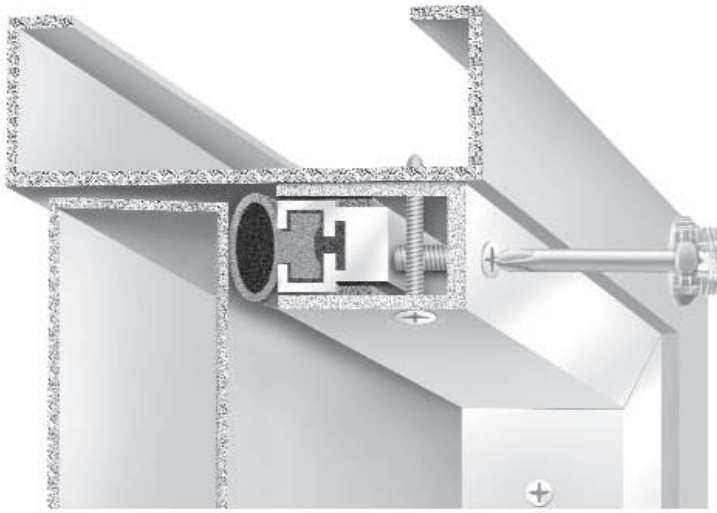
Ultimately, the quality of the acoustical gasketing is the biggest factor in overcoming any installation deficiencies and determining how close the actual sound performance of an assembly will come to the published rating of the door. Improving the quality of the gasketing brings the STC value of the functioning opening closer to its theoretical maximum.

It is important to understand that STC values are not proportionate units of measurement. To continue reducing sound transmission–that is, to achieve increasingly higher levels of sound control–each 10 dB increment requires ten times as much improvement as the one before. While door openings rated in the range from STC 30 to STC 40 are common, achieving STC 50 and higher ratings is extraordinarily difficult.

What does It Mean to You? ...Practical Applications

With a basic understanding of acoustical barriers and their ratings, you can now return to Figure 1 to begin assessing your sound problem and what you need to solve it. The difference between the sound level you want to achieve and the unwanted noise you need to block is the required STC rating of your door opening. For example, if you need to block 90 dB-level sound from a noisy, adjacent factory in order to maintain normal office sound levels of around 50 dB, you will need a sound door assembly with a 40 STC rating. Increasing that rating to 50 STC will provide sound levels suitable for a private office. Very high ratings are typically needed to create soundproof rooms for recording studios—and to isolate performance halls from exterior noise. Relatively lower ratings will usually suffice for less demanding applications, such as solving a noise problem in an apartment building or a doctor's office.

In addition to sound ratings, it may be necessary to consider other performance criteria for the door assembly. Durability is a special concern for doors installed in schools and other high-traffic, high-abuse locations. And fire ratings are required for doors in fire-rated partitions, stairwells and other code-designated locations.



#770

Expert Help From ZERO ...With a Promise

Once you have completed a preliminary assessment, specialists in ZERO's Engineering Department can help clarify your needs—and then identify your options for achieving the desired level of sound control for your door opening. ZERO offers dozens of specialized acoustical seals configured in various ***SOUND TRAP*** gasketing systems designed to achieve optimum ratings for specific doors and assemblies.

All SOUND TRAP systems are tested and rated with operable doors. Installed with hinges and seals in a test assembly, the door is opened and closed a number of times before measurements are taken. The results therefore represent the STC rating for the opening–not the wall partition in which the door was tested.

To simplify our discussion, we will focus on two SOUND TRAP systems that together can satisfy a wide range of common commercial and industrial sound-control needs for single doors. The STC ratings of our ***SOUND TRAP-52*** and ***SOUND TRAP-49*** systems are built into their names.

The component that primarily distinguishes between the two systems is the gasket that seals the head and jamb of the door. Our **Model #770 adjustable jamb-applied gasket**, which has achieved an excellent track record in a wide range of applications, is recommended for ensuring the highest possible rating for most purposes. The adjustable design of the #770 allows you to maintain that high level of sound control for the long term. When clearances increase from the inevitable shifting and settling of buildings and doors over time, all it takes to restore a sound-tight seal is a few turns of a Phillips screwdriver.

However, that model only works with frames that have no stop. In addition, if your door has a low sound rating—or is not rated at all—it will not be possible to achieve the full benefit of the #770. In those circumstances, we recommend other models.

The years of experience and advanced technology reflected in our SOUND TRAP systems allow ZERO to set the standard for acoustical gasketing. In practical terms, that means we are able to guarantee performance within two STC points of the published rating of your door using our integrated gasketing systems.

Using Gasketing to Upgrade an Existing Door

You will typically have the most options if you are building a new opening or installing a new door as part of a renovation. However, it is usually possible to achieve significant improvements even with an existing door by using the right gasketing. To determine the best solution, we will ask a series of questions about your existing door.

- **Is your door wood or metal? Is it sound-rated? And how thick is it?**
  Metal, sound-rated doors are good candidates for our SOUND TRAP-52 systems using the Model #770. Certain wood doors may also be suitable.
- ***What kind of frame is in place?***
  This helps determine if the #770 will fit. As noted above, frame stops prevent the installation of the #770 because of its bulk. Models with thinner design are available as alternatives. In some cases, wood frame stops can be removed, thus expanding the range of options.
- ***How much clearance is there under the door? If there is sufficient room, will the traffic through the door allow the use of a threshold?***
  A threshold helps to complete the uninterrupted seal needed for maximum sound control. However, that may not be possible if a flat surface is needed for any reason, such as accommodating the movement of equipment.
- ***Does the opening have a single door or a pair of doors? For pairs, is there a flush bolt—i.e., is one door bolted? Or are both doors active?***
- ***Is the door equipped with a knob or a lever?***
  Door knobs prevent the use of the #770.
- ***Is the door fire-rated?***
  A fire-rated door requires a fire-rated gasketing system.

Designing Openings for Maximum Sound Control

To minimize sound transmission through your opening, you will need a sound-rated metal door with a cased-opening frame fitted with a SOUND TRAP-52 STC gasketing system. Our specialists will provide complete advice on gasketing options for your application. We can also provide an overview of issues that must be considered for specifying a complete, effective sound barrier. You will most likely need the assistance of an acoustical consultant to advise you about the necessary components for that barrier. The wall itself must be constructed for good resistance to sound transmission. For example, a sound door installed in a 1/2" sheet rock wall provides virtually no noise-reduction value. The consultant will also assist in evaluating available options to select the door and hardware best suited for both your acoustical and design needs.

Sound locks consisting of a pair of gasketed doors separated by a narrow vestibule are incorporated in the design of many soundproof rooms. The same effect can sometimes be achieved with the use of multiple sets of continuous seals.

SOUND TRAP SYSTEMS ...PROVEN SOLUTIONS FOR SEALING THE GAPS

When ***SOUND TRAP-52 STC*** systems are properly fitted with a suitable, high-rated sound door, loud sounds will be heard only faintly, or not at all, on the opposite side of the door. That level of sound control satisfies the typical needs of recording studios and performance halls. It is also suitable for office buildings and other commercial facilities that need to mute very loud noise originating from outside—such as the sound of aircraft overhead or heavy city traffic nearby—as well as interior equipment noise. Your door must have a metal frame without a stop in order to use the Model #770 head and jamb seal, which is an important component in this system.

Our ***SOUND TRAP-49 STC*** systems feature several alternative head and jamb seals designed for use with frame stops. A 49 STC value means that loud speech will be heard only faintly and cannot be understood on the opposite side of the door. Considered to provide very good sound control, that level of acoustical performance is suitable for a variety of applications ranging from doctors' offices to busy schools and multi-family residential buildings.

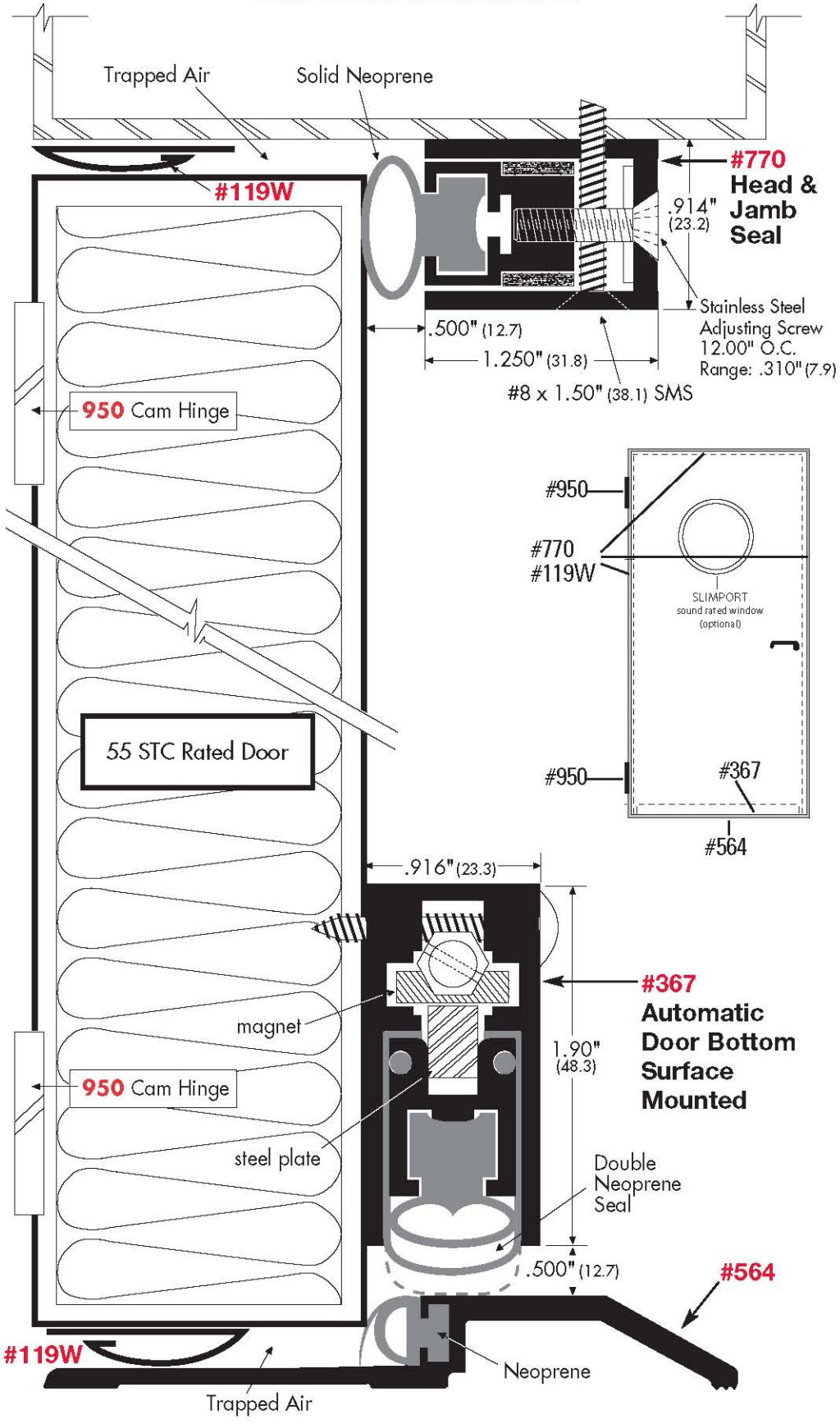
	SOUND TRAP-52 STC	SOUND TRAP-49 STC
Head and Jamb Seal		
- Primary	Model 770	Model 870
- Supplemental (recommended)	119W	119W
Saddle	564, 565 or 566	564, 565 or 566
Automatic Door Bottom	367	365
Hinge	950 Cam Lift (1 pair-opt.)	ZBB961 (2 pairs)
STC Rating	52	49

Both systems tested with STC 55 acoustical doors (rated as panels).

The Product Code for ordering the SOUND TRAP-52 system is STC 2.
The Product Code for ordering the SOUND-TRAP-49 system is STC 6.

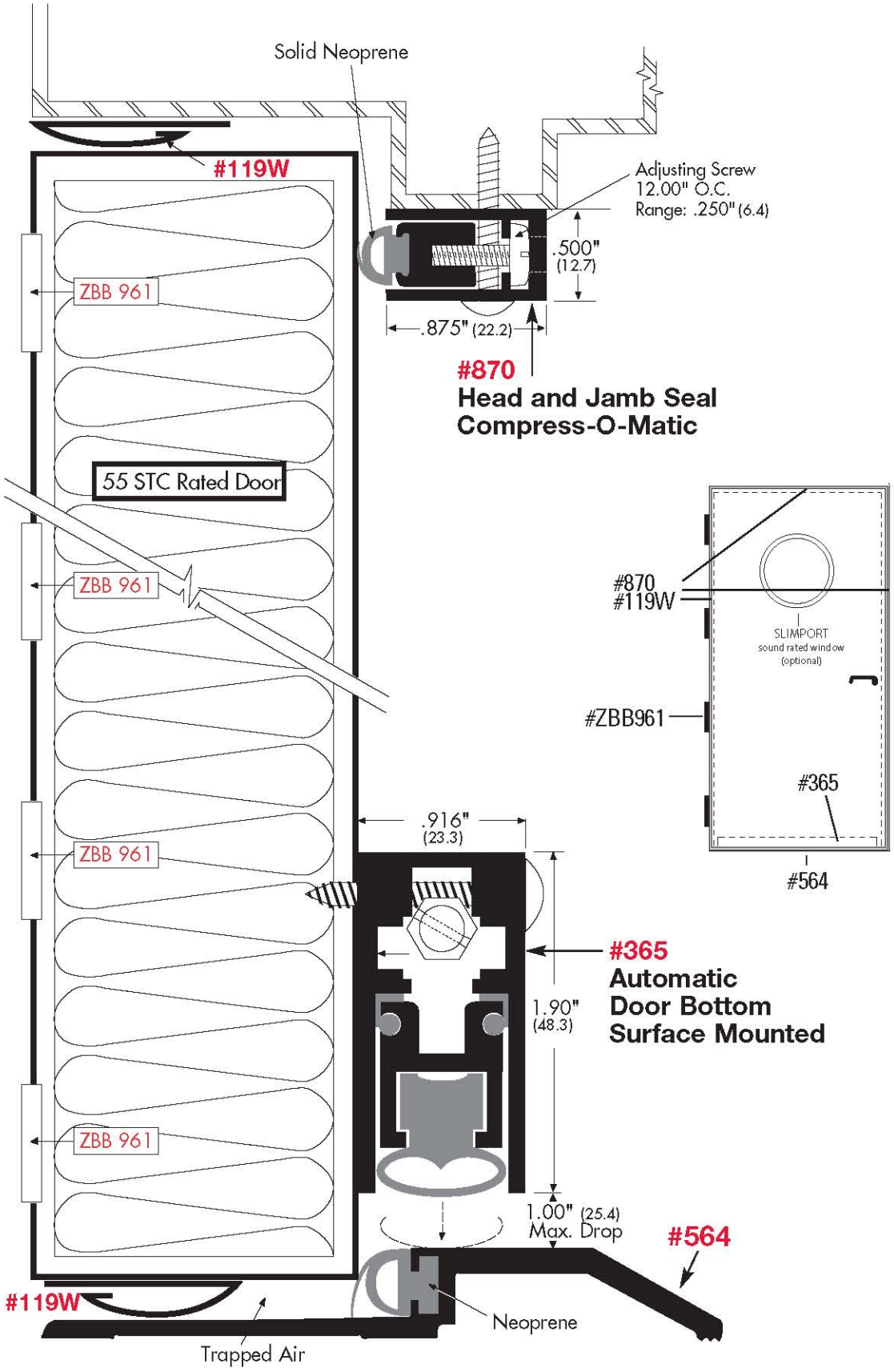
SOUND TRAP-52 STC SEALING SYSTEM

PRODUCT CODE STC 2



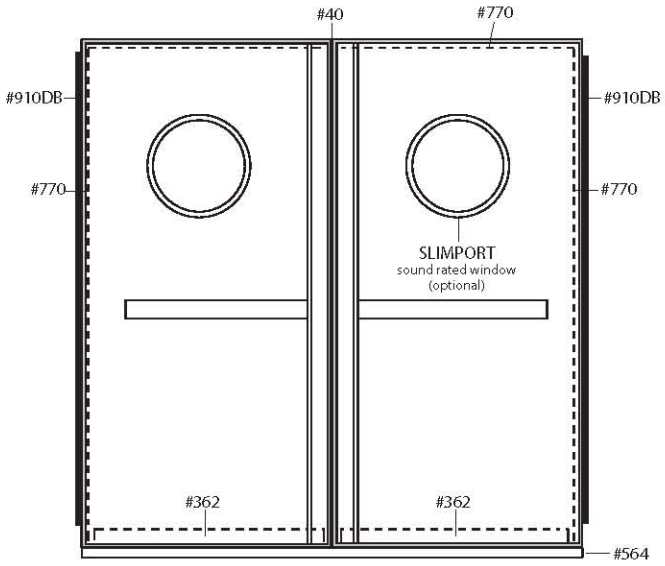
SOUND TRAP-49 STC SEALING SYSTEM

PRODUCT CODE STC 6



Sound Trap for Double Doors

Pairs of doors pose additional challenges for sound control because there are more openings to seal. The need for additional corners and a meeting stile means there will always be relatively more sound leakage through pair assemblies than with single doors. ZERO's **SOUND TRAP-PAIRS** system for metal doors achieves an STC rating of 42—sufficient to provide privacy for office conversations—with an optimal configuration that balances those limitations with appropriate, cost-effective technology.

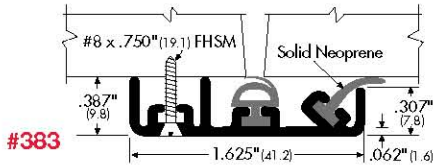


	SOUND TRAP-PAIRS
Head and Jamb Seal	Model 770
Meeting Stile Astragal	40
Saddle	564
Automatic Door Bottom	362
Hinge	910 DB
STC Rating	41

System tested with STC 52 acoustical door (rated as a panel).

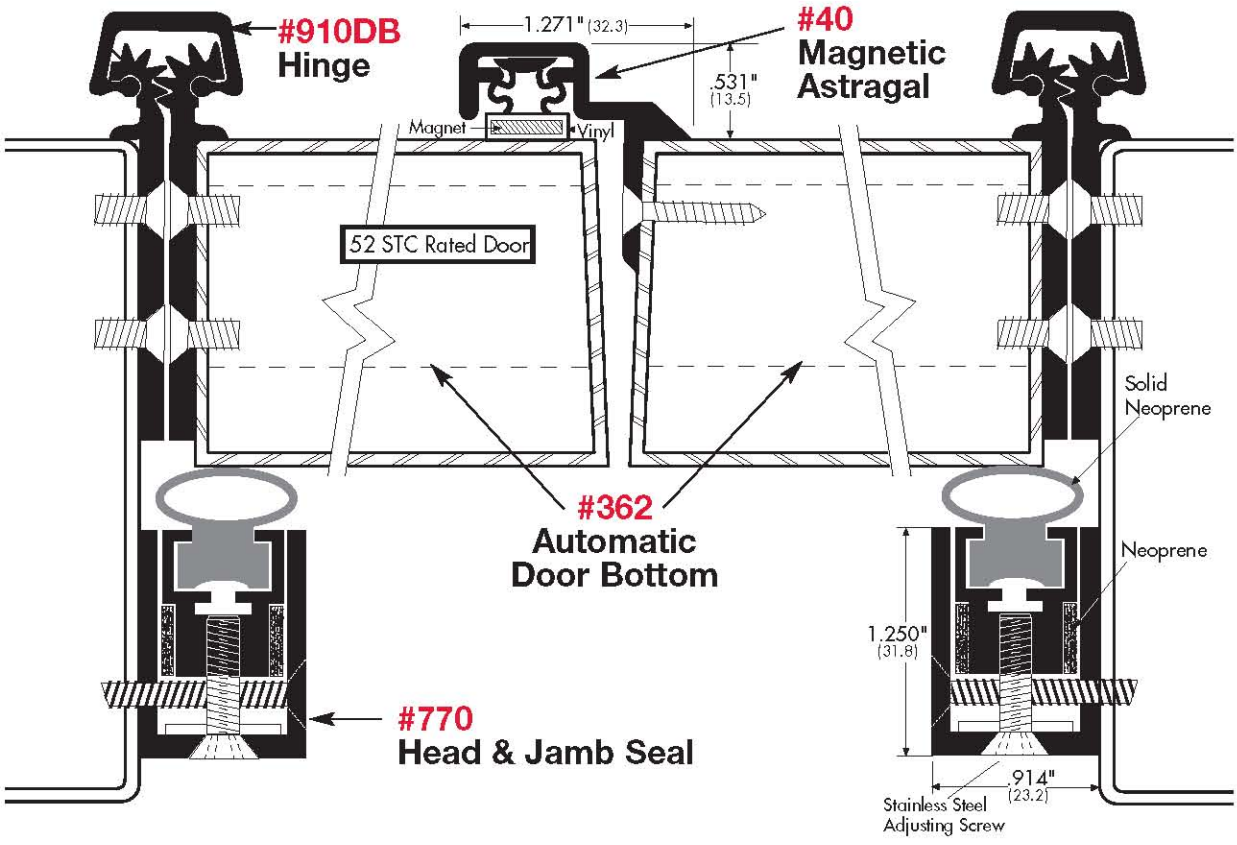
The Product Code for ordering the SOUND TRAP-Pairs system is JD6S.

For a similar configuration with suitable wood doors, you need Model #383 astragals for the meeting stile. #383 provides three sets of seals to block sound: the neoprene bulb with extra "lip" of neoprene in the primary seal at the meeting edge, plus another neoprene "finger" for added sound cushioning against the active door.



SOUND TRAP - PAIRS SYSTEM

Product Code JD6S



Sound Trap Components

The following descriptions will provide a basic understanding of how the various components in these systems work. We also highlight the distinguishing features of other available components. Some of those alternatives may be used interchangeably to achieve similar ratings. Other options may have relatively greater impact on the overall rating as a trade-off for various design features.

If you are considering substituting an alternate or optional component, consult our Engineering Department to determine the likely impact on the performance of the system.

We use the following symbols to identify specific parts that work best with our featured SOUND TRAP systems.

S-52 **STANDARD**
SOUND TRAP-52 systems

S-49 **STANDARD**
SOUND TRAP-49 systems

S-P **STANDARD**
SOUND TRAP-PAIRS systems

Alt-52 **ALTERNATE**
SOUND TRAP-52 systems

Alt-49 **ALTERNATE**
SOUND TRAP-49 systems

Alt-P **ALTERNATE**
SOUND TRAP-PAIRS systems

CAD

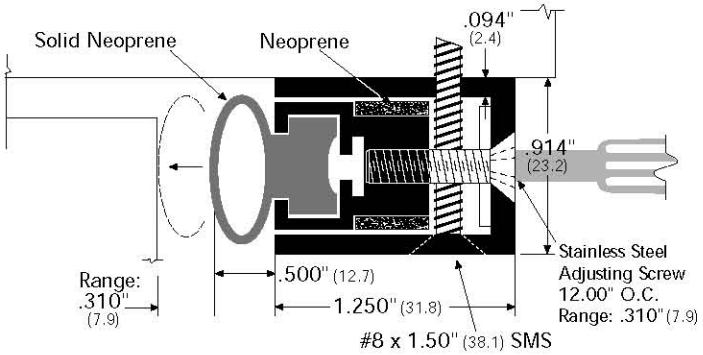
CAD drawings for all parts are available online at our website. Go to **www.zerointernational.com**, click on the Catalog and CAD Library menu button, and enter the part number you want in the CAD Drawing Finder box.

Head & Jamb Protection

Model #770 (S-52) (S-P) CAD

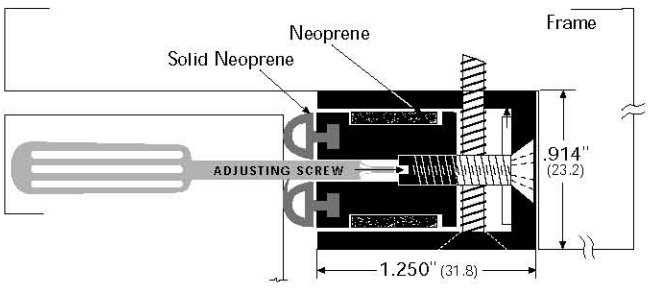
Secured directly to the door jamb, this acoustical gasket features our unique Compress-O-Matic® design with a sound-absorbing neoprene bulb that compresses to form a tight seal as the door is closed. It includes adjusting screws for field correction of irregular clearances that might compromise actual sound performance. When used with a metal cased-opening frame, the #770 offers the added benefit of eliminating the need for an additional frame stop—and its unaesthetic projection into the door opening.

The gasket is also listed for use with both wood and metal acoustical doors with fire listings ranging from 20 to 90 minutes under both negative and positive-pressure testing standards. Its exceptional engineering, design features and performance have made the #770 a long-time favorite of acoustical engineers and specifiers.



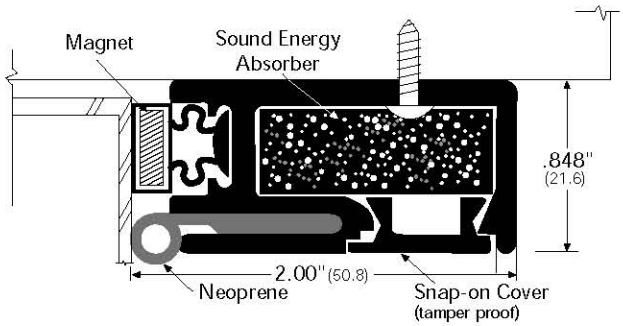
Model #7770 (Alt-52) CAD

This variation on the #770 Compress-O-Matic features two smaller neoprene bulbs. Designed to provide greater design latitude, the gasket accommodates adjustment from the front of the gasket so that end moldings can be used to cover the frame



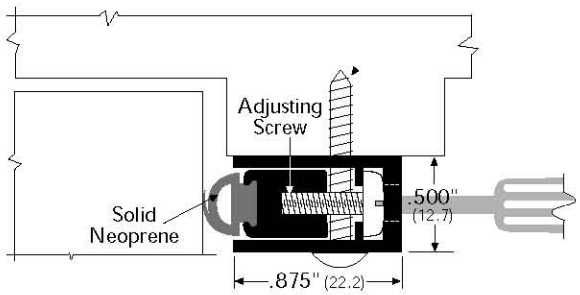
Model #3708 (Alt-52) CAD

This head and jamb seal provides performance that is very comparable to the #770. Suitable for metal doors, it features a snap-on cover and magnet for streamlined design that eliminates exposed mounting screws.



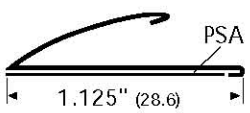
Model #870 (S-49) CAD

Adjusting screws make the #870 the preferred head and jamb seal for SOUND TRAP-49 systems. This Compress-O-Matic gasket is much thinner than the #770 in order to fit into an opening with a frame stop. Its reduced mass means that the #870 also has a relatively lower sound rating



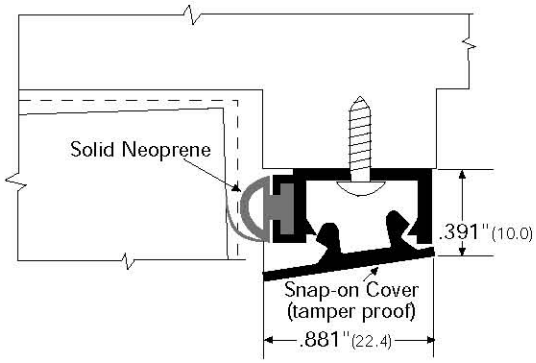
Model #119WB (S-52) (S-49) CAD

This self-adhesive bronze spring seal provides excellent supplemental protection and is recommended for all SOUND TRAP systems. Mounted on top to the frame—and at the bottom to the door—it is compressed with a spring action as the door is closed. The trapped air surrounding the seal furnishes additional sound reduction.



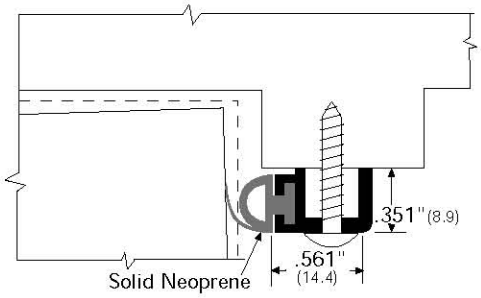
Model #475 (Alt-49) CAD

A non-adjustable alternative to the #870, the #475 also installs to the frame stop. It incorporates a solid neoprene bulb with an extra "finger" that helps compensate for misalignment in the door. As the finger compresses against the rubber bulb, it is also compressed by the door itself. Tamper-proof design featuring a snap-on cover protects the gasket from impact.



Model #485 (Alt-49) CAD

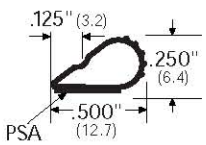
This gasket is similar in design to the #475 without the snap-on cover.



Model #188 Supplemental CAD

Applying this self-adhesive neoprene seal will provide additional protection for any Sound Trap system

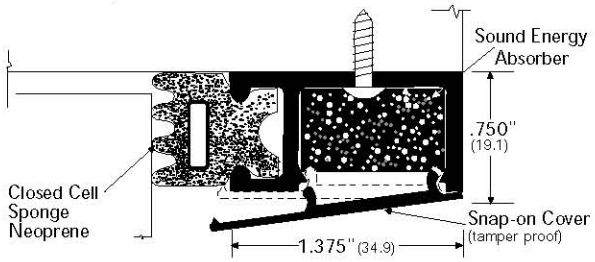
Tear Drop
Compress-O-Matic®



Head and Jamb Options For Other SOUND TRAP Solutions

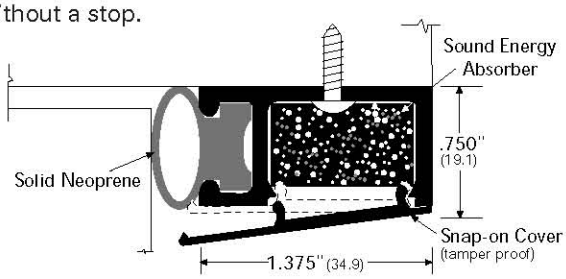
Model #470 CAD

With a closed cell sponge neoprene seal, the #470 has additional integral sound-absorption material and a snap-on, tamper-proof cover. Its dimensions are sized to allow installation as a stop. Like the other alternatives discussed below, the absence of an adjusting screw makes this an option where the requirements for sound control do not require the highest possible STC ratings over time for the installed system.



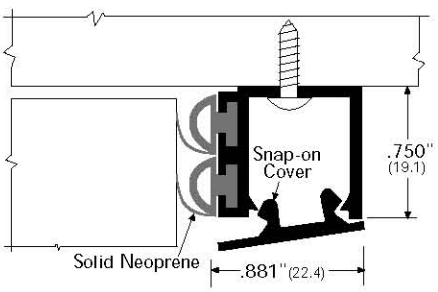
Model #472 CAD

A Compress-O-Matic solid neoprene bulb serves as the primary seal on this gasket. The dimensions and all other design features are identical to the #470. ZERO recommends the #472 for use with wood doors or wood frames without a stop.



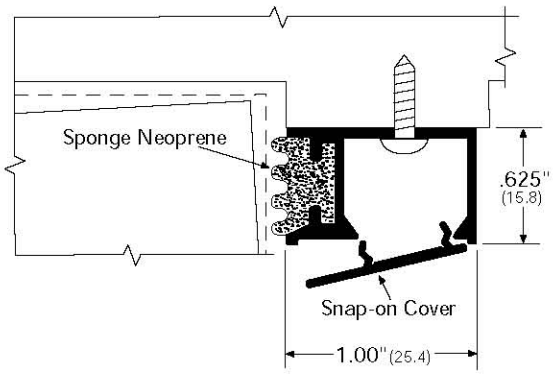
Model #478 CAD

Some designers may prefer the look of the double Compress-O-Matic seals in this gasket, which is also sized to be installed as a stop. The extra "finger" of neoprene that presses against the solid neoprene bulbs when the gasket is compressed by the door helps compensate for any misalignment of the door, which helps to boost sound-control performance.



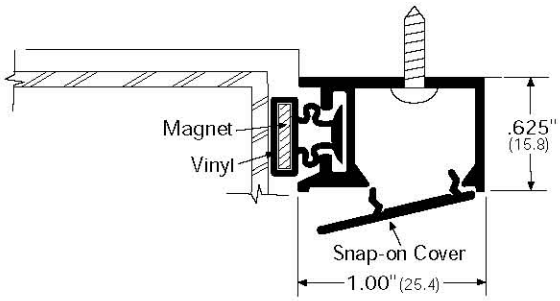
Model #376 CAD

The 5/8" depth allows this versatile gasket to be installed as a stop—or attached to an existing 5/8" stop. The seal is sponge neoprene, and the gasket comes with a tamper-proof cover.



Model #375 CAD

Similar to #376 in its function and other design features, model #375 offers a vinyl sound seal with a magnet.

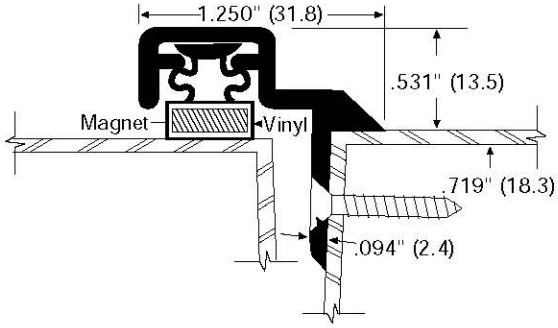


Meeting Stile Protection

SOUND TRAP-PAIRS uses an astragal designed for double doors with one door active. We will advise you on special hardware needed for your meeting stile.

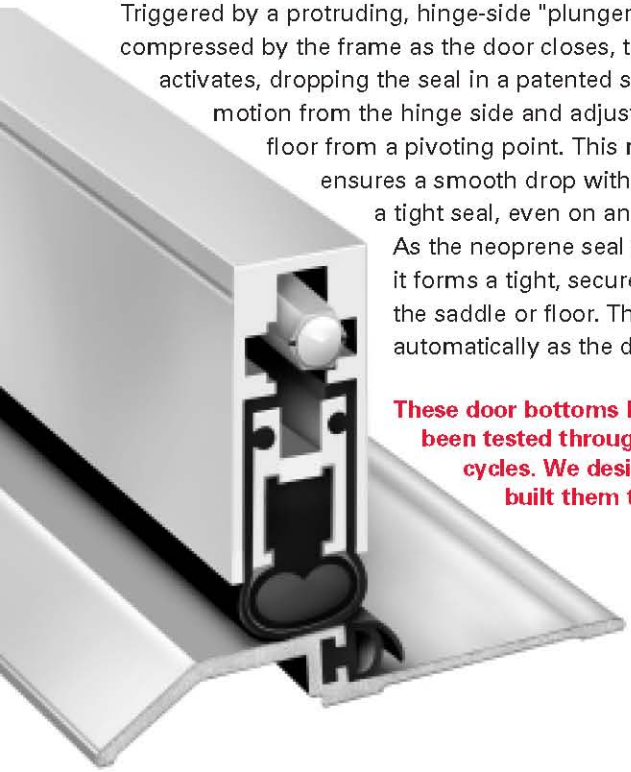
Model #40 S-P CAD

For metal doors, this astragal uses a vinyl-covered interior magnet. It is applied to the inactive door only.



Automatic Door Bottoms

The advanced technology common to all of our automatic door bottoms utilizes a concealed flat spring mechanism, which activates when the door is closed, lowering a neoprene seal insert firmly against the floor or saddle. Triggered by a protruding, hinge-side "plunger" that is compressed by the frame as the door closes, the spring activates, dropping the seal in a patented scissor-like motion from the hinge side and adjusting to the floor from a pivoting point. This motion ensures a smooth drop without drag and a tight seal, even on an uneven floor. As the neoprene seal compresses, it forms a tight, secure bond against the saddle or floor. The seal retracts automatically as the door is opened.



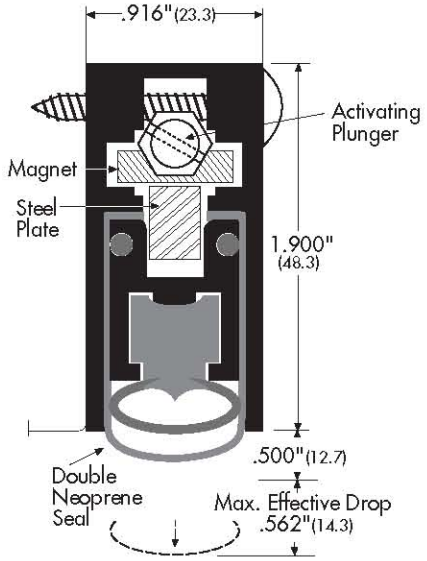
These door bottoms have been tested through 5 million cycles. We designed and built them to last.

Model #367

S-52

CAD

The double neoprene bulb in our "High Sound" automatic door bottom provides maximum sound reduction. Extra features in its patented design include lock-side magnets and a steel plate that amplify the action of the spring mechanism to ensure a controlled, uniform drop and seal. It can be mortised into the door or surface mounted.

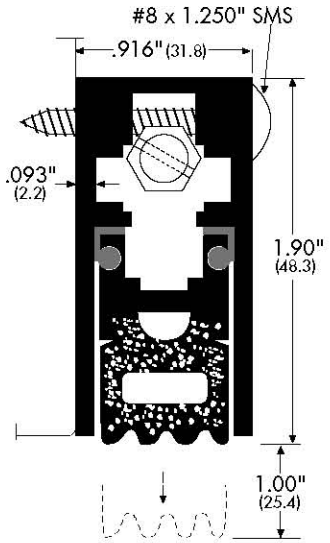


Model #362

S-P

CAD

The compression seal in #362 is closed cell sponge neoprene. In addition to the standard #362 semi-mortised door bottom for SOUND-TRAP pairs, we also offer model #361 for a surface-mounted alternative.

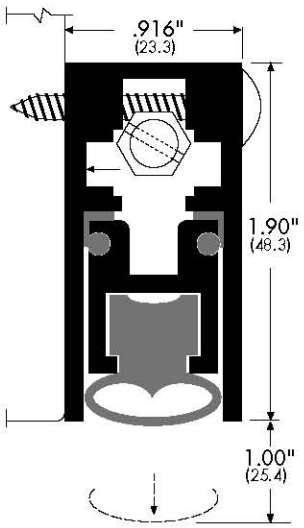


Model #365

S-49

CAD

The compression seal in this door bottom is a neoprene bulb. This model can be surface mounted. For semi-mortised installation, model #366 is available.

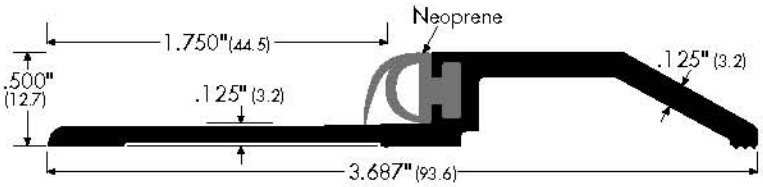


Saddles

To achieve the highest sound ratings, our automatic door bottoms should be combined with sound-rated saddles.

Model #564

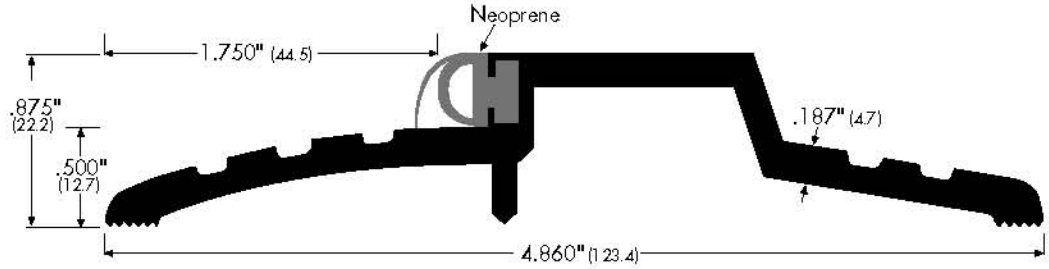
S-52 S-P Alt-49 CAD



This aluminum or bronze door saddle features a neoprene bulb with a protruding rubber finger to help correct for any misalignment in the door as it is closed against the seal.

Model #565

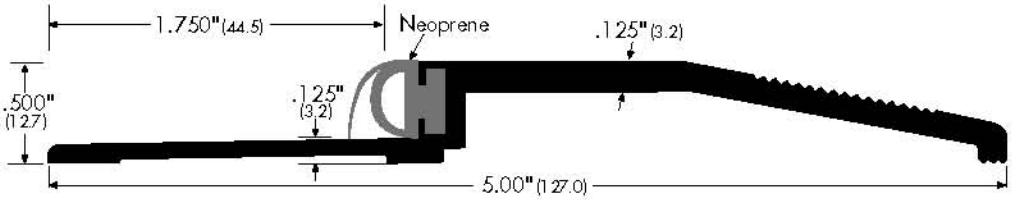
S-49 Alt-52 Alt-P CAD



Identical to the #564 in the design of its acoustical seal, the #565 incorporates a 7/8 inch rise in the saddle, to accommodate a 1/2 inch clearance under the door.

Model #566

Alt-52 Alt-49 Alt-P CAD



This saddle has a one-half inch rise, allowing a 1/8 inch clearance under the door. Similar to the #564, it is a good option for those who prefer the more aesthetic look of a wider ramp.

Hinges

Model #950

S-52 CAD

ZERO's #950 cam lift hinge is designed for sound-rated and other heavy doors weighing up to 500 pounds. This mortise-type hinge is available for right or left-swinging doors. The cam action greatly improves the sealing characteristics, lifting and lowering the door with the swing. Manufactured from high precision "investment" stainless steel casting, the hinge provides a 1/2 inch drop over a rotation of 180 degrees. It can be used with a parallel arm door closer without any special modification.

Model #955 Cam Lift Hinge
An option for applications with 4.5"x4.5" standard weight hinge preparations

Model #910DB

S-P CAD

Designed for smooth, effortless door swing, this heavy-duty continuous hinge has double support bearings to accommodate heavy doors. Our UNIGEAR design spreads stress evenly along the full length of the door and frame.

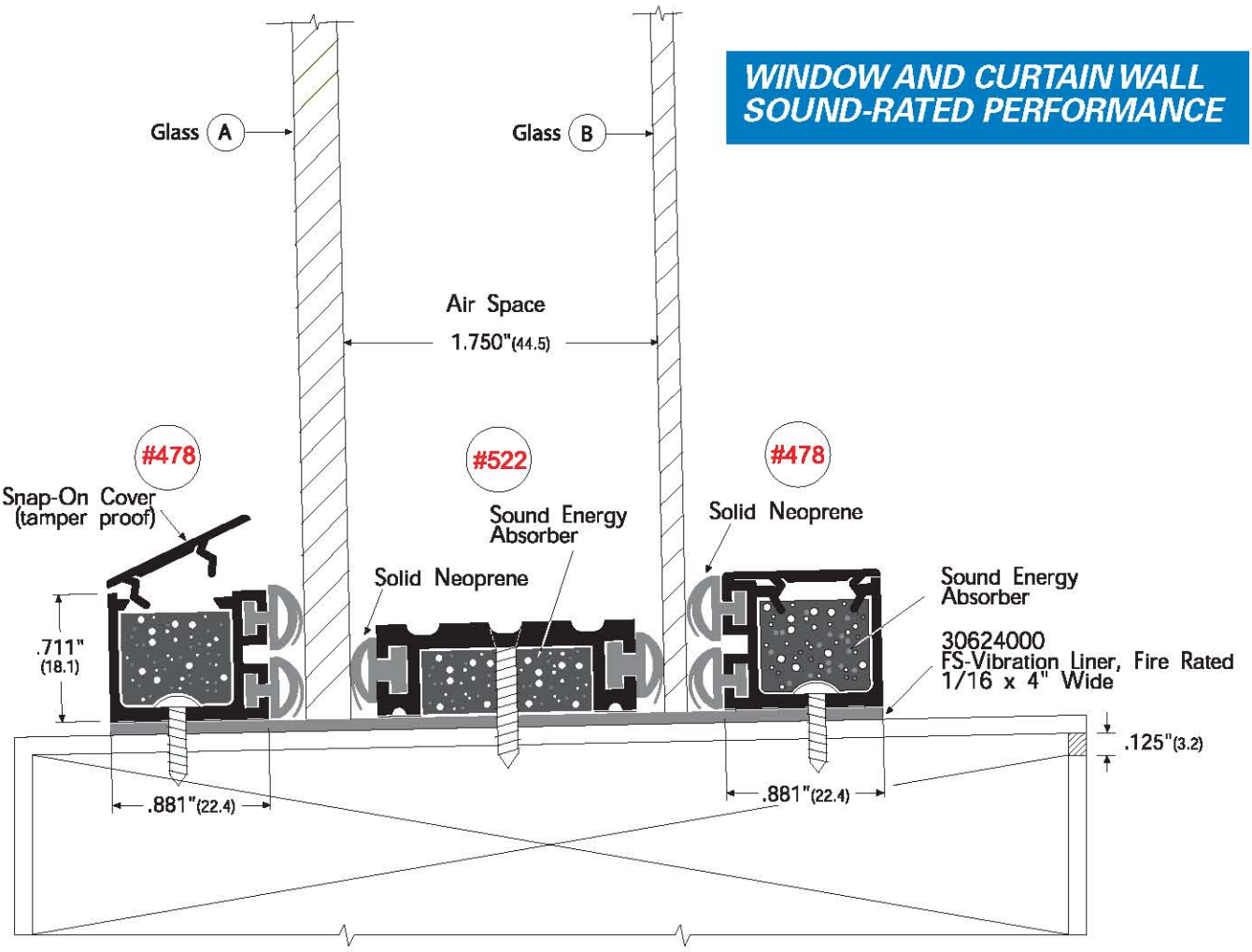
Application and Installation Considerations

The overall sound transmission rating will be only as good as the weakest part of your system.

ZERO guarantees the performance of all SOUNDTRAP systems provided that other manufacturers' gasketing products are not mixed with ZERO components.

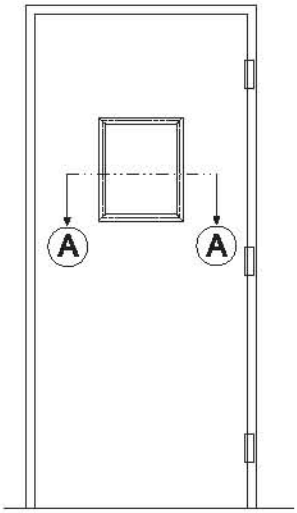
Because it is extremely difficult to duplicate laboratory performance in the field, a safety factor of 3 to 5 STC is usually recommended for selecting doors and gasketing to achieve a desired level of noise reduction. However, ZERO systems are engineered to deliver their rated performance in the field when properly installed. We provide detailed instructions and guidance to assist in proper installation. On-site installation support is available from our Installation Division. We can also assist with field testing to verify STC performance of the installed acoustical assembly.

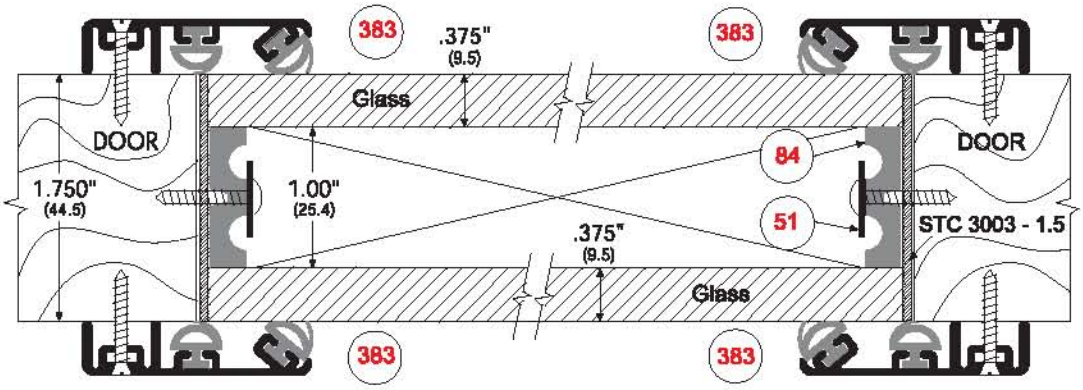
WINDOW AND CURTAIN WALL SOUND-RATED PERFORMANCE



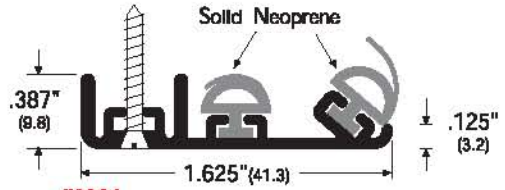
SOUND TRAP SYSTEMS RATING For GLASS PARTITION Max. Opening 48" x 48"			
GLASS TYPE (A)		(B)	STC RATING (Estimated)
1/4" Anneal	- 1 3/4" Air Space	- 1/8" Anneal	34 STC
1/4" Anneal	- 1 3/4" Air Space	- 1/4" Anneal	35 STC
1/4" Laminated	- 1 3/4" Air Space	- 1/8" Anneal	37 STC
1/4" Laminated	- 1 3/4" Air Space	- 1/4" Anneal	38 STC
1/4" Laminated	- 1 3/4" Air Space	- 1/4" Laminated	41 STC
3/8" Laminated	- 1 3/4" Air Space	- 3/8" Laminated	44 STC

System #38384 - VISION LITE™

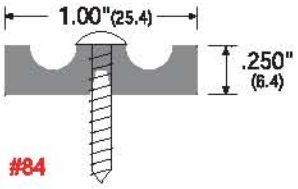




Section A - A (full illustration not to scale)



#3831

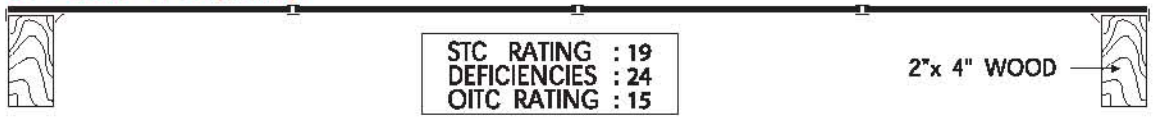


#84

STC 3003 Sound Sheet from ZERO

Help for Boosting Your Door's Sound Performance

STC 3003 - 1/16"(1.5mm)



STC 3003 - 1/8"(3mm)

Using the right gasketing to block sound leaks around the perimeter is not going to solve your noise problem if your door itself is not an effective sound barrier. See our chart on page 4 for guidelines showing the maximum STC values you should expect from various doors. If your door does not measure up, check with our Engineering Department to discuss possibilities for enhancing its performance with the addition of one or two layers of sound-blocking material.

STC 3003 SOUND SHEET sound barrier is a fireproof INTUMET™, intumescent material that acts as a dense sound barrier layer. It is as effective as solid lead in stopping the transmission of sound and can increase STC values by up to 6 points. SOUND SHEET is suitable for layering during construction of acoustical doors. In some cases, it can be applied as an outer layer to an existing door, provided it is installed carefully with trim strips over its seams. Available in standard black 12"(304.8) x 96"(2438.4) sheets and in various thickness: 1/16"(1.5), 1/8"(3), 1/4"(6.3), and 3/8"(9.5)

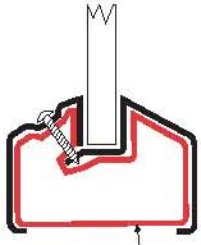
Product Code STC 3003

Sound Doorlite Systems: Let the light in

SOUND SHEET can be used with our attractive Slimport circular frames to install vision lites in sound-rated doors. With a unique, flush-fitting design, Slimport frames are available in seven finishes.

Product Code

SP250 – 10" Dia. (250mm)
SP350 – 13.75" Dia. (350mm)
SP450 – 17.75" Dia. (450mm)
SP550 – 21.75" Dia. (550mm)



STC 3003 Sound Sheet