SOUNDPROOF
OPENINGS

Soundproof doors and frames are necessary in many commercial buildings, such as auditoriums, offices, hospitals, schools, and apartment blocks. They limit the intrusion of noise into a room and ensure both quiet and privacy.

DEFINITION OF SOUND:

Sound is a wave produced by the vibration of air. Sound pulses are measured in cycles per second, called frequencies or hertz (Hz), and the pressure of sound is measured in decibels (dB). The higher the decibel level, the louder the sound, which can cause discomfort or even pain to the ear.

SOLUTIONS :

One of the solutions for problems related to ambient noise is to prevent the transfer of sound through an opening or through gaps between the door and frame. The capacity for an opening to reduce noise is measured by the reduction of the transmission of sound (TL: transmission loss). The higher the TL value, the better the soundproofing result. This value is measured in the laboratory according to ASTM E90 Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements.

When comparing soundproof doors, it is important that the transmission loss (TL) value be measured within a spectrum of equivalent frequencies. ASTM E413 Classification Standard for Rating Sound Insulation meets this requirement and the rating represents the sound transmission class (STC). Doors with an STC rating of 30 or higher qualify as soundproof doors.

EVALUATION METHODS:

There are two methods used to evaluate the soundproofing quality of an opening. A door may be evaluated as a panel; therefore, it is sealed into a wall, and the STC rating generated represents that of the wall. The other method, more representative of reality, consists of determining the rating of an operable door. Generally, manufacturers will use one of these two methods to evaluate their doors' soundproof quality. It is very important to confirm which evaluation method was used to determine the stated STC rating.

IN PRACTICE:

To ensure that reality reflects the results achieved in the laboratory, it is essential to use the correct acoustic gasketing system and to install each component of the opening with precision. The slightest gap can have a considerable effect on the outcome.

The difference between the sound level you wish to achieve and the sound level you wish to block represents the STC rating of the opening. For example, if you wish to block 90 dB coming from a noisier room or area while maintaining a sound level of 50 dB in the next room, you will require an opening with an STC rating of 40.

De La Fontaine offers a soundproof opening with an STC rating of 47, in compliance with the following standards:

- ASTM E90 (Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements).
- ASTM E413 Classification Standard for Rating Sound Insulation

This rating is evaluated according to the operable method. The opening includes the frame, the door, and the hardware; each of the components is factory pre-assembled. This process allows us to ensure that when the opening is installed on the jobsite in compliance with the installation instructions, it will meet the required rating.

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The maximum dimensions for this opening are 4’ x 8’ (1219.2 mm x 2438.4 mm), with a door thickness of 1 3/4” (45 mm). Double doors are also available; however, this option has a rating for which we have not yet conducted an official evaluation. De La Fontaine provides the following components:

- Cased open profile frame series, 14-gauge, continuously welded. The frame must be filled with mortar on the jobsite.
- Door (without windows), 14-, 16- or 18-gauge, door core with vertical steel stiffeners, mineral fiber wool
- Full surface continuous geared hinge, clear anodized aluminum
- Soudproof jamb gasketing, aluminum finish
- Door sill, aluminum finish
- Magnetic astragal for double doors, aluminum finish
- Soundproof automatic door bottom, aluminum finish

This information is also available in our technical data book.

We can also provide a steel door only, manufactured with a soundproof core. This door, evaluated as a (non-operable) panel, achieves different STC rating when used in conjunction with hardware supplied by Zero International. Based on acoustic performance tests of Zero International and De La Fontaine products, it is both realistic and reliable to use the final results with confidence. Please refer to the document below for more information on our products and the soundproofing ratings available.

The hardware must nonetheless be installed in accordance with the manufacturer’s specifications and by a qualified installer. Because De La Fontaine does not assemble the frame and hardware in the factory, we cannot guarantee that the opening will meet the desired rating.

THE FOLLOWING TABLE PROVIDES OUR SOUNDPROOFING RATINGS:

De La Fontaine soundproof door	**Soundproofing rating with Zero International IT hardware system**	**Soundproofing rating with Zero International IT 9R hardware system**	**Soundproofing rating with Zero International 2U hardware system**	**Soundproofing rating with Zero International 2J hardware system**
A0-honeycomb core (soundproofing rating STC 37)	STC 32	STC 36	STC 29	STC 30
A99-door core with special vertical steel stiffeners and mineral fiber wool (sound-proofing rating STC 39)	STC 34	STC 38	STC 31	STC 32
A75-door core with vertical steel stiffeners and mineral fiber wool (soundproofing rating STC 52)	STC 47	N/A	STC 44	STC 45

Hardware details can be found on Zero International’s website at http://www.zerointernational.com in the “Sound Trap Acoustical Gasketing Systems/sound ratings information” section.