



DASMA
Door & Access Systems
Manufacturers Association
International

COMMERCIAL & RESIDENTIAL GARAGE DOOR DIVISION

TECHNICAL DATA SHEET

#189

**1300 Sumner Avenue
Cleveland, Ohio 44115-2851
Phone: 216-241-7333 • Fax: 216-241-0105
E-mail: dasma@dasma.com**

Sound Transmission

Introduction

Building partitions, façades (exterior walls) and façade elements (windows and doors) may require a rating for sound transmission. Two types of ratings are presented in this data sheet: the Sound Transmission Class (STC), and the Outdoor to Indoor Sound Transmission Class (OITC).

General

Elements are tested either in a laboratory (STC) or in the field (OITC). These two scenarios differ in that the STC test is performed on an element and does not take into account the weak points through where sound travels, such as penetrations and gaps, whereas the OITC test encompasses an entire assembly.

Sound Classifications

Sound Transmission Class (STC)

The STC rating is typically applied to building partitions exposed to speech, television, radio and office equipment, and is calculated in accordance with ASTM E413 (1970). The STC provides an integer rating that increases as the noise reduction increases. This represents the difference in decibels on one side of a wall or partition versus the other. A product with a low rating, such as 1, will be inefficient at preventing sound transmission. It is important to note that the ratings are logarithmic in scale as opposed to linear, as a function of product thickness.

This STC rating can only be applied to an element tested in a laboratory over a frequency range of speech, 125 to 4000 Hz. If an element is tested in the field, an ASTC (Apparent Sound Transmission Class) rating is assigned and is typically 5-8 points lower than an STC rating on the same product.

The STC rating has its limitations as stated in ASTM E413-10, 4.1. It states, in reference to STC classification, “These single-number ratings correlate in a general way with subjective impressions of sound transmission for speech, radio, television, and similar sources of noise in offices and buildings. This classification method is not appropriate for sound sources with spectra significantly different from those sources listed above. Such sources include machinery, industrial processes, bowling alleys, power transformers, musical instruments, many music systems, and transportation noises such as motor vehicles, aircraft and trains.”

Note: Technical Data Sheets are information tools only and should not be used as substitutes for instructions from individual manufacturers. Always consult with individual manufacturers for specific recommendations for their products and check the applicable local regulations.

This Technical Data Sheet was prepared by the members of DASMA's Commercial & Residential Garage Door Division Technical Committee. DASMA is a trade association comprising manufacturers of rolling doors, fire doors, grilles, counter shutters, sheet doors, and related products; upward-acting residential and commercial garage doors; operating devices for garage doors and gates, sensing devices, and electronic remote controls for garage doors and gate operators; as well as companies that manufacture or supply either raw materials or significant components used in the manufacture and installation of the Active Members' products.

Another rating that could be applied to the material is the SAA (Sound Absorption Average). This is a number between 0 and 1 rounded to the nearest 0.01 that rates how absorptive a material is, whereas the STC rates the barrier properties of the material. A rating of 0 would have perfect reflection and a rating of 1 would have perfect absorption. For example, if a material has a rating of 0.80, 80% of the sound will be absorbed per square foot and 20% will be reflected. Information about the SAA can be found in ASTM C423.

Outdoor to Indoor Sound Transmission Class (OITC)

The OITC rating is typically applied to façades (exterior walls) and façade elements (windows and doors) exposed to transportation noises and calculated in accordance with ASTM E1332 (1990). The OITC provides an integer rating that increases as the noise reduction increases. This represents the difference in decibels on one side of a wall or partition versus the other. A product with a low rating, such as 1, will be inefficient at preventing sound transmission. It is important to note that the ratings are logarithmic in scale as opposed to linear, as a function of product thickness.

The OITC rating can be applied to elements tested in either a laboratory or in the field over a frequency range of 80 to 4000 Hz. These low frequencies transmit thru the construction material much easier than the higher frequencies, which are absorbed first by the material. A higher indoor-outdoor transmission loss yields a higher OITC rating.

Acoustic Standard

The 2012 International Green Construction Code (IGCC) Section 807, Acoustics, provides the Sound Transmission Class (STC) and Outdoor to Indoor Sound Transmission Class (OITC) ratings for interior and exterior sound transmission, mechanical and emergency generator equipment and systems, separating assemblies, mechanical and emergency generator equipment outside of buildings, and HVAC background sound.

Sound Transmission Application for Doors

IGCC Section 807 does not specifically regulate vehicular access doors placed in a partition that separates a mechanical room from the outdoors. If the door is placed in the partition, it may have a direct impact on the sound transmission and may directly affect the STC or OITC. To comply with Section 807.3.1, used when sound levels are field measured, designers may have to consider the presence of the door and its impact on the STC or OITC.

Changes in STC and Perception

The table below shows the perception for the apparent loudness for different changes in the STC rating.

Changes in STC Rating	Changes in Apparent Loudness
+/- 1	Almost imperceptible
+/- 3	Just perceptible
+/- 5	Clearly noticeable
+/- 10	Twice (or half) as loud

Note: Technical Data Sheets are information tools only and should not be used as substitutes for instructions from individual manufacturers. Always consult with individual manufacturers for specific recommendations for their products and check the applicable local regulations.

This Technical Data Sheet was prepared by the members of DASMA's Commercial & Residential Garage Door Division Technical Committee. DASMA is a trade association comprising manufacturers of rolling doors, fire doors, grilles, counter shutters, sheet doors, and related products; upward-acting residential and commercial garage doors; operating devices for garage doors and gates, sensing devices, and electronic remote controls for garage doors and gate operators; as well as companies that manufacture or supply either raw materials or significant components used in the manufacture and installation of the Active Members' products.