

Sound Transmission Class (STC) is a single number rating that indicates the sound single value stating a door assembly's ability to resist sound transfer from one side to the other. The STC rating is based on measuring transmission loss (TL) in decibels across a range of frequencies (80Hz to 5000Hz). Testing and calculations are done in accordance with industry standards:

**Industry Standards:**

- SDI 128** Guidelines for Acoustical Performance of Standard Steel Doors and Frames
- ASTM E90-09 (2016)** Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements
- ASTM E413-16** Classification for Rating Sound Insulation
- ASTM E1332-16** Standard Classification for Rating Outdoor-Indoor Sound Attenuation
- ASTM E2235-04 (2012)** Standard Test Method for Determination of Decay Rates for Use in Sound Insulation Test Methods

MPI has done extensive testing in operable and inoperable conditions to provide the best possible solution to meet your project needs. We use our knowledgebase from testing to make logical evaluations of how a product should perform. Keep in mind that published tests from actual lab test are from a controlled environment and that field testing data will vary due to the uncontrolled construction conditions such as flooring, ceilings, walls, etc.... If there is air flow, then there is sound loss.

There is no 3rd party certification or labeling requirements of sound tested assemblies, due to the nature of the installation of a unit in the field and the uncontrolled aspects of wall construction. Therefore, assemblies sold by MPI are built to the specs as our tested units. There is expected differences in sound from published lab tested results and field tested actual due to uncontrolled instances.

To help better understand the process we will discuss the types of testing

- Inoperable:** once door and frame are installed and able to operate, the lab techs add duct seal compound all the way around the door and frame meeting edges as well as across the threshold. This test gets the true rating of the door and frame design. The door is not able to open or close as it is sealed shut.
- Operable:** once an inoperable test is run, the duct seals are removed and applied seals are installed. The door must be able to open and close properly.
- Logical Evaluations:** is using operable and inoperable data sets to determine how a set of seals would perform on a given door without fully testing.

**Example:** Door A received an STC 45 inoperable, and STC 43 operable. It would be logical that Door B, that was an STC 44, would lose the same 2 points with the same seal set, and would be a logical rating of STC 42. Door C, that was an STC 46 inoperable would only be able to go to the max the seal set has performed and would have an STC 43 without testing.

Since STC products are not certified by any 3rd party lab and are not required to bear any label. Published data is for informational purposes only. MPI does however apply a mylar label to indicate the sound door as constructed as tested, meaning it's our self-declaration that the unit provided is built in the same manner as the product tested in the lab.

### Inoperable Testing to Determine Effect of Frame Fill

Purpose is to evaluate how a frame is filled affects the rating of an assembly.

Frames tested were 16 Gauge MPI Standard Frame & 16 Gauge MPI Standard Split Frame, these were a butted design and filled fully accordingly.

Door Openings Were 3'0" X 7'0" and Flush

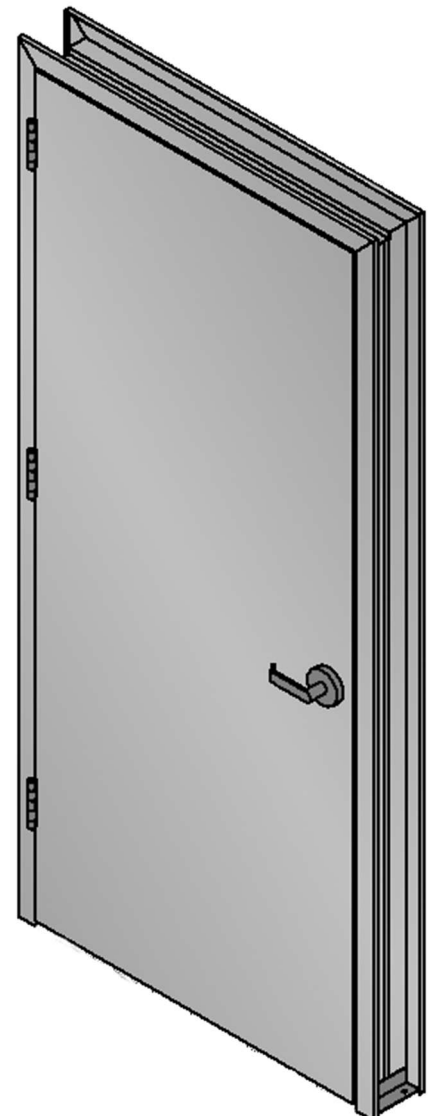
Door Construction	Grouted	Batt Filled (6lb Density)	Unfilled	Split Frame
18 Gauge Polystyrene	STC 32	STC 32	STC 32	STC 32
16 Gauge Steel Stiffened	STC 46	STC 43	STC 43	STC 44
MPI STC Proprietary #1	STC 53	STC 46	Not Tested	STC 47

### Inoperable Testing to Determine Effect of Opening Size

Purpose is to evaluate how opening size affects the STC rating.

Frames tested were 16 Gauge MPI Standard Frame Filled with Grout

Door Construction	3070 Flush Single	4080 Flush Single	6070 Flush Pair
18 Gauge (0.042 min) Polystyrene	STC 32	STC 26	STC 30
16 Gauge (0.053 min) Polystyrene	STC 34	STC 29	
18 Gauge (0.042 min) Embossed Polystyrene	STC 35		
18 Gauge (0.042 min) Polyurethane (Polyiso)	STC 30		
18 Gauge (0.042 min) Steel Stiffened	STC 41		
16 Gauge (0.053 min) Steel Stiffened	STC 46	STC 42	STC 43
14 Gauge (0.067 min) Steel Stiffened	STC 50	STC 47	
18 Gauge (0.042 min) Special Construction	STC 42		
16 Gauge (0.053 min) Special Construction	STC 46	STC 45	
14 Gauge (0.067 min) Special Construction	STC 48		
MPI STC Proprietary #1	STC 53	STC 51	
MPI STC Proprietary #2		STC 53	



### Tested Glass Kit Options

Door Construction	Glass Kit / Glass Type	STC
16 Gauge (0.053 min) Steel Stiffened	NGP L-FRA100-SP STC 22x34 -1/2" Laminated	STC 41
14 Gauge (0.067 min) Steel Stiffened	NGP L-FRA100-SP STC 22x34 - 3/8" Laminated	STC 42

**Industry Standards:**

**ASTM E90-09 (2016)** Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements

**ASTM E413-16** Classification for Rating Sound Insulation

**ASTM E1332-16** Standard Classification for Rating Outdoor-Indoor Sound Attenuation

**ASTM E2235-04** (2012) Standard Test Method for Determination of Decay Rates for

**Seal Package Includes: (From National Guard Products, Inc)**

**NGP #5050** Silicone Bulb Seal (header and jambs)

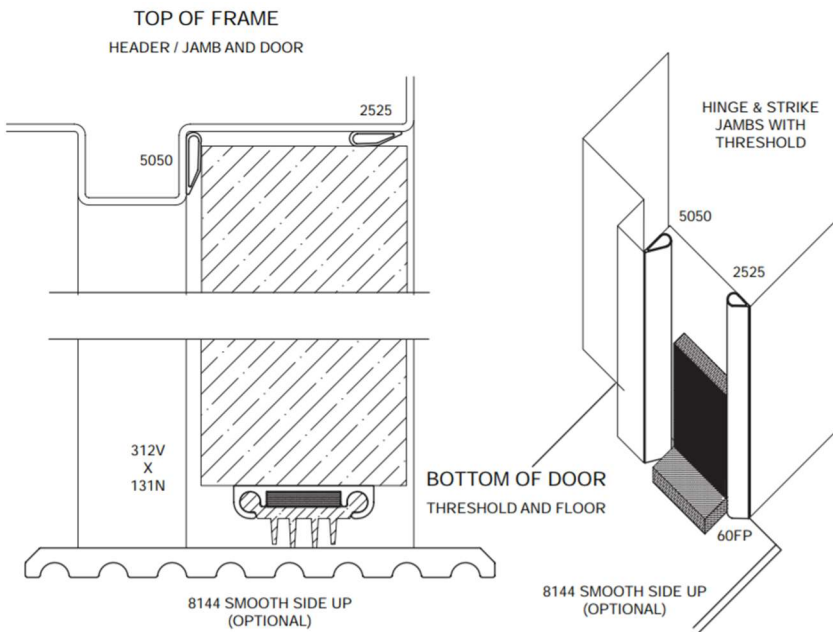
**NGP #2525** Silicone Bulb Seal (header and jambs)

**NGP #312V X 131N** Acoustical Door Shoe (bottom of door)

**NGP #60FP** Acoustical Foam Corner Pad (bottom corner of frame/floor)

**NGP #8144S** Threshold (Optional) (floor)

Door Construction	3070 Flush	4080 Flush	ADA/FIRE
18 Gauge (0.042 min) Polystyrene	STC 32	STC 26	
16 Gauge (0.053 min) Polystyrene	STC 33	STC 29	
18 Gauge (0.042 min) Embossed Polystyrene	STC 33		
18 Gauge (0.042 min) Polyurethane (Polyiso)	STC 30		
18 Gauge (0.042 min) Steel Stiffened	STC 33		



STC ratings based on lab testing and data collection by Intertek Testing Services. MPI testing was performed on fully grouted frames. Field testing may vary from lab testing results shown, as lab testing is a controlled testing environment. Testing results here are by logical evaluation process, where NGP seals had no sound loss. Assembly max of STC 33, any door used over STC 33 would result in STC 33, any door used STC 33 or lower would keep the door rating.

**Industry Standards:**

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**ASTM E413-16** Classification for Rating Sound Insulation

**ASTM E1332-16** Standard Classification for Rating Outdoor-Indoor Sound Attenuation

**ASTM E2235-04** (2012) Standard Test Method for Determination of Decay Rates for

**Seal Package Includes: (From National Guard Products, Inc)**

**NGP #5075** Thermo-Plastic Elastomer Gasketing (header and jambs)

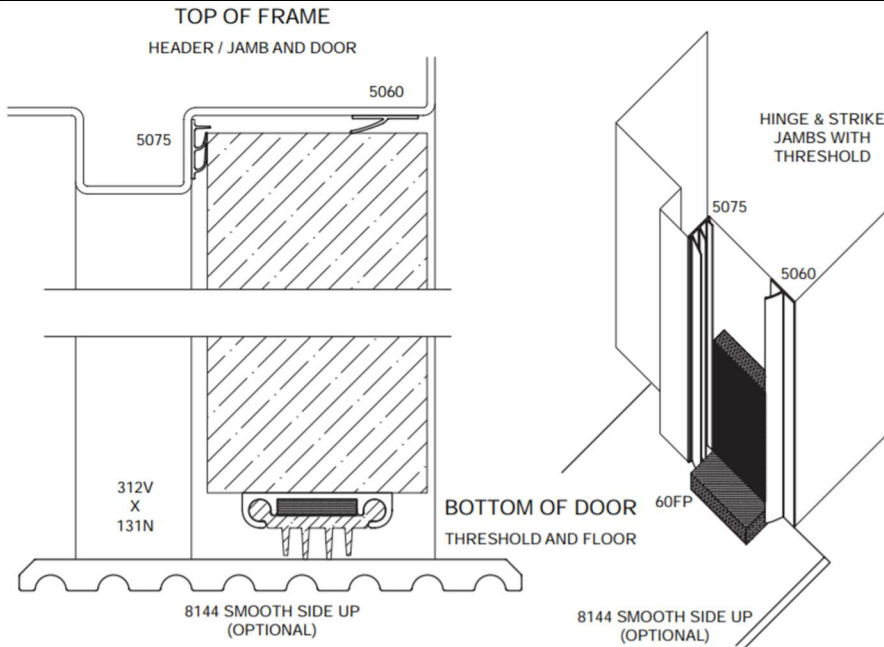
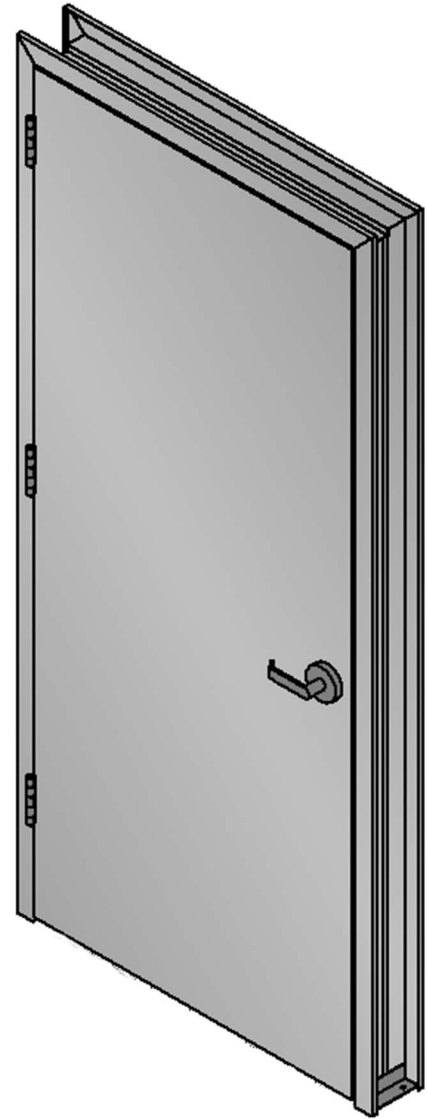
**NGP #5060** Silicone Fin Seal (header and jambs)

**NGP #312V X 131N** Acoustical Door Shoe (bottom of door)

**NGP #60FP** Acoustical Foam Corner Pad (bottom corner of frame/floor)

**NGP #8144S** Threshold (Optional) (floor)

Door Construction	3070 Flush	4080 Flush	ADA/FIRE
18 Gauge (0.042 min) Embossed Polystyrene	STC 35		
18 Gauge (0.042 min) Polyurethane (Polyiso)	STC 30		
18 Gauge (0.042 min) Steel Stiffened	STC 41		
16 Gauge (0.053 min) Steel Stiffened	STC 45	STC 42	
14 Gauge (0.067 min) Steel Stiffened	STC 45	STC 45	
18 Gauge (0.042 min) Special Construction	STC 42		
16 Gauge (0.053 min) Special Construction	STC 45	STC 45	
14 Gauge (0.067 min) Special Construction	STC 45		



STC ratings based on lab testing and data collection by Intertek Testing Services. MPI testing was performed on fully grouted frames. Field testing may vary from lab testing results shown, as lab testing is a controlled testing environment. Testing results here are by logical evaluation process, where NGP seals had no sound loss. Assembly max of STC 45, any door used over STC 45 would result in STC 45, any door used STC 45 or lower would keep the door rating.

**Industry Standards:**

**ASTM E90-09 (2016)** Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements

**ASTM E413-16** Classification for Rating Sound Insulation

**ASTM E1332-16** Standard Classification for Rating Outdoor-Indoor Sound Attenuation

**ASTM E2235-04** (2012) Standard Test Method for Determination of Decay Rates for

**Seal Package Includes: (From National Guard Products, Inc)**

**NGP #5075** Thermo-Plastic Elastomer Gasketing (header and jambs)

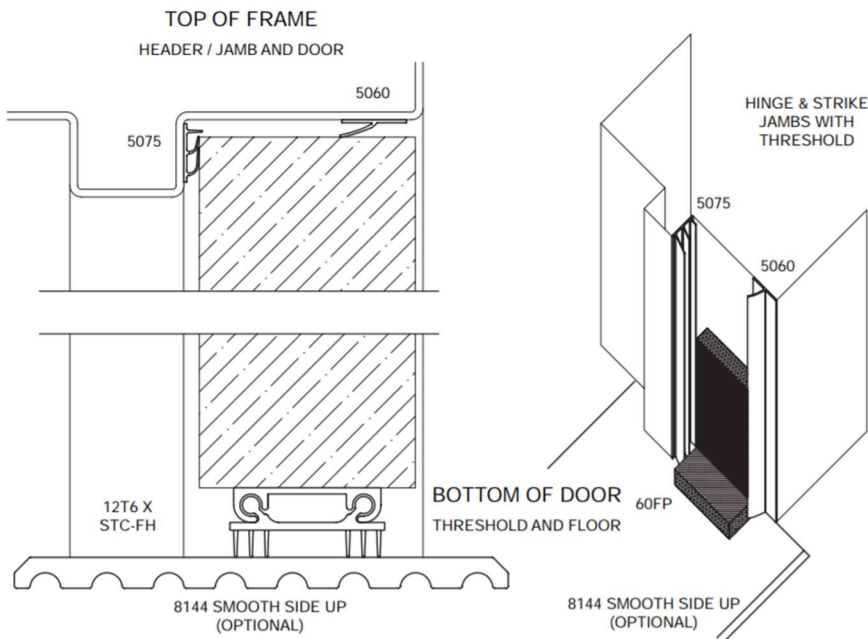
**NGP #5060** Silicone Fin Seal (header and jambs)

**NGP #12T6 x STC-FH** Thermo Plastic Door Shoe (bottom of door)

**NGP #60FP** Acoustical Foam Corner Pad (bottom corner of frame/floor)

**NGP #8144S** Threshold (Optional) (floor)

Door Construction	3070 Flush	4080 Flush	ADA/FIRE
18 Gauge (0.042 min) Steel Stiffened	STC 41		
16 Gauge (0.053 min) Steel Stiffened	STC 46	STC 42	
14 Gauge (0.067 min) Steel Stiffened	STC 50	STC 47	
18 Gauge (0.042 min) Special Construction	STC 42		
16 Gauge (0.053 min) Special Construction	STC 46	STC 45	
14 Gauge (0.067 min) Special Construction	STC 48		
MPI STC Proprietary #1	STC 52	STC 51	
MPI STC Proprietary #2		STC 52	



STC ratings based on lab testing and data collection by Intertek Testing Services. MPI testing was performed on fully grouted frames. Field testing may vary from lab testing results shown, as lab testing is a controlled testing environment. Testing results here are by logical evaluation process, where NGP seals had no sound loss. Assembly max of STC 52, any door used over STC 52 would result in STC 52, any door used STC 45 or lower would keep the door rating.

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**ASTM E2235-04** (2012) Standard Test Method for Determination of Decay Rates for

**Seal Package Includes: (From National Guard Products, Inc)**

**NGP #5075** Thermo-Plastic Elastomer Gasketing (header and jambs)

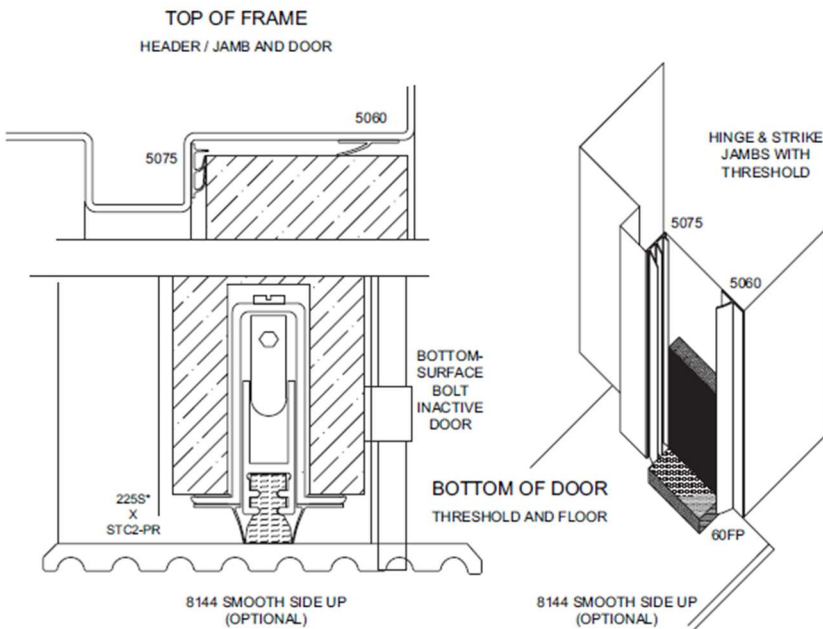
**NGP #5060** Silicone Fin Seal (header and jambs)

**NGP #225S x STC2** Automatic Door Bottom (mortised)

**NGP #60FP** Acoustical Foam Corner Pad (bottom corner of frame/floor)

**NGP #8144S** Threshold (Optional) (floor)

Door Construction	3070 Flush	4080 Flush	ADA/FIRE
18 Gauge (0.042 min) Steel Stiffened	STC 41		
16 Gauge (0.053 min) Steel Stiffened	STC 46	STC 42	
14 Gauge (0.067 min) Steel Stiffened	STC 50	STC 47	
18 Gauge (0.042 min) Special Construction	STC 42		
16 Gauge (0.053 min) Special Construction	STC 46	STC 45	
14 Gauge (0.067 min) Special Construction	STC 48		
MPI STC Proprietary #1	STC 52	STC 51	
MPI STC Proprietary #2		STC 52	



\*For Best Acoustic Results a 1/4" Drop is Recommended; 3/8" Drop Maximum

STC ratings based on lab testing and data collection by Intertek Testing Services. MPI testing was performed on fully grouted frames. Field testing may vary from lab testing results shown, as lab testing is a controlled testing environment. Testing results here are by logical evaluation process, where NGP seals had no sound loss. Assembly max of STC 52, any door used over STC 52 would result in STC 52, any door used STC 52 or lower would keep the door rating.

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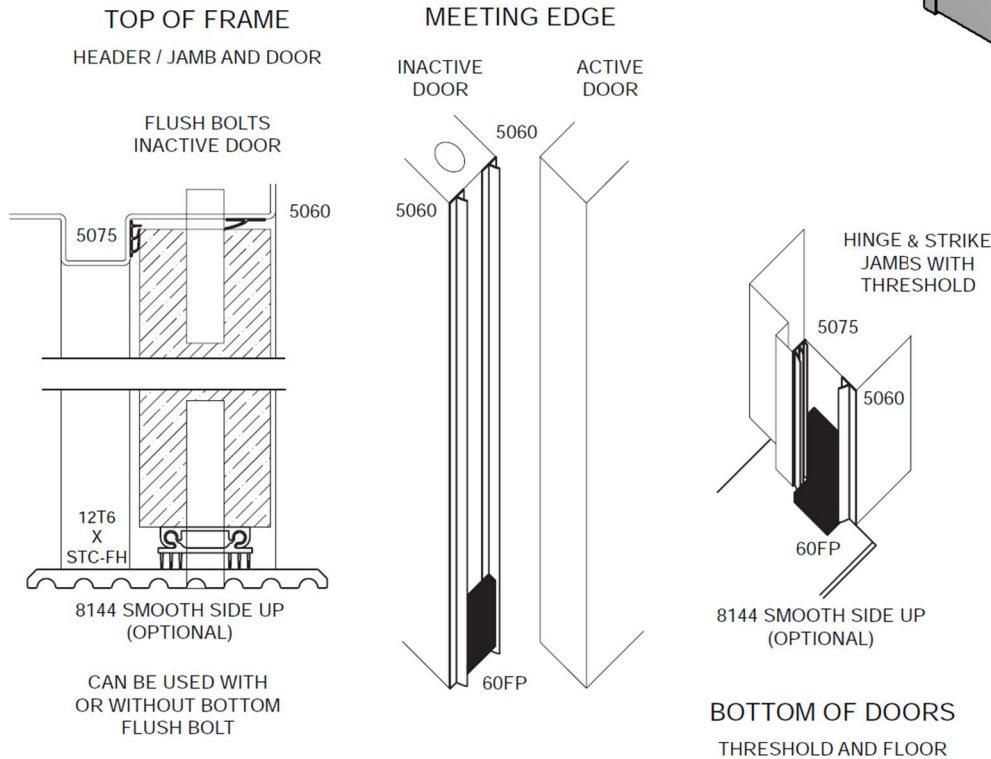
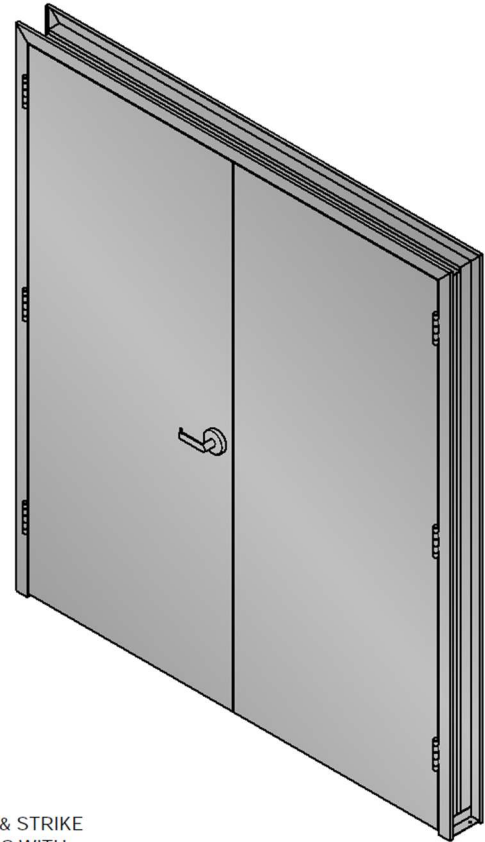
**NGP #5060** Silicone Fin Seal (header and jambs)

**NGP #12T6 x STC-FH** Thermo Plastic Door Shoe (bottom of door)

**NGP #60FP** Acoustical Foam Corner Pad (bottom corner of frame/floor)

**NGP #8144S** Threshold (Optional) (floor)

Door Construction	6070 Flush Pair	ADA/FIRE
16 Gauge (0.053 min) Polystyrene	STC 30	
16 Gauge (0.053 min) Steel Stiffened	STC 43	



STC ratings based on lab testing and data collection by Intertek Testing Services. MPI testing was performed on fully grouted frames. Field testing may vary from lab testing results shown, as lab testing is a controlled testing environment. Testing results here are by logical evaluation process, where NGP seals had no sound loss. MPI tested sealed in place (inoperable pair), published results shown is based on NGP testing data. Typical recommendations is to use single door data at min 2 points about your desired rating. .