

### ToughGard® MAX Duct Liner

#### 1. PRODUCT NAME

ToughGard® MAX Fiber Glass Duct Liner

#### 2. MANUFACTURER

CertainTeed Corporation  
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#### 3. PRODUCT DESCRIPTION

**Basic Use:** ToughGard MAX Duct Liner is used primarily as an acoustical liner in HVAC sheet metal ducts to absorb unwanted crosstalk, equipment and air rush noise.

This product can be used in most types of comfort heating and cooling duct systems, operating at velocities up to 6,000 fpm (30.5 m/s) and temperatures to 250°F (121°C).

**Benefits:** ToughGard MAX Duct Liner is more water repellent than standard duct liners. This product is durable, abuse-resistant and easy to clean. In addition, ToughGard MAX Duct Liner provides excellent thermal properties, exhibits low air flow resistance and meets all applicable fire resistance standards and building code requirements. This product has a factory-applied edge coating that assures sealing of the transverse edges as per SMACNA and NAIMA Installation Standards. The product can be precision cut using both manual and automatic cutting equipment.

**Composition and Materials:** Composed primarily of glass fibers firmly bonded together with a thermosetting resin overlaid with an extremely tough and durable fire-resistant, black composite surface on

the air stream side. The airstream surface contains an EPA registered antimicrobial agent in order to reduce the potential of microbial growth that may affect this product. The antimicrobial properties are intended to only protect this product.

**Limitations:** Insulation should be kept clean and dry during shipping, storage, installation and system operation.

**Sizes:** See the table below for available sizes. Contact CertainTeed for availability and minimum order quantities.

#### 4. TECHNICAL DATA

##### Applicable Standards:

- Model Building Codes:
  - (BOCA, ICBO, SBCCI, ICC)
  - California Title 24
- Material Standards
  - (ASTM C 1071)
  - (CAN/CGSB-51.11-92)
- Fire Safety Standards:
  - (NFPA 90A, NFPA 90B)



##### Fire Resistance:

- Fire Hazard Classification:
  - (UL 723, ASTM E 84, NFPA 255)
  - (CAN/ULC-S102-M88)
- Max. Flame Spread Index: 25
- Max Smoke Developed Index: 50
- Limited Combustible: (NFPA 259)
  - < 3,500 Btu/lb

##### Physical/Chemical Properties:

- Thermal Performance:
  - See table on back page.
- Acoustical Performance:
  - See table on back page.
- Operating Limits:
  - Temperature: (ASTM C 411)
  - Max. 250°F (121°C)

STANDARD SIZES							
Product Types		Nominal Thickness		Length		Width	
ToughGard2	ASTM <sup>1</sup>	in.	mm	ft.	m	in.	mm
150 Density: 1.6 pcf (24 kg/m <sup>3</sup> )	I	1	25	50 & 100	15.2 & 30.5	24 to 72 in 1/4" increments*	610 to 1829 in 6 mm increments
		1 1/2	38	100	30.5		
		2	51	50	15.2		
200 Density: 2.0 pcf (32 kg/m <sup>3</sup> )		1/2	13	100	30.5		
1		25	50 & 100	15.2 & 30.5			
300 Density: 3.0 pcf (48 kg/m <sup>3</sup> )		1/2	13	100	30.5		
1	25	50 & 100	15.2 & 30.5				

1) Classification per ASTM C 107: Type I is roll form; Type II is sheet form  
 \*Not all widths between 24" and 72" are standard. Please contact CertainTeed for the standard sizes.  
 \*Made-To-Order sizes are available and subject to an upcharge, additional lead time and minimum quantities.

- Air Velocity: (ASTM C 1071, UL181)  
Max. 6,000 fpm (30.5 m/s)
- Water Vapor Sorption: (ASTM C 1104)
  - < 3% by weight
- Corrosion Resistance: (ASTM C 665)
  - Pass
- Bacteria Resistance: (ASTM G 22)
  - No Growth
- Fungi Resistance: (ASTM C 1338 & ASTM G 21)
  - Pass; No Growth
- Water Repellency Rating
  - ≥ 4 (INDA IST 80.6-92)

**5. INSTALLATION**

All duct liner products shall be installed in accordance with the requirements of NAIMA Fibrous Glass Duct Liner standard, or SMACNA HVAC Duct Construction standards and the project specification.

The products can be precision cut using both manual and automatic cutting equipment. The liner shall be cut and fitted to assure all joints are neatly and tightly butted with no interruptions or gaps.

All duct liner products shall be adhered to the sheet metal ductwork using an adhesive meeting the requirements of ASTM C 916. The adhesive film coverage shall be a minimum 90% of the metal surface. Secure the duct liner to the sheet metal ductwork using mechanical fasteners (impact-driven or weld-secured). These fasteners vary in length and type. Mechanical fasteners of the specified type and length shall be used assuring no greater than 10% compression of the liner thickness. Maximum fastener spacing shall be in accordance with NAIMA or SMACNA standards.

ToughGard Duct Liner provides clean "battered" transverse edges. However, some circumstances will require the use of adhesive to "butter" raw exposed liner edges. Final job site "buttering" may be required to coat duct cut-ins and/or minor installation damage. ToughGard Duct Liner fabricated duct systems shall be kept clean and dry from the point of fabrication through job site installation. Special precautions at the job site may be necessary to accomplish this. The installed lined ductwork shall be protected to avoid contamination by water and dirt. An HVAC system commissioning program should be considered to assure proper start up and purging of the duct system.

ACOUSTICAL PERFORMANCE									
Product			Sound Absorption Coefficients @ Octave Frequencies (Hz)						NRC
Type	Nominal Thickness*		125	250	500	1000	2000	4000	
	in.	mm							
150	1	25	0.14	0.29	0.55	0.77	0.94	0.94	0.65
	1½	38	0.16	0.47	0.77	0.96	1.04	1.00	0.80
	2	51	0.23	0.62	1.01	1.04	1.00	1.01	0.90
200	½	13	0.06	0.15	0.33	0.56	0.76	0.91	0.45
	1	25	0.10	0.33	0.65	0.86	0.94	0.96	0.70
	1½	38	0.16	0.47	0.77	0.96	1.04	1.00	0.80
300	2	51	0.24	0.57	0.90	0.95	0.95	0.96	0.85
	½	13	0.06	0.15	0.33	0.56	0.76	0.91	0.45
	1	25	0.10	0.33	0.65	0.86	0.94	0.96	0.70
300	1½	38	0.20	0.46	0.82	0.94	0.95	0.91	0.80
	2	51	0.27	0.72	1.04	1.02	0.96	0.92	0.95

Sound absorption tested in accordance with ASTM C 423 using Type A mounting per ASTM E 795

INSERTION LOSS, dB per ft of Lined Duct												
P/A, ft/ft²	1" Liner Octave band center frequencies, Hz						2" Liner Octave band center frequencies, Hz					
	125	250	500	1000	2000	4000	125	250	500	1000	2000	4000
8	0.6	1.5	2.7	5.8	7.4	4.3	0.8	2.9	4.9	7.2	7.4	4.3
6	0.5	1.2	2.3	5.0	5.8	3.6	0.6	2.3	4.2	6.2	5.8	3.6
4	0.4	0.8	1.9	4.0	4.1	2.8	0.5	1.6	3.5	5.0	4.1	2.8
2	0.2	0.5	1.4	2.8	2.2	1.8	0.3	0.8	2.3	3.3	2.0	1.7
1	0.1	0.3	1.0	2.0	1.2	1.2	0.2	0.5	1.8	2.3	1.1	1.1

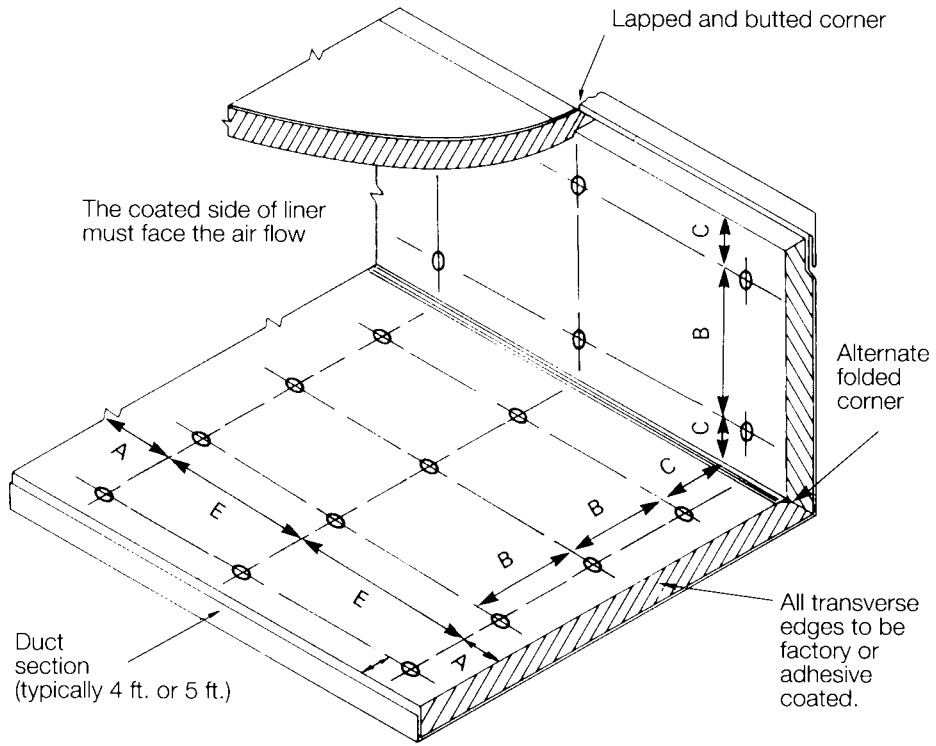
Duct Liner Insertions Loss—Data extracted from ASHRAE Handbook, HVAC Applications, Chapter 46, 1999. P/A = duct perimeter, ft/duct cross sectional area (ft²). Example: 12" x 12", P/A = 4 (1/ft).

THERMAL PERFORMANCE		
Type	Nominal Thickness*	R-Value
150	1	4.2
	1½	6.3
	2	8.3
200	½	2.1
	1	4.4
300	½	2.1
	1	4.5

Tested in accordance with ASTM C 518 and/or ASTM C 177 at 75° F (24° C) mean temperature.

\*Actual finished thicknesses are 1.05" (nominal 1.0"), 1.55" (nominal 1.5", Type 150), 2.05" (nominal 2", Type 150).

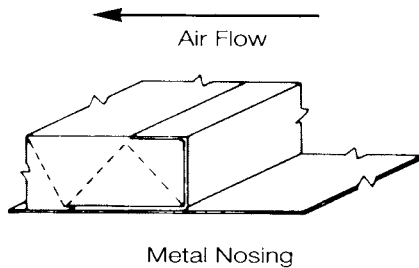
## FASTENER SPACING



Velocity	Dimensions			
	A	B	C	E
0-2500 FPM	3"	12"	4"	18"
2501-6000 FPM	3"	6"	4"	16"

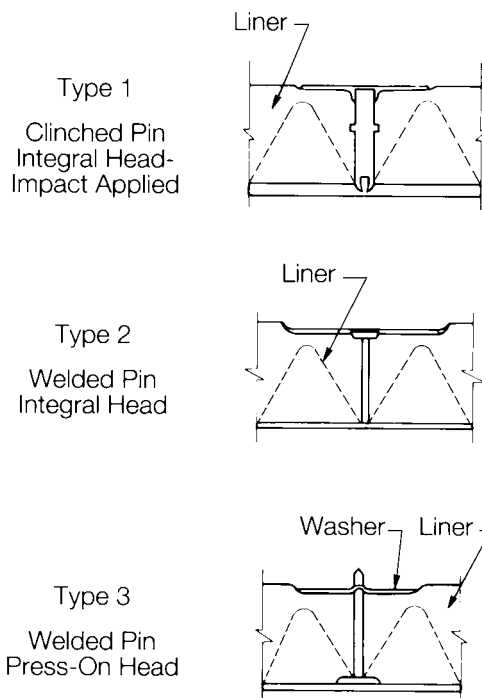
Maximum spacing for fasteners. Actual intervals are approximate.

## METAL NOSING



When velocity exceeds 4000 FPM use metal nosing on every leading edge. Nosing may be formed on duct or be channel or zee attached by screws, rivets or welds.

## LINER FASTENERS



**Design Considerations:**

- "Butter" all raw exposed edges
- High, in-duct air turbulence areas may require special procedures, i.e. perforated inner metal liner, etc.
- Metal nosings shall be securely installed over transversely oriented liner edges facing air stream at fan discharge and at any interval of lined duct preceded by unlined duct.

**6. AVAILABILITY AND COST**

Manufactured and sold throughout the United States. For availability and cost contact your local distributor, or call CertainTeed Sales Support Group in Valley Forge, PA at 800-233-8990.

**7. WARRANTY**

Refer to CertainTeed's Limited One Year Warranty for ToughGard® Fiber Glass Duct Liner (30-29-047).

**8. MAINTENANCE**

An inspection and preventative maintenance program for the HVAC system is recommended to ensure optimum performance. Use NAIMA guidelines for duct cleaning methods and procedures.

**9. TECHNICAL SERVICES**

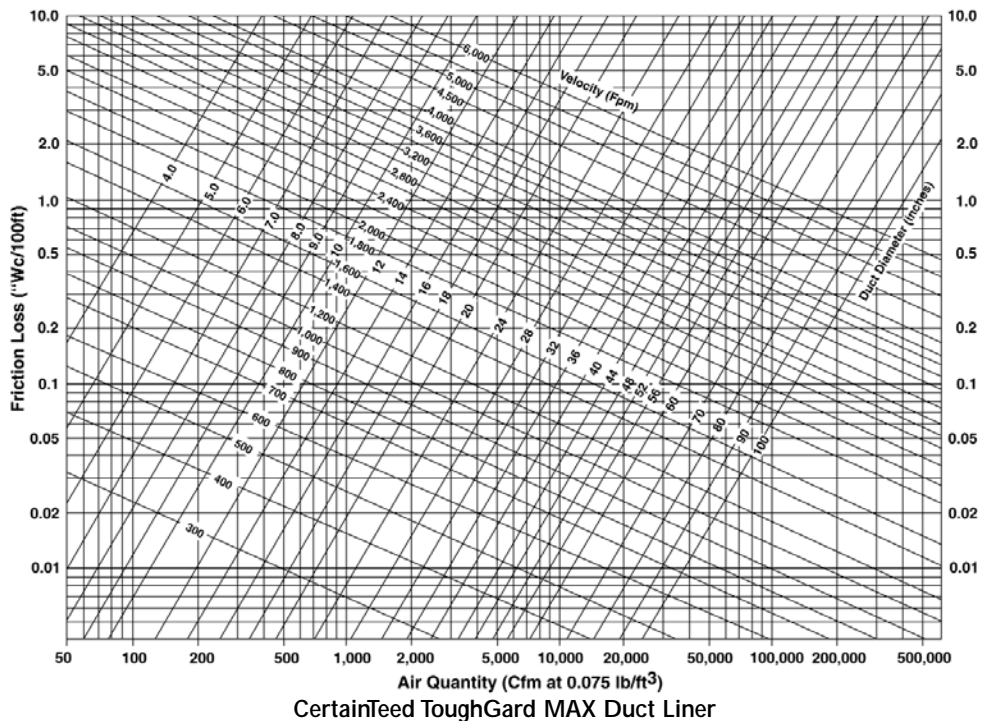
Technical assistance can be obtained either from the local CertainTeed sales representative, or by calling CertainTeed Sales Support Group in Valley Forge, PA at 800-233-8990.

**10. FILING SYSTEMS**

- Sweet's Engineering & Retrofit Files
- CertainTeed Pub. No. 30-36-004
- Additional product information available upon request.

**TOUGHGARD MAX DUCT LINER AIR FRICTION CHART**

This chart is to be used in place of the standard friction loss chart published in the ASHRAE Handbook of Fundamentals. For conversion of round equivalents to rectangular sizes, use Table 2 "Equivalent Rectangular Duct Dimensions" from the same reference. Test conducted in accordance with ASHRAE 120P.



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