



DUCT LINER & INSULATION

A SIMPLE FIBER FREE INSULATION FOR DUCTWORK

Thermatuff® Insulated Phenolic Duct Liner panels are made from rigid, closed cell phenolic foam faced on both sides with aluminum to serve as an excellent option for insulating sheet metal ductwork. With an aluminum foil facing on both sides serving as a vapor barrier, Thermatuff® offer a fully encapsulated, fiber free duct insulation. Compared to commonly used flexible insulation materials, our panels are lightweight and easy to apply, not requiring any glues or adhesives by following Thermaduct®'s patented application methods (See www.thermaduct.com/patents).

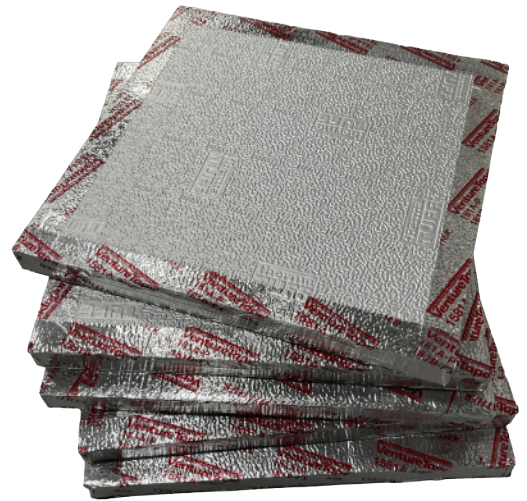
Thermatuff® duct insulation panels increases the efficiency of the duct system by offering many attributes of phenolic ductwork, now usable as a sheet metal liner. High insulated values are achieved with a variety of panel thicknesses and R-values, you can easily meet the needs of many applications. Properly applied insulation liner also can reduce air leakage rates and reduce noise created by the duct system with a reduction in expansion, flagging and echoing throughout the interior.

THERMATUFF® PHENOLIC THERMAL PERFORMANCE

Thermatuff® phenolic panels provide high thermal performance in a thin insulation profile, allowing designers to meet required R-values without excessive wall thickness. Thermal resistance has been evaluated in accordance with **ASTM C518**.

- **1 inch Panel - R6 Value**
- **1 3/8 inch Panel - R8 Value**
- **1 7/8 inch Panel - R12 Value**

R-value is determined by ASTM C518 in accordance with with FTC Rule (16 CFR, Part 460) and ASTM C1126 -sec. 13.7.2



TECHNICAL DATA - THERMATUFF DUCT INSULATION

Operation

Panel Size: **47 1/4" x 154 3/4" dimensions**

Aluminum Facing Thickness: **80 Micron Applied on Both Inner & Outer Surfaces**

Facing Perforations: **Zero Perforations**

Mean Air Velocity Max: **6000 fpm (30.5 m/s)**

Design Pressure Limits: **2" w.g. Positive & Negative when secured with Tufflock Clips Only (47.25" Duct Length)**
10" w.g. Positive & Negative when secured with Airtruss Members Per Thermaduct Fabrication Guidelines (47.25" & 56" Duct Length)

Temperature Limits: **-15° - 185° F**

Compatibility: **Galvanized, Aluminum and Stainless Duct Materials**

Size: **Not limited by liner panel dimensions when ductwork is designed in accordance with SMACNA Duct Construction Standards and installed per Thermaduct Fabrication Guidelines**

Sealants: **Designed for use with Thermatuff High Performance Silicone Free Sealant (UL Tested)**

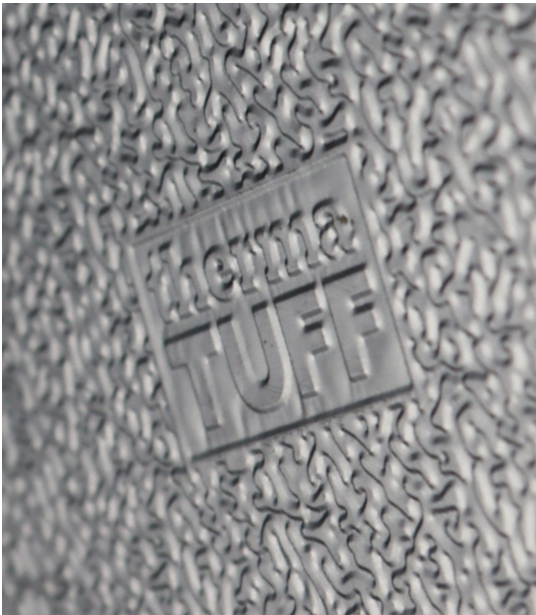
Physical
Properties &
Flame / Smoke
Performance

Thermatuff® panels incorporate a thick, non-perforated aluminum facing (0% open area) designed to function as a continuous vapor retarder when seams and joints are sealed using UL-approved taping methods, greatly limiting vapor transmission under normal operating conditions.

Nominal Density: 55-60 kg/m³ (3.4 - 3.7 lb/ft³)

Surface Burning Characteristics (ASTM E84): FSI <25, SDI <50 on all panel thicknesses

NFPA 90A/90B: Thermatuff® meets the surface burning criteria for use in air distribution systems



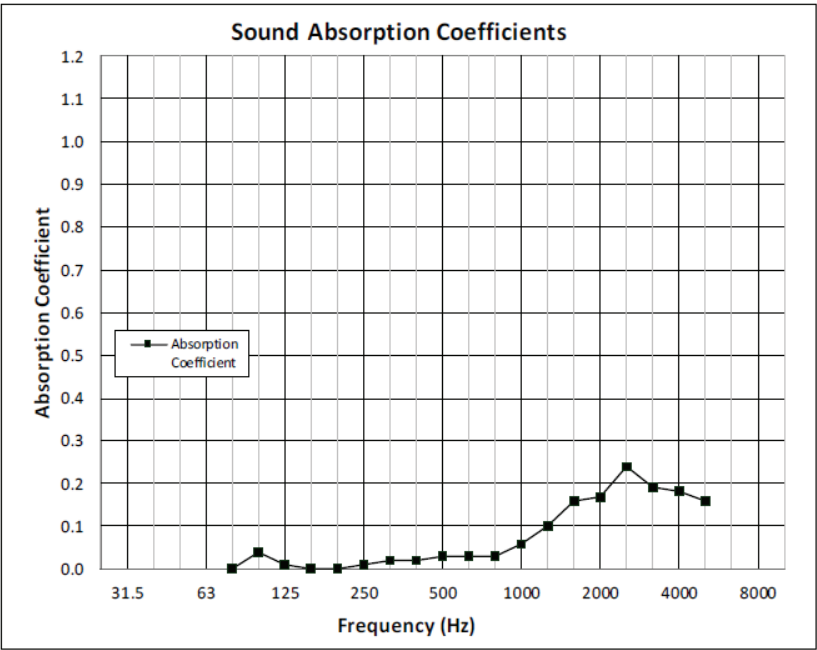
Acoustics

Thermatuff® phenolic liner approaches acoustics differently than traditional fibrous or elastomeric duct liners. Rather than relying on sound absorption within a porous material, Thermatuff® reduces noise generation at the source by maintaining a rigid, dimensionally stable duct interior. The phenolic liner does not expand, contract, or “flag” under airflow, which helps limit turbulence-induced noise, pressure fluctuations, and tonal effects that can develop in traditional lined metal ductwork at higher velocities. By minimizing vibration and panel movement, Thermatuff® supports a quieter air delivery system without acting as a sound propagating or echo inducing surface. This makes it well suited for applications where airflow noise control and long-term dimensional stability are a priority.

Where project requirements include defined insertion loss targets, Thermatuff® can be paired with conventional silencers or absorptive treatments as part of a complete acoustic design solution.

ASTM C423 Sound Performance - 1/3 Octave Sound Absorption Coefficients at the Octave Band Frequencies

125	250	500	1000	2000	4000	NRC	SAA
0.01	0.01	0.03	0.06	0.17	0.18	0.05	0.07

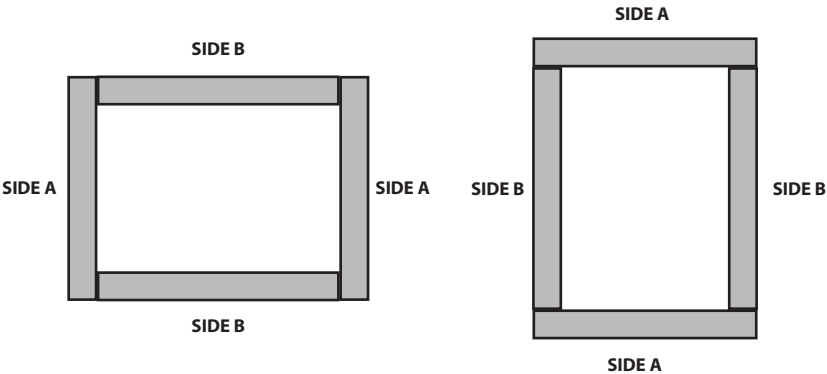


Thermatuff® is installed as a continuous liner and does not introduce additional longitudinal air leakage paths beyond the metal duct construction. Proper fabrication and sealing practices by Thermaduct® installation guidelines allow the liner to support air leakage performance consistent with SMACNA Class 3 duct construction.

Thermatuff® duct liner is installed using a mechanical, glueless retention method that secures the phenolic insulation within metal ductwork. In the installation method shown, phenolic panels installed on Side A of the duct are mechanically restrained by opposing Side B panels. Retention is achieved using Tuff-Lock® liner retention clips or the Thermaduct® Airtruss® system, depending on duct size and design pressure.

47.25" DUCT SECTIONS

SIDE W or H (inches)	# OF FASTENERS
4-24"	1
25-42"	2
43-60"	3
61-78"	4



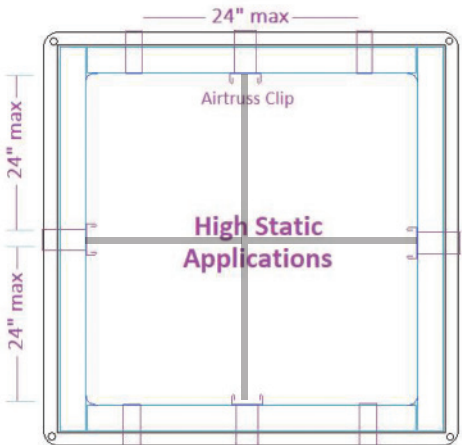
For smaller duct sizes and lower pressure systems, Tuff-lock® liner retention clips may be used to secure phenolic panels to the metal ductwork by anchoring to the TDC or TDF flange. Clip spacing is dependent on duct dimensions and pressure class and shall not exceed 12 inches on center from duct corners.

The panel fastener teeth shall be embedded into the phenolic insulation and secured by folding the clip end around the TDC or TDF flange. All exposed fasteners shall be sealed using UL 181–approved tape to maintain vapor barrier continuity.

Additionally, UL 181 approved tape shall be applied to cover all exposed phenolic edges and sealed continuously to the TDC or TDF flange. Internal insulation seams shall be sealed using a continuous bead of Thermatuff® High Performance Silicone Free Sealant.

For larger duct sizes, lengths over 47.25", or higher static pressure applications, the Thermaduct® Airtruss® reinforcement system shall be utilized. The Airtruss® system is installed in conjunction with conduit in accordance with Thermaduct® standards to maintain structural performance consistent with SMACNA duct construction practices.

Assembly and finishing methods for Airtruss® reinforced installations shall follow the same procedures described above, with continuous sealant application and UL-approved tapes used to cover all exposed phenolic material and maintain vapor barrier integrity.



DESIGN INTENT - FIBER FREE DUCT DESIGN AND GLUELESS INSULATION

Thermatuff® Phenolic Duct Liner is intended for use as an internal duct insulation installed within metal duct systems. Performance characteristics presented herein are based on tested material properties and assembly methods when fabricated and installed in accordance with Thermaduct® guidelines and applicable industry standards. Because we treat the phenolic materials as a liner, system design should base duct leakage, pressure class, and structural performance as functions of the underlying metal duct construction and installation practices built and installed by SMACNA standards.

System performance of the Thermatuff® Phenolic Duct Liner is dependent on proper fabrication, attachment, sealing, and installation. Deviations from recommended practices may affect system performance and should be reviewed prior to installation

STANDARDS & TEST METHODS REFERENCED

Thermatuff® phenolic panels have been third party tested under a variety of criteria included in this document. The following standards and test methods have been used to establish performance data.

- ASTM E84 - Surface Burning Characteristics
- ASTM C518 - Thermal Resistance
- ASTM D1621 - Compressive Strength
- SMACNA Metal Duct Construction Practices
- SMACNA Phenolic Duct Construction Practices

MAINTENANCE & CLEANING

The Thermatuff® phenolic duct liner system is suitable for cleaning using industry-accepted dry or non-abrasive cleaning methods commonly employed by professional HVAC duct cleaning service providers. Abrasive cleaning methods are permitted by the standards in the table below. Cleaning methods shall not damage the liner surface, facing, or sealed joints. The rigid, non-perforated aluminum liner surface supports cleaning without fiber release or liner degradation when properly maintained.

Selection of appropriate cleaning procedures should be consistent with standard HVAC duct maintenance practices and project requirements. For application-specific recommendations or questions regarding acceptable cleaning methods, consult Thermaduct Technical Services.

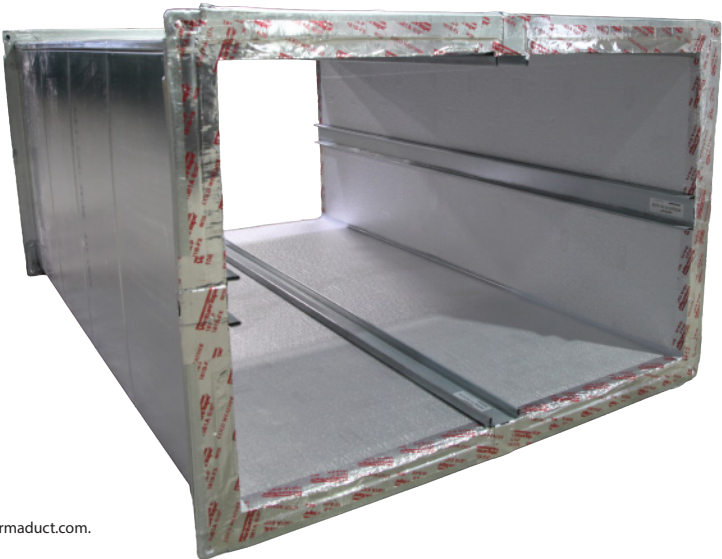
PERMITTED ABRASIVE SPECIFICATIONS

BRUSH BRISTLE				
0.16 diameter with 2.25 crimp 0.05 diameter no crimp level				
MACHINE RPM SPEEDS				
250	350	450	550	

TECHNICAL SUPPORT

Thermaduct® Technical Services provides application guidance, installation clarification, and project-specific support for Thermatuff systems. Technical support is intended to assist during design review, submittal evaluation, and field installation coordination. This technical assistance is available via phone at 855-809-6903 or through our website. Inquiries may also be directed to training@thermaduct.com for installation and product-specific questions.

On-demand installation training courses are available 24/7 at training.thermaduct.com, allowing engineers, contractors, and installers to review product-specific installation methods and best practices as needed.



LEARN MORE AT THERMADUCT.COM

For the current installation guidelines and compliance information, visit www.thermaduct.com.

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HIGH EFFICIENCY AIR DISTRIBUTION