

Introduction

INSULTECH® Acoustic Blankets are a custom fit high quality pre-engineered insulation blanket system designed to reduce harmful noise levels and improve the surrounding work environment. INSULTECH® is also capable of withstanding weather and chemical environments. INSULTECH® is flexible and easy to remove and reinstall allowing quick access and easy equipment serviceability.

Common Applications and Markets served

INSULTECH® Acoustic Blanket Applications include; Compressors, Motor Housings, Blowers, Rotary Chillers, Gear Boxes, Compressor Housings, Piping and Fittings, Pump Housings and Fan Housings. INSULTECH® Acoustic Blanket Markets include; OSHA Required Sound Limits on Equipment, HVAC Commercial, Process Industrial Markets and OEM Original Equipment Manufacturers.

Maximum Service Temperature

This design is to act as a "SOUND ATTENUATION" and Thermal Barrier, with a maximum service temperature of 450°F (232°C).

Product Components

The Outer and Inner Jacketing is a 16.5 oz/sq. yd. PTFE Teflon® Impregnated Fiberglass Cloth. The Insulation Material is an 11PCF Fiberglass Needled Mat-Type "E" Fiber, which acts as a sound "Absorber". Barium Sulfate Loaded Vinyl Sheet (1lb/sf to 2lb/sf Surface Mass) is layered onto the Insulation Mat to act as a "Reflector" of sound. The "Reflector" and "Absorber" materials are encapsulated by the PTFE Teflon® Cloth Jacketing and sewn together, producing a self contained blanket system. The INSULTECH® Blanket System includes fasteners for easy install and removal.

Application & Specification Guidelines

The Blanket System is designed and has been tested to compare the sound pressure levels measured when a constant sound source was enclosed with four different samples of INSULTECH® Blanket Systems. From this data, both the insertion loss and the a-weighted noise reduction for each of these samples could be calculated. See results on page three.

Blanket Construction

Blanket construction shall be a double sewn lock stitch with a minimum of 7 stitches per inch. Raw jacket edges will have a tri-fold PTFE Teflon® cloth binding. No raw cut jacket edge will be exposed. Stitching will be done with pure Teflon® thread.



16" x 18" Centrifugal Pump
Design: LT450A-TT-1.5" Thick
6.0dBA Reduction

Blanket Overlap

Blanket will overlap mating flanges as well as existing insulation a minimum of 2". Where blanket cannot overlap existing oversized insulation, blanket will butt up to existing insulation with a friction fit closing seam. Open gaps are not acceptable. Blanket diameters which are 2" or larger than existing insulation must be end capped to eliminate open air void.

Leak Accommodations

To accommodate a leak and detect its origin, blankets will have a low point stainless steel or brass drain grommet or the design must incorporate a mating seam at the lowest point of the blanket.

Blanket Insulation Weight

When designing blanket insulation for large equipment where a multi-piece construction is necessary, the total number of pieces will be minimized. Any one piece will not exceed 40 lbs. in weight.

I.D. Plate

For easy identification, a stainless steel or aluminum nameplate tag will be riveted to each blanket piece. With 1/8" embossed lettering, the nameplate will show; item location, description, size, pressure rating and tag number sequence. Each blanket will require a tag.

Quilting Pins

To enhance blanket quality and to maintain uniform thickness, 14 gauge type 304 stainless steel quilting pins will be placed at random locations no greater than 18 inches apart. Quilting Pins will prevent shifting of the insulation. 14 gauge type 304 Stainless Steel speed washers will secure the quilting pin stem in place.

Minimized Air Void

Equipment and equipment heads are typically a multi-piece design and are installed in tag number sequence. Heat exchanger heads, large vessel flanges and pump housings will be designed in two half sections.
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Blanket design will conform to the equipment with minimized air void. All valve covers will be a two piece design with a separate body and bonnet.

Minimized Acoustic Void Leaks

All blanket pieces which match mating seams and expose hot spots, will include a 2" PTFE/Septum flap to cover the exposed seam and minimize potential noise leaks.

Standard Fastener (Wiretwists & Velcro® Flaps)

A 20 gauge stainless steel wire will be doubled up and twisted in a spiral fashion, with a minimum of 4 to 5 twists per inch. Wiretwist length will be 16" or longer. The Wiretwist will be secured to the lacing pin at the pin stem. Lacing pin stems will be 14 gauge. Wiretwists will be spaced 6" on center along closing seams with matching lacing pins to lace and secure to.

Velcro® hook-and-loop fasteners are sewn to an outer jacketing flap. A 2" wide hook will be stitched to the blanket and a 2" wide loop will be stitched to an extended outer jacketing flap. The flap design will include vinyl material to minimize "Hot Spots".

FASTENING OPTIONS

1) Lacing Pins - 12 or 14 gauge Type 304 Stainless Steel lacing pins will be utilized. Location of pins on the blanket will be 2" or more from blanket edge and 8" or less from centerline to centerline along a closing seam. The lacing pins will be held in place with 1" diameter 14 gauge type 304 stainless steel speed washers.

2) Metal "D" Ring Strap with Velcro Tab - A multi layer fabric strap is double sewn. One strap is a 16" long pull down strap, the other is a 6" long stationary strap. Both straps are stitched to the outer jacketing of the blanket. The stationary strap includes a metal "D" Ring measuring 1.125" to 1.25" in width and placed 1/2" from the closing seam edge. The pull-down strap is placed 3" in from the closing seam edge. Both matching straps are spaced along the closing seam edge no greater than 8" apart along the blanket. The pull-down strap includes hook-and-loop Velcro®, measuring at least 1" wide by 6" long, and is box stitched to the strap surface. All closing seams have a 1.5" extended vinyl fabric flap, which is placed along the stationary strap side of the closing seam.

Assembly Drawing Requirements

Each INSULTECH® project will include an instruction package shipped with the blanket material. This package will include Assembly Drawings identifying piece location, a Material List of all pieces and Instructions for Installation on how INSULTECH® will be installed. Accurate CAD files & project records must be kept by the manufacturer. For a minimum of ten years these records will assure accuracy in re-ordering and individual parts replacement.

Production Drawing Record Keeping

The correlating Project Production Drawings will also be kept on file with the blanket manufacturer. The latest revisions, if any after installation, will be recorded on the CAD drawing system. This file will also be kept for a minimum of ten years to assure accuracy in re-orders of replacement parts.

Project Qualifications

All items to be insulated will require a field takeoff prior to bid submittal, and must be reviewed for proper cost estimation. Upon receipt of project contract, each and every item must be accurately measured for retrofitting to existing field conditions and tagged with an aluminum or stainless steel identification tag showing an item number for installation reference. At the time of installation, blankets must have corresponding item number shown on the blanket tag and must match to existing tagging on fitting. No standard blanket designs will be accepted. This will assure accurate noise reduction performance.

Project Accuracy and Effectiveness

Demonstrate the efficacy of precision through the use of State-of-the-Art CAD Design. The efficacy of precision markings, with the ability to maintain a high degree of repetitiveness and control of manufacturing tolerances for locations of identification tags, stitch lines, Hook and Loop (Velcro®), cut lines for after stuffing, cutting of the outer and inner layer of fabrics, septum (Acoustic Blankets only) and insulation through the use of State-of-the-Art CNC cutters

Warranty

We guarantee that all custom manufactured blankets will accommodate vibration probes, gauges, tubing, piping, brackets, etc. and fit correctly for optimum performance as per the design specification provided in the quotation process. In addition, for 18 months we will cover the cost of replacing the blanket should the failure be due to premature degradation of any component utilized in the blanket construction, as well as any defects due to poor workmanship.

Design Construction Sample

Upon bid submittal a blanket design sample must be presented for review and product approval. A (7" x 9") "Cut-Away" Sample will be required and must identify all characteristics mentioned in the above fabrication requirements. Any deviations from the above stated requirements may result in rejection.

Installation Guidelines

INSULTECH® will follow these simple guidelines:

- Once material is received, open boxes with care. DO NOT "cut" deep into container to avoid damaging blankets.
- Locate the Instructions for Installation.
- Follow the Material List to determine blanket part number.
- Refer to the Assembly Drawing for orientation of each blanket part number and installation details of each part.
- Locate the Identification Tag on each blanket, for correct description and sequence of blankets.
- Material is installed in tag number sequence.
- Use leather gloves to install material.
- A physical effort is required for proper placement and fit.

INSULTECH® ACOUSTIC BLANKET LT450A-TT

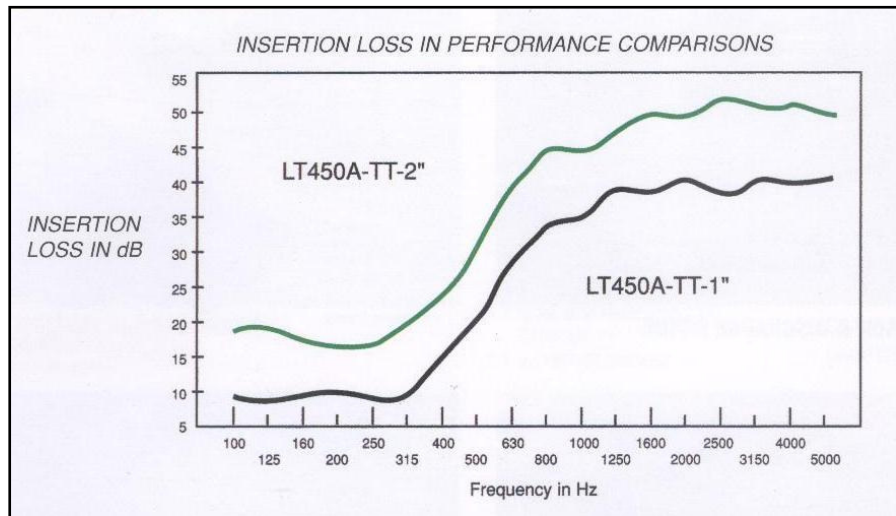
Storage

Once shipment is received, protect INSULTECH® Blanket Insulation from water damage and/or other abuses prior to installation. INSULTECH® Blanket Insulation will be shipped in cardboard boxes or crated for export shipping. Packaging is not designed for outdoor storage, thus a tarp or covering of some type is necessary if stored outdoors until installation is completed.

Preparation

Apply INSULTECH® Blanket Insulation on clean, dry surfaces and avoid trapping oils, greases or combustible materials.

System Test Results.....



With the following listed Noise Reductions measured in the A-Weighting, the total Noise Reduction from the 107 dBA loudspeaker level over a 100-5000Hz frequency band would be: 20.8 dBA for design LT 450A TT-1" Thickness and 29.5 dBA for design LT 450A-TT-2" Thickness.

The above data is representative of Test Procedure ASTM E1222-87 for the Laboratory Measurement of the Insertion Loss of Pipe Lagging Systems. Shannon Enterprises will not be warranted for performance results of INSULTECH® Blanket Insulation expressed or implied.

The published ASTM testing reflects a controlled laboratory environment. Field results will vary depending on conditions. These values should be interpreted as a performance guideline

107dBA SOURCE	A-WEIGHTED MEASUREMENTS		LINEAR WEIGHTED MEASUREMENTS	
	LT 450A-TT-1" Noise Reduction (in dBA)	LT 450A-TT-2" Noise Reduction (in dBA)	LT 450A-TT-1" Insertion Loss (in dB)	LT 450A-TT-2" Insertion Loss (in dB)
Test Frequency (in Hz)				
100	8	19	8	18
125	8	20	7	19
160	9	17	9	17
200	9	16	9	16
250	8	17	8	16
315	10	20	9	20
400	14	24	14	23
500	21	30	20	30
630	28	39	27	39
800	34	44	33	44
1000	35	44	34	43
1250	38	46	37	46
1600	37	49	36	49
2000	38	48	38	48
2500	37	51	36	51
3150	40	50	39	50
4000	39	49	38	50
5000	41	49	40	49

**INSULTECH® ACOUSTIC BLANKET
LT450A-TT**

Blanket Thickness Surface Temperature Reference:						
Operating Temperature	Thickness / Surface Temperature		Thickness / Surface Temperature		Thickness / Surface Temperature	
250°F (121°C)	1"	100.2°F	1.5"	92.0°F	2"	87.4°F
300°F (149°C)	1"	108.6°F	1.5"	98.2°F	2"	92.3°F
350°F (177°C)	1"	117.2°F	1.5"	104.6°F	2"	97.4°F
400°F (204°C)	1"	126.0°F	1.5"	111.2°F	2"	102.7°F
450°F (232°C)	1"	135.1°F	1.5"	118.0°F	2"	108.2°F

- * The above referenced cold face surface temperatures should be used as guidelines for blanket thickness design.
- * The cold face surface temperature of the blanket should achieve ambient temperature conditions.
- * The economic thickness of the blanket should consider blanket cost to thermal performance.
- * Heat loss calculations are based on a 70°F ambient using a flat surface condition.

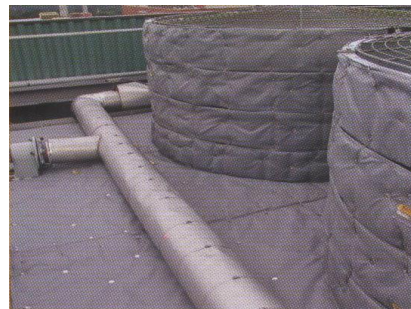
Typical Product Properties Specifications

System Test	ASTM E 1222-87	Test Method for Laboratory Measurement of the Insertion Loss of Pipe Lagging Composite System Test Results
Sound Reflector	ASTM E 90-90	Test Method for Laboratory Measurement of airborne Sound Data Transmission Loss of Building Partitions & Elements Acoustic Barrier – Barium Sulfate Loaded Vinyl (.5 to 1.5 PSF)
Core Blanket	ASTM C 1086-88	Standard Specification for Glass Fiber Felt Thermal Insulation Service Temperature Up to 1200°F (649°C)
Jacketing Material	---	PTFE (Teflon®) Coated Fiberglass Composite - Material weight 16.5 oz/yd ² (560 g/m ²) PTFE & Fiberglass Respective Continuous Service Temperature 600°F (316°C) 1000°F (538°C) - Tensile Strength of Jacketing Composite Warp: 410 lbs/in (3664 N/50 mm) Fill: 355 lbs/in (3137 N/mm)

Typical Applications.....



Rotary Screw Liquid Chiller
Design: LT450A-TT-2.5" Thick
8.8 dBA Reduction



Cooling Tower
Design: LT450A-TT-1.5" Thick
10 dBA Reduction

INSULTECH® ACOUSTIC BLANKET LT450A-TT

Caution

Typical industry handling practices should be exercised for the protection of the worker. The field mechanic should wear long-sleeve loose-fit clothing, wear proper head covering, leather gloves, wear proper fitted eye protection and use appropriate respiratory protection when handling, inspecting, installing and removing INSULTECH®. The worker should wash with soap and warm water after exposure. Since there is a likelihood of fiberglass exposure and the fiberglass is considered a nuisance fiber, it is recommended that you wash and rinse work clothes separately. For specific handling practices, refer to the product MSDS sheets.

Notes

The chemical and physical properties of INSULTECH® Acoustic Blanket represent typical average values determined in accordance with accepted test methods. The data is subject to normal manufacturing variations and is supplied as a technical service subject to change without notice. In addition, test data are average results of tests conducted under standard procedures and are subject to variation. Results should not be used for specification purposes. Design Guidelines are as follows: To access the true limitations of this recommended design, refer to the technical data for each product component. Following these guidelines will produce the highest achievable service life. Blanket design quality can be reduced or enhanced by changing any one component. If a question arises regarding deviations from those stated guidelines, or to insure the information is most current please contact your regional representative or call Shannon Enterprises direct.

