

**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; Exhaust Piping, Expansion Joints, Turbocharger Cases, Exhaust Plenums, Exhaust Ducting, Silencer Housings, Exhaust Manifolds, Exhaust Cones, By-pass Piping, Mufflers and Fittings. INSULTECH® Acoustic Blanket Markets include; Gas Transmission Stations and Cogeneration Power Plants.

**Maximum Service Temperature:**

This design is to act as a “SOUND ATTENUATION” and Thermal Barrier, with a maximum service temperature of 1100°F (593°C).

**Product Components:**

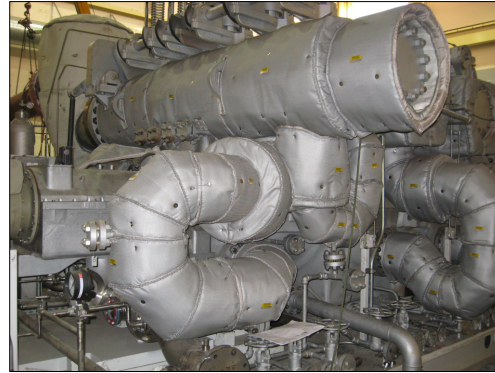
The Outer Jacketing is a 17.0 oz/sq. yd. Silicone Impregnated Fiberglass Cloth enclosed by .011” Dia. Type S.S. 304 Knitted Mesh. The Insulation Material is an 11PCF Fiberglass Needled Mat-Type “E” Fiber, which acts as a sound “Absorber”. Barium Sulfate Loaded Vinyl Sheet (1lb/sf to 2lb/sf Surface Mass) is layered onto the Insulation Mat to act as a “Reflector” of sound. The “Reflector” and “Absorber” materials are encapsulated by a layer of 17.7 oz/sq. yd. Plain Fiberglass cloth. enclosed by .011” Dia. Type S.S. 304 Knitted Mesh Jacketing and stapled together, producing a self contained blanket system. The INSULTECH® Blanket System includes fasteners for easy install and removal.

**Blanket Construction**

Blanket construction shall be a stapled construction. Outer jacket materials will be drawn down, to match at the inner jacket edge. Jacketing will be folded under and stapled with 3/8” Monel bevel point staples at the seam. Staples are to follow the inner jacket edge with at most 1” spacing between staples.

**Blanket Overlap**

To minimize heat loss from fittings, the blanket will extend beyond mating flanges unto existing insulation for a minimum of 2”.



Multi-Stage Turbine

Where blanket cannot fit over existing oversized insulation, blanket will butt up to existing insulation with a friction fit closing seam. All sections of pipes will be insulated and open gaps are not acceptable. Blanket diameters which are 2” or larger than existing insulation must be end capped to eliminate open air void.

**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. 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.

### **STANDARD FASTENER (Wiretwists)**

A 21 gauge type 304 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 type 304 stainless steel. Pins will be held in place with 1" diameter type 304 stainless steel speed washers. Wiretwists will be spaced 6" on center along closing seams with matching lacing pins to lace and secure to.

### **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, 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. An 8" x 10" 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.

### **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 Reference & Test Results.....

<b>Blanket Thickness Surface Temperature Reference:</b>						
<b>Operating Temperature</b>	<b>Thickness / Surface Temperature</b>		<b>Thickness / Surface Temperature</b>		<b>Thickness / Surface Temperature</b>	
700°F (371°C)	1.5"	156.5°F	2"	139.6°F	2.5"	128.4°F
800°F (427°C)	1.5"	174.6°F	2"	154.5°F	2.5"	141.2°F
900°F (482°C)	1.5"	194.5°F	2"	171.0°F	2.5"	155.4°F
1000°F (538°C)	2"	189.4°F	2.5"	171.2°F	3"	158.1°F
1100°F (593°C)	2"	209.7°F	2.5"	188.8°F	3"	173.7°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 approach surrounding 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.

<b>Blanket Thickness to Acoustic Performance:</b>		
<b>Thickness</b>	<b>Surface Mass</b>	<b>Estimated Reduction</b>
1.5"	1.82 - 2.82 lb/SF	3 - 6 DBA
2"	2.26 - 3.26 lb/SF	7 - 9 DBA
2.5"	3.14 - 3.70 lb/SF	10 - 13 DBA

\* The above DBA reductions are approximations. These figures are only guidelines of performance.

\* True estimates should include field verification of DBA levels and frequency concentrations.

## Typical Product Properties Specifications

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	---	Silicone Impregnated Fiberglass Composite - Material weight 17.0 oz/yd <sup>2</sup> (577g/m <sup>2</sup> ) Silicone & Fiberglass Respective Continuous Service Temperature 480°F (249°C) 1000°F (538°C) - Tensile Strength of Jacketing Composite Warp: 350 lbs/in (3128 N/50 mm) Fill: 300 lbs/in (2681 N/mm) Plain Fiberglass Fabric – Material Weight 17.7 oz/yd <sup>2</sup> (601g/m <sup>2</sup> ) Continuous Service Temperature 1000°F (538°C) Stainless Steel Type 304 Knitted Wire Mesh - .011" Dia. @16 sf/lb.

**Typical Product Properties Specifications (cont'd.)**

ASTM C 335 Standard Test Method for Steady-State Heat Transfer Properties of Pipe Insulation.

ASTM E 1222 – 90 Standard Test Method for The Laboratory Measurement of the Insertion Loss of Pipe Lagging Systems.

ASTM C 1045 - 07 Standard Practice for Calculating Thermal Transmission Properties Under Steady-State Conditions

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**Caution**

Typical industry handling practices should be exercised for the protections of the worker, such as: Wear long-sleeved, loose-fitting clothing, head covering, gloves and eye protection and also appropriate respiratory protection when handling and applying material. Wash with soap and warm water after handling. Wash work clothes separately and rinse washer. For specific handling practices, refer to the product MSDS sheets for the Thermal Blanket System.

**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.

