

**Blanket Design: LT121C-A-VP
“Low Temp Commercial Noise Reduction”**

Manufacturers of..... INSULTECH® Acoustic Blanket Insulation
Manufacturers of..... INSULTECH® Acoustic Shield Insulation

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Introduction

INSULTECH® Thermal Blankets are a CAD designed /CNC produced, high quality pre-engineered insulation system designed to save energy, retain radiant heat, minimize insulation maintenance and improve the surrounding work environment. INSULTECH® is also capable of withstanding weather conditions and chemical environments. INSULTECH® is flexible and easy to install, easy to remove and reinstall allowing quick access and easy equipment serviceability. The key benefit is “Re-Usability”.

Common Applications and Markets served

INSULTECH® Acoustic Blanket Applications include; Process Piping, Pumps, Valves, Flanged Fittings, Compressors, Fan Housings, Liquid Chillers, Gear Drives, Ducting and Custom Designed Acoustic Enclosures.

Maximum Service Temperature

This design is to act as an Acoustic Noise Reduction Barrier with a maximum service temperature of **121°C (250°F)**.

Product Components

The Outer and Inner Jacket is a 610 g/m² (18.0 oz/yd²) **Vinyl Coated/Impregnated Polyester Cloth**. The Insulation Material is an 176.2 kg/m³ (11 lb/CF) **Fiberglass Needled Mat-Type “E”** Fiber which acts as a sound “Absorber”. Barium Sulfate Loaded Vinyl 4.8 Kg/m²-9.6 Kg/m² (1 lb/sf to 2 lb/sf) surface mass is layered onto the insulation mat, to “Reflect” sound energy. The Fiberglass Mat & Mass Loaded Vinyl is encapsulated by the Vinyl Coated Polyester Cloth and sewn together, producing a “Self Contained Blanket System”. The INSULTECH® Acoustic Blanket System includes Integral Fasteners for install & removal.

Blanket Construction

Blanket construction shall be a “**Double Sewn**” lock stitch with a minimum 4.3 stitches per CM (7 Stitches/Inch). All raw jacket edges will have a tri-fold Vinyl Coated Polyester Cloth binding. No raw cut jacket edge will be exposed. Stitching will be Polyester thread.

Blanket Overlap

To minimize heat loss, the blanket will extend beyond mating flanges unto existing insulation for a minimum of 3 CM (1.5”). 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 3 CM (1.5”) or larger than existing insulation must be end capped to eliminate open air void.



Centrifugal Liquid Chiller (6-8 DBA Reduction)

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 18 KG (40 lbs) in weight.

I.D. Plate

For easy identification and location, a stainless steel or aluminum name plate tag is riveted to each blanket piece. 0.21 CM (1/8”) embossed lettering shows location, description, size, pressure rating and tag number sequence. Each blanket will include an I.D. Plate.

Quilting Pins

To enhance blanket quality and to maintain uniform thickness, stainless steel quilting pins @ 2.5 mm² (14 Gauge) will be placed at random locations no greater than 30 CM (18”) apart. Quilting Pins will prevent shifting of the insulation. 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.

Minimized Acoustic Void Leaks

All blanket pieces which match a closure mating seam that will expose “Hot Spots” must include a 3cm wide (1.5”) Mass Loaded Vinyl Septum Flap to cover the “Hot Spot”. This approach will minimize potential noise leaks to assure maximum acoustic performance.



INSULTECH BLANKET INSULATION

Submittal Specification
"Metric"

Blanket Design: **LT121C-A-VP**
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Leak Accommodations

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

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 and filed 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.

STANDARD FASTENER "WIRETWISTS & Velcro Flaps"

A stainless steel wire 0.50 mm2 (20 Gauge) will be doubled up and twisted in a spiral fashion, with a minimum of 3 to 5 twists per CM. Wiretwist length will be 27 CM (16") or longer. The Wiretwist will be secured to the lacing pin at the pin stem. Pin stems will be 2.5 mm2 (14 gauge). Wiretwists will be spaced 10 CM (6") on center along closing seams with matching lacing pins to lace and secure to.

Velcro® Flaps

Jacketing flaps are secured closed by the utilization of Hook/Loop Velcro® fasteners. A 3 CM (1.5") wide section of the Hook portion of the fastener will be stitched to the outer surface of the blanket. A 3 CM (1.5") wide section of the Loop portion will be aligned and stitched on the mating inner surface of an extended jacketing flap.

Assembly Drawing Requirements

Each blanket insulation 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 part replacement. **All blankets are to be CAD designed / CNC produced** to assure 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.

Project Accuracy & 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 I.D. tags, stitch lines, cut lines for stuffing, cutting of jacketing materials and cutting of insulation through the use of State-Of-The-Art CNC cutting systems & software.

Project Qualifications

All items insulated will require a site visit prior to bid submittal. Upon receipt of project contract, each item must be field measured for "Custom Fitting" to existing field conditions. Each item must be tagged and or marked for installation reference. At the time of installation, blankets must have a corresponding tag on the blanket and must match to an existing tag on the fitting. No standard blanket designs will be accepted. This will assure a "Custom Fit" design with maximum thermal efficiency.

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 13cm x 17cm (7"x9") 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 a bid 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.



Acoustic Enclosure – 15 DBA Reduction



Axial Exhaust Fans – 6 DBA Reduction



Scroll Compressors – 6 DBA Reduction

Blanket Thickness Surface Temperature Reference:

Operating Temperature	Thickness	Surface Temperature	Thickness	Surface Temperature	Thickness	Surface Temperature
121° C (250° F)	25 mm (1")	37.9° C (100.2° F)	40 mm (1.5")	33.3° C (92.0° F)	50 mm (2")	30.8° C (87.4° F)

- * The above referenced Cold Face Surface Temperatures should be used as guidelines for blanket insulation 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, thermal performance and blanket design constraints.
- * Heat Loss Calculations are based on a 21.1° C (70° F) ambient temperature using a flat surface condition.

Acoustic Noise Reduction Reference:

Acoustic Performance	Reduction	Thickness / Surface Mass Range	Reduction	Thickness / Surface Mass Range	Reduction	Thickness / Surface Mass Range
Thickness to Reduction	2-5 DBA	1" – 1.38-2.38 lb/SF	6-10 DBA	1.5"-1.82-3.1 lb/SF	11-15 DBA	2"-2.5-3.51 lb/SF

Product Properties Specifications:

Insulation Core: Standard Specification for Fiberglass Needled Fiber Felt Thermal Insulation
 ASTM C 1086-88 Service Temperature Up to 649°C (1200°F)

Jacketing Materials: Outer & Inner layer: Vinyl Coated Polyester weight 610g/m² (18.0 oz/yd²)
 Continuous Service Temperature 121°C (250°F)

Sound Reflector: Mass Loaded Vinyl weight 4.8 Kg/m²-9.6 Kg/m² (1.0 to 2.0 PSF)
 Continuous Service Temperature 121°C (250°F)
 Grab Tensile Strength: Warp: 4094 N/50 mm (460 lbs/in) / Fill: 3783 N/50 mm (425 lbs/in)

INSULTECH® Blanket Design Testing:

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 Insulation.
 ASTM C 1045 – 07 Standard Practice for Calculating Thermal Transmission Properties Under Steady-State Conditions
 UL 1709 Standard Fire Test of Protection Materials for MOV / Structural Steel

Caution:

Typical industry handling practices should be exercised for the protection of the worker. Worker should wear long-sleeved, loose-fitted clothing, head covering, leather gloves, eye protection and appropriate respiratory protection (as required) when handling and applying INSULTECH® material. Wash with soap and cold water after handling INSULTECH® material. 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® Thermal 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.