

### Introduction

INSULTECH® Thermal Blankets are a custom fit high quality pre-engineered insulation system designed to save energy, retain radiant heat, minimize insulation maintenance and improve the surrounding work environment. INSULTECH® PTFE Laminate Jacketing is designed for challenging chemical/thermal environments. INSULTECH® is flexible and easy to install, easy to remove and reinstall allowing quick access and easy equipment serviceability.

### Common Applications and Markets Served

INSULTECH® Thermal Blanket Applications include; Steam Process Piping, Gate Valves, Condensate tanks and Pumps, Slip and Bellows Expansion Joints, Steam Traps, Pressure Reducing Valves and Stations, Heat Exchangers and associated equipment. INSULTECH® Thermal Blanket Markets include; Chemical and Petrochemical Processing industry, Food Processing and Handling Industry where a non-porous, vapor barrier blanket system can be chemically sanitized. In addition, with the use of certain approved pigments, the INSULTECH® Blankets can be made to comply with the Regulations of the FDA Title 21 CFR 177.1550 Standards for Components of Articles Intended to come in Direct Contact with Food and also in Institutional Utility Steam Distribution (confined space) applications.

### Maximum Service Temperature

This design is to act as a Thermal Barrier with a maximum service temperature of 500°F (260°C).

### Product Components

The Outer and Inner Jacketing is a 13.5 oz/sq. yd. 100 percent PTFE Laminate. The Insulation Material is an 11 PCF Fiberglass Needled Mat-Type "E" Fiber. The Mat is encapsulated by the PTFE Laminate and sewn together, producing a self contained blanket system. The INSULTECH® Blanket system includes buckle and strap fasteners for easy install and removal. The strap system is a 29 oz/sq. yd. 100 percent PTFE Laminate attached to the outer jacketing in a two step process. First it is attached by a heat seal process then it is cooled down through a controlled heat sink process to achieve optimum attachment strength.

### Blanket Construction

Blanket construction shall be double sewn lock stitch with a minimum 7 stitches per inch. All raw jacket edges will have a tri-fold PTFE Laminate binding. No raw cut jacket edge will be exposed. Stitching will be done with PTFE 3 ply braided thread.



Spirax Sarco Condensate Pumps  
Manhole Steam Pit

### Blanket Overlap

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

### 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 will 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 and location, a 304 stainless steel name plate tag is riveted to each blanket piece. 1/8" embossed lettering will show location; item date of manufacture, work order number, location, description, size, pressure rating and tag/item number sequence. Each blanket will include an I.D. Plate.

### **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 blanket 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 (Buckle and Strap)**

The blanket fasteners will be 1 1/2" Polypropylene Side Release Buckles with 1.5" wide 29 oz/sq. yd. 100 percent PTFE Laminate Straps. The Buckle strap will be a minimum of 4 3/4" long and will be heat sealed to the outer surface for a minimum of 1 1/4" in length. A matching pull strap will be heat sealed on the outer jacket surface and will match up to the Buckle Strap. The pull strap will be a minimum of 15" long.

### **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 field 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 a "Custom Fit" design with maximum thermal efficiency.

### **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 2 piece 4" Gate Valve 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.
- 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 Results.....

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 reference 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

Core Blanket	ASTM C 1086-88	Standard Specification for Glass Fiber Felt Thermal Insulation Service Temperature Up to 1200°F (649°C)
Jacketing Material	21 CFR 177.1550	Perfluorocarbon Resins – Articles Intended to Contact Food per Applications Regulated by the Food and Drug Administration (FDA) 100 percent PTFE Laminate - Material Weight 13.5 oz/yd <sup>2</sup> (458g/m <sup>2</sup> ) Continuous Service Temperature 500°F (260°C) Tensile Strength of Jacketing - 48 lbs/in (427 N/50 mm) Tear Strength of Jacketing - 45 lbs (200 N/mm)

## 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 component product MSDS sheets.

## 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.

