

### 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® 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.

### Common Applications and Markets served

INSULTECH® Thermal Blanket Applications include; Engine Manifolds, Exhaust Reducer Cones, Mufflers, Expansion Joints, Exhaust piping, Fittings, By-Pass Piping and Turbo Charger Casings. INSULTECH® Thermal Blanket Markets include; Gas Transmission Stations and Cogeneration Power Plants.

### Maximum Service Temperature

This design is to act as a Thermal Barrier with a maximum service temperature of 1100°F (593°C).

### Product Components

The Outer Jacketing consists of a layer of Stainless Steel Type 304 Knitted Wire Mesh (.011" Dia. @ 16SF/LB) and 17.7 oz/sq. yd. Silicone impregnated Fiberglass cloth. The inner jacket consists of a layer of Stainless Steel Knitted Wire Mesh (same as above) on the outside, encasing a layer of 17.7 oz/sq. yd. Plain Fiberglass cloth. The Insulation Material is an 11PCF Fiberglass Needled Mat – Type "E" Fiber. The Mat is encapsulated by the mesh, Silicone cloth, the Plain Fiberglass cloth, and knitted mesh 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". 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.



TCV -12 Manifold

### 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.

### 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 stainless steel or aluminum name plate tag is riveted to each blanket piece. 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 will be placed at random locations no greater than 18 inches 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.

### **STANDARD FASTENER (Wiretwist)**

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. Wire-twists will be spaced 6" on center along closing seams with matching lacing pins to lace and secure to.

### **FASTENING OPTIONS**

#### **1) Lacing Pins**

Stainless Steel Type 304 lacing pins. Lacing Pins will be 12 gauge. 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. Pins will be held in place with 1" diameter type 304 stainless steel speed washers.

### **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 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.

### **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 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.....

<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.

## 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	----	A layer of Stainless Steel Type 304 Knitted Wire Mesh (.011" Dia. @ 16SF/LB) (Is installed on the inner Jacket outer layer and outer Jacket inner layer) Outer layer: Silicone Impregnated Fiberglass Composite Material weight 17.7 oz/yd <sup>2</sup> (601g/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) Inner layer: Plain Fiberglass Cloth Material weight 17.7 oz/yd <sup>2</sup> (601g/m <sup>2</sup> )

### 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® 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.

