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; Gate Valves, Ball Valves, Centrifugal Pumps, Condensate Pumps, Expansion joints, Steam Traps, PRV’S, Heat Exchangers, Strainers, Control Valves, Steam-Mud Drums and Boiler Heads. INSULTECH® Thermal Blanket Markets include; Chemical and Petro Chemical Processing Plants.

Maximum Service Temperature
This design is to act as a Thermal Barrier with a maximum service temperature of 550°F (288°C).

Product Components
The Outer and Inner Jacket is a 16.5 oz/sq. yd. PTFE Teflon® impregnated Fiberglass cloth. The Insulation Material is an 11PCF Fiberglass Needled Mat – Type “E” fiber. The inner jacket also has a layer of Stainless Steel Type 304 Knitted Wire Mesh (.011” Dia.@ 16 SF/lb.) The Mat is encapsulated by the PTFE Teflon® impregnated Fiberglass cloth and sewn together, producing a self contained blanket system. The INSULTECH® Blanket system includes fasteners for easy install and removal.

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 Teflon® Fiberglass cloth binding. No raw cut jacket edge will be exposed. Stitching will be done with Teflon® coated fiberglass thread. Monel staples shall follow the outer jacket edge for reinforcement and be spaced no greater than 1 inch.

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.

High Pressure Single Stage Steam Turbine
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 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 will show 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, 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 FASTENERS (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.

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 three layer fabric strap is double sewn. One strap is a 18” long pull-down strap, the other is a 4” long stationary strap. Both straps are stitched to the outer jacketing of the blanket. The stationary strap includes a metal “D” Ring measuring 1.50” in width. This is placed ½” 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. The pull-down strap includes hook-and-loop Velcro®, measuring at least 1” wide by 6” long, and is perimeter stitched to the strap surface. All closing seams have a 1.5” extended fabric flap, which is placed along the stationary strap side of the closing seam.

3) Velcro® Flaps
Jacketing flaps are secured closed by the utilization of Hook and Loop (Velcro®) fasteners. A 2” wide section of the Hook portion of the fastener will be stitched to the outer surface of the blanket. A 2” wide section of the Loop portion will be aligned and stitched on the mating inner surface of an extended jacketing flap.

4) Side Release Buckles
The blanket fasteners will be 1 1/2” Polypropylene Side Release Buckles with 1.5” wide Fabric Straps. A tri-fold 1.5” (finished width) belt will be sewn together utilizing PTFE 3 ply thread. A row of stitching, along each side of the belt will be parallel for the entire length. The Buckle strap will be a minimum of 7” long and will be box stitched to the outer surface for a minimum of 5” in length. A matching pull strap will be box stitched on the outer jacket surface and will match up to the Buckle Strap. The pull strap will be a minimum of 18” long.

Assembly Drawing Requirements
Each INSULTECH® project will include an instruction package shipped with the blanket material.
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.....
### Typical Product Properties Specifications

<table>
<thead>
<tr>
<th>Core Blanket</th>
<th>ASTM C 1086-88</th>
<th>Standard Specification for Glass Fiber Felt Thermal Insulation</th>
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<tbody>
<tr>
<td></td>
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<td>Service Temperature Up to 1200°F (649°C)</td>
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<table>
<thead>
<tr>
<th>Jacketing Material</th>
<th>----</th>
<th>PTFE (Teflon®) Coated Fiberglass Composite Material weight 16.5 oz/yd² (560 g/m²)</th>
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<tbody>
<tr>
<td></td>
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<td>Teflon &amp; Fiberglass Respective Continuous Service Temperature</td>
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<tr>
<td></td>
<td></td>
<td>600°F (316°C) – Tensile Strength of Jacketing Composite Warp:</td>
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<tr>
<td></td>
<td></td>
<td>410 lbs/in (3664 N/50 mm) Fill: 355 lbs/in (3137 N/mm) Fill:</td>
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<td></td>
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<td>355 lbs/in (3137 N/mm)</td>
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Stainless Steel Type 304 Knitted Wire Mesh - .011” Dia. @16 sf/lb.


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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® 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.