



**INSULTECH** BLANKET INSULATION

Submittal Specification  
"Metric"

Blanket Design: HT593C-MSGM  
"Power Generation"

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

Page 1 of 3

**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, remove and reinstall allowing quick access for equipment service.

**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 **593°C (1100°F)**.

**Product Components**

The Outer Jacketing consists of a layer of Stainless **Steel Type 304 Knitted Wire Mesh** (0.28 mm Dia. @ 3.3 m2/KG) and 601g/m<sup>2</sup> (17.7 oz/yd<sup>2</sup>) **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 601g/m<sup>2</sup> (17.7 oz/yd<sup>2</sup>) **Plain Fiberglass Cloth**. The Insulation Material is an 176.2 kg/m<sup>3</sup> (11 lb/CF) **Fiberglass Needled Mat-Type "E" Fiber**. The Fiberglass Mat is encapsulated by the Knitted SS Mesh, Silicone Cloth, Plain Fiberglass Cloth and SS Mesh, then stapled together, producing a "Self Contained Blanket System". The INSULTECH® Blanket System includes Integral Fasteners for install & 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 0.63 CM Monel bevel point staples at the seam. Staples are to follow the inner jacket edge with at most 1.6 CM 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 3 CM. 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 or larger than existing insulation must be end capped to eliminate open air void.



**Dual Engine Exhaust**

**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 18 KG in weight.

**I.D. Plate**

For easy identification and location, a stainless steel or aluminum I.D. Plate tag is riveted to each blanket piece. 0.21 CM 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 mm<sup>2</sup> (14 Gauge) will be placed at random locations no greater than 30 CM 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.



INSULTECH® BLANKET INSULATION

Submittal Specification  
"Metric"

Blanket Design: HT593C-MSGM  
"Power Generation"

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

Page 2 of 3

**STANDARD FASTENER (Wiretwist)**

A stainless steel wire (0.50 mm2) 20 Gauge, will be doubled up and twisted in a spiral fashion, with a minimum of 3-5 twists per CM. Wiretwist length will be 27 CM 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 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 2.5 mm2 (14 Gauge). Location of pins on the blanket will be 3 CM or more from blanket edge and 13 CM or less from centerline to centerline along a closing seam. Pins will be held in place with 1.7 CM 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. **All blankets are to be CAD designed / CNC produced** to assure the highest quality and precise fit.

**Production Drawing Record Keeping**

The correlating Project Production Drawings must be kept on file with the blanket manufacturer. The latest revisions, if any after installation, will be recorded on the CAD file drawing system. This file will be kept for a minimum of ten years to assure accuracy in the ordering of replacement parts.

**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.

**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.

**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 13 CM x 17 CM 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.



**INSULTECH** BLANKET INSULATION

Submittal Specification  
"Metric"

Blanket Design: HT593C-MSGM  
"Power Generation"

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

Page 3 of 3

**Blanket Thickness Surface Temperature Reference:**

Operating Temperature	Thickness	Surface Temperature	Thickness	Surface Temperature	Thickness	Surface Temperature
371° C (700° F)	40 mm (1.5")	69.2° C (156.5° F)	50 mm (2")	59.8° C (139.6° F)	65 mm (2.5")	53.6° C (128.4° F)
427° C (800° F)	40 mm (1.5")	79.2° C (174.6° F)	50 mm (2")	68.1° C (154.5° F)	65 mm (2.5")	60.7° C (141.2° F)
482° C (900° F)	40 mm (1.5")	90.3° C (194.5° F)	50 mm (2")	77.2° C (171.0° F)	65 mm (2.5")	68.6° C (155.4° F)
538° C (1000° F)	50 mm (2")	87.4° C (189.4° F)	65 mm (2.5")	77.3° C (171.2° F)	80 mm (3")	70.1° C (158.1° F)
593° C (1100° F)	50 mm (2")	98.7° C (209.7° F)	65 mm (2.5")	87.1° C (188.8° F)	80 mm (3")	78.7° C (173.7° 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.

**Product Properties Specifications:**

Insulation Core: ASTM C 1086-88      Standard Specification for Glass Fiber Felt Thermal Insulation  
 Service Temperature Up to 649°C (1200°F)  
 Jacketing Materials      Stainless Steel Type 304 Knitted Wire Mesh (.28 mm Dia. @ 3.3 m2/KG)  
 ( Installed on the inner Jacket on the outer layer and on the outer Jacket outer layer )  
 Outer layer: Silicone Fiberglass Composite Material weight 601g/m<sup>2</sup> (17.7 oz/yd<sup>2</sup> )  
 Silicone & Fiberglass Respective Continuous Service Temperature 249°C (480°F)  
 538°C (1000°F) - Tensile Strength of Jacketing  
 Warp: 3128 N/50 mm (350 lbs/in) / Fill: 2681 N/mm (300 lbs/in)  
 Inner layer: Plain Fiberglass Cloth weight 601g/m<sup>2</sup> (17.7 oz/yd<sup>2</sup>)

**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. The 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.