

Introduction:

Shannon Safety Shields are a CAD designed, CNC produced, high quality custom fit protective composite jacketing. Safety Shields are designed to address potential flange rupture leaks, deflect potential affluent and contain liquid discharge, protecting the surrounding work environment. Shannon Safety Shields are weather and chemical resistant. Shannon Safety Shields are flexible and easy to install, remove and reinstall allowing quick access and easy equipment serviceability. The key benefit is "Re-Usability".

Engineering Standards

Shannon Safety Shields follow the ASTM D3786 Mullen Burst Test per ASTM F1138 (Spray Shields for Mechanical Joints)

Applications and Markets

Applications include; Valves, Flanges, Equipment & Equipment Heads, Instrumentation and Complex Surfaces that otherwise are left untreated. 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 260°C (500°F).

Product Components

The Outer to Inner Jacketing will be as follows:

- 1 (each) Layer - 17.7 oz/yd² (601g/m²) Silicone Impregnated Fiberglass Cloth
- 3 (each) Layers - 21.5 oz/yd² (731g/m²) Aluminum Foil Laminate Fiberglass Cloth
- 4 (each) layers of fabric are sewn together, producing a "Self-Contained Fabric Sleeve."

Blanket Construction

Blanket construction shall be a "Double Sewn" lock stitch with a minimum 7 stitches/inch (2.8 stitches/cm). All raw jacket edges will have a tri-fold Silicone Cloth Binder. No raw cut jacket edge will be exposed. Stitching thread will be stainless steel.

Blanket Overlap

To effectively capture the total surface exposure of a potential flange leak risk, the Shannon Safety Shield will cover both the flange seam as well as the side wall of the flange, covering the bolt and nut surfaces as well. Shannon Safety Shield material will be designed to draw down and match up to the pipe/equipment surface.

Leak Accommodations

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



Pig Launcher / Process Valves / Flanges

Safety Sleeve Weight

Shannon Safety Shield for large equipment will minimize the total number of pieces and will not exceed 20 lbs (9.1 kg) in total weight

I.D. Plate

For easy identification and location, a stainless steel or aluminum name plate tag is riveted to each piece. 1/8" (0.32 cm) embossed lettering shows location, description, size, pressure rating and tag number sequence. Each piece will include an I.D. Plate.

Quilting Pins

To enhance product quality and to maintain uniform sleeve thickness, stitch quilting, using stainless steel thread will prevent shifting of the fabrics.

Minimized Air Void

Equipment is typically a multi-piece design and installed in tag number sequence. Heat exchanger heads, large vessel flanges and pump housings will be designed in half sections. Safety Shield design will conform to the equipment with minimized air void. All gate, globe and control valves will be a two piece design with a separate body and bonnet.

Design Construction Sample

Upon bid submittal a product sample must be presented for review and product approval. A 7" x 9" (18cm x 23cm) 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.

Standard Offering – Wiretwist Fasteners: A 20 gauge stainless steel wire will be doubled up and twisted in a spiral fashion, with a minimum of 4-5 twists per inch (5-7 stitches/cm). Wiretwist length will be 16" (40cm) or longer. The Wiretwists will be secured to the lacing pin at the pin stem. Lacing pin stems will be 14 gauge (2.5mm²). Wiretwists will be spaced 6" (15cm) on center along closing seams with matching lacing pins to lace and secure to.

FASTENING OPTIONS

Metal "D" Ring Strap with Velcro® Tab

A three layer Silicone Cloth strap is double sewn. One strap, a 12" (30cm) long pull-down strap, the other is a 3" (8cm) long stationary strap. Both straps are stitched to the outer jacketing of the blanket. The stationary strap includes a metal "D" Ring measuring 1.5" (2.5cm) width. This is placed ½" (1cm) 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 6" (15cm) apart. The pull-down strap includes hook-and-loop Velcro®, measuring at least 1" wide by 6" (15cm) long, and is perimeter stitched to the strap surface. All closing seams have a 1.5" (2.5cm) extended fabric flap, which is placed along the stationary strap side of the closing seam.

Velcro® Flaps

Jacketing flaps are secured closed by the utilization of Hook and Loop (Velcro®) fasteners. A 2" (5 cm) wide section of the Hook portion of the fastener will be stitched to the outer surface of the blanket. A 2" (5 cm) wide section of the Loop portion will be aligned and stitched on the mating inner surface of an extended jacketing flap.

Side Release Buckles

The blanket fasteners will be 1.5" (2.5cm) Polypropylene Side Release Buckles with 1.5" wide Fabric Straps. A tri-fold 1.5" (2.5cm) a 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 5" (12.7cm) long and will be box stitched to the outer surface for a minimum of 3" (8cm) 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 12" (30cm) long.

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.

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.

Project Qualifications

All items treated 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, "Shields" must have a corresponding tag on the shield and must match to an existing tag on the fitting. No standard generic designs will be accepted. This will assure a "Custom Fit" design with maximum performance.

Warranty

We guarantee that all Shannon Safety Shields 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 shield should the failure be due to premature degradation of any component utilized in the application, as well as any defects due to poor workmanship.

Installation Guidelines

Shannon Safety Shields will follow these simple guidelines:

- Once material is received, open boxes with care. DO NOT "cut" deep into container to avoid damaging shields.
- Locate the Instructions for Installation.
- Follow the Material List to determine shield part number.
- Refer to the Assembly Drawing for orientation of each shield part number and installation details of each part.
- Locate the Identification Tag on each shield for correct description and sequence.
- Material is installed in tag number sequence.
- Use leather gloves to install material.

Storage

Once shipment is received, protect Shannon Safety Shields from water damage and/or other abuses prior to installation. Shannon Safety Shields 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 Shannon Safety Shields on clean, dry surfaces and avoid trapping oils, greases or combustible materials.

Blanket Thickness Surface Temperature Reference:

Operating Temp	Thickness	Surface Temp	Thickness	Surface Temp	Thickness	Surface Temp
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)
149° C (300° F)	25 mm(1")	42.6° C (108.6° F)	40 mm (1.5")	36.8° C (98.2° F)	50 mm (2")	33.5° C (92.3° F)
177° C (350° F)	25 mm(1")	47.3° C (117.2° F)	40 mm (1.5")	40.3° C (104.6° F)	50 mm (2")	36.3° C (97.4° F)
204° C (400° F)	25 mm(1")	52.2° C (126.0° F)	40 mm (1.5")	44.0° C (111.2° F)	50 mm (2")	39.3° C (102.7° F)
232° C (450° F)	25 mm(1")	57.2° C (135.1° F)	40 mm (1.5")	47.8° C (118.0° F)	50 mm (2")	42.3° C (108.2° F)
260° C (500° F)	25 mm(1")	62.5° C (144.5° F)	40 mm (1.5")	51.7° C (125.1° F)	50 mm (2")	45.5° C (113.9° 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 (Optional):

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

Jacketing Materials:
Silicone Impregnated Fiberglass Cloth

 ASTM D 3776 Material Weight 17.7 oz/yd² (601 g/m²)
 Continuous Service Temperature 500°F (260°C) Intermittent: 700° F (371°C)
 ASTM D 5587 Tensile Strength Warp: 300 lbs/in (53.6 kg/cm) Fill: 225 lbs/in (40.2 kg/cm)

Aluminum Foil Laminate Fiberglass Cloth

 ASTM D 3776 Material Weight 21.5 oz/yd² (731g/m²)
 Continuous Service Temperature 450°F (232°C) Intermittent: 500° F (260°C)

ASTM D3786 Mullen Burst Test (per ASTM F1138) Spray Shields for Mechanical Joints

 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 Lagging Systems.
 ASTM C 1045 - 07 Standard Practice for Calculating Thermal Transmission Properties under "Steady-State" Conditions

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 Shannon / INSULTECH® material. Wash with soap and cold water after handling Shannon / 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 Shannon / INSULTECH® products 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.