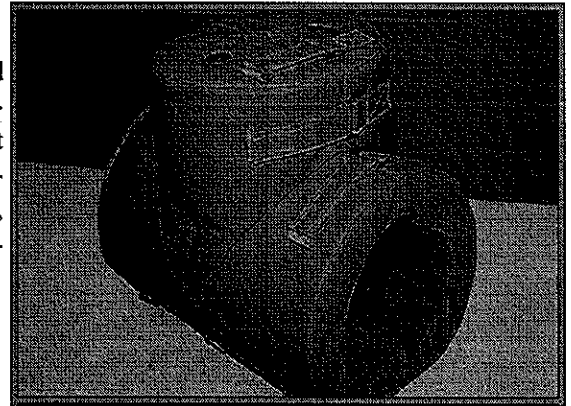


ADVANCE THERMAL CORP.

SUBMITTAL SHEET FOR REMOVABLE/REUSABLE INSULATION COVERS FOR STEAM AND HOT WATER SERVICE UP TO 1200°F.

Scope:

This specification defines the type and quality of materials, related accessories, and methods of fabrication for removable/reusable insulation covers. The covers described in this specification will be thought of and referred to as pre-fabricated/custom-fit units designed and fabricated especially for utilization on specified piping, flanges, valves, and equipment in steam and hot water services with operating temperatures up to and including 1200°



Special Provisions:

Definitions of Responsibilities:

The Engineer will specify those items requiring removable/reusable insulation covers.

The Vendor shall submit in writing any proposed deviations from this specification, including alternative fabrication materials and methods. These proposals must be approved by the Company prior to their implementations.

The Vendor shall measure all items requiring removable/reusable insulation covers and shall be responsible for their proper fit.

The Vendor shall maintain dimensional drawings of all items requiring insulation covers in the event that future replacements are necessary.

The Vendor shall warrant all insulation covers to be free of defects due to materials or workmanship for a period of no less than one year from receipt by the End User.

Definitions of Terms Used in this Specification:

Hot Face - The inside surface area of a removable/reusable insulation cover. The materials in direct contact with the item being covered.

Cold Face - The outside surface area of a removable/reusable insulation cover. The materials exposed to atmospheric and ambient temperature conditions.

One Piece Construction - A removable/reusable insulation cover designed and fabricated to be installed as one unit, rather than two or more components requiring separate installations to comprise the finished cover.

Inside Seam - A sewn seam which is turned to the inside of a cover shell, so as not to show on the outside.

Outside Seam - A sewn seam which is not turned to the inside of a cover shell, but remains exposed on the outside.

Closing Seam - The final seam sewn on a cover after the shell has been filled with the core insulation. This seam is to be the only outside seam.

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Definitions of Terms Used in this Specification:

Parting Faces - The edges of a removable/reusable insulation cover which butt together when the cover is installed and secured.

Terminal Ends - The ends or tops of a removable/reusable insulation cover which are drawn down around adjacent insulation, valve packing stems, pump flange nozzles, etc.

Gusset Construction - Fabrication of a removable/reusable insulation cover using inside seams to achieve square edges on the cover rather than rounded edges. The gusset is equal to the insulation core thickness, and shall be utilized on covers of 2" thickness or greater.

Core Unit - The insulating material(s) inside a removable/reusable cover.

Tie-Down/Anchor Straps - Straps used in conjunction with buckles to secure removable/reusable insulation covers in place when they are installed on the items being insulated. Straps shall be used in lieu of lacing hooks and wire.

Materials:

Insulation:

For operating temperatures between 100°F and 550°F the insulation core material shall be 1000°F rated Type F rated ET-Blanket.

For operating temperatures between 551°F and 1200°F the insulation core material shall be 1200°F rated Type E Needled Glass Fiber Blanket.

Ceramic Fiber shall be used only for operating temperatures above 1200°F to 1400°F and in cases where fiberglass would be ineffective such as moist areas in tunnels, sewers, and other damp areas where liquid and/or steam are prevalent.

Jacket Materials:

Hot Face:

For operating temperatures between 100°F and 550°F the covering of the hot face shall be either silicone impregnated fiberglass fabric having a minimum density of 16 oz./yd² or with Teflon impregnated fiberglass fabric of similar density.

For operating temperatures between 551°F and 850°F the hot face covering shall be 2LAM-HT cloth with the aluminum side facing inwards. The hot face outer covering shall be lined with 1100°F rated .011"X60 Density 304 stainless steel mesh.

For operating temperatures between 851°F and 1200°F the hot face covering shall be 2LMA-HT cloth with the aluminum side facing inwards. ATC 1400-HT rated to 1400°F having a density of 18 oz./yd² shall be placed between the mesh and the ATC 1400-HT cloth. The hot face outer covering shall be lined with 1100°F rated .011"X60 Density 304 stainless steel mesh.

Cold Face:

The blanket cold face shall be weatherproofed with the same fabric as the hot face covering.

Thread:

All covers shall be sewn. Stapled or "hog-ringed" covers are not acceptable.

For operating temperatures between 100°F and 600°F the sewing thread shall be Teflon coated fiberglass with 20 lb tensile strength and 1500 yds./lb. weight.

For operating temperatures between 601°F and 1200°F the sewing thread shall be 10 strand Type 304 stainless steel.

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Fasteners:

For all threaded valves and piping, the method of fastening shall be a hook and loop fastener.

Hook and loop fasteners shall be fire retardant and matching in color.

For all flanged valves, straps shall be used as a fastening device.

Tie-down/anchor straps shall be made from the same material as the cold face covering. For valves having nominal pipe sizes up through 4 inches, a minimum 7/8 inch wide strap shall be used. For valves having nominal pipe size larger than 4 inches, a minimum 1-1/2 inch strap shall be used.

D-Rings for tie-down/anchor straps shall be made from 1/8 inch O.D. rolled Type 304 stainless steel wire. Wire shall be welded to form continuous rings with no splits. No rectangular rings shall be used.

Fasteners:

For operating temperatures between 451°F and 1200°F seam fasteners shall be minimum 14-gauge Type 304 stainless steel lacing hooks and 16 gauge annealed stainless steel wire. 1-1/2 inch wide straps shall be used on seams as guides for installation of covers for operating temperatures between 551°F and 1200°F.

Fabrication Requirements:

Requirements:

Removable/reusable covers shall meet the following requirements:

Shall conform to the configuration of the items being insulated.

Shall include allowances for packing gland openings, protrusions, etc.

Shall be fabricated such that no force folding or bending is required for their installation.

Fabrication Requirements:

Shall overlap permanent insulation a minimum of the thickness of the insulation core or 2 inches, whichever is larger. The overlapping section of the cover shall be full thickness.

Shall enclose the valve bonnet to the greatest extent practical without covering the packing gland.

The interior and exterior cover shall completely encapsulate the insulation core to form a weatherproof unit.

Shall have their parting faces at the installed low points to allow drainage without the use of weep tubes or grommets.

Requirements:

Covers for valves shall be designed for installation over the valve handwheel or wrench.

Where possible, covers with a weight of 40 lbs or less shall be fabricated in one piece.

Covers whose one-piece weight would be more than 40 lbs. shall be fabricated in more than one piece.

The terminal ends or splits in covers shall have flaps for sealing against entrance by wind or water. Terminal ends shall be a minimum of 3 inches wide.

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Insulating Material:

Insulation core thickness shall be in accordance with the following schedule:

<u>Operating Temperature</u>	<u>Nominal Thickness</u>
100° F - 450° F	1 inch
451° F - 850° F	2 inches
851° F - 1200° F	3 inches

The insulation core shall be secured within the jacket with quilting pins or hand tufting to prevent the insulation from settling to the bottom of the jacket.

The insulation core shall be fabricated in one piece whenever possible.

Insulating cores fabricated with more than one piece shall use staggered joints to prevent hot spots.

The joint edges shall be butted together and extra quilting shall be provided at the joint edges.

Jacket:

The cold face jacket shall be manufactured in one piece whenever possible.

Seams other than the final closing seam shall be inside seams. The final closing seam may be an outside seam.

The final outside closing seam shall be double machine stitched. This seam shall be as short as possible.

Raw seams are unacceptable on exterior surfaces. Jackets shall be manufactured inside-out, then turned correct side out before inserting the insulation.

Gusseted seams are required for covers with core insulation thickness in excess of 1 inch. Folded seams are acceptable for covers with core insulation thickness of no more than 1 inch.

Gussets shall be made from the same material as the hot face.

A splice in a cold face jacket shall have a double folded, double stitched seam.

Machine stitching shall be used for all sewing. Sewing shall be double straight stitched with 8 to 10 stitches per inch and parallel stitch rows spaced from 1/8 inch to 1/2 inch apart.