FORM & NOTE REF.

PROCESS SPECIFICATION
MAKING AND ATTACHING GLASS-FILLED ASBESTOS CLOTH COVERED THERMAL INSULATING BLANKETS

60-03-59

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GENERAL: This specification covers the making and attaching of glass-filled asbestos cloth-covered thermal insulating blankets, mattresses or bags for steam turbines.

CAUTION CLAUSE: DO NOT BREATHE DUST FROM FIBERGLAS OR ASBESTOS. AVOID CONTACT OF FIBERGLAS OR ASBESTOS WITH THE SKIN. WORKERS HANDLING FIBERGLAS OR ASBESTOS MUST BE PROVIDED WITH AND USE A WELL VENTILATED ROOM, AND BLANKET FILLING OPERATIONS MUST BE CONDUCTED UNDER A HOOD PROVIDED WITH SUFFICIENT DRAFT TO CARRY THE DUST PARTICLES AWAY FROM THE WORKMEN. IN ADDITION, THE WORKMEN MUST BE PROVIDED WITH AND USE GOGGLES AND SHOULDER LENGTH GLOVES OF AN IMPERVIOUS MATERIAL. USE RESPIRATORS ON ANY JOB WHERE THE DUST IS NOT PROPERLY CARRIED AWAY BY THE HOOD.

The specification is divided into five PARTS as follows:

"GENERAL" PART: This part covers the requirements of construction that apply equally to PARTS I, II and III and are given in "GENERAL" to avoid duplication in each of the three parts.

PART I: This part covers the manufacture of blankets for steam turbines operating at temperatures up to 500°F.

PART II: This part covers the manufacture of blankets for steam turbines operating at temperatures between 500° and 825°F.

PART III: This part covers the manufacture of blankets for steam turbines operating at temperatures between 825° and 950°F.

PART IV: This part, appearing in the original edition of this specification, has been cancelled and combined with PART III.

PART V: This part covers the method of attaching the blankets to the turbine.

"GENERAL" PART

Fill all blankets with Fiberglas Wool, Material 7793, to a uniform density of 6 pounds per cubic foot.

Cut and sew all cloth to have the least possible number of seams. Cut all cloth to allow for stitching at least one inch from the edge of the cut. When the width of a blanket requires two or more widths of cloth, lap all seams at least 1-1/2 inches and sew with a double row of stitching.

Sew all seams completely except for the filler opening. Turn the bag inside out and fill. All cut edges and seams are on the inside Tuck in edges at filler opening and sew from the outside with overhand stitching.

Quilt all blankets on approximate 6 inch staggered centers to prevent the filler from shifting in the bag. To prevent the quilting wires from tearing the cloth pass a U shaped wire through a

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-o-hole reinforcing washer on one side of the blanket, through the anket, through a two-hole reinforcing washer on the other side, nd twist the wire ends together and leave in a manner to prevent nagging of the cloth.

Use lacing hooks to secure the blankets on the turbine. asten the lacing hooks to the blankets by quilting wires and rein- orcing washers. Place lacing hooks along the edges of the blankets t approximately 6 inch intervals and approximately 5 inches from he edge of the blanket. 5"

Identify all blankets and all blanket p sitions on the urbine in accordance with drawing 10-H-97 using 18-8 stainless steel identification tags of design on drawing 10-H-70.

The insulation assembly drawings will show the thickness and location of all blankets.

PART I

MATERIALS:
(1) Asbestos Cloth, Material 7794-1.
(2) Asbestos Yarn, Material 7795-1, containing two brass wire inserts .062
(3) Quilting Wire, 0.072 inch diameter copper.
(4) Reinforcing Washers, two-hole copper, to drawing 10-H-69 Item 1.
(5) Lacing Hooks, brass, to drawing 10-H-118 Item 1.

ONSTRUCTION: Construct all blankets to the requirements in the "GENERAL" PART.

ATTACHING BLANKETS: Attach all blankets to the turbine in accordance with PART V.

PART II

MATERIALS:
(1) Asbestos Cloth, Material 7794-2, for inner cloth (hot side) and for the side wall cloths where a mattress type cover is required.
(2) Asbestos Cloth, Material 7794-1 for outer cloth (cold side)
(3) Asbestos Yarn, Material 7795-2, containing two Inconel metal wire inserts.
(4) Quilting Wire, 0.035 inch diameter 18-8 stainless steel.
(5) Reinforcing Washers, two-hole 18-8 stainless steel to drawing 10-H-69 Item 2.
(6) Lacing Hooks, 18-8 stainless steel, to drawing 10-H-118 Item 2, attached to blanket with 0.072 inch diameter 18-8 stainless steel wire and reinforcing washers of 18-8 stainless steel.

NSTRUCTION: Construct all blankets to the requirements in the GENERAL" PART.

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ATTACHING BLANKETS: Attach all blankets to the turbine in accordance

APPLICATION OF BLOCK AND MOLDED INSULATION

GENERAL: THE DETAILED PROCEDURES NECESSARY FOR THE APPLICATION OF INSULATING BLOCK AND/OR PIPE COVERING TO TURBINE CYLINDERS, VALVE COVERS, STEAM CHESTS, PIPES, FLANGES OR OTHER PARTS ARE DESCRIBED IN THIS SPECIFICATION. THE INSULATION [illegible] AND THICKNESS WILL BE SHOWN ON THE INSULATION DRAWING FOR EACH CLASS OF TURBINE.

THIS SPECIFICATION IS DIVIDED INTO TWO PARTS AS FOLLOWS:-

PART I. APPLICATION OF BLOCK.
PART II. APPLICATION OF MOLDED PIPE COVERING.

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PART I. APPLICATION OF BLOCK.

GENERAL: WHERE TEMPERATURE DOES NOT EXCEED 600°F., MATERIAL 7308 SILICATE BLOCKS SHALL BE APPLIED IN A SINGLE LAYER DIRECTLY TO THE SURFACE BEING INSULATED.

WHEN TEMPERATURE EXCEEDS 600°F. A LAYER OF MATERIAL 7309-1 HI-TEMP BLOCK COVERED BY A LAYER OF MATERIAL 7308 SILICATE INSULATION SHALL BE USED.

OPERATIONS:

1. SELECTING, CUTTING AND FITTING BLOCKS
2. ATTACHING ANCHOR POINTS.
3. ATTACHING RETAINING WIRES.
4. COVERING TURBINE ASSEMBLY FLANGES.
5. COVERING PIPE FLANGES.
6. PATCHING, FILLING AND FINISHING WITH MATERIAL 7311 CEMENT.
7. COVERING PIPES OF LARGE DIAMETER.

1. SELECTING, CUTTING AND FITTING BLOCKS.

BLOCK SHAPES SHALL BE SELECTED TO CONFORM AS NEARLY AS PRACTICAL TO THE SHAPE OR CONTOUR BEING COVERED. INSULATION MAY BE CUT WITH EITHER A HAND OR A POWER SAW, DEPENDING ON THE QUANTITY AND AMOUNT OF FITTING NECESSARY.

IN GENERAL, THE LONG DIMENSION OF BLOCKS OR FORMS SHOULD BE PLACED 90° TO THE CURVATURE OF THE SURFACE BEING COVERED

WHEN FITTING BLOCKS, SLIGHT DIFFERENCES IN CONTOUR BETWEEN THE INSULATION AND THE PART TO BE COVERED ARE PERMISSIBLE. IN SUCH CASES, THE INSULATION BLOCKS SHALL BE SECURED OVER A THIN COATING OF INSULATION CEMENT MATERIAL 7311 APPLIED DIRECTLY TO THE SURFACE OF THE PART. BLOCKS SHALL BE APPLIED WHILE THE CEMENT IS WET.

WHERE SEVERAL LAYERS OF BLOCKS ARE REQUIRED, THE JOINTS OF THE TOP LAYER SHALL BE STAGGERED WITH RELATION TO THE INNER LAYER. EACH LAYER SHALL BE WIRED DOWN TO THE ANCHOR POINTS AND ALL JOINTS AND OPENINGS FINISHED WITH CEMENT MATERIAL 7311.

2. ATTACHING ANCHOR POINTS

ON ALLOY STEEL CASTINGS OR FORGINGS, AT POSITIONS SHOWN ON "CYLINDER (AND OTHER) INSULATION PAD" DRAWINGS INSULATION PADS TO STYLE NUMBER 270A089H01 WILL BE WELDED IN PLACE.

CAUTION: NO FURTHER WELDING OF ANY ANCHOR POINTS DIRECTLY TO ANY ALLOY STEEL CASTINGS OR FORGINGS SHALL BE DONE WITHOUT ENGINEERING APPROVAL.

EYE BOLT STUDS, STYLE NUMBER 270A091H01, SHALL BE WELDED TO THE INSULATING PADS ONLY WHERE REQUIRED TO ANCHOR INSULATION, USING A NELSON (OR EQUAL) STUD WELDING GUN. (SEE FIGURE 1)

ON CARBON STEEL CASTINGS OR FORGINGS, EYE BOLT STUDS MAY BE WELDED DIRECTLY TO THE CASTING OR FORGING USING THE STUD WELDING GUN. THE STUDS SHALL BE LOCATED SO THAT RETAINING WIRES ATTACHED TO THEM SHALL RUN AT RIGHT ANGLES TO THE CURVATURE OF THE SURFACE BEING COVERED, OR AT RIGHT ANGLES TO THE LONG DIMENSION ON FLAT SURFACES.

3. ATTACHING RETAINING WIRES

FOR SERVICE TEMPERATURES UP TO 500°F., SOFT GALVANIZED OR BLACK STEEL WIRE, MATERIAL 3657-1, OF 16 GAGE SIZE SHALL BE USED FOR RETAINING WIRES. FOR SERVICE TEMPERATURES ABOVE 500°F. STAINLESS STEEL WIRE, .062 DIA., OF 7860-2 MATERIAL SHALL BE USED.

THE WIRES SHALL PASS OVER THE BLOCKS OR SHAPES AND BE TIED TO THE ANCHOR POINTS SECURING THE BLOCKS FIRMLY IN PLACE.

WIRE LOOPS SHALL BE USED ON PIPE INSULATION AND SHALL BE TWISTED TOGETHER AND BENT TO PREVENT SNAGGING. THE PITCH BETWEEN LOOPS SHALL NOT EXCEED 15 INCHES.

4. COVERING TURBINE ASSEMBLY FLANGES

INSULATION SHALL BE STOPPED A SUFFICIENT DISTANCE FROM ALL FLANGES TO ALLOW ACCESS TO OR REMOVAL OF BOLTS AND ASSOCIATED PARTS AT OR ADJACENT TO THE FLANGES.

IN GENERAL, INDUSTRIAL TURBINE ASSEMBLY FLANGES FOR TEMPERATURES TO 950°F SHALL BE COVERED WITH GLASS FILLED ASBESTOS CLOTH COVERED BLANKETS AS SHOWN IN FIGURE 1. (SEE PROCESS SPECIFICATION 600359 PARTS I, II AND III.)

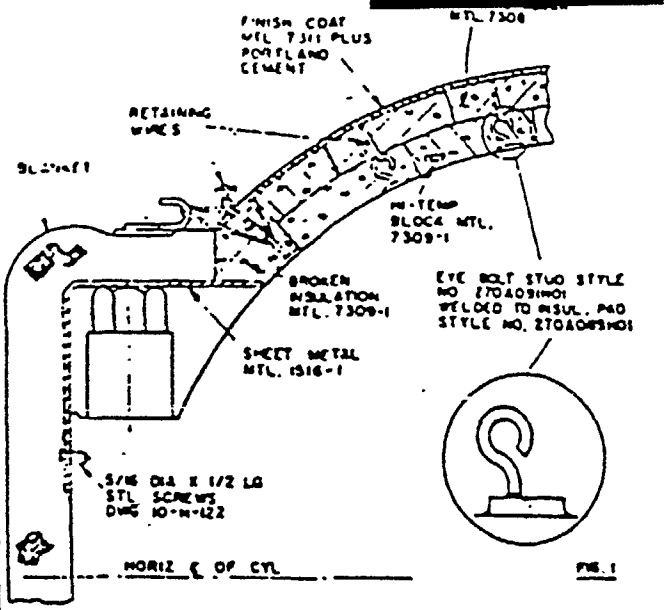
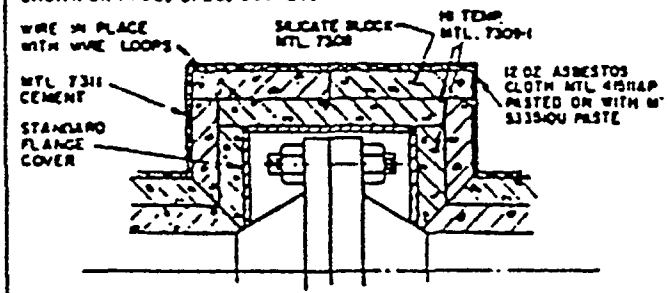


FIG. 1

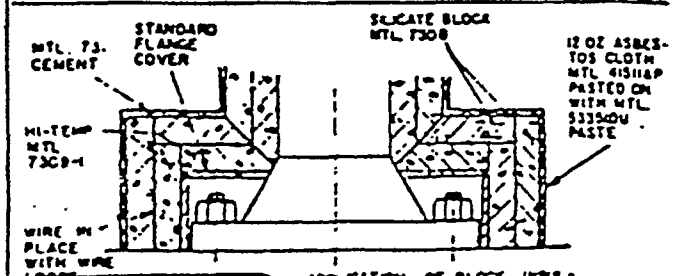
ON SPECIAL INSTALLATIONS AND ON INSTALLATIONS FOR TEMPERATURES OVER 950°F. BLOCKS MAY BE REQUIRED FOR JOINT COVERING IN SUCH CASES, THE JOINT SHALL BE PROTECTED BY A COVERING O 1/16 INCH SHEET STEEL, MATERIAL 1516-1 REINFORCED WITH SUITABLE ANGLES TO ASSURE RIGIDITY OR AS PROVIDED IN PROCESS SPEC 600729. BLOCKS SHALL THEN BE APPLIED TO THE PROTECTING SURFACES.

5. COVERING PIPE FLANGES

WHEN STANDARD PIPE FLANGES ARE INVOLVED, COVER THEM WIT SHEET METAL COVERS AND INSULATE AS SHOWN ON FIGURES 2 AND 3 WHEN PRESSURE RATING AND FLANGE DIMENSIONS ARE BEYOND THI SCOPE OF THESE STANDARD FLANGE COVERS USE ARRANGEMENT AS SHOWN ON PROC. SPEC. 600729.



APPLICATION OF BLOCK INSULATION TO MATING FLANGES FIG 2



APPLICATION OF BLOCK INSULATION TO SINGLE FLANGE FIG 3

with PART V.

PART III

MATERIALS: (1) Asbestos Cloth, Material 7794-3, two wire Inconel metal inserted.
(2) Asbestos Yarn, Material 7795-2, two wire Inconel metal inserted.
(3) Quilting Wire, 0.035 inch diameter 18-8 stainless steel.
(4) Reinforcing Washers, two-hole 18-8 stainless steel to drawing 10-H-69 Item 2.
(5) Lacing Hooks, 18-8 stainless steel, to drawing 10-H-118 Item 2, attached to blanket with 0.072 inch diameter 18-8 stainless steel wire and reinforcing washers of 18-8 stainless steel.

CONSTRUCTION: Construct all blankets to the requirements in the "GENERAL" PART.

ATTACHING BLANKETS: Attach all blankets to the turbine in accordance with PART V.

PART V

Provide and weld into position sufficient lacing rails of adequate size for securing the blankets to the turbine.

Where a blanket is in contact with a sharp edge, nut, bolt head or point where cutting of the cloth or heat concentration occurs, protect the cloth by a piece, patch, cap, special shape or covering of 1/16 inch sheet metal. Shape the sheet metal protectors to the curvature being covered and secure with 5/16 inch diameter machine screws to drawing 10-H-122 drilled and tapped into the surface being protected. The insulation assembly drawings will show in outline form only, but not dimensioned, the positions where the protectors are located. Standard pipe flanges should be protected with sheet metal covers as shown on Sul. Book sheet No. 777.1.

Use 0.072 inch diameter brass or galvanized iron wire to attach the blanket to the turbine for temperatures below 500°F. Use 0.072 inch diameter 18-8 stainless steel wire to attach the blanket to the turbine for temperatures above 500°F. Lace the blankets together by means of the lacing hooks provided on each blanket and pass the lacing wires under or around the lacing rails in a manner to secure the blanket firmly to the turbine.

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Metallurgical Engineering
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