PROCESS SPECIFICATION
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 TYPE AND THICKNESS WILL BE SHOWN ON THE INSULATION DRAWING FOR EACH CLASS OF TURBINE.

THIS SPECIFICATION IS DIVIDED INTO THREE PARTS AS FOLLOWS -

PART I - APPLICATION OF BLOCK
PART II - APPLICATION OF MOLDED PIPE COVERING
PART III - APPLICATION OF BLOCK FOR GAS TURBINES

PART I - APPLICATION OF BLOCK

GENERAL: WHERE TEMPERATURE DOES NOT EXCEED 600°F., MATERIAL 4610288 CALCIUM SILICATE BLOCKS SHALL BE APPLIED IN A SINGLE LAYER DIRECTLY TO THE SURFACE BEING INSULATED.

WHEN TEMPERATURE RANGES FROM 601° TO 1050°F., A DOUBLE LAYER OF MATL. 4610288 BLOCK INSULATION SHALL BE USED.

OVER 1050°F., A DOUBLE LAYER CONSISTING OF MATERIAL 4608144 (INNER) AND 4610288 (OUTER) 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 4611084 CEMENT.
7. COVERING PIPES OF LARGE DIAMETER.

1. SELECTING, CUTTING AND FITTING BLOCKS.

BLOCK SHAPES SHALL BE SELECTED TO CONFORM AS [illegible] 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 [illegible] 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 [illegible] ARE PERMISSIBLE. IN SUCH CASES, THE INSULATION BLOCKS SHALL BE [illegible] OVER A THIN COATING OF INSULATION CEMENT MATERIAL 4611084 APPLIED DIRECTLY TO THE SURFACE OF THE PART. BLOCKS SHALL BE APPLIED WHILE THE CEMENT IS WET.

WHERE SEVERAL LAYERS OF BLOCK ARE REQUIRED, THE JOINTS OF THE TOP LAYER SHALL BE STAGGERED [illegible] TO THE INNER LAYER. EACH LAYER SHALL BE WIRED DOWN TO THE ANCHOR POINTS AND ALL JOINTS AND OPENINGS FINISHED WITH CEMENT MATERIAL 4611084.

2. ATTACHING ANCHOR POINTS

ON ALLOY STEEL CASTINGS OR FORGINGS, AT POSITIONS SHOWN ON CYLINDER AND OTHER INSULATION [illegible] DRAWINGS, INSULATION PADS TO STYLE NUMBER 270[illegible]01 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 2380091H01, SHALL BE WELDED TO THE INSULATION PADS AND 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 OF FLAT SURFACES.

3. ATTACHING RETAINING WIRES

FOR SERVICE TEMPERATURES UP TO 900°F., SOFT GALVANIZED OR BLACK STEEL WIRE, MATERIAL 1013082, OF 16 GAGE SIZE SHALL BE USED FOR RETAINING WIRES. FOR SERVICE TEMPERATURES ABOVE 900°F., STAINLESS STEEL WIRE, .062 DIA., OF 1073008 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 15.00 INCHES.

ON LARGE SURFACES 20 GAGE POULTRY NETTING SHALL BE FASTENED OVER BLOCK TO ANCHOR FINISH CEMENT.

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 SHALL BE COVERED WITH BLANKETS AS SHOWN IN FIGURE 1. (SEE PROCESS SPEC. 600[illegible].)

ON SPECIAL INSTALLATIONS, BLOCKS MAY BE REQUIRED FOR JOINT [illegible]. IN SUCH CASES, THE JOINT SHALL BE PROTECTED BY A [illegible] OF [illegible] SHEET STEEL, MATL 1030144 REINFORCED WITH SUITABLE ANGLES TO ASSURE RIGIDITY OR AS PROVIDED IN PROCESS SPEC. 600[illegible]. BLOCKS SHALL THEN BE APPLIED TO THE PROTECTING SURFACE.

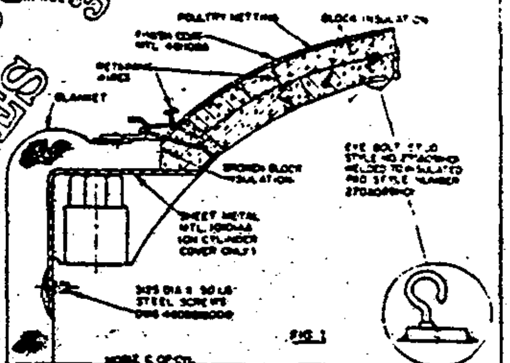
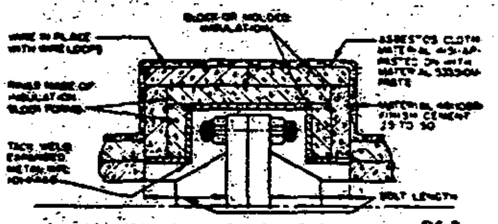


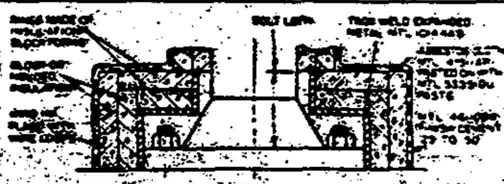
FIG. 1

5. COVERING PIPE FLANGES

WHEN PIPE FLANGES 6.00 IN. AND OVER ARE INVOLVED COVER THEM WITH EXPANDED METAL COVERS AND INSULATE AS SHOWN ON FIGURES 2 AND 3 AND AS DESCRIBED IN PART II OPERATION 7.



APPLICATION OF INSULATION TO MATING FLANGES FIG. 2



APPLICATION OF INSULATION TO SINGLE FLANGE FIG. 3

CONF[illegible] PROCESS SPECIFICATION

APPLICATION OF BLOCK AND MOLDED INSULATION

6. PATCHING, FILLING AND FINISHING WITH 461108A MATERIAL

INSULATION CEMENT MATERIAL 461108A SHALL BE USED WITH 314A OR 461028B BLOCK FOR PATCHING, FILLING IRREGULAR AREAS FOR APPLYING THE FINISHING COAT .25 TO .50 INCH THICK, OVER FINAL LAYER OF BLOCK.

MATERIAL 461108A IS APPLIED BY MIXING WITH A MINIMUM AMOUNT OF WATER TO PRODUCE A STIFF MIX AND THEN TROWELING IN PLACE.

7. COVERING PIPES OF LARGE DIAMETER

LARGE PIPES (OVER 13 IN.) SHALL BE COVERED AS PREVIOUSLY DESCRIBED IN OPERATIONS 1 AND 3 WITH BLOCK INSULATION AND FINISHED AS DESCRIBED IN PART II, OPERATION 4.

PART II - APPLICATION OF MOLDED PIPE INSULATION

GENERAL. MATERIAL 4660[illegible]A, HI-TEMP. PIPE INSULATION AND MATERIAL 54[illegible]SIAH SILICATE PIPE INSULATION ARE MOLDED TO FIT STANDARD PIPE SIZES. MATERIAL 46[illegible]COLOA CONSISTS OF A SINGLE LAYER OF HI-TEMP. INSULATION IN SIZES UP TO 1.50 IN., [illegible] AND A DOUBLE LAYER OF A HI-TEMP, AND A SILICATE INSULATION IN SIZES OVER 1.50 IN.)

OPERATIONS
1. SELECTING AND FITTING PIPE INSULATION.
2. COVERING PIPE FLANGES.
3. SECURING INSULATION.
4. FINISHING.

1. SELECTING AND FITTING PIPE INSULATION.
STRAIGHT PIPE SECTIONS

ON STRAIGHT SECTIONS OF PIPE, SPLIT CYLINDRICAL MOLDED SECTIONS OF PIPE INSULATION SHALL BE USED. EACH LAYER SHALL BE INDIVIDUALLY APPLIED ONE OVER THE OTHER, UNTIL THE SPECIFIED THICKNESS HAS BEEN ATTAINED. THE END JOINTS BETWEEN SECTIONS SHALL BE TIGHTLY BUTTED IN EACH LAYER, AND THE LONGITUDINAL JOINTS FROM SECTION TO SECTION SHALL BE STAGGERED AND [illegible] DRAWN TOGETHER BY MEANS OF WIRE LOOPS. THE LONGITUDINAL [illegible] CIRCUMFERENTIAL JOINTS FOR EACH LAYER SHALL ALSO BE STAGGERED WITH RELATION TO THE ADJACENT LAYER.

CURVED PIPE SECTIONS

ON CURVED SECTIONS OF PIPE USE SPLIT, MOLDED CURVED PIPE INSULATION WHEN AVAILABLE, AND WIRE IN PLACE.

WHEN CURVED SHAPES ARE NOT AVAILABLE, SHORT LENGTHS OF STRAIGHT MOLDED PIPE INSULATION OR BLOCK MAY BE USED. THESE SHALL BE WIRED IN PLACE OVER A WET LAYER OF CEMENT MATERIAL 461108A APPLIED DIRECTLY TO THE PIPE S[illegible] WHEN SUCH IRREGULAR SHAPES ARE USED. THE OUTSIDE SURFACES SHALL BE FINISHED NEATLY AND SMOOTHLY, USING [illegible] CEMENT TO PRODUCE THE DESIRED RESULTS.

2. COVERING PIPE FLANGES

PIPE INSULATION SHALL BE STOPPED A SUFFICIENT DISTANCE FROM FLANGES TO ALLOW ACCESS TO AND REMOVAL OF FLANGE BOLTS OR TO ALLOW FOR FLANGE INSULATION THICKNESS, WHICHEVER IS GREATER.

PIPE FLANGES FOR [illegible] AND [illegible] SHALL BE PROTECTED WITH EXPANDED METAL COVERS MTL. [illegible] BEFORE APPLYING INSULATION AS SHOWN IN FIG. [illegible] AND 3 AS FOLLOWS:-

FIT EXPANDED METAL COVERS MADE IN A MINIMUM OF TWO SECTIONS AROUND THE FLANGE. BUILD UP SECTIONS WITH BLOCK OR MOLDED PIPE INSULATION TO DESIRED THICKNESS. (SECTIONS NOT TO EXCEED 40 LBS.) [illegible] SECTIONS [illegible] FLANGE AND TIE TOGETHER WITH MTL. 107300[illegible] WIRE EXPOSING THE WIRES AT SECTION JOINTS IN ORDER TO FACILITATE DISMANTLING.

ON PIPE FLANGES UNDER [illegible] IN. INSULATE AS SHOWN IN FIG. 4.

PATCH, FILL AND FINISH ALL OPENINGS AND JOINTS WITH CEMENT MTL. 461108A AS DESCRIBED IN OPERATION 4.

3. SECURING INSULATION

PIPE INSULATION SHALL BE SECURED IN PLACE BY MEANS OF WIRE LOOPS OF SOFT STEEL 16 GAGE WIRE, MATERIAL 101308J, FOR TEMPERATURES UP TO 300°F. AND WITH STAINLESS STEEL .0[illegible] DIA. WIRE, MATERIAL [illegible] FOR TEMPERATURES OVER 300°F. WIRE LOOPS SHALL BE TWISTED TOGETHER AND LEFT IN A MANNER TO PREVENT SNAGGING. THE PITCH BETWEEN LOOPS SHALL NOT EXCEED 12.00 INCHES.

4. FINISHING

INSULATION CEMENT, MATERIAL 461108A, SHALL BE USED FOR FITTING, PATCHING AND FINISHING PIPE INSULATION.

WHEN PIPE INSULATION IS SECURED IN PLACE, FILL ALL JOINTS AND OPENINGS WITH CEMENT 461108A MIXED WITH A MINIMUM OF WATER TO PRODUCE A STIFF MIX. TROWEL IN PLACE UNTIL A SMOOTH NEAT APPEARANCE IS OBTAINED.

PIPING SHALL BE COVERED WITH 12 OUNCE PER SQUARE YARD ASBESTOS CLOTH (MATERIAL 415112AP) PASTED ON WITH MATERIAL 9335100 PASTE. A FINAL COAT OF PASTE SHALL BE APPLIED OVER THE ASBESTOS CLOTH.

ON CROSS-OVER PIPES, WHEN PASTE IS DRY, PAINT SHALL BE APPLIED IN ACCORDANCE WITH FINISH SPECIFICATION 116C.

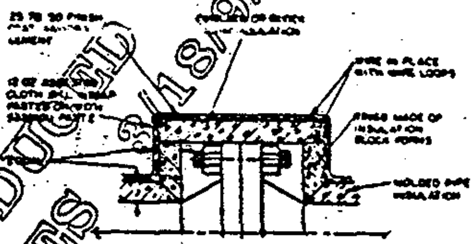


FIG. 4

PART III - APPLICATION OF BLOCK FOR GAS TURBINES

THIS PART IS THE SAME AS PART I EXCEPT AS FOLLOWS:-

1. A SINGLE THICKNESS OF BLOCK INSULATION MTL. 461028B IS TO BE USED IN ALL CASES.
2. WHEN BLOCK INSULATION IS SECURED IN PLACE, FILL ALL JOINTS AND OPENINGS WITH CEMENT MTL. 461108A MIXED WITH A MINIMUM OF WATER TO PRODUCE A STIFF MIX. TROWEL IN PLACE UNTIL A SMOOTH NEAT APPEARANCE IS OBTAINED.

   THE BLOCK SHALL THEN BE COVERED WITH 12 OZ. PER SQ. YD. ASBESTOS CLOTH MTL. 415112AP PASTED ON WITH MTL. 9335100 PASTE. A FINAL COAT OF PASTE SHALL BE APPLIED OVER THE CLOTH.
3. WHERE RIBBED MEMBERS ARE TO BE INSULATED CUT BLOCK AS SHOWN BELOW:-

CUT BLOCK LOCALLY TO ACCOMMODATE RIBS

WESTINGHOUSE ELECTRIC CORPORATION, LESTER, PA. U.S.A.
STEAM DIVISIONS — STANDARDS ENGRG.