

WJL R+B 1990

JOHNS-MANVILLE RESEARCH CENTER
Manville, New Jersey

BASIC RESEARCH AND TESTING
INTERNAL REPORT

PLAINTIFF'S
EXHIBIT
K-1499

Requested by: K. F. Greene

Report No. 433-R3b-30

Problem No. 65-433-13

Date: May 26, 1949

Subject: EXPERIMENTAL WOVENSTONE PIPE INSULATION - Thermal Conductance

Report:

Material:

A sample of Experimental Wovenstone Pipe Insulation consisting of two 3' sections for use on a 2" diameter pipe was received from the Insulations and Refractories Group for thermal conductance test 1-24-49.

The insulation was composed of a weatherproofed asbestos cloth wrapper lined with a filler of amosite, chrysotile and rayon fibers woven together with asbestos yarn into slivers. Eleven of the slivers formed the filler for the two inch pipe size.

The wrapper or jacket was provided at each end of the longitudinal joint with a flap to close the joint against ingress of water.

A flap or overlap was also provided circumferentially for water protection. The covering was held on the pipe by copper wire laced across the hooks provided on the covering.

Dimensions and weights of the sections were:

<u>Sample</u>	<u>Section I</u>	<u>Section II</u>
<u>Dimensions - inches</u>		
Wrapper	37.50 x 14.37 x 0.10	37.00 x 14.50 x 0.10
Wrapper overlap (flap)	37.50 x 3.25 x 0.10	37.00 x 3.25 x 0.10
Filler	35.75 x 13.00 x 1.03	35.92 x 13.00 x 1.10
Total sample weight - lbs	4.59	4.78

DEFENDANT'S
EXHIBIT

OE-70

MVL R & D 1990

RECEIVED

NOV 16 1948

RESEARCH LABORATORY
I & R SECTION

Mr. W. L. Stafford
Manville Research

Division Headquarters
November 15, 1948

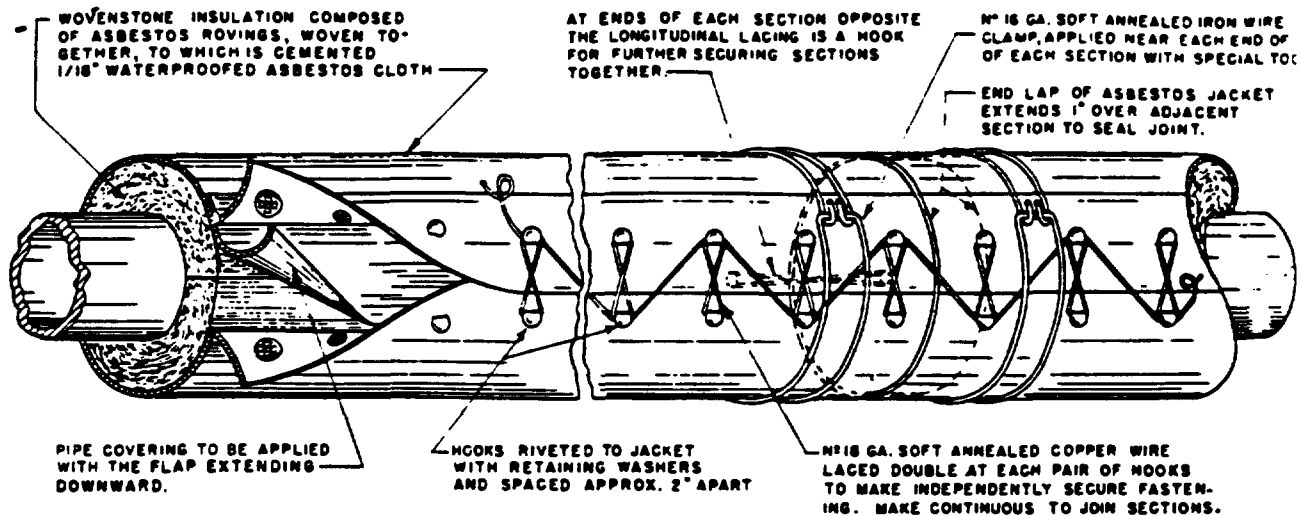
Re: Wovenstone and Insutape

In accordance with our conversation when I was at Manville on November 3rd, I am sending you herewith three copies of our drawings R-12755 and R-12761, showing Wovenstone and Insutape application.

C. E. Bryant, Jr.

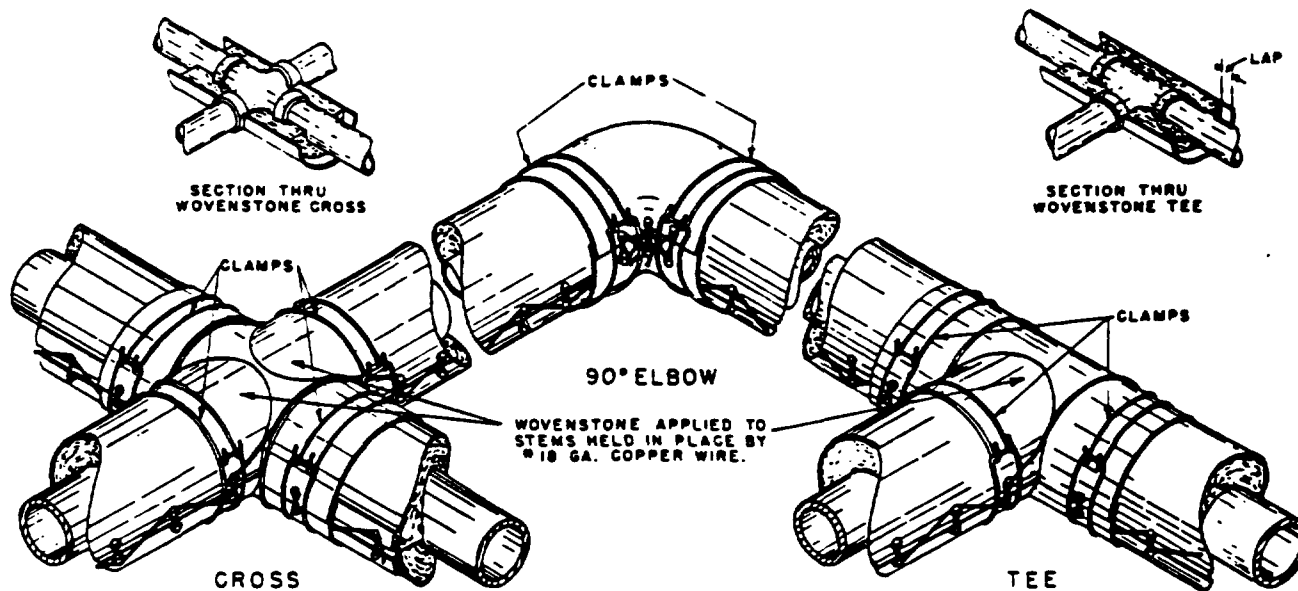
CC

Mr. H. T. Coss, Manville Research
Mr. R. P. Townsend
File

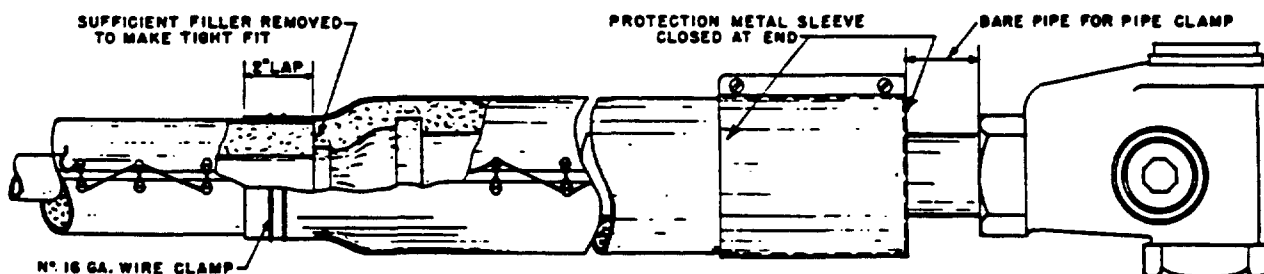


WOVENSTONE FOR SATURATED STEAM PIPE INSULATION

TEMPERATURE LIMIT 450° F.



APPLICATION OF WOVENSTONE FITTINGS, ELLS, TEES, & CROSS



APPLICATION OF WOVENSTONE TO REDUCING FITTINGS

RECOMMENDED METHOD FOR PROTECTING INSULATION AT ENDS OF STEAM PIPE

JOHNS-MANVILLE

TRANSPORTATION DEPARTMENT

WOVENSTONE & H.T. WOVENSTONE PIPE COVERING

DATE: 8-17-43
REVISIONS
A-2-19-48

DRAWN BY: G.
APPROVED: E.

FORMER NO. R-87

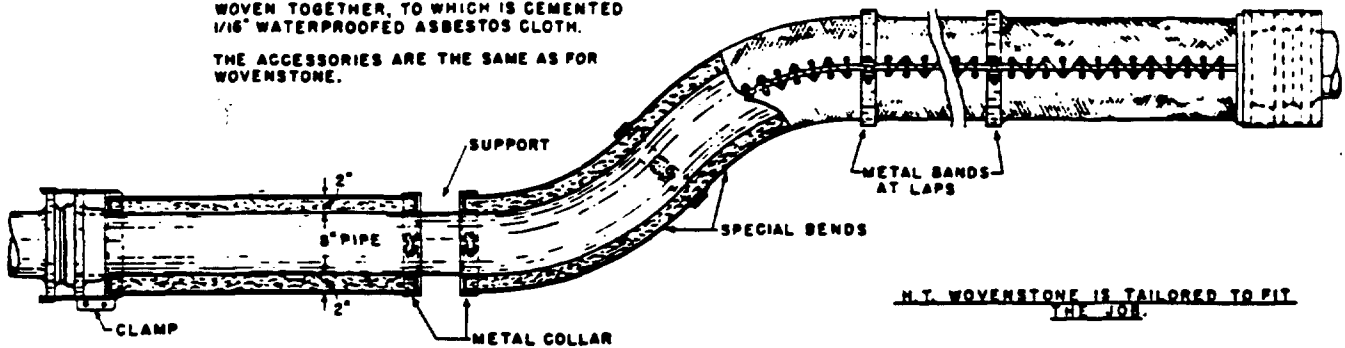
R-12755

A

85D

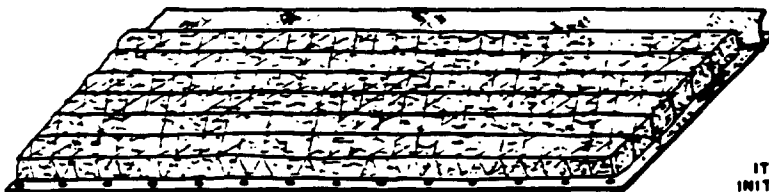
WOVENSTONE INSULATION COMPOSED OF HIGH TEMPERATURE ASBESTOS ROVINGS, WOVEN TOGETHER, TO WHICH IS CEMENTED 1/16" WATERPROOFED ASBESTOS CLOTH.

THE ACCESSORIES ARE THE SAME AS FOR WOVENSTONE.



H.T. WOVENSTONE FOR SUPERHEATED STEAM PIPE INSULATION TEMPERATURE LIMIT 900°F.

APPLICATION INSTRUCTIONS



WOVENSTONE & H.T. WOVENSTONE

THE WOVENSTONE AND H.T. WOVENSTONE ARE FURNISHED IN FLAT SHEETS IN STANDARD 3'-FOOT LENGTHS. THEREFORE IN ORDER TO FACILITATE APPLICATION THE FLAT SHEET SHOULD BE TIGHTLY ROLLED UP LONGITUDINALLY TO ADAPT IT TO THE CONTOUR OF THE PIPE. WHEN THE INSULATION IS TO BE APPLIED TO BENDS, ADDITIONAL FLEXIBILITY IS DESIRED, AND THIS MAY BE OBTAINED BY ALSO ROLLING IT UP TRANSVERSELY AND FURTHER REMOVING ANY INITIAL STIFFNESS. APPLY THE INSULATION TO THE PIPE AS SHOWN ABOVE. CAUTION SHOULD BE TAKEN TO HOLD THE INSULATION IN PLACE AND PROPERLY CLOSE THE LONGITUDINAL LAP JOINT AHEAD OF THE LACING TOGETHER, OF THE HOOKS. WHEN NECESSARY TO CUT THE WOVENSTONE, OBTAIN A BOX WITH A 3/16" WIDE SLOT, LAY INSULATION FLAT ON BOX WITH JACKET SIDE UP AND USE KNIFE WORKING UP AND DOWN AS A SAW THROUGH THE SLOT.

AFTER THE INSULATION IS LACED ON, APPLY THE WIRE CLAMPS WITH THE CLAMPING TOOL AS FOLLOWS. PLACE WIRE CLAMP ON JACKET AND HOLD WITH THUMB. WITH OTHER HAND, BEND WIRE AROUND JACKET AND PUSH ENDS THROUGH LOOP. FIGURE -1.

NEXT INSERT THE ENDS OF THE WIRE CLAMP IN HOLE IN REVOLVING MEMBER AND PULL NOSE OF TOOL UP AGAINST THE LOOP OF THE WIRE CLAMP BY TURNING VICE HANDLE. TURN VICE HANDLE FURTHER UNTIL REQUIRED TENSION IS OBTAINED. SEE FIGURE -2.

THEN REVOLVE TOOL AROUND JACKET SUFFICIENTLY TO BEND WIRE TO SET CLAMP. RELEASE TOOL, CUT OFF WIRES AND HAMMER OVER TO FINISH LOCK AS SHOWN FIG. 3

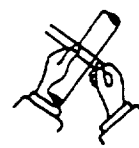


FIG. -1

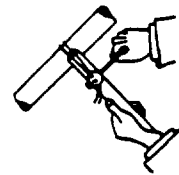


FIG. -2

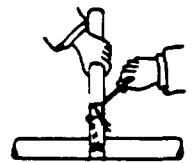


FIG. -3

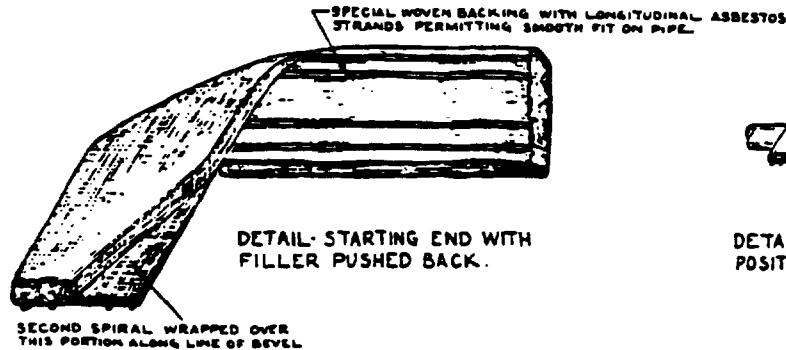
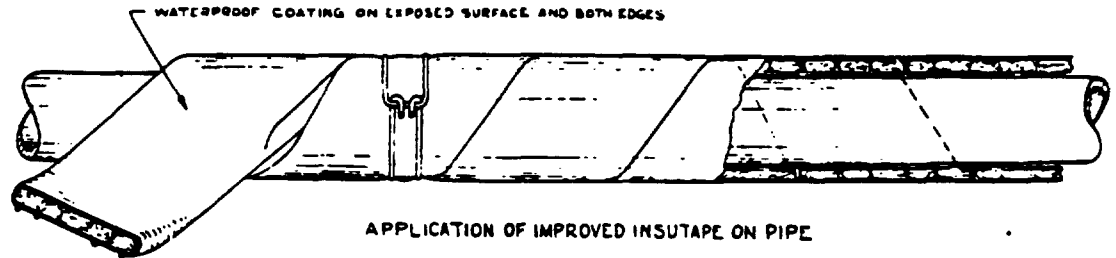
MATERIALS

WOVENSTONE

WOVENSTONE IS FURNISHED STANDARD IN SHEETS OF 1", 1 1/2" AND 2" THICKNESS AND LENGTHS OF 3'-0" TO FIT 3/4" TO 8" IRON AND STEEL PIPE AND 1/4" TO 3" BRASS AND COPPER TUBING. IN 1" THICKNESS ONLY FOR 1/8", 1" AND 1 1/2" BRASS AND COPPER. 90° AND 45° ELLS, TEES, AND CROSSOVER FITTINGS ARE FURNISHED AS SHOWN IN SIZES AS ABOVE. THE WIRE CLAMPS FOR THE VARIOUS SIZE PIPES, THE CLAMPING TOOL AND THE LACING WIRE ARE ALSO AVAILABLE.

H.T. WOVENSTONE

H.T. WOVENSTONE IS FURNISHED STANDARD IN SHEETS OF 1 1/2" TO 2 1/2" THICKNESS AND LENGTHS OF 3'-0" TO FIT IRON AND STEEL PIPE SIZES. THE INSULATION IS FURNISHED IN SPECIAL LENGTHS AND VARIOUS SHAPES AND FITTINGS AS MAY BE REQUIRED FOR A PARTICULAR INSTALLATION.



DETAIL-IMPROVED INSUTAPE IN STARTING POSITION SPIRALED LOOSELY ON PIPE

METHOD OF APPLYING UNARCO IMPROVED INSUTAPE

THE STARTING END IS PREPARED BY PUSHING THE INSULATING FILLER TO ONE SIDE IN THE JACKET TO FORM THE BEVEL AS SHOWN WHICH CORRESPONDS TO THE LINE OF SPIRAL. THEN CLAMP THE STARTING END AND PULL AS TIGHTLY AS POSSIBLE SEVERAL SPIRALS. THEN WITH A BLOCK OR BOARD TAP IN THE DIRECTION OF THE WRAPPING TO TIGHTEN THE INSUTAPE AROUND THE PIPE AND EVEN THE OUTER SURFACE. THEN PULL TIGHT SEVERAL MORE WINDINGS AND REPEAT THIS PROCESS UNTIL EXPOSED SURFACE OF PIPE IS COVERED.

APPLY CLAMP TO HOLD MATERIAL SECURELY AT THE FINISHING END AND ADDITIONAL CLAMPS ABOUT 2 FT. APART. IN ORDER TO SQUARE INSUTAPE AT THE FINISHED END, THE FILLER IS PUSHED OVER IN THE SAME MANNER AS AT THE STARTING END AND THE JACKET TURNED UNDER. TO CONNECT A NEW ROLL OF INSUTAPE TO THE END OF THE ROLL BEING WRAPPED, PUSH BACK FILLER INTO JACKET APPROXIMATELY 2 INCHES, AND INSERT NEW ROLL INTO THIS SPACE AND PROCEED AS ABOVE.

FOR GENERAL PIPING CONDITIONS USE 2 1/2" x 3/4" IMPROVED INSUTAPE AND FOR SMALLER SIZE PIPES AND SHARP CURVES USE 2" x 1/2", 1 1/2" x 3/4" AND 1 1/2" x 1/2".

SIZES OF IMPROVED INSUTAPE	SIZES OF PIPE											
	3/8"	1/2"	3/4"	1"	1 1/4"	1 1/2"	2"	2 1/2"	3"	3 1/2"	4"	5"
2 1/2" x 3/4"		1.73'	1.99'	2.34'	2.86'	3.12'	3.81'	4.51'	5.37'	6.07'		
2" x 1/2"	1.52'	1.78'	2.13'	2.53'	3.14'	3.55'	4.26'					
1 1/2" x 3/4"	1.83'	2.16'	2.61'	3.14'	3.92'	4.45'	5.36'					
1" x 1/2"	2.00'	2.42'	2.88'	3.47'								

TABLE SHOWING APPROX. NO. OF LINAL FT OF MATERIAL PER ONE FT OF PIPE. NOTE: ALLOWANCE MUST BE MADE FOR CURVED PIPE, BEVELLING ENDS, & JOINING ROLLS ETC.

METHOD OF APPLYING WIRE CLAMP



FIG. 1

WIRE CLAMP IS FIRST PLACED AGAINST INSUTAPE AND BENT AROUND THE INSULATION. THE ENDS OF THE WIRE CLAMP BEING PUSHED THROUGH THE LOOP.

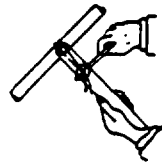


FIG. 2

THE TOOL IS THEN APPLIED- THE ENDS OF THE WIRE CLAMP BEING INSERTED IN THE HOLE IN THE REVOLVING MEMBER AND THE NOSE OF THE TOOL PULLED UP AGAINST THE LOOP OF THE WIRE CLAMP BY TURNING THE VISE HANDLE. CLAMP IS THEN TIGHTENED TO THE REQUIRED TENSION BY FURTHER TURNING OF THE VISE HANDLE.

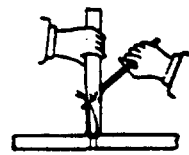


FIG. 3

THE TOOL IS THEN REVOLVED AROUND THE PIPE SUFFICIENTLY TO BEND THE WIRE OVER TO HOLD CLAMP FROM SLIPPING. THE TOOL IS RELEASED BY TURNING BACK ON THE VISE HANDLE. WIRES ARE THEN CUT OFF AND ENDS HAMMERED OVER.

JOHNS-MANVILLE

TRANSPORTATION DEPARTMENT

METHOD OF APPLYING UNARCO IMPROVED INSUTAPE

DATE: 9-22-48
REVISIONS

DRAWN BY:
APPROVED:

FORMER NO. 88

R-12761

MVL R + b 1990

Report 457-345
Problem 51-457
August 18, 1948

Johns-Manville Research Center
Manville, New Jersey

STYLE 1342 ASBESTOS TUBE INSULATION
COMPLAINT ON WEAR RESISTANCE OF COATING

RECEIVED

AUG 18 1948

RESEARCH
LABORATORY

-1-
-SUMMARY-

The Sales Department was in receipt of a complaint concerning the coating on factory-made Style 1342 asbestos tube insulation. It was reported that the coating tended to wash off when subjected to the severe action of steam, water and cleaning compounds as used for washing locomotives. Research was asked to supply samples of an improved product.

As covered by this report, laboratory tests were conducted on factory-made material versus a heavily coated sample prepared in the laboratory. The tests consisted of subjecting the test specimens to a jet of steam for approximately 50 hours with intermittent immersions in kerosene and Oakite solutions. No pronounced wear of the coating could be noted after the tests.

Since the severe tests described above did not disclose any lack of resistance to steam, oil or caustic in our standard product, it is believed that the field failure on the Union Pacific was (a) the result of some unusual service condition not reported in correspondence, or (b) due to an off-standard lot of tubing.

Work on this project has been discontinued pending clarification of the problem.

APPROVED BY:

H. G. Koch

REPORTED BY:

E. Poltorak

APPROVED BY:

R. T. Halstead

lvp

This report consists of Summary (1) and Test Data (2).

C. F. Rassweiler, GH
A. Cromwell, GH
E. R. Williams ✓
W. L. Stafford
H. R. Poulson, DHQ (1)
H. J. Landis, DHQ (1)
P. D. Cannon
E. G. Carlson
F. L. Hess (2 copies)
J. R. Robson
H. Hinsenkamp
R. Jacobs
E. C. Lindstrom, GH
J. S. Crawford, GH
File 4335

Memorandum No. R-97
Thermal Insulations and
Textile Research
J-M Research Center
Manville, New Jersey
July 27, 1948
File 4335
CR 461

G. F. Hunt's Visit to Manville
July 22, 1948

On July 22, 1948 Mr. G. F. Hunt of our New York office visited the Textile Section of the Research Laboratory mainly to discuss, with Messrs. I. Barnett and the writer, the possibilities of changing the present construction of Insutape so that present royalties, or licensing fees, paid to Union Asbestos Company can be eliminated.

The following subjects were discussed:

A. Insutape

1. Inner filler
 - (a) Possibility of braiding and knitting this filler
 - (b) Possibility of waterproofing the filler with Neoprene, Permal, etc.
2. Outer Sheathing
 - (a) Possibility of braiding or knitting.
 - (b) Possibility of treating the complete outer surface (front and back when flat) rather than one side (front when flat), as is now done.

Samples of filler and sheathing treated various ways were inspected, and it was suggested to Mr. Hunt that if further research work was needed a request be forwarded for whatever assistance is needed.

B. Redesign of Twisters in Canadian Plant

In order to increase production, reduce waste, and improve quality the Canadian plant would like to increase the size of the yarn package on the twister spindle.

We are of the belief that these twisters were originally at our Waukegan Plant and are 30 to 40 years old, or more. Apparently the yarn is wound directly on the spindle of the twister and a filling wind (cam) is used.

It was suggested that Mr. Hunt forward us the following information and we would get additional information from the machine builder and present change over suggestions to him in a letter or report:

1. Make of machine
2. Serial No. and date of installation, if possible (generally found on small name plate)
3. Diameter of ring
4. Gauge of machine (distance between spindles)
5. Sample of present full package made

July 27, 1948

C. Dyeing of Asbestos Fiber, Roving, and Yarn

This subject was discussed in a general way, and it was finally agreed that we would experiment with the package dyeing of roving, either 8 or 10 cut, when possible to do so. We will notify Mr. Hunt of the results.

D. Nylon (210 denier) for Core Strand in Asbestos Roving and Yarn

Nylon (210 denier) strand is now used to reinforce certain rovings and yarns, at the Canadian Plant, but the nylon is of a slippery nature, thus, causing the outer roving to slide resulting in skips or bunches on the end product of customers. At present it is necessary to combine a cotton strand with the nylon to reduce or eliminate the slipping of the outer covering (roving). This increases the cost of production. The Manville Textile Plant are investigating the use of nylon as a core strand and have run into the slippery characteristics of nylon.

1. It may be possible to neutralize the slipperiness of the nylon by adding, at increased cost, a twisting process where some of the filaments are broken by stretching or by means of emery or carborundum in the thread eye. The latter appears most practical.
2. It was suggested that the use of Syton (Monsanto), or Indox (DuPont) be investigated as a means of neutralizing the slippery characteristics of the nylon; either by spraying or strand wetting. These are colloidal silica products.

Manville Plant plans to experiment with this and the results will be forwarded.

E. Sizing of Warp Yarns to Improve Weaving

This subject was discussed in a general way. There is a possibility that sizing of warp yarns will improve weaving. We have had that belief for some time but to really experiment or investigate this the purchase of Sizing equipment would be necessary. It is hoped that between our present scheduled experiments and investigations we can carry on inexpensive investigations along this line.

/lvp

J. L. Tucker
J. L. Tucker

cc: K. W. Haffine, GH
V. C. Kline, GH
G. F. Hunt, GH
E. R. Williams
H. T. Coss
File
Project No. 106

MVA R + S 1990
RESEARCH LABORATORY
JOHNS-MANVILLE
MANVILLE, N. J.

REPORT NO. 433-TB-31
PROBLEM NO. 65-481-13
DATE 2-5-48

REQUESTED BY: R. C. Parlett
SUBJECT: THERMOFLEX TAPE - Thermal Conductance

SUMMARY:

Thermoflex Tape, 1-3/4" nominal diameter, composed of M1 Amosite Fiber encased in .0045" Knitted Inconel Mesh was tested and found to have a thermal conductivity of 0.54 to 0.74 Btu in. per hr per sq ft per F deg over a 200 to 600F mean temperature range.

Thermal conductance for the two layer 1.62" thick tape was 0.47 to 0.65 Btu per hr per sq ft per F deg over the same range.

The addition of a thin coat of J-M 302 Cement over the tape did not appreciably change the conductance values, and with additional tape layers, the effect could be disregarded.

* * * * *

This report consists of (1) Summary and (2) Detailed Investigation.

at

cc: G. E. Grimshaw, GH (1,2 & 1)
C. F. Rassweiler, GH
S. Collier, GH (1)
E. C. Lindstrom, GH
H. T. Coss (1)
W. L. Stafford
K. Greene
J. S. Parkinson
E. R. Williams
File: 43322

APPROVED

E. R. Williams
S. E. WILLIAMS

REPORT BY

J. N. Anderson
J. N. ANDERSON

MVt R + D 1990

Johns-Manville Research Center

TAPE INSULATION FOR STEAM PIPING ON
RAILROAD ROLLING STOCK

Report No. 433-45
Product Code No. 43-433-13
September 12, 1949

I. SUMMARY

The Transportation Department requested the development of a product suitable for insulating various small sizes of piping on railroad rolling stock by spiral wrapping, which could replace the Insutape presently manufactured for us by Union Asbestos and Rubber Company, and which could be sold competitively with that product.

The Textile Section of Research designed a tape having an asbestos fabric jacket partially coated with a rubber compound and filled with a Thermoflex pad.

Manville Industrial Products Plant developed and modified the product to adapt it to a satisfactory production basis and within the allowable cost as contained in SPR No. IN-87.

Results of tests on samples of the tape made at Manville Plant indicate that this new product has far greater heat resistance than Insutape as made by Union Asbestos and by Canadian J.M. on the basis of retention of filler during exposure at service temperatures as well as at accelerated heat exposure. In addition, the new tape has a flap which is used for overlapping adjacent coils when wrapped on pipe. This should improve the weather resistance of the product by preventing the possible passage of water between coils.

* * * * *

APPROVED BY

J. L. Tucker
J. L. Tucker

REPORTED BY

Irvin Barnett
Irvin Barnett

THIS REPORT CONSISTS OF

- I. SUMMARY
- II. INTRODUCTION
- III. DESCRIPTION OF INVESTIGATION
- IV. APPENDICES
 - A. PHOTOGRAPHS OF PRODUCT AND METHOD OF APPLICATION
 - B. HEAT RESISTANCE TESTS
 - C. CONSTRUCTION DATA
 - D. COST DATA

Mvt R + D 1990

JOHNS-MANVILLE RESEARCH CENTER
MANVILLE, N. J.

Report No. 433-42
Product Code No. 42-433-13
Date 10-14-49

Requested by: SPR - IM81

Subject: INSULATION FOR STEAM TRAIN LINES ON
RAILROAD ROLLING STOCK. PRODUCT PROPOSAL MVL 110-PP-55

I. SUMMARY

The development of a product which could be sold competitively with Wovenstone, which is manufactured by Union Asbestos & Rubber Company and sold by Johns-Manville, was requested in SPR IM-81.

The Insulations & Refractories Section of Research developed a product which had satisfactory properties but was too expensive to manufacture, based on a class "A" cost estimate.

Manville Industrial Products Plant has developed a satisfactory product using textile methods and has issued Product Proposal MVL 110-PP-55.

(Original data in Notebook No. ATI23, pages 95 - 98. Refer. IR-137)

- - - - -

This report consists of: I. SUMMARY
II. INTRODUCTION
III. DETAILED INVESTIGATION
APPENDIX A THERMAL CONDUCTIVITY
APPENDIX B PHOTOGRAPHS

bg

C. F. Rassweiler, GH
R. P. Townsend, GH
C. E. Bryant, GH
R. C. Parlett, GH (I, II & I)
P. D. Cannon, Manville
R. Jackson, Manville
E. G. Carlson, Manville
E. R. Williams
H. T. Coss
File 4335

(Approved by) W. L. Stafford (Reported by) K. F. Greene
W. L. STAFFORD K. F. GREENE

MVL R & B 1990
RESEARCH LABORATORY
JOHNS-MANVILLE
MANVILLE, N. J.

REPORT NO. 433-11

PROBLEM NO. 03-IP-042

DATE 3-25-47

REQUESTED BY: R. C. Parlett
SUBJECT: FINISH COAT FOR THERMOFLEX TAPE

SUMMARY:

Tests have shown that standard finishing coat cements such as #302 or #352, alone or with Portland cement added, can be used as a finish coat for Thermoflex insulation. Because of the fact that it sets up to a firm layer, cold, and will heat dry to a strong, smooth coat a mixture of equal parts of #302 and Portland cements with 165 percent of water, applied one quarter inch thick, was found to be especially satisfactory.

This report consists of: I. SUMMARY and II. DETAILED INVESTIGATION

(Refer. IR-41)

bg

G. E. Grimshaw - GH (I, II & I)
E. H. Wells - GH
C. F. Rassweiler - GH
E. R. Williams
H. T. Coss
S. E. Williams
File
4333-Fla

APPROVED

W. L. Stafford
W. L. STAFFORD

REPORT BY

Pierre van Dyck
PIERRE VAN DYCK

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Box 6

all



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