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RESEARCH LABORATORY
JOHNS-MANVILLE
MANVILLE, N. J.

REPORT NO. 21-6481
PROBLEM NO. 3-LP-074
DATE 10-20-44

REQUESTED BY: P. F. McDermott

SUBJECT: EXPERIMENTAL AMOSITE PIPE INSULATION - Physical Properties. Compliance with U. S. Navy Specification 32-P-8.

SUMMARY

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The subject material throughout the density range of 11.5 to 16.2 lb per cu ft met the physical requirements of Navy Specification 32-P-8, Grade II, 6-1-44. In fact, the results for 24 hours at 1000 F are within the requirements for 6 hours at 750 F. In two instances the material was too soft after heat treatment, but the other 4 groups met the specification in hardness.

The specimens made using in part the scrap from the previous run, for which a virgin mix was used, appeared to be as satisfactory as the first run material.

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

jh

CC - P. F. McDermott
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File.

PLAINTIFF'S EXHIBIT 1822 ALL-STATE LEGAL SUPPLY CO.

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2. DETAILED INVESTIGATION:

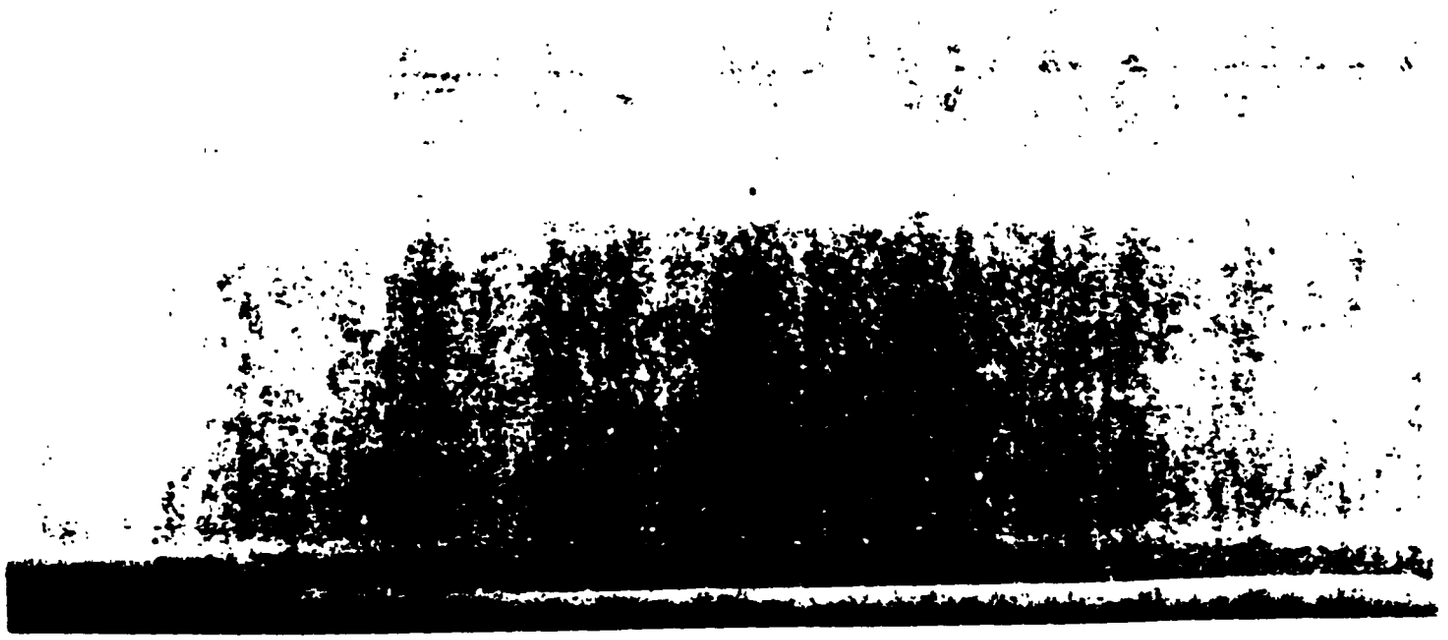
Material

Of Amosite Pipe Insulation made from a virgin mix, 1 section of 12" diameter 1" thick and 5 sections of 3" diameter, 1" thick, were submitted by P. F. McDermott on June 20, 1944 for test; of the 5 sections of 3" size, 3 were of approximately 11.8 lb, 1 of 13.5 lb, and 1 of 16.2 lb per cu ft density.

Three sections of 3" diameter, 1" thick material made using in part scrap from the previous run were submitted on June 24th. Of these, 1 section had a density of 11.7 lb per cu ft, the other 2 of 13.8 lb per cu ft, as received.

Tests

Complete physical tests, covering all the items in Navy Specification 32-P-8, 6-1-44, Grade II, were run on the 3" diameter, 1" thick samples. Since there was only 1 section of 12" diameter, 1-1/2" thick material available, it was not cut up but checked only for dimensions and density.



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2. DETAILED INVESTIGATION-Cont'd.

Physical Properties of Experimental Amosite Pipe Insulation Mfd. f

Test	No. of Samples Tested Each Section	12" Diameter, 1½" Thick, 12.4# Density, 1 Section Avg	High	Low	3" Diameter, 1" Thick, 11.8# Density, 3 Sections Avg	High	Low	3" Diameter, 1" Thick, 13.5# Density, 1 Section Avg	High	Low	16 Avg
Dimensions-in.											
Length	1	36.0	-	-	36.0	36.0	36.0	36.06	-	-	36.0
Thickness	1	1.57	-	-	1.02	1.16	0.94	1.13	-	-	1.0
I.D.	1	12.7	-	-	3.68	3.70	3.64	3.66	-	-	3.7
Density											
As Received		12.4	-	-	11.8	12.0	11.5	13.5	-	-	16.2
Dried at 235 F											
Abrasion Loss-%											
10 min	2				26.2	28.6	23.8	15.2	16.0	14.5	12.3
20 min	2				52.2	54.5	49.8	30.4	32.0	28.7	24.8
Transverse Strength-psi	3				75	85	54	132	164	107	175
Heat Resistance											
6 Hr at 750 F											
Weight Loss-%	3				2.7	3.1	2.6	2.7	2.8	2.4	2.3
Linear Shrinkage-%	3				.05	.08	.02	0.4	0.6	0.2	0.2
Hardness - 1/4" pt.**											
Before Heating	2				59	-	-	47	-	-	23
After Heating	2				76	-	-	48	-	-	124
24 Hr at 1000 F											
Weight Loss-%	2				3.3	3.4	3.1	3.0	3.1	2.8	3.8
Linear Shrinkage-%	2				0.2	0.4	0.1	0.2	0.4	0.06	0.4
Hardness - 1/4" pt.**											
Before Heating	2				59	-	-	47	-	-	23
After Heating	2				>200	-	-	45	-	-	81
Moisture Absorption											
% by Weight	3				9.4	10.3	8.7	9.4	9.0	6.2	7.2
% by Volume	3				1.7	-	-	2.6	-	-	1.8

*Three times [illegible]

**Expressed [illegible]

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te Pipe Insulation Mfd. from Virgin Mix												
						Same Composition but With Scrap [illegible]						
Diameter, 1" Thick										11.7# Dens y		
13.8# Density, 1 Section			16.2# Density, 1 Section			No. of Samples Tested	13.8# Density, 2 Sections			No. of Samples Tested		Navy Spec. 32-P-8 Grade II, 6-1-44
Avg	High	Low	Avg	High	Low		Avg	High	Low		1 Section	
36.06	-	-	36.0	-	-	2	36.00	36.00	36.00	1	36.0	
1.13	-	-	1.08	-	-	2	0.97	0.98	0.96	1	1.04	
3.66	-	-	3.72	-	-	2	3.59	3.62	3.56	1	3.56	
13.5	-	-	16.2	-	-	2	13.8	13.8	13.8	1	11.7	15.0 max
						2	13.5	13.5	13.5	1	11.5	
15.2	16.0	14.5	12.3	13.1	11.5	1	24.1	-	-	1	27.7	40 max
30.4	32.0	28.7	24.8	25.6	23.9	1	48.1	-	-	1	55.6	70 max
132	164	107	175	217	133	6	83.5	135	60	3	50.0	*
2.7	2.8	2.4	2.3	2.7	1.9	6	2.1	2.5	1.6	3	2.4	10.0 max
0.4	0.6	0.2	0.2	0.3	0.02	6	0.2	0.4	0.1	3	0.3	2.0 max
47	-	-	23	-	-		-	-	-		-	60 max
48	-	-	124	-	-		-	-	-		-	90 max
3.0	3.1	2.8	3.8	3.8	3.7	6	3.1	3.9	2.8	3	3.1	
0.2	0.4	0.06	0.4	0.5	0.3	6	0.4	0.5	0.2	3	0.4	
47	-	-	28	-	-							
45	-	-	82	-	-							
7.4	9.0	6.2	7.2	7.4	6.9	6	8.8	9.7	8.2	3	9.2	
1.6	-	-	1.8	-	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	3	1.7	2.00 max

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