INTERNAL CORRESPONDENCE

Westinghouse

FROM Hampton Works

DATE January 31, 1956

SUBJECT Progress Report on C.O.D. D-8-56 - Fireproof Bulkheads to be Used on New Ships - Moore McCormack and

Mr. D. E. Baldwin - Hampton Works

cc: Mr. G. F. Sutton - Hampton Works
Mr. A. E. Anderson - Hampton Works
Mr. S. L. White - Hampton Works
Mr. R. R. Hetrick - Hampton Works

We have completed the basic engineering requested on this C.O.D. request. This project was initiated in an effort to develop a Micarta product that had fire-resistant properties, corrosion resistances, and an acceptable surface appearance. In previous applications, we had suggested that our Aluminum Bonded Micarta be used in such an application; however, we were informed that this would not be acceptable on this application because of the corrosion of the Aluminum by salt spray. In an effort to develop a new product that would be suitable for this application, we made several laboratory samples. I will outline each of these products with my observations.

The first sample consisted of molding a decorative surface directly to a Johns-Manville Marinite Core. Since most any product that we develop will be glued to a Marinite Core before installation, it was felt we could offer some advantage by molding the surface directly to the Marinite. In a patent disclosure in July, 1955, we disclosed that it was possible to mold a surface directly to Marinite, Flexboard, and Transite if an epoxy binder sheet was used. Several laboratory samples were molded using this information. It was found that an acceptable surface could be obtained. It is felt that we definitely need to mold some 50 x 100 size sheets to state definitely that this product can be made on shop equipment. We might encounter rupture of the Marinite Core on large size sheets. One sheet was molded in the Small Baldwin 32 x 62. The cure on this board was not adequate and sticking was encountered.

The second series of boards was made using 1/8 Flexboard as a core. Here again an epoxy binder was used. These samples were made after the Sales Department presented a sample of Johns-Manville Deluxe Flexboard which had been approved for this job. This sample was a Flexboard product with a D.A.P. surface. We were able to mold two boards of the melamine surfaced Flexboard on the Small Baldwin without difficulty. Upon investigating Johns-Manville literature, I believe the Deluxe Flexboard was molded on one of their asbestos products known as Asbestocite Type "B". This is a less dense product than commercial Flexboard. We ran comparative tests between the Micarta and the Deluxe Flexboard and the Micarta has certain advantages. (See attachment)

The third series of boards consisted of a board molded using one of our industrial-treated asbestos materials as a core. Several boards were molded with this construction - 1 sheet 5H211 overlay, 1 sheet surface, 7 sheets 541. 541 is a .010 asbestos paper treated with a phenolic resin. These boards had good surface appearances. We encountered no difficulty in molding. As a matter of caution, the asbestos paper used on 541 will occasionally have what we term "hard-spots". These spots are high density areas. I am sure they would affect the surface appearance and might possibly damage our pressing plates. We could manufacture this product with care and inspection of the asbestos paper. If this product should be approved, we can possibly get a better grade of asbestos paper but this would greatly increase the cost.

The fourth series of boards was molded using .032 brass plate as a core material. Using the information acquired on the Air Force Academy job, we were quite successful in bonding a melamine surface to the brass. The brass was sand blasted on the sand blasting machine in "A" Building. The boards were molded with the following constructions - 1 sheet 5H211, 1 sheet surface, 1 sheet 5E19, 1 sheet .032 Brass (sand blasted), 1 sheet 5E19, 2 sheets 5H299. The bond on these samples was good.

The fifth series of boards was molded using a phenolic-treated glass mat as a core material. We found that it was almost impossible to treat the mat with the equipment available in the laboratory. Two boards were molded with this construction - 1 sheet overlay, 1 sheet surface, 1 sheet 5H383, and 1 sheet glass mat. The resin on the glass mat bled thru to the decorative surface. The surface appearance of the boards was poor. In my opinion, it is both impractical and non-economical to try to manufacture this product on shop equipment.

An approximate cost estimate was made on each of the above products. (See attachment)

Since we are not certain as to the product that will be used as bulkheads on these ships, I suggest that all these samples be presented to the customer in the forthcoming meeting. It appears from our results that the melamine faced Flexboard and the sample made with the asbestos paper core have the best possibilities of meeting the requirements for this installation on quality and price.

In addition to the samples mentioned above, we have samples of .025 aluminum, balanced construction and .035 steel, balanced construction. Approximate cost estimates are attached for these products.

W. C. Hood
Engineering Department

6.40

Costs - Approximately W.D.C. on Products for Moore McCormack

All Costs Calculated on 50 x 100 Size

1. ~~3/4"~~ 1/2" Marinite - Balanced with Decorative Face

1-5H211	$ .81	
1-Surface	1.35	1/2" would be 13
1-Epoxy Binder	.61	
1-3/4" Marinite	19.20	Estimated $ .03/sq.ft. Freight Cost
1-Epoxy Binder	.61	
1-5H299	.81	
1½ Glassine	.12	
Cost of Molding	4.40	
Trim to Size	.96	
	$28.86 per 50 x 100 sheet	
Estimated W.D.C. -	$ .90/sq.ft.	would be .70 for 1/2 (as per sample)

2. .050 - Asbestos Core with Melamine Surface

1-5H211	$ .81
1-Surface	1.35
6-541	3.85
Cost of Molding	1.36
Sanding	.32
Trim	.32
1½ Glassine	.12
	$ 8.13 per 50 x 100 sheet
Estimated W.D.C.	$ .255/sq.ft.

3. .035 Steel-Balanced Construction

W.D.C. from Previous Cost Estimate	$ .69/sq.ft.
Additional Cost of Sand Blasting and Bonderizing	.15/sq.ft.
	$ .84/sq.ft.

4. .081 Aluminum -Balanced Construction

W.D.C. - .081 Aluminum not Balanced		$ .74/sq.ft.
Additional Cost to Balance		
1 sheet 5E19	.61	
1 sheet 5H299	.81	
Sand Aluminum Back	1.25	
Glassine	.12	
	2.79	
		.087
Estimated W.D.C.		$ .83/sq.ft.

5. 1/8 Flexboard - Balanced and Not Balanced

1 sheet 5H211	$ .81
1 sheet Surface	1.35
1 sheet Epoxy Binder	.61
1 sheet 1/8 Flexboard	3.20 (might possibly be low)
Molding Cost	3.00
Trim	.64
	$9.61 per 50 x 100 sheet
Estimated W.D.C.	$ .30/sq.ft.
Balanced - 11.85 or	$ .37/sq.ft.

6. .031 Brass-Balanced Construction

1 sheet 5H211	$ .81
1 sheet Surface	1.35
1 sheet 5E19	.61
1 sheet .031 Brass	35.00 (sand blasted)
1 sheet 5E19	.61
1 sheet 5H299	.81
1½ sheets Glassine	.12
Trim	.32
Molding Cost	3.50
	$43.13 per 50 x 100 sheet
Estimated W.D.C.	$ 1.35/sq.ft.

No estimated cost is included on glass mat construction because of poor appearance and difficulty in making laboratory samples.

DATA SHEET ON COMPARATIVE TESTS ON
JOHNS-MANVILLE DELUXE FLEXBOARD AND MICARTA MELAMINE SURFACED FLEXBOARD

NEMA and Other Tests	Johns-Manville Deluxe Flexboard	Micarta Melamine Surface Flexboard
1. Taber Abrasion NEMA Spec. LP 2-1.06 Wear Value Rate of Wear/100 cycles NEMA Max. - .08	575 cycles (avg.) .088*(higher than NEMA Max. of .08)	650 .049
2. Resistances to Boiling Water NEMA Spec. LP 2-1.07	Not affected	Not affected
3. Resistances of Surface to High Temperature NEMA Spec. LP 2-1.08	Not affected	Not affected
4. Bond Test - Insert Knife Blade Between Surface and Flexboard - Then Try to Peel Surface	Surface can be peeled - poor bond	Surface will peel but asbestos product comes with surface
5. Flammability Test Remove Surface and Ignite with Match	Burns freely, Supports combustion	Will not burn, will not support combustion.

	Johns-Manville Deluxe Flexboard	Micarta Flexboard	Micarta Marinite
6. Rockwell Hardness "M" Scale	84	90	-8