

FILE NAME: Eagle-Picher (EP)

DATE: 1953 - 1969

DOC#: EP009

DOCUMENT DESCRIPTION: Letters

20 October 1953

Mr. Walter P. Sinclair
4000 Glenmore Avenue
Baltimore 6, Maryland

Dear Walter:

After catching up with the accumulated work that awaited me upon my return from my recent trip to Washington and the Experimental Station, I have had a chance to collect my thoughts sufficiently to write you about One-Cote Cement. I hope that my frank recital of its characteristics and potential uses will be of help to you.

As we discussed at the Station, One-Cote Cement is a combination Finishing and Insulating Cement. It derives its attractiveness, as a finishing material, from its smooth, hard and white surface upon drying. Its claim as an insulating cement is evident from the excellent thermal conductivity values that you yourself have measured. Naturally, in a single material, one cannot have all the best of things. In the case of One-Cote Cement, the coverage is poorer than for the regular single purpose insulating cements that meet specification MIL-C-2861.

Working down the list of physical properties, we find its conductivity at 500°F. mean temperature to be somewhere between .81 and .83; MIL-C-2861 requires a maximum of .90. You might wonder just how such a good conductivity can be achieved in a material that has an appreciable higher density than regular insulating cements. We have reasoned that this favorable condition has been brought about by the fact, that the formulation contains both our mineral wool and diatomaceous earth. Actually, the combined weight of the truly insulating ingredients, in One-Cote Cement, is considerably greater than in many competitive single purpose insulating cements.

The dry adhesion of One-Cote is variable. It has good dry adhesion to other insulating materials like block or blankets, but adheres poorly to metal surfaces. However, our experience in industry has shown that this is not necessarily a detrimental characteristic, as its wet adhesion is more than adequate for application to metal surfaces, particularly in the case of valves and fittings as large as 6". If the application on One-Cote Cement completely encloses the valve or fitting, a hard shell forms on drying and "dry adhesion" is no problem. We do recognize the fact that One-Cote should not be applied to flat metal surfaces.

When we come to shrinkage, One-Cote Cement is outstanding, in that it has no shrinkage when air dried. This absence of measurable shrinkage means that the

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To: Mr. Walter P. Sinclair
20 October 1953

frequency of cracking is about nil. Contrary to the experience with normal Finishing Cements, there are no shrinkage cracks to come back to and point up.

When we received the assignment to develop a cement which eventually became known as One-Cote, one of the original requirements was for a hard material. Your measurement of hardness by the plastometer shows how successful we have been. Your measurements showed a penetration of .17, while the maximum for insulating cements is 125 and for finishing cements .40. A further measure of the hardness of One-Cote is shown by the better than 200 psi load it will sustain with a deformation of 10% in thickness. This hardness is of course achieved through the use of a hydraulic setting binder. This hydraulic binder gives One-Cote Cement a further characteristic of green strength or green set. Though One-Cote is still wet, within a period of four hours, the cement is firm enough to be canvassed. Furthermore, after achieving its green set, it is unaffected by water and cannot be easily washed off. We should think that this green setting property and its characteristic of being unaffected by water after being dry should be a great advantage aboard ship where drying takes place very slowly and insulation might be easily damaged in the case of steam and water leakage.

Its structural strength as measured by the abrasion loss test is superior to regular insulating materials and better than many of the finishing cements commonly available. As you found in your initial examination, this development of structural strength is dependent entirely upon the drying conditions. Forced drying or application to a heated surface, greatly reduces the effectiveness of the hydraulic bond. On the other hand, air drying permits the full development of its natural hard setting properties.

Its performance under soaking heat conditions is adequate; better than that required of the insulating cements. Its suggested maximum use limit of 1000°F. is better than that recommended for the asbestos type material.

Certainly not the least important is the fact that One-Cote Cement like Eagle Super "66" Cement is inhibited to prevent the rusting of steel surfaces to which it is applied. To our knowledge, none of the asbestos type of finishing cements are formulated with rust inhibitors. Again on shipboard, as you well know, this is an important and desirable characteristic.

In One-Cote Cement, we feel that we have a superior product. One that meets the requirements of many applications. Its rapid acceptance by industry is recognition of this fact. We believe that once this material has been accepted for Naval use, its characteristics will be of interest to the ship building trade as well as those who use insulating materials for repairs at shore establishments and at sea.

To: Mr. Walter P. Sinclair
20 October 1953

Walter, you can be assured that we are happy to be able to work with you on this matter and sincerely believe that One-Cote Cement will be of benefit to the Navy. Thanks for giving us this opportunity of outlining its important features.

Yours truly,

THE EAGLE-PICHER COMPANY

Paul L. Losse
Insulation Division

PLL/js

bcc: Mr. Glen J. Christner
Dr. A. P. Thompson

2 cc: Mr. J. Burgstresser, Phila. Asb. C
1 " W. J. Myers, Jr.
1 " G. J. Christner
1 " Paul Losse, Joplin Research ✓
1 " L. C. Jenne
File



October 14, 1955

Mr. Saul Sirotta
U. S. Navy Department
Piping & Machine Sec., Code No. 548
8th Wing, Room 3850
Navy Building
Constitution Avenue
Washington, D.C.

SUBJECT: EAGLE-PICHER ONE-COTE CEMENT
(INSULATING & FINISHING CEMENT)

Dear Mr. Sirotta:

Yesterday, in my presence, you and Mr. J. Dwinelle of the Navy Specifications Section had a conference telephone conversation with Mr. Walter Sinclair of the Naval Experimental Engineering Station in regard to the merits of Eagle-Picher One-Cote Cement versus the standard Navy approved Asbestos Finishing Cement.

The particular application of applying finishing cement over block insulation was established as an example and, after considerable discussion, the three of you were in agreement on the following conclusions:-

1. Eagle-Picher One-Cote Cement possesses a lower density than Asbestos Cement.
2. Realization of increased thermal efficiency over Asbestos Cement.
3. One-Cote Cement will produce a finish of pleasing stipple effect; and the applied cement is tougher and harder than Asbestos Finishing Cement.
4. No doubt, monetary savings would be realized since One-Cote Cement possesses working qualities unequalled in other finishing cements.

In conjunction with the above mentioned conclusions, you verbally approved the use of Eagle-Picher One-Cote Cement as an alternate for Asbestos Finishing Cement.

We shall be awaiting your letter of confirmation; and anticipate you will fully express your opinion as to the use of Eagle-Picher One-Cote Cement as an approved finishing-insulating material.

Very truly yours,
THE EAGLE-PICHER COMPANY

L. C. JENNE
Area Manager



DEPARTMENT OF THE NAVY
BUREAU OF SHIPS
WASHINGTON 25, D. C.

EXHIBIT D-22

IN REPLY REFER TO
S39/2(548D)
Ser 548-3194

*LEC
A. J. 11/6
H. J. 11/7
PLV*

21 OCT 1955

The Eagle-Picher Company
420 Lexington Avenue
New York 17, New York

Attention Mr. Lee C. Jenne

Gentlemen:



Your letter of 14 October 1955, requested information concerning the extent of naval approval for shipboard use of your product "Eagle-Picher One-Cote Cement". Results of evaluation tests conducted at the U.S. Naval Engineering Experiment Station, Annapolis, Maryland, indicate that this product is suitable for use as a thermal insulation finishing cement. When these tests are concluded, it is expected that this type of material will be included in a government specification. In the interim, tentative approval is hereby granted for the utilization of "Eagle Picher One-Cote Cement", as an alternate for Navy approved material for all applications where a thermal insulation finishing cement is authorized.

The results of tests or any part of test reports, or other information relating to qualification shall not be circulated, referred to, or otherwise used for publicity or advertising purposes, or for sales other than those leading to ultimate use of the product by an agency of the Federal Government. If so used, the qualification approval of the product is subject to cancellation.

Sincerely yours,

W. E. Pittman

W. E. Pittman, Cdr., USN
Asst. Head, Research & Development
Planning Branch
By direction of Chief of Bureau

OFFICE NEW YORK - INSULATION DIVISION

DATE August 27, 1956

AIR MAIL - REGISTERED



JOPLIN RESEARCH:

MR. PAUL LOSSE

SUBJECT: U.S. NAVAL ENGR. EXPERIMENT STATION
ANNAPOLIS, MARYLAND
EVALUATION REPORT 010148
NS-065-001
Dated June 29, 1956

Dear Paul:

Enclosed you will please find the U. S. Naval Engineering Experiment Station Evaluation Report 010148, pertaining to Eagle One-Cote Cement.

Since there is photostating equipment available at the lab, the report is being sent to you for copying. It would be appreciated if you would also include the Cincinnati office in with those to receive copies, and return the original report to me in New York so that it may be available until the final Naval specifications are written.

Best regards.

LCJ:ns

Lee C. Jenne
LEE C. JENNE

August 10, 1951

Mr. J. E. Strickland
 Check & Mortar Insulation Co.
 P.O. Box 62
 Santa Fe, N.M.

Dear Mr. Strickland:

Upon the request of our Mr. William P. Cook, I am happy to provide you the background regarding the Navy interest in Super "44" Cement and Geo-Crete Cement.

Super "44" Cement is probably the oldest and best known of the siliceous sand cementing cements. This material, without chemical formula change has been in continuous manufacture since 1933. Shortly thereafter, the material was submitted to the Navy for its approval. Presently, Super "44" Cement is listed as an approved material that complies with the requirements of MIL-C-10000 for Type 3 material. Many thousands of tons of Super "44" Cement have shipped during the war years and in more recent times.

Geo-Crete Cement as the material is of more recent origin. It was brought on the market in 1948 to meet the demand of an increasing and finishing cement. Like its companion product, it has beyond the standard of the industry and was the first such cement to be tested and accepted by the Navy. This test, under MIL-C-10000, dated June 29, 1948 established the acceptance for Naval construction. Also, this testing criterion applied to the basic Geo-Crete Cement MIL-C-10000. Geo-Crete Cement has always had Navy approval and was approved upon publication of MIL-C-10000.

Mr. Cook has also requested that I pass on to you my information that I have regarding the presence of antimony impurities in Super "44" or Geo-Crete Cements. During the war years that each of these products have been available and used in Naval construction, the

many chemical analyses made by an independent laboratory, Bureau
William Laboratory, Dupont, Co. have never disclosed the nature
of any substance of consequence.

We appreciate your interest in these two questions and hope that
you will find this background information helpful.

Very truly,

The Hydrocarbon &
Fertilizer Division

Paul L. Jones
Manager of Research

WHL/p

cc: Walter P. Hall

cc: W.P. Myers, Jr.,
R.P. Mann

(4) 11-1



DEPARTMENT OF THE NAVY
NAVAL SHIP ENGINEERING CENTER, PHILADELPHIA DIVISION
PHILADELPHIA, PA. 19112

IN REPLY REFER TO
6764:MA:1a1
9390(FA-287)
Ser 826

28 MAY 1969

Eagle Picher Industries, Incorporated
American Building
Cincinnati, Ohio 15202

Gentlemen:

Re: Proposed Insulating Materials for Naval Vessels

The serious hazards of asbestos have recently received widespread publicity and have generated a high level of interest concerning its use by the U. S. Navy as an insulating material. There are many varied uses of asbestos in the Navy but the most disturbing, from a health hazard viewpoint, is that for piping and boiler insulation and lagging. The chief hazard exists wherever there is a possibility of dust evolution during operations such as fabrication, installation and especially during rip-out.

In order to minimize the hazards associated with the use of asbestos and therefore reduce the possibility of deleterious effects to the workers, a comprehensive study has been initiated by the Naval Ship Engineering Center, Hyattsville, Md., to investigate the feasibility of substituting alternate materials for asbestos used as lagging, piping and boiler insulation. High temperature insulation, as used by the Navy, must be composed mainly of inorganic materials in order to endure temperatures above 200 F for extended periods. In addition, an acceptable insulation must exhibit the following characteristics:

1. Low heat conductivity.
2. Non-combustibility.
3. Lightweight.
4. Capability of easy molding and application.
5. Moisture repellency.
6. Non-corrosive, insoluble and chemically inert.
7. Composition, structure and characteristics must remain unchanged by temperature at which it is to be used.

8. Must be vermin proof.
9. The material and application costs should be economical.
10. The ideal insulation should be nontoxic and non-injurious to personnel during fabrication, installation, use, or rip-out.
11. Once installed, it should not cluster, become lumpy, disintegrate or build up in masses from vibration.

The Philadelphia Division of the Naval Ship Engineering Center has been assigned tasks to conduct a survey of suppliers of insulation to the Navy, to secure technical data literature, and to investigate medical research findings, safety manuals, and data on research being pursued by private industry intended to develop new or improved materials which may be suitable for replacements for asbestos for piping, felts and lagging. The cooperation and support of industry for this study is earnestly solicited by this activity since the health of the worker is the concern of management, labor and the government. Accordingly, the Navy is desirous of obtaining information on the following:

- a. Are alternate non-asbestos containing materials available which may be used as thermal insulation pipe covering? The insulation must offer protection up to 750 F and be manufactured in cylindrical sections up to 3 feet long, and split in half lengthwise.
- b. Are there any single layer or combination layered non-asbestos molded materials available which may be used as thermal insulation pipe covering for protection from 750 to 1200 F?
- c. What materials may be substituted for asbestos insulating felt (plain or water repellent) for use on valves or other irregular surfaces and which are suitable for a range from cold water temperature to 900 F?
- d. What non-asbestos containing cloth materials may be used as a lagging jacket over thermal insulation, or as a wrapping on engine exhaust pipes, or for piping or tubing, or on the inner and outer surfaces of removable covers and on flanges and valves from -5 F to 1050 F?
- e. What heat-resistant bonding materials may be substituted for asbestos insulation finishing cement over block insulation and irregular surfaces where powdering during rip-out has been a problem?

6764:MA:1a1
9390(FA-287)
Ser 826

- f. What safety precautions to prevent inhalation of dust are observed during the manufacturing and processing of insulation materials?
- g. What safety precautions are recommended during the installation and replacement of insulating materials to prevent the inhalation of asbestos fibers and dust?
- h. To what extent or degree will material and installation costs be affected by the curtailment of the use of asbestos containing insulation?

Due to the urgency of this undertaking, it is requested that the above information be forwarded at your earliest convenience to Dr. M. Anmuth, the project engineer of this task, at the Naval Ship Engineering Center, Philadelphia Division 6764, Philadelphia, Pa. 19112 (telephone number (215) 755-3922). Information submitted to the Philadelphia Division of the Naval Ship Engineering Center will be utilized by the Naval Ship Systems Command in promulgating a directive which will minimize the use of materials and practices which are potentially hazardous to the health of insulation workers. This activity has been directed to complete a survey of insulation suppliers by 30 June 1969 to afford time for collation and personal contacts, if deemed necessary.

Please be assured that any product composition and formulae submitted in response to this survey will be held in strict confidence and will be viewed as a voluntary contribution to this perplexing problem to the insulation industry. It is understood that submission of information solicited by this activity will not obligate the government or its agencies in any manner whatsoever.

Very truly yours,

J. W. Murdock
J. W. MURDOCK
Head, Applied Physics Department

31
July 3, 1967

AIR MAIL

Department of Navy
Naval Ship Engineering Center
Philadelphia Division
Code 6764
Philadelphia, Pennsylvania 19112

ATTENTION: Dr. Morton Amuth

Dear Dr. Amuth:

RE: Proposed Insulation Material for Naval Vessels

6764:NA:1a1
9370 (PA-227)
Ser. 826

With reference to the above letter, we respectfully submit that we have several mineral fiber products which are well accepted in the trade. Of late, such mineral fiber products are frequently replacing various asbestos products by most end-users. Such products also include piping and boiler insulations, as well as insulating and finishing bonding cements.

To the best of our knowledge, based on periodical medical check-ups for employees exposed during such product manufacturing, we believe that the proposed Eagle-Picher mineral fiber products are not hazardous to health and have the following merits.

1. Lower heat conductivity than similar asbestos products.
2. Lighter weight than asbestos insulation products.
3. Water repellent and moisture resistance.
4. Non-corrosive and insoluble in water.
5. Unaffected by chemicals between pH 4.5 - 12.5.
6. They are incombustible and their composition, structure, and insulative qualities do not change up to its maximum recommended temperature.

July 3, 1960

7. They are vermin proof.
8. Generally, they cost lower than similar asbestos products.
9. The application cost is comparable or lower than asbestos products.
10. They are non-toxic and have no side effect on prolonged exposures during fabrication, installation, service condition, or during rip-out.
11. Such insulation material will not become lumpy, cluster, or disintegrate under normal equipment service conditions and at maximum recommended serviceable temperature.
12. Majority of the Eagle-Picher mineral fiber pipe insulation materials suggested below are shipped and stored flat; thus, they eliminate "boxed air" and reduce warehouse and shipping costs.

Based on the above said properties, we recommend the following mineral fiber insulation products for the Navy Department to consider.

- a. For material (a) of the above referenced letter, we recommend Eagle-Picher Alum-A-Felt for thermal insulation pipe covering.

This material is composed of mineral fiber and is then molded in two half cylindrical segments, scored or V-grooved flat places, to fit all different pipe sizes. Alum-A-Felt is made in up to four foot long sections and offers temperature protection up to 850° F. As the name of the product indicates, it has factory installed Aluminum Jacketing for weather protection.

- b. For item (b) of the same referenced letter, we recommend Eagle-Picher Tab-Lok Pipe Covering. This product is also made of mineral fiber and is recommended for temperatures up to 1200° F. with galvanized metal mesh, and up to 1400° F. with monel or stainless steel metal mesh.

This product is factory fabricated in single layers, with Eagle-Picher patented Tab-Lok closure device for quick and snug attachment on the pipe to be insulated.

- c. & d.

We do not have any product to offer.

- e. For heat resistant bonding materials over block insulation and for irregular surfaces, we recommend Eagle-Picher One-Cote Finishing Cement. This is a mineral fiber product and meets all the requirements of SS-C-163, Type III, Grade F.

Such a mineral fiber bonding cement material is effectively used over block insulation and irregular surfaces. They will not powder under normal service condition and during rip-out.

