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KAYLO IMPROVEMENT PROGRAM

PROGRESS REPORT

JANUARY - FEBRUARY - MARCH, 1962

p. 7,9

p. 13 talks of S-M+E wiring supplier

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CONTENTS

1. GLASS FIBERS

(a) Coatings of various types have been tried for a protective covering for glass fibers, to reduce or eliminate attrition through the autoclave process. Some of these tried by General Research are:

(1) Vinyl Chloride Plastisol - Excellent, but is high in chloride and is costly.

(2) Vinyl Acetate S-55 - Coating disappeared during process - fiber attack.

(3) Urea Formaldehyde - Urac 180 - Coating disappeared, but fiber appeared to be in good condition. No adhesion to Kaylo.

(4) Shell Expoxy #828 - Trace of coating left after processing. Fiber appeared in good condition. High cost.

(5) Dow Polystyrene - PS2 - Resin disappeared. Being thermoplastic may have been absorbed by the Kaylo.

(6) Melamine Melmac 405 - Same results as #3, formaldehyde.

(7) Hi Temp Phenolic, Monsanto #1013 - Excellent results. Slightly superior to Tybon 5418 but very high cost.

(8) Novolak Type Phenolic, Acme X-475 - Poor results when compared to Tybon 5418.

(9) Dicy - Phenolic Copolymer - Newark Plant - Poor results when compared with Tybon 5418.

(10) Melamine - Phenolic Copolymer - Newark Plant - Poor results when compared with Tybon 5418.

(11) General Mills Polyamid - Hot Melt - Resin absorbed away from fiber into Kaylo matrix during process. Fiber appeared in good condition.

The following specification was set for a coating that gave the best results, and which was low in chloride content. It was Tybon 5418 Phenolic Resin (American - Mariatta) at 62% solids. It was used on K75 1/0 yarn at 636 size, with 40% nominal ignition loss, with 35-45% range. There are approximately four (4) beads/inch of length.

There were various runs made with variations in percent of coating ranging from 38.5 to 57%; chopped lengths at 1-1/2" to 2".

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The main reasons for using Tybon 5418 Phenolic Resin are:

(1) Lower cost
(2) Survival of autoclaving process
(3) Low chloride content
(4) Beading ability
(5) Good adherence to Kaylo body.

(b) Test runs were made with various formulations that are designed for different percentages of coated fibers, which gave a similar variance in glass percentages; different types of fibers; multiple lengths of fibers; pouring method variances. In the January tests the vinyl chloride coated fibers gave superior test results to any of the phenolic fibers. Some of the fibers, coatings, etc., used are:

(1) Vinyl chloride - 2" length
(2) Phenolic 1-3/4" length
(3) Phenolic - 1-1/2" length
(4) Combinations of (2) and (3)
(5) Sprout-Waldron opened W3 amosite asbestos
(6) Combinations of vinyl chloride and Sprout-Waldron opened W3 asbestos.
(7) Combinations of Phenolic Resin and Sprout-Waldron opened W3 amosite.

Runs using above variations of coated glass fibers and dry milled opened W3 amosite were made using different designs of the 36" pouring device. The presence of air holes and slip planes, formed by clogging of the nozzle, at too frequent intervals, was the main defect and was the technical problem to be overcome.

A combination of 9% opened amosite; 9% chrysotile; and 3% vinyl coated glass fiber, for a total of 21% of fiber, gave a maximum of eight (8) drops; an average of 5.8 and 6.8 drops. The orientation of the fiber was good.

The 36" Bauer Mill was redesigned for a dry mill basis, for opening W3 and other amosite and chrysotile grades of asbestos. Various types of coated fibers were used, both phenolic and vinyl. The vinyl coating gave a more pliable glass fiber, which resulted in less clogging of the pouring nozzles, than was experienced from the stiff phenolic covering. Vinyl coated glass fibers were used in many of the February and early March test trials. These results are summarized:

(1) It was found that a fiber content of 18 to 20%, of which at least 15%, based on batch weight, was dry milled opened amosite or amosite plus coated glass fiber, produced a significant increase in the drop test results.

(2) Although resistance to breakage in the drop test was markedly increased by the inclusion of 5 to 7% of phenolic coated fiber, these amounts of the stiff fiber contributed to forming difficulties, that resulted in a poorly consolidated body and low modulus of rupture values. The ware was generally unacceptable, in spite of rather high drop test values.

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(3) The inclusion of 0.5% vinyl coated fiber resulted in no noticeable effect on the drop test values. This amount of vinyl fiber was easily observed in the product.

(4) Bauer Milled opened amosite proved to be as satisfactory as amosite opened by Sprout-Waldron equipment or by the shredder at Newark.

(5) The inclusion of 5% of sodium silicate in the batch, to nullify the effect of chloride ion, resulting from the vinyl coated fiber, resulted in no adverse effects, process or product wise.

(6) Cores out method of pouring, gave on an average of 1.3 more drops than similar ware poured with the cores in.

(c) Shipments of various test runs were made to Granville, New Orleans and Grand Rapids. The New Orleans ware was returned to Berlin. The equipment used in these shipments was:

(1) Granville - Commercial LTL truck
(2) New Orleans - Car load R.R. Acme Fast Freight
(3) Return to Berlin - Commercial LTL truck
(4) Grand Rapids - Commercial LTL truck

Abuse in transit varied, in manner of equipment, rather than distance.

(1) Granville: Some abuse - horizontal loading of some cartons - evidence of other material loaded on cartons.

(2) New Orleans: Not too much damage - R.R. Car condition good - no evidence of horizontal loading - some end damage to cartons by dropping.

(3) New Orleans (2) return to Berlin: Terrific abuse on LTL shipment - cartons on side other heavy material loaded on top - cartons palletized and metal straps pulled tight, cutting into cartons and cracking ware.

(4) Grand Rapids: Cartons loaded on side - large size 12 x 1-1/2 had considerable damage - LTL shipment.

In the Granville, New Orleans and return to Berlin shipments, 599 pieces were damaged out of 1134 pieces shipped, which included competitors ware, for a total 52.8%. The results were:

(1)	Carey-Temp - Highest damage	81.3%
(2)	Kaylo standard production second highest damage	60.8%
(3)	John-Manville	56.5%
(4)	Glass fiber reinforcements in all percentages and variables	47.1%
(5)	Sprout- Waldron opened W3 amosite fiber	5.6%

On these shipments there was 8% of total ware shipped to Granville damaged; 15.5% to New Orleans: 76.5% return from New Orleans to Berlin.

To size defective:

3 x 1	153 pcs.	25.5%
4 x 1	211 "	35.3%
6 x 1	187 "	31.2%
8 x 1-1/2	24 "	4.0%
12 x 1-1/2	24 "	4.0%
	599 pcs.	100%

Total pieces shipped were 1134.

The ware shipped to Grand Rapids was loaded horizontally, at some trucking terminal, after leaving Berlin. The cartons very definitely showed wear marks on both sides of cartons. Improvement was noted breakagewise on the later formulation in use. This ware had 36" Bauer Mill opened, dry w/ asbestos, in the formulation and phenolic coated glass fibers. Damaged ware after inspection out of the total size shipped.

12 x 1-1/2	80.0%
8 x 1-1/2	33.3%
6 x 1	17.5%
4 x 1	11.1%

Following was the percentage of defective half sections by size, as related to the total of all half sections damaged:

12 x 1-1/2	68.1%
8 x 1-1/2	8.5%
6 x 1	14.9%
4 x 1	8.5%

This last table records the damaged half sections as related to size, of total half sections inspected:

12 x 1-1/2	25.0%
8 x 1-1/2	3.1%
6 x 1	5.5%
4 x 1	3.1%

This LTL shipment to Grand Rapids, eventhough most of the ware suffered exceptionally heavy abuse by being horizontally loaded, some place enroute, reflected the improvement made formulation wise since the first three shipments were made to Granville, New Orleans and Berlin.

(d) A Kaylo Product Improvement Committee Meeting was held in New York, Tuesday, March 20, 1962. It was agreed there that the improved formulation would be placed in production at the Berlin Plant, on March 21, 1962, and it was. The 36". Bauer Mill was moved into position for dumping dry milled amosite and other asbestos directly into the hydropulper. Sufficient vinyl coated glass fiber was secured from Anderson to place 1/2% in formulation. W3 opened amosite was included. The density was set at 10.5 pcf. The dust amount was temporarily designated at 500 lbs., if this amount could be had and maintained from present finishing lines. The plant has continued in production with the above outlined first phase formulation. Some problems were encountered, but these have been mostly overcome, at least to the point where they are not in a major classification. Cutters for the vinyl coated glass fibers were secured to chop the fiber to the 1-1/2" length first used.

(e) The General Research Laboratory personnel were instructed by the committee, to proceed as quickly as possible to discover a coating for glass fibers that would:

(1) Be less costly than vinyl chloride coating
(2) Have the same or additional flexibility
(3) Contain less chloride
(4) Have a rapid drying rate.

(f) The objectives of the program of using coated glass fibers in Kaylo batch are:

(1) Discontinue the use of the present coated glass fibers, which are for screening purposes, replacing them with glass waste.

(2) Reduce the present glass fiber cost by utilizing textile or general product's waste.

(3) Through a series of choppers, cutters, shredders, etc., process glass waste to where it is sized suitable for inclusion in Kaylo slurry.

(4) Design equipment necessary to coat glass fibers as prepared by (3) and dry for immediate use.

(5) Utilize the glass fiber waste at Barrington through use of (3) and (4) for use at Berlin. If more tonnage needed, go to next Fiberglas Plant source, with lowest freight cost for shipment to Berlin.

(6) Determine the optimum length of coated glass fibers, which gives the highest number of drops; greatest impact resistance results; takes most handling abuse before cracking or breaking.

(7) Ascertain improvements in K factor if varied percentages of coated glass fibers affect this property.

2. STRESS CORROSION

(a) Sales has need for a calcium silicate product with a lower than competitors' measurable chloride content; to be the leader in heat insulation, for use in combating stress corrosion on stainless steel pipe or vessels; when such attack is aggravated by the presence of moisture, particularly sea water.

(b) Sales, Research and Testing groups had a meeting with DuPont personnel regarding acceptance of OCF's measurements, together with those of Dr. Fontana of Ohio State regarding ppm of chloride present in Kaylo end products, particularly pipe covering. DuPont's people did not accept these measurements as such. However, DuPont personnel did state that Kaylo would be acceptable as a heat insulation for stainless steel, if an inhibitor in the form of sodium silicate were present.

(c) It is an academic question whether or not other customers would follow along with DuPont representatives stand of Kaylo acceptance. It is thought that they would, which would include Carbide Chemicals, Monsanto, Dow, Shell and others. It would at least give Sales an opportunity to present strong arguments in favor of low chloride content of Kaylo.

(d) There are two ways to add the inhibitor, sodium silicate, that DuPont people insisted be added:

(1) Introduce it into the batch at the mixing stage and follow through the process. There will probably be some attrition result. Whether this can be a measurable variable is not yet known.

(2) It can be added as a coating, to ID - OD - Ends and Side edges by either spraying or dipping, before wrapping. If applied as a coating, a slight overtrim to preserve the dimensional stability may need to be made. Also a study on drying needs, must determine the method and equipment needed, for coated material, before canvas is applied, if such is necessary.

(e) Some companies, Carbide Chemicals included, use a material called "Placite 7122" on all stainless steel before insulating with materials, including Kaylo. The upper temperature limit is only 482 degreed F, and it costs $0.50 a sq. ft. applied. R and R bond, which is now designated as K Bond, has a temperature limit of 2000 degrees F. It should have an application cost of less than $0.50 per sq. ft. However, it has a pot life of 18-20 minutes. We feel this OCF distributed K Bond material has advantages that outweigh the disadvantage of the relatively short pot life. A study is to be made whether a Gunnite spray may be used, with the 20 minute pot life.

(f) Sales will want all material sent to these customers to be of a low chloride content. This, whether they the customers, intend to use it on stainless steel or other applications. It is reasoned that there cannot be any question of human failure, if only one type of insulation is present, to be placed on stainless. Therefore, it is planned to include sodium silicate as a batch component, so as to have this inhibitor in all Kaylo end products.

(g) The Navy specifications call for covering all stainless steel with Benjamin Foster 57X coating, before insulation is applied. Here again samples of OCF's K Bond should be submitted for trial purposes, along with Kaylo insulation, after sodium silicate has been placed successfully in the batch, as a stress corrosion inhibitor.

(h) A different grade of chrysotile asbestos, of lower chloride content, has been adopted as a standard batch material. This naturally lowers the overall chloride content of Kaylo heat insulation.

(i) Arrangements have been made with the Barrington Plant to conduct chloride tests, in their laboratory, of Berlin's production. This is an end product chloride determination and the purpose is to check daily chloride content stability, once it is established at the lowest ppm possible. The sampling method is to be devised and set up by General Research and Testing Laboratories.

(j) DuPont currently approves the following insulations for stainless steel applications and states that these products are relatively free of causing stress - corrosion cracking:

(1) Unibestos - 1200°F max.
(2) Carey Temp - 275°F max.
(3) Foam Glass - 300°F max.
(4) Rigid urethane foam - 150°F max.

(k) In a report issued 3/2/62 W. A. Lotz stated: "Mr. J. Roy Allen is the insulation and maintenance painting consultant in DuPont's Engineering Services Department and is also chairman of DuPont's Thermal Insulation Practices Committee. Mr. Allen told us that the majority of DuPont's applicators do not like to work with Unibestos, due to its poor handleability. Carey Temp is limited to 275°F because the silicone treatment in Carey Temp starts to lose its water repellency characteristic at approximately 275°F. Foam glass is limited to 300°F. It is primarily used on low temperature applications, but Mr. Allen stated that his experience has shown that urethane is less expensive on an applied basis."

Mr. Allen, in W. A. Lotz's report, stated "that if Owens-Corning wishes to get approval for Kaylo, we could probably do so by adding 5% sodium silicate by weight. This approach would undoubtedly get us immediate approval without requiring tests. Mr. Allen strongly recommended that we use a sodium silicate inhibitor rather than attempt to make our product water repellent".

"He also suggested that we consider dripping water on the interface of the stainless steel and the Carey Temp to simulate field conditions, as he is concerned that this test procedure as used by DuPont is not completely applicable to nonwicking materials such as Carey Temp."

(l) "Sodium silicate glass "F" powdered can be substituted for sodium silicate solution #9 in batch "10L 1 x 7" without adverse effect on consistency, either on the mixing floor or on the pouring line. Laboratory tests indicate that a significant reduction in consistency can be expected, since the powdered sodium silicate will remain an inactive ingredient in the batch until subject to autoclaving."

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"DuPont charges as much as 3.58 cents more per pound solids for the powder, delivered to Berlin. Sodium silicate solution delivered to Berlin @ 3.60 cents per lb.. Sodium silicate powder delivered to Berlin is 7.18 cents per pound." Above from R. F. Shannon's letter to R. C. Amos, dated 3/27/62.

(m) The basic sodium silicate is produced at Grasselli, New Jersey, by DuPont. General Research Laboratory is to conduct a test to determine whether or not these basic sodium silicate chunks can be run through a Bauer Mill and ground sufficiently fine, for incorporation into the Kaylo batch. This should produce even lower delivery costs to Berlin.

(n) Tests are to be run at Berlin, to produce samples for DuPont to check, test and appraise the week of April 2, 1962.

(o) It is reported that Mr. Allen has retracted his inference that if 5% sodium silicate were placed in Kaylo batch, that immediate approval could be secured without testing. These samples are to be submitted, but will have to undergo a six months testing application period, before acceptance is forthcoming, as an approved insulation meterial relatively free from chlorides that cause stress-corrosion cracking on stainless steel.

3. FORMULATION STUDIES

(a) Past standard K-10 light density batch was geared to 300# of dust. Various problems of dust delivery have been overcome. Formulation changes have made it possible to use additional amounts of dust.

This dust amount was increased to 500# per batch on March 26, which is the maximum the system can continuously deliver, and there are times when no dust at all is available, the weigh hopper is to be increased to 750# capacity. An additional blower is to be procured, for the increased dust capacity, in the 15 minute delivery cycle required. The equipment installation should be completed, after blower delivery, the week of May 21,1962.

(b) It is probable at 500-600# dust per batch, that this amount will not be available continuously, from scalping, kerfing and trim operations. It may then be necessary to install grinding equipment, which would reduce all Kaylo processed offware to dust, for inclusion in batch.

(c) Sharples Corporation recommends their model P2000 Horizontal Seeper-D-Canter for conversion of 70,000 lbs. of slurry per day, having a water/solids ratio of about 20, to one having a constant and definite water/solids ratio of about 6. An experiment of this treatment of waste slurry will be made by the Sharples Corporation on April 18, 1962. This equipment will handle all of the waste slurry and remove the variability of water/solids now encountered, when placed in batch. This test will be followed with diligence for favorable results.

(d) Read Standard, a Division of Capitol Products Incorporated, located at York, Pennsylvania had a representative call at the plant and we discussed various projects with him. One that they expressed immediate interest in was concentration control of waste slurry, for water solids. They produce a device for thickening sludge and upgrading slurries. A sample was sent to them of waste slurry at a water solids ratio of 43:3. They will attempt to reduce it to a 7-10 to 1 ratio.

(e) The grinding of dust through the wet process of the 18" Bauer Mill on a .025 setting was set-up as a standard procedure. Where and when necessary this is coupled with the wet milling of asbestos fibers, at the same plate settings.

(f) Dry Milling of amosite fibers - W3 and AW, as well as 4T-3 Lake asbestos, has been successfully accomplished. The plant is using the 36" dry mill plates, of devil tooth design. The W3 amosite and other amosite and chrysotile fibers are being successfully opened, without length attrition. Some changes in physical location of the Bauer Mill were made for direct introduction of opened asbestos fibers into hydropulper. An unloading of asbestos bag equipment and a subsequent feeding conveyor, into charge side of Bauer Mill are now being designed by General Engineering. Increased strength and resistance to impact was secured by this dry milling method. It was adopted as the standard procedure of milling of asbestos fibers on March 21, 1962.

(g) The dry milling of asbestos makes it mandatory that all asbestos be stored under roof and kept dry. This poses a problem in an already crowded raw material space, but it must be done to secure the benefits of the procedure.

(h) K factor tests are to be run at General Testing Laboratory, on present production which has additives still incorporated for a lower K factor result. Tests will also be made on samples with additives removed. If K factor holds on non additive specimens, the additives will be removed, for K factor is now competitively stable. This will result in a lower cost per batch and increased strength, as reflected in the modulus of rupture.

(i) The production formulation as of March 21, 1962 is at 10.5 pcf. The M/R for this brief period seems to be satisfactory; well above minimum in Kaylo CAS for K-10 light density. After a stabilizing period it is planned to reduce density still further, without any deteriorating effects on K-10 light density product quality.

(j) Quicklime was substituted for hydrated lime, giving a higher consistency, in K-17 core material. After some trials it was adopted as the standard formulation. It reduced the drip loss damage and the offware for MEM.

(k) The prehardening of K-17 core material is to be tried during week of April 16, at Berlin, using the colloidal silica made at the Granville Research Laboratory. Commercial Ludox, purchased from DuPont has been tried and the results were successful. The K-17 core material was prehardened.

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The cost was far too high. The cost of the prehardening agent made at Granville is much less. However, the present plant K-17 core formulation, using quicklime is giving the plant improved operating results and lower offware. Unless this formulation is directly responsible for proved "blows" in Roddis door manufacturing processes, the K-17 core material will not be prehardened, with the agent necessary to speed up the chemical reaction being added. This will keep the cost of producing K-17 core material at a lower base.

The results of this prehardening test run will be kept for future use, if needed, the same with the process procedures for making, as developed by the General Research group.

(1) The present production formulation has been subjected to a temperature of 1200 degrees F. for 96 hours, on the hot pipe tester at Berlin. This contains 0.5% of coated vinyl glass fiber. Further tests are to be conducted at once to determine whether the maximum temperature of serviceability for K-10 light density can be increased to 1500 degrees F.

4. CORE MATERIAL

(a) A meeting was held January 24th with Roddis Division personnel, of the Weyerhaeuser Company and General Research and Sales, regarding possibilities of mutually developing a 1-1/2 hour rated fire door. Another desire was to have a low cost door with a 3/4 hour fire rating. About 100 degrees increase in temperature on cold side of door would be needed. At one hour present rating the temperature is from 1700 to 1750 degrees F. The weakness in present one hour fire doors is the salts impregnated wood rails. To reach 1-1/2 hours advancement in fire resistance of this wood must be secured.

(b) The R and R bond cement, which is now known as K Bond, being a good fire retarding agent, has a good chance of increasing the range of fire resistance. This work of development is to continue as rapidly as possible.

(c) It should be the concern of all interested OCF parties to make any improvements resulting in a 1-1/2 fire rated door a proprietary process or product, rather than one mutually shared with one customer only.

(d) Roddis Division, of Weyerhaeuser Company has been granted permission by Underwriters' Laboratory to substitute K-17 for K-20 core material, for use in one hour B label doors. K-17 core material has been sent to Roddis for their trials. Roddis is now receiving K-17 core material, except for K-20 core still in stock for them at Berlin.

(e) Curtis Companies, Inc. saw a fire test at Forest Products Lab at Madison, Wisconsin that was successful. Kopper's treated styles and rails, with salts impregnation to 3 to 4 lbs. were used. A change from standard Kaylo door assembly was made. Two pieces nominal 24" x 36" were used on top, rather than standard 12" x 18" and 18" x 36". However, temperature on cold side @ 30 minutes was 190°F. For Roddis at Underwriters' it was 156°F.

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Curtis Companies made up five doors at New London, Wisconsin Plant on February 6, 7 and 8 for tests at Underwriters' Lab in Chicago, four (4) on glue wheel, with hand placed clamps and one (1) assembled by hand and glued by hand placed clamps, in horizontal positions, on table. These were made under inspection of Underwriters' inspector. They were shipped to Chicago on February 9, 1962

Curtis Companies had a fire test at Underwriters' Lab in Chicago on March 8, 1962. It failed to pass because the fire somehow crept around the door and ignited the cold side. From Jim Hearons report, "the Kaylo stood up perfectly. The stiles and rails, however did not stand up too well. At approximately 40 minutes flames started about half way between the door knob and the top of the door. Slowly, but surely, the whole face of the door ignited. This was the north door. On the south door at 45 minutes the face started to burn at the upper right hand door know corner. It worked its way down the whole side." The test continued through the hour. "At the end of the hour the face (cold side) was almost completely burned off the north door and the face was burned half way off the south door. When they hit it with the 30 lb. pressure of the fire hose, the Kaylo and the door (north) completely disappeared; the south door about half of the door disappeared."

This was a disappointment to everyone concerned. Although the Curtis first test at Madison ran into some problem with fire, the second test was very successful.

Curtis intends to go back through Underwriters' Lab again and have another test made in the near future.

(f) Young Door Company at Sunbury, Pennsylvania have the desire and intent to manufacture a one hour rated, Class B, wood face, fire door, using K-17, as the mineral core material. They set a target date of March 1, 1962, and K-17 core material was shipped from Berlin to their Sunbury Plant, where experimental door manufacture was to begin. They plan to test these doors at an eastern laboratory, before going for an acceptance test at Underwriters' Lab in Chicago.

(g) General Research has been asked by the Plant, on the basis of slab rejection at Roddis, to try to develop a sonic device for detection of defects, leading to "blows" in hot press wood fire door manufacturing processes. The Research people are evaluating the sonic concept for practicality for development. This report is set for April 30, 1962

(h) It is planned to make some experimental trial runs in April incorporating coated glass fibers in K-17 and evaluate results.

5. BONDED AGGREGATES

(a) United Clay Mines Corporation, in February, stated to R. F. Shannon, that they had developed a high temperature bonded aggregate product that does not crack on drying, with 12" x 12" samples. They had secured M/R values in excess of 110 psi at 13.5 lb. density. They have submitted these samples to OCF for evaluation. They are filing patents on this product. I and C Division have indicated they are interested in following this development. J. B. Dennis of United Clay has stated that if we do not take the product, they will go to J-M, who have indicated they want it.

(b) It was proposed several months ago that trials be made on a pressed mixture of Kaylo dust and Ludox. It is now proposed that such a mixture be strengthened by the addition of non-coated glass fibers, of random lengths, if necessary.

(c) A combination of Zeosil, which is an ultra fine, precipitated silico-aluminate compound, with lime, asbestos and water has, on small lab sample tests given good strengths, when dried at 8 hours at 150°F. Zeosil is very reactive with CaO. It is manufactured by the J. M. Huber Corporation, Haver-De-Grace, Maryland. It is planned to try tests of our own during the week of April 9th, at Granville. This offers another lead for a non-autoclaved product.

(d) The necessity for a non-autoclaved, high temperature heat insulation product, is most pronounced for the foreign markets, such as Mexico, South Africa and Australia. The non-autoclaved product, if strengthened with non-coated glass fibers, particularly of waste derivative, would be of immense value to foreign subsidiaries of Owens-Corning. The cost of remixing, pressing and drying equipment, with as few molds as necessary, would greatly reduce the investment cost for getting into production. A good top grade product, could give Carey Temp real competition. If the cost can be lowered and this passed on to the customer, this has all of the ear marks of a real industry leader. We intent to keep pressing on this development work, with the General Research group at Granville.

6. RAW MATERIALS

(a) Rice sized #34 pebble lime produced by National Gypsum is yet to be evaluated at General Research Laboratory.

(b) Zeosil has prospects as a prehardening agent for K-17 core material and the possible source of silica for a non-autoclaved calcium silicate material. This is a J.M. Huber product. Tests are to be made in April

(c) Caddo Tripoli, of Glenwood, Arkansas, produced by Baker and Collinson, is in production on 200 and 325 mesh material. This may afford a source for a second supply vendor, if material and price are satisfactory.

(d) Johns-Manville expects to be in production of a new type (for them) of diatomaceous earth, sometime in the fourth quarter of 1962. There is reason to believe that the deposit is in New Mexico. This material may be satisfactory as a second source of diatomaceous earth and cost and freight will probably be competitive to other suppliers, such as Eagle-Picher.

(e) Long fibered amosite, particularly W3, has been opened by dry Bauer Milling, on the 36" mill. Trial formulation runs have indicated that a superior product results, giving added strength and increased resistance to impact and abuse.

There is not sufficient W3 amosite available in the now required tonnages, since it was substituted for like amounts of chrysotile asbestos. The AW on hand will be used, but this grade is in short supply also. A k3 grade of amosite is to be trial tested at the General Research Laboratory and if successful, trial tested in several production runs in the plant. It is anticipated that this grade of amosite will be acceptable for substitution, since it was so successfully tested several years ago. This should be completed by April 20 and General Purchasing then can contract for the K3 grade of amosite.

7. IMPACT MACHINE

The General Testing Laboratory has completed the development, building, calibrating, in foot pounds and testing, of the requested impact machine.

As soon as the test data has been analyzed and the machine declared, by the General Testing Laboratory, to be ready for plant Quality Control tests for impact measurements, it will upon request from the plant, be sent to Berlin. Another machine is to be built and kept in the General Testing Lab for correlation of results with Berlin Quality Control Department. This detail should be handled in April.

8. 36" POURING DEVICE

(a) Additional changes have been made to the 36" pouring device. The pouring technique has demonstrated that a successful operation can be expected on 1-1/2" minimum thickness sizes, where the opening is sufficient to allow coated glass fiber to pass through the mold filling slot, without clogging and causing slip planes and air holes. Design must be secured to allow the filling of the device to be in proportion to the size of the nozzle opening and this to be variable and controllable. Engineering and Design application is to be followed closely to successfully complete this device. Preliminary tests have indicated that slip planes, air holes and pouring folds can be eliminated, if the nozzle velocity is not too great and no clogging is had.

9. INCREASE OF OPENING BETWEEN CORE AND SHELL ON 1" MOLDS

(a) The use of dry milled opened asbestos fibers, as well as coated glass fibers has resulted in more clogging, roping and balling of these fibers in the transmission lines, valves, and pouring nozzles. Opened amosite clogging is pre-nozzle, in areas of regulating valves. Coated glass fibers, particularly the hard coated phenolic ones have a tendency to clog at the pouring nozzle.

It is an advantage to have the pouring nozzle as large as possible, to reduce such clogging to a minimum. This point is true also, as experienced on the limited use of the trials with a 36" pouring device.

(b) Costs are to be procured from an outside shop, for the trimming of cores on the 1" thickness molds of pipe covering, to a minimum of 1/8". This will increase the opening in the hand pouring nozzles. By utilizing a thinner, but stronger metal, for nozzle fabrication, additional opening can be secured, over and above this 1/8".

(c) The plant is to proceed, as soon as possible, to open this slot on several flights of 2 x 1 molds. These are to be placed into production to see if the 1/8" remaining lip is sufficient to secure good stripping. Based upon these and other trial results, the decision will be made whether or not to trim back the 1" cores.

10. KAYLO-KLAD

(a) Aluminum

A sample from Insul-Coustics presently furnished aluminum embossed jacket for Kaylo-Klad was reported by them to be full hard Alcoa Aluminum. This statement was suspect upon examination of the material.

The sample was sent for checking to the metallurgist at Alcoa, Tennessee Laboratory for Alcoa and the result was:

(1) 3003 alloy
(2) H154 temper
(3) Hardness between 1/2 (H14) and 3/4 (H16)
(4) Was not H18 or full hard, temper.

The present aluminum jacket is somewhat harder than the first stocks of aluminum from which the first months of Kaylo jackets were supplied. It is not as hard as J-M's plain aluminum jacket. It does not have the spring-back that J-M's aluminum jacket has.

It will be determined at once whether or not the embossing can be done on H18 or full temper. It will further be determined what degree of embossing penetration can be had from Alcoa.

It was stated some months ago that the H14 full hard temper could not be embossed. This statement will be checked for accuracy.

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11. TWO LAYER HIGH TEMPERATURE PIPE INSULATION

(a) Work will be done at once to determine if a two-layer high temperature pipe insulation can be developed by placing an 1" or 1-1/2" section of Kaylo inside a similar thickness of Fiberglas, cemented into place and producing good handling results, with correct nesting and fit.

12. REDUCE OR ELIMINATE DUST ON KAYLO BLOCK

(a) The Kaylo audit held on January 23, 1962, carried the recommendation that the light density block have the dustiness of the packaged product reduced or eliminated.

(b) The material to do this is Ludox. This can be diluted with water and a light spray be directed on one or both sides. This, with one side sprayed greatly reduces the dust. With both sides sprayed, the dust is practically eliminated. General Engineering and Research are combining efforts to design the equipment needed for application and drying after application, if tests prove this is necessary, to avoid mildew attack in high humidity and temperature conditions, particularly in storage, before field application.

13. BOILER INSULATION

(a) Sales is desirous also of having an insulation that could be applied to boilers, by impaling upon fastened sharp points, in a manner similar to mineral wool. We will explore the possibilities of developing such a product and make trial tests of those formulations showing promise.

(b) Product Testing Laboratories issued on February 12th, a report stating that "there was no apparent degradation of any samples returned from field service".

(1) Kaylo block - 30 months on 630°F outdoor Dowtherm tank at Monsanto, at Nitro, water stained.

(2) Kaylo curved block - 10 years at 550°F - #1 cylinder at OCF Plant, Berlin.

(3) Kaylo block - double layer - 10 years at 600°F on duct between economizer inlet header on B & W Boiler - Justin R. Whiting Plant, Erie, Michigan.

(4) Kaylo block - double layer - 1-1/2 years at 600°F on secondary air duct test poured at Segoo, Wilsonville #2 unit - B & W coal fired R. B. boiler.