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KAYLO IMPROVEMENT PROGRAM

New York Meeting - October 16, 1962

Messrs.: Vyverberg
Boynton
Pfeifer

P. 2 shows vinyl chloride an additive

DISCUSSION:

A meeting was held in New York, October 16, 1962, with Messrs. Boynton, Pfeifer and Vyverberg present. The purpose was to review the progress made in the Kaylo Improvement Program and to outline projected plans covering further thermal and physical properties improvements.

The Marketing Group desired:

I. Further general over-all improvement on K10 molded pipe insulation in particular, to make it the leader in the field of present calcium silicates, bonded light-weight aggregates, or bonded amosite fibers. Listed fields of improvement were:

1. Handleability
2. Stress corrosion - stainless steel
3. Absorptivity
4. Thermal properties
5. Dimensional stability
6. Physical dimensions of molded pipe
7. Visual appearance

II. Development of a new insulation, other than a calcium silicate, to compete with Careytemp, namely a non-autoclaved, bonded aggregate.

III. Increase productive throughput of the Berlin plant, with its present facilities, and/or with minor alterations or additions of needed equipment.

IV. Increase gross margins on Kaylo products.

V. Maintain a closely cooperative group working relationship among Marketing; Product-Process Development; Research; Plant; Personnel, to attain maximum program results, on as wide a project coverage as possible, with firm, active direction and follow up on assignment completions.

I. 1 - Handleability

A. Improved impact resistance

1. Adoption of a formulation using 5% coated glass fibers, with:

a. As low a chloride content as possible, or a coating with another base that Textile or General Research can discover.

DISCUSSION: continued

b. A flexible coating is needed not only for plant pouring and processing needs, but to avoid skin punctures of insulation applicators, in the field, when handling or cutting the product.

c. Sufficient quantities of coated glass fibers must be available for uninterrupted formulation continuance, once it is placed in production.

d. A vinyl chloride base coating is agreed to as a beginning, until a different, improved coating is available.

e. The purchase price to Kaylo is to be in line with other raw materials or less, so as to not increase costs and adversely affect Kaylo gross margins.

f. Coated glass fibers are to reduce breakage from rough handling in transit or in the field, and to increase number of times the insulation can be reapplied, after being removed for line inspection or repair purposes.

I. 2 - Stress Corrosion - stainless steel

A. Marketing desires an insulation that is non-contributory to the corrosion of stainless steel. It is highly desirable that this product property-wise and cost-wise would be such as to permit general use. This by:

1. An inhibitor being introduced into the batch; or through raw material analysis control; formulation coverage.

2. Any use of an OD or ID coating, spray or otherwise applied, is acceptable, as long as nesting or clearance tolerances are not adversely affected.

B. An insulation non-contributory to stress corrosion can be secured on a short-range approach by:

1. Using a special batch, which may possibly compromise other physical properties, and be somewhat higher in cost.

2. Such end products are to be manufactured on a made-to-order basis by the plant.

3. Coating the OD and ID surfaces, is permissible, to augment resistance obtained from special batch, provided present dimensional stability and clearances are maintained.

DISCUSSION: continued

C. Corrosion protected end product must be accepted industry-wise.

1. By use of "DuPont Method" in testing.

a. OCF is to conduct test for six months and result must show no corrosion attack, using the accelerated method, involving moisture application. This is the only basis on which DuPont will accept result.

b. OCF is to guarantee that all future production will be of the same composition (batch formulation) as on those specimens on which test results were secured, for corrosion-free attack on stainless steel.

D. Present OCF agreement with Du-Pont on testing is:

1. OCF tests must show a corrosion-free end product at the end of six months, under the accelerated method of testing, at General Testing Lab, in Granville.

2. Samples are to be submitted to DuPont from same group as OCF secured the six months corrosion-free test results.

3. DuPont is to further test for three additional months, the samples turned over to them. If at the end of nine months there is not any evidence of stress corrosion, the products from that tested composition will be acceptable to Dupont, for application on stainless steel pipe or vessels.

E. Any future formulation change, from the one DuPont has accepted, through test results and so accredited for their corrosion resistance use, will have to go through the same test procedure, with the same elapsed time, as the original one, before that end product will be acceptable.

I. 3 - Absorptivity

A. William Turner of Carbide has stated the need for a high temperature heat insulation with a low absorptivity characteristic, coupled with high resistance to impact and flexural strength.

1. Would eliminate damage to insulation from moisture absorption, when stored unprotected out of doors, and exposed to inclement weather. This particularly applies to conditions at construction sites.

DISCUSSION: continued

2. Would reduce fire hazards which are now present, because all calcium silicates act as a wick, for any liquids which escape through a leaking pipe, if these are of a flammable or inflammable nature.

3. Would eliminate corrosion, mostly from rust attack, on structural steel members, where they are not waterproofed with a coating, before insulation is applied, for fireproofing purposes, on vessels exposed to outdoor weather conditions.

I. 4 - Thermal Properties

A. Thermal conductivity at 0.50 Btu/SF/Hr./°F/In. @ 500°F mean temperature to be maintained and/or improved, on K10 light density formulations.

I. 5 - Dimensional Stability

A. Dimensional stability at 1200°F for twenty-four hours at 1.4% maximum shrinkage shall be maintained or decreased for K10 light density material.

B. Dimensional stability at 1800°F for twenty-four hours at 2.0% maximum shrinkage shall be maintained or decreased for K17 or K20 light density insulations.

I. 6 - Physical Dimensions of Molded Pipe Insulation

A. Variances in physical dimensions of molded pipe are to be reduced or eliminated.

1. Some dimensional variances are caused by tolerances set up during early mold manufacture years ago. These variances will be encountered until mold equipment is replaced.

2. Floating cores are a cause of some off-true dimensions, in matching half section or full sections one to another.

a. Work in General Engineering is under way to design a mechanical device for eliminating off physical dimensions from this source, using pouring technique of cores in or cores out.

3. Pouring techniques can permit strengthening fibers to come between spacers and cores, causing an off matching dimension between half section and half section. These variances have been and can be eliminated, to remove this source of non-matching OD surfaces at joints.

FIBERGLAS INTRA-COMPANY CORRESPONDENCE

To O. W. Pfeifer - Toledo

From J. H. Boynton - New York

Subject -KAYLO MEETING - OCTOBER 16

Date October 22, 1962

cc D W. Ladd, Jr. - New York
J. F. Vyverberg - New York
W. K. Sidwell - Toledo

Confirming our recent conversations on the above subject, it was agreed that there are five basic fundamental areas to keep in mind for our Kaylo products to be the best in the Industry. They are: 1) handleability, 2) prevention of stress corrosion, 3) absorptivity, 4) quality as it relates to thermal and visual appearance, 5) dimension control. The areas to be pursued for the balance 1962 and 1963 are the completion of our handleability program, a solution to the stress corrosion problems and a solution to absorptivity.

It was also agreed that to date, with our present batch formulations incorporating the use of glass fibers, that we have an improvement in resistance to breakage and shown be an increase in drop tests to an average four number. This is encouraging to sales, however, it should be pointed out that it is not felt that this is yet at a merchandisable state to announce to the Industry. We are still looking for a Kaylo calcium silicate product with a tilt drop average of seven to eight.

Also discussed was the decision by Manufacturing to incorporate a 5% vinyl coated glass yarn to be introduced to our manufacturing approximately the middle of November. There is no basic objection to this from Sales, except for two points. They are: 1) the use of our present scrap screening product which has an high soluable chloride content which, from all testing data to date, would greatly increase the possibility of stress corrosion; and 2) with our present extended delivery cycles and current backlog, sales questions whether the timing is correct for the introduction of glass reinforcement as it relates to through-put and off-ware. These subjects will be discussed at length, if necessary, with Manufacturing representatives at our October 23 Sales Board Meeting.

J. H. Boynton

JHB:pw

OC-42-2

OWENS-CORNING FIBERGLAS

INTRA-COMPANY CORRESPONDENCE

To R. S. Grant

From O. W. Pfeifer

Date October 25, 1962

cc B. E. Boyd
W. K. Sidwell
H. V. Smith

Subject KAYLO MEETING - NEW YORK,
OCTOBER 16, 1962
MESSRS. BOYNTON - PFEIFER - VYVERBERG

The attached letter from J. H. Boynton of October 22, covers most of the main points of discussion and agreements of the meeting. My outline of October 22 was made from my notes before receiving his communication. His five points have been extended, by me, to seven by inserting as a separate item "Dimensional Stability" and "Physical Dimension Control".

Instead of handling the "bonded aggregate product" under the general title of "absorptivity", we introduced it as a new development project. This is the material similar to, but desired to be better than, present Careytemp insulation.

Mr. Boynton's second paragraph states the desire of marketing for a drop test of eight rather than present securable four. Four drops can be secured without the use of coated glass fibers and with 15 per cent W3 amosite. The present batch, which has been used in production at Berlin since September 8 gives an average of only 2.2. During September, after the 8th, the results of Quality Control show test drop samples were made, to the number of 145. There was not a single drop beyond three before breakage, in any of these. We ran several test batches of the 15 per cent amosite content and Berlin Quality Control made by test drops of 4 x 1 half sections. There were 71 per cent of these drops that went beyond three. It is Taylor's and my opinion, based on results experienced, that there is a better chance of obtaining drops of five or greater with high amosite with cores than getting three with the current batch being used.

We will point out once more that the "breakage" problem is being compromised by using the present batch composition, which is a modified 136A formulation of prior to March 22, 1962, plant usage. We again also want to say that all of the air hole problem at the plant, was not due to the batch formulation and all of the visual appearance improvement made, since September 8 was not due to the formulation change either.

Mr. Boynton does not mention in his memo, two other desires of Marketing, namely, a plant productive throughput increase, with the present or slightly added to facilities, which are to reduce extended cycles in some 30 odd sizes of molded pipe using K-10 light density formulation, which in turn will return overall delivery cycles to the desired 9 to 12 days, without a large per cent

of partial shipments. Also he did not list the gross margin improvement for Kaylo which is desired by everyone.

His third paragraph states that "there is no basic objection from Sales" to Manufacturing's decision to incorporate a five per cent vinyl coated glass yarn to the Kaylo batch by November 15, 1962. He does state that Sales has two points for consideration on this five per cent coated glass fiber inclusion, namely, (1) that present scrap screening coated glass fiber "would greatly increase the possibility of stress corrosion". Mr. Boynton refers to William Lotz's test of four weeks @ 80 per cent cracking. Recent conversations with Dr. Marzocchi disclose he expects to have a coating available for trial purposes around November 1, that will be as low as, if not lower in soluble chloride on end product, thus equaling or giving a better than present production stress corrosion attack rate on stainless steel. (2) Mr. Boynton's other point reflects a concern that the plant's production efficiencies and throughput may be lowered, when the five per cent coated glass fibers are introduced into the batch. This is not necessarily so and the planning and follow through by everyone and the plant personnel themselves, should be pointed to prevent such an occurrence.

Mr. Boynton further did not state, but we are sure he implied, by the approval given to the incorporation of five per cent vinyl coated glass fibers, in K-10 light density Kaylo batch, that both he and Mr. Vyverberg were also in agreement to the development of a special batch that is non-contributory to the corrosion of stainless steel. This would be the so called short range approach. Their overall desire to to have an insulation that is universally used, but is non-contributory to stress corrosion.

We feel that Mr. Boynton, as well as Mr. Vyverberg, will endorse the outline that we have drawn up. If they have any differences, these can and will be soon adjusted to be in agreement.

It is emphasized also that we should vigorously pursue the projects to completion that have been set up, namely:

1. Textile Engineering and Production groups at Anderson set up the equipment necessary to produce 60 - 70,000#/month of coated yarn, using at the beginning a method for single strand coating, either 75 or 150's, waste if available. This must be an operative, production unit as far as they are concerned, in order to maintain the coated yarn, uninterrupted in Berlin's K-10 light density formulation. By the time they have this operation ready, it is reasonable to assume that we will have plant process tested Dr. Marzocchi's low chloride coating on sufficient yarn to ascertain end results.

2. General Products Engineering group will have to have designed, purchased and installed the equipment needed at Berlin to —

a) Chop, if coated yarn is spool or hank shipped from Anderson
b) Place in storage bin
c) Have weigh hopper for measuring amount for each batch
d) Blower, cyclone and spinner arrangement for introduction into hydrapulper, in a light, falling, separated, "rain-like" manner to result, by being well dispersed, in having the best fiber orientation possible in the end product.

This is going to take some doing; demanding the cooperation of all interested parties, in the securing of the answers needed and to keep decisions, that have been made, from being changed, as the time for the program completion approaches.

The various opinions as to the scope of increased degree of stress corrosion attack on stainless steel, incurred by the use of vinyl coated glass fibers over present Kaylo composition rate of attack, should not be allowed to affect the program completion , (1) of coating of the fibers, or (2) their introduction into the batch. It is very reasonable to expect that any soluble chloride retained in the end product will be lower and probably considerable lower than the vinyl coated screen yarn tested by Lotz and related in his report No. 21193 dated 9/19/62, by reason of Dr. Marzocchi's findings by November 1, 1962.

O. W. Pfeifer

OWP/jem