

February 16, 1956

To: Mr. J. W. Mchett - Technical Center
Dr. W. C. Taylor - Technical Center
Dr. G. L. Kalousek - Technical Center
Mr. H. E. Casey - Technical Center
Mr. B. F. Trumm
Mr. L. R. Finn
cc: Mr. O. O. Burch
Mr. W. J. Stewart

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GENERAL RESEARCH - KAYLO DIVISION
MINUTES OF MEETING - Friday, February 10, 1956

CORE MATERIAL

Since two lots of core material which had been made for label service by Underwriters had been rejected, this matter was discussed at some length. The core material in both batches No. 8 and 15 was strong, but the small fire test which Underwriters ran showed both of them to give temperature rise on the cool side considerably in excess of that which the existing specification E-2969 allowed. This specification was based on core material made at Berlin several years ago. Another batch No. 13, made with hydrated lime, was tested by them unofficially and indicated that it may have been suitable from a temperature rise standpoint, based on only one test.

Since a cement batch would be slightly cheaper to make from a raw material standpoint, batch No. 12 was tried containing cement, and data subsequent to this meeting indicated that it also had high temperature rise and would not be acceptable from this standpoint. Batches No. 11, 13, 14 and 15 were based on suggestions by General Research. Batch No. 12, containing cement, was based on former formulations at Sayreville.

Data obtained by Drs. Taylor and Kalousek led to a discussion of the possible causes of the high temperature rise. One thing was clear, and that is that both batches No. 13 and 15 indicated by X-ray that about 10% of unreacted silica was present. There was a difference of opinion as to the cause, but no specific data were available to indicate whether the unreacted silica was due to insufficient induration, or due to formulations containing alumina and iron which, under the conditions of induration used, produced an end structure from which some of the available silica had been rejected.

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It should be noted that indurating pressures at both Berlin and Sayreville were 125 and 150-175 psi, respectively. The pressure used in those runs was 250 psi. It was generally conceded that the SID system, per se, was usable but that the pressures may have produced a crystalline structure which from some standpoints might be desirable, but would lead to high conductance paths for heat and, therefore, give high temperature rise in a fire test. The data obtained at Underwriters' Laboratories bear out this last point.

Drs. Taylor and Kalousek will study the data available and make recommendations as soon as practicable as to the next formulations to try and whether or not other pressures should be used.

KAYLO 20

It was pointed out that from a manufacturing standpoint Kaylo 20 is expensive to make, largely because of its inability to be pre-hardened, and because the slurry itself is so thin that settling of the solids and leakage from the pans produces bad ware. The items discussed were:

1. Means for thickening the slurry.
2. Reduction or modification of asbestos types, treatment and content.
3. The effect of radiation in density of the K factor.

It was pointed out by Dr. Taylor that work had been done on a precooked slurry which was then extruded continuously to form pipe insulation. A sample was shown which had some irregularities in the surface, but it was pointed out that this was made on a rather crude mock-up intended primarily as a demonstration rather than even a pilot machine. The problem of producing a pilot model is entirely one of engineering, and since General Research has no engineers available, it was agreed by Mr. Trum to review the engineering situation within the Kaylo Division to see if any assistance at all could be given. It was Mr. Hackett's estimate that it would take two months of a qualified engineer's full time, with a large part of that time being spent in Toledo to work with the General Research people.

NORMAL KAYLO

A. Thermal Conductivity

It was pointed out that our normal Kaylo is no longer one of the leading calcium silicates in the field, and that it was imperative that we take steps to improve our product to be as good or better than competition. One of the main factors is thermal conductivity and the following items were discussed:

1. Review Dr. Taylor's program for studying thermal conductivity in different batches.
2. Since making specimens by the SID system can be done only at Berlin, plans are to be made for making samples at Berlin for testing in the apparatus at General Research. The planning of the specimens to be made under this program will be coordinated by Dr. Taylor and Mr. Shuman. Mr. Hackett stated that in view of the extensiveness of the program, it may be worth considering a second pipe testing apparatus in order to get answers in a reasonable time. Duplicating the apparatus now in use would not be as complex after building the original.
3. The lack of softness was discussed at length, in which it was pointed out that there are different points of view on this property. However, more and more opinions in the field seem to indicate that a product softer than normal Kaylo is desirable. Comments have been made that it should be like Thermobestos, yet at times Thermobestos has been found to be as hard or harder than normal Kaylo.

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It has also been stated that normal Kaylo should have the softness of Kaylo 20. An attempt will be made by the Kaylo Division to evaluate the definition of the term "softness" by means of specific value in the hardness tester, as run by the Navy. It is rather obvious that the term "softness" is probably tied up in other factors, such as the ease of breaking when a piece of insulation is bumped and the ease with which wires can be buried in the insulation during installation.

4. Amosite Asbestos. It was the concensus that it is highly desirable to use amosite asbestos in all Kaylo products, and Mr. Tramm stated that work was under way in obtaining suitable grades for use at the Berlin plant.

The question of AE amosite was discussed for use in normal Kaylo, and it was Dr. Taylor's opinion that it should not be considered suitable for light density products. This is based on the weakness of the fiber and the fact that it does not have the suspending power of 6D asbestos. It was considered probable that it may have some benefit in heavy density material, but that this should be evaluated by actual tests rather than adopted on the basis that it does no harm being included.

5. Shrinkage. Shrinkage of Kaylo materials in service was discussed, particularly from the standpoint of re-application of the material in the field, as is done in many cases where the insulation is removed for inspection of the metal beneath it and the insulation re-applied.

The question of chamfering the inner edge was discussed, and it was pointed out that this would need some study before being adopted as a standard procedure, because the Navy has minimum thickness requirements which would be violated by this.

Throughout the meeting as each general topic was discussed, the desire for more basic research was expressed so that the Kaylo Division would have more data available as to the effects of the many possible variables on the end product.

It is presumed that General Research will consider this matter in setting up their research programs.

Respectfully submitted,

E. C. Shuman

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