

NINTH PROGRESS REPORT

ON

STUDIES OF KAYLO

905

OWENS-ILLINOIS GLASS COMPANY

C-57334

|      |    |
|------|----|
| ROLL | 81 |
| CODE | 71 |

May 16, 1947

### 3. SUBSTITUTION OF ASBESTOS BY CELLULOSE PULPS

As will be discussed in detail in the following section, the first phase of our investigation has proven quite conclusively that from a strength point of view asbestos can be successfully replaced by paper pulp, whereby our experiments thus far were limited to Kraft pulp as made from new Kraft clippings.

In preparing a batch of similar consistency as now used in actual production and in obtaining satisfactory strength:

- (1) the use of about 10% clay addition (whereby the  $\text{SiO}_2$  of the clay is substituted for  $\text{SiO}_2$  of the basic batch) was found for successful total substitution of asbestos by paper pulp and,
- (2) the addition of Gum Karaya for dispersion of the fiber was found to be quite helpful and is included in our preferred batch formulation.

Batches made with paper or even paper and asbestos mixtures are not satisfactory with respect to hinging however.

Typical batch compositions are given in Table VI under 3a and 3b.

Our present experience appears to indicate that for partial replacement of asbestos the amount of clay to be added may be a function of the degree of reduction in asbestos addition.

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typical record chart in Plate II. The autoclave, boiler, program controller, and temperature recorder are shown in Plate III.

The samples were dried as shown in the various tables and conditioned in the laboratory for 24 hours before testing.

The asbestos and paper were beaten on a standard paper beater and the degree of beating checked by the standard freeness test.

## 2. EVALUATION OF DATA

Close approximation of plant procedure on a laboratory scale introduces considerable difficulties with respect to reproducibility of data. The short mixing time in particular appears to be objectionable in this respect.

Nevertheless, it was decided to adhere to the above outlined procedure rather than to adopt the methods used in the Toledo "Laboratory," since it was believed that in this manner results were more directly applicable to plant procedure.

Ten pound density was chosen for most of our experiments, since it was assumed that differences between paper pulps and asbestos would become more noticeable in the lighter product.

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In connection with this series the effects of  
and as dispersing agents were tried.  
While there was some indication that these additions have  
a slightly beneficial effect, results were not significant  
enough to warrant further investigation.

#### 4. SECOND SERIES, INFLUENCE OF DRYING TEMPERATURE

The inconsistency of results, and the known  
properties of cellulosic materials suggested a brief  
investigation of the influence of drying procedure as  
summarized in Table II.

The variations in drying procedure did not  
show any significant results for the Kraft samples and  
the average difference between asbestos and Kraft samples  
was even greater than in the first series.

#### 5. THIRD SERIES, MISCELLANEOUS ADDITIONS

Observations of the batch mixtures appeared to  
indicate that paper pulp has a tendency to agglomerate  
during mixing in the concentrations used in our batches.  
The relatively good results previously obtained with  
batches containing 4% Kraft where this effect would be  
minimized appear to bear out this conclusion.

Various unsuccessful approaches to obviate  
this are summarized in Table III.

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