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Analysis
of
Johns-Manville and Competitive
Lime Silica and Magnesia
Insulations
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ANALYSIS OF JOHNS-MANVILLE AND COMPETITIVE
LIME SILICA AND MAGNESIA INSULATIONS

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ANALYSIS OF COMPETITIVE
MAGNESIA AND LIME SILICA INSULATIONS

Approximately 100 sections and 400 pieces of competitive Magnesia and Lime-Silica Pipe Covering and Block Insulations were purchased for a comparison with Thermobestos and New Process Magnesia taken from our inventory. Samples of New Process Magnesia produced by Commercial Alcohols Ltd. were also included in this comparison.

This material was shipped directly to the Research Laboratories. Upon arrival, each carton was photographed to show the conditions of the carton. The cartons were then opened and photographed to show the condition of the material upon arrival. All material was removed from the carton and inspected to J-M specifications by a regular Quality Control inspector from "E" Building. Each piece of P/C and Block was measured to the nearest 1/32" for a statistical study of the dimensional characteristics by Headquarters Quality Control. Samples of each material were secured by Research for the conductivity test. Five samples of each material were also forwarded to Vanville Quality Control Laboratory for physical tests.

In any comparison study, the number of samples tested always presents a question as to whether or not it is wholly representative. In such a study as this, it would be economically impossible to obtain a truly representative sample that would comply with statistical laws. However, to help correct for this condition, an equally small sample of J-M material was selected at random so as to be as comparative as possible with that material purchased from the competitors. The results presented here are therefore, a relative comparison based on the relative few samples.

This report has been subdivided into four parts, each part giving the complete detailed picture for Lime-Silica P/C, Lime-Silica Block, New Process Magnesia P/C and New Process Magnesia Block. The following is a brief summary of these sections.

SUMMARY

- I. LIME-SILICA P/C - Physical and conductivity tests indicate J-M to be better than competitive, but with higher density and higher abrasion losses.

J-M has dimensional difficulty, but all competitors have difficulty with one or more dimensions. Pabco would appear to have less dimensional difficulties than the others.

When sections were picked at random for nesting, J-M material would nest as well as the competitive, but with a looser fit.

- II. LIME SILICA BLOCK - J-M appears to be better than all others for all properties; however, Pabco is equal to J-M dimensionally.

- III. MAGNESIA P/C - As with Lime-Silica P/C, the physical and conductivity tests indicate J-M to be better than competitive, but with a higher density. Dimensionally all appear to have difficulty. Commercial Alcohols appears to be better than all others dimensionally. Comparative sizes of Manville material was not available for nesting at the time of this report.

- IV. MAGNESIA BLOCK - Physical tests indicate J-M to be better than or equal to all others and also shows the best thermal conductivity. J-M and K&M appear to have the greatest difficulty with dimensions.

COMPARISON WITH PAST DATA:

As compared with the studies in 1952 there is an improvement in J-M's thermal conductivity and some dimensional improvement; however, the length dimension seems to show greater variation. All manufacturers would appear to have reduced their dimensional variation since February, 1952.

- CONDUCTIVITY-GENERAL - J-M Thernobestos and New Process Magnesia have lower conductivities than the Kaylo and Pabco-type pan cast materials. J-M's better insulating value is due to the process which provides filter-moulded block and pipe covering insulation with a laminate structure perpendicular to the source of heat.

Kaylo pipe covering smokes badly when first subjected to soaking heat. This is caused by the oil which Kaylo uses as a parting compound in their pan cast process.

Pabco-type pipe coverings fit metal pipes too tightly and become cracked down the back when the metal pipes are heated and expand in diameter.

HOT PIPE TEST -

This test is an observation of hot-face cracks resulting from one surface heat shrinkage of pipe covering. The test is effected by a number of factors including size of pipe covering and whether single or double layer insulation is run.

It appears from the photographs that with equal sizes, Thermobestos pipe covering cracks less transversely and longitudinally than the competitive Kaylo, Caltherm, or Calsilite lime-silica insulations.

HANDLING PROPERTIES -

J-M material has been shipped to Waukegan and is to be returned so that the condition of the carton and its contents may be observed after shipping and handling. This material had not been received at the time of preparing the report and will be issued as a supplement to this report at a later date. Pabco-type pipe covering is soft and weak, and arrived with a considerable proportion of broken legs and cracked backs, and with ends mashed.

Kaylo pipe covering is brittle due to the short "spiculated" fibre used, and the pan cast method of molding, and falls apart when broken.

J-M New Process Magnesia pipe covering is stronger than competitive magnesia due to its laminate structure and the method of molding under pressure.

Thermobestos pipe covering is tough, due to the longer unground fibre used, pre-jelling, and the laminated structure resulting from the filter-molding process.

CONCLUSIONS -

In general, present J-M molded insulations compare very favorably with all competitive products tested.