MVL R&D 1990

JOHNS-MANVILLE RESEARCH AND ENGINEERING CENTER

Memorandum M431-41

Date May 8, 1963 431

MANUFACTURE OF SLINGER-TYPE INSULATING FIRE BRICK BY THE ALL-DRY MIX PROCESS

Requested by: W. M. MacAlpine

RECEIVED
A. C. SMITH
MAY 8 1963

A review of problems at Zelienople on April 22 by representatives of the Production, Sales and Research Departments revealed that a Technical Project to make slinger-type IFB by the all-dry mix process was awaiting approval at DH.

Two limited trial runs in 1959 showed that JM-26 IFB could be made by the all-dry mix process (TP 015-8, Research Reports 431-338 and S1). Although there were obvious deficiencies in the available equipment at that time, the properties of the brick were essentially the same as those made by the slip process. Recovery was 93.9 per cent from 4500 brick when the process was in relatively good control. However, the system for weighing the ingredients did not provide enough material to maintain the standard rate of production; control of the rate of delivery from the storage bin to the pug mill was not adequate and a more uniform flow of water into the pug mill was needed.

More recent work in the laboratory has indicated that the new JM-25 IFB at a density of 41 pcf (Product Proposal 431-59 to issue) could also be made by the all-dry mix process. The processing shrinkage, density and shrinkage were reduced slightly when the all-dry mix process was used. These results suggested that a slight reduction in the amount of sawdust would be required to maintain the properties.

The benefits to be derived from use of the all-dry mix process include the following:

1. A more positive measurement of the amount of clay in the mix would result. Effects of unavoidable present variations in the specific gravity of the clay slip and possible malfunction of the slip metering pump would be eliminated.

2. A more uniform blend of raw materials should be attained by eliminating the surges of clay slip into the pug mill.

3. Elimination of necessary adjustments in the amount of clay slip to compensate for changes in specific gravity would promote a more uniform consistency of the wet mix. Consistency would be controlled by one valve on the water line. It has been demonstrated that good control of the consistency is required for good recovery.

4. The small amount of alkali from the deflocculents in the clay slip would be eliminated. Alkalies are fluxes and trace amounts are detrimental with respect to performance of the brick in service.

Installation of the automatic batching system at Zelienople has eliminated a major obstacle from the commercialization of the all-dry mix process. Although additional trial runs are needed to prove the process, benefits which may not be amenable to financial analysis are possible. For example, we are confident that use of the all-dry mix in the cast process has been a significant factor in the success attained with the new lightweight brick to date.

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PLAINTIFF'S EXHIBIT K-1628

DEFENDANT'S EXHIBIT OE-199

It is recommended that every effort be made to evaluate thoroughly the use of all-dry mix in the slinger process.

S. E. Wooley

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cc: D. C. Josephs, DH
E. C. Lindstrom, DH
G. T. Creswell, DH
N. J. Kent, DH
G. E. Grimshaw, DH
C. E. Ernst, DH
R. E. Robinson, Zel
H. R. Bennett, Zel
R. G. Frederick, Zel
C. F. Rassweiler, GH
A. C. Smith
S. E. Wooley
File:
W. M. MacAlpine
J. Q. Trice
Library (3)
C