INTER COMPANY AND INTER-DEPARTMENTAL CORRESPONDENCE

TO: Mr. P. A. Ramey
(Dallas)

FROM: Robert R. Dzurilla

DATE: November 9, 1972

SUBJECT: NEW PATENT CASE ON LIZARDITE CONTAINING INSULATING MATERIALS FS 775

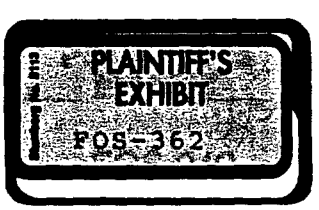
Upon receipt of a sample of Hedman Fundamental Cationic Fibre (HFCF) a number of laboratory experimental tests were conducted in order to determine the benefits and range of percentages that HFCF could have in water base PROFLEX and PROFAX slurries. Tests as to the compatibility of HFCF with various refractory fillers (page 25) without the use of asbestos were very encouraging. The refractory fillers which were tried in our basic PROFLEX 31 included Anthracite coal, olivine, calcium silicate, Magnesite, mullite, kyanite, alumina, grog, chrome magnesite and silica flour. All of the fillers formed well and the physical properties (page 26) obtained from the pads were encouraging. The following recipe was used for the filler tests.

Raw Material	%
Filler	76
HFCF	4
(other designations XS236 & X3220)	
Resin	5
Slag Wool	11
Diatomite	4

The urgency of the removal of asbestos from hot tops used by REPUBLIC STEEL began in September of 1972. The original PROFLEX® G recipes used by REPUBLIC STEEL in their hot top insulator boards and one-piece tops contained 15% asbestos. The recipe which was designed to replace the PROFLEX® G series was in the form of EP-5267/PROFLEX (formerly XS1485B) (page 73).

EP-5267/PROFLEX® Recipe

Raw Material	%
Silica flour	49
Diatomite	25
Resin	2
Alumina Silicate Fiber	10
Fiberglass	6
HFCF	7
Asbestos	1



The HFCF is used primarily as a suspension and dispersion agent. Suspension tests were conducted (page 93) on EP-5267 with and without the use of HFCF. The test uses a 1000 ml. graduate which has a height of 14" and is 2-3/8" in diameter. The slurry to be tested is mixed well and poured to the 1000 ml marker. After intervals of time, the solids settle and in some cases rise. The liquid which divides the single or double layer of solids is measured and recorded as % water. The formulations which have a tendency to slowly rise to the surface are the better suspension slurries. The experiment showed that the slurry with HFCF did rise and had a better overall suspension of 16% water as compared to 27% after 15 minutes. Fifteen minutes is the optimum time used for all slurry suspension tests.

Dispersion of the fibers is something that can only be seen and not measured. HFCF in combination with a surfactant disperses fibers sufficiently to form a homogeneous slurry which is necessary for good fiber orientation during the forming cycle on production machines and satisfactory surface texture of the various shaped hot tops.

Three production runs totaling over 2,000 hot tops were produced successfully on production machines from EP-5267/PROFLEX . Hot tops included one, three and four cavity tools. The #571 and #572 (pages 27 and 72) were the part numbers produced on Foseco Mark III machines. Physical properties including the Amitec hot heat transfer (also enclosed) were all satisfactory. Only the resin level was adjusted to the optimum during the first production run. Verbal reports from the field have indicated yields have increased 2% at REPUBLIC STEEL, Warren, Ohio with the usage of our EP-5267/PROFLEX hot tops.

The minimum amount of HFCF needed for proper suspension and dispersion of fibers in a PROFLEX and PROFAX recipe is 7% (page 69).

The range of from 4% to 100% HFCF was experimented with in water base slurries (pages --- 82, 83, 90, 91 and 92). The first experiment was tried by using 100% HFCF slurried in water (page 83). The solids concentration was too low and all the slurry passed through the screen. The second test conducted was with 96% HFCF and 4% resin (page 90) at a higher solids level but again the slurry passed through the screen. The following tests were conducted with levels of HFCF at 90%, 70%, 50% and 30% in a PROFLEX type recipe. The forming times were affected greatly as the HFCF was reduced. The forming is considered to be the time it takes a pad to be formed from the slurry. Forming time is very important for it is one of the determining factors to whether it can be made at all or produced economically on a production basis. The best range of HFCF in PROFLEX is from 7% to approximately 30% because of the satisfactory physical properties and most important being the forming times. The range from HFCF from 30% to 90% formed satisfactorily but the forming times were much too high to make it economically feasible to produce even though the other physical properties such as strength and density were acceptable.

Hopefully, you will now have sufficient information to produce a specification suited to the requirements of the U.S. Patent Office. If you feel that you need additional information, we will be happy to forward it to you as our work progresses with the use of HFCF.

Sincerely yours,

Robert R. Merrilla

RRD/ccl

Att.