

IV. TECHNICAL DEPARTMENT

**Monthly Report
September, 1974**

Raw Materials: Through the third quarter, raw material increases showed strong evidences of increasing at a much slower rate than through the first half of this year. The major increases have been in silica flour, amioca starch, and special kraft paper. The only major affect on the base raw material cost of Profax comes from silica flour where the percent change is due to 70% under utilization of the bulk silica system. The increases come from higher packaging and transportation costs. The amioca starch price rise negates its economic advantage as a PF resin substitute. X 3579 (PVAC) has been recommended to the Chicago plant manager as its replacement. There have been no major price increases affecting the Ferrux group.

Initial estimates for X 3562 requirements were overstated. Our projections for 1975 now stand at 600 tons per month. We plan to discontinue the use of starch X 3578 at Chicago and Mt. Braddock. X 3198 (Alumino- silicate fiber) is being researched relative potential availability if needed. RM 267, paper, has plentiful supplies available. In the event that we convert to paper containing formulations, we most likely will have to pre-pulp or hammermill before use.

Profax and Ferrux development: During the month of September, we set up a time table for the various projects considered necessary for future product development. This evaluation outlines standard procedures from the initial work through plant experiments and field evaluations with the time elements involved. We hope that this standardization will allow greater control over project completion. The initial format is enclosed.

Project 24032 is completed from the laboratory standpoint; that is, the use of Hedman fiber in Profax formulations. We will run Amitecs to determine the recipe effectiveness.

Laboratory evaluations involving combinations of 131D and 00E for improved forming and curing are in initial stages. No visual appearance or transverse strength variations are obvious. This evaluation will be assigned a project number for thorough investigation.

Many problems were encountered at the Chicago plant, in an attempt to produce asbestos-free, paper free rings (EP 5669A) on #7 ring machine. Due to production limitations, further experiments on asbestos free Proflex are temporarily delayed. We have, however, achieved a reasonable degree of success on asbestos free Profax, but the results have been erratic and for the time being Chicago has elected to go to a low asbestos content formulation.

Ferrux development: The marketing of a low cost Ferrux to compete with Topex and Kaul Clay has been investigated and depends on the future availability of competitively priced ball mill dust. When large supplies of this

are available, we can set up field trials and commence a selling effort. We also have revised costs of RM 531X (expandable graphite) containing Ferrux products. They indicate that these products are competitively priced on an effective application rate basis.

Non-Heading development: Project 1-1-03-2 involved a complete evaluation of substitution suspension agents for RM 459 and 488. Out of all of the samples tested, one met the minimum specifications required. During this period, however, there was an increase in the availability of the aforementioned suspending agent. A combination of all three will be utilized for maximum production flexibility.

Project 1-1-04-3 (Monomix 180) has indicated that we can successfully replace the more expensive vitreous silica with the less expensive RM 131A. A buffer of RM 74C is proposed. Three additional projects still carry old R & D project numbers: 1. A-21-D Corseal has involved considerable testing of alternate raw materials to achieve the adhesion and crack free surface requirements evidenced in the Corseal supplied via Foseco-Canada. The project is not complete and manufacturing process modifications, as well as raw material substitutes are being investigated.

Project A-2-2-D Garpak is still unfinished.

Project A-107-D Koron 40: the completion of a 2-pak version of Koron 205 for U.S. Steel-Fairfield. The recipe is on the books and awaiting field trial.

Mr. Hodgkinson is in the process of establishing the same laboratory testing and man hour breakdown being instituted in the headings development sector. These will be available in the October monthly report.

General discussion: The Technical Department, during the month of September, supplied considerable man power in the supervision of the Bethlehem-Johnstown in situ Profax operation. A number of equipment, as well as recipe modifications, were instituted. Currently no significant permanent recipe modifications have been made. The current recipe involves a 1:1 ratio of EP 5676 and EP 5482. The complete maintenance of the in situ installation will continue through the end of October.

The incidence of increased pipe on the 669 1-Pc hot top at Republic-Canton using EP 5672 caused great concern. An extensive Amitec evaluation was conducted and the conclusions are that a lean 5/8" thick hot top could produce conditions that could lead to pipe formation. The data collected comparing the two Profax materials, Profax 31C and EP 5672, indicated that the difference between the two products is negligible from a statistical standpoint. There is no doubt, however, that to achieve the maximum insurance necessary to eliminate the possibility of pipe, we should be forming a minimum 3/4" thick hot top and moreover approaching 7/8 of an inch.

A partial success was conducted on the 684 injection tool using EP 5669A Proflex vs. EP 4651F Proflex. The trial showed that high fiber rings did not have the necessary strength in the injection port area, due to random fiber formations created by turbulence in that area. Low fiber formulations are the key; subsequently, EP 5492 was tried and achieved a higher degree of success.

The key to injection forming for rings depends on specialized tool design. With the current work load on the Engineering Department it is not possible to speed up the program. It is hoped that this can be eliminated.

EP 5476 Garnex: the 343 Middletown tool was used to produce Garnex boards for the Keystone tundish liner. The production run was good but many of the boards burned out in the oven because of the high paper content. Field tests will be conducted shortly.

Amitec testing: It is the expressed and implicit desire of the Technical Department to process Amitec tests as quickly as they are submitted. This processing is in hand and as Amitecs are requested they are put into a non-alterable schedule and completed on the date when promised. This practice is to continue permanently.

It is the aim of the department to produce as quantitative an interface between manufacturing and technical so that the conducting of various trials in the plant can be done so in a smooth and unimpaired manner. To enhance this, Mr. Clay Bulan has been assigned the job of monitoring densities and transverse strengths as well as other technological problems he may observe and reporting them in a meaningful way to manufacturing to evaluate product performance. His findings of the first 30 days of his work will be available in the October monthly review.

DJM/llr