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REPORT ON VISIT TO EUROPE- AUGUST 27-31, 1970

FOSECO INTERNATIONAL, LTD.

PROFAX-PROFLEX-KALFLEX:

A slide show was presented illustrating our efforts to date with Proflex indicating that its application in the U.S.A. was to gain new business where current Profax could not be sold or was proving troublesome.

It was evident that our approach to the use of Proflex was more advanced than theirs or any other operating company. Foseco International terms of reference were to develop a flexible type Profax free from asbestos because of asbestosis and the industrial legal questions arising from its use in both England and Europe. They subsequently developed from Proflex as we know it- to Kalflex- a duplex system free from asbestos. The duplex being necessary in order to import a strong hard front-face to withstand the rigors of rim-stabilized steel practice.

The culmination of a final satisfactory receipe has not yet been obtained to meet steel mill practices due to variable thickness, occasional burning tops, floaters, boiling and metal penetration into the board have been problems.

Although the raw material costs of Kalflex is higher than current Profax 20, it is found in practice that a quicker dewatering cycle can be achieved- even with two sluices. As production rate is increased and dry scrap reduced to a minimum, it is felt that the increased raw material cost balances out with current production.

ADHESIVE:

They are currently maintaining high pressure on this aspect in an endeavor to develop a production technique with the prime suppliers of adhesives. The Bostick Company was first contacted following the initial successful trials but were unwilling to supply or manufacture bulk rolls of strip adhesive on silicon paper. The Dunlop Rubber Corporation came up with a production outlet which gave good laboratory results. However, a field test on molds at S.C.O.W. in the writers presence failed to get the boards secured due to low adhesiveness. (See S.C.O.W. Visit). Attempts are being made to cut back from a 100% coverage of the back of the board to 50% and even 25% coverage is not considered to be unrealisitic.

The current system is only good up to a mold temperature of 150-170°C (300-340°F) using a two stage system, a lower system up to about 90°C (194°F) and an upper system from 90-170°C (194° to 340°F). At the change-over point, problems could exist for the adhesion system is at its weekest point.

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ADHESIVE:-Cont'd.

They are currently working on systems in an endeavor to beat the higher mold temperature problem, but to date with little success. It must be pointed out, however, that the bulk of the work has been aimed at S.C.O.W., where mold temperatures will be maintained within the temperature limits of the current adhesive system. One hot mold on a drag could however pose a severe restriction on the heading system contemplated.

In production, it is necessary to apply a P.V.A. sealant-coat followed by a coat of mastic, followed by adhesive and then more mastic. The actual sequence of this operation is envisaged as follows:

(1) Make wet Kalflex tops.
(2) Apply by roller P.V.A. emulsion sealant.
(3) Dry in the normal manner.
(4) On removal from oven apply coat of mastic while warm.
(5) Cut adhesive/mastic silicon paper.
(6) Apply to board when cool.
(7) Pack.

This operation does not appear too unreasonable- although it has not yet been reduced to practice.

FLUXES:

Bottom Pouring: Interest in the Stelotol 10, Accutherm, Thermofin types appear to be waning in Europe with a swing to the more fluid types based upon basalt and or perlite. Stelotol 12B (basalt) is being sold in Germany whilst Stelotol 15 (perlite) is sold in England.

Top Pouring: Stelorit 101 is proving to be a good flux for inclusions, removal and general cleanser when used directly in the mold.

Rimming Steel: No more effort has been applied in an endeavor to solve the higher carbon, higher manganese grades or to the low carbon variety. FIL feels that the current products available should be sufficient to cover these grades.

FLUXES:-Cont'd:

Desulfex: The French Company have a good business going for them with Desulfex 51 for treatment of electric furnace steel giving reductions of up to 50% sulphur at addition rates of up to 60# per ton-preignited in the ladle. Fume has proven to be a problem to the United Kingdom company who have opted to go to a non-exothermic Desulphex 100 ladle treatment used at a rate of 20-40# per ton. 30% sulphur reduction have been achieved with this product.

Desulfex 51 is being sold to one Open Hearth Shop in France who sell the resultant steel as electric furnace quality steel because of the improved cleanliness and low sulphur obtained.

Con-Cast: Of little interest in the United Kingdom although floride free compositions are of interest in Germany.

COMMERCIAL CONCLUSION:

F.I.L. felt that our efforts were most promising with Proflex, the seal-on system and the leak free casting. However, our efforts will have to improve to increase our product mix by diversifying into other products like fluxes etc. in an endeavor to increase our overall profitability. Its profit that counts- not sales.

FOSECO (F.S.) LTD:

PROFAX-PROFLEX-KALFLEX:

Most of the comments made under the heading of Foseco International Ltd. are appropriate here also.

The need for an asbestos free receipe capable of withstanding rim-stabilized grades is of paramount importance to the continuation of business to Foseco (F.S.) Ltd. To date, the results are promising, but theyh have a good competitor in the shape of London-Scandinavian (Ferro Engineering) who are currently supplying a very hard asbestos free board.

PROFAX-PROFLEX-KALFLEX:-Cont'd:

At S.C.O.W. for instance, Foseco has the majority of the business on square or near square mill ingots with Hilti-nailed 8 piece assemblies and still have a floating problem. Ferro has the bulk of the 8 piece slab-Hilti nailed boards. Stiffness of board and the long tracking time from mold preparation to pouring platform are considered reasons for the floater problem. I was able to indicate some of the hardware systems used in the U.S.A. that they may find advantageous. Metallurgical performance of Kalflex is said to be as good as Profax on tests run to date.

ADHESIVE:

Not considered to be a production problem in view of current negotiations with Dunlop Rubber Company. However, current test tops for S.C.O.W. trials are all hand made.

FERRUX:

Nothing new, but they are attempting to produce a highly efficient low density product to replace Ferrux 40 and Ferrux 300 at a higher profit margin.

STRIM:

Maintaining sales and penetration although nothing new in the offing.

DESULFEX:

The few trials that have been carried out with Desulfex 51 have confirmed results coming from Japan, France and Germany. However, the fume problem and application costs have restricted sales. This has led to the introduction of Desulfex 100 a non-exothermic ladle addition-cheaper cost with a lower addition rate. Although higher tap temperatures are required for the 30-40#/ton addition, sulphurs have been lowered by 30%. A sales push is now on with Desulfex 100.

STELOTOL:

Sales of Stelotol 10 now losing ground to Stelotol 15- a synthetic with a perlite base having given better and more reproducable results. Nothing has yet been done with Stelotol 12B. If we require Stelotol for sale at Lukens, Dr. Davies, feels he could supply it from the United Kingdom, cheaper than Accutherm or Thermofin from Germany.

CON-CAST:

Of very limited interest because of low production in United Kingdom.

STEEL COMPANY OF WALES (S.C.O.W.) Project:

This project is a joint F.I.L./F.S. team gathered together for the purposes of designing a rapid heading technique with an asbestos free insulating system for a three B.O.F. shop operation at full production on mill ingots with a mold temperature below 200°F. The system must head up a full drag in less than 30 minutes for use on fully killed and rim stabilized grades of steel.

The development work that has been conducted to date has given rise to the duplex, asbestos free receipe Kalflex with an in Foseco factory adhesive backing, already described.

The engineering side consists of a system very much like a Tigerschiold umbrella which is supported on a carriage capable of moving along the platform (as at Roebling, Sparrows Point, Ashland, etc, who have double setting platform). The umbrella's capable of being lowered and raised and also rotated. The current design requires a separate umbrella for each mold size.

In operation, the carriage with umbrella in the up position is hand pushed to No.#1 ingot in the platform area. This is lowered into the mold at the pre-determined setting height. Setting pins are then pushed out onto the mold wall at the shoulder area or hot top junction. A four piece Kalflex assembly is then dropped into the mold after removal of the backing paper between the umbrella and mold wall. The sides of the umbrella then open up forcing the hot top onto the mold wall. After holding for a few seconds the umbrella is collapsed and withdrawn for use on mold No. #2. The whole operation taking about one minute to set a hot top.

The Mark I System currently located at S.C.O.W. is a hand operated rig for demonstration and de-bugging operations only. A Mark II air operated system was observed at F.I.L. before my visit to S.C.O.W. indicating a much simpler and slicker operation using two valves only. A Mark III is in the process of being developed as a further definement in an endeavor to make the system more fool-proof, compact and versatile for use on multi-mold sizes.

STEEL COMPANY OF WALES- Cont'd:

To date only two pouring tests have been conducted with the system. The first with the Bostick adhesive was a success in every respect with no setting our pouring problems. The second, witnessed by the writer using the Dunlop adhesive was a failure in that the system failed to stick the boards to the mold wall.

Although the system appears to be fast and slick, unsatisfactory answers were given to questions about use on dirty molds or the occasional hot mold that will undoubtedly slip into the system. The current Mark I and II models are obviously not beefy enough and would be considered by the writer too be too fragile for the mill use. All these problems are receiving attention and only time and patience will solve these production difficulties.

In this particular setting area, Foseco has sold a bulk storage system for Koron 160 used to spray both stools and molds. A large storage tank gravity feeding into two 60-gallon pressure vessels using simple spray guns to do the job at hand. The system is completely over-hauled every three months by a serviceman who removes about 6-9" of solid sludge with a shove onto the pit floor from the storage tank! EXPENSIVE! Tank size approximately 40' X 10' X 4'.

VISIT TO FOSECO-GERMANY:

KRUPP-BOCHUM:

A side visit because of available time to observe bottom poured BEU and BED 5 ton mill ingots using Accutherm. Trials have been carried out with Stelotol 128 although the customer prefers VIPEX a recent product introduced to the market from Czechoslovakia based upon perlite said to be the best product. Supply of VIPEX was limited. I was not able to see any ingots poured or in stock that had been cast with VIPEX.

It was hoped that I would be able to see Desulfex 51 used in this Open Hearth Shop but none was scheduled during my visit. They use the material only and when they run into problems of high sulphur.

VISIT TO FOSECO-GERMANY:

RHEINSTALL-HATTINGEN:

This visit was arranged as a follow up visit to the Lukens visit in May-June to clarify their observations of use of Foseco products in the concast and static ingot pouring areas. Although Stelotol 12B was in use at this shop on bottom poured ingots, it had also been superceeded by VIPEX as being far superior. Even so, unexplaniably the shop was currently using Thermofin in preference to 12B due to the short supply of VIPEX. Whilst there, I was able to observe two trials with low fluoride-fly ash casting powders for the concast slab machine using a submerged snorkel. Both materials performed extremely well giving good coverage and slabs almost free from surface cracks. Further trials are to be conducted as this customer requires a fluoride-fume free product..

CONCLUSIONS:

1. A very worthwhile visit indicating several areas of interest to Foseco, Inc.

2. Evan Jones of FIL is to supply all technical details on fluxes, Desulfex, Stelotol, VIPEX and concast fluxes to Ted Jago for our exploitation in the U.S.A.

3. Although the writer was impressed with the work so far carried out on the S.C.O.W. project, it is still very early and a lot has yet to be learned about the KALFLEX, ADHESIVE and engineering, operations to be a viable proposition for a range of uncontrollable variables.

4. We think we have problems with our products with regards to supply, demands, service-sales etc. So do they and the writer feels that we are on even par if not better in some areas giving us the opportunity to shine much brighter in the future.

D. P. Helliwell

DPH/kfg
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