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Visit with Glass Fibers, Inc. - Toledo, Ohio

C. F. Rassweiler, K. W. Huffine, W. R. Wilkinson, E. A. Phoenix, and H. T. Coss visited Glass Fibers, Inc. at their new Toledo office, 1810 Madison Avenue on October 29. Mr. R. H. Barnard, president, had arranged a program for the day, including a discussion over the conference table in the morning, luncheon at the Toledo club, and a visit to their Waterville plant in the afternoon. At the morning discussion, Mr. Barnard had Messrs. R. F. Mensing (treasurer), F. H. May (secretary), R. H. Capaul (sales manager), and H. W. Paul (assistant to the president) in attendance.

Before the meeting opened, Mr. Barnard in response to a question from Dr. Rassweiler stated that probably $100,000,000 had been invested in glass fibers in the past two years. He stated that at least 47,000 oz of platinum had been advanced to this industry by the government in that time and possibly 100,000 oz in all had been advanced. Platinum is now quoted at $93 per oz. All glass fiber operations still depend on platinum but the amount used per pound of glass has been reduced.

Mr. Barnard started the meeting by explaining the development of his ideas of using round platinum crucibles and bushings in comparison with the rectangular bushing which the competition uses. Mr. Barnard's crucibles are heated by high frequency induction (it was brought out later that the location of the water-cooled induction coils is extremely important. In fact, a difference of even 1/8 in. in location, vertically or horizontally, means success or failure.). The Owens-Corning rectangular bushings require water-cooled electrodes and use resistance heating, and this creates non-uniformity of temperature in the 204 orifices in the bushing. This is one reason for lack of uniformity in the Fiberglas yarn or flame-blown fiber. In addition to having the circular orifice arrangement, Mr. Barnard uses air pressure of about 80 in. of water above the melt. This pressure gives another measure of precision control and the combination of electronic heating, round shape, and air pressure is considered responsible for the two basic patents which Glass Fibers hold. Oscillator tubes have been used to secure the high frequency current but 150 kw motor generators are being installed and it is expected that the mg sets will result in very substantial reductions in heating cost.

Mr. Barnard stated that Owens-Corning were going directly from glass melting to orificing. In other words, they were bypassing the production of marbles. He stated it is 4¢ more expensive per lb to use marbles but that up to now it is his opinion that this extra cost is more than justified by reduction in rejects and downtime. He stated that Owens-Corning use a portable pot furnace for melting glass for Aerocor at their Santa Clara plant and that each furnace is good for only 30 days. At the South Carolina textile yarn plant Owens-Corning are also bypassing the marbles, but are reported to be in serious difficulty.

Incidentally, it was explained that all the Glass Fibers, Inc. production is made with these same circular bushings; that textile yarn to "B" fiber to "AAAA" fiber is all made on the same type melting equipment, but with different orifice sizes.

Mr. May stated the Vitron patent position. He said they have 24 U. S. patents pending and 15 which have been issued, and one Vitron trademark in five product classifications with 9 pending. Sixty foreign patents have been issued.

Glass Fibers stock has been sold twice on the open market, and the Glass Fibers people say that in each case the Underwriters examined their patents and considered them sound. They did not, however, say that the Underwriters had investigated the possibility that they might be infringing Owens-Corning patents. Mr. Staelin, the Owens-Corning Patent Attorney, wrote Glass Fibers a letter in 1949 stating that they intended to bring action against Glass Fibers if they should at any time find evidence that Glass Fibers was infringing their patents. Owens-Corning must know the basic processes Glass Fibers is using, and their failure to start suit in the last two years would seem to put them in a very bad position to start suit at some future time.*

This philosophy, however, does not apply to their possible infringement of the Owens-Corning patents on flame-blown fiber. Mr. Barnard showed us a copy of a recent letter they had written to Owens-Corning, obviously in reply to Owens-Corning having called their attention to six Owens-Corning patents. The patents referred to had the following numbers: 2,450,363; 2,457,777; 2,481,543; 2,489,242; 2,489,243; 2,489,244. In the letter, Glass Fibers stated that they were "not infringing any valid claims of these patents". This would clearly imply that they were infringing certain claims of the patents. Mr. Barnard stated that they considered the basic claims of these Owens-Corning patents as being invalid as the result of prior teaching on this subject in an expired Canadian patent.*

Mr. Capaul discussed production and applications. He started out by emphasizing that fabrics made with Vitron yarn were preferred to Fiberglas yarns because of the greater uniformity of the Vitron. He stated that the broad fabric field was the largest use for Vitron yarn. Wide cloth is used chiefly for plastic lamination. Aircraft laminates are not as big a field yet as anticipated because the aircraft program is not in high gear. The importance of the curtain and drapery field was minimized by Mr. Capaul.

The second important field is that of narrow fabrics; electric tape, carpet tape, etc. amount to 25 to 30 per cent of the broad fabric field. All Vitron yarns are sold direct. The large inventory of yarn which had been accumulated by Owens-Corning after the war was liquidated by Gustin-Bacon who chopped the yarn up in making Ultralite.

Mr. Capaul stressed the importance of the development of 150s yarn (15,000 yd per lb - 0.00038 in. diameter). Owens-Corning shell and hull cloth used 450s yarn (45,000 yd per lb - 0.00023 in. diameter). The 150s yarn is essentially coarser and easier to run and is considerably cheaper than the 450s so that the latter is in much smaller volume today than before. The 450s yarn has a price of $1.46 per lb and prior to a price reduction by Owens-Corning (when Vitron came on the market), the 150s yarn was priced at 61¢ to 78¢ per lb. When Vitron introduced the 150s yarn to General Electric, Westinghouse, and a few others, Owens-Corning dropped the price 30 per cent to 41¢. They subsequently brought it back up to 44¢. Glass Fibers, Inc. are not selling against this price although they could, according to Mr. Barnard. The reason is that they can sell their capacity as plied yarns for which the price of the 150s was not reduced and is still 61¢ to 78¢. One of the results of this development is that Vitron's entrance into the 150s yarn field has

*These two paragraphs were dictated by C. F. Rassweiler.

broadened the variety of uses for glass yarn so that big textile mills are now interested as well as concerns like General Electric, Minnesota Mining, U. S. Plywood, Irvington Varnish, Formica, etc. For example, the plastic laminates glass mat costs 55¢ per lb but one-third must be thrown away. 150s glass cloth is 85¢ to 95¢ per lb. Cotton cloth is 23¢ per yd and Glassfab is almost at this price. Not much reduction would be required to enable glass cloth to compete with cotton cloth in which case tremendous markets would open up for electrical uses.

It is believed that the motor generator development combined with the production expansion underway will permit Vitron to get the price of the 150s yarn down to within shooting distance of the cotton. Varnished cloth for the electrical business accounts for 60 per cent of the 150s cloth sales now and varnished cloth for aircraft use constitutes 40 per cent.

The house wiring market was the largest yarn market next to the broad fabric field but did not develop as anticipated, because of government restrictions. Due to the price drop the use of glass yarn for reenforced paper has become of importance. Vitron sell 150,000 to 200,000 lb per month to one little plant of Glasscraft who make a competitive paper to Sisalkraft, and the Minnesota Mining and Manufacturing Company uses glass yarn for reenforced tape. Magnet wire is moving into the 150s yarn class as well as sleeving and tubing. A big market for 450s yarn on which Mr. Barnard is very bullish is photo-template cloth. U. S. Rubber make it now and it has several advantages over the conventional tracing cloth because of its dimensional stability, and translucency. U. S. Rubber use Vitron because of its uniformity over Fiberglas.

At the beginning of 1951 the markets were estimated to be one-third glass yarn, one-third superfine fiber, and one-third underground pipe wrap. The selling price of pipe wrap is $1.06 per 100 sq ft on which the company has a 50 per cent gross profit. The single machine they are operating is 60 in. wide. Owens-Corning on the other hand has a 36-in. wide machine in addition to a 60-in. machine on which they make specialities like lamp shades, battery separators, etc.

The Addex Company of Cleveland makes a cold repair mat for asphalt roofing. The U. S. patent is 2,503,246. Vitron make a swirl type of mat for Addex. Incidentally, they believe a swirl type of mat built up to 30-34 mil by heavy asphalt coating is a good possibility as a felt for lining irrigation ditches.

Most of the superfine fiber is made in "A" fiber grade (0.000065 in. diameter) as flotation wool for Navy life preserver jackets. Some of this same grade of wool is used for winter clothing interlinings.

Owens-Corning split the Navy flotation wool market with Glass Fibers on a 50-50 basis. The selling price is $1.75 per lb in felt form with a silicone and phenolic binder. The reason this market exists is that the Navy found that a mothball program for Kapoc life preservers was unsuccessful and in another three years will have completely replaced all life preservers in the Navy with "A" wool. Incidentally, the more uniform fiber diameter of Vitron gives 7 to 8 per cent better flotation than Fiberglas in the Philadelphia Navy Yard tests.

They are just setting up to operate a unit on "B" fiber at Defiance. Owens-Corning sell "B" Aerocor for 98¢ per lb for automotive uses, seat cushions, and they also supply the Vibradamp Corporation in Los Angeles. Vibradamp are not satisfied with Fiberglas' Aerocor and are negotiating with Barnard for Vitron.

As regards the "AAAA" fiber or glass pulp, it is $20 per lb at this time but this is an unrealistic experimental price. The Navy is interested in it for gas mask paper. Mr. Barnard is particularly enthusiastic about the future possibilities for glass pulp as a raw material for papers. He presented each of us a booklet containing various grades of glass pulp paper samples.

Throughout the discussions, it was evident the personnel of Glass Fibers, Inc. have a conviction that their process produces greater uniformity of textile yarn than Owens-Corning, and that this means they have markets opened to them (such as the photo-template cloth, special purpose treated tapes, etc.) which Owens-Corning have failed to satisfy. Mr. Barnard was definite in stating that his process would control the glass pulp fiber diameter to 0.1 micron variance. In other words, it can be made from 0.5 to 0.6 microns. This relative precision applies to the other coarser flame-blown fibers also, as compared with Owens-Corning Aerocor, which they said are all over the map. Incidentally, aside from the melting pot arrangement, we understand their flame process is identical with the O-C process, but that Glass Fibers use a different combustion burner than the special type which Selas developed for Owens-Corning.

In the afternoon the entire party with the exception of Mr. Paul visited the Waterville plant. In addition to the information contained in Memorandum D-146 of December 1950, the following should be noted. Two tank furnaces are being operated for making marbles. Dr. Jesse Plummer who is now in charge of the plant stated each tank had a capacity of 4000 lb per 24 hr. Several additional Atwood silk twisting frames are being installed for the glass yarn packaging. A warehouse extension has been added so that the entire plant floor area amounts to about 10,000 sq ft. Forty new textile furnaces and winding machines are being installed and floor space is being provided for perhaps 120 more. An excellent engineering arrangement appears to characterize this new layout. Since all of the flame-blown fiber production has been transferred to the Defiance plant (where Mr. Draper is manager), the area formerly occupied is available for installation of another pipe wrap unit.

The group witnessed the operations at the marble machines, the textile yarn spinning and twisting, and the pipe wrap production machine. The latter appears to be operating at about 60 ft per min and contains the longitudinal yarn reenforcement. The twenty textile yarn production units appear to have made big strides ahead in operating smoothness compared with eleven months ago. Then only about one-third of the furnaces were making glass yarn without difficulty, and the other units were either cold or not winding. This time all units appear to be smoothly operating.

Mr. Barnard has a young and evidently competent group surrounding him of whom he is quite proud. The caliber of his associates made a good impression on all of us.

H. T. Coss

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CC - C. F. Rassweiler, GH
K. W. Huffine, GH
W. R. Wilkinson, GH
J. A. O'Brien, GH
E. A. Phoenix, GH
V. C. Kline
E. R. Williams
file

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