

SIX MONTHS REPORT
PRODUCT DEVELOPMENT &
TECHNICAL SERVICE DEPARTMENT

January thru June 1977

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SGP 0014770

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SIX MONTHS SUMMARY

New products developed at the Tigard Gypsum Laboratory during the past five years contributed $125,781 to gross profits and $427,177 to net sales during the first half of 1977. The transition to non-asbestos joint compounds involved the entire product line and therefore, were not considered new products.

Product Development

The firedoor core with special edge banding will be tested for 1 1/2 hour rating at Warnock Hersey in July. Our customers tell us that the 1 1/2 hour rating will substantially increase our core sales.

The Consumer Product Safety Commision's proposed ban on asbestos fiber convinced us to cease all production of joint compound containing asbestos on May 5, 1977. We have replaced them with alternate non-asbestos formulas, but this substantial change is having quite an impact on our marketing. The ban also had an effect on our wall texture which contained talc. The new wall texture is being well received and is saving $.10/bag in raw material costs.

A simpler and less expensive Pre Dec paint formula will be adopted at Acme after a successful plant run and U.L. test. The savings are conservatively estimated at $1.44 per M sq. ft.

Manufacturing Services

A method for achieving acceptable water resistant properties for tile backer, sheathing and loadmaster has been developed and proven by plant trials. It will now be up to all plants to use the new method in their operation.

Another competitive wall board survey showed G-P 1/2" and 5/8" type x products to be of competitive quality for most properties. Edge hardness and end grinding still need improvement.

The automatic preservative system installed at Marietta has been functioning well and permitting about 1 1/2¢ per pail savings by using a new liquid preservative. The other four joint compound plants will install similar systems.

Ryan Preble has been transferred from Sigurd to Tigard for training to assume the future technical responsibilities for the Franklin Roofing Plant. Preparations for evaluation of raw materials and testing of finished roofing products are under way.

We assisted in the gypsum Quality Control Supervisor School and concurrently conducted a training program for joint system quality supervisors.

Shortages of mica, hamico starch and attapulgus clay have necessitated efforts to find substitutes.

Sales Services

A successful fire test of the I-Stud shaft wall was made at the Los Angeles Fire Department furnace. This test was co-sponsored with Flintkote & Studco. Another co-sponsored test of the I-Stud system with Domtar and Westroc at U.L. in Canada is planned. The objective is to expand our sales but limit our testing expense through co-operative tests.

An improved polystyrene texture has been developed and market trials are planned. Our goal is to substantially expand the sale of polystyrene texture.

Patents & Legal

We should shortly have an answer to our response to the examiner's objections to our firedoor patent application. Cordon, inventor of patent #3,565,650 has contacted us regarding a license since he believes our firedoor process is within the claims of his patent. We have responded stating that we are outside their patent claims and should have a royalty free license since we purchase all of our basic raw materials from one of the patent owners.

In the past half year, some time has been devoted to the Lyons case (claim of asbestosis due to the use of metal casting plaster); the Ecker complaint arbitration and the various implications of the Consumer Products Safety Commission and the Toxics Substance Control Act.

Industry

The controversial wallboard application standard is now stalemated in ASTM Committee C-11. The 1977 edition of the Gypsum Association Fire Resistance Design manual is ready for printing and should maintain its reputation as the best and most up-to-date publication of its kind.

Recruiting and Training

Wayne (Chick) Ciccarelli has been transferred from the Tigard Lab to the Sigurd Plant.

SALES & PROFITS FROM NEW PRODUCTS
FOR FIRST SIX MONTHS OF 1977

UNIT	PRODUCT	SALES VOLUME	LIST SALES AMOUNT	GROSS PROFIT AMOUNT
MSF	Sentinel Wallboard (all)	652	$ 64,977	$ 7,757
BGS	Polystyrene Texture	5,554	20,854	3,354
EACH	Firedoor Cores (raw)	3,429	47,087	12,972
EACH	Firedoor Cores (banded)	10,700	282,710	98,401
LN FT	Fire Retardant Wood	33,008	11,549	3,297
TOTAL:		53,343	$427,177	$125,781

Projected Annual Cost Savings

*50,000 MSF Pre Dec @ $1.44/M = $72,000/yr

*60,000 Bags of Wall Texture @ $.10/bag = $ 6,000/yr

*Based on first six months sales.

PRODUCT DEVELOPMENT SECTION

PRODUCT DEVELOPMENT

1. Firedoor Cores

There have been several concurrent developments in firedoor. The first is a continuing effort to upgrade quality which has resulted in some definitive tests to determine core quality. Tensile strength was found to be one of the most significant measures of the overall core quality. It also correlates with resistance to impact in the slam test. A tensile strength of at least 40 lbs. per sq. inch and preferably 50 lbs. is a good indication of a high quality core. Weekly checks show that our tensile strength results are consistently in the 50 lb./sq. inch range. The production capacity of the firedoor plant was increased and shortly thereafter a loss in core quality, as determined by low tensile strength, was noted. This was found to be due to calcination, so some dryer adjustments were made to correct the problem. An overall firedoor core quality control program has been prepared which involves all aspects of core manufacturing and packaging.

Another firedoor project came about as a result of difficulty in gluing veneer to the treated Hemlock edge banding. Most of the problem has been with casein adhesive. We evaluated a number of different adhesives and even considered applying a sealer to the core. This evaluation showed that a compatible sealer for one adhesive would not necessarily be compatible with another adhesive. Sealers were found to be desirable, but under the circumstances,it would not be practical for G-P to apply the sealer. This should be a problem for the adhesive manufacturer but we became involved when our customers asked us for assistance.

A third development is a major effort which has been directed to a core for a 1 1/2 hour firedoor. Since the edge banding is the probable failure point, a special gypsum edge banding was formulated to be used in conjunction with the fire retardant wood around the edges. Several compositions were tried and finally a formula and a thickness of 3/4" was decided on. Several pilot doors were tested before arranging for the full scale test. The test is scheduled for mid July. If successful, it will still take some time to determine how to manufacture the edge banding and assemble the specially banded core. According to customer reports, a 1 1/2 hour core will greatly expand our sales.

Some effort has been devoted to seeking alternate binders for the firedoor core. This project is still in progress but thus far none has been found which is better than the PVA we are using.

2. Asbestos Free Joint Compounds

Early in 1977 a decision was made to furnish both asbestos and non-asbestos products until such time as everyone was forced to discontinue the manufacture of joint compounds with asbestos. This allowed some time to gain experience with the asbestos free materials. However, the asbestos products were

preferred except in isolated markets where there were restrictions against using them so we didn't gain as much experience as we would have liked.

The proposed ban came in early May and the decision was made to discontinue manufacture of joint compounds with asbestos as of May 4. By that time we had settled on a ready mix formula which had about the same raw material cost as the asbestos ready mix. The first asbestos free formulas were about 20¢ per 5 gallon pail higher in raw material cost. As warm weather arrived, fast drying complaints have been reported and we are currently working on this problem. The asbestos free caseins are complex formulas with as many as 15 different ingredients. This places a burden on the plants to formulate them properly. For the moment we have decided to concentrate on the ready mix and try to have sales shift disgruntled casein users to our dry vinyl products. Problems with the asbestos free products are not unexpected and it may take some time to resolve them.

3. Wall Texture

Even though the wall texture didn't contain asbestos, it did contain fibrous talc, which has been considered as hazardous as asbestos. Trial of a talc free wall texture were completed just prior to the ban. It was necessary to field test a gypsum base texture from Acme and a limestone base texture from Marietta. The reports from the trials indicate that the new texture is better than the old. Also, there is a 10¢ per bag raw material saving.

4. Gypsum Fibers

The fiber project is being revived since it looks like there will be a demand for fiberous materials now that asbestos and talc have been banned. It is a question of whether the gypsum fibers can be manufactured at a reasonable cost.

MANUFACTURING SERVICES SECTION

MANUFACTURING SERVICES

1. Water Resistant Wallboard

An all out effort was directed to improve water absorption properties of water resistant wallboard products ie. tile backer, sheathing and loadmaster. After several unsuccessful attempts were made, it was found that an accelerator mixture of land plaster, lignosite and potash ground in the ball mill and a slower machine speed dramatically improve the water absorption properties imparted by the asphalt wax emulsion. Another factor is the absorption of water by the face and back paper. We have requested the paper mills not to apply wetting agent to the bond line of the paper used for water resistant products. The first plant run of the accelerator mixture proved that absorption can be improved to meet the ASTM requirements. A program was established for all plants to try the new system with the objective of having them in compliance with the ASTM absorption standards in 90 days. As of now, 6 plants have made trial runs, all of which have been successful. Originally it was expected that there would be a substantial sacrifice in machine speed but now it appears that there will be less than 10% loss of production.

2. Competitive Wallboard Survey

Another wallboard survey was made to evaluate our position in the market. This survey differed from previous ones in that two G-P 1/2" boards were requested, 5/8" type x boards were compared and some of the non-essential tests were eliminated. G-P 1/2" board fared better than in previous surveys. The chief weaknesses are soft edges and the need for better end grinding. G-P 5/8" x was judged to be one of the best. The 5/8" type x weights were 50 to 97 lbs/M higher than the U.L. standards so a reduction in weight to about 25 lbs. above the minimums is desirable for cost savings, if it can be accomplished.

Competitive board surveys have been conducted approximately every 8 months. It should be possible to settle on one per year unless some unusual circumstance occurs.

3. Automatic Preservative Addition System

Previous investigations of ready mix preservative candidates resulted in some liquids as offering the best protection. These products, some mercurial and some non-mercurial, are toxic and would involve safety hazards in using them. It was therefore decided that a system should be devised that automatically meters the correct amount of preservative without exposing anyone to safety hazards. A stainless steel tank, precision displacement pump and a timer were installed at Marietta. The preservative is added along with the mixing water and colors the water brown so this is another check that the preservative is present. A liquid called Proxyl was chosen

since it was the best performer of all the preservative candidates tested. Two months have passed since the Marietta plant began using the Proxyl and the new system and thus far we have no reports of spoilage. In addition, there is a 1 1/2¢ per pail saving over the dry mercurial previously used.

As a result of the success at Marietta, automatic preservative units will be installed at all the other plants.

4. Roofing

Shortly after the decision to build a roofing plant in Franklin, Ohio, we met with Tom Brady to compile a list of laboratory equipment and apparatus that will be needed to test asphalt roofing products, asphalt, granules and other raw materials used in the manufacture of roofing. Some recruiting was done to try to find someone with experience in asphalt to set up the equipment and begin testing raw materials and subsequently transfer to Franklin as Plant Chemist. No viable candidates surfaced so we turned to our own organization and transferred Ryan Preble who was a gypsum plant trainee at Sigurd. He is learning all about asphalt roofing and the test methods as well as visiting asphalt and granule suppliers to acquire as much knowledge as possible. We are hopeful of being able to have Ryan visit some roofing plants as well.

4. Quality Control Schools

We participated in training schools for gypsum quality supervisor trainees and joint system quality supervisors. The objective was to review all the product and raw material testing procedures, complaint handling, etc. and in the case of joint compounds and textures, application methods as well.

6. By-Product Gypsum

We considered the waste gypsum from American Cyanamide's titanium dioxide plant in Savannah. They have two streams, one which may be usable and the other which could not be used. After they insisted that we use a blend of the two streams, we lost interest. They also expected us to bear the expense of any large scale trials at Brunswick and we couldn't have agreed to that either.

Another source under consideration is a potential desulfurization unit in Brunswick. This is some time off, since it will take two years for the installation to be completed after the contract has been signed.

7. Mica Replacement

A shortage of mica has occurred and some effort has been devoted to find ways to reduce our mica requirements. A dry vinyl joint compound with 10% instead of 20% mica will be tried at Chicago. One mica extender which appears to be effective is also in short supply. There is some indication that the supply situation may ease up later in 1977.

8. Analyses

We are continuing to conduct analyses of rock, land plaster and stucco samples as requested by the various operations. A salt water spray is being considered at Nova Scotia to control the dust and our analyses indicate that it could introduce excessive salt that may cause problems at the board plants.

SALES SERVICES SECTION

SALES SERVICE

1. Tests of Industrial Products

Some comparative tests were conducted on G-P and U.S.G. pottery plaster. Some Loadmaster wallboard samples were tested for paper ply strength to assist a customer, Dalin Associates, with a wind uplift test. Also, we provided some assistance to Dalin in their heat damage tests at Factory Mutual.

2. I-Stud Shaft Wall System

This has been rather a dead issue recently except that a small scale test was conducted at the Los Angeles Fire Department Test furnace. This was a co-operative test with Flintkote and Studco and was designed to obtain I.C.B.O. approval for a 2 hour rating on the shaft wall from both sides. A test at U.L. in Canada is planned and will be co-sponsored with Westroc and Domtar if it ever comes off. The object of the co-op tests are to limit our investment in fire tests of the I-Stud System, but maintain some ability to compete for high rise wallboard sales.

3. Polystyrene Texture

Reports from the field have made it apparent that our polystyrene ceiling texture does not apply as easily or hide as well as competitive products, chiefly Hamilton's texture. A complaint in Seattle of poor hiding qualities was resolved by adding titanium dioxide to the bags remaining in the customer's warehouse. Based on this, the texture was reformulated and a plant trial at Acme has been requested. Hopefully a more acceptable product will result which will substantially increase our polystyrene texture sales.

4. Complaints

We participated in an arbitration to settle a complaint in Florida concerning casein joint compound that came loose from the corner bead. We are convinced that the corroded corner bead caused the problem and believe we proved our case in the arbitration meeting.

Another serious casein complaint was investigated in West Germany. This was a tape bond failure problem. Analysis showed the proper amount of casein so the problem was probably job related. Since it had been completed over one year ago, it would be difficult to pinpoint the cause. The bags becoming wet or contamination by gypsum joint compound used on the same job are possibilities. We have arranged to have trials of both asbestos free casein and vinyl in Germany. We delayed shipping orders for casein all purpose until they would try the asbestos free products.

5. Product Literature and Bag Directions

The Sweets Catalogue literature is in the process of being revised for 1978. In view of the change to non asbestos joint compounds, certain designations and instructions on the bags had to be changed. The literature also required revision to delete all references to asbestos products. At the same time some streamlining was done to delete out-of-date instructions, highlight some precautions, and in general, to make for clear, concise instructions with appropriate precautions and recommendations.

INDUSTRY REPRESENTATION SECTION

INDUSTRY REPRESENTATION

Gypsum Association

We participated in the Technical Committee and Annual Meetings of the Gypsum Association in 1977. The major topics being considered by the Technical Committee:

1. Fire Resistance Design Manual

The Manual has been reviewed and several changes and additions were made that will substantially improve what is already considered as the best available collection of fire and sound information. One of the reasons this book is so highly regarded is the fact that it is reviewed frequently to keep the information current. The new issue should be ready for distribution for this summer.

2. Generic Shear Values for Mobile Homes Board

The program proposed was to use member company tests for an engineering study that will result in a listing for the Association with the long range objective of reducing the duplication in testing. U.L. was unwilling to do this because the small number of shear tests which have been conducted. Instead a small scale test program will be conducted by U.L. involving all member companies wallboard. Based on these results, one large scale test would be run on the board performing the worst in the small scale test. This is quite a lengthy program, but should result in generic U.L. listings published by the Association.

3. Tile Industry

There has been a controversy with the tile industry regarding the taping of joints under ceramic or plastic tile. The tile industry objects to the recess joints leaving an uneven surface for the tile application and the gypsum industry feels that the joint compounds are too water sensitive to be used. It appears that this will be resolved with the tile companies assuming responsibility to see that the joints are well sealed prior to the tile application. Also a co-sponsored test program is under consideration.

4. Research Associate Program

The continued funding of a man at the Bureau of Standards Fire Research section is recommended by the Technical Committee. There will be more fire research going on at the Bureau that will affect the gypsum industry and it is in our interest to have someone representing us.

ASTM

Committee C-11 is still wrestling with the proposed wallboard application standard. It is now in limbo since contractors and manufacturers disagree on whether 1/2" board should be permitted on 24" center ceiling framing when water base textures are applied.

The bench test for type x board has been proposed to ASTM and hopefully will be adopted in lieu of the full scale fire test.

PATENTS & LEGAL SECTION

PATENTS & LEGAL SECTION

Lyons Case

A deposition was given in the case where the plaintiff Lyons claims to have gotten asbestosis from using our metal casting plaster.

Firedoor

1. G-P Patent

A response to the examiners rejection of our patent application on the firedoor composition was submitted. There is quite a lot of art close to our invention but we hope to at least get some limited claims allowed.

2. Cordon Patent

We received a not unexpected letter from Mr. Cordon who holds a patent describing a composition similar to our firedoor core. Our response was to the effect that we can remain outside his claims by merely using a coarser grade of perlite. Since we purchase perlite from one of the patent owners, we have simply informed them that we can buy our perlite elsewhere but the best arrangement is for them to furnish us with a royalty free license.

3. Consumer Products Safety Commission and Toxic Substances Control Act

We have been handling requests for safety information in regard to the use of our products. These requests are being processed in co-operation with our Legal Department, but thus far, no consistent procedure has been devised.