

BESTWALL GYPSUM COMPANY

R&D REPORT FOR 6 MONTH PERIOD ENDING DECEMBER 31, 1964

PLAINTIFF'S EXHIBIT

GP-1313

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SGP 0014901

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FOREWORD

This is a report of the activities of the Research Department for the last six months of 1964. During this period there were no personnel changes in the department. The major change which did take place was the restoration of the Research & Development test facilities in a new building. Our large scale testing facilities had been removed during the consolidation of Bestwall's general offices in Paoli. In the new building, better equipment and more space have been provided for us to perform our function.

The 1964 expenditure is estimated by the Cost Department at \$133,880 as opposed to the figure of \$150,000 which had been projected for 1964. In 1965, more reliable figures will be available because of the new accounting system which will be in effect. A better analysis of research expenses will therefore be possible. With the information available this year, the chart on the following page was prepared and shows the approximate distribution of research costs in 1964.

Also included in this report is a record of the market performance of products which have resulted from the efforts of the Research Department. There is no sure method of evaluating certain accomplishments, such as fire rated constructions or sound rated constructions which were developed to provide assistance to Sales. The fact that our sales of 1/2" Firestop are up 48.7% in 1964 and our sales of 5/8" Firestop are up 34.2% in 1964 over 1963, are indications that we are reaping some benefits from this work.

This report is divided into three sections:

Projects Completed
Projects Nearing Completion
Projects Underway

These sections appear in the order named and indicate the progress to date for the projects within each section.

*1964 MARKET PERFORMANCE OF NEW PRODUCTS

<u>PRODUCT</u>	<u>SALES VOLUME</u>	
	<u>Last 6 Mos</u>	<u>Year</u>
FIRESTOP 120	251 M sq. ft.	557 M sq. ft.
GRABIT ADHESIVE	53 T	75 T
ONE DAY JOINT COMPOUND	284 T	548 T
DENS-COTE PLASTER	911 T	1,629 T
DENS-COTE BASE	4,952 M sq. ft.	8,774 M sq. ft.
DENS-COTE TAPE	7,302 rolls	13,764 rolls
READY MIX	13,203 cans	15,617 cans
TILE BACKER BOARD	321 M sq. ft.	345 M sq. ft.
TILE BACKER TAPE	139 rolls	139 rolls
MODEL DENSITE	4.5 T	4.5 T
TOOLING DENSITE	0.8 T	0.8 T
HIGH EXPANSION DENSITE	2.1 T	2.1 T
BESTEX "C"	527 bags	527 bags

TOTAL

PATENT INFORMATION

Patents Issued - None

Patents Applied For - None

Patent applications previously submitted:

Processing of Synthetic Gypsum

One Day Joint Compound

Grabit Adhesive

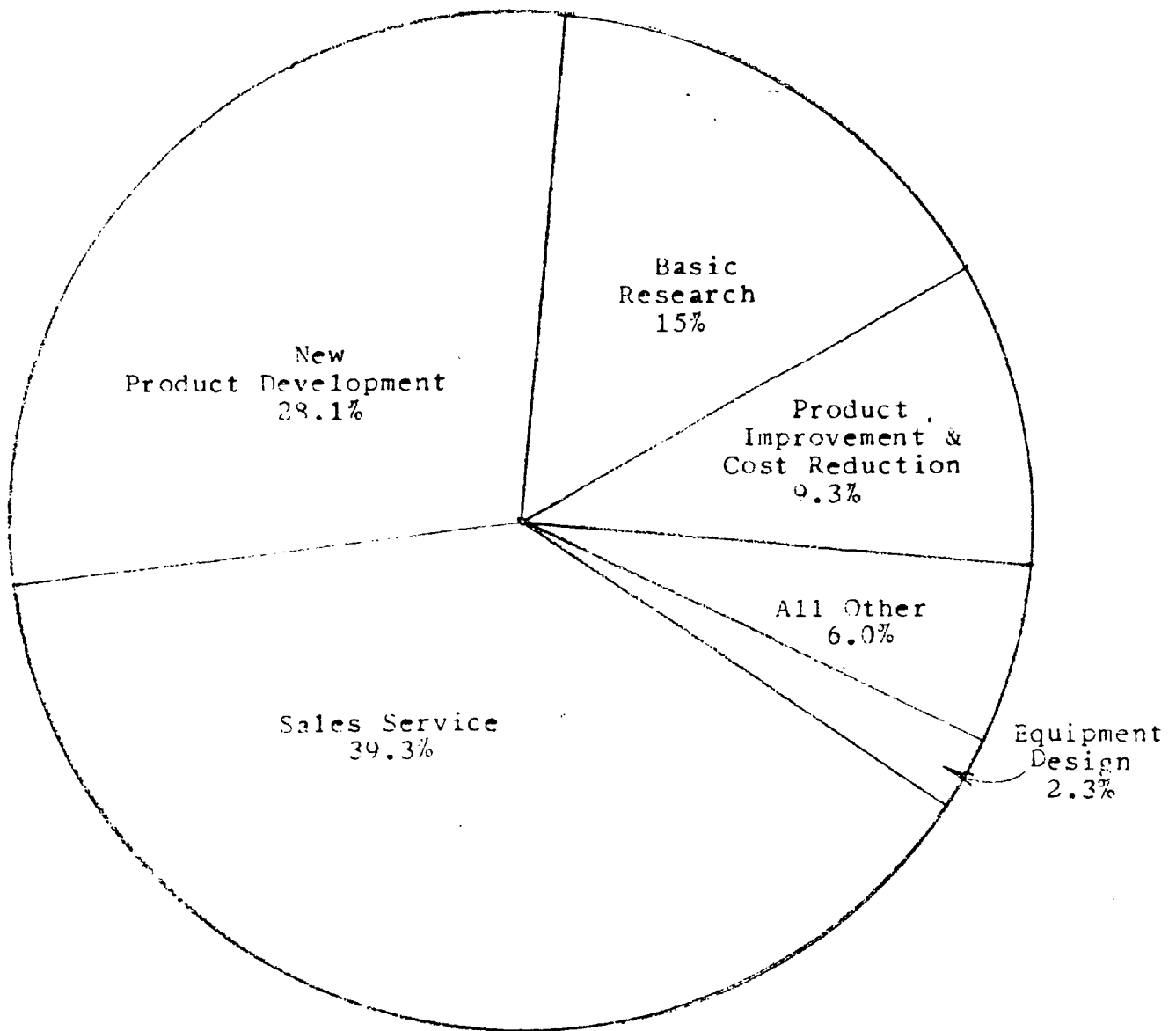
Dens-Cote Plaster

Dens-Cote Base

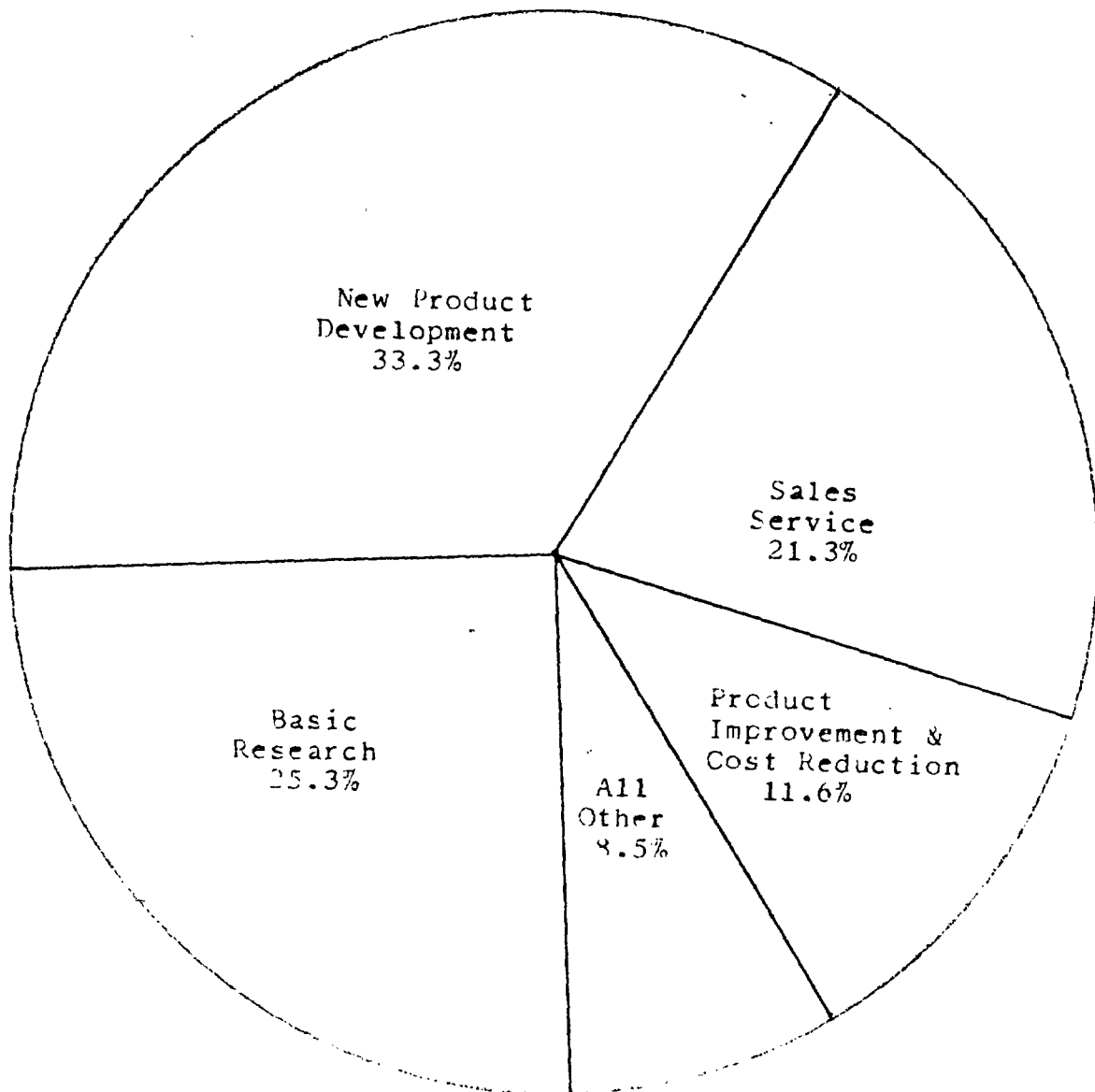
MILL BASE SALES		ESTIMATED GROSS PROFIT	
<u>Last 6 Mos</u>	<u>Year</u>	<u>Last 6 Mos</u>	<u>Year</u>
\$ 34,380	\$ 76,751	\$ 9,875	\$ 22,432
10,048	14,259	5,778	8,181
45,826	92,459	11,862	24,346
49,124	88,032	8,478	16,228
209,280	370,667	79,988	143,909
7,465	13,770	3,129	5,801
57,488	68,496	8,662	10,279
25,058	26,742	9,344	10,390
1,273	1,273	769	769
158	158	63	63
41	41	14	14
99	99	25	25
<u>2,848</u>	<u>2,848</u>	<u>1,018</u>	<u>1,018</u>
443,088	755,595	139,005	243,455

*Cost figures computed by the Financial Department from the machine accounting records.

TOTAL RESEARCH EXPENSES - 1964

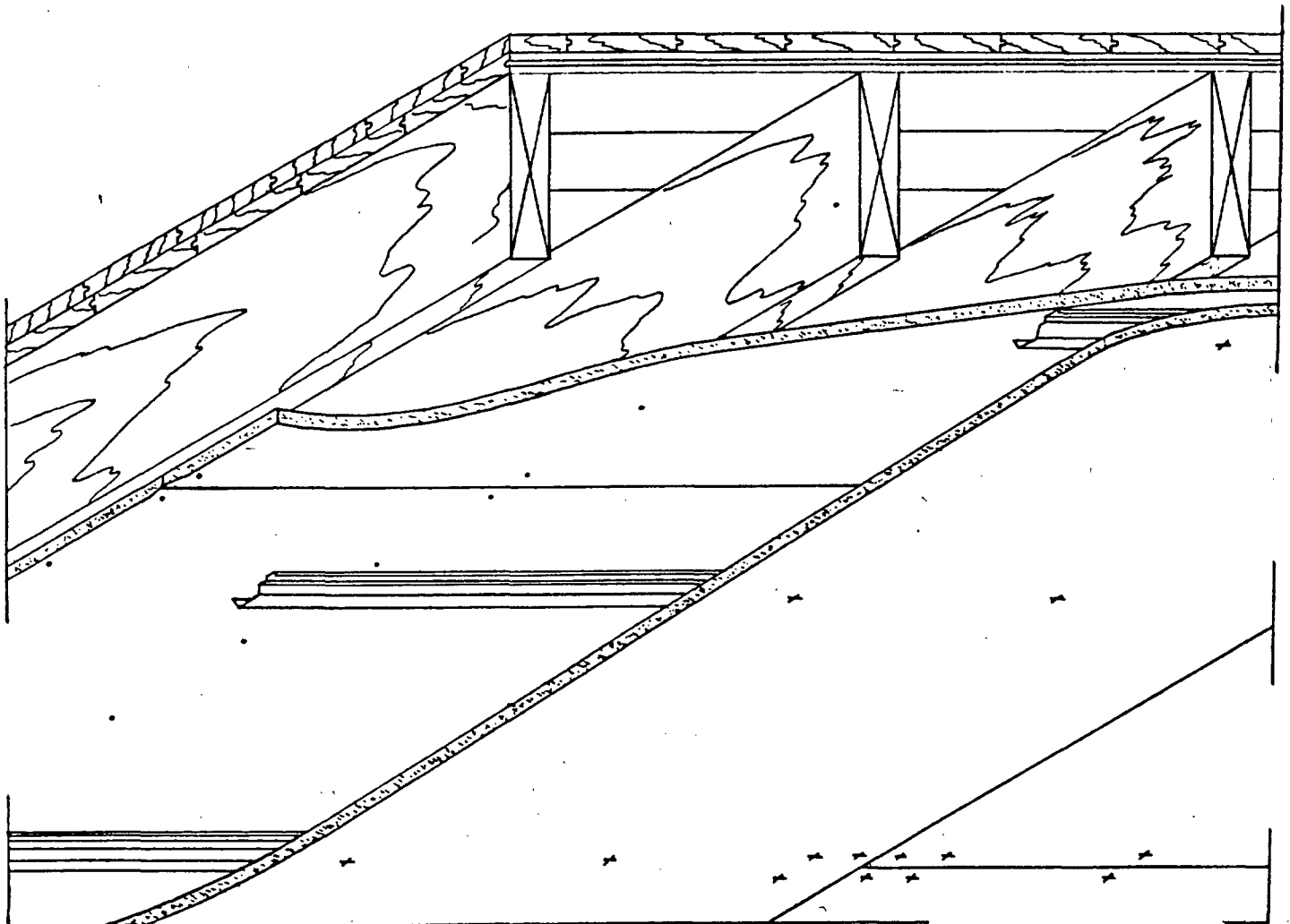


TOTAL RESEARCH TIME - 1964



ANOTHER **BESTWALL** FIRST

TWO-HOUR FIRE RATED
WOOD FLOOR & CEILING



PROJECTS COMPLETED

1. TWO HOUR FIRE RATED COMBUSTIBLE FLOOR & CEILING - R&D #273

Objective: To develop a two hour fire rating for wood frame floor construction protected by a ceiling of Firestop on the underside.

Investigation: In the previous six months' period, exploratory tests were conducted in the small furnace at Ohio State to determine whether such a rating would be possible using a 2 layer 5/8" Firestop ceiling with a resilient metal channel between the 2 layers of Firestop. The exploratory tests indicated that there was a reasonable chance of attaining this rating, so a full-scale test was proposed. The installation method, the joint locations, and the attachment details were all carefully planned, based on the information obtained from the exploratory test. A cross section of the ceiling construction is shown in the drawing on page 5.

Result: The construction lasted for 2 hours 5 minutes, thereby giving the 2 hour rating. This is the first 2 hour fire rated combustible floor & ceiling assembly to be achieved by any company and is another first for Bestwall. This ceiling construction has the additional advantage of providing good sound isolation because of its resilient attachment.

2. ONE HOUR FIRE RATED COMBUSTIBLE PARTITION - R&D #278

Objective: To achieve a one hour fire rating on a load bearing wood stud assembly, faced with an underneath layer of 1/2" fiberboard and a face layer of 5/8" Firestop. This is one of several projects undertaken in cooperation with Johns-Manville.

Investigation: The Insulation Board Institute is promoting the use of fiberboard, in conjunction with gypsum board, to provide constructions with good sound barrier properties. Recognizing that fire ratings would be required in many cases, IBI conducted several tests using fiberboard & 5/8" Type X wallboard and, in each case failed to pass the one hour rating. We felt that we had a good chance to pass this test, in spite of their failures, because Firestop generally out-performs fire rated boards of the Type X classification. Johns-Manville agreed to finance half the test. The construction decided upon was one which gave a sound transmission class (STC) value of 45. A regular wood stud partition without the fiberboard has an STC value of 34. An additional value of this partition is its laminated construction, which reduces the incidence of joint beading and nail popping.

Result: The one hour rating was passed and gives Bestwall another first in fire rated constructions. Subsequently, arrangements were made by Management to have Bestwall's plants handle Johns-Manville fiberboard; so this advantage could be fully exploited.

3. SOUND TESTING PROGRAM - R&D #276

Objective: Develop partition & floor-ceiling constructions with good sound barrier properties.

Investigation: The field of sound control has become important to us, in view of the amount of sound testing being done by other companies and because FHA is introducing certain sound transmission loss requirements for the various types of building constructions, for which they insure the financing. A series of sound transmission loss tests were conducted at Ohio Research, which is a subsidiary of Donn Products. Some of the partitions tested were of interest to Donn Products and, in these cases, the cost of the tests was shared.

Result: Sound transmission class or STC is the one number method being used by the industry to compare the sound transmission properties of various constructions. This method assures that the construction will provide a specific resistance to sound at each frequency. While sound transmission loss requirements depend to a great extent on the background noise, in general it can be said that a rating of over 50 would be considered to be very good; a rating of 45 good; a rating of 40 fair; and a rating of 35 or below might be considered to perform poorly. We were able to obtain ratings of over 50 STC for certain wood stud, metal stud, and all gypsum partitions. Quite a number of constructions gave readings in the 45 to 50 range. Two partitions, one metal stud and one gypsum stud, are different from any being promoted by competition. It is felt that these ratings will meet our present needs, but that we will require additional assemblies to be tested from time to time. A brochure entitled "Sound Advice" is being prepared by the Advertising Department, based on the sound ratings which were developed.

No tests were made on floor-ceiling constructions, because a standard method of conducting the impact sound test has not been settled on. Also, the need for sound rated floor-ceiling assemblies is not as great as it is for partitions.

4. NEW WOOD GRAIN PRODUCTS - R&D #268

Objective: To improve our grainboard line to compete with USG Ultra-Wall.

Investigation: At our request, the Purchasing Department contacted a number of paper suppliers. The only one which had much to offer was Di-Noc Arts, a division of the 3M Company. Di-Noc sent a number of small samples of grainboard paper and subsequently several full width sheets of certain patterns, some with vinyl facing and some without. Simultaneously, Fort Dodge was asked if they could develop a piece of equipment which would impart depressed black lines to the grainboard.

Result: After examining a number of patterns, one Fruitwood and one Cherry pattern, both with a 2 mil vinyl overlay, were selected to go along with our old Autumn Mahogany, Figured Aspen, and Knotty Pine grainboard patterns. After several attempts, a piece of equipment was developed at Fort Dodge which would simultaneously indent & ink black lines on the face of the grainboard. All of the patterns mentioned, except Knotty Pine, will be striated with the black lined indentations to give the effect of plank marking. The black striations are a distinguishing characteristic of USG's Ultra-Wall. All of our new patterns will be placed on the market shortly after the first of the year. The Driftwood & Faun Mahogany patterns from the old grainboard line have been discontinued.

5. PARTICLE SIZE STUDIES - R&D #263

Objective: To determine the particle size gradation in the stuccos used in the manufacture of our wallboard & plaster products.

Investigation: Samples of board stucco were requested from each plant, so that this comparative analysis could be made. Samples of molding plaster, air-separated molding plaster, tubed stucco, Densite, & Imp Mill Densite were obtained from Blue Rapids. USG's low consistency base Hydrocal & B-11 Hydrocal were analyzed for fineness, along with our basic plaster items from Blue Rapids.

Result: The two series of comparative fineness evaluations were conducted chiefly for our own information. In the case of the board plant stucco analysis, the comparison was sent to each plant for their enlightenment. The following facts were learned from these analyses:

1. The fineness of board plant stucco does vary from plant to plant.
2. Some board plant stuccos have a larger range of particle size than others.
3. Tubed mill stucco is superfine as compared to all other stuccos analyzed. This confirms a previous analysis made with Wilmington tubed stucco.
4. Our base Densite is finer than USG's low consistency base Hydrocal but not as fine as their standard Hydrocal.
5. Imp Mill Densite has about the same fineness as USG's standard Hydrocal.
6. Air-separated molding was finer than regular molding and showed less difference at the finer end of the particle range. This is to be expected, since the air-separator merely scalps off the coarse fraction.

Another series of particle studies are planned, in which several stuccos of different grinds will be compared for fineness and also for consistency, compressive strength, density, hardness, expansion, etc. to try to determine whether the particle size has an effect on these other properties.

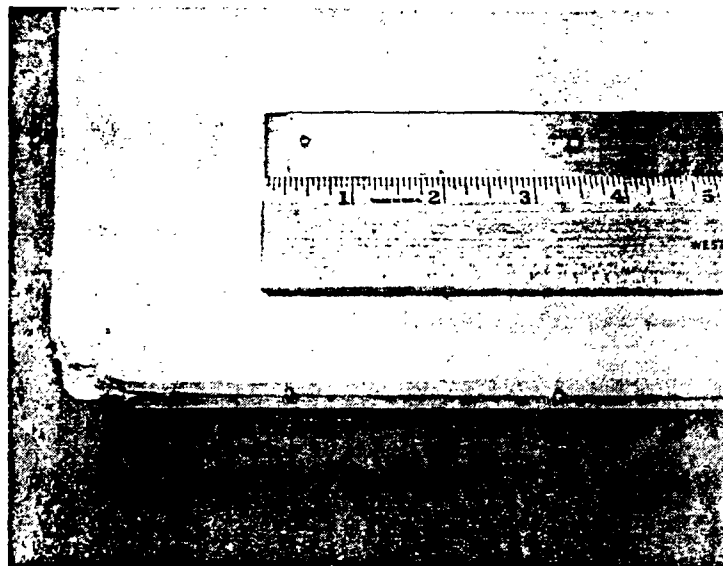
6. HIGH EXPANSION DENSITE - R&D #132

Objective: To develop a high expansion Densite suitable for use as a casting plaster for the Kirksite dies used in the formation of automobile bodies. It is necessary for this product to expand $1/8$ " per foot to counteract this much shrinkage in the Kirksite, as it cools in the mold.

Investigation: It was found sometime ago that a formula containing ground gypsum made from a set gypsum block in which cane sugar was incorporated maintained the high expansion characteristics over a longer period of time than plain raw gypsum. Details of the best method to prepare such sugared coated ground gypsum were worked out with personnel of the Fort Dodge plant. Subsequently, it was discovered in tests in Paoli R&D that addition of a small amount of alkali, such as lime or portland cement, further improved the performance.

Result: Successful field trials of the latest high expansion formula have resulted in its addition to our Industrial line. We do not expect much volume of high expansion Densite to be sold, but we do expect it to enable us to sell more of molding plaster which is used in large volume.

To illustrate the expansion of our product, a cast was poured over a 2 foot length of aluminum bar. The picture shown below was taken $1\frac{1}{2}$ hours after set. The ruler indicates that $1/4$ " total expansion was achieved for the 2 feet or $1/8$ " for each foot of length.



7. DENS-COTE SYSTEM - R&D #219

Objective: To improve the application properties of Dens-Cote Smooth Finish. This work was undertaken due to some comments from the field that Gibsonberg Lime Co.'s "Tigerskin" plaster had better working properties than Dens-Cote.

Investigation: The formula was revised to reduce the take-up time, and this seemed to improve the application properties. Faster take-up merely means that the plaster loses its water quicker. This provides (1) more working time, (2) freer working properties, and (3) a tendency for the Dens-Cote to be applied thicker. The thicker application is an advantage in that it offers more resistance to beading & cracking at the joints.

Result: The formulas were revised to reflect the faster take-up. In the markets where "Tigerskin" was said to be better than Dens-Cote, this revision appears to overcome the "Tigerskin" advantage.

8. PREDECORATED WALLBOARD PRODUCTS - R&D #215

Objective: To improve the flame spread rating of Eternawall.

Investigation: Bestwall Eternawall consisting of a gypsum board with a 10 mil vinyl facing has a fire hazard classification of more than 50. In many cases, a fire hazard classification of below 50 is required and, in certain isolated places, the fire hazard rating must be below 25. In order to improve the fire hazard characteristics, it is necessary to use a fire retardant adhesive. This proved to present many problems to the adhesive manufacturers. Many samples were tested, and the best one made by Monumental Adhesive Company was selected for test, in combination with an 8 mil vinyl in place of the standard 10 mil. It was hoped that the combination of the fire retardant adhesive and the thinner vinyl would give a rating of 25 or less. Unfortunately the rating achieved was 30, and another test was planned in view of the variation possible at U. L. in this type test. However, we again ran into problems with the adhesive, as the next shipment from Monumental did not give satisfactory adhesion. Monumental is presently attempting to work out their difficulties. In the meantime, Masland Duraleather, manufacturer of the vinyl, expressed some doubt regarding the quality of the 8 mil vinyl. Their reason is that the vinyl film has to be stretched rather than calendared to obtain the 8 mil thickness, and they are uncertain of the dimensional stability of the vinyl when it is processed in this manner.

Result: In view of all these difficulties, it has been decided to postpone any further attempts to obtain a 25 flame spread rating. Masland Duraleather is installing equipment to calendar both 6 mil & 8 mil vinyls. Our project will be resumed as soon as Masland has the thinner vinyl available, and the adhesive problem has been resolved. In addition to the flame spread rating, an attendant objective of this project is the improved economics possible by using a thinner vinyl film.

9. PRELIMINARY INVESTIGATIONS - R&D #10

Objective: This was a preliminary investigation to see if there is any merit to the use of polystyrene beads to reduce the weight of gypsum board.

Investigation: This idea was presented by a person outside the Company, with the idea that he would make some business arrangements with us, if we wished to use his idea. A few samples of 1/2" boards were made, in accordance with the inventor's recommendation. These 1/2" boards weighed about 1400 lbs/M. sq. ft. but had a very weak core. It is highly doubtful that this board would be commercially acceptable. Some theoretical calculations were made to evaluate the economics of the pellets. Also, a number of mixes of various quantities of the polystyrene beads were cast into cubes to determine the weight reduction per lb. of pellets, from which the economics could again be calculated and compared to the theoretical figures.

Result: The only advantage gained from the pellets was light weight. Our tests show that no additional fire resistance would be obtained, and the added thermal insulation value would be insignificant. It was highly questionable whether a board with polystyrene beads would be acceptable, due to its weaker core. A board with polystyrene beads would cost a premium of about \$2.50 to \$5.00/M., depending on the quantity used. The light weight would certainly not justify this additional cost. On this basis, the proposition was turned down.

10. EVALUATION OF JOB MIXED THINCOAT PLASTER - R&D #5

Objective: To conduct racking & impact tests on panels of Job Mixed Plaster to compare its performance with standard Lite Mix plaster & Dens-Cote.

Sales requested this information.

Investigation: Job Mixed Thincoat is the designation given to a construction consisting of 3/8" thick x 16" wide plain lath, 1/8" thick basecoat of a 50-50 mixture of gauging plaster, & plastering sand, and a 1/16" finish of 3 to 1 lime-putty-gauging. This construction is being used in the Detroit market, and our sales people there requested these tests. The Lite Mix application consisted of 3/8" thick x 16" wide plain lath, 7/16" perlited basecoat, and 1/16" of 3 to 1 lime-putty-gauging. The Dens-Cote system consisted of 1/2" x 4" wide Dens-Cote Base & 3/32" of Dens-Cote smooth finish. In each case the wood framing was 2 x 4's on 16" centers. Racking & impact tests of the above applications were made in conformance with ASTM E-72-55.

Result: The following conclusions were drawn from these tests:

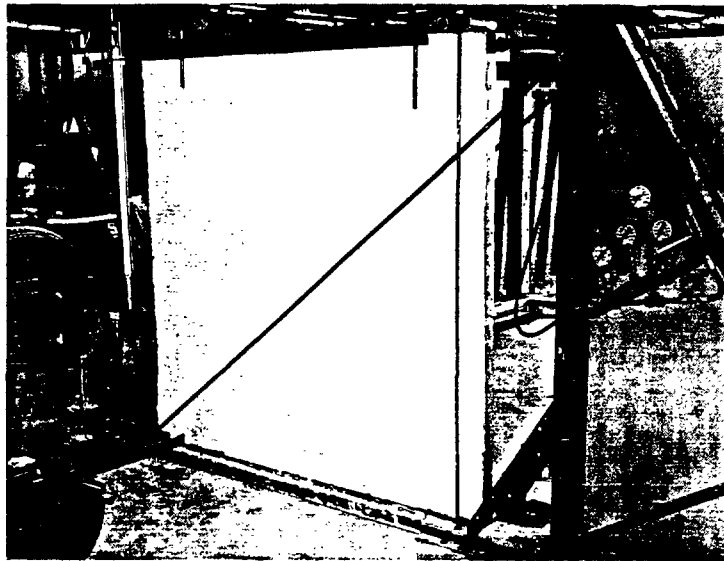
I. Rigidity of the panels is in the following order:

1. Lite Mix; 2. Job Mixed Thinfoat; 3. Dens-Cote System. All panels were acceptable.

II. The crack resistance was in the following order:

1. Dens-Cote System, Lite Mix, and Job Mixed Thinfoat. There wasn't a very significant difference between the last two.

The photograph below shows one of the panels in the racking frame ready to be tested.



PROJECTS NEARING COMPLETION

1. JOINT SYSTEM TEXTURES * R&D #261

Objective: To develop a complete line of textures suitable for spray application.

Investigation: Earlier field trials of a formula in the Fort Dodge market were unfavorable. It was found that the texture, when applied & dry, had a sheen which under certain types of light appeared like shiny spots on the ceiling. This was overcome with a revised formula, and a series of trials in the Brunswick area and elsewhere were conducted. These trials were moderately successful, but the texture still lacked adequate hiding properties. It was found that the texture as applied piled up in local areas instead of flattening out and resulted in small areas which were not covered by texture. The necessary formula revisions were made, and another series of trials were conducted. This time we returned to Kansas City, where some of the earlier unsatisfactory trials were held. The simulated acoustic texture was given the most attention, since this type is the most popular. Field trials of the simulated acoustic texture have all been quite favorable, and it has been released under the trade name of Bestex C. Other proposed products for the spray texture line are currently undergoing field performance trials. These are:

Bestex A - Non-aggregated texture for spray application. This texture is often applied to walls when one of the other textures is used on the ceiling.

Bestex B - Sand finish type texture for contractors who prefer a lighter texture.

Bestex D - Coarse, rust inhibiting texture for direct application to concrete slab ceilings.

A great deal has been learned in the course of this investigation which adds to our experience in the application of decorative materials. If the current field testing meets our expectations, the Bestex A, B, & D should be released within the next few months.

2. NEW TYPE OF GLASS FIBER - R&D #131

Objective: Evaluate Owens-Corning's fine filament 636 glass fiber for use in our wallboard products.

Investigation: The 636 glass fiber consists of .00026" diameter filaments. This compares to 710 fiber which has .00040" filaments and 799 fiber which is a mixture of the two filament sizes. There are twice as many individual filaments per pound of 636 glass fiber than there are of 710 glass fiber. This

advantage can be used either to improve the product or permit cost savings by accomplishing the same result with less glass fiber. All three fiber types are the same price per pound.

Laboratory investigation indicated that the cutting characteristics of this fiber were satisfactory, and the dispersion properties are excellent. Several plant trials of the 636 glass fiber have confirmed our beliefs and to date Acme, Brunswick, Fort Dodge, and Wilmington have reported satisfactory performance of this fiber, when used in our regular (not Firestop) wallboard products. Formula reductions of 25% and 50% are being tried with 636 glass fiber. The good reports thus far have prompted us to ask all plants to order at least 10,000 lbs. of this 636 glass fiber. As soon as a reasonable number of their reports are in, consideration will be given to reductions in the amount of glass fiber used in regular wallboard. Our annual glass fiber usage for regular wallboard is about 1,278,533 pounds, which costs \$332,000 at the current price of 26¢/lb. Even a 25% reduction will result in an annual savings of \$83,000.

The evaluation of the 636 glass fiber for use in Firestop wallboard is being carried out under R&D #279.

3. ANALYSIS OF NATIONAL GYPSUM SUPER-X FIRESHIELD WALLBOARD - R&D #131

Objective: Analyze National Gypsum Co.'s fire rated wallboard for glass fiber & vermiculite content. This information will be used to determine whether National Gypsum is infringing our patents on glass fiber & vermiculite.

Investigation: We have been able to ascertain that National has between 8 & 9 lbs. of glass fiber per 1000 sq. ft. in their 1/2" Super-X Fireshield. The vermiculite content is proving rather difficult to pin down because of the problems of separating it from the siliceous matter in the board. Samples of National Gypsum's 5/8" Super-X Fireshield have also been requested, and these will be analyzed as soon as received.

4. ONE HOUR FIRE RATED LATH & PLASTER PARTITION - R&D #282

Objective: Develop the one hour rating for this partition consisting of Inland Steel's Milcor studs, Neslo's resilient clips, and our 3/8" lath & 1/2" sanded plaster. This will be a cooperative test, in which Inland will pay 45%, Neslo 5%, and Bestwall 50% of the cost of the test.

Investigation: The details of the construction were planned by us and sent to Inland and Neslo for their approval. Two partitions, one for fire endurance and one for hose stream, were erected at Ohio State. The test will probably be conducted sometime in January.

5. TWO HOUR METAL STUD PARTITION - R&D #283

Objective: A two hour rating is the prime objective of this metal stud partition, with 2 layers of 5/8" Firestop on one side and 1 layer on the other side. A 1-1/2 hour rating will be of some value in the event 2 hours is not achieved.

Investigation: This construction with a 1 1/2" glass fiber blanket in the cavity yielded a 50 STC rating in the sound transmission tests. If the 2 hour rating could be obtained, it would be another first for us in fire rated assemblies. It will be tested with the single layer side facing the fire, which is reputed to be the severest case. If the 2 hour rating is achieved, it will be desirable to run the test with the 2 layer side facing the fire to insure code acceptance of the test. If we obtain only 1 1/2 hours, it probably will not be worth running from the other direction, and we then will test a partition with 2 layers on each side to get the 2 hour rating. This partition has a sound value of 52 STC. Donn Products has agreed to cooperate in this test to the extent of \$750, which is half the Ohio State fee. The two partitions have been built at Ohio State and will be tested shortly after the first of the year.

6. ONE HOUR FIRE RATED WOOD STUD PARTITION - R&D #284

Objective: To develop a one hour rating for this load bearing partition consisting of wood studs, resilient channels one side, and one layer of 5/8" Firestop on each side.

Investigation: This construction with a 1 1/2" glass fiber blanket in the cavity gave a 50 STC sound rating. It is felt that good sound rated constructions also need to have fire ratings, in order to derive the maximum advantage from the construction. This partition will be tested with the resilient side facing the fire, which we believe to be the severest test. It may be desirable to test from the other side, if this test is successful and if Ohio State will not otherwise make an unqualified report.

Donn Products has agreed to cooperate financially to the extent of \$750 in this test, since their resilient channel is a significant facet of this construction. Two partitions have been constructed at Ohio State and will be tested soon after the first of the year.

7. COMPETITIVE EVALUATION OF THINCOAT PLASTER - R&D #219

Objective: To make a comparison of the formulations, physical characteristics and application properties of competitive thin-coat plaster products & Dens-Cote.

Investigation: The competitive thincoat plaster products being tested are Gibsonberg Lime's "Tigerskin"; Fiberboard Paper Products' "Pabcote"; National Gypsum's "Kal-Kote Base," "Kal-Kote Smooth Finish," "Kal-Kote Texture Finish & Uni-Cal"; United States Gypsum's hand application "Tufcon," one coat "Red Top" & "Imperial Finish"; and J. J. Brouk's "Hard Kote."

These products will be analyzed to determine their approximate formula. They will also be tested to determine water requirement, set, plasticity, density, hardness, abrasion resistance, compressive strength, flexure strength, bond to base, coverage, and whiteness. In addition, a panel of each will be applied to judge the working properties and all-around performance.

8. SYNTHETIC GYPSUM - R&D #221

Objective: To confirm the conclusions of two previous successful trial runs of relatively short duration (several hours) with a run of longer duration (several days). The conclusions established in the previous runs were:

1. The synthetic gypsum by-product of the manufacture of phosphoric acid can be effectively neutralized with precipitated chalk or fine ground calcium carbonate.
2. This neutralized product, after being further processed by tube milling, can be successfully used in the manufacture of wallboard.

Investigation: These trial runs involve the neutralization, drying, grinding, calcination, and manufacture of wallboard from the synthetic gypsum obtained from Pascagoula, Miss. In the last trial run, the synthetic was dried in the Raymond mills rather than the small Roto-Louvre dryer, which has limited capacity & which was used in the first test. This means that the synthetic can be dried fast enough to keep up with the board plant stucco demand and thereby make a longer run possible. The long run had been scheduled for December, but was postponed due to a mud slide which inundated the section of the plant where the synthetic will be processed. The trial will be rescheduled at the first opportune time. This larger trial will be divided into segments to learn the optimum calcination temperature, the degree of grinding (tube milling) necessary, the type & amount of neutralizer required, and any other pertinent information which can be learned in the process.

9. HUMMER SYSTEMS - R&D #209

Objective: Develop an improved laminated gypsum rib for semi-solid partitions.

Investigation: A $2\frac{1}{2}$ " thick x 3" wide rib, consisting of 4 layers of $\frac{5}{8}$ " board laminated together, was developed & tested in the Laboratory. Our tests were favorable, and the one field trial held brought out that this rib had several advantages over the thinner ribs. Another larger field trial was to be held but, after 6 months have passed, Sales has not been able to find a trial job for us. In the meantime, a sound test of a partition using these ribs gave 51 STC, and a fire test of the construction will be made.

One of the aims of this new rib was to sell it in competition with metal studs. All of our gypsum ribs including the 2½" x 3" rib have been repriced, so that this is now possible. Under the new field test method being adopted, we should be able to get the trial more readily.

10. TOOLING DENSITE - R&D #132

Objective: To develop a tooling plaster which will meet the needs of the aircraft industry.

Investigation: The investigation was first directed at satisfying Lockheed's specifications. We had Pittsburgh Testing Laboratories witness our tests, and the specifications were passed but then Lockheed changed their specifications. At the same time, the workability of the product was improved, and this improved formula was put in the line in place of the formula we had been shipping. Not too much has been done since then, except for a visit Mr. Green made to the various pattern & tool making shops in Detroit. What is wanted now is a product which will meet most requirements but not necessarily be a match for USG's B-11 Hydrocal.