PLAINTIFF'S EXHIBIT

GP-1329

GEORGIA-PACIFIC CORPORATION
BESTWALL GYPSUM DIVISION

R&D REPORT FOR LAST 6 MONTHS OF 1965

TABLE OF CONTENTS — PAGE NUMBER

Foreward - 1
Market Performance of New Products - 2
Chart of Increasing Sales and Profits Resulting from Research- - - 3
1965 Distribution of R&D Expenditures- 4

PROJECTS COMPLETED

Vinyl Joint Compound- 5
Ready Mix Joint Compound- 8
Dens-Cote Projects- 8
Trowel Finish Plaster - 9
Firestop Tile Backer Board- 9
Cooperative Fire Tests with Owens-Corning - 10
Sound Test Program- 11
Assistance to Sales - 14
Assistance to Legal Department- 14
Plant and Quality Problems- 15
Particle Size Studies - 15

PROJECTS NEARING COMPLETION

Fire Rating for Dens-Cote Partition - 17
Pre-Decorated Wallboard - 17

PROJECTS UNDERWAY

Industrial Uses for Gypsum- 19
Firestop Formula- 19
Glass Fibers in Wallboard - 20
Special Densite Products- 21
Hummer System Studs - 21
Synthetic Gypsum- 22
Lightweight Wallboard - 23
New Grainboard Products - 26
Gypsum Acoustical Tile- 26
Weight Reduction of 5/8" Firestop - 27
Glass Fiber Reduction of 5/8" Firestop- 28
One Hour Partition with 1/2" Firestop - 28
Microscopic Studies - 29
Steel Roofdeck with Lightweight Metro Mix - 32
Gypsum Firedoor Filler - 32

SUMMARY- 34

FORWARD

This report covers the activities and accomplishments of the Research Department for the past six months. Since this is the year-end, some of the figures shown encompass the results for all of 1965 as well as for the six month period.

The total research budget for 1965 was $184,000. The total expenditures were $186,790 and the approximate distribution of this expenditure is shown on page 4 . The total budget for 1966 will be $210,000 and plans are to proportion this expenditure in approximately the following manner:

Fundamental or exploratory investigations	15.0%
Wallboard and Joint System	12.6%
Lath and Plaster	3.8%
Industrial Gypsum Products	9.6%
Fire, Sound, and Structural Systems	24.5%
Acoustical Tile	10.3%
Plant Problems	1.6%
Other	5.8%

The budget provides for the addition of two new men, one of which has already been obtained. Mr. Maturo, was transferred to Paoli from the Grand Rapids plant and will be handling all of the research on industrial gypsum products. Another addition to the Research Staff is planned later in 1966.

The market performance of new products on page 2 shows the sales and estimated gross profit from the products which have been developed through research. The graph on page 3 shows the growth of Bestwall sales and profits from research since 1961. These figures do not include cost savings, product improvements, or the effect of such work as fire and sound testing. The sale of Firestop continues to increase with 1/2" up 157% and 5/8" up 15.6% in 1965 compared with 1964 sales. Joint System production, an area where a lot of effort has been devoted to product improvement, shows an increase of 5.1% in sales not including Ready Mix which has also gained. A new product called "Triple Duty Joint Compound" will be released nationwide after undergoing comprehensive field testing and finally being marketed in four sales districts to further evaluate its potential. Even with such a limited distribution, approximately 800 tons of Triple Duty were sold during the past 6 months.

The main section of this report is devoted to progress of the individual projects during the past six months. Those which have been completed are listed first, followed by those which are nearing completion, and finally those in which work is underway.

SGP 0015287

1965 MARKET PERFORMANCE OF NEW PRODUCTS

PRODUCT	LAST SIX MONTHS SALES VOLUME	LAST SIX MONTHS GROSS SALES	ESTIMATED GROSS PROFIT
Dens-Cote Base (all)	8460 M sq.ft.	$ 351,227	$ 91,696
Dens-Cote Plaster (all)	1665 tons	98,612	11,251
Tile Backer Board	1278 M sq.ft.	98,875	29,884
Tru-Grain Wallboard	523 M sq.ft.	36,059	3,404
Firestop 120 Tile	443 M sq.ft.	59,557	12,532
Triple Duty Joint Comp.	800 tons	141,840	23,236
Ready Mix Joint Comp.	39,501 cans	154,172	5,228
One Day Joint Comp.	125 tons	35,316	6,153
Bestex A, B and C	14,385 bags	36,516	874
Model Densite	17 tons	807	274
Ram Process Plaster	6.6 tons	650	278
High Expansion Densite	1.1 tons	59	-
Dens-Cote Tape	11,579 rolls	12,145	4,862
Tile Backer Tape	227 rolls	1,608	746
Grabit Adhesive	137 tons	11,217	3,116
TOTALS		$1,038,660	$193,534

SGP 0015288

YEAR 1965

SALES VOLUME	GROSS SALES	ESTIMATED GROSS PROFIT
14,223 M sq.ft.	$606,683	$172,493
2698 tons	160,809	17,837
2091 M sq.ft.	161,651	50,407
809 M sq.ft.	54,051	4,151
755 M sq.ft.	102,846	22,893
915 tons	162,540	29,296
60,840 cans	239,819	17,286
346 tons	74,543	14,215
17,915 bags	50,067	2,247
35 tons	1,659	557
6.6 tons	650	278
1.2 tons	64	-
20,806 rolls	21,040	8,301
436 rolls	3,042	1,532
191 tons	20,105	6,273
	$1,659,569	$347,766

PROJECTS COMPLETED

1. DRY VINYL JOINT COMPOUND - R&D 211

Objective:
To develop joint system products with vinyl or other synthetic resin binders.

Investigation:
This product was under development for about four years without any degree of success. At one point the objective was a vinyl topping compound, but Sales advised us that they were not interested in this product, and dropped the project from their list. In spite of our previous lack of success and the low level of sales interest, two factors caused us to continue the experimentation. One factor was the sharply increasing cost of casein, which started early last year. The increase in casein cost induced us to consider other binders, even the higher priced vinyl binders. The second reason was a formulation breakthrough made by Mr. Morrone which permitted certain previous bonding limitations of vinyl joint compounds to be overcome.

After successful field testing with one customer, the vinyl joint compound was tried by other contractors in the Wilmington Sales district. Finally it was released for sale in the entire district. Some slight formula modifications were made from time to time to improve the product. After a few months, the product was released for sale in the Brunswick, Detroit, and Cleveland sales districts to gain field experience in different climates. It was sold at a price slightly higher than our regular joint compound. During the past 6 months, 800 tons of dry vinyl joint compound has been sold in these limited market areas. Just recently, successful field trials were held in Chicago and on the West Coast. All of this experience has shown good acceptance for the product. Ageing and other testing in the Laboratory indicates that the product has no significant weakness.

Conclusions:
On the basis of the experience and testing which has been so successful, it has been decided to release the product nationally under the trade name "Triple Duty Joint Compound". The contractor advantages we plan to promote are:

a. The single product can be used for taping, finishing, and texturing operations.

b. It has lower shrinkage than regular casein products.

c. It is easy to sand.

SGP 0015290

d. It has excellent application properties.

e. It has complete viscosity stability.

f. It has outstanding resistance to spoilage.

The latter two advantages are of greater interest to contractors, since Triple Duty can be mixed in large quantities and put into pails for subsequent use - like Ready Mix. The company advantages for this product are:

a. A more consistent product can be furnished, because synthetics are more uniform than casein. This should result in fewer complaints.

b. The product is more resistant to being affected by adverse weather conditions and the like, so this should also contribute to a reduction in complaints.

c. Easier and better manufacturing control can be achieved, because it requires fewer ingredients and there is no alkaline reaction to control, as we need to do with casein products.

d. There is a better profit potential. Although there isn't much difference in the cost of Triple Duty and regular joint compound at the present time, the price trend for casein is rising and the price trend for vinyls is falling.

SGP 0015291


TRIPLE DUTY
BESTWALL
TRIPLE DUTY
WALLBOARD
JOINT COMPOUND
(AN ADHESIVE)
A Vinyl Base Material
CAUTION
NET WEIGHT 25 LBS.
GEORGIA-PACIFIC
BESTWALL GYPSUM DIVISION
GENERAL OFFICES • PAOLI • PENNSYLVANIA
TRIPLE DUTY
WALLBOARD

SGP 0015292

2. READY MIX - R&D 211

Objective:
To improve the quality and cost structure of Ready Mix Joint Compound.

Investigation:
In the last report it was noted that a new Ready Mix formula was being field tested in St. Louis. During the past six months the field testing was extended to Brunswick. Subsequently, both the Fort Dodge and Brunswick Ready Mix operations were converted to the new formula because of better acceptance in the field. Recently, Akron was also converted to the new Ready Mix.

Conclusion:
Since the new formula was adopted, our complaints on Ready Mix have largely disappeared, and the new product has received much better acceptance even by those who were satisfied with the old formula. In addition to the improved acceptance, the freeze-thaw and cold bonding properties have been improved. A raw material savings of $.20 per pail also has been realized which will benefit the profit picture.

3. DENS-COTE PROJECTS - R&D 219

Objective:
To improve our Dens-Cote line by developing new products and by finding new uses for the current products.

Investigation:
A formula consisting of tubed stucco, graded sand, and a small amount of lime was developed to be used as a basecoat application of a two-coat system. The finish coat is the same lime-putty gauging which is used over regular basecoast plaster. Field testing was conducted in the Detroit and Syracuse areas, and the reaction to this product was quite favorable.

In cooperation with the Purchasing Department, an improved glass fiber tape was found. This tape is J. P. Stevens 10 x 10 mesh as opposed to the Owens-Corning 7 x 11 mesh, which we have been furnishing. The J. P. Stevens tape is stiffer and therefore easier to handle than the old tape. A number of rolls of the new tape were tried in the field and received very good acceptance. This was done in the "nick of time", as Owens-Corning has just announced that they are withdrawing from the glass fiber tape business.

Another facet of thincoat plaster which has been undergoing investigation is its application in radiant heating systems. This system involves the application of Dens-Cote Base to the ceiling joists; stapling the electric

SGP 0015293

SUMMARY

The last six months and full year gross sales resulting from products developed through research were $1,038,600 and $1,659,569 respectively. The corresponding gross profits were $191,534 and $347,766. Other annual sales increases which we believe have been favorably affected by research efforts were: 1/2" Firestop - up 157%; 5/8" Firestop - up 15.6%; Dry Joint System - up 5.1%; and Ready Mix - up 290%. The research projects completed during the past six months, that should result in more sales volume, are as follow:

1. The development of a vinyl binder joint compound called "Triple Duty". The formal release of this product will be announced at the G. D. C. I. Convention in March.

2. The improvement in quality and cost of our ready mix joint compound. This new formula has been adopted and we believe that it is a contributing factor to our increasing ready mix sales.

3. Successful fire tests have produced new fire rated assemblies and a 5/8" Firestop version of our Tile Backer board. This Firestop Tile backer has been added to our Underwriters' listed products and will be promoted for partitions where water resistance and fire protection are both required.

4. One new product was added to our Dens-Cote family and a new application for Dens-Cote was approved. The new product is "Dens-Cote Base plaster", which is the first coat material of a two coat system. The normal lime-putty guaging is used for the finish coat. Texture Finish Dens-Cote, developed in 1964, has been approved for use in radiant heated ceilings.

5. Sound transmission ratings were obtained for ten different partition assemblies. Most of these were tests mutally sponsored by Owens-Corning and Georgia-Pacific. These partitions consist of Fiberglas Noisestop and Firestop applied to metal studs. In addition to the financial assistance in conducting the tests, we will have the benefit of Owens-Cornings' efforts to add to our own in promoting these partition systems.

Looking ahead, a 1966 research program has been planned which should protect our future, as well as providing for our immediate needs. Some of the objectives of this program are:

SGP 0015294

1. To provide a sound technical basis for producing a lighter weight wallboard.

2. To gain a better understanding of our products and processes through the use of the polarizing microscope.

3. To improve the fire endurance properties and the economics of our Firestop products.

4. To pursue the development of such new products as a fire rated gypsum acoustical tile, a combination gypsum/plywood stud, and a precast gypsum firedoor filler.

5. To improve our predecorated product line and our Industrial gypsum product line.

It is felt that we are currently making good progress in all areas with the exception of structural systems and components. This weakness will be overcome when we can hire and train a mechanical engineer. This addition has been incorporated into our 1966 budget. Some new Laboratory furniture and equipment have also been included in next year's budget. This will enhance our abilities and provide for more efficient use of our space. Research is primarily a long range approach to the profits of the company. This may be demonstrated by the fact that the original research on Firestop and Densite, two current mainstays, was conducted over ten years ago. By the same token, it may take a number of years before our present research work begins to pay off.

SGP 0015295

GEORGIA-PACIFIC CORPORATION
BESTWALL GYPSUM DIVISION

R&D REPORT FOR FIRST 6 MONTHS OF 1965

TABLE OF CONTENTS

	PAGE NO.
Foreword	1
Market Performance of New Products, Patent Data	2
Distribution of R&D Expense	3
PROJECTS COMPLETED	
New Glass Fiber	4
Joint System Textures	4
Synthetic Gypsum	4
Joint System Formula Revisions	5
Two Hour Fire Rated Incombustible Floor-Ceiling with 1/2" Firestop	6
One Hour Fire Rated Wood Floor-Ceiling with 1/2" Firestop	6
Two Hour Fire Rated Metal Stud Partition	7
Fire Rated Lath & Plaster Partition	7
Metal Stud Partition for 2 Hour Rating	8
Wood Stud Partition for One Hour Rating	8
Gypsum Stud Partition for One Hour Rating	8
Competitive Thincoat Plaster Survey	9
Radiant Heating Panel	10
Pilot Fire Testing	10
Assistance to Legal Department	11
PROJECTS NEARING COMPLETION	
Vinyl Joint Compound	12
Ready Mix Joint Compound	12
Evaluation of Dens-Cote Tape	13
Dens-Cote over Masonry	13
New Grainboard Products	14
PROJECTS UNDERWAY	
Two-Coat Veneer Plaster	15
Dens-Cote Radiant Heating System	15,16,17
Prepared Trowel Finish Plaster	18
Particle Size Studies	18
Gypsum Acoustical Tile	18
Sound Testing Program	19
Gypsum Exposed to High Temperatures	19
Cooperative Research with Johns-Manville	20
Pre-Coated Wallboard	21
Lightweight 5/8" Firestop	21
Reduce Glass Fiber in 5/8" Firestop	22
Firestop Tile Backer	22
One Hour Fire Rated Partition with 1/2" Firestop	22,23
SUMMARY	24,25

SGP 0015296

FOREWORD

This report covers the activities of the Research Department for the six months ending June 30, 1965. One organizational change was made during this period: Mr. R. F. Martin was hired as a research chemist from several candidates interviewed. This addition will help us resume some long-term projects which have been delayed because of insufficient manpower. Another reason for adding to the department is to obtain qualified young men with good potential and train them, with a view toward greater research effort in the future.

The 1965 research budget is $170,000, and $60,000 of this amount is slated for fire and sound testing. To date a total of $90,213 has been spent.

A record of the past six months' market performance of products developed through research is shown on page 2. Some of the efforts cannot be evaluated directly in terms of sales or profits. An example is the seven fire ratings attained during this period. This gives Georgia-Pacific just about every rating that our competitors have, and several which our competitors do not have. Some measure of the value of this work may be shown by the 52.1% increase in 1/2" Firestop sales, and 23.6% increase in 5/8" Firestop sales for the first 6 months of this year as compared to the same period last year.

Some significant cost reduction programs have recently been completed. A formula revision of the four basic joint system items will save 10¢ to 17¢ per bag. This will offset increased costs and save about $108,000 per year, based on the first half 1965 sales of these four products.

The transition to a finer filament glass fiber has just been completed. Some plants have reduced their usage of glass fiber in regular (not Firestop) wallboard by 25%, and other plants have made a 50% reduction. A 25% reduction at all plants would save about $83,000 per year, as estimated from 1964 wallboard production figures.

On page 3 is the distribution showing how the research dollars were spent for the six months' period.

The bulk of this report is devoted to the progress of the individual projects. This section is categorized into those projects which were completed during the past six months; those which should be completed shortly; and those which have either just been started or which will require quite a bit more time to complete.

SGP 0015297

1965 SIX MONTHS' MARKET PERFORMANCE OF NEW PRODUCTS

PRODUCT	SALES VOLUME	LIST SALES	ESTIMATED GROSS PROFIT
Firestop 120 Tile	312,000 sq. ft.	$ 43,289	$ 10,361
Grabit Adhesive	54 tons	8,888	3,157
One Day Joint Compound	221 tons	39,227	8,062
Dens-Cote Plaster	1,033 tons	62,197	6,586
Dens-Cote Base (all)	5,763 M. sq. ft.	255,456	80,797
Dens-Cote Tape	9,227 rolls	8,895	3,439
Ready Mix Joint Comp.	17,654 - 5 gal.pails 3,685 - 1 gal.pail	85,647	11,133
Tile Backer Board	813,300 sq. ft.	62,776	20,523
Tile Backer Tape	209 rolls	1,434	786
Model Densite	18.3 tons	852	283
Tooling Densite	1.7 tons	108	26
High Expansion Densite	0.1 tons	5	-
Bestex A, B, and C	3530 bags	13,551	1,373
Tru-Grain Wallboard	286,000 sq. ft.	17,992	747
Vinyl Joint Compound	115 tons	20,700	6,060
		$621,017	153,333

PATENT INFORMATION

Patents Issued - None

Patent Applications being Prepared - High Expansion formula with outstanding resistance to ageing.

Patent Applications Filed
Dens-Cote Plaster
Dens-Cote Base

Patent Applications Previously Submitted - Processing of Synthetic Gypsum - Second rejection by patent office being considered.

Grabit Adhesive - First rejection by patent office answered.

One Day Joint Compound - No action.

SGP 0015298

PROJECTS COMPLETED

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

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

Investigation: It was previously reported that reduced amounts of 636 glass fiber were being tried in our regular wallboard products. These plant trials with reduced quantities of fiber were successfully completed during the past six months.

Conclusion: A 25% reduction in the glass fiber content was made in the wallboard formulas of those plants where no paper fiber is being used in the core. A 50% reduction in glass fiber content has been made in those plants which use paper fiber. The savings previously estimated for a company-wide reduction of 25% was 83,000 per year. With some plants reducing their fiber content by 50%, the savings will obviously be greater.

2. JOINT SYSTEM TEXTURE - R&D 261

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

Investigation: Three different products had been undergoing field performance evaluation for the past year. The products being field tested were: Bestex A, which is a non-aggregated texture for spray or hand application; Bestex B, which is a lightly aggregated texture for giving a sand type finish; Bestex C, which is heavily aggregated to give a coarse or simulated acoustic appearance; and Bestex D, which is also a coarse texture with rust inhibiting qualities for direct application to concrete slab ceilings.

Conclusion: After successful field experience, Bestex A, B, and C have been released and added to our line of Joint System materials. Trials of Bestex D were not as favorable, and further work will be necessary, if Sales still feels that this product is required.

3. SYNTHETIC GYPSUM - R&D #221

Objective: To further prove that it is possible to use synthetic gypsum in the manufacture of gypsum wallboard, and to establish what equipment and operating conditions are desirable or necessary in this process.

Investigation: A one-week run was conducted at the New Orleans plant, in which about 500 tons of synthetic gypsum were purchased from Coastal Chemical Corporation at Pascagoula, Miss. and converted into the manufacture of wallboard. The synthetic was neutralized, dried, calcined, and tube milled prior to being transferred to the board stucco bin. Variations in the amount and type neutralizer used and variations in calcination temperatures were tried. In the board making process, the grind of of the synthetic transferred to the mixer was varied by means

SGP 0015299

of a hammermill. The amount and type of accelerator used was also varied. The machine speed used was 40 fpm and was subsequently increased to 60 fpm. The slower machine speed was to enable the synthetic gypsum to fully hydrate, since past experience has shown that synthetic gypsum hydrates at a slower rate than natural gypsum.

Conclusion:

1. It was confirmed that the hydration of the synthetic gypsum proceeds at a slower rate than with natural gypsum. The hydration appeared to be improved by using a lower temperature for calcination. The longer hydration time required means that a longer belt section prior to the dryer would be necessary to maintain normal manufacturing speeds.

2. Highly tubed stucco did not perform satisfactorily on the board machine; however, a small amount of tubing is highly desirable.

3. It appears to be necessary to use aluminum sulfate to provide sufficiently quick hydration, even at the reduced machine speed. A ratio of 60% ground block and 40% aluminum sulfate appeared to be optimum.

4. It appears to be desirable to include a hammermill in the system to provide a fine grind stucco.

5. The board manufactured was satisfactory in every respect. Approximately 100,000 sq. ft. of this wallboard has now been shipped, without any comment whatsoever from the field.

4. PROTEIN JOINT COMPOUND FORMULATIONS - R&D #275

Objective: To make revisions or improvements where necessary or advisable in our Joint System formulations.

Investigation: The work on this project was intensified when the price of casein began to rise sharply last December. At that time, it was 19¢ a pound, and the present price is 38¢ per pound. We were already evaluating a new alkali system which permitted less casein to be required. This alkali system is a combination of soda ash and borax. The alkalies are not new, but we have never been able to use them previously, because the water retention agent we were using was not compatible with borax. We have just recently begun to use a water retention agent called Natrosol which is compatible with borax. The reduction in the amount of casein and the use of borax, which has some preservative properties, has enabled us to use a milder preservative in lesser quantities. This has resulted in some economies in preservative usage, in addition to the savings in casein.

Conclusion: This work was intensified as soon as the price situation regarding casein began to get out of hand. The Lab work was concluded, and a comprehensive field testing program was commenced. Field trials were held in Cleveland, Rochester,

SGP 0015300

Kansas City, Wilmington, Philadelphia, Denver, Chicago, and Houston. In every case, the results were favorable. As of April 1, Akron was converted to the new formulas. On May 1, Acme also made the transition. Based on a casein price of 38¢ per pound, the per bag savings varies from 10¢ to 17¢, depending on the product and whether the manufacturing point is Acme or Akron.

5. TWO-HOUR FIRE RATED INCOMBUSTIBLE FLOOR & CEILING - R&D #279

Objective: Test a concrete and bar joist floor & ceiling construction protected by 1/2" Firestop to gain a 2-hour rating.

Investigation: National Gypsum Company was the first to obtain this rating with their Super-X 1/2" Fireshield board. Subsequently, USG also obtained a rating with their Type C Firecode wallboard. Last October, we made an attempt to achieve the rating with our regular 1/2" Firestop, but we were unsuccessful. It was obvious that a special board with improved performance would be required, in order to pass the test. The installation of our pilot furnace was completed in December 1964 and, by January 1965, it was operational. A long series of exploratory tests were conducted in the pilot furnace, so we could determine what was needed to achieve this rating. The exploratory tests brought out the following facts:

1. A new type of glass fiber from Owens Corning, designated 636, was found to perform better than the 710 or 799 glass fiber formerly used.

2. Firestop from Wilmington was found to perform better than Firestop from Fort Dodge.

3. 1/2" Firestop from Wilmington, with either 799 or 636 glass fiber types, was found to outperform samples of National's Super X and USG's Type C boards obtained in the field.

A special run of 1/2" Firestop using 636 glass fiber was conducted at the Wilmington plant, and this board was rechecked in the Lab. The results were again favorable, and the full scale test at Underwriter's was arranged.

Conclusion: On May 11, the test was passed giving us the 2-hour rating. At the same time, a lower weight limit for 1/2" and 5/8" Firestop was established. The minimum for 1/2" Firestop was reduced from 2000 to 1930 lbs/M., and the minimum for 5/8" Firestop was reduced from 2525 to 2415 lbs/M. This is based on our using 636 glass fiber, which we intend to do.

6. ONE HOUR FIRE RATED WOOD FLOOR & CEILING WITH 1/2"FIRESTOP - R&D #287

Objective: To test a wood joisted floor, protected by 1/2" Firestop on the underside at Underwriters' Laboratories, in order to gain a one hour fire rating.

SGP 0015301

PROJECTS NEARING COMPLETION

1. DRY VINYL JOINT COMPOUND - R&D #211

Objective: To develop joint system products with vinyl or other synthetic resin binders.

Investigation: A joint compound consisting of polyvinyl alcohol and spray dried polyvinyl acetate as the binders, and Natrosol as the water retention agent was formulated and tested extensively here in the Laboratory. On the basis of favorable lab results, a field test was conducted in Hartford, Conn. This customer was selected because of his interest in a vinyl joint compound. The material was followed through all phases of the joint treatment, and then examined again after it had been decorated; Results in all cases were satisfactory to us and to the customer. On this basis he was shipped another truckload. After this second truckload was used, another investigation was made, and it was found that the bond of the vinyl joint compound to the tape was not quite as good as it should be. This was traced to a problem with the USG tape that they were using. Since the vinyl compound bonded satisfactorily to Bestwall tape, they began to use our tape and continued to place orders for the vinyl product. Subsequent laboratory investigations indicated that a plasticizer, such as Dibutyl Phthalate would add significantly to the bond under humid conditions, regardless of what tape might be used. This change was put into effect on the third truckload, and another inspection was made after it had been used. In the meantime, the new plasticized formula was tried in several areas around Philadelphia, Wilmington, Washington, D. C., and Baltimore. All of the trials except the one in Wilmington drew favorable comments on the workability and performance of the material. After these tests, it was decided to release the product in the Wilmington Sales District, so that it would be exposed to wider market coverage. At the same time, additional trials will be held in other parts of the country.

There is very little difference in the economics between the dry vinyl joint compound and our regular casein joint compound. If the products are priced the same, there appears to be sufficient advantages to the dry vinyl joint compound to induce customers to request it in preference to the casein products.

2. READY MIX JOINT COMPOUND - R&D #211

Objective: To improve the quality and cost structure of Ready Mix Joint Compound.

Investigation: Quite a number of problems developed with Ready Mix after it was initially introduced. Some of these problems were viscosity control, inadequate humid bond, insufficient resistance to cracking, and unsatisfactory workability. Quite a lot of additional work has been done in cooperation with the plants, and some formula revisions have been made. It is felt that all of these problems are under control at the present time, based on recent market reactions. Further work is being done

SGP 0015302

toward a reduced formula cost. Successful initial field tests were conducted on the latter in the St. Louis market, and we will continue to furnish St. Louis to gain further experience with this lower cost formula.

Also under investigation are lower cost containers. The Purchasin Department has contacted several manufacturers of containers, to see if we can get a cheaper container than the metal pail presently used. We are searching in two directions: First, to obtain some sort of corrugated package which could be used in conjunction with Ames Tools. For this use the package must be sufficiently rigid, in order to transfer the material from the container by means of a pump. The second type of package under consideration is a waterproof bag which would be strong enough to contain the product in loading and shipping. If bags of this kind can be developed, they should be quite inexpensive.

A small amount of time was provided to give technical assistance to the Engineering Department in their design of a Ready Mix plant for Acme.

3. DENS-COTE TAPE - R&D #219

Objective: To develop sources for Dens-Cote tape and to prepare a raw material specification for this product.

Investigation: Several tapes of different mesh sizes, and from different manufacturers, have been received. Thus far, it appears that a very fine mesh tape (18 x 14) offers greater joint strength and better resistance to cracking than the present 7 x 11 tape. Some further work remains to be done, to establish what the results will be for mesh sizes falling in between these two. A second consideration is the ease of application of the tape, and still another consideration is the cost of the tape. We are working closely with Purchasing, so that eventually some standard tape specifications can be established.

4. USE OF DENS-COTE OVER MASONRY SURFACES - R&D #219

Objective: To approve the use of Dens-Cote plaster over masonry wall surfaces.

Investigation: Some trial jobs were held, wherein our Texture Finish Dens-Cote was used over concrete block walls. This application proved to be quite satisfactory, and we have approved the use of texture finish Dens-Cote for this purpose. There is some concern as to whether the smooth finish can be used in this manner and, in any event, no field trials have yet been conducted. Laboratory investigations have shown that Dens-Cote for use over smooth monlithic concrete does not provide a satisfactory bond; so we will not recommend it for this purpose.

SGP 0015303

S U M M A R Y

The major accomplishments by the Research Department during the first half of 1965 were:

1. The two hour rating for a concrete & steel floor and the one hour rating for a wood floor using 1/2" Firestop. These tests enabled the minimum weight of 1/2" Firestop to be reduced from 2000 lbs/M. to 1930 lbs/M., and 5/8" Firestop from 2525 lbs/M. to 2415 lbs/M. In addition to the promotional value of these fire rated assemblies, the lower weights will reduce the manufacturing costs and freight charges.

2. The two hour fire rating and 47 STC sound rating gained for a metal stud partition with 2 layers of 1/2" Firestop on each side. Neither National Gypsum nor USG has this rating.

3. Several fire ratings were obtained for wood stud, metal stud, and gypsum stud partitions; all of which have 50 STC or better sound transmission values. The combination of resistance to sound and fire protection makes these partitions especially attractive for apartments and other multi-family dwellings.

4. Substantial cost reductions have been and will continue to be realized from research effort in two areas: First, the amount of glass fiber used in regular wallboard has been reduced, since the new finer filament fiber has proven satisfactory. Secondly, the formula revisions for four basic products of the Joint System line will help offset what could have been an increased cost structure due to the casein shortage.

5. A successful one week plant run confirms that we can manufacture wallboard from at least one source of byproduct gypsum. Although this gives us an alternate supply of our basic raw material, at the present time there are no known sources of synthetic gypsum located close enough to our plants to make its use economically attractive.

There was one very disappointing result during the past 6 months. This was our inability to print black accent lines on the Deluxe Tru-Grain so that it could be released as planned. After repeated failures, we have had to admit defeat for the present time. This Deluxe Tru-Grain was to compete with USG's Ultra-Wall and National's Fashion Grain. This unfavorable result brings out a weak point in our structure; i.e., we cannot emphasize every area of product research. In certain instances, nothing is done until a competitive situation develops, and sales pressure dictates that a concentrated effort should be made. Often the competitor has already spent several years of research on the product and has a background of experience on the subject. At this point, it can be difficult to catch up in a reasonable period of time. In some special situations, such as fire testing and joint system, we have been able to keep pace with our two largest competitors, because we have concentrated our effort in these directions. It is felt that our emphasis has been properly placed, but we must recognize that we cannot put our emphasis

SGP 0015304

in every direction; and we stand to fall behind wherever there is little or no effort. Time has been devoted to certain projects that show unusual promise, such as the acoustical tile development. If all of the time was spent catching up with competition instead of exploring new ideas, we would never have any industry firsts. We have endeavored to divide the time proportionately to approach an optimum balance of our immediate and future needs.

The progress made would not have been possible without the assistance and cooperation of the various other departments. With such combined effort, even greater progress should be possible in the future.

Tentative plans for the next 6 months shape up as follows:

1. The acoustical tile development will be continued on a high priority basis.

2. The particle size evaluation just resumed will be pursued to gain all the information desired. This work is being done primarily to gain a better understanding of our products but could be a stepping stone to some significant development in the future.

3. The development of both thincoat plaster and drywall radiant heating systems will be emphasized, in view of the increasing amount of electric heat in new construction and the interest in radiant heating.

4. Mr. Morrone has become involved in the training of new joint system quality personnel and will continue to have this responsibility until the program is complete. The development work on joint system will be handled simultaneously with the training. The evaluation of synthetic binders for these products will be stressed, in view of the high casein price.

5. Fire and sound testing will once again be an important segment of our program. Specific objectives are the cost reduction of 5/8" Firestop, development of a fire rated tile backer (water resistant) board, and one hour fire rated partitions using 1/2" instead of 5/8" Firestop.

SGP 0015305