PLAINTIFF'S EXHIBIT
GP-1027

Chapter V

CERTROCK

Certrock is a specially compounded plaster containing additives which lower the pouring consistency and give it a paint-like flow not found in other plasters. Because of this flow characteristic, Certrock will take the finest detail of a mold and produce casts having extremely smooth surfaces. The low consistency also makes Certrock casts very dense, and high in compressive strength. (About 2-1/2 times stronger than molding plaster.)

There are two grades of Certrock available, Low Consistency and Medium Consistency Low Consistency Certrock is made only at Blue Rapids and is used mainly for pottery case molds. Certrock is made at Blue Rapids from white plaster, and at Fort Dodge and Akron from gray plaster. These two products differ from each other in water requirements, Medium Consistency Certrock requiring more water than Low Consistency Certrock to make a pourable slurry. Since Certrock has no period of plasticity, it cannot be build up or screeded into templates.

Low Consistency Certrock is especially designed for the production of highly detail case molds in potteries and sanitary ware plants. The high strength and hardness of this material contributes to lower case mold costs through increased wear resistance and better surface.

PHYSICAL CHARACTERISTICS

		Water / Plaster Ratios	
		Thin Pour	Medium Pour
		10 parts Low Consistency Certrock	10 parts Low Consistency Certroc
		5 water	4-1/2 water
Tensile Strength	- Wet Average	265	360
Tensile Strength	- Dry Average	485	580
Compressive Strength	- Wet Average	1700	2000
Compressive Strength	- Dry Average	4000	4400
Setting Time	- Normal	15-30 min.	15-30 min.
Setting Expansion	- Normal	.135%	.150%

Low Consistency Certrock is used in making models (poured) for die and mold duplicating machines, for foundry match plates, for pattern shop models, statuary, lamp bases, book ends, and for any other purposes where high strength and hardness are desirable in a plaster cast.

The larges volume of sales of Certrock is for the formulation of floor patching and floor underlayment materials. This is generally Medium Consistency material.

SGP 0003399

	Thin Pour 4 parts water 10 parts plaster	Thick Pour 3½ parts water 10 parts plaster
Dry Compressive Strength	5000 - 6300 p.s.i.	7000 - 7700 p.s.i.
Normal Setting Time	20 - 30 min.	15 - 25 min.
Setting expansion	0.14 - 0.16%	0.15 - 0.17%

NOTE: Setting time can be adjusted to meet individual requirements.

MIXING DIRECTIONS

Proper mixing of Certrock is important if good results are to be obtained. This material is somewhat confusing to new users in that it mixes first to a dough which thins out to pouring consistency as mixing is continued. Those unfamiliar with this property tend to assume that more water is needed to thin the mix. Addition of more than the amounts of water shown above will result in failure due to a watery mix. This unusual characteristic of Certrock should be pointed out to new users. Use of a power mixer should always be recommended, since hand mixing of large batches is rather tiring. Mixing directions should be followed carefully to obtain best results. For pouring consistencies, use 3.5 to 4.0 parts of water to 10 parts of Certrock by weight or 3 to 3½ measures of dry Certrock to 1 measure of water. Stir vigorously for 2 or 3 minutes by hand or preferably by machine mixer, until the initial doughlike consistency has been reduced to a smooth slurry. Pour into mold at once.

The best results are obtained with a prescribed mixture. By using more water, the strength of the cast is reduced and the setting time lengthened. Stronger and harder casts can be made by using less water to form a doughlike consistency, which can be vibrated to fill out details of the mold and remove air bubbles. Certrock should be kept in a dry place before use.

Chapter V

Breakaway Plaster

Bestwall Breakaway Plaster is a special product developed for use in casting expendable mandrels. The aircraft industry uses many hollow shapes of irregular contour such as square ducts, "S" shaped tubes, etc. These are made of Fiberglas cloth which has been impregnated with a resin and then cured to form a rigid hollow shape. In order to form these hollow shapes, the impregnated glass cloth must be wrapped around a core of mandrel which must be removed after curing the part. Breakaway Plaster is used to cast these mandrels. After the part has been cured on the mandrel, it is immersed in hot water. This causes the special plaster to soften and wash out of the part.

Other industries making irregular shapes of plastic are also prospects for this product which is made at Blue Rapids, Kansas. U.S.G. has the only competitive product manufactured at Southard.

SGP 0003401

Chapter V

TUFCAST PLASTER

"Tufcast" is a special plaster product containing an additive which gives the finished cast great resistance to chipping or breaking. This plaster is mixed and cast in the ordinary way. When set, the cast is placed in an atmosphere of steam at atmospheric pressure and "cooked" for a time based on the thickness of the cast, (30 minutes per inch). After processing, the cast is dried in the usual way and develops unusual "toughness" in the dry state. This product is excellent for the production of novelty items such as statues, plaques, etc. since the castings are much more resistant than ordinary plaster casts to damage by shipping and handling.

SGP 0003402

	WATER RATIO DATA EQUIVALENTS			Density Dry Lbs. Per Cu. Ft.	Percent Void Volume Total Absorption	Dry Compressive Strength Lbs. per Sq. In.
	WATER Per 100 Plaster	PLASTER Per Pound Water	Water & Plaster = 100	(Approximate Data)		
	160	0 lbs.-10 oz.	61 - 39	37.3	74.3%	50 p.s.i.
	145	0 lbs.-11 oz.	59 - 41	40.5	72.1	100
	133	0 lbs.-12 oz.	57 - 43	43.2	70.2	200
	123	0 lbs.-13 oz.	55 - 45	46.0	68.3	300
	114	0 lbs.-14 oz.	53 - 47	48.8	66.3	400
	107	0 lbs.-15 oz.	51 - 49	51	64.8	500
GYPSUM PLASTERS	100	1 lb. - 0 oz.	50 - 50	54.5	62.4	650
	94	1 lb. - 1 oz.	48½-51½	56.2	61.2	850
	89	1 lb. - 2 oz.	47 - 53	58.5	59.6	1000
	84	1 lb. - 3 oz.	46 - 54	61.0	58.0	1200
	80	1 lb. - 4 oz.	44 - 56	63	56.5	1400
	76	1 lb. - 5 oz.	43 - 57	65.3	55.0	1600
	73	1 lb. - 6 oz.	42 - 58	67	53.8	1750
	70	1 lb. - 7 oz.	41 - 59	69	52.5	2000
	67	1 lb. - 8 oz.	40 - 60	71	51.0	2100
	64	1 lb. - 9 oz.	39 - 61	73.0	49.7	2275
	61.5	1 lb. -10 oz.	38 - 62	75	48.5	2400
	59	1 lb. -11 oz.	37 - 63	77	47.	2750
	57	1 lb. -12 oz.	36 - 64	78.5	46.	3000
	55	1 lb. -13 oz.	35½-64½	80.5	44.5	3250
	53	1 lb. -14 oz.	35 - 65	82	43.5	3500
	51.7	1 lb. -15 oz.	34 - 66	83.5	42.5	3650
	50	2 lbs.- 0 oz.	33 - 67	85.0	41.5	3750
	48.5	2 lbs.- 1 oz.	32½-67½	86.5	40.5	4000
CEMENTS	47	2 lbs.- 2 oz.	32 - 68	88.2	39.2	4500
	45.7	2 lbs.- 3 oz.	31.4-68.6	89.5	38.3	5000
	42	2 lbs.- 6 oz.	29 - 71	93.8	35.5	5500
DENSITE	40	2 lbs.- 8 oz.	28⅓-71⅔	96.0	34.0	6000
	38	2 lbs.-10 oz.	27½-72½	99.0	31.6	7000
	35.5	2 lbs.-13 oz.	26 - 74	102.0	29.5	8250
	33.3	3 lbs.- 0 oz.	25 - 75	105.5	27.0	9750
	30.0	3 lbs.- 3 oz.	24 - 76	110.8	23.5	11000
	27.0	3 lbs.-11 oz.	21.3-78.7	116.	20.	13000
	24.0	4 lbs.- 2 oz.	19.3-80.7	122.	16.	14000
	21.0	4 lbs.-12 oz.	17.4-82.6	128.	11.5	15000

CENTRAL TABLE

showing effect of quantity of mixing water on
Density - Voids - Strength.

SGP 0003403

CHART #1 Physical Properties — Bestwall Industrial Plasters

	Pouring Consistency (PC)	Setting Time Gillmore Needle Initial	Setting Time Gillmore Needle Final	Setting Expansion % Percent	Setting Expansion Inch Per Inch	Compressive Strength 1 Hour After Set†	Compressive Strength Dry†	Hardness* Number	Alkaline	Color	Remarks
Sunflower	68-70	38-50 min.	50-65 min.	.17 to .19	.0017 -.0019	1000-1100	2100-2400	20-25	No	White	
Sunflower	68-70	38-50 min.	50-65 min.	.09 to .11	.0009 -.0011	1000-1100	2100-2400	20-25	No	White	Low Expansion
#1 Statuary	62-64	38-50 min.	50-65 min.	.18 to .20	.0018 -.0020	1200-1400	3000-3400	30-34	No	White	
Reg. Statuary	64-66	38-50 min.	50-65 min.	.18 to .20	.0018 -.0020	1100-1300	2500-2900	28-33	No	White	
Pottery K-55	68-70	38-50 min.	50-65 min.	.17 to .19	.0017 -.0019	1000-1100	2100-2400	20-25	No	White	
" K-58	64-66	38-50 min.	50-65 min.	.18 to .20	.0018 -.002	1100-1300	2500-2900	28-33	No	White	Treated for Thermal Shock
" K-59	64-66	38-50 min.	50-65 min.	.18 to .20	.0018 -.002	1100-1300	2500-2900	28-33	No	White	
" K-60	64-66	38-50 min.	50-65 min.	.08 to .12	.0008 -.0012	1100-1300	2500-2900	28-33	No	White	Low Expansion
" K-61	64-66	38-50 min.	50-65 min.	.18 to .20	.0018 -.002	1100-1300	2500-2900	28-33	No	White	Fine Ground
" K-62	59-61	38-50 min.	50-65 min.	.19 to .21	.0019 -.0021	1300-1500	3300-3700	32-36	No	Blue**	Treated for Thermal Shock and Finest Ground
Densite K-5	33-34	18-24 min.	25-35 min.	.31 to .33	.0031 -.0033	4000-4500	9000-10000	105-115	No	White	
" K-5F	39-41	16-22 min.	20-30 min.	.27 to .29	.0027 -.0029	3000-3400	7000-8000	95-105	No	White	Fine Ground
" K-6	33-34	30-40 min.	40-50 min.	.31 to .33	.0031 -.0033	4000-4500	9000-10000	105-115	No	White	
" K-8	43-45	30-40 min.	40-50 min.	.25 to .27	.0025 -.0027	2200-2600	5500-6500	50-60	No	White	
" K-11	33-34	25-35 min.	35-45 min.	.08 to .10	.0008 -.001	3400-3800	6400-7400	95-105	No	White	Medium Low Expansion
" K-11F	37-39	25-35 min.	35-45 min.	.08 to .10	.0008 -.001	2900-3300	5500-6500	85-95	No	White	Medium Low Expansion
" K-12	36-37	25-35 min.	35-45 min.	.035 to .045	.00035-.00045	2500-3000	5600-6300	90-100	Yes	Gr.-Wh.	Low Expansion
" K-12F	39-41	25-35 min.	35-45 min.	.035 to .045	.00035-.00045	2200-2500	5200-6000	70-80	Yes	Gr.-Wh.	Low Expansion
" K-13	41-43	25-35 min.	35-45 min.	.04 to .05	.0004 -.0005	2100-2400	4500-5500	70-80	Yes	Gr.-Wh.	Low Expansion
" K-13F	44-46	25-35 min.	35-45 min.	.04 to .05	.0004 -.0005	2000-2300	4000-4500	50-60	Yes	Gr.-Wh.	Low Expansion
" K-14	50-52	25-35 min.	35-45 min.	.045 to .055	.00045-.00055	1100-1200	2600-3000	32-38	Yes	Gr.-Wh.	Low Expansion
" K-15, K-16	43-45	20-30 min.	30-40 min.	.09 to .11	.0009 -.0011	2000-2500	5000-6000	50-60	No	Blue or Bf.	Medium Low Expansion
" K-17	43-45	20-30 min.	30-40 min.	.06 to .07	.0006 -.0007	2000-2500	5000-6000	55-65	Yes	Gr.-Wh.	Low Expansion — High Plasticity
" K-17F	45-47	20-30 min.	30-40 min.	.06 to .07	.0006 -.0007	1900-2400	4800-5800	50-60	Yes	Gr.-Wh.	Low Expansion — High Plasticity
" K-20	41-43	30-40 min.	40-50 min.	1.0 to 1.2	.01 -.012	900-1200	2200-2700	65-75	No	White	High Expansion
" K-25	44-46	30-40 min.	40-50 min.	.04 to .05	.0004 -.0005	1900-2400	4800-5800	55-65	Yes	Gr.-Wh.	Low Expansion — High Plasticity
" K-31	43-45	24-30 min.	27-33 min.	.04 to .055	.0004 -.00055	2000-2500	5000-5600	50-60	Yes	Gr.-Wh.	Low Expansion
" K-32	44-46	35-45 min.	45-60 min.	.050 to .065	.0005 -.00065	1800-2100	4200-4800	50-60	Yes	Gr.-Wh.	Low Expansion — Good Plasticity
" K-33	37-39	25-35 min.	35-45 min.	.035 to .050	.00035-.0005	2500-3000	5600-6300	90-100	Yes	Blue	Low Expansion—Medium Plasticity
" K-34	27½-28½	20-25 min.	25-30 min.	.11 to .13	.0011 -.0013	4200-4700	9500-11500	140-145	Yes	Gr.-Wh.	Medium Low Exp. — Viscous Pour
" K-36	54-56	25-35 min.	35-45 min.	.21 to .23	.0021 -.0023	1850-2150	4300-4700	45-50	No	White	Normal Exp.—Highest Plasticity
" K-40	31-33	25-35 min.	35-45 min.	.07 to .10	.0007 -.001	4000-4500	8000-10000	135-140	Yes	White	Viscous Pour—Med. Low Exp.
Certrock	39-41	25-35 min.	35-45 min.	.17 to .19	.0017 -.0019	2400-2700	4700-5200	80-90	Yes	Grey	Viscous Pour—Normal Expansion
Densflor	45-47	5-7 hrs.	6-8 hrs.	.06 to .07	.0006 -.0007	2300-2500	4000-5000	48-55	Yes	Gr.-Wh.	Low Expansion
Bestrock	35-37	25-35 min.	35-45 min.	.12 to .14	.0012 -.0014	3400-3800	6500-7500	110-120	Yes	Dark Grey	Viscous Pour—Medium Expansion
Breakaway	110-120	40-50 min.	50-60 min.	.09 to .11	.0009 -.0011	60-80	250-350		No	Tan	
Metal Casting	110-120	35-45 min.	45-55 min.	.10 to .12	.001 -.0012	100-150	250-350		No	White	

Densite formulas designated as F are fine grind.

All physical data obtained at Laboratory pouring consistency.

Average setting times based on Laboratory tests are shown on this chart. Setting times can be adjusted to suit customers requirements.

* Monotron Hardness Number — Kilogram load required for 0.01" penetration of 10mm steel ball.

** White in bag — blue in cast.

† Compressive strengths are shown in pounds per square inch.
Plasticity under "Remarks" column refers to workability of plaster that enables it to be used for built up work.

SGP 0003404

Chapter V

SUPER STRENGTH GYPSUM PRODUCTS

DENSITE

Densite (registered Bestwall Trademark) is a relatively new gypsum plaster produced at the Bestwall Gypsum Company plant at Blue Rapids for the first time in 1949. This product is produced by an exclusive patented process involving a unique method of calcination. This process yields a plaster differing markedly from ordinary kettle stucco in physical properties. Crushed rock graded _____ is cooked in a kettle covered with a water solution of _____. Incidentally, the basic competitive product, United States Gypsum's "Hydrocal" is produced by calcining crushed gypsum under steam pressure.

Densite has the appearance of ordinary white molding plaster. Although it is chemically the same as molding plaster, a given volume of the dry powder weighs about twice as much as an equal volume of molding plaster. It is somewhat similar to U.S.G.'s Hydrocal (registered U.S.G. trademark) but requires considerably less mixing water to obtain a given consistency; therefore, Densite casts are far harder and stronger than Hydrocal casts. More recently, U.S.G. has produced a so-called Low Consistency Hydrocal which, while made under a different process, has very similar properties to Densite.

To obtain plastering consistency only 22 parts of water to 100 parts of Densite by weight are required. Casts made at this water/plaster ratio develop a compressive strength in excess of 13,000 pounds per square inch when dry.

To obtain pouring consistency, only 33 to 35 parts of water are required with base Densite, as compared to 70 parts for Sunflower Molding Plaster and 45 for Hydrocal. Casts made at this pouring consistency (33 water/plaster ratio) develop a compressive strength of approximately 9,000 pounds per square inch when dry. This is over four times the strength of casts made from molding plaster at the same pouring consistency; i.e., 70 water/plaster ratio.

Densite mixes with water like ordinary molding or casting plaster and the setting action is also similar to that of molding plaster. Ordinarily, it sets a little faster than molding plaster, but the setting time can be regulated as required to suit a particular use.

Setting expansion at pouring consistency is approximately 0.32% but this can be reduced to as little as .04% or increased to as much as 1.5% by the addition of certain ingredients.

SGP 0003405

Chapter V

Base Densite (K-5) is Densite taken directly from the storage bin and contains no accelerator, retarder, or other additives. The setting time of base Densite varies slightly from batch to batch, final Gilmore set running on the average about 20 minutes.

Industrially, base Densite is used by dental stone manufacturers, some investment casting plants and some gypsum flooring firms. In each case the Densite is used as a basic ingredient of a special compound manufactured by our customer. That is, the people who buy base Densite do not use it as such, but add various modifiers to produce finished dental stones, floor patching compounds, investment casting compounds, etc.

SGP 0003406

BESTROCK

Pouring Consistency	- 35 to 37 lbs. water per 100 lbs. plaster
Setting time normal job conditions	- 30 to 45 minutes
Setting expansion	- 0.12 to 0.14%
Dry compressive strength	- 6,500 to 7,500 p.s.i.
Color	- Dark grey

NOTE: Poure with a viscous flow and is self-leveling.

Uses: (1) For Anchoring Bolts, Rods, etc., in Concrete

Drill hole large enough to allow at least one-half inch thickness of Bestrock around piece to be anchored, fill hole with water, remove excess water with rag; then put bolt or rod in hole and pour Bestrock around it. As soon as set, while still wet, Bestrock has a compressive strength of over 3,000 p.s.i.

(2) As a Grout for Levelling Machinery

Fills space completely, due to viscous flow and self-levelling characteristics. Does not shrink as do some grouting materials. Equipment can often be used same day, due to high wet strength.

(3) As a Floor Patch for Concrete Floors

Clean the areas to be patched, roughen surface if necessary, dampen and then pour Bestrock. Due to self-levelling property, little - if any - troweling is necessary. Patch is ready for traffic soon as set, usually in less than one hour.

Bestrock is easy to use. Add required water only, mix and pour. Saves time because it sets hard in one hour or less. (Faster or slower setting time can be furnished if desired.)

Precautions: Bestrock is not recommended for driveways and sidewalks. If used for exterior anchoring, paint with a water resistive coating.

7. COMPETITION

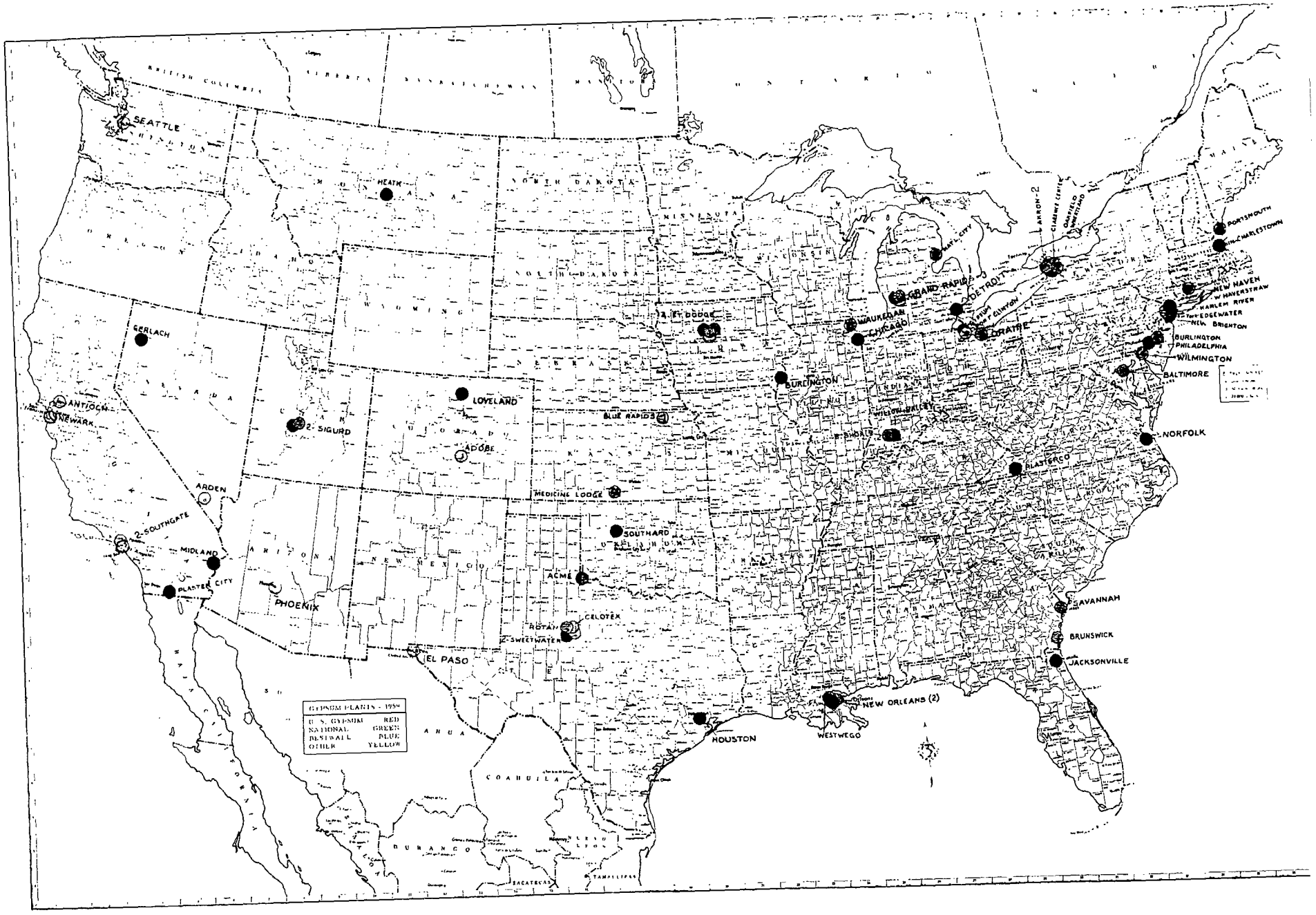
GYPSUM INDUSTRY NOVEMBER, 1958

	COMPANY	MAIN OFFICE	% Board	PLANTS				INDUSTRY POSITION
				Pl.	Bd.	Pl.&Bd.	Prop.	BOARD ONLY
1	Barrett	New York, N. Y.	2.3	-	1	-	-	8
2	Bestwall	Ardmore, Pa.	8.2	1	-	5	1	3
3	Blue Diamond	Los Angeles, Calif.	2.4	-	-	-	-	7
4	Celotex	Chicago, Ill.	6.4	-	-	3	-	4
5	Fiber Products (Pabco)	San Francisco, Calif.	3.2	-	2	1	-	6
6	Flintkote	New York, N. Y.	2.0	-	-	1	-	9
7	Grand Rapids Plant	Grand Rapids, Michigan	-	1	-	-	-	-
8	Kaiser Gypsum Company	Oakland California	4.4	0	1	2	-	5
9	National Gypsum Company	Buffalo, New York	28.4	-	-	13	2	2
10	Ruberoid	Rochester, N. Y.	1.1	-	-	1	-	10
11	Union Gypsum Company	Phoenix, Arizona	0.8	-	-	1	-	11
12	United States Gypsum Co.	Chicago, Ill.	40.8	-	-	21	2	1

FORMER GYPSUM COMPANIES	PURCHASED BY
Cardiff	Celotex
Connecticut Adamant	National
French	No Board or Plaster
Ideal Cement	Pabco
Newark	Barrett

TOTAL DOLLAR BUSINESS GYPSUM INDUSTRY

$200 million	1948-50 average
$245 million	1953
$272 million	1954
$320 million	1955
$322 million	1956
$301 million	1957
$330 million	1958 - Estimated


SEATTLE
HEATH
GERLACH
ANTIOCH
NEWARK
2-SIGURD
LOVELAND
ADOBE
ARDEN
2-SOUTHGATE
MIDLAND
PLASTER CITY
PHOENIX
EL PASO
MEDICINE LODGE
SOUTHARD
ACME
CELOTEX
ROTAN
2-SWEETWATER
BLUE RAPIDS
BURLINGTON
WAUKEGAN
CHICAGO
GRAND RAPIDS
DETROIT
ORATRE
NAT'L CITY
AKRON-2
CLARENCE CENTER
GARFIELD
WHEATLAND
PORTSMOUTH
CHARLESTOWN
NEW HAVEN
W HAVERSTRAW
HARLEM RIVER
EDGEWATER
NEW BRIGHTON
BURLINGTON
PHILADELPHIA
WILMINGTON
BALTIMORE
NORFOLK
PLASTERCO
SAVANNAH
BRUNSWICK
JACKSONVILLE
NEW ORLEANS (2)
WESTWEGO
HOUSTON
GYPSUM PLANTS - 1959
U. S. GYPSUM RED
NATIONAL GREEN
BESTWALL BLUE
OTHER YELLOW

SGP 0003410

8. GYPSUM ASSOCIATION