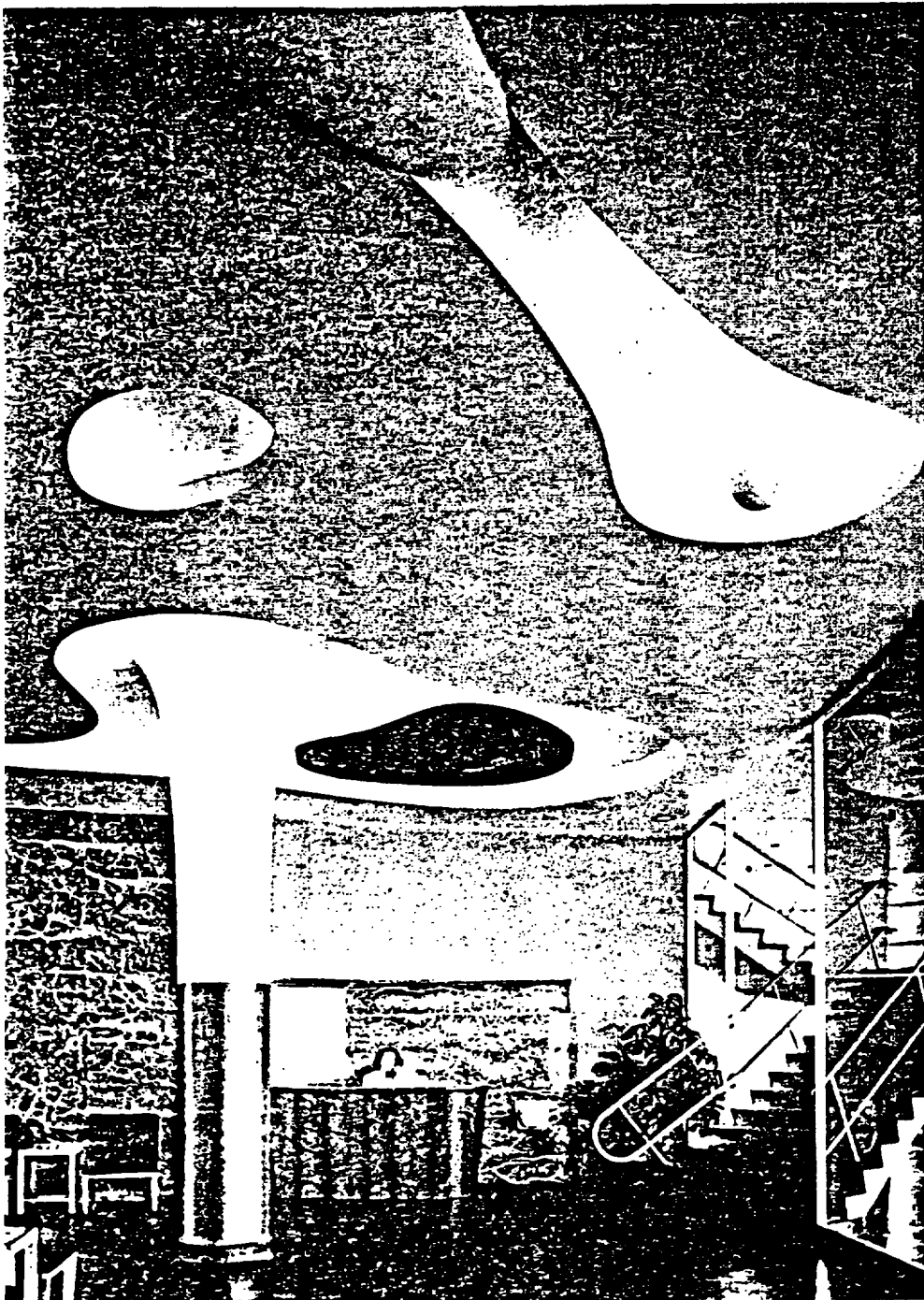


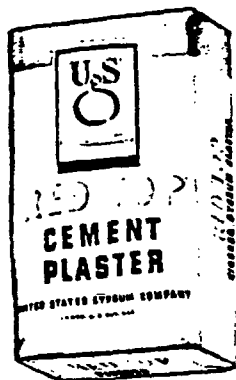
PLAINTIFF'S EXHIBIT

USG-2072

Gypsum Plaster and Building Lime



GP003 0010



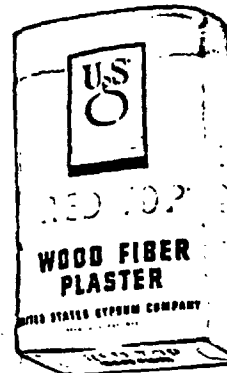
**Cement
plaster**

Neat gypsum plaster requiring the addition of an aggregate and water on the job.

Use only where good plastering sand, or other good aggregate is available.

RED TOP Cement Plaster is lowest in cost of the four types of gypsum basecoats described on this page. It is mixed with low cost aggregate, increasing bulk and coverage.

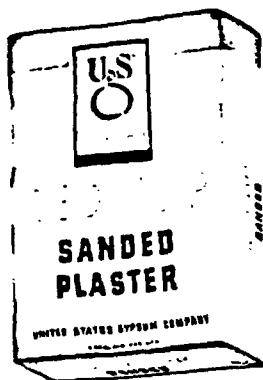
RED TOP Cement Plaster requires the addition of an aggregate proportioned strictly according to specifications. Use of too much aggregate drastically reduces finished plaster strength. See data, page 12.



**Wood fiber
plaster**

Mill-prepared gypsum basecoat plaster contains finely shredded selected wood fiber for use where extra strength is desired. Requires the addition of water only on the job.

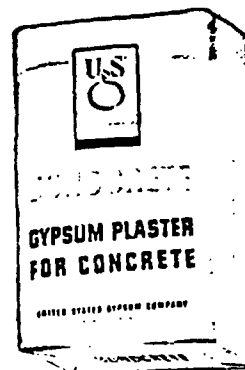
The strongest of the four types of basecoat plaster has greater compressive and tensile strength, greater resistance to lateral impact, greater surface hardness, greater resistance to cracking. Also provides from 30% to 130% greater fire resistance than sand plaster and is about 25% lighter in dead load. Greater coverage and workability, up to one part sand may be added in mixing, although strength and fire resistance are then somewhat reduced.



**Sanded
plaster**

Sanded at the mill to insure correct gradation and proper proportioning of sand. RED TOP Sanded Plaster is manufactured for use in areas where good plastering sand is costly or not available.

Ready to use—requires addition of water only on the job. Better than most job-sanded plasters because only selected aggregate, properly proportioned, is used.



**Bondcrete
plaster**

Factory prepared gypsum basecoat plaster special formulated to bond with rough interior monolithic concrete surfaces. Requires addition of water only on the job. Total thickness of plaster, including finish coat, not to exceed $\frac{3}{8}$ " on concrete ceilings, $\frac{1}{2}$ " on walls.

Apply only on concrete surfaces properly prepared for plastering and free from oil from form board. Full directions are printed on the bag.

The leadership enjoyed by USG RED TOP gypsum plasters is the result of the most extensive scientific research program in the industry, plus superior manufacturing and marketing facilities.

As a result of U.S.G.'s research and development work, plasterers and contractors expect today's plaster products to be uniform, plastic and fireproof; they must be free spreading, easily mixed by hand or machine, and must provide high coverage while setting dependably to maximum hardness and high tensile strength.

RED TOP gypsum plasters fully meet all these requirements. The complete RED TOP line offers a USG product for every plastering need. Each product more than meets applicable standard specifications.

Basecoat plasters

Gypsum basecoat plasters are applied to bases of masonry or lath and support the finish coat. The United States Gypsum Company is continuing to improve these important products. New materials are tested in laboratories and in the field before being offered. Tests are made at all stages of manufacture and on finished products in warehouse stock. Special grinding equipment has been devised to produce super-fine, easily mixed plasters having increased slip under the trowel.

There are four distinct USG basecoat plasters—each designed for a specific use—each best on the market for its specific purpose.

Packed in convenient 100 lb. multi-wall paper bags.

When in doubt read the instructions on the bag

RED TOP plasters will give the most satisfactory results when instructions are carefully followed. Observe the directions on the bags, or consult the specifications in U.S.G. technical literature.

RED TOP plasters are for interior use and should not be used on the exterior where exposed to the elements. They should not be used where contact with excessive moisture is expected, whether on the exterior or interior.

Only RED TOP BONDCRETE (see page 10), or RED TOP COVER-COAT Finishing Plaster (see page 17), should be applied over concrete. Special care should be taken in preparing the bonding surface in accordance with directions printed on the bag.

Gypsum basecoat plasters are not recommended for application over surfaces that have been treated with asphalt or other bituminous compounds, nor for application directly over interior surfaces of exterior masonry walls.

The widespread usage of RED TOP plasters can be attributed principally to these outstanding features:

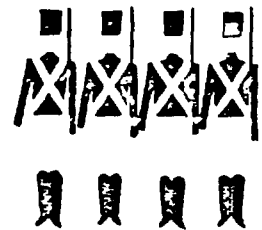
Made from the mineral gypsum, RED TOP plasters are incombustible, will not transmit high temperatures until completely calcined; actually fight fire.



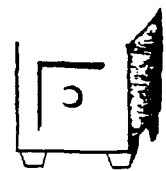
RED TOP Basecoat plasters bond firmly to approved plaster bases and are specially processed to receive any type of finish coat in common use. Plastic, they permit wide latitude in design of either plain or curved surfaces.



Manufactured on a nationwide basis in 23 modern mills, RED TOP plasters are held to rigid specifications. Their setting time is stabilized to minimize the hazards of impure additives, unexpected job conditions and seasonal irregularities.



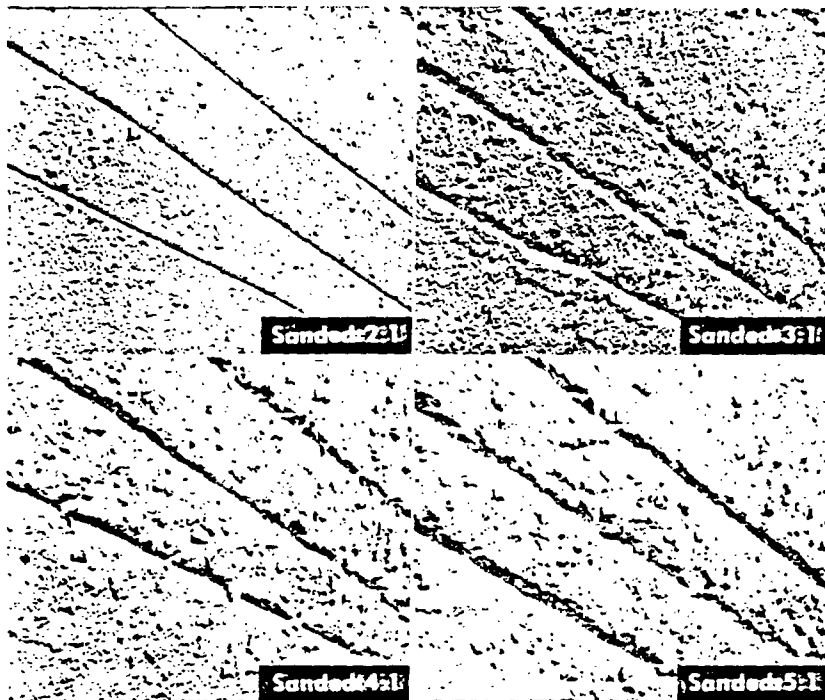
RED TOP plasters are made to withstand normal usage for the life of the building. (Compressive and tensile strength data Page 13.)



Processed to give high coverage with minimum effort, RED TOP plasters, by their easy working qualities and additional bulk, assure good work at low cost for both material and labor.



GP003 0012



For ideal strength and hardness, the proper proportion of aggregate to plaster must be used

Illustrations show reduced hardness with increasing proportion of sand.

GP003 0013

Recommended proportions of gypsum cement plaster to sand by weight and approximate covering capacity at recommended grounds

Plaster Base:	Gypsum Lath	Insulation Lath	Metal Lath	Brick-Clay Tile	Gypsum Tile
Two Coat Work Scratch Double-back Plaster	1:2½	1:2½	—	1:3	1:3
Three Coat Work Scratch Coat Plaster	1:2	1:2	1:2	—	—
Brown Coat Plaster	1:3	1:3	1:3	—	—
Coverage Range Sq. Yds. Per Ton	175-220	175-220	90-125	175-200	200-240

Water

All gypsum plasters require the addition of water to the job. As a general rule any water fit to drink is suitable for mixing plaster.

Sand

Neat or gypsum cement plaster is designed to be mixed with an aggregate on the job. Sand is the most commonly used plaster aggregate because it is economical and generally available.

Proper proportioning and gradation of sand are most important in determining bulk and working quality of plaster, and the ultimate quality of the finished wall. Over-sanding or the use of an excessive amount of fine sand, each reduce the strength and hardness of gypsum plasters.

The American Society for Testing Materials in ASTM Designation C35-39 has established the following specifications which are regarded as standard for the proper gradation of good plastering sand:

Size of Sieve	Percentage of Sand Retained	
	Max.	Min.
No. 4 (4760-micron)	0	..
No. 8 (2380-micron)	10	0
No. 30 (590-micron)	80	15
No. 50 (297-micron)	95	70
No. 100 (149-micron)	..	95

The amount of material finer than a No. 200 (74 micron) sieve shall not exceed 5%.

Lightweight plaster aggregates

The use of lightweight aggregates is growing in many markets. When properly used their light weight, fire resistance, adaptability to winter plastering and ease of handling on the job make them highly desirable.

Perlite

This is an excellent lightweight plaster aggregate, and is becoming increasingly available. It is a product derived from lava ore which is exploded under heat.

When used as a plaster aggregate it must conform with the ASTM Specifications for Plastering Sand and weigh from $7\frac{1}{2}$ to 15 lbs. per cu. ft.

It is generally sold in bags containing 3 or 4 cu. ft., and is mixed on a *volume* of aggregate to weight of gypsum plaster basis.

Perlite has excellent fire-resistance qualities. When mixed with gypsum plaster it provides a plaster strength greater than that with vermiculite and nearly equal to that with sand.

Premixed plasters containing the correct propor-

tions of gypsum plaster and perlite are available in some markets.

Vermiculite

This aggregate is produced from a non-metallic mineral of the mica family. It is ground and exploded under heat into lightweight granules. As an aggregate for plastering, vermiculite must conform in particle size to ASTM Designation C35-39 for gradation of plastering sand, and shall weigh between $7\frac{1}{2}$ and 10 lbs. per cubic foot.

Vermiculite plaster aggregate is generally sold in bags containing 4 cu. ft. and is mixed with gypsum plaster on a *volume* of aggregate to weight of plaster basis. Premixed plasters containing the correct proportions of gypsum plaster and vermiculite are available in some markets.

Walls plastered with a mix containing vermiculite as an aggregate have lower strength and require a longer period for drying than walls of sanded plaster, but are lighter in weight and have greater fire resistance.

Recommended proportions of lightweight aggregate per 100 lbs. plaster.

	Gypsum, fiber insulating, or metal lath	Masonry bases
Scratch Coat	Not over 2 cu. ft.	Not over 3 cu. ft.
Brown Coat	Not over 3 cu. ft.	Not over 3 cu. ft.

Note: In two-coat plaster work over gypsum or fiber insulating lath not more than $2\frac{1}{2}$ cu. ft. of lightweight aggregate should be used per 100 lbs. gypsum plaster. Masonry surfaces should be moderately wetted to reduce suction. When perlite is used and wetting is impractical, amount of perlite may be increased to not more than 4 cu. ft.

Gypsum plaster—strength data

	Wood Fiber	Cement Plaster: Sand				Cement Plaster			
						Vermiculite		Perlite	
		1:1	1:2	1:3		100 lbs.: 2 cu. ft.	100 lbs.: 3 cu. ft.	100 lbs.: 2 cu. ft.	100 lbs.: 3 cu. ft.
Compressive strength (lb. per sq. in.) (typical test results)	2600	2100	1200	750		500	300	1000	650
Tensile strength (lb. per sq. in.) (typical test results)	440	245	170	120		130	90	165	105

CP003 0014

STORAGE, MIXING, APPLICATION



Plastering specifications may indicate either two-coat or three-coat work. Two-coat work consists of one base coat and one finish coat, and it is generally used over a masonry plaster base and often over gypsum or insulation lath. In three-coat work there are two separate base coats and a finish coat; three-coat work is required over metal lath. The first coat is known as the "scratch" coat and the second coat as the "brown" coat.

Two-Coat Work

Where base coats are applied by either the "single coat" or "scratch-double-back", the overall plastering operation is termed two-coat work. The basecoat plaster is applied to slightly less than the thickness of the grounds and rodded and darbied to a true, even surface left rough enough to take the finish coat.

Three-Coat Work

The scratch coat is sanded 2 parts of sand to 1 part of plaster by weight (for vermiculite or perlite, proportion by volume of aggregate to weight of plaster). It is applied to a thickness of approximately $\frac{1}{4}$ " over the face of the lath and then cross-raked before it sets to provide a mechanical key for the brown coat.

The brown coat is sanded 3 parts of aggregate to 1 part of plaster, and is applied directly to the set scratch coat. The brown coat is used to fill out to just slightly below the grounds and is rodded and darbied to a true, even surface. It is left rough enough to receive the finish coat.

How to use Basecoat plaster

RED TOP plasters are the best that research and efficient production methods can provide. Nevertheless, to assure best results care and skill should be exercised in handling and application. U.S.G. provides detailed directions and complete specifications for proper use of each of its plastering products. Compliance with Standard Specifications for Gypsum Plastering of the American Standards Association is recommended.

Warehousing

Store plaster in a dry, well ventilated warehouse. Rotate stocks by shipping oldest material first. RED TOP plasters are mixed for use in the same season shipment is made from the mill.

Delivering

Protect plaster bags from moisture, both in transit and stocking on jobs. Wet bags cause trouble.

Mixing

In hand mixing, determine proper proportion of aggregate to be used (if aggregate is required), and place aggregate and plaster in one end of box. Hoe dry from one end to the other, working aggregate and plaster together until thoroughly blended. Then add water and hoe plaster into the water, mixing thoroughly to proper mortar consistency.

In machine mixing, put in water, then half the required amount of aggregate, then dry plaster, then balance of aggregate. Mix to desired consistency.

Never mix plaster in dirty mixing boxes or machines. Do not prolong mixing beyond time required for uniform intermixture of the components.



Machine mixing of plaster is economical on large jobs

Keep moisture away from plaster before mixing

Use only clean water

Use only properly graded aggregate in proper proportions

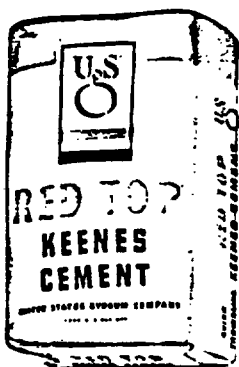
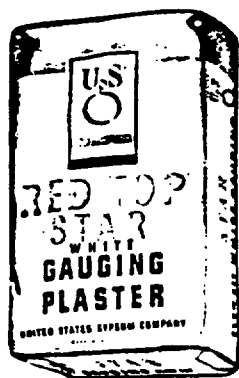
Keep set-up plaster out of the mix

Mix no more than can be applied in one hour

Do not retemper plaster that has started to set

In cold weather provide adequate heat to prevent freezing

Prevent plastered walls from drying out until set



Available brands, setting times and finishes

Brand	Set with Lime Putty
RED TOP CHAMPION Gauging Plaster (white)	Quick set—10-15 min.
RED TOP STAR Gauging Plaster (white)	Slow set—45-60 min.
RED TOP Gauging Plaster (gray)	Slow set—45-60 min.
RED TOP Gauging Plaster (gray)	Quick set—10-15 min.
RED TOP Regular Keenes Cement (white)	3-6 hours
RED TOP Quick Trowelling Keenes Cement (white)	1-2 hours

Brand	Type of Finish
RED TOP Trowel Finish Plaster	smooth
RED TOP IMPERIAL Finish Plaster	smooth
RED TOP Skim Coat Finish Plaster	smooth
RED TOP Sand Float Finish Plaster	sand float

All finish plasters are shipped in 100 lb. multi-wall paper bags.

Finishing plaster

Finish coat plaster completes the architectural design and provides a suitable base for decoration. Finishes are either factory prepared, usually requiring the addition of water only, or they may be job mixed, involving a blend of lime putty and gauging plaster or lime putty and Keenes cement. The finish coat is applied to a thickness of $\frac{1}{8}$ " to $\frac{1}{2}$ ". Several types of finish coat are available, each designed to serve specific requirements.

Lime-Gauging Finish Coat consists of hydrated finish lime or finishing quicklime soaked or slaked to putty consistency, and blended in proper proportion with gypsum gauging plaster. For complete description and data on finishing limes, see page 20.

Gauging Plaster. The function of gauging plaster in a lime-gauging finish is to provide initial set and strength and hardness to the surface finish. It is ground to the proper fineness to blend readily and completely with the lime putty. To serve various job and market requirements, USG gauging plasters are produced in 2 setting times and in a choice of gray or white colors.

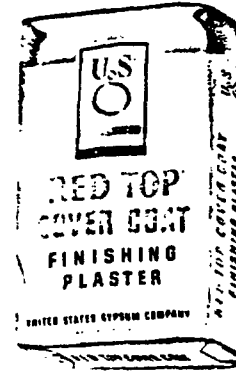
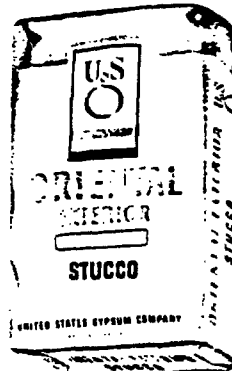
Gauging plasters are used only with finish limes as described on page 20 in the proportion of one part gauging plaster to three parts of lime putty by volume. This is the equivalent of one part gauging plaster to two parts of dry lime by weight.

Keenes Cement is a high strength, pure white gypsum plaster used with finish lime putty for extremely hard, dense surfaces. Keenes cement provides the strength and the lime putty imparts the necessary plasticity. When mixing, proper proportions must be carefully observed.

For "medium hard" finish, mix in the proportion of 50 lbs. of dry hydrated lime (100 lbs. lime putty) to 100 lbs. of Keenes cement.

For "hard finish" limit the quantity of lime to 25 lbs. of dry hydrated lime (50 lbs. lime putty) to 100 lbs. of Keenes cement.

Gypsum Trowel and Float Finish Plaster. Factory prepared gypsum plasters requiring the addition of water only on the job. These finish plasters have a natural bond to gypsum base coats, develop superior hardness, are non-alkaline, may be decorated safely much sooner than lime putty finishes, and contain nothing injurious to paint or other final decoration.



ORIENTAL Interior Finish Plaster. Integrally colored in a choice of 12 colors at the factory, this finish plaster requires the addition of water only. It has a natural bond to gypsum basecoat plaster, may be finely floated or textured and requires no further decoration.

Colors: White Tusk Ivory Golden Buff Shell Pink
Sahara Cream Harvest Buff Mist Gray Desert Rose
Ivory Parchment Caenstone Cool Green

For coverage see data below.

ORIENTAL Exterior Stucco Finish. Exterior stucco finish in eleven pastel colors and white. It is uniformly pre-mixed, water-resistant, non-staining, easy to apply, and enduring. Eliminates much of the uncertainty inherent in a job-mixed stucco finish. Uniformity of aggregate and color standards permits matching of colors between batches mixed at different times and under different conditions. ORIENTAL Stucco sets slowly to facilitate proper finishing, minimizing unsightly streaks and shading. Will produce either period textures or smooth trowel, stipple sponge, rough coat or spatter-dash finishes.

Applied over a base coat of portland cement, lime and sand. Coverage approximately 150-200 yds. per ton.

Colors: White Sun Tan Alamo Buff Puebla Tan
Pewter Gray Stone Gray Mission Cream Indian Coral
Eggshell Ivory Copper Rose Cascade Green Rancho Brown

RED TOP COVER COAT Finishing Plaster, unlike all other types of plaster, bonds directly to smooth unpainted concrete surfaces and provides a smooth finish ready for decoration. Because COVER COAT bonds directly to such surfaces, considerable time and expense are saved by using COVER COAT instead of other procedures such as surface roughening plus bond plaster, buffing plus spackling compound, or furring, lathing and plastering in the conventional manner.

Factory prepared, RED TOP COVER COAT requires the addition of water only on the job. It is applied in two thin coats to a total average thickness not exceeding 1/8". Careful adherence to directions on the bag for surface preparation is necessary. Coverage, 300-700 yds. per ton depending on surface.

Finish plaster data

	Gauging Plaster to Lime	Quick Trowelling Keenes to Lime		Gypsum Trowel Finish	Gypsum Float Finish	ORIENTAL Finish
Mix by weight of dry materials:	1:2	2:1, Medium Hard	4:1, Hard	NEAT	NEAT	NEAT
Color	White or Gray (1)	White	White	White	White or Gray	12 Colors
Finish Texture	Smooth	Smooth	Smooth	Smooth	Float	Float
Hardness in Kilograms (2)	34	50	70	55	(See Note 3)	(See Note 3)
Workability	1	3	6	2	5	4
Coverage	1 ton gauging 2 tons lime cover approx. 1000-1400 yds.	2 tons Keenes 1 ton lime cover approx. 850-1200 yds.	4 tons Keenes 1 ton lime cover approx. 1300-1700 yds.	1 ton will cover approx. 350-400 yds.	1 ton will cover approx. 250-275 yds.	1 ton will cover approx. 250-300 yds.

(1) Gray with "local" gauging plaster. (2) Kilograms required to force a 10MM ball .01" into plaster face.
(3) These are hard finishes but the aggregate in the surface does not permit an indication with this test.

Special plasters

In addition to its complete line of wall plasters, U.S.G. has perfected and formulated a number of special plasters for other applications. They are recognized as quality leaders in their respective classes because of the carefully controlled scientific processing by which they are made.

RED TOP Moulding Plaster—used in specialized work such as casting ornamental enrichments or running cornices. The grind is conducive to fine detail. In cast work, moulding plaster is used neat, whereas for running cornices a small portion of lime is used.

RED TOP Moulding Plaster is available in white and local, or grayish colored, grades.

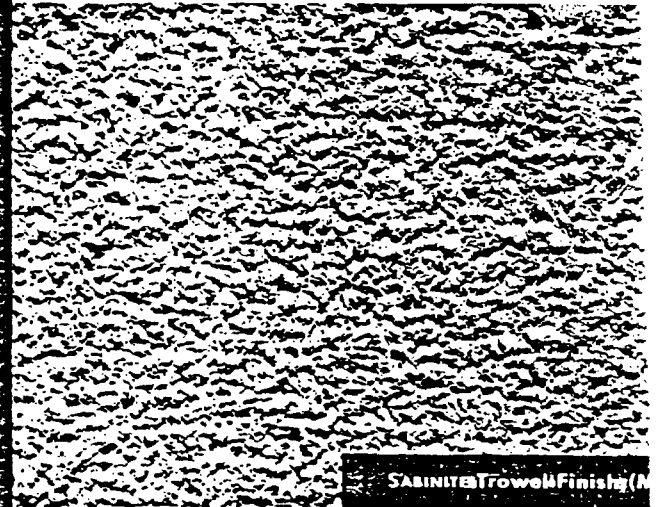
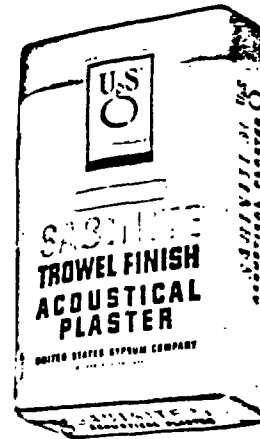
RED TOP Casting Plaster—for moulding done directly in the plaster. Results in smoother castings showing excellent detail—ideal for making fine plaques and art statuary.

Art Plaster—different from any other class of plaster, being designed especially for casting novelty artware ready for painting. It contains additives to produce surface hardness in the finished work that minimize paint absorption. Available in white or ivory colors.

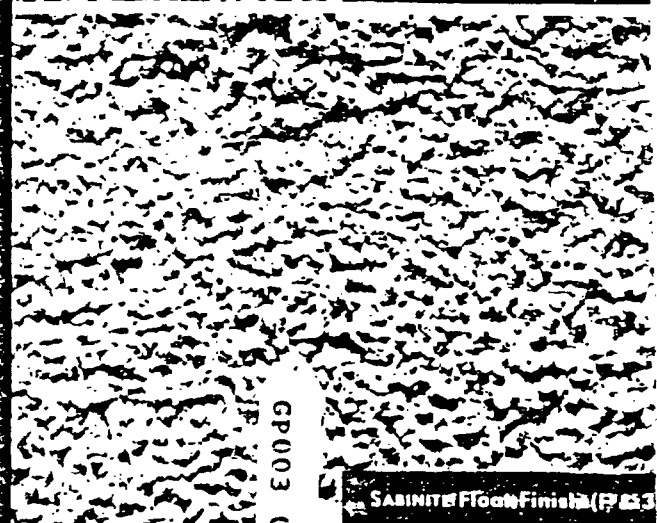
Dental and Orthopedic Plaster—made from selected gypsum and remarkably free from grit and other foreign elements. Extremely fine grind—exceptional quality. These plasters are very well known under the brand names: WHITE STAR Dental Plaster and USG Orthopedic Plaster.

RED TOP Partition Tile Cement—a specially prepared gypsum cement used with water and sand as a mortar for setting interior partitions of gypsum or clay tile and gypsum fireproofing and column covering. RED TOP Partition Tile Cement makes an easy working, economical mortar having early high strength that provides strong mortar joints for any non-bearing partition tile work.

SABINITE acoustical



SABINITE Trowel Finish (M)



SABINITE Float Finish (F 453)

GP003 0019

Plaster absorbs unwanted noise...incombustible...provides wall and ceiling beauty...easily applied

SABINITE Trowel Finish (M)

A highly efficient acoustical plaster, prepared to produce a continuous surface with exceptional sound absorbent qualities.

Sound absorption. With countless sound traps, SABINITE Trowel Finish absorbs a high percentage of all noise that strikes its surface. Has a Noise Reduction Coefficient of .60 (see table below).

Fire resistance. Basically mineral, it is incombustible.

Flexible in use. Like any plaster, SABINITE Trowel Finish is adaptable to any architectural design. Its continuous trowel finished surface lends beauty to any decorative plan. For use on any ceiling area and on sidewalls not subject to contact.

High light reflection. Laboratory tests indicate reflection of 64% for SABINITE Trowel Finish Oyster White.

Easily applied. SABINITE Trowel Finish is applied as a finish coat plaster and requires only the skill of a competent plasterer.

Economical. More sound absorption per dollar than most other commonly used acoustical materials.

Maintenance. SABINITE Trowel Finish plaster may be cleaned with a good putty-type wallpaper cleaner or with a vacuum cleaner using hose and brush attachments.

Redecoration. SABINITE Trowel Finish may be redecorated with TEXOLITE paint (Standard or Imperial). Apply according to U.S.G. directions. Tests by a nationally recognized laboratory showed SABINITE Trowel Finish had no loss in noise reduction coefficient after 2 spray coats of Imperial TEXOLITE were applied.

Colors. Available in Oyster White, Colonial Cream, Antique Ivory, Spanish Buff and Caenstone. Color samples are available on request.

Over existing ceilings. SABINITE Trowel Finish may be applied over most existing surfaces through use of a special asphalt emulsion bonding coat. Refer to U.S.G. representative or to technical literature for data.

SABINITE Float Finish (F)

A highly efficient acoustical plaster used where a float finish is desired.

Sound absorption. Noise Reduction Coefficient of .55 (see table below).

Fire resistance. Basically mineral, it is incombustible.

High light reflection. Laboratory tests indicate reflection of 54% for SABINITE Float Finish Oyster White.

Flexible in use. Similar to SABINITE Trowel Finish, SABINITE Float Finish is economical, easily applied.

Maintenance. SABINITE Float Finish plaster may be cleaned with a vacuum cleaner using hose and brush attachments.

Redecoration. SABINITE Float Finish may be redecorated with TEXOLITE paint (Standard or Imperial). Apply according to directions. See statement under SABINITE Trowel Finish for results of redecoration tests.

Colors. Available in same colors as SABINITE Trowel Finish.

SABINITE 38

A float finish acoustical plaster specially prepared for sound conditioning in locations subjected to high moisture conditions, such as ceilings in shower rooms, ceilings and sidewalls in swimming pools, etc.

Sound absorption. Noise Reduction Coefficient of .50 (see table below).

Fire resistance. Basically mineral, it is incombustible.

Maintenance. SABINITE 38 plaster may be cleaned with a vacuum cleaner using hose and brush attachments.

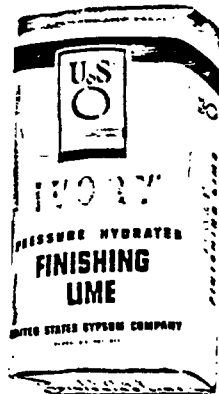
Redecoration. It may be painted with TEXOLITE Imperial paint applied according to U.S.G. directions, which will vary according to conditions encountered. Directions available on request. See statement under SABINITE Trowel Finish for results of redecoration tests.

Colors. Available in White only.

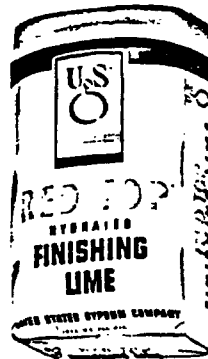
SABINITE Acoustical Plasters are ordered on a yardage basis... sufficient material is provided for application to a thickness of 1/2 inch. All standard colors are immediately available.

Sound Absorption Data

SABINITE Type	Thickness	128	256	512	1024	2048	4096	NRC	Authority
Trowel Finish ("M")	1/2 inch	.18	.24	.45	.78	.85	.83	.60	National Bur. of Stds.
Float Finish ("F")	1/2 inch	.19	.22	.43	.80	.75	.75	.55	National Bur. of Stds.
"38".....	1/2 inch	.25	.26	.32	.60	.76		.50	Riverbank Lab.



The finest of finishing limes! Produced by exclusive U.S.G. patented process... for hand or mechanical mixer... requires no more than 15 minutes mixing on the job.



Highly plastic, easy working, pure white... smooth, hard finish when properly mixed with gauging plaster... requires 12 hours soaking for a plastic putty.



Long known as a quality product... proper slaking and aging determine job results. Age at least 16 hours before using to obtain maximum plasticity.

Double Hydrated Finishing Lime

Brand	Type Material	U.S.G. Mfg. Mill	Size Container	Approximate Coverage per ton
IVORY	Dolomitic Double Hydrate	Genoa, Ohio	50 lbs.	700 yds.

Hydrated Finishing Lime

Brand	Type Material	U.S.G. Mfg. Mill	Size Container	Approximate Coverage per ton
GRAND PRIZE	Dolomitic Hydrate	Genoa, Ohio	50 lbs.	700 yds.
RED TOP	Dolomitic Hydrate	Genoa, Ohio	50 and 25 lbs.	700 yds.
RED TOP	High Calcium Hydrate	Farnams, Mass.	50 lbs.	700 yds.
RED TOP	High Calcium Hydrate	New Braunfels, Tex.	50 lbs.	700 yds.

Finishing Quicklime

Brand	Type Material	U.S.G. Mfg. Mill	Size Container	Approximate Coverage per ton
RED TOP	High Calcium Quicklime	Evans, Wash.	60 lbs.	1000 yds.
RED TOP	High Calcium Quicklime	New Braunfels, Tex.	50 lbs.	1000 yds.
RED TOP	High Calcium Quicklime	Farnams, Mass.	80 lbs.	1000 yds.

The purpose of finishing lime is to provide plasticity and bulk to the finish coat. Lime, however, does not set, is subject to considerable shrinkage when drying, and will not produce a hard finish when used alone. For these reasons it is mixed with gypsum gauging plaster to provide hardness and resistance to shrinkage. For complete description of USG gauging plasters see page 16.

USG finishing limes are manufactured under carefully controlled processes. Dolomitic hydrates from the northwestern Ohio fields, where U.S.G. operates the largest finishing lime plant in the world, are preferred because of the high purity, whiteness, plasticity, smoothness and excellence of the finish they produce. Since the development of dolomitic double hydrated finishing lime there is a growing preference for this type.

IVORY Double Hydrated Finishing Lime

Double hydrate is the finest achievement in finishing limes. As produced by patented U.S.G. methods under the new autoclave process it produces a completely hydrated, highly plastic putty. This permits soaking by *either hand or mechanical mixing*, speeds up job operations, and assures freedom from further expansion due to subsequent hydration of the finish plaster.

IVORY Double Hydrated Finishing Lime is the standard of excellence for modern, durable walls and ceilings. Smooth, easy working putty is developed without long soaking. Use $5\frac{1}{2}$ -6 gal. water per 50 lb. bag of lime, sifting the lime into the water. Mix thoroughly in a mechanical mixer; or hoe in a box, screen, and the putty is ready for use. If overnight soaking is desired,

sift lime into the water using same amount as indicated above; screen putty before using. For the finish coat, blend together gypsum gauging plaster and lime putty exactly as shown for regular hydrated finishing lime. Meets ASTM Designation C206-49 type S, and Federal Specification SS-L-351 type F, including the added requirement of not more than 8% unhydrated oxides.

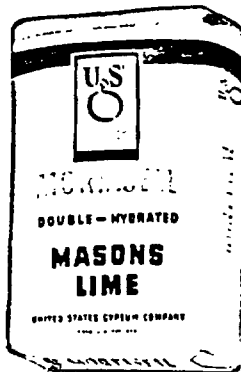
GRAND PRIZE and RED TOP Hydrated Finishing Lime

Highly plastic, easy working, pure white, RED TOP and GRAND PRIZE hydrated finishing limes provide extremely smooth, hard finishes when properly mixed with gauging plaster. For proper results, soak hydrated finishing lime 12 hours (overnight) in box using 6-6½ gal. of water per 50 lb. bag of lime. Blend together gypsum gauging plaster and lime putty in the proportion of 1 part gauging plaster to 3 parts lime putty by volume (1 part dry gauging plaster to 2 parts dry lime by weight). Meets ASTM Designation C6-49 type N, and Federal Specification SS-L-351, type F.

RED TOP Finishing Quicklime. Because it is smooth, easy working and economical. RED TOP Finishing Quicklime is known as a quality product. Proper slaking and aging determine job results. Slake with 15 gal. of water per 50 lb. bag (18 gal. per 60 lb. bag), screen, and store in aging box for at least 16 hours before using. Add gauging plaster in the same proportions as with hydrated finishing lime. Meets ASTM Designation C5-26 and Federal Specification SS-Q-351.

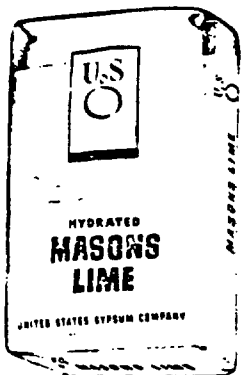
Lime putty ring is formed and water placed in center. Gauging is sifted into water and thoroughly blended.





Double Hydrate Hydrate Quicklime

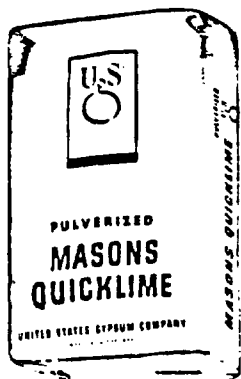
For masonry mortar, masons lime is generally mixed with portland cement and sand in varying proportions, depending on the strength and workability desired. Hydrated or double hydrated lime is also used as an admix in concrete to increase workability and water-resistance.



Recommended Mortar Mixes

(Portland Cement-Lime-Sand,
by volume)

Above grade	1-2-9
Below grade	1-1-6
Specialized use	
Abnormal strength	1-2-7 to 8 1-1-4 to 5
Excessive continuous moisture conditions	1-¼-3



MORTASEAL Double Hydrated Masons Lime—The latest development in building lime. Requires no soaking as it develops its maximum plasticity immediately. Its superior working qualities, water retention properties and maximum sand carrying capacity assure high quality, economical masonry mortar. Mix by volume with portland cement, sand and water to specified proportion. Meets ASTM Designation C207-49 type S and Federal Specification SS-L-351, type M, including the added requirement of not more than 8% unhydrated oxides.

Advantages of using MORTASEAL double hydrated lime in masonry mortars:

Easier working—MORTASEAL transforms mixes with cement and sand into plastic, smooth-working, uniform mortar.

Better bond—Plastic MORTASEAL in mortar makes it easier to get full joints and maximum bond because it retains water remarkably well and stiffens slowly.

Weather-resistant—Full joints and proper bond help produce walls that repel rain, snow, ice and wind.

Lower cost—Maximum sand-carrying capacity, less retempering, faster construction and easier laying—all these factors add up to lower cost for finished walls.

Better walls—Exceptional plasticity, remarkable water-retention, adaptability to volume changes, slow stiffening and better bond—all help to produce better masonry walls.

RED TOP Masons Hydrate—The smooth working qualities of RED TOP Masons Hydrated Lime increase the plasticity and adhesive properties of portland cement-lime-sand mortars. Full plasticity is developed by soaking to putty overnight, using approximately 6½ gal. water per 50-lb. bag. Mix with portland cement, sand and water by volume in specified proportions. Meets ASTM Designation C207-49 type N, and Federal Specification SS-L-351, Type M.

RED TOP Masons Quicklime—Uniform quality quicklime with high putty yield and excellent plasticity. Improves the working quality and sand-carrying capacity of masonry mortars. After slaking it is best to age pulverized and ground quicklimes at least 16 hours before using. Mix with portland cement, sand and water by volume in specified proportions. Meets ASTM Designation C5-26 and Federal Specification SS-Q-351.

RED TOP General Purpose Hydrated Lime—Specially processed for consumer use around the home and on the farm. Ideal for such purposes as soil sweetening of lawns and gardens, whitewash, sanitation around barns, etc. Attractively packaged and shipped in convenient master containers.

Double Hydrated Masons Lime

Brand	Type Material	Use	U.S.G. Mfg. Mill	Size Container	Approx. Putty Yield Per Ton
STASEAL	Dolomitic Double Hydrate	Masons	Genoa, Ohio	50 lbs.	45 cu. ft.

Masons Hydrate

Brand	Type Material	Use	U.S.G. Mfg. Mill	Size Container	Approx. Putty Yield Per Ton
TOP	Dolomitic Hydrate	Masons	Genoa, Ohio	50 lbs.	45 cu. ft.
TOP	High Calcium Hydrate	Masons	Evans, Wash. & Farnams, Mass.	50 lbs.	45 cu. ft.
TOP LOW DRIFT	High Calcium Hydrate	Masons	New Braunfels, Texas	50 lbs.	45 cu. ft.

Masons Quicklime

Brand	Type Material	Grind	Use	U.S.G. Mfg. Mill	Size Container	Approx. Putty Yield Per Ton
TOP	High Calcium	Pulverized	Masons	Evans, Wash.	60 lbs.	85-90 cu. ft.
TOP	High Calcium	Pulverized, Fine Grain, Super Fine	Masons	Farnams, Mass.	80 lbs.	85-90 cu. ft.
TOP	High Calcium	Pulverized, Pebble	Masons	New Braunfels, Texas	80 lbs.	85-90 cu. ft.

General Purpose Hydrated Lime

Brand	Type Material	Use	U.S.G. Mfg. Mill	Size Container	Neutralizing Power
TOP	Dolomitic Double Hydrate	General Purpose	Genoa, Ohio	5, 10, 25 lbs.	140
TOP	High Calcium Hydrate	General Purpose	Evans, Wash.	5, 10 lbs.	126
TOP	High Calcium Hydrate	General Purpose	Farnams, Mass.	5, 10 lbs.	126
TOP	High Calcium Hydrate	General Purpose	New Braunfels, Texas	5, 10 lbs.	126

Agricultural and Spray Hydrate

RED TOP agricultural hydrate is used for soil sweetening and general sanitation purposes. RED TOP spray hydrates are used for mixing insecticides and fungicides, and may also be used for dusting.

Brand	Type Material	Use	U.S.G. Mfg. Mill	Neutralizing Power	Soil Coverage per 100 lbs.
RED TOP	Dolomitic Hydrate	Agriculture	Genoa, Ohio	160	3000 sq. ft.
RED TOP	High Calcium Hydrate	Agriculture	Farnams, Mass. and New Braunfels, Texas	126	3000 sq. ft.

GP003 0024

Because of variations in market practices, aggregates, plaster bases, weather and workmanship, this chart has been prepared to assist in the understanding, diagnosis and treatment of job problems.

SYMPTOM	CONDITION	MATERIALS	CAUSE	REMEDY OR PREVENTION
CRACKS	1. Connected vertical and horizontal cracks at somewhat regular intervals, often in "stepped" pattern.	Plaster over any sheet lath: fiber, metal, or gypsum.	Plaster too thin. Weak plaster. Lath not properly applied.	Apply another coat of plaster. See "Weak Soft Walls" opposite page. Apply Metal Lath and replaster.
	2. Cracks around and over openings.	Plaster over brick clay tile, gypsum tile or cement block. Plaster over gypsum lath and other bases (except rarely metal lath).	Lintel construction is poor. Improper door buck construction. Plaster too thin. Weak plaster. Failure to use Striplath. Expansion of wood frames.	Remedy—patch. Prevention—follow manufacturers' specifications. Apply another coat of plaster. See "Weak Soft Walls" opposite page. Cut out and repair. Prime frames—cut basecoat free of ground.
	3. Fine cracks, random pattern usually less than 12" apart. Map cracks Crazing Chip cracks Fine cracks	Cracks in gauged lime putty over gypsum base coat. Cracks in base coat over brick, clay tile, gypsum tile or cement block.	Insufficient gauging plaster. Base coat too wet or too dry when finished. Insufficient trowelling. Slow set gauging plaster. Shrinkage due to high suction. Undersanding of base coat.	Strip off finish and replaster with correct mix. Strip off finish and refinish over partially dry basecoat. Water trowel sufficiently. Add moulding plaster or accelerator to gauging. Spray water on masonry to reduce suction. Remove plaster and replaster with correct mix after adjusting suction.
	4. Crack at wall or ceiling angles.	Plaster over gypsum lath. Plaster over brick, clay tile or gypsum tile.	Thin plaster coat, or failure to use Cornerite, or poor lumber in framing. Failure to wedge at ceiling, or to interlock or tie walls together.	Cut out and patch. Add Cornerite if possible. Prevent by correct construction.
	5. Ceiling cracks not due to any of the above causes, or to structural failures.	Plaster on metal lath or gypsum lath. Plaster on metal lath or gypsum lath on channel frame.	Metal lath too light, not lapped or not properly tied. Thermal shock. Improper spacing of channels. Thermal shock.	Prevented by following manufacturers' specifications. Control job temperatures from sudden change. Prevent by proper spacing. Prevent by job temperature control.
	1. Water soluble mildew-like fuzz on surface generally white but may be colored. Can be brushed off.	Base coat or finish plaster over concrete, brick, or clay tile.	Efflorescence. As masonry units dry out, water-soluble salts from the masonry are being deposited on the surface of the plaster.	Eliminate source of moisture, furr, lath, and replaster.
	2. Streaky discolorations.	Lime finishes gauged with gauging plaster or with Keenes Cement.	Lime and gauging not thoroughly mixed. Too much water used in trowelling. Efflorescence from masonry. Dirty tools or dirty water.	Prevented by thorough mixing. Remedied by painting with white TEXOUTE Imperial paint. Paint with white TEXOUTE Imperial Paint. See condition 1, above. Wash tools and obtain clean water. Remedied by painting as above.
	3. Streaked—joinings show. "Slobbers."	Gypsum trowel finish.	Improper trowelling—too much water on brush. Dirty water.	Paint with white TEXOUTE Imperial paint.
	4. Light and dark spots due to causes other than "dry out."	Float finish.	Improper floating or too much water used in floating. Variable suction in basecoat.	Paint with TEXOUTE Imperial paint to get uniform color. Dampen basecoat uniformly.
	5. "Pops"—peak-like projections which fall out making little craters or pits; often with fine radial cracks.	Lime base coats and finish.	Unslaked lime in mortar which slakes and swells after it is applied.	Remove core of "pops" and patch. Prevented by using double hydrated lime.
	6. Same as (5) above except pit is discolored tan or greenish tan.	Gypsum base coats and finishes.	Retarder spots. Lumpy or undissolved retarder added at job. Retarder lumps swell or "pop" when wet.	Cut out spots and patch. Prevented by screening retarder thru 40 mesh screen.
	7. Blisters (do not confuse with (5) above).	Gauged lime putty finish. Gypsum trowel finish.	Base too green, insufficient suction; or too much water used in trowelling. Finish lime too plastic. Base coat too wet when finish applied.	After finish has "set," trowel with very little water. Cut putty with small amount fine white sand or increase amount of gauging plaster. After finish begins to "set," trowel with very little water.
	8. Uneven color (not due to texture shadows).	Interior colored plaster finishes.	Uneven absorption of base coat, or too much water used in finishing, or dirty box and tools, or variation in water content of successive batches. Finish not dry.	Prevented by following specifications. Remedied by painting with TEXOUTE Imperial paint. Ventilate to dry wall properly.
	9. Uneven color—light, or "fat" spots in light colors (See 13 below).	Oil paint over gauged lime putty finish.	Painted too soon after plastering (alkali in lime saponifies paint); or, pigment not lime-proof.	Repaint with TEXOUTE primer and TEXOUTE paint.
	10. Uneven color—dark colors.	Any colored paint over any plaster finish.	Color variation due to non-uniform absorption. Binder strikes in unevenly.	Apply TEXOUTE Sealer and repaint.
COLORS, SURFACE STAINS and BLEMISHES	11. Yellow surface stains—"yellowing."	Any finish over any plaster base.	Contaminated sand. Burning green wood in fireplace. Open gas heaters not vented to outside. Tar paper back of plaster base. Creosote treated framing lumber, tar, or tar derivatives used around job.	Prevent by using clean sand. Improve draft to stop smoke. Vent heaters to outside. Use asphalt paper. Avoid source of air contamination. Seal with TEXOUTE Sealer. Redecorate.
	12. Paint peels (new work).	Oil paint over any finish.	Weak finish (worked thru set). Plaster not dry when painted.	Patch with patching plaster and paint with TEXOUTE paint. Repaint after areas are completely dry and loose paint removed.

SYMPTOM	CONDITION	MATERIALS	CAUSE	REMEDY OR PREVENTION
WEAK, SOFT WALLS	1. Soft, white, chalky surfaces, occurring during hot, dry weather, usually near openings.	Gypsum base coat over any plaster base.	Dry-out. Too much ventilation has removed water before plaster could set.	Remedy—Persistent spraying will set-up the dry out areas. Prevention—Screen openings in hot, dry weather and spray during setting period if necessary.
	2. Soft, dark, damp surfaces occurring during damp weather.	Gypsum base coat over any plaster base.	Sweat-out. Too little ventilation has allowed water to remain in wall after plaster set. Some of plaster has re-dissolved.	Remedy—Dry the walls with heat and ventilation. Prevention—Heat and ventilate as soon as plaster has set.
	3. Soft (exactly as 2 above), but occurring in freezing weather.	Gypsum base coat over any plaster base.	Frozen plaster.	Close building, supply heat. When plaster has set, continue heat and ventilate.
	4. Soft, weak wall. Condition general—not spotty nor due to slow set.	Gypsum base coat over any plaster base.	Use of too much aggregate.	No remedy. Prevent by use of proper amount of aggregate.
	5. Soft, weak wall.	Gypsum trowel finish over any base coat.	Dry-out or retempered finish.	If dry-out treat as condition (1) above. Trowel well when set. If retempered, no remedy except tear off and refinish.
	6. Soft, weak wall.	Gauged lime putty finish over any base.	Insufficient gauging plaster, retempered material, or insufficient trowelling.	No remedy except to remove finish and replaster.
BOND FAILURE	1. Separating from plaster base.	Gypsum plaster over gypsum lath or fiber insulating lath.	Too much aggregate, freezing, or addition of lime or portland cement.	No remedy except to replaster.
	2. Separating from plaster base.	Gypsum plaster over metal lath.	Too much aggregate.	Replaster with correct mix.
			Freezing.	Thaw and allow to set and dry, or replaster.
			Lack of fiber.	Replaster with more fiber added, or use extra fibered plaster.
	3. Separating from plaster base.	Gypsum plaster over masonry.	Excessive suction.	Dampen masonry surfaces.
			Masonry non-absorbent; has glazed surface.	No remedy. Prevent by hacking masonry surface.
			Efflorescence.	Eliminate source of moisture. Furr, lath and replaster.
	4. Separating from plaster base.	Gypsum plaster over concrete.	Use of ordinary gypsum plaster.	Remove and replaster with BONDCRETE.
		Gypsum bond plaster over concrete.	Surface oily, too smooth, dirty, or efflorescing.	Remove plaster. Clean and roughen surface. Replaster.
	5. Finish separating from brown coat.	Gauged lime putty finish over gypsum brown coat.	Brown coat too smooth, too dry, too wet or too weak; finish improperly applied; incomplete hydration of finish lime.	Where brown coat is cause, strip off finish, correct condition of brown coat and replaster. Where finish is cause, refinish properly using completely hydrated lime.
	6. Finish separating from brown coat.	Gypsum float and trowel finish over gypsum brown coat.	Brown coat too smooth.	Roughen brown coat.
			Brown coat too dry.	Dampen brown coat until half green.
			Brown coat too weak.	Strip down to lath and replaster.
	7. Finish separating from brown coat.	Colored interior finishes over brown coat.	Finish improperly applied.	Apply as directed.
			Brown coat not broomed.	Roughen brown coat and refinish.
			Thin finish not ground in.	Finish following application directions.
			Brown coat too weak.	Correct condition of base coat and re-finish.
"SET" AND WORKING QUALITIES	1. Soft walls for over 6 hours after application.	Gypsum base coat over any plaster base.	Dry-out, sweat-out, frozen plaster, over-sanding, sand too fine, or dirty sand.	See "Weak, Soft Walls" above.
			Slow set due to error in manufacture.	Send samples to manufacturers' representative.
			Slow set due to poor sand or poor water.	Obtain good sand and water or accelerate plaster.
	2. Sets in box or sets on wall before it can be daubed or straightened.	Gypsum base coat over any base.	Quick set due to dirty water, tools and mixing equipment.	Use clean water, tools, equipment.
			Mixing too long.	Reduce mixing time.
			Quick set due to poor sand.	Use good washed sand or add retarder.
			Quick set due to error in manufacture.	Add retarder. Send samples to manufacturers' representative.
			Quick set due to machine mixing.	Add retarder.
	3. Works hard or "short." Will not spread. Does not carry proper amount of sand.	Gypsum base coat over any plaster base.	Aged or badly stored plaster.	Get fresh plaster, or use equal parts fresh and aged plaster, or use less sand.
	4. Works hard or "short." Will not spread.	Gypsum base coat over any plaster base.	Over-sanding.	Correct conditions using proper proportions.
			Old material partially carbonated; warehoused too long.	No remedy. Can be used for masons lime.
			Improper soaking, aging or slaking.	No remedy. Prevented by proper preparation.
	5. Tough and short working, rubbery or lumpy lime putty.	Gauged lime putty over gypsum base coat.	Low temperatures.	Do not soak at temperatures below 40° F.
			Unusual temperatures.	Use quick set gauging or heat building in cold weather. Use slow set gauging in hot weather.
	6. Lack of uniformity in set.	Gauged lime putty over gypsum base coat.	Improper gauging.	Use proper type and amount of gauging plaster.
	7. Finish works hard.	Gypsum finishes over	Mixed too stiff.	Use more water.

USG Plastering Bases
and Plastering Systems **tried and**
tested essentials for successful wall and
ceiling construction

Covered up, hidden from sight by base coat plaster, finish coat and decoration in the completed job, the plaster base and the partition structure must be RIGHT or the job may go wrong.

Through almost fifty years of constant research, the United States Gypsum Company has developed the plaster base materials and partition construction methods best suited to every situation.

ROCKLATH plaster base—plain, perforated or insulating—is today the most widely used plastering base. Metal lath—including USG COLOR-RITE metal lath—is second in variety of uses and volume produced. USG PYROBAR, precast gypsum partition tile, precision molded and 30 to 50% lighter than comparable products, is the ideal partition and plaster base material for some types of installation, such as large office buildings. Hollow partitions for concealing pipes, ducts, etc., are best made by USG TRUSSTEEL Studs supporting USG COLOR-RITE metal lath or ROCKLATH. For maximum savings in floor space, the USG 2" Solid Partition Systems are increasingly favored by progressive architects and builders.

There is a tried and tested U.S.G. wall construction system and material for every type of job.