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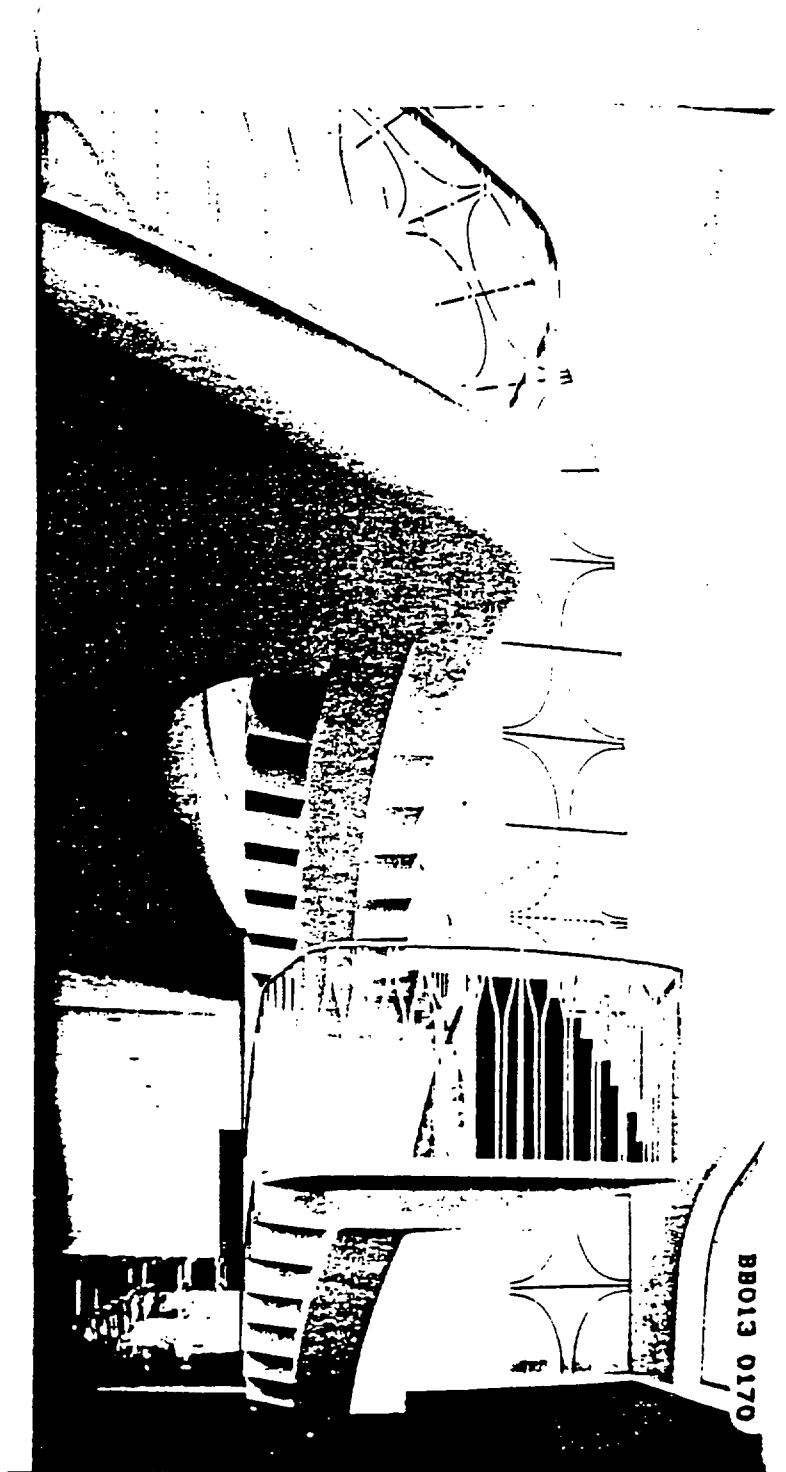
UNITED STATES GYPSUM
THE GREATEST NAME IN BUILDING



GWMAN
EX 88

Red Book of Lathing & Plastering

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UNITED STATES GYPSUM

Red Book of Lathing & Plastering

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This RED BOOK is a guide to good lathing and plastering procedures and describes the newest developments in the plastering field—including the time-saving, lower cost methods now booming in popularity.

Versatile and dependable, lath and plaster construction meets the wide range of building requirements including durability and strength, fire resistance and sound isolation. Lath and plaster are not only ideal finishing materials for conventional wall and ceiling surfaces, but their flexibility also suits them to ornamental contours—the only interior finish that can be readily adapted to such design.

In addition to descriptions of plaster systems and their installation, this book contains new data on products, methods of application and performance ratings. It is designed to serve not only the experienced contractor and journeyman, architect and dealer, but the novice who wishes to better understand plastering, its advantages and applications.

The United States Gypsum RED BOOK, like the company's plastering products, sets the standard of the industry.

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Good Lathing and
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CHAPTER 1

Good Lathing and Plastering Practices

WHAT'S PLASTERING TODAY?

In the last few years plastering has broken its traditional bounds, met changing needs in construction and advanced to open up countless new opportunities. As a result of concentrated research and development, a whole new concept in products and systems is available to meet market needs.

Today's plastering products include high-strength veneer plasters economically applied to large-area plaster base; hard, durable finish plasters for smooth, long-lasting walls and ceilings; special materials that won't deteriorate in strength or appearance for use with electric cable radiant heating; and modified conventional structural accessories, fasteners and trim that result in easier application and better performance.

To meet the specialized needs in today's building design, products must be coordinated into systems that provide high performance at competitive costs. Today's systems offer added structural stability, excellent fire resistance and improved sound isolation—one of the fastest growing requirements in modern building.

United States Gypsum has long been the leader in developing high-performance products and systems for the plastering industry. At the U.S.G. Research Center, largest in the industry, within recent months a series of dependable cost-saving



10 GOOD PRACTICES: Advantages of Plastering

systems has been developed to join the list of historic U.S.G. "firsts" which already included gypsum partition tile, gypsum lath, truss-design studs, acoustical and perlited plasters, and double hydrated lime.

Such improvements are released only after their superiority has been clearly proved by thorough testing and field trial. Manufacture of these products is to rigid specifications carefully controlled to insure consistently high-quality products for fine craftsmanship. Evidence of this is an overwhelming preference for USG's products at the marketplace.

Success and growth in today's plastering depends on keeping job standards of quality and appearance high while cutting construction time and costs to a minimum. This handbook outlines United States Gypsum's new and time-proven products and systems; gives application information for good construction practices demanded of plastering today.

ADVANTAGES OF PLASTERING

FIRE RESISTANCE: gypsum plaster will not support combustion. When attacked by fire, water of crystallization is released and turns to steam which effectively retards the spread of flame. Fire-resistance ratings of up to 4 hrs. are available with specific partition, ceiling and fireproofing constructions.

SOUND RESISTANCE: gypsum lath and plaster partitions have high resistance to sound transmission. Resilient attachment of plaster base further improves sound ratings, makes partitions ideally suited as party walls.

VERSATILITY: suitable as divider, corridor and party walls; pipe chase and vent shaft enclosures; acoustical and radiant heated ceilings; exterior walls and wall furring; membrane fireproofing. Adaptable for use in every type of new construction—commercial, institutional, industrial and residential—and in modernization. Produces beautiful joint-free walls and ceilings whether in plane or free-flowing contoured surfaces. Easily adapts to most modules and dimensions.

HIGH STRENGTH: lath and plaster surfaces resist cracking, have high structural integrity, are resistant to impact and scratching.

FINISHES BEAUTIFULLY: plastering offers wide possibilities for finishing: smooth, monolithic-appearing trowelled surfaces that readily accept paint, wallpaper, vinyl coverings, or ceramic tile; beautifully random textured and floated surfaces; machine-textured acoustically treated surfaces; decorative exposed colored aggregated surfaces.

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LOW MAINTENANCE: the hard, smooth finish of plaster, particularly the new IMPERIAL Plaster and DIAMOND Finish, is highly abrasion resistant and durable; makes the surface easy to keep clean and sanitary; can be attractively redecorated many times.

LIGHTWEIGHT: PYROBAR Partition Tile is 30% to 50% lighter than commonly used masonry. The new IMPERIAL Plaster systems compare with the weight of conventional drywall.

SPEEDY INSTALLATION: the new high-strength veneer plastering is fast. Big 4 ft. wide base goes up quickly. Perfectly integrated components speed erection. Plasters mix fast, trowel on easily, set in less than 1½ hours ready for next-day decoration.

UNIFORM QUALITY: factory made to rigid specifications, USG plastering products are carefully controlled to insure uniformity in results time after time.

GOOD LATHING AND PLASTERING PRACTICES

Two ingredients are required for a *quality plaster job*—quality products and skilled craftsmen correctly employing good lathing and plastering practices. USG plaster bases, plasters and plastering accessories are top quality products designed to *work together*, job-proven and constantly improved. But without proper planning and correct installation by the contractor, the products cannot be expected to produce the desired quality results.

This section deals with the basic recommendations that should be followed in planning and completing the best possible job. These good lathing and plastering practices can give the contractor greater profit through fewer callbacks, less waste and lower job costs, and quality results that produce quicker sales, higher prestige and an enduring business reputation.

FRAMING REQUIREMENTS

The framing that will receive plaster bases should be thoroughly inspected to be certain that all previous work has been completed in good order. Good framing, particularly wood, is essential regardless of the type of wall surfacing materials used.

Wood framing meeting the following minimum requirements is necessary for proper performance.

1. Framework should meet the minimum requirements of FHA and local building codes.
2. Framing members should be straight, true, of uniform dimension, and framing should be properly aligned.
3. All framing lumber must be of the proper grade for the

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12 GOOD PRACTICES: Job Storage



Joists must be aligned where necessary

intended use, and 2"x4" nominal size or larger must bear the grade mark of a recognized inspection agency using grading rules for lumber recommended to American Lumber Standards Committee.

4. All framing lumber should have a moisture content not in excess of 15% at the time of gypsum base application. Use of kiln-dried lumber for joists is recommended.

5. Extremely hard (dense) or soft framing members should not be used for attachment of base.

Failure to observe these minimum framing requirements, which are applicable to screw and nail attachment, will materially increase the possibility of fastener failure due to warping or dimensional changes. This is particularly true if framing lumber has greater than normal tendency to warp or shrink after erection.

Framing should approach as closely as possible the moisture content it will reach in service by allowing the building, after it is enclosed, to stand as long as possible prior to the application of the gypsum plaster base.

JOB STORAGE

Lath and plaster products should be ordered for delivery to the job the day before application. Materials stored on the job for longer periods are liable to damage and abuse.

Rather than ship all plaster to the job at one time, fresh plaster should be sent to the job daily as needed. Plaster stored for long periods is subject to damage, variable moisture conditions and aging that probably will produce variations in setting time and create performance problems.

Plastering products must be stored inside in a dry location and away from heavy traffic areas. Stack plaster bags on planks or platforms away from damp floors and walls. Store gypsum plaster bases flat on a clean dry floor; vertical storage may damage edges or deform board. Protect metal corner beads, casing beads and trim from being bent and damaged.

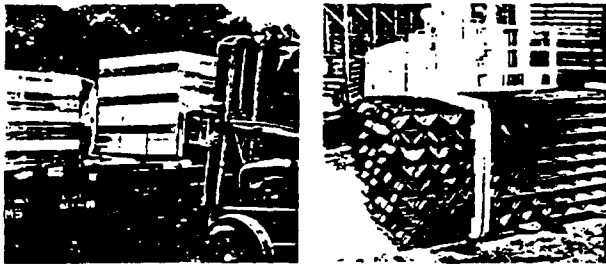
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All materials used on the job should remain in their wrappings or containers until ready for use.

MECHANICAL HANDLING

Completely mechanized on-site handling of plastering materials is one of the few remaining ways for contractors to lower prices in the face of today's rising costs. Time and money savings can be substantial when correct handling procedures are used. Job conditions vary so widely that it is impossible to establish universal materials handling procedures. However, there is much to be learned from inspecting methods used in various job situations and from reviewing resulting costs.

Case studies and step-by-step materials handling procedures used by contractors around the country have been made by U.S.G. Its products are packaged to provide low handling



costs. Its experts will apply this accumulated experience and knowledge to contractor's on-site handling problems to help save money and submit a better bid. For more details on this personalized service, consult the local U.S.G. Sales Offices listed inside the back cover.

TEMPERATURE AND HUMIDITY CONDITIONS

In cold weather (outdoor temperatures less than 55°F.), the temperature of the building must be maintained in the uniform range of 55° to 70°F. both day and night for an adequate period prior to the erection of gypsum plaster base, the application of plaster, while the plastering is being done, and after the plaster is dry. The heat should be well distributed in all areas, with deflection or protective screens used to prevent concentrated or irregular heat on plaster areas near the source.

Ventilation must be provided to properly dry the plaster during and subsequent to its application. In glazed buildings, this should be accomplished by keeping windows open sufficiently to provide air circulation; in enclosed areas lacking normal ventilation, provisions must be made to mechanically remove moisture-laden air.

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14 GOOD PRACTICES: Plaster Bases

GENERAL APPLICATION RECOMMENDATIONS FOR PLASTER BASES

Plaster bases, those materials that receive the basecoat of plaster, may be classified as (1) gypsum or metal lath bases, or (2) masonry bases. These materials provide a level surface for plastering and add reinforcement to the plaster. As such, they must be rigid enough to accept plaster and produce a secure bond between the plaster and the plaster base—both necessary to develop strength and resistance to abuse and cracking.

Acceptable plaster bases provide either a suction, mechanical, or adhesive bond to secure the plaster to the base. In a suction bond the tiny, needle-like gypsum crystals, upon setting, penetrate the surface of the base and weld the plaster to it. A mechanical bond occurs when plaster is pressed through holes in the base, forming keys and a secure bond. In an adhesive bond, a liquid bonding agent coats the masonry to form an adhesive surface to hold the finishing materials.

To insure adequate rigidity of plaster constructions, recommendations for the spacing of supports and fasteners must be strictly followed.

Apply plaster bases to ceilings first and then to partitions, starting at the top and working down to the floor line. **EXCEPTION:** In application of ROCKLATH Base to TRUSSTEEL Studs begin application at the floor. (see Chapter 4 for details).

Gypsum Lath

ROCKLATH PLASTER BASE, a gypsum lath in sheet form, is an ideal high-suction rigid base for gypsum plasters. It should be applied face out with the long dimension across the supports and with end joints staggered between courses. Cut lath accurately so it slips easily into place without forcing and fits neatly around electrical outlets, openings, etc. All lath ends should bear on supports and be securely fastened. Install any lengthwise raw cut edges at bottom ground strip or wall-ceiling angle. BRIDJOINT B-1 Clips should be used at end joints between supports. Apply Cornerite to all interior angles. Staple to the lath only.

Metal Lath

USG Metal Lath is an excellent base for plastering because the steel becomes embedded in plaster producing a reinforced plaster slab. It should be applied with the long dimension across the supports and with end joints staggered between courses. Apply Riblath with the rib against supports. Lap ends of metal lath 1" and sides at least 4". Lap Riblath by nesting outside ribs. If end laps occur between supports, they should be laced or tied with 18-ga. tie wire. Secure lath

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to all supports at intervals not exceeding 6". At all interior angles, metal lath should be formed into the corners and carried out onto the abutting surface.

Interior Masonry

PYROBAR GYPSUM PARTITION TILE is specifically designed as a plaster base for interior non-load bearing partitions and is used extensively for its light weight, low cost and outstanding fire resistance. Only gypsum plaster should be applied to PYROBAR since lime and portland cement plaster do not bond adequately.

For the same reason, only RED TOP Partition Tile Cement should be used for mortar (see Chapter 4 for installation details).

CLAY TILE AND BRICK are frequently used for plaster bases. Care should be taken to make sure that surfaces are sufficiently porous to provide suction for the plaster and are scored for added mechanical bonding. Smooth-surfaced clay tile that is glazed or semi-glazed does not offer sufficient bond for plaster.

CONCRETE BLOCK offers a satisfactory base for plaster that is relatively stable and strong. The surface of the units should be porous, for proper suction, or face-scored for adequate mechanical bond. Units must be properly cured to minimize dimensional changes during and subsequent to plastering.

MONOLITHIC CONCRETE ceilings, walls, beams and columns should have a complete and uniform application of a high-quality bonding agent before plastering. This surface treatment produces an adhesive bond suitable for the direct application of gypsum plasters or gypsum gauged lime putty finish coats.

Exterior Masonry

Plastering direct to *exterior masonry walls* is not recommended. Exterior walls are subject to water seepage and moisture condensation that may wet the plaster and damage interior decoration.

BITUMINOUS WATERPROOFING COMPOUNDS also do not provide a good plaster base. Gypsum plasters should not be applied to surfaces treated with these compounds.

FOAMED PLASTIC INSULATIONS have not proven to be ideal plaster bases for direct application of gypsum plaster because of foam plastic's low suction characteristics and low structural strength which may result in cracking of the plaster.

However, some foamed insulation manufacturers have specific directions for application of foam when direct plas-

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16 GOOD PRACTICES: Reinforcing/Control Joints

tering is to be used, as well as detailed specifications for plaster mixes and methods of application to be employed.

While U.S.G. does not recommend direct application of plaster to foamed plastic base, if this method is to be used we suggest adhering closely to the foamed plastic manufacturer's recommendations.

REINFORCING

Holes cut in a thin lath and plaster membrane, such as door frames, borrowed lights, etc., cause a concentration of stresses in the plaster, typically at intersection of head and jamb. The



Reinforcing of frame

Reinforcing at door

use of additional reinforcement (channels, runners, striplath, self-furring diamond mesh lath) is recommended at the weakened area to distribute concentrated stresses.

Wood or metal inserts used as reinforcing for cabinets and shelving on non-resilient surfaces should always be applied to the inside of the stud chord or flange to prevent breaking up the stress skin of the plaster. Heavy fixtures such as water closets and lavatories should be supported by separate carriers and not the lath and plaster surface (see Chapter 5 for details).

ISOLATION AND CONTROL JOINTS

Lath and plaster surfaces (non-load bearing) will not resist stresses imposed by structural movement and are subject to dimensional changes in temperature and humidity. It is recommended that lath and plaster surfaces be isolated from the following structural elements by Control Joints, Floating Interior Angles, or other means where:

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a. a partition or ceiling abuts any structural elements, except the floor, dissimilar wall or partition assembly, or other vertical penetration.

b. the construction changes within the plane of the partition or ceiling.

In long partition runs, control joints should be provided no more than 30 ft. o.c. Door frames extending from floor to ceiling may be used as control joints. For doors less than ceiling height, control joints extending from the center or both corners of the frame to the ceiling may be used.

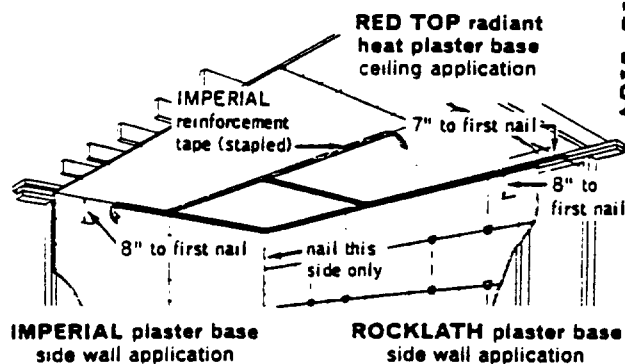
Expansive ceiling areas should have control joints, spaced not to exceed 60 ft. in either direction. The continuity of both lath and plaster should be broken under control joints. Control joints may be positioned to intersect light fixtures, heating vents, or diffusers, etc., which are already breaking ceiling continuity.

FLOATING INTERIOR ANGLES

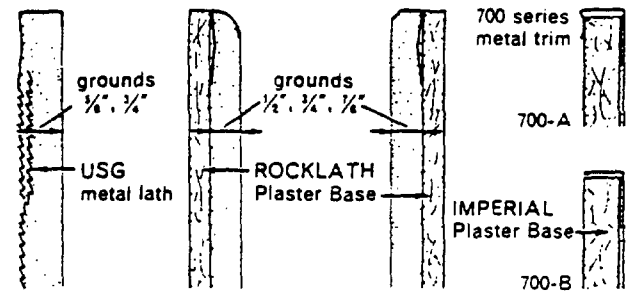
The floating interior angle method of applying gypsum plaster bases should be used at all ceiling angles, particularly with radiant heat applications. This construction effectively reduces angle cracking caused by stresses at intersections of walls and ceilings.

At the intersection, the first ceiling fastener should be spaced about 7" from the wall. Specified fastener spacing should be used in the remainder of the ceiling area.

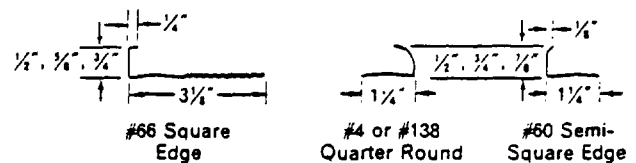
On the sidewalls, all gypsum plaster base must be applied to overlap and maintain firm contact at ceiling line in order to support the ceiling plaster base previously applied. Along the ceiling intersection, fasteners should be omitted adjacent to the ceiling angle. The first fastener should be nominally 8" from the ceiling intersection.



18 GOOD PRACTICES: Grounds



USG Casing Beads (expanded or short flange)



GROUNDS

The thickness of conventional basecoat plaster is one of the most important elements of a good plaster job. To insure proper thickness, grounds should be properly set and followed. Grounds may be defined as wooden strips, corner beads (plumbed and aligned), metal base screed, or metal casing beads applied at the perimeter of all openings and other locations.

In addition to these, and especially on walls with no openings and on ceilings, plaster screeds should be installed to insure plumb and level surfaces. Plaster screeds are either dots or continuous strips of plaster applied to required ground thickness to permit proper plumbing and leveling.

Grounds should be set to obtain the following minimum plaster thicknesses:

1. Over gypsum lath 1/4"
2. Over brick, clay tile, gypsum block or other masonry 3/8"
3. Over metal lath, measured from face of lath 3/8"
4. Over veneer plaster base, one coat 1/8"
5. Over veneer plaster base, two coat 1/8"

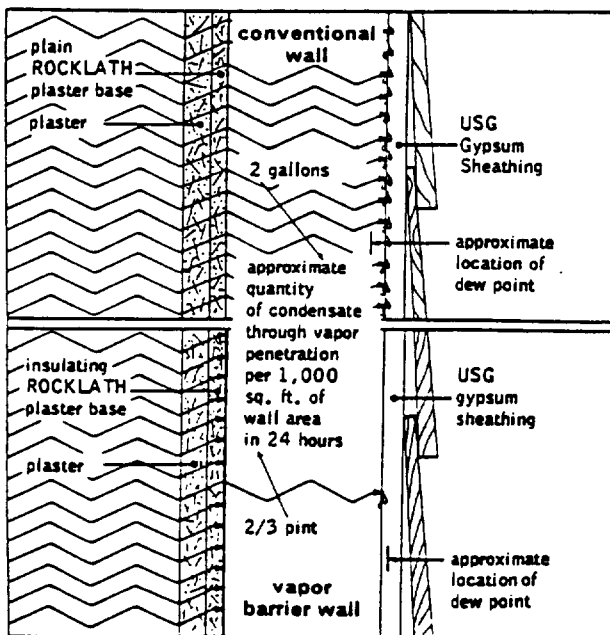
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VAPOR BARRIERS

The condensation of moisture in exterior walls is a common cause of peeling and other paint failure, warped siding, rotted studding and sills. Efficient vapor barrier installation in all exterior walls and ceilings of buildings constructed where freezing weather occurs for extended periods of time usually prevents this damage. A vapor barrier should be located on the warm side of exterior walls and top floor ceiling. Aluminum foil is one of the best vapor barriers known and used commercially. Bright aluminum foil is laminated to the back of Insulating ROCKLATH and IMPERIAL Plaster Base to provide vapor barrier protection.

ILLUSTRATION OF IMPORTANCE OF VAPOR BARRIER

Inside Atmosphere		Outside Atmosphere
70°F	Temperature	10°F
45%	Relative humidity	90%
3.63	Grains moisture per cu. ft.	0.69
0.332 in. Hg	Resultant vapor pressure	0.057 in. Hg



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20 GOOD PRACTICES: Fastening

FASTENING

Correct fastener selection and adherence to fastener spacing is extremely important to good plastering performance. This is particularly true in fire-rated construction where greater fastener spacing or use of improper fasteners will not offer sufficient structural strength and fire-resistance rating needed.

Gypsum plaster bases are attached to framing with screws, nails, staples or special clips. Nails, screws and staples should be driven so that the fastener head or crown bears tightly against the base but does not cut the face paper. To prevent core fracturing, they should be driven at least $\frac{3}{8}$ " away from ends and edges. Staples should be of flattened wire driven so the crown is parallel to wood framing. Screws should be used to attach gypsum plaster bases to USG Metal Studs, Furring Channels or RC-1 Resilient Channels.



Screw application of plaster base

ROCKLATH Plaster Base may also be applied to USG Metal Studs with MS-1 Clips.

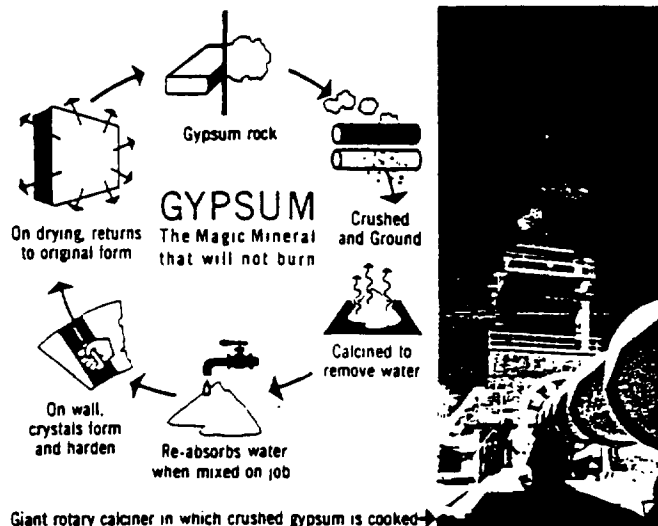
Metal lath should be attached to metal supports with tie wire (minimum 18 ga.) and to wood framing with fasteners engaging two strands or a rib and providing at least $\frac{3}{4}$ " penetration. For attaching cross furring channels to supports or main runners, use at least two strands of 16 ga. tie wire.

For the exact type of fastener and spacing used in specific plastering systems, see Chapter 4.

PLASTERS

The base of all gypsum plasters is gypsum rock—hydrous calcium sulfate, which has a water content of about 20% in chemical combination. In manufacture, about $\frac{3}{4}$ of this chemically combined water is removed from the gypsum rock by means of a controlled calcination process. Then water is added at the job, the material crystallizes (sets), reverting to its original chemical composition.

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RED TOP Gypsum Plasters are specifically formulated to control setting time and other important characteristics. This depends upon the intended use and method of application, the climatic conditions of the area, and job conditions.

USG Basecoat Plasters can be applied by using either hand or machine methods, on gypsum or metal lath; gypsum or clay tile; concrete or cinder blocks; brick, or other approved plaster bases.

BASECOAT PLASTERS

The architect's specifications and the plaster base will determine the plastering method, either two-coat or three-coat, to be used.

TWO-COAT PLASTERING, often called scratch and double back, is generally accepted for plaster application over gypsum lath and masonry. The base (first) coat should be applied with sufficient material and pressure to form a good bond to the base and to cover well, and then be doubled back to bring the plaster out to grounds, straightened to a true surface with rod and darby without the use of additional water, and left rough to receive the finish (second) coat.

THREE-COAT PLASTERING is required over metal lath and over edge-supported or perforated gypsum lath used in ceilings. It is preferred for other bases because it develops a harder, stronger basecoat. The scratch (first) coat should be applied with sufficient material and pressure to form good

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22 GOOD PRACTICES: Water/Aggregates

full keys on metal lath, and a good bond on other bases, and then cross-raked. The brown (second) coat should be applied after the scratch (first) coat has set firm and hard, brought out to grounds and straightened to a true surface with rod and darby without the use of additional water, and left rough to receive the finish (third) coat.

To obtain the full hardness, high strength and superior performance available in gypsum basecoat plasters, water, aggregates and setting time must be carefully controlled. In addition, proper mixing and drying of the plaster are required to obtain these superior functional characteristics. Factory prepared gypsum plasters such as the high-strength veneer plasters—IMPERIAL and RED TOP Radiant Heat Plaster—RED TOP Wood Fiber Plaster and STRUCTO-LITE Plaster are highly suited to provide trouble-free results on the job. Requiring the addition of water only on the job, they conquer the drawbacks of job-aggregated plasters.

WATER

All gypsum plasters require the addition of water on the job. Water provides lubrication and workability to permit application to the plaster base. It also induces the proper setting of gypsum.

Water should be clean, fresh, suitable for domestic consumption, and free from mineral and organic substances which affect the plaster set. Water which is used for rinsing or cleaning containers and tools should not be used, as it accelerates the plaster set.

Only enough water should be used to provide a plaster of workable consistency. Too much water in machine-applied plasters (in excess of 10% more than for hand applied mixes) or over-aggregated plasters will cause weak, soft walls and ceilings. Excessive water creates voids in the mass upon drying and reduces the plaster strength and hardness.

AGGREGATES

Aggregates are added to gypsum plasters to extend coverage, reduce shrinkage, and lower cost. Aggregates recommended are: (1) sand, which is denser, stronger and provides greater sound transmission loss than lightweight aggregates, and (2) perlite, a lightweight aggregate that generally offers better fire resistance, insulation values and reduced weight. For sand float finishes the aggregate should be a finely ground silica sand. Because of its low strength and slower drying properties, vermiculite is not recommended as an aggregate.

All aggregates used should have proper gradation of size as outlined in ASTM C-35. Improperly sized aggregates will produce weak walls because there is insufficient plaster to bond the aggregate particles. Sand should be clean and free

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USE OF AGGREGATES WITH GYPSUM PLASTERS

Maximum Recommended Proportions

Plaster Base	No. of Coats	Types of Coats	Maximum Quantity of Aggregate, in Cu. Ft., To Be Used With 100 Lbs. of Neat Gypsum Plaster			
			Under Smooth Trowel Finish		Under Other Finishes	
			Sand (1)	Perlite	Sand (1)	Perlite
Gypsum Lath	3	scratch brown	2	2	2	2
	2	basecoat	2½	2	2½	2
Metal Lath	3	scratch brown	2	—	2	2
	3	basecoat	3	—	3	2
Unit Masonry	3	scratch brown	3	3	3	3
	2	basecoat	3	3	3	3

(1) Approx. 6 No. 2 shovels of sand equal 1 cu. ft. NOTES: In a construction system which has metal lath as the plaster base, perlite aggregate is not recommended for use in the basecoat plaster, unless a float or acoustical finish is used. In a smooth trowel finish over a basecoat with perlite aggregate, add ½ cu. ft. of fine silica sand per 100 lbs. of gauging plaster, or use aggregated gauging.

of dirt, clay and foreign matter that might affect the setting time of plaster. Perlite aggregated plasters should not be machine applied when vertical lift is over 30 ft. or hose length exceeds 150 ft. Over-aggregating or the use of excessively fine aggregate reduces the strength and hardness of plaster. The maximum recommended proportions for aggregates are shown in the table above.

SETTING TIME

The proper setting time for conventional basecoat plasters is generally from 2 to 4 hours after mixing, and this should be checked for close conformity on both the scratch coat and the brown coat operation.

Normally, plaster shipped to the job will fall in this range. If conditions exist that affect normal setting time, retarders or accelerators are used.

The danger of "quick set" plaster is that there will not be sufficient time to get the plaster from the mixer to the walls without retempering on the mortar board, and such retempering will produce a plaster of lower than normal strength. The correction for "quick set" is to add the proper amount of retarder in solution with water at the mixer. USG Retarder is less efficient in cold weather than in warm weather, and greater amounts are usually required to produce like results.

If plaster does not set for 5 to 6 hours, no harm will be done to the resulting plaster surfaces, but a "slow set" of the plaster (generally one taking more than 6 hours) should be avoided by adding accelerator in a dry state at the mixer, as

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24 GOOD PRACTICES: Mixing

such plaster may be subject to a "dry out", particularly in hot, dry weather, and will have a lower than normal strength when finally set.

Only USG Accelerator and USG Retarder should be used with USG Plasters. Other materials may not be compatible with USG Plaster, producing undesirable results.

MIXING

A mechanical mixer is preferred to box mixing, because it is easier to assure that the plaster aggregate and water are evenly mixed. Keep the mixer continually clean—a most important precaution—because partially set material is a powerful accelerator. Mechanical mixing is mandatory with veneer plaster and RED TOP Radiant Heat Plaster.

When mixing by hand, plaster and sand first should be mixed dry to a uniform color in a mixing box. Then the water is added and the plaster hoed into the water immediately, and thoroughly mixed to a proper consistency.

Proportioning is *weight of gypsum to volume of aggregate*.

A No. 2 shovel used to add sand to the plaster mix generally carries 15 lbs., or approximately one-sixth of a cubic foot. Thus, a 100:1 mix would use 6 shovels of sand to 100 pounds of gypsum plaster, a 100:2 mix 12 to 13, and a 100:3 mix 18 to 19 shovels of sand.

Perlite is generally packaged in bags containing 3 or 4 cu. ft. Thus, proportioning of the plaster mix can be easily worked out.

Prepare only one hour's supply of plaster at one time and do not remix if plaster has started to set. All such plaster should be discarded.

FINISH PLASTERS

Finish coat plasters applied to basecoats provide the surface for final wall or ceiling decoration. The visible success of the job depends on the finish coat, and required measures should be taken to finish correctly. Finish coats should be applied only to properly prepared basecoats, except IMPERIAL Finish that is applied only to IMPERIAL Plaster Base.

TROWEL FINISH COATS should be scratched in thoroughly and immediately doubled back to fill out to a smooth, dense surface for decoration, free of surface blemishes and irregularities. Thickness should be $\frac{1}{8}$ " to $\frac{1}{4}$ ". Keenes Cement Finishes should be troweled until the material sets.

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FLOAT FINISH COATS should be scratched in thoroughly and immediately doubled back to a true, even surface. Float, using a shingle, cork, wood, carpet or rubber float to bring aggregate to the surface to produce a finish of uniform texture free of slick spots, cat faces, and other blemishes. Use water sparingly in natural color, and use no water on colored finishes. With ORIENTAL Exterior Stucco, no water should be used in floating or texturing; surface should be fog-sprayed with water for several days after setting.

MACHINE-APPLIED SPRAY FINISHES should be uniformly applied to produce a texture approved by the architect.

ACOUSTICAL PLASTERS should be applied in not less than two coats, to full ½" grounds, following the manufacturer's directions.

In the mixing and application of finish coats, U.S.G. recommendations, as described in Chapter 3 and as printed on each bag, should be strictly followed. Other recommendations, outlined below should also be followed for satisfactory results.

1. Factory prepared finishes such as DIAMOND Finish, IMPERIAL Plaster, ORIENTAL Interior Finish and Exterior Stucco are ideally suitable as a finish coat. Requiring the addition of water only on the job, these finishes eliminate the need for job-mixing ingredients and time-consuming soaking.

2. A smooth trowel finish should not be used over lightweight aggregate gypsum basecoat applied over metal lath. A sand float finish or an acoustical plaster is recommended.

3. Where the gypsum basecoat is STRUCTO-LITE or contains lightweight aggregate (perlite or vermiculite) and a smooth trowel finish is used, the finish coat should be RED TOP Gauging Plaster and lime, with addition of ½ cu. ft. of perlite fines or 50 lbs. of No. 1 white silica sand per 100 lbs. gauging plaster or use RED TOP "Quality" Gauging Plaster that is mill-aggregated.

4. Gypsum or lime base finishes, including Keenes cement, should not be used directly over a portland cement basecoat or over concrete block or other masonry surfaces.

5. Gauging plasters providing an extremely hard surface, such as STRUCTO-GAUGE and Keenes cement, must not be used over STRUCTO-LITE, or a basecoat with a lightweight aggregate.

6. DIAMOND Finish is not for use over lightweight aggregate gypsum basecoats.

7. Only gauging plasters should be used for gauging lime putty. Nest plasters should not be used.

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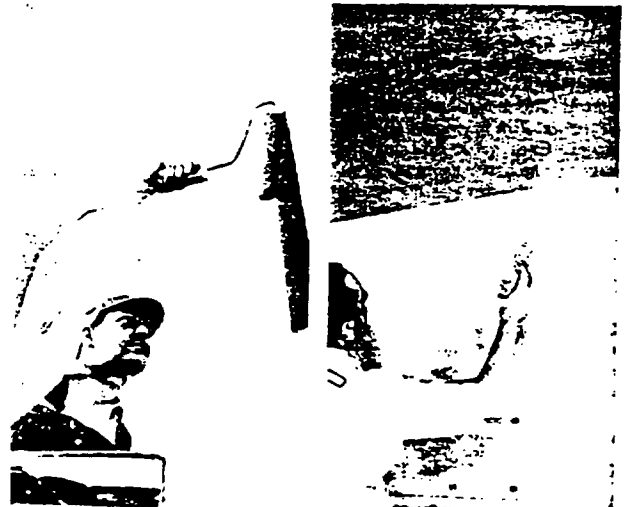
DRYING

Proper drying of plastered surfaces is important to their ultimate performance. Rapid drying *after the plaster has set* is good because it produces high strength. Drying too fast *before the plaster has set* may leave insufficient water for the chemical reaction needed to properly set plaster. Slow drying should be avoided because it may cause "sweat out" and reduced strength. Proper ventilation should be provided to remove moisture-laden air.

COMPLETION: at the completion of the finish plaster work, all plaster should be cleaned from beads, screeds, metal base and metal trim, leaving work ready for decoration by others. All plaster rubbish should be removed from the building, leaving floors broom clean. Excess material, scaffolding, tools and other equipment should be removed from the building and job site.

DECORATING

Quality plaster construction merits equally good decoration, and the wise plasterer will recommend paints that enhance the appearance of his finished job. For superior results, U.S.G. has specifically developed TEXOLITE Primer-Sealer as a surface treatment over plaster. It is compatible with GRAND PRIZE Latex Wall Paint, TEXOLITE Alkyd Latex Paint, and other quality USG interior finishes. U.S.G. also manufactures a full line of texture finishes to meet the preference of every customer. Refer to Chapter 3 for the Selector Guide to USG Paint Products.



Roller application

Spray application

Good practices for decorating require that:

1. All surfaces must be dry, sound, clean, free of dust, grease or oil.
2. Paints should be delivered in original unopened containers and protected from damage and tampering.
3. All materials should be used according to instructions.

SOUND CONTROL

Where plaster construction is used as a sound barrier, a non-hardening caulking material should be used to seal all cutouts, such as at electrical, TV and telephone outlets. Caulking should also be used under floor and ceiling runners to seal the voids between runner and structural slab. Seal by caulking around the perimeter of the construction and at all intersections with the adjoining structure. Avoid cutting holes back to back and adjacent to each other. Use sand aggregate only; do not use lightweight aggregates. Door and borrowed light openings are not recommended when the plaster partition is used as a party wall.

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CHAPTER 2
Veneer Products
and Application

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CHAPTER

2



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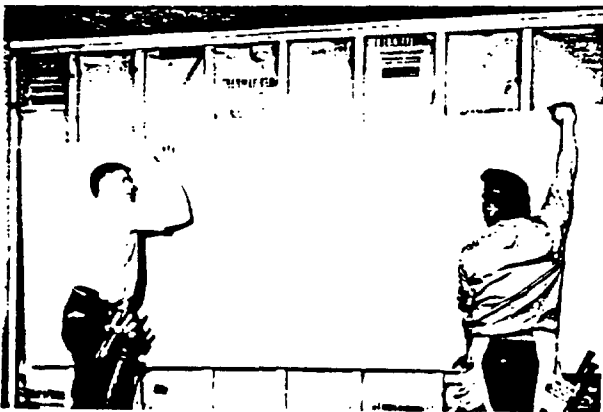
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CHAPTER 2

Veneer Products and Application

As the unchallenged leader in the development of plastering products and systems, U.S.G. also ranks first in meeting the specialized needs of today's building design. Within recent years, U.S.G. has released a series of economical high-strength veneer IMPERIAL Plaster systems and made a breakthrough in plaster used in electric cable radiant heated ceilings. These new systems have received rapid acceptance because they meet today's demand for abrasive-resistant surfaces, lower cost, fire and sound-resistant construction. They are treated separately in this chapter since they represent a new concept in plastering.

IMPERIAL Plaster Systems are leading the new trend to veneer plastering because of their inherent economy, speed of application, and extremely hard surface durability that is obtainable with few other materials. Lower in cost than conventional plaster systems; IMPERIAL Plaster Finish is applied in a one-coat operation permitting next-day decoration.



IMPERIAL PLASTER Base 4 ft. wide and in lengths up to 14 ft. covers area quickly

Radiant Heat Plaster Ceilings combine two new products specially fortified for use with electric heating cable—RED TOP Radiant Heat Plaster and Plaster Base. The surface provides higher long-term resistance to heat deterioration

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32 VENEER PRODUCTS: Bases

and permits faster, more uniform heat emission—yet the system offers lower applied costs than other material combinations. In these systems large-sized gypsum plaster base is screwed or nailed to wood framing, metal studs or channels or adhesively applied to gypsum coreboard. Special glass fiber tape is stapled over joints before high-strength veneer plaster is applied. As the materials and installation methods used may be new to lathing and plastering, the following pages are devoted to a description of these products and their application.

GYPSUM BASES

IMPERIAL PLASTER BASE, PLAIN, is a special gypsum lath in large sheet form that has been specifically engineered for use with IMPERIAL Plasters. It provides the strength, absorption and troweling characteristics necessary for top quality veneer plastering performance. The large sheets minimize the number of joints and speed installation. The high-density, fire-resistant gypsum core has a superior controlled absorption paper lightly tinted blue on the face side and a strong gray liner paper on the back side. The face paper is folded around the long edges to reinforce and protect the core. Long edges are square; ends are cut square and finished smooth. Available in two thicknesses: $\frac{1}{2}$ ", for single-layer application in new residential construction; $\frac{5}{8}$ ", recommended for the finest high-strength veneer plaster construction. The greater thickness provides increased resistance to fire exposure and sound transmission and allows 24" o.c. spacing on wood framing.

Width: 4'; lengths: 8', 9', 10', 12'; approx. weight: 1,970 lbs./MSF for $\frac{1}{2}$ ", 2,460 lbs./MSF for $\frac{5}{8}$ ".

IMPERIAL PLASTER BASE TYPE X, made in $\frac{3}{4}$ " and $\frac{1}{2}$ " thicknesses, combines all the advantages of Plain IMPERIAL Plaster Base with additional resistance to fire exposure—the result of a specially formulated mineral core. Listed by U.L., Inc. under Label Service for certain fire-tested partition, floor-ceiling and column constructions (see Chapter 4 for details).

Width: 4'; lengths: 8', 9', 10', 12'; approx. weight: 2,025 lbs./MSF for $\frac{1}{2}$ ", 2,460 lbs./MSF for $\frac{3}{4}$ ".

RED TOP RADIANT HEAT PLASTER BASE is a large-size gypsum lath used with RED TOP Radiant Heat Plaster in electric cable ceilings. Developed after years of research and testing, this unique product provides the high structural strength and resistance to heat deterioration needed as a base for RED TOP Radiant Heat Plaster. A special chemically fortified fire-resistant gypsum core gives the base excellent resistance to heat deterioration and face paper delamination at normal cable operating temperatures (135°F.). Highly absorbent blue paper is bonded to the face side of the fortified

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core and is folded around the long edges. Strong gray liner paper is bonded to the core back. Long edges are square; ends are cut square and finished smooth.

RED TOP Radiant Heat Plaster Base is suitable for direct application to wood joists or metal furring channels and for resilient application to RC-1 Resilient Channels. Joints are reinforced with IMPERIAL glass fiber tape before heating cable is attached.

Available: $\frac{1}{4}$ " or $\frac{3}{4}$ " thickness in plain core, $\frac{1}{2}$ " thickness only in Type X core for fire-rated construction; lengths 8', 9', 10', 12'; approx. weight: 1,970 lbs./MSF for $\frac{1}{4}$ " plain, 2,460 lbs./MSF for $\frac{3}{4}$ " plain, 2,025 lbs./MSF for $\frac{1}{2}$ " Type X.

USG COREBOARD is a 1" thick solid gypsum board product to which additional layers of plaster base are laminated in the Solid and Double Solid IMPERIAL Partitions. Thickness: 1"; width: 24"; edge: "V" T&G; length: 8', 9', 10' and 12'; approx. weight: 4,150 lbs./MSF; finish: gray paper, not suitable as an exposed surface or plaster base.

SHEETROCK W/R GYPSUM WALLBOARD is a water-resistant large sheet form base for the adhesive application of ceramic, metal, and plastic tile. Used in lieu of IMPERIAL Plaster Base in tub, shower and other high-moisture areas where tile is to be adhesively applied. It is water resistant all the way through: (1) multi-layered face and back paper is chemically treated to combat penetration of moisture; (2) the gypsum core is made water-resistant with a special asphalt composition. Easily recognized because of its distinctive green core and face. Raw cut edges and nail heads must be treated with SHEETROCK Brand W/R Sealant.

Thickness: $\frac{1}{2}$ " and $\frac{3}{4}$ "; width: 4'; length: 8' or 12'; approx. weight: 2,025 lbs./MSF; edges: tapered; finish: green treated face paper, suitable for receiving tile. Sealant available in 1-qt. cans, 6 qts. per carton.

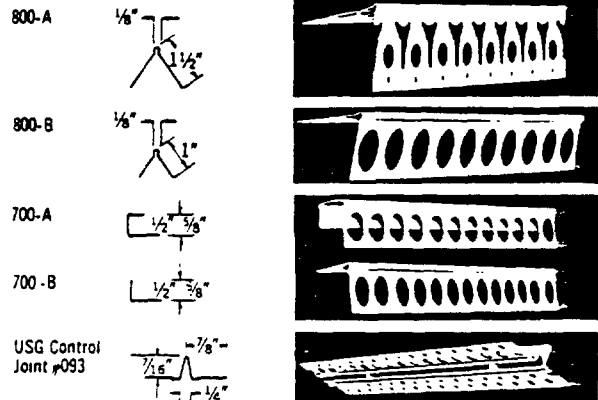
TRIM ACCESSORIES

With today's plastering advancements comes the need for special-function accessories to produce economical, better, more beautiful walls and ceilings. U.S.G.'s concept of "package design" has produced a separate line of corner beads, metal trim, reinforcing and structural accessories designed specifically for high-strength veneer plastering. Use of these accessories gives the important advantage of dealing with a single manufacturer for all components of a wall or ceiling.

USG CORNER BEADS are 26-ga. galvanized steel angle reinforcement for external corners. Various sizes provide plaster protection, true and straight lines at corners and grounds for plastering.

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34 VENEER PRODUCTS: Trim Accessories



800-A CORNER BEAD provides for a plaster thickness up to $\frac{1}{8}$ ". Used with IMPERIAL Plaster in two-coat system applications. Length: 8'; weight: 136 lbs./MLF; packages: 60 pcs. per ctn.

800-B CORNER BEAD gives $\frac{1}{4}$ " grounds for veneer IMPERIAL Plaster in single-coat applications. Length: 8'; weight: 75 lbs./MLF; packages: 125 pcs. per ctn.

USG METAL TRIMS provide neat edge protection and offer a means for isolation at cased openings, at ceiling angles and at intersections where veneer plastering abuts other materials. Made of 29-ga. galvanized steel, these trims have perforated flanges to strengthen the plaster bond. They fit over $\frac{1}{4}$ " or $\frac{3}{8}$ " IMPERIAL Plaster Base and provide $\frac{1}{8}$ " grounds for IMPERIAL Plaster.

NO. 700-A is a channel-type casing nailed to door or window back. Sizes: $\frac{1}{2}$ " and $\frac{3}{4}$ "; length: 7', 10'; weight: 98 lbs./MLF for $\frac{1}{2}$ ", 106 lbs./MLF for $\frac{3}{4}$ "; packaged: 50 pcs. per ctn.

NO. 700-B is an angle edge trim used at junction of plaster base with rough concrete or masonry—attached by stapling when used with metal framing. Sizes: $\frac{1}{4}$ " and $\frac{3}{4}$ "; length: 10'; weight: 74 lbs./MLF for $\frac{1}{4}$ ", 80 lbs./MLF for $\frac{3}{4}$ "; packaged: 50 pcs. per ctn.

USG CONTROL JOINT NO. 093 is designed to relieve expansion and contraction stresses in large areas of IMPERIAL Plaster over IMPERIAL Plaster Base. Made of roll-formed zinc to provide $\frac{3}{32}$ " ground dimension. An open slot, $\frac{1}{4}$ " wide and $\frac{7}{16}$ " deep, is protected with plastic tape which is removed after plastering is completed. The short flanges are perforated for key-locking plaster and for stapling to plaster base. Used from floor to ceiling in long partition runs, and from door header to ceiling. Length: 8', 10'; weight: 112 lbs./MLF; packaged: 30 pcs. 8' or 25 pcs. 10' per ctn.

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IMPERIAL Tape



IMPERIAL TAPE is a glass fiber lino-weave tape, $2\frac{1}{4}$ " wide, used to conceal and reinforce joints of IMPERIAL Plaster Base and RED TOP Radiant Heat Plaster Base. Tape is attached with $\frac{3}{8}$ " staples before veneer plaster is applied. Open weave of tape allows rapid air escape during plaster embedding. Usage: about 370 lin. ft. of tape per MSF of surface; packaged: 12 rolls of 300 ft. ea. per ctn.

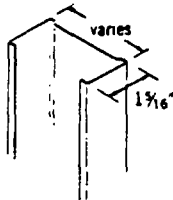
STRUCTURAL ACCESSORIES

USG METAL STUDS are non-load bearing channel type studs roll-formed from 25-ga. electro-galvanized steel. Cutouts at top and bottom of studs provide limited chaseways for pipe and conduit. The channel is designed for 16" stud spacing for large-size IMPERIAL Plaster Base in USG Metal Stud Partition Systems. Also used in certain other plastering systems (see Chapter 4 for construction details). Packaged: 10 pcs. per bdl.; available as follows:

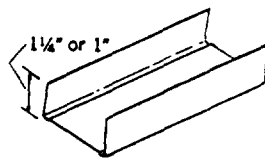
Size	Width	Length	Wt. lbs./MLF
No. 158	$1\frac{1}{4}$ "	8', 9'	340
No. 212	$2\frac{1}{4}$ "	8', 9', 10', 12'	430
No. 358	$3\frac{1}{4}$ "	8', 9', 10', 12', 16'	510

USG METAL RUNNERS are roll-formed from 25-ga. electro-galvanized steel channel type sections designed to receive USG Metal Studs and to secure various types of USG partitions to floor and ceiling. Also used in rough framing door and borrowed light openings. Length: 12'; packaged 10 pcs. per bdl.; available as follows:

Size	Width	Wt. lbs./MLF
No. 158	$1\frac{1}{4}$ "	283
No. 212	$2\frac{1}{4}$ "	339
No. 358	$3\frac{1}{4}$ "	422



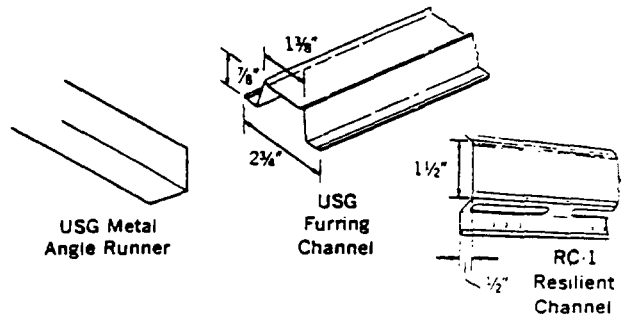
USG Metal Stud



USG Metal Runner

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36 VENEER PRODUCTS: Fasteners/Adhesives



USG METAL ANGLE RUNNERS are $1\frac{1}{8}$ " x $\frac{7}{8}$ " x 22-ga. electro-galvanized steel angle sections used to secure 1" coreboard at floor and ceiling in USG Solid and Double Solid IMPERIAL Plaster Partitions. Length: 10'; weight: 176 lbs. per MLF; packaged: 10 pcs. per bdl.

USG FURRING CHANNELS are roll-formed hat-shaped sections of 25 ga. electro-galvanized steel. Designed as ceiling and wall furring channels for screw attachment of IMPERIAL Plaster Base. Also suitable furring for ROCKLATH Plaster Base and RED TOP Radiant Heat Plaster Base. May be clip-attached to $1\frac{1}{2}$ " main carrying channels with USG Furring Clip. Face width: $1\frac{1}{8}$ "; furring depth: $\frac{7}{8}$ "; length: 12'; weight: 320 lbs. per MLF; packaged: 10 pcs. per bdl.

RC-1 RESILIENT CHANNELS are 25 ga. electro-galvanized steel channels used for resilient attachment of IMPERIAL and RED TOP Radiant Heat Plaster Bases to wood framing. Widely used as one of the most effective, lowest-cost methods to improve sound transmission loss in partitions and ceilings of garden-type apartments, motels and other structures. Flange is pre-punched 4" o.c. for screw fastening to framing with USG $1\frac{1}{4}$ " Screw Type W. Base is attached to channel with 1" Screw Type S. Channel is $2\frac{1}{4}$ " wide x $\frac{1}{2}$ " in depth. Length: 12'; weight: 213 lbs. per MLF; packaged: 20 pcs. per bdl.

USG CONTROL JOINT No. 75 and CASING BEADS Nos. 60 and 66 are used with radiant heat plaster ceilings. For descriptions of these items, see Chapter 3.

FASTENERS AND ADHESIVES

USG SCREWS are the result of many years of development aimed at producing the best possible attachment of gypsum boards to steel, wood or gypsum supports simply and quickly. A complete line of 13 different special, self-drilling, self-tapping steel screws has been made available to improve construction systems and simplify installation methods. All screws are highly corrosion resistant and have a Phillips head recess for easy installation with a special bit and power-driven screwdriver.

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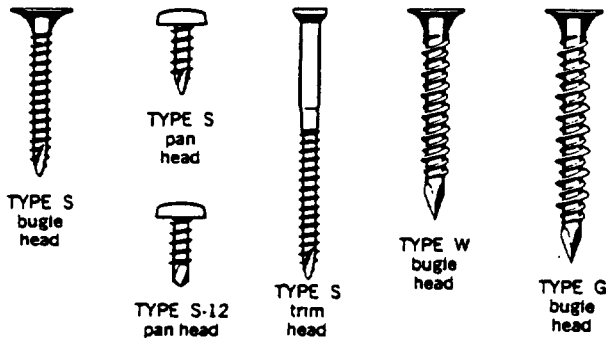
IMPERIAL Plaster Base or RED TOP Radiant Heat Plaster Base is fastened to steel framing with the Type S screw, to wood framing with the Type W screw.

Type S screws have a patented drill point and special design threads that provide maximum holding power in steel studs, minimize thread stripping. Special Hi-Lo threads on Type G and Type W screws speed installation, provide excellent holding power in gypsum or the various woods used in framing.

The special patented bugle head used when attaching gypsum bases spins the face paper into the cavity under the screw head and produces a uniform depression free of fuzz. Other head designs are available for the assembly of metal framing and installation of wood and metal trim.

The ability of USG screws to pull the plaster base tightly to the framing without damaging the board has virtually eliminated loose board attachment and consequent problems of "fastener pops" in wood frame construction. Fewer screws than nails are generally required. Speed of installation compares favorably with nailing when electric screw guns (see Chapter 5) are used. An adjustable screw depth control assures uniformity of penetration, protects the face paper, minimizes core fracturing.

Applications and types of USG Screws are shown below:



1" TYPE S—BUGLE HEAD

- $\frac{1}{4}$ " and $\frac{3}{8}$ " single layer IMPERIAL base to metal studs, metal furring channel or resilient channel; or RED TOP Radiant Heat Plaster Base to metal furring or resilient channel.

1 $\frac{1}{4}$ " TYPE S—BUGLE HEAD

- 1" gypsum coreboard to metal angle runner.

1-5/16" TYPE S—BUGLE HEAD

- $\frac{1}{2}$ " face layer to metal in double layer IMPERIAL systems.

1 $\frac{3}{8}$ " TYPE S—BUGLE HEAD

- $\frac{3}{8}$ " face layer to metal in double layer IMPERIAL systems.

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38 VENEER PRODUCTS: Plasters

1 7/8" TYPE S—BUGLE HEAD

- 1/2" face layer IMPERIAL base through coreboard to metal angle runner.

2 1/4" TYPE S—BUGLE HEAD

- 3/4" face layer IMPERIAL base through coreboard to metal angle runner.

3/8" TYPE S—PAN HEAD

- Metal studs to metal runners.

3/8" TYPE S-12—PAN HEAD

- Metal studs to metal door frame (12 ga. max.).

1 3/8" TYPE S—TRIM HEAD

- Wood trim over single layer IMPERIAL base to metal studs and runners.

2 1/4" TYPE S—TRIM HEAD

- Wood trim over double layer IMPERIAL base to metal studs and runners.

1 1/4" TYPE W—BUGLE HEAD

- 1/2" or 3/8" single layer IMPERIAL or Radiant Heat bases to wood framing and RC-1 resilient channels to wood framing.

1 1/2" TYPE G—BUGLE HEAD

- Face-layer IMPERIAL base to base-layer IMPERIAL base or gypsum coreboard in laminated construction.
- Face-layer IMPERIAL base to gypsum coreboard.

USG ADHESIVES represent the latest advancement in the attachment of face-layer IMPERIAL base to base-layer IMPERIAL base or gypsum coreboard in double-layer laminated and USG Solid and Double Solid IMPERIAL Partitions.

Two adhesives are recommended, both dry powder products, applied by spreader; require job-mixing with water and temporary fastening with 1 1/2" Type G Screw; qualify for fire-rated construction.

USG LAMINATING ADHESIVE provides excellent bond, levels minor misalignments. Available in 25-lb. bags.

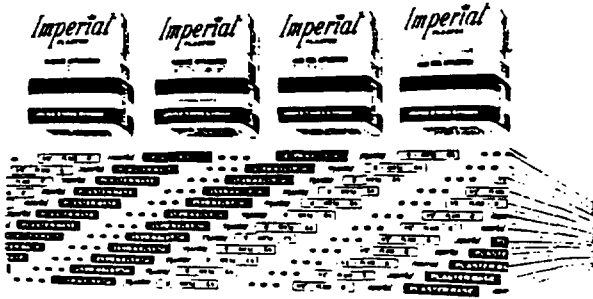
PERF-A-TAPE JOINT COMPOUND (EMBEDDING TYPE) provides a tight bond, permits adjustment of boards after contact. Available in 25-lb. and 32-lb. bags.

VENEER PLASTERS AND APPLICATION

IMPERIAL Plasters

These products lead the way to faster, more economical, better performing jobs in today's plastering. Applied to a thickness of only 1/16" to 3/32", these high-strength veneer plasters offer beautiful, hard (3,000 psi), abrasion-resistant surfaces that are ready for decoration the next day. Factory-prepared IMPERIAL Plasters are easy to work, have stabilized set, offer excellent trowelability, high plasticity and outstanding coverage. In applied cost they average only slightly above

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conventional drywall. Systems using IMPERIAL Plaster qualify for fire-resistance ratings up to 2 hours and 54 STC (see Chapter 4 for details). IMPERIAL Plasters are available in 80-lb. bags and in four formulas:

Hand Tool Application and Machine Application Finishes—for single-coat application composed of scratch coat and immediate doubling back, directly over large-size gypsum IMPERIAL Plaster Base, glass-fiber tape and special corner bead. Provides a smooth trowel, float, or spray texture finish ready for further decoration.

Hand Tool Application and Machine Application Basecoats—for use in two-coat application with a lime putty finish. Can be applied to either IMPERIAL Plaster Base, directly to concrete block, or over a bonding agent on monolithic concrete. Formulated to receive high-strength gauged lime putty, DIAMOND Finish Plaster, STRUCTO-GAUGE-lime, or Keenes-lime-sand float finishes.

The machine-application basecoat and finish are spray-applied only by the E-Z Coater Machine operated in strict accordance with the machine manufacturer's directions.

Mixing

MIX IMPERIAL Plaster with a heavy duty drill capable of producing a minimum of 650 RPM under load.

Place correct amount of water shown in table below in a 12 to 15-gal. smooth-sided container. Operate mixer, slowly add one bag (80 lbs.) plaster and mix for at least 3 min. to disperse lumps completely. Do not mix longer than 5 min.

IMPERIAL Plaster Products	Water—Qts./80 lb. Bag.
Hand Tool Application Finish	11 to 13
Machine Application Finish	13 to 15
Hand Tool Application Basecoat	8 to 10
Machine Application Basecoat	8 to 10

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40 VENEER PRODUCTS: IMPERIAL Plasters

FOR SAND FLOAT FINISH add 20 lbs. clean silica sand per 80 lb. bag IMPERIAL Finish.

FOR MACHINE APPLICATION add IMPERIAL Catalyst solution at spray nozzle. For IMPERIAL Finish, mix 3 lbs. (1 bag) Catalyst in 3 gals. clean water; for IMPERIAL Basecoat mix 9 lbs. (3 bags) Catalyst in 3 gals. clean water. Stir mixture until catalyst dissolves; let residue settle and pour into accelerator tank of machine.

Application—IMPERIAL Plaster Finish

APPLY IMPERIAL Plaster Finish to a thickness of 1/16" min. to 3/32" max. over IMPERIAL Plaster Base. First, embed tape and fill beads with a tight, thin coat IMPERIAL Plaster Finish and allow to set. When tapes and beads have set, scratch in a tight thin coat over entire area, immediately doubling back to full thickness. Fill all voids and imperfections. It is best to scratch and double back with same mix and avoid intermixing batches.

FINAL TROWEL after surface has become firm, holding trowel flat and using water sparingly. Do not over-trowel. Best results are obtained by planning the plastering to permit continuous application from angle to angle.

FOR SAND FLOAT FINISH omit final troweling and instead, after surface has become firm, float to desired texture, using sponge, carpet or other float. Use water sparingly.

FOR MACHINE APPLICATION adjust material and catalyst flow control to give 60 to 90-min. set. Check on scrap piece of base by timing set. Spray all taped joints and over flanges of corner bead. Immediately trowel to completely embed tapes and bead flanges and leave surface level, without voids.

Spray IMPERIAL Plaster Finish to 1/16" thickness in two coats. Apply first coat approx. 1/32" thick, then cross spray to uniform 1/16" thickness. *Do not apply more than 3/32" thickness.* Trowel to fill voids, depressions and level surface. Final trowel as described above.

FOR MACHINE TEXTURE FINISH apply plaster as above, but omit final troweling. Level surface to remove trowel marks, voids, catfaces and other defects. Apply texture coat as soon as base application has set. Set the catalyst flow control to produce 15 to 20-min. set. Do not allow base application to dry before texture finish is applied.

Application—IMPERIAL Plaster Basecoat

TO IMPERIAL PLASTER BASE: apply IMPERIAL Plaster Basecoat to a thickness of 1/16" min. to 3/32" max. as described above for IMPERIAL Plaster Finish. Omit final trowel and instead leave surface rough or cross rake with

fine wire rake. Allow basecoat to set and dry sufficiently to provide proper suction for following finish coat.

TO MONOLITHIC CONCRETE: apply IMPERIAL Plaster Basecoat only to interior, structurally sound, clean, reasonably smooth surfaces prepared for plaster with a bonding agent applied according to directions. Fill all voids and depressions with IMPERIAL Basecoat; allow to set and partially dry. Scratch in a tight, thin coat over the entire area, immediately doubling back to 1/16" to 3/32" thickness. Leave rough and allow basecoat to set and dry prior to finish application.

TO CEMENT BLOCK: apply IMPERIAL Plaster Basecoat only to interior cement block surfaces that develop proper suction or are scored to provide adequate mechanical bond. Surfaces should be sound, clean and reasonably smooth with broken or chipped units replaced or repaired. Prior to plastering, lightly spray walls with water to provide uniform suction. Fill and level all voids, depressions and joints with IMPERIAL Plaster Basecoat. After sufficient take-up has occurred, apply scratch coat to entire area, and immediately double-back to 1/16" to 3/32" thickness. Leave rough and allow basecoat to set and dry prior to finish application.

FOR MACHINE APPLICATION adjust material and catalyst flow control to give 25 to 35-min. set. Check on scrap piece of base by timing set.

TO IMPERIAL PLASTER BASE: spray IMPERIAL Plaster Basecoat over all taped joints and corner bead flanges; trowel level. Apply IMPERIAL Basecoat to 1/16" thickness in two coats: first coat approx. 1/32" thick; then cross spray to uniform 1/16" thickness. Allow basecoat to set and dry prior to finish application.

TO MONOLITHIC CONCRETE: apply IMPERIAL Basecoat only to interior, structurally sound, clean, reasonably smooth surfaces properly prepared with a high-quality bonding agent. Spray a leveling coat, filling all voids and depressions. Allow this coat to stiffen and level with light troweling. When set, spray second coat IMPERIAL Basecoat over entire surface with a coarse, sharp texture pattern. Total thickness for both leveling and texture coat need not exceed 3/32". Allow basecoat to set and dry prior to finish application.

TO CEMENT BLOCK: apply IMPERIAL Basecoat only to interior cement block surfaces that develop proper suction or are scored to provide adequate mechanical bond. Surfaces should be sound, clean and reasonably smooth with broken or chipped units replaced or repaired. Spray a leveling coat to fill voids and depressions; trowel lightly to level. When set, spray second application basecoat to a total thickness not to exceed 3/32" for both coats. Allow to set and dry prior to finish application.

BB013 0207

BB013 0206



DIAMOND Finish Plaster

A mill-prepared finish plaster to be applied over previously prepared conventional sanded or IMPERIAL basecoats. It is designed to meet today's plastering requirements for faster, easier application, greater strength and smoother appearance.

Pre-mixed at the factory, it requires addition of water only on the job. Thus, mixing time is cut, gauging and soaking eliminated. Also provides stabilized set and constant high-quality job performance. Its excellent troweling and easier working properties offer time-saving features that increase production without raising labor costs.

DIAMOND Finish Plaster offers superior surface hardness—1½ times as great as a 1 to 3 mix of regular gauging and lime. Its excellent resistance to abrasion, cracking and delamination from basecoat makes DIAMOND Finish Plaster ideal for use on all interior surfaces where durability and hard wear are expected.

Available in two formulations: *Regular Set* for use over conventional sanded gypsum basecoat, and *Quick Set*, for use over thin veneer basecoat such as IMPERIAL Plaster. Not recommended for use over lightweight aggregate gypsum basecoat.

Mixing and Application

MIXING: equipment used for mixing must be clean. For mixing DIAMOND Finish Plaster use a high-speed, motor-driven, propellor-type mixer. Place clean water in mixing container, slowly add one bag of plaster and mix for at least 3 min. to disperse lumps completely. Do not mix longer than 5 min.

APPLY over a partially dry sanded gypsum basecoat or IMPERIAL Basecoat. Scratch in the thin coat, well ground into the base, and immediately double back with second coat, filling imperfections. Water-trowel to a smooth finish, free of all blemishes. Continue troweling until final set has taken place. Clean tools and equipment after each mix.

DB013 0208/1

RED TOP Radiant Heat Plaster

This is a specially fortified high-strength veneer type gypsum plaster used in electric cable ceilings. Developed after years of research and testing, this unique product provides more efficient heat transmission and greater resistance to heat deterioration due to a chemical fortification in the plaster.

Cable operating temperatures can reach as high as 135°F. provided heating cable wattage of 2.75 watts per lin. ft. and watt density of 25 watts per sq. ft. (a minimum cable spacing of 1 1/4" o.c. as specified by National Electric Code, 422-52b) are not exceeded. This is in lieu of the Gypsum Assn. maximum temperature restriction of 125°F. for heating elements in contact with conventional plaster.

Factory-mixed RED TOP Radiant Heat Plaster requires addition of water only on the job. Hand-applied in two coats—a 3/16" fill coat to embed cable, then a finish coat of 1/16", which gives a total thickness of 1/4". Applied only to large-size RED TOP Radiant Heat Plaster Base or directly to properly prepared monolithic concrete ceilings.

This is the *only* plaster system recommended by United States Gypsum for use with electric cable heating systems.

Mixing and Application

MIX RED TOP Radiant Heat Plaster with a heavy duty drill capable of producing a *minimum* of 650 RPM. *Do not hand mix.* Slower operating drills will adversely affect setting properties of plaster.

Since this material will set in approximately 1 hr., mixing and application must be coordinated so that no more material than can be applied in 30 min. is mixed. *Do not retemper.* Place approximately 15 to 17 qts. of water in a 12 to 15-gal. smooth-sided metal container, about 14" in diameter, and, with mixer operating, slowly add one bag of plaster. Mix for minimum of 3 min. to disperse all lumps completely, but do not mix longer than 5 min. Mixing equipment and tools must be kept clean to prevent acceleration from set plaster or other contaminants.



Application of fill coat

Application of finish coat

44 VENEER PRODUCTS: Radiant Heat Plaster

Application over RED TOP Radiant Heat Plaster Base

Apply RED TOP Radiant Heat Plaster to a $\frac{1}{4}$ " total thickness over RED TOP Radiant Heat Plaster Base. Apply a fill coat of the plaster parallel to the cable direction and of sufficient thickness to *completely cover the cable*. Do not use cables as a screed. Level this fill coat with trowel, rod or darby to fill any low spots or remove any high ridges, etc. "Tooth" the fill coat to provide key for finish coat, by using a serrated darby or by lightly brooming prior to set.

The average fill coat thickness should be 3/16". After fill coat has developed sufficient suction (in good drying weather, about 2 hrs. after fill coat has set; in damp and/or cold weather the time interval might possibly extend overnight, unless good supplementary heat and ventilation are provided), apply a finishing coat of RED TOP Radiant Heat Plaster to provide $\frac{1}{4}$ " total thickness. Fill all voids and imperfections. Final trowel when surface has become firm. Avoid using edge of trowel during final trowelling. Use water sparingly. Do not over-trowel. Always work to a wet edge. Avoid dry joining.

FOR SAND FLOAT FINISH: application of fill coats should not be altered. A Sand Float Finish may be obtained by adding up to 20 lbs. clean white silica sand per 80-lb. bag RED TOP Radiant Heat Plaster, depending upon texture desired. The quantity of sand added per bag must be consistent. Application of Sand Float Finish is the same as outlined for trowel finish, except that when it has become firm, but unset, float to the desired texture, using a sponge, carpet, or other float. Use water sparingly.

FOR SIMULATED ACOUSTICAL FINISH: a maximum $\frac{1}{4}$ " thickness of IMPERIAL QT Texture Finish, QT Simulated Texture Finish or similar product may be spray applied over the full $\frac{1}{4}$ " thickness of RED TOP Radiant Heat Plaster.

Application over Monolithic Concrete Ceilings

RED TOP Radiant Heat Plaster must only be applied to interior, structurally sound, clean, reasonably smooth surfaces prepared for plaster with a bonding agent.

Install radiant heat cable in accordance with specifications.

After the radiant heat cable has been installed, apply RED TOP Radiant Heat Plaster to an approximate 5/16" thickness to completely cover cable and anchor devices, followed by a 1/16" finishing coat that may be sand float finished if desired.

BB013 0210



Single layer wall application



Resilient ceiling application

APPLICATION OF VENEER BASES

Veneer Gypsum Base

IMPERIAL Plaster Base provides an economical, durable, fire-resistant, easily applied base for high-strength veneer plasters in interior wall, ceiling and partition construction. This base may be applied in one or two layers directly to wood framing members, to metal studs or channels or to gypsum coreboards.

SINGLE LAYER APPLICATION is used on interior walls and ceilings not exposed to extreme or continuous moisture where economy, fast erection and fire resistance are required. It is equally suitable for remodeling, altering and resurfacing cracked and defaced areas.

DOUBLE LAYER APPLICATION: a face layer of IMPERIAL Plaster Base is job-laminated to a base layer of IMPERIAL Base directly attached to framing members. This construction offers greater strength and higher resistance to fire and sound transmission. Walls and ceiling so constructed are highly resistant to cracking and minimize the possibility of fastener "pops" and discoloration over fastener heads.

FASTENING METHODS: veneer bases are applied by several alternate methods depending on the type of supports and materials used:

1. **SINGLE NAILING:** conventional attachment for wood framing.
2. **SCREW ATTACHMENT:** USG Screws are the best known insurance against fastener pops caused by loosely attached base. Recommended in wood frame application; required with systems employing metal studs, metal channels and resilient channels.
3. **ADHESIVE ATTACHMENT:** the latest advancement for producing high sound control and the finest room interiors. Usually requires only supplemental fasteners to attach face layers to base layer or gypsum coreboard.

BB013 0211

46 VENEER PRODUCTS: Framing

FRAME SPACING AND ATTACHMENT

Framing	Max. Frame Spacing C. to C.	Attachment	Fastener Spacing C. to C.
½" IMPERIAL Plaster Base			
wood	16" to 24"	Nails—1½" 13 ga., ½" head, ring or barbed shank, blued, polished, or cement coated	7" cigs., 8" walls
		Screws—USG 1½" Type W	12"
		Nails for Type X Lath—1½" 5d cooler type—cement coated	6" cigs., 7" walls
USG metal stud	16"	Screws—USG 1" Type S	12"
RC-1 resilient channel	16" cigs., 24" walls	Screws—USG 1" Type S	12"
¾" IMPERIAL Plaster Base			
wood	24" 16" single layer	Nails—1½" 13 ga., ½" head, ring or barbed shank, blued, polished, or cement coated	7" cigs., 8" walls
		Screws—USG 1½" Type W	12"
		Nails for Type X Lath—1½" 6d cooler type—cement coated	6" cigs., 7" walls
USG metal stud	24" double layer	Screws—USG 1" Type S	12"
RC-1 resilient channel	16" cigs., 24" walls	Screws—USG 1½" Type W for channel to framing; USG 1" Type S for plaster base	12"
½" RED TOP Radiant Heat Plaster Base			
wood joists	16"	Nails—1½" 13 ga., ½" head, ring or barbed shank, blued, polished, or cement coated	7" cigs.
		Screws—USG 1½" Type W	12"
		Nails for Type X Lath—1½" 5d cooler type—cement coated	6" cigs.
RC-1 resilient channel	16"	Screws—USG 1½" Type W for channel to framing; USG 1" Type S for plaster base	12"
USG metal channel	16"	Screws—USG 1" Type S	12"
¾" RED TOP Radiant Heat Plaster Base			
wood joists	24"	Nails—1½" 13 ga., ½" head, ring or barbed shank, blued, polished, or cement coated	7" cigs.
		Screws—USG 1½" Type W	12"
RC-1 resilient channel	24"	Screws—USG 1½" Type W for channel to framing; USG 1" Type S for plaster base	12"
USG metal channel	24"	Screws—USG 1" Type S	12"

BB013 0212

WOOD FRAMING meeting the following minimum requirements is necessary for proper performance. Framework shall meet the minimum requirements of FHA and local building codes. Framing members shall be straight, true, of uniform dimension, and framing shall be properly aligned. All framing lumber shall be of the proper grade for the intended use, and 2"x4" nominal size or larger shall bear the grade mark of a recognized inspection agency using grading rules for lumber recommended by the American Lumber Standards Committee. All framing lumber shall have a moisture content not in excess of 15% at the time of gypsum base application. Use of kiln dried lumber for joists is recommended. Do not attach base to extremely hard (dense) or soft framing members.

NAIL POP: a protrusion, from an otherwise smooth surface, located directly over the head of a nail. The protrusion or bump is caused by an outward movement of the concealed nail head in relation to the finished surface, or it can be caused by an inward movement of the finished surface in relation to the nail head. Nail popping may occur whenever materials of any kind are joined with nails of any kind, size or shape.

Nail pops are caused by nail heads puncturing face paper, lack of pressure on base during nailing, base improperly fitted, nailing base from ends and edges toward center, framing members out of alignment bowed or twisted, base applied over protrusions, nails insecurely driven, nails loosened by pounding, use of improper nails, or lumber shrinkage.

Failure to observe these minimum framing requirements will materially increase the possibility of ineffective fastener concealment, due to poor application practices, shrinkage of lumber, or a combination of the two. Check the studs, plates, joists, headers, heating ducts, electrical attachments and plumbing pipes to see that none will cause the base to be held away from the fastening surfaces of the framing members. Straighten any bowed, twisted studs or joists. Shim as required.

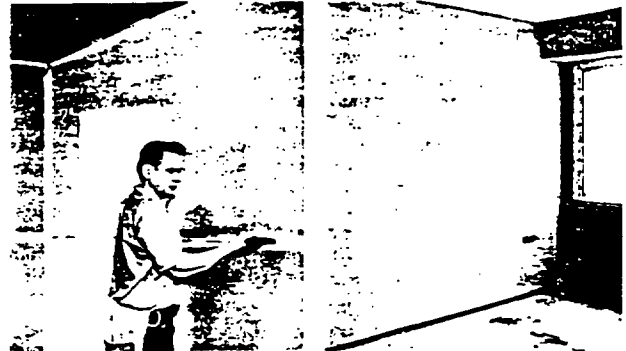
HORIZONTAL VS. VERTICAL APPLICATION: IMPERIAL Plaster Base may be applied horizontally (long edges of the base at right angles to the framing) or vertically (long edges parallel to framing). Fire rated partitions generally require vertical application.

In wood frame construction horizontal application is generally better because it offers the following advantages:

1. Strongest dimension of base runs across framing members.
2. Bridges irregularities in alignment and spacing of framing.
3. Better bracing continuity—each panel ties more framing members together.

BB013 0213

48 VENEER PRODUCTS: Installation/IMPERIAL Base



Horizontal application

Vertical application

4. Reduces lineal footage of joints up to 25%.

5. Joints on walls are at a convenient height for finishing.

For wall application, if ceiling height is 8'2" or less, horizontal layout of base will result in fewer joints, easier handling, and less cutting. If ceiling height is greater than 8'2" or wall is 4' wide or less, vertical application will be more practical. For ceiling application, use whichever method will result in fewer joints.

Installation of Plaster Base

WOOD AND METAL FRAMING: IMPERIAL may be applied in either a vertical or horizontal direction. All ends and edges of base should occur over framing members, except when edge joints are at right angles to framing members as in horizontal application.

The plaster base should be applied first to ceilings and then to walls. To minimize end joints, use maximum practical lengths. Bring base into contact, but do not force into place. Where ends or edges abut, fit them neatly. Stagger end joints. Arrange joints on opposite sides of partitions so as to occur on different studs.

Fastening should proceed from central portion of base toward ends and edges. While fasteners are being driven, hold base in firm contact with underlying support. Space fasteners as shown in Frame Spacing and Attachment chart, page 46, and not less than $\frac{3}{4}$ " from edges and ends of base. Set fastener heads flush with surface of paper but not breaking paper. Where base appears too loose from stud or joist, use double fastening.

Interior vertical and horizontal angles should be floated by not fastening to framing members in angles. When framing members are at right angles to interior angle, fasten approx. 8" away from angle.

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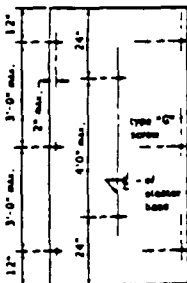
Cut and fit base neatly for pipes, electrical outlets, medicine cabinets, etc. Cut holes for electrical outlet boxes with special outlet box cutting tool. For circular holes, use adjustable circular cutting tool. Remove any loose face paper at cut and use quick setting plaster to fill any holes or openings.

GYPSUM BASES: IMPERIAL Plaster Base face layers are job-laminated to 1" Gypsum Coreboard in solid and double solid systems and may be laminated in double layer construction in steel studs. Latter may have face layer screw-applied. Attachment is with USG Laminating Adhesive and USG 1½" Type G Screws. Face layers are attached by applying adhesive in vertical strips to base layer, *strip lamination*.

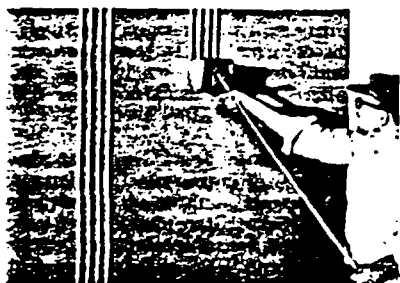
Mix Adhesive in a clean metal container using approx. 11 gal. of clean cool water per 25-lb. bag. Sift powder into water, stirring continuously and mix until smooth. Adhesive will thicken and is usable after 30-min. soaking period. When necessary, consistency of mix can be adjusted by adding small amounts of powder or water. Wet mix may be held for up to 24 hr. by covering with small amount of water.

Strip Lamination is suitable for vertical application of face layer panels on walls, significantly reduces the amount of adhesive used, and simplifies attachment of the face layer. Strip lamination provides flush even edge joints and is recommended when a high degree of sound control is required. It is not intended for use on ceilings or for horizontal application of face layers.

Precut and prefit face panels as required and apply adhesive in vertical strips 24" o.c. to base layer or coreboard. Each strip should consist of four beads approx. ¾" wide at base and ¼" high spaced 1½" to 2" o.c. Adhesive is applied most easily with a 7" or 10" Ames laminating head. Permanently attach face board to base layer or core units with 1½" USG Type G Screws located so they penetrate adhesive strips (see diagram for installation of Type G Screws).



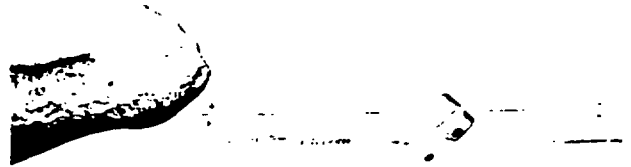
Screw placement



Strip lamination

BB013 0213

50 VENEER PRODUCTS: Joint Reinforcing



Staple application of IMPERIAL Tape

Application of Joint Reinforcing

APPLY IMPERIAL Tape over all IMPERIAL and RED TOP Radiant Heat Plaster Base joints (edges and ends) with a spring-driven hand stapler using $\frac{3}{8}$ " staples. Tape should be applied over the full length of all joints but *must not overlap at intersections*. Affix tape with two staples at top of tape—one on each side of the joint, 24" o.c. along length of tape, alternating from side to side, with two staples at bottom.

At wall-ceiling intersections, staple tape every 18" to 24" along ceiling edge only; for wall and partition interior corners, staple every 18" to 24" on one edge only, working from top to bottom. Position tape to bridge the joint at all interior corners. For fire-rated assemblies, staple tape 8" o.c.

ALTERNATE METHOD: Under certain adverse climatic or job conditions, veneer plasters can develop a small ridge or bead over the plaster base joints. Such joint deformation is more likely to occur when low humidity or rapid drying job conditions exist during lathing and plastering stages, such as in dry arid climates, or during cold winter weather when dry temporary or permanent heat is used. This condition is not the result of a product defect. Standard joint reinforcement procedures will minimize or effectively eliminate the hazards of joint deformation. In those instances where extremely dry job conditions are known to exist and the standard recommendations prove insufficient, the following alternate joint reinforcement procedure should be substituted.

1. Mix DURABOND Joint Compound according to directions on bag. Using a 5" broad steel finishing knife or trowel, butter compound over joint areas formed by edges and ends of IMPERIAL Plaster Base; take care to avoid heavy fills. Cement PERP-A-TAPE Reinforcement and press it down with fresh joint compound. Hold knife or trowel at an approx. 45° angle to board. Draw knife or trowel along joint with sufficient pressure to remove excess compound. Leave sufficient com-

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pound under tape for proper bond, but not over $1/64$ " under feathered edge. When tape is embedded, apply a skim coat of joint compound over tape. After embedding and skim coat are completed, apply a finish coat feathered 3" to 4" beyond edges of first coat. This same procedure should be used for interior angles.

2. Use DURABOND Joint Compound to fill trim and corner beads. Apply liberally, filling to nose of beads and feathering material 6" to 8" from nose. Smooth compound to remove excess material from nose of bead, leaving approx. $1/32$ " ground for finish plaster.

3. Allow applications over both joints and beads to set and dry thoroughly, before application of finish plasters.

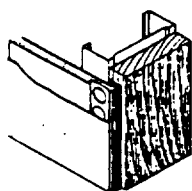
Application of Metal Accessories

CORNER BEAD should be applied to all external angles, held tightly over base and nailed or stapled not over 12" o.c. on both flanges along entire length of bead. When bead is in place, inside nose should be flush with base corner. Use 800-A for plaster thickness up to $1/4$ "; 800-B for $1/16$ " grounds.

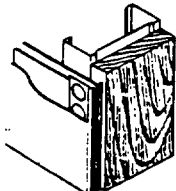
METAL TRIM: fasten IMPERIAL Plaster Base in normal manner but omit fasteners at framing member where metal trim is to be installed. Leave a space $3/4 \times 1/2$ " wide between edge of base and face of jamb or wall. This spacing adds a fluted



700-A



700-B



effect to openings and provides space for hardware or door bucks. It also allows expansion when trim is used for perimeter isolation.

Slip 700-A trim over edge of base, or position 700-B trim over corner of base with perforated flange on room side. Fasten to base by nailing or stapling not over 12" o.c.

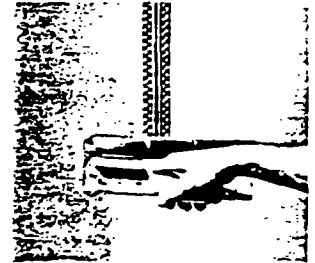
CONTROL JOINT: apply USG Control Joints No. 093 over face of IMPERIAL Plaster Base where specified. Cut to required lengths with a fine-toothed hack saw (32 teeth per in.). Cut end joints square, butt together and align to provide near fit. Attach control joint to plaster base with $9/16$ " staples spaced not over 6" o.c. in each flange. The protective plaster tape applied over the open groove should be left in place until fastening is completed.

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52 VENEER PRODUCTS: Runner Installation



Corner Bead application



Control Joint No. 093

Application of Structural Accessories

Runner Installation

IMPERIAL Plaster Partitions are secured to floors, ceilings and abutting walls with runners fastened to the supporting structure. The USG Metal Runner, a metal channel, is used with various systems employing USG Metal Studs. The USG Solid and Double Solid IMPERIAL Partitions are attached with a metal angle runner. A wood runner may be used when a nailer for wood base trim is needed, but generally is not acceptable when a fire rating is required.

To improve the sound control characteristics of a partition, a non-hardening caulking material, Plastic Sealer No. 579.64 as manufactured by Presstite Division of Interchemical Co. or equal, should be used under all wood and metal runners to seal the runner to the structure. Caulking of metal runners and plasterbase of IMPERIAL Systems is required to obtain sound ratings shown in Chapter 4.

CAULKING: surfaces to be caulked should be clean, dry and free of all foreign matter. Using an air pressure-activated or hand caulking gun, apply non-hardening caulking compound in beads about $\frac{3}{8}$ " diam. on either side of runners and studs at juncture with floor, ceiling and walls. Use single beads under angle runners. Then caulk perimeter of plasterbase after it is installed.

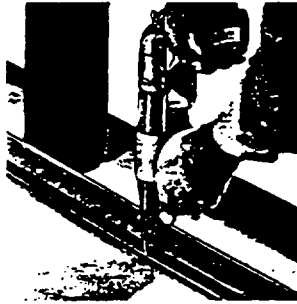
Caulking material will keep its proper tacky consistency if stored on the job in an insulated box heated with a 100-watt light bulb.



Caulking of runner tracks



Fastening channel runners



Fastening angle runners

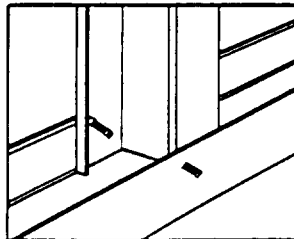
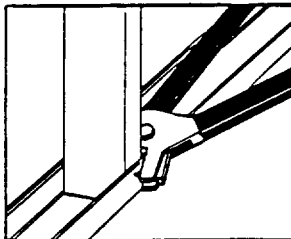
FASTENING: after caulking, securely attach runners,

1. To concrete slabs using concrete stub nails, shielded screws, or power-driven fasteners.
2. To gypsum or concrete block walls using square cut nails or power-driven fasteners.
3. To suspended ceilings using expandable molly type fastener or toggle bolts.
4. To wood framing using 12d nails or suitable screws.

Secure runners with fasteners placed at corners, at runner ends and spaced not to exceed 24" o.c. on floor runner and 16" o.c. on ceiling runner. **EXCEPTION:** fasteners securing ceiling runners on solid and double solid partitions may be spaced 24" o.c.

At partition corners, extend one runner to end of corner and butt other runner to it allowing clearance for plaster base thickness as necessary. Runners should not be mitered.

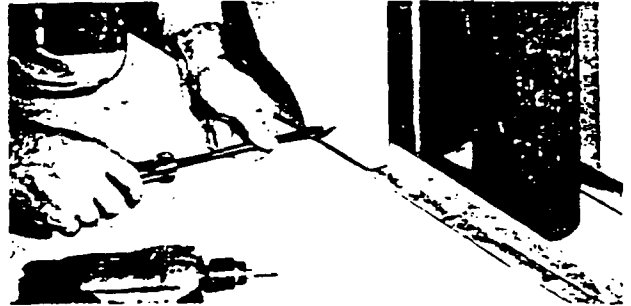
STUD ERECTION: Insert floor-to-ceiling height USG Metal Studs between runners, twisting them into position. Anchor all studs adjacent to door and borrowed light frames, partition intersections and corners to floor and ceiling runners. Use the USG Metal Lock Fastener or positive screw attachment with $\frac{3}{8}$ " USG Type S Screws, pan head, through each stud flange and runner flange.



USG Metal Lock Fastener - Pierces and folds light metal

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Erection of USG Coreboard

COREBOARD ERECTION: cut 1" coreboard to fit between floor and ceiling metal angle runners. Before installation, cut necessary openings in coreboard to accept electrical services (i.e. rigid conduit, flexible cable, electrical boxes, etc.). Install coreboard vertically, exposing rounded tongue edge. Secure each coreboard to metal angle runners both floor and ceiling with two 1 1/4" Type S screws placed about 2" from vertical edges.

Application of Fasteners

Screw Application

USG Screws are applied with a positive-clutch electric screwdriver, equipped with adjustable screw depth control head and a Phillips bit. The use of screws provides a positive mechanical attachment of plaster base to wood and metal framing with fewer fasteners than when nails are used. Correct use of electric screwdriver is shown below.

SET SCREWDRIVER: set adjustment for proper screw depth on scrap plaster base and framing. Drive screw head slightly



Adjusting screw depth locator



Placing screw on magnetic tip



Screws set with one hand

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below face of base but not deep enough to break the paper. To adjust, grasp control head firmly with one hand and loosen control head lock bushing with the other. Rotate control head to provide proper screw depth. When proper adjustment has been made, positively secure control head to maintain adjustment.

PLACE SCREWS: magnetic tip holds screw for driving. Bit tip does not rotate until pressure is applied to plaster base during application.

ENTER SCREW STRAIGHT: firm hand grip on electric screwdriver is important for straight line of entry. Screw must enter perpendicular to panel face for proper performance. Drive screws at least $\frac{1}{8}$ " from ends or edges of base to provide a uniform dimple not over $1/32$ " deep.

The electric screwdriver handling technique is relatively simple to learn and a proficiency with the tool can be developed after a few hours' use. The following procedures are recommended:

1. Allow motor to run continuously during usage.
2. Seat screws into boards with one thrust. Re-application of thrust pressure may cause clutch to re-engage and chew up screw head or force the screw head below the surface of the plaster base.
3. See illustrations, previous page, showing proper setting and adjusting of screwdriver depth locator.

Nail Application

Begin nailing from central portion of base and proceed toward outer ends or edges. When nailing, apply pressure adjacent to nail being driven to insure base is secured tightly on framing member. Position nails on adjacent ends or edges opposite each other and at least $\frac{1}{4}$ " from ends and edges. Drive the nails with shank perpendicular to plaster base. The nail heads should be driven flush with paper surface but should not break paper. A nail set should not be used. Where base appears too loose, a second nail should be driven within 2" of first nail while applying pressure to bring base in firm contact with framing.

CHAPTER 3
Standard Products
and Application

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CHAPTER

3



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CHAPTER 3

Standard Products and Application

QUALITY PLASTERING PRODUCTS

It is universally acknowledged that a completed plaster job can be no better than the basecoat or finish materials used, and the base to which they are applied. In the years since the company's formation in 1902, United States Gypsum plastering products have earned the overwhelming preference of the marketplace. They have earned it on one basis: *performance*.

This record of performance extends through the complete USG line—broadest in the industry—of plaster and lime products, plaster bases and accessories. It rests largely on the compatibility of components in the plastered wall or ceiling assembly—all designed by U.S.G. to work together. Coming from a single source, they are most capable of satisfying the specific requirements of the job.

Presented on the following pages are the basic materials recommended by United States Gypsum Company for quality plaster walls and ceilings. They are designed to meet the essential requirements of economy, speed of installation, fire and sound resistance, strength and ease of decoration; produced to rigid specifications and carefully quality-controlled throughout their manufacture. These manufacturing safeguards are backed by regular testing and constant product improvement at the USG Research Center, largest and best equipped in the industry. The USG trademark on a product is your assurance of consistent high quality and proven performance to meet your construction needs.

United States Gypsum maintains special plaster sales representatives to consult with contractors, architects and dealers on plastering materials, systems, and special job conditions. They may be reached through the nearest USG Sales Office (listed inside back cover) or by writing to United States Gypsum, Dept. 147, 101 S. Wacker Dr., Chicago, Ill., 60606.

PLASTER BASES

Proper use of USG plaster bases and plasters provides the secure bond necessary in order to develop strength and resistance to abuse and cracking. A "mechanical" bond is formed when plaster is pressed through the mesh or holes of the lath, forming keys on the back side—as with metal lath

BB013 0224

60 PRODUCTS: ROCKLATH Bases

or perforated gypsum lath. A "suction" bond is formed when gypsum plaster is applied over gypsum lath and masonry bases; the tiny needle-like plaster crystals penetrate into the surface pores of the base by suction. When perforated gypsum lath is used, both suction and mechanical bonds are developed.



ROCKLATH multi-ply face paper

Gypsum Plaster Bases

ROCKLATH, IMPERIAL and RED TOP Radiant Heat Plaster Bases are gypsum lath in sheet form providing a rigid, fire-resistant base for the economical application of gypsum plasters. ROCKLATH requires about 45 percent less basecoat plaster than with metal lath.

The gypsum core of this lath is faced with multi-layer laminated paper formulated by an exclusive U.S.G. process to check plaster slide and resist lath sag. As illustrated, the three outer layers (1) are made super-absorbent to draw moisture from the plaster mix so uniformly and so quickly that the plaster takes on anti-slump strength before it can slide; the inner layers (2) are chemically treated to form a positive barrier against moisture penetration, thus prevent softening of the gypsum core and consequent sag after board is in place.

The face paper is folded around the long edges of all three types of gypsum bases; in addition, the ends of IMPERIAL and RED TOP Radiant Heat bases are square-cut and finished smooth. See Chapter 2 for details.

These gypsum bases are fabricated in three thicknesses and in eight different products for specific uses as listed below. ROCKLATH complies with ASTM C37, and Fed. Spec. SS-L-30b. Other features found in gypsum plaster bases are:

INCOMBUSTIBLE: when used with gypsum plaster, gypsum plaster bases provide for excellent fire-resistant construction; up to 2 hrs. for partitions and 4 hrs. for ceilings and column fireproofing.

STRENGTH: when securely attached, gypsum plaster bases add lateral stability to the assembly.

BB013 0225

SOUND RESISTANCE: partitions faced with gypsum plaster bases and plaster on both sides have high resistance to sound transmission; resilient attachment further improves ratings; makes assemblies suitable for party walls.

BONDING: gypsum plaster bonds to these gypsum plaster bases with a safety factor far higher than required to meet usual construction standards.

DURABILITY: not harmfully affected by decay, dry rot, or normal moisture; will not attract vermin.

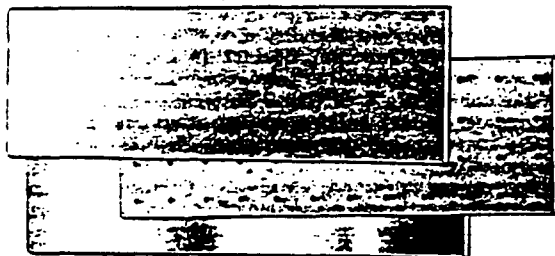
ECONOMY: low cost, ease and speed of erection and savings in plastering are outstanding. ROCKLATH, IMPERIAL, and RED TOP Radiant Heat Plaster Bases are made only by United States Gypsum.

GENERAL LIMITATIONS

1. Max. framing spacing: $\frac{3}{4}$ " thick ROCKLATH, 16" o.c.; $\frac{1}{2}$ " ROCKLATH, 24" o.c.; $\frac{1}{4}$ " veneer bases, 16" o.c.; $\frac{1}{8}$ " veneer bases, 24" o.c. Some deviation from the above is permitted in certain constructions (see system descriptions, Chapter 4).
2. Should be used with gypsum plaster only. Bond between lime or portland cement plaster and ROCKLATH is inadequate.
3. Gypsum lath and plaster, painted, has a vapor permeability of about 3% perms. For higher resistance to vapor transmission, Insulating ROCKLATH Plaster Base (see page 62) should be used.
4. Should not be used in areas exposed to excessive moisture for extended periods. USG galvanized metal lath and portland cement-lime plaster are recommended.

PLAIN ROCKLATH PLASTER BASE is recommended for nail or staple application to wood and nailable steel framing, for clip attachment to wood framing, steel studs and suspended metal grillage, and for screw attachment to USG Metal Studs and Furring Channels.

PERFORATED ROCKLATH PLASTER BASE is identical with Plain ROCKLATH except that $\frac{1}{4}$ " round holes are punched



Types of ROCKLATH Plaster Bases

BB013 0226



Screw application of
ROCKLATH Plaster Base



Clip attachment of
ROCKLATH Plaster Base

through the lath 4" o.c. in each direction, one $\frac{3}{4}$ " diam. hole for each 16 sq. in. of lath area. This provides a mechanical key in addition to the natural plaster bond, and obtains higher fire ratings. Not recommended for attachment to ceilings, either wood framing or metal grillage, where the only support provided is by clips at edges.

ROCKLATH FIRECODE PLASTER BASE is a gypsum lath which combines all the advantages of Plain ROCKLATH with additional resistance to fire exposure—the result of a specially formulated core containing special mineral materials.

LONG LENGTH ROCKLATH PLASTER BASE is manufactured for use in constructions requiring floor to ceiling height lath, such as the Solid ROCKLATH and Plaster Partition System and the USG Exterior Wall Furring System (see Chapter 4 for details). Lengths are mill cut as required up to 10 ft.; formed with longitudinal "V" edges.

INSULATING ROCKLATH PLASTER BASE offers all the advantages of Plain ROCKLATH as a rigid plaster base, is made in the same sizes, but has bright aluminum foil laminated to the back side. This creates an effective vapor barrier at no additional labor cost, to combat moisture condensation—a common cause of peeled exterior paint, warped siding and rotted studding. Its vapor permeability of 0.67 perms is well below the FHA permeability limit of 1.00. In addition, Insulating ROCKLATH provides positive insulation value when installed with the foil facing a $\frac{1}{4}$ " min. air space. When used as a ceiling under winter heating conditions its resistance value is 2.69; in retarding downward heat flow in summer, its effectiveness is nearly double for a resistance value of 4.88 including air space (see table page 63). Corrosion and normal dust accumulation exert negligible effect on the vapor barrier and insulation characteristics of Insulating ROCKLATH.

LONG LENGTH INSULATING ROCKLATH, also with aluminum foil laminated to the back side, is used primarily for furring exterior masonry walls. Lengths are mill cut as required up

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Metal Lath: PRODUCTS 63

to 12 ft.; formed with square edges. Thermal resistance values of Insulating ROCKLATH are as follows:

THERMAL RESISTANCE VALUES

Surface, Heat Flow & Season			Insulating ROCKLATH	
			1/4"	1/2"
horizontal	(up)	winter	2.69	2.82
horizontal	(dn)	summer	4.88	5.01
vertical	(hor)	winter		
		or		
vertical	(hor)	summer	3.89	4.02

NOTE: Resistances are based on still air film, 1/2" sanded plaster, and include air space of 1/4" or more.

GYPSUM PLASTER BASES—TYPES AND SIZES

Product	Thick- ness	Length	Width	Pcs./ bdl.	Approx. Wt. (lbs./ MSF)
ROCKLATH plain, perforated or insulating	1/4"	48"(2)	16"(1)	6	1450
	1/2"	48"	16"(1)	4	1980
ROCKLATH FIRECODE plain (1)	1/4"	48"	16"	6	1500
Long Length ROCKLATH plain or insulating	1/4" (3)	4' to 12'	24"	3	1450
plain	1/2" (4)	4' to 10'	24"	2	1980
IMPERIAL plain (5)	1/4"	8' to 12'	48"	2	1970
	1/2"	8' to 12'	48"	2	2460
IMPERIAL Type X (5)	1/4"	8' to 12'	48"	2	2025
	1/2"	8' to 12'	48"	2	2460
RED TOP Radiant Heat plain (5)	1/4"	8' to 12'	48"	2	1970
	1/2"	8' to 12'	48"	2	2460
Type X (5)	1/4"	8' to 12'	48"	2	2025

*Limited distribution—check for local availability. (1) Also available in 16-1/5" widths in Pacific Coast area—5 pcs./bdl. (2) Plain and Perforated types also available in 96" lengths unbounded. (3) Furnished with square edge. (4) Furnished with "V" edge. (5) See Chapter 2 for product description.

USG Metal Lath

USG Metal Lath is sheet steel that has been slit and expanded to form a multitude of small mesh openings. It is made in Diamond Mesh, Riblath and Stuccomesh types and in two different weights for each style. All are manufactured from rust-resisting copper alloy steel, further protected by a coating of black asphaltum paint, except diamond mesh, which is also available in galvanized steel.

Ends of bundles of USG Metal Lath are spray painted in different colors for various weights, thus simplifying stocking and handling. All 3.4 lb. lath is painted red; 2.5 lb. diamond mesh and 2.75 lb. 1/4" riblath are white; 4.0 lb. 1/2" riblath is yellow.

As a plaster base, USG Metal Lath offers these additional features:

STRENGTH: metal lath embedded within the plaster provides high resistance to transverse impact, thus decreases the

BB013 0228

64 PRODUCTS: Metal Lath

hazards of serious cracks and failures due to structural movement of the frame.

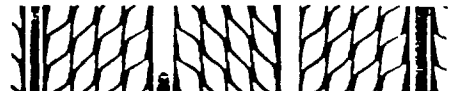
FLEXIBILITY: readily shaped to ornamental contours to a degree not possible with other plaster bases.

FIRE RESISTANCE: when used with gypsum plaster, metal lath provides excellent fire-resistant construction; up to 2 hrs. for partitions and 4 hrs. for ceilings and column fireproofing.

USG
Junior Diamond
Mesh Lath



USG
4-Mesh Riblath



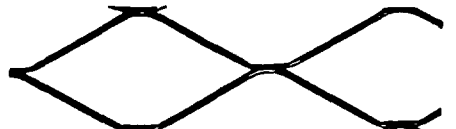
USG
 $\frac{3}{8}$ " Riblath



USG
 $\frac{3}{4}$ " Riblath



USG
Expanded Metal
Stucco Mesh



USG B-V Lath



USG JUNIOR DIAMOND MESH LATH is a small diamond mesh metal plaster base (approx. 11,000 meshes per sq. yd.). A general all-purpose lath, best for ornamental, contour plastering. The small meshes conserve plaster and reduce droppings. Also available in *self-furring* type having $\frac{1}{4}$ " "dimple" indentations spaced $1\frac{1}{4}$ " o.c. each way for use as exterior stucco base, column fireproofing and for replastering over old surfaces.

USG 4-MESH Z-RIBLATH is a "flat rib" type of lath with smaller mesh openings, suitable for "double-up" type of plastering. More rigid than diamond mesh, it is excellent as nail-

on lath, and for tie-on work on flat ceilings. Not recommended for contour lathing.

USG $\frac{3}{4}$ " RIBLATH comes in a herringbone mesh pattern with $\frac{3}{8}$ " V-shaped ribs running lengthwise of the sheet at $4\frac{1}{2}$ " intervals, with inverted intermediate $3/16$ " ribs. The heavy ribs provide exceptional rigidity. Used when supports are spaced more than 16" o.c. and not more than 24", and for 2" solid studless metal lath and plaster partitions. Also used as a centering lath for concrete floor and roof slabs. Unsuitable for contour plastering. Minimum ground thickness must be 1".

USG $\frac{3}{4}$ " RIBLATH provides a herringbone mesh pattern with $\frac{3}{8}$ " deep V-shaped ribs lengthwise of the lath at 6" intervals. It is a structural lath, providing the dual functions of centering and reinforcement for concrete floor and roof slabs; for greater spans than permissible with $\frac{3}{8}$ " riblath. It is not recommended as a plastering lath.

USG EXPANDED METAL STUCCOMESH is a $1\frac{1}{4}$ "x $3\frac{1}{4}$ " diamond mesh pattern designed as a base for exterior stucco, hand or pump applied. It should be applied with $1\frac{1}{2}$ " galvanized self-furring nails; when used over sheathing other than wood, longer nails providing min. penetration of $1\frac{1}{4}$ " into studs should be used.

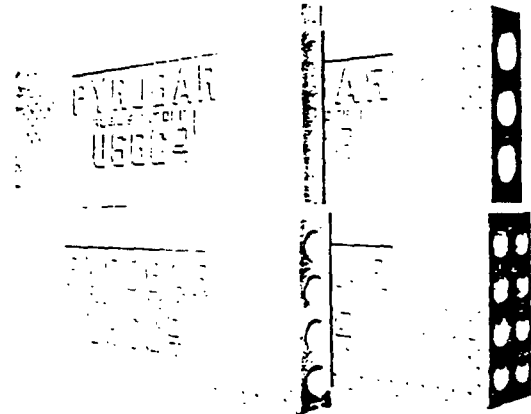
USG B-V LATH has large $\frac{1}{2}$ " diamond-shaped openings, which makes it suitable for reinforcement for many types of light concrete slab work.

USG METAL LATH—TYPES, WEIGHTS, SUPPORT SPACING

Type of Lath (1)	Weight per Sq. Yd.	Size Sheets	Maximum Allowable Spacing				
			Vertical Supports		Horizontal Supports		
			Wood	Metal		Wood or Con- crete	Metal
				Solid Par- titions	Others (5)		
Diamond Mesh	2.5 lb.	27"x96"	16"	16"	12"	(4)	(4)
Diamond Mesh (2)	3.4 lb.	27"x96"	16"	16"	16"	16"	13 $\frac{1}{4}$ "
$\frac{1}{4}$ " Z-Rib	2.75 lb.	27"x96"	16"	16"	16"	16"	12"
$\frac{1}{4}$ " Z-Rib	3.4 lb.	27"x96"	19"	24"	19"	19"	19"
$\frac{1}{4}$ " Rib	3.4 lb.	27"x96"	24"		24"	24"	24"
$\frac{1}{4}$ " Rib	4.0 lb.	27"x96"	24"		24"	24"	24"
B-V Lath	2.5 lb.	24"x96"					
B-V Lath	3.4 lb.	24"x96"					
Stuccomesh (3)	1.8 lb.	48"x99"	16" (3)				
Stuccomesh	3.6 lb.	48"x99"	16" (3)				
			wt. per sq. ft.		size sheets		
$\frac{1}{4}$ " Riblath			0.60 lb.		2' x 8', 10' or 12'		
			0.75 lb.				

NOTES: Diamond Mesh laths also available in self-furring styles. (1) All types made from copper alloy steel containing from 0.20% to 0.25% pure copper, and painted with rust-inhibitive black asphaltum paint. (2) Also available in galvanized steel. (3) Generally applied over exterior sheathing. (4) Not recommended except for fireproofing of steel shapes. (5) Including vertical furring.

BB013 0230



PYROBAR Partition Tile

PYROBAR is a precast, kiln dried gypsum tile for building non-load bearing fireproof partitions. It is made in 12"x30" size, in four thicknesses with indented surfaces, in hollow and solid types as follows:

2" Solid 3" Hollow for column fireproofing

3" Solid, 3" Hollow, 4" Hollow and 6" Hollow for partitions.

Complies with ASTM C52, Fed. Spec. SS-T-316; offers the following advantages:

FIRE RESISTANCE: PYROBAR provides the greatest fire protection per inch of thickness of any commercial partition assembly; fire ratings up to 4 hours for partitions, vent shafts and column fireproofing.

SOUND RESISTANCE: excellent sound transmission loss ratings when plastered two sides, further improved as suitable party wall construction by resilient lath and plaster facing on one side (see Chapter 4 for details).

LIGHTWEIGHT: 30% to 50% lighter than other commonly used masonry units.

ECONOMY: Fewer joints than with smaller masonry units; machine molded units lay accurately to form level surface, require less plaster and mortar than other types; easily cut, handled and maintained; ideal for tenant office renovations.

PLASTER BOND: PYROBAR is the most compatible masonry plaster base for gypsum basecoat plasters.

LIMITATIONS

1. For use only in non-load bearing constructions.
2. Portland cement and lime mortars do not bond adequately

BROOKLYN

with PYROBAR. RED TOP Partition Tile Cement should be used.

3. Portland cement or lime plasters cannot be used over PYROBAR. RED TOP Gypsum Plaster should be used.

4. PYROBAR must be protected by a continuous coating of asphaltic material prior to any contact of wet flooring or base material with the face of the tile.

PYROBAR GYPSUM TILE—TECHNICAL DATA

Product	Approx. Tile Wt. (psf)	RED TOP Partition Tile Cement (bags/MSF) (1)	Sand (cu. ft./MSF)
2" solid	10	5	15
3" solid	15	8	24
3" hollow	10	8	24
4" hollow	13	10	30
6" hollow	22	15	45

(1) 100-lb. bags.

RED TOP PARTITION TILE CEMENT is a specially prepared gypsum cement that develops high early strength; also is excellent for setting clay tile. Used as a mortar in mix of 1 bag per 3 cu.-ft. of sand. Available in 100-lb. bags.

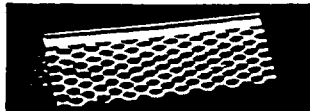
TRIM ACCESSORIES

USG trim accessories—corner reinforcements, screeds, metal trim, control joints, partition terminal and joint reinforcement tape—enjoy the industry's top acceptance because of their dependability and continual improvement in design.

USG Corner Beads should be used on all external plaster corners to provide plaster protection, true and straight lines at corners, and grounds for plastering; USG Casing Beads around wall openings and at intersections of plaster with other finishes. USG Screeds are used to divide different types of plaster finishes and as a separation between plaster and a cement base, or as a permanent incombustible screed to control plaster thickness and alignment beneath the wood or other rigid trim.

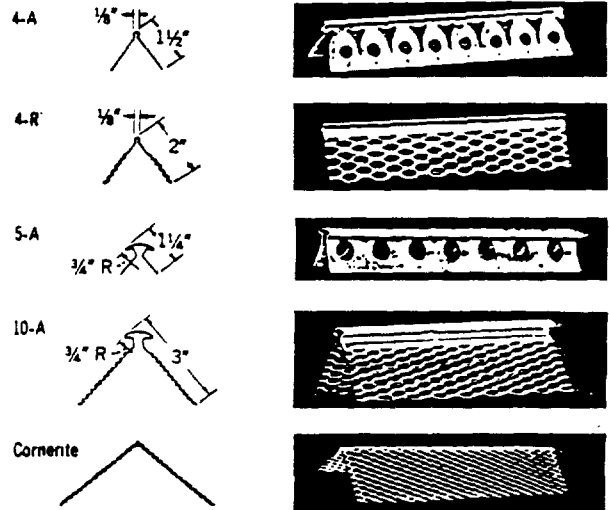
They are made from top-quality galvanized steel—corner beads and screeds from 26-ga., casing beads from 24-ga. steel.

1-A EXPANDED CORNER BEAD has wide expanded flanges that are easily flexed. Preferred for irregular corners. Provides increased reinforcement close to nose of bead.



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68 PRODUCTS: Trim Accessories



4-A FLEXIBLE CORNER BEAD is a general purpose corner bead, economical and most generally used. By snipping flanges, this bead may be bent to any curved design (for archways, telephone niches, etc.). Can be secured to corners with 9-A Corner Bead Clips attached to flanges.

4-R EXPANDED CORNER BEAD is an outstanding item with small nose and totally expanded 2" wide flanges designed to increase plaster keys and minimize corner cracking. A general purpose bead, suitable for straight or arched corners.

5-A BULL NOSE CORNER BEAD is $\frac{3}{4}$ " radius bead with short flange. Used for rounded corners. Can be secured with 9-A Corner Bead Clips attached to flanges, where wide nailing flanges are required.

10-A EXPANDED BULL NOSE CORNER BEAD is a bull nose bead similar to above, but with $2\frac{1}{4}$ " wide expanded flanges. Especially suitable on irregular corners.

CORNERITE AND STRIPLATH are strips of painted copper alloy Diamond Mesh lath used as reinforcement. Self-edge Cornerite, bent lengthwise in the center to form a 100° angle, should be used in all internal plaster angles where metal lath is not lapped or carried around; over non-ferrous lath anchored to the lath, and over internal angles of masonry constructions. Its use is optional in Resilient ROCKLATH lathing systems; also used in the "Floating Angle" method of applying gypsum lath to wood framing in order to reduce plaster cracking. Striplath is a similar flat strip, used as a plaster reinforcement over joints of non-metallic lathing bases and where dissimilar bases join; also to span pipe chases.

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USG CASING BEADS (styles shown below) are used as a plaster stop and exposed to eliminate the need for wood trim around window and door openings; also recommended at junction or intersection of plaster and other wall or ceiling finishes. May be used with USG Metal Lath, ROCKLATH Gypsum Plaster Base, or masonry construction. In order to insure proper grounds for plastering, $\frac{3}{4}$ " casing beads are recommended for use with metal lath, $\frac{1}{2}$ " beads with all masonry units, $\frac{3}{4}$ " beads when the flange is applied under ROCKLATH Plaster Base, $\frac{1}{2}$ " beads when the flange is applied over ROCKLATH.

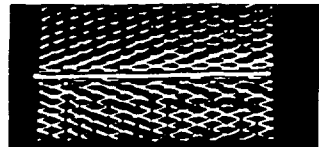
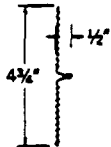


USG CASING BEAD—PRODUCT DATA

Style & Flange	Shipping Unit (Pcs.)	Grounds & Shipping Wt./ MLF (lbs.)			
		$\frac{1}{2}$ "	$\frac{3}{4}$ "	$\frac{1}{2}$ "	$\frac{3}{4}$ "
#4—qtr. rd.—expanded	80 @ 7' or 8'	250	—	280	—
#138—qtr. rd.—short		205	—	227	232
#60—semi-square—expanded	60 @ 10'	222	—	245	—
#60—semi-square—short		167	—	188	202
#66—square—expanded	—	231	241	255	—
#66—square—short		178	—	202	212

3-A EXPANDED BASE SCREED is a flush type $\frac{1}{2}$ " ground (job shimmed for $\frac{3}{4}$ " grounds) with wide flexible expanded flanges for added reinforcement; suitable for uneven surfaces. Used as a dividing strip between plaster and flush portland cement base.

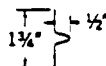
3-A



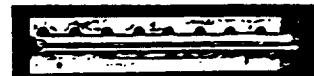
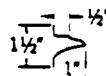
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70 PRODUCTS: Trim Accessories

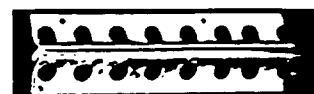
6-A



7-A



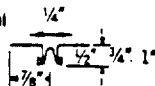
8-A



Partition
Terminal



USG Control
Joints #50,
75, 100



6-A PLAIN BASE SCREED is a flush type $\frac{1}{2}$ " ground (job shimmed for $\frac{3}{4}$ " grounds), used as a straight divider strip between different types of plaster, as between gypsum and portland cement.

7-A CURVED POINT BASE SCREED is a dividing strip for use between plaster surface and projecting portland cement base. Upper ground is $\frac{1}{2}$ ", bottom ground is 1".

8-A PICTURE MOULD provides a concealed mould, attached to lath and plastered flush to the notch opening, leaving a $\frac{1}{4}$ " wide slot into which hooks may be inserted to support picture, maps, etc. Grounds $\frac{1}{2}$ " (job shimmed for $\frac{3}{4}$ " grounds).

USG 2" PARTITION TERMINALS are used as vertical terminals for 2" solid metal lath or ROCKLATH Partitions. Can be used as a ceiling runner where 2" solid partitions abut an unplastered surface. Formed of 24-ga. galvanized and bonderized steel.

USG CONTROL JOINT is designed to relieve stresses of both expansion and contraction in large plastered areas. Made from roll-formed zinc, it is resistant to corrosion in both interior and exterior uses with gypsum or portland cement plaster. An open slot, $\frac{1}{4}$ " wide and $\frac{1}{2}$ " deep, is protected with plastic tape which is removed after plastering is completed. The short flanges are perforated for keying and attachment by wire-tying to metal lath or by stapling to gypsum lath. Thus the plaster is key-locked to the control joint, which not only provides plastering grounds but can also be used create decorative panel designs. Sizes and grounds: No. 50, $\frac{1}{2}$ "; No. 75, $\frac{3}{4}$ "; No. 100, 1" (for uses such as exterior stucco, acoustical plaster work).

BRONZE FINISH

USG TRIM ACCESSORIES—PRODUCT DATA

Product	Shipping Unit (pcs.)	Ship. Unit Length (ft.)	Wt./MLF (lbs.)
1-A Exp. Corner Bead	80 60	7 or 8 9, 10, or 12	195
4-A Flex. Corner Bead	60	7, 8, 9 10, or 12	179
4-R Exp. Corner Bead	80 60	7, 8 9, 10, or 12	155
5-A Bull Nose Corner Bead (1)	80 60	7 or 8 9, 10, or 12	245
10-A Exp. Bull Nose Corner Bead	30	7, 8 9, 10, or 12	350
800-A Corner Bead (3)	60	8	136
800-B Corner Bead (3)	125	8	75
Cornerite	75	8 (2"x2") (3"x3")	90 133
Striplath	75	8 (4") (6")	95 133
3-A Exp. Base Screed	50	10	196
6-A Plain Base Screed	50	10	164
7-A Curved Point Base Screed	50	10	172
8-A Picture Mould	50	10	231
USG 2" Partition Terminal	30	8 or 10	498
USG Metal Trim (3)	700-A	7, 10 (1/4") (3/4")	98 106
		10 (1/4") (3/4")	74 80
	700-B	10 (1/4") (3/4")	74 80
USG Control Joint #50	75	10 (1/4") (3/4")	172 192
	100	(1")	216
	30	8	112
USG Control Joint #093 (3)	25	10	112
IMPERIAL Tape (3)	1	3,600 (2)	—

(1) Fabricated on order. (2) Consists of 12 rolls 300 ft. ea., per carton.

(3) See Chapter 2 for product description.

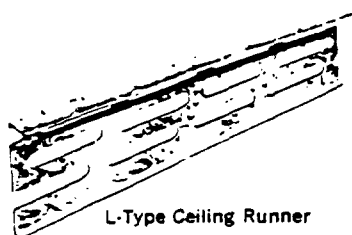
STRUCTURAL ACCESSORIES

USG leads the industry in the development and acceptance of structural components for plastering systems. They offer the advantages of light weight, low material cost and quick erection, superior strength, and versatility in meeting job requirements. All are incombustible, made from cold rolled or galvanized steel or rods.

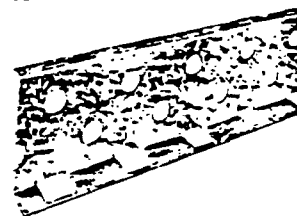
USG runners, metal base and base clips provide secure anchorage, alignment and installation economies for various plaster partitions and wall furring assemblies. Both runners and base clips are pre-punched for quick attachment. Also included are two non-load bearing studs of the truss and channel types, complete with runner tracks, shoes and screws as needed; hat-shaped and U-shaped furring and lathing channels, and an adjustable wall furring bracket.

BR013 0236

72 PRODUCTS: Structural Accessories



L-Type Ceiling Runner



Z-Type Ceiling Runner



Floor Runner-Screed

USG CEILING AND FLOOR RUNNERS, of 26-ga. galvanized steel, come in two models: L-Type Ceiling Runner providing ceiling anchorage for studless metal lath or ROCKLATH Solid Plaster Partitions, Z-Type Ceiling Runner to anchor and align $\frac{3}{4}$ " channels in either solid partition construction or exterior wall furring.

USG FLOOR RUNNER AND SCREED is a one-piece, channel-type combination unit used to anchor 2" solid lath and plaster partitions to concrete floors. Can be cut with a hacksaw or tin snips; fastens to floor with concrete stub nails or rawl drives. Base requires no grouting, except with studless metal lath partitions. One inch legs provide an excellent ground establishing the 2" thickness of the partition. Designed for covering with asphalt or rubber base, and may be installed over a 2" wide wood strip where nailing for wood base is required. Formed of 20-ga. cold rolled steel painted black. Also available with center guides positioned for use with $\frac{1}{2}$ " and 1" Long Length ROCKLATH Plaster Base.

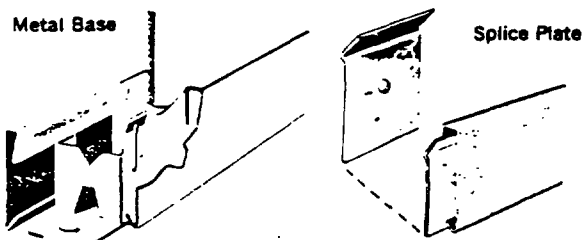
USG METAL BASE makes possible flush installation of a $2\frac{1}{2}$ " high 18-ga. face plate adaptable to all plaster partitions and furred exterior walls, by means of specially formed steel clips.

A strong, rugged base goes into place with minimum labor through snap-on application to the double base clip used in 2" solid plaster partitions or to the single base clip used with hollow partitions or furred walls. The ears of the floor clips engage the top flange of the face plates, automatically adjusting the face plates to uneven or irregular floors. The face plates are easily mitered or notched and bent to form outside corners. For inside corners or continuous uninterrupted runs from one type of wall construction to another, the face plates are butted.

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As a floor runner with solid partitions, the base is grouted full with sanded plaster and raked out in a "V" to receive the Long Length ROCKLATH. The base is mill-primed with a rust inhibitive paint.

USG METAL BASE SPLICE PLATES join the metal base face plates together quickly and in proper alignment.

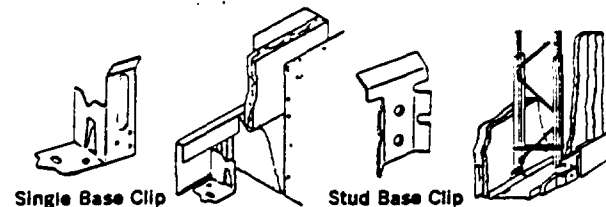
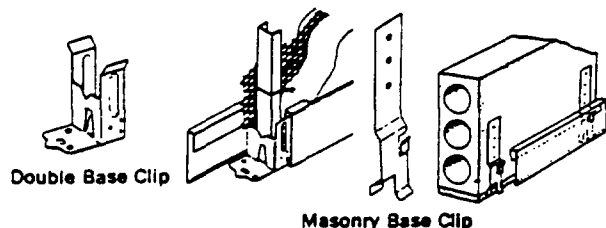


USG DOUBLE BASE CLIP is designed to secure a solid plaster partition to the floor and provide attachment of the USG 2½" Metal Base Face Plate to both sides. Available for the 2" and 2½" Solid Partitions.

USG SINGLE BASE CLIP is used primarily as an attachment for the 2½" USG Metal Base Face Plate for furred walls or partition systems of varying widths.

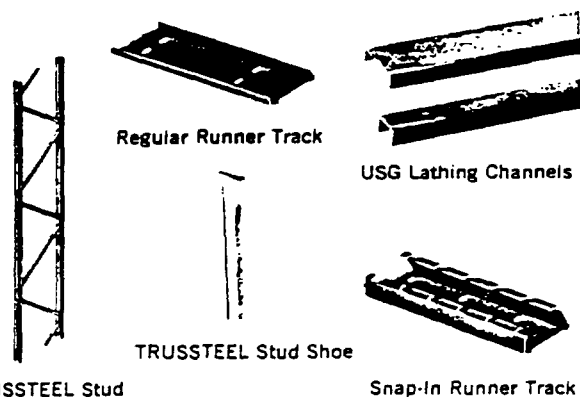
USG MASONRY BASE CLIP is designed for attachment of the USG Metal Base Face Plate to masonry; providing a ¾" plaster ground.

USG STUD BASE CLIP attaches the USG Metal Base Face Plate to studs. Clips may be wire tied, nailed or screwed to the studs.



BB013 023B

74 PRODUCTS: Structural Accessories



TRUSSTEEL Stud

Snap-In Runner Track

TRUSSTEEL STUDS are the original open truss design studs for the erection of hollow, fire-resistant partitions. The strongest non-load bearing studs on the market, they are formed from cold drawn No. 7-ga. steel wire rods with a tensile strength of 90,000 psi—substantially higher than the hot rolled sheets from which pressed metal and edge angle studs are formed.

Made with a continuous diagonal wire web welded to double wire flanges, TRUSSTEEL Studs are fabricated in five stud widths: 1½", 2½", 3½", 4" and 6", mill cut to job lengths. The open-web design readily accommodates pipes, conduits and ducts without impairing the strength of the partition assembly. This engineered member, together with its accessories, provides a framework for easy direct or resilient attachment of metal lath or ROCKLATH plaster base.

USG SNAP-IN RUNNER TRACK is used in anchoring the TRUSSTEEL Stud Partition to the floor. Attachment of stud to track is by a snap-in feature, eliminating the need for stud shoes. When the track serves as a ceiling runner, however, stud shoes are used if a fire rating is required. Available for all except the 6" width of TRUSSTEEL Studs.

USG REGULAR RUNNER TRACK is used in conjunction with TRUSSTEEL Stud Shoes to anchor the partition to the floor or ceiling, particularly where there is considerable floor-to-ceiling height variation. Available for all widths of TRUSSTEEL Studs. Where top track is attached to suspended or furred framing, 1" tapping screws are used to anchor top course of lath into web wires of studs.

TRUSSTEEL STUD SHOES: 7" long, are used for connecting studs to regular track and permit up to a 4" adjustment in partition height.

USG LATHING CHANNELS are cold rolled from 16-ga. steel, black asphaltum painted; used for furring, suspended ceilings, partitions, and ornamental lathing. Sizes: ¾", 1½", 2".

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BOLTS
GREAT

USG METAL STUDS are roll formed in three stud widths, 1½", 2½" and 3½", from 25-ga. electro-galvanized steel. Their channel design allows economical 24" spacing of studs, and eliminates need for component accessories. Limited chaseways are provided by cutouts at top and bottom of the studs. They may be overlapped and spliced by means of screws or wire ties.

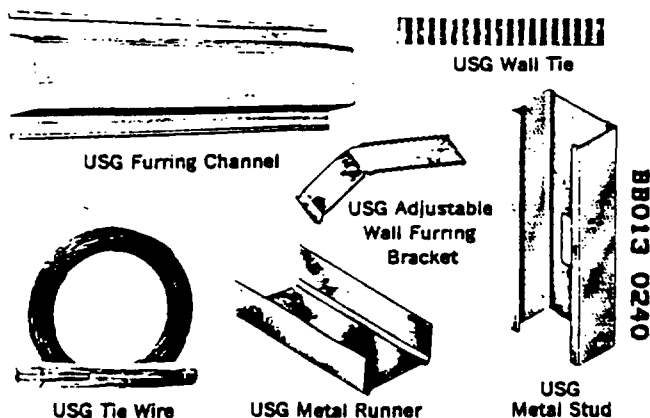
USG METAL RUNNER is supplied in the three stud widths for use at floor and ceiling. The 25-ga. electro-galvanized steel track also functions as a header over metal door and borrowed light frames. At the floor, the track may be used in combination with the USG 2½" Metal Base and Stud Base Clip.

USG FURRING CHANNEL is a roll formed hat-shaped section of 25-ga. electro-galvanized steel. It may be clip attached with USG Furring Clips to the 1½" main carrying channel for economical screw attachment of ROCKLATH as a base for either adhesive attachment of acoustical tile or a basecoat plaster. The Metal Furring Channel also provides an incombustible furring for exterior walls with screw attachment of ROCKLATH or IMPERIAL Plaster Base.

USG ADJUSTABLE WALL FURRING BRACKETS are used for attaching ¾" furring channels to exterior masonry walls. Made with serrated edges of 20-ga. galvanized steel, they are wire-tied to horizontal stiffeners in braced furring systems. Normal furring depth is ¾" to 2¼"; with USG Furring Channels, depth is increased by ¾".

USG WALL TIES are ¾"x7" corrugated galvanized steel anchors used to tie masonry veneer to the structure.

USG TIE WIRE is 18 to 16-ga. galvanized soft annealed wire for tying metal lath to channels and furring to runner channels; also 8-ga. Hanger Wire for suspended ceiling channel runners when spaced not more than 4 ft. o.c.



76 PRODUCTS: Fasteners

USG STRUCTURAL ACCESSORIES—PRODUCT DATA

Product	Lengths (ft.)	Shipping Unit (pcs.)	Wt./M	
			pcs.	lin. ft.
USG Ceiling & Floor Runner				
L-Type ceiling runner	8	80		175
Z-Type ceiling runner	10	50		255
USG Floor Runner & Screed	10	50		470
USG Metal Base	10	10		640
USG Metal Base Splice Plate	—	500	75	
USG Double Base Clip	—	400	92	
USG Single Base Clip	—	500	70	
USG Masonry Base Clip	—	350	92	
USG Stud Base Clip	—	500	58	
TRUSSTEEL Stud	per order to job length	—		400-515
USG Snap-In Runner Track	8	10		295-470
1½"-2½"-3½"-4" widths				
USG Regular Runner Track	8	10		200-525
1½"-2½"-3½"-4"-6" widths				
TRUSSTEEL Stud Shoes	—	500	90	
USG Metal Studs—				
widths 1½"	8, 9	10		340
2½"	8, 9, 12	10		430
3½"	8, 9, 10, 12, 16	10		510
USG Metal Runners	12	10		283-339-
1½"-2½"-3½" widths				422
USG Metal Angle Runner				
Size 1½"x½" (2)	10	10		176
USG Furring Channel	12	10		320
USG Furring Clip	—	500	36	
USG Adj. Wall Furring Bracket	—	500	52	
USG Lathing Channels—½"	16-20	20		300
1½" and 2"	16-20	10		500-629
RC-1 Resilient Channel (2)	12	20		213
USG Wall Ties	—	1000	35	
USG Tie Wire	(1)	50# coil		
	(1)	25# hank		

(1) Approx. footage of wire: 8-ga.—671 ft.; 16-ga.—5,000 ft.; 18-ga.—8,000 ft.

(2) See Chapter 2 for product description.

CLIPS AND SCREWS

A complete line of specially formed steel clips and self-drilling steel screws is available to provide positive attachment and rapid erection of USG gypsum plaster bases and metal lath. Various types are designed for use with different USG partition and ceiling systems.

BRIDJOINT Clips provide a rigid alignment of **ROCKLATH** Plaster Base where ends of lath do not fall on structural members, thus adding crack resistance at vulnerable points;

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BRACE-TITE Clips, of special wire, attach $\frac{3}{8}$ " ROCKLATH to metal ceiling grillages, exterior wall and beam furring channels, and TRUSSTEEL Studs in partitions; TRUS-LOK Clips attach $\frac{3}{8}$ " ROCKLATH to TRUSSTEEL Studs; USG Bracing Clips and Ceiling Runner Clips attach Long Length ROCKLATH to channels and runners.

USG Resilient Clips provide a non-rigid or floating attachment of $\frac{3}{8}$ " ROCKLATH Plaster Base and USG Metal Lath to the structural frame, thus affording increased protection against plaster cracking due to structural movement, and increased sound resistance.

BRIDJOINT FIELD CLIP B-1 is used to support and align end joints which do not fall opposite structural members; sizes for both $\frac{3}{8}$ " and $\frac{1}{2}$ " ROCKLATH.

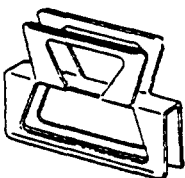
BRIDJOINT CORNER CLIP B-2 is used in conjunction with B-1 clips to eliminate nailing of ROCKLATH in interior corners or angles; also when ceilings are resilient and walls nailed direct. For $\frac{3}{8}$ " ROCKLATH only.

BRACE-TITE FIELD CLIP BT-1 is used for suspended ceilings, exterior wall and beam furring and hollow pipe chase partitions. Provides support across full width of lath. For use with standard $\frac{3}{8}$ " cold rolled channels.

BRACE-TITE STARTER CLIP BT-1 is used in conjunction with BT-1 field clip to start first course of lath.

TRUS-LOK FIELD CLIP TL-1 is designed for attaching $\frac{3}{8}$ " ROCKLATH Plaster Base to TRUSSTEEL Studs.

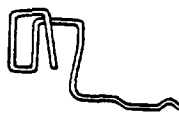
TRUS-LOK STARTER CLIP TL-2 is used in conjunction with TL-1 Clips, MS-1 Clips and runner track to start first course of lath.



BRIDJOINT B-1



BRIDJOINT B-2



BRACE-TITE
Starter Clip BT-1



BRACE-TITE Field Clip BT-1



TRUS-LOK Starter Clip TL-2



TRUS-LOK Field Clip TL-1

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78 PRODUCTS: Clips



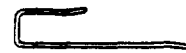
TRUS-LOK
Drive-In
Starter Clip



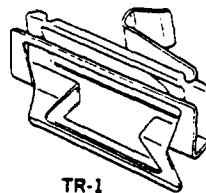
MS-1 Clip



USG Bracing Clip



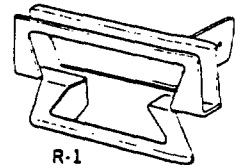
Ceiling Runner Clip



TR-1



R-SF



R-1

TRUS-LOK DRIVE-IN CLIP is used to anchor (1) bottom course of lath in direct attachment to TRUSSTEEL Studs, and (2) top course of lath in partitions to underside of monolithic concrete flat slab or concrete joist filler construction; also as starter-finisher clip with Metal Stud-ROCKLATH Partition.

MS-1 CLIP serves for direct attachment of $\frac{3}{8}$ " ROCKLATH to channel-type USG Metal Studs.

USG BRACING CLIP is provided for attaching $\frac{3}{4}$ " channels to $\frac{1}{2}$ " long length ROCKLATH as temporary braces in 2" solid ROCKLATH and plaster partition construction.

CEILING RUNNER CLIPS are used for attaching Long Length ROCKLATH to "L" shaped ceiling runners.

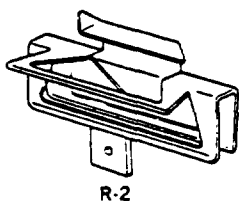
RESILIENT CLIP TR-1 attaches $\frac{3}{8}$ " ROCKLATH to TRUSSTEEL Studs spaced 16" o.c., furs lath $\frac{3}{8}$ " from stud face.

RESILIENT STARTER-FINISHER CLIP R-SF is used with starting and last courses of resiliently attached ROCKLATH Plaster Base on wood studs or TRUSSTEEL Stud snap-in runner track.

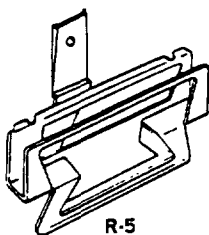
RESILIENT CLIP R-1, for wood studs or joists spaced 16" o.c., is attached by nailing with 13-ga., $1\frac{1}{4}$ " lathing nail. ROCKLATH is floated $\frac{3}{8}$ " free of framing members.

RESILIENT CLIP R-2 is for internal angles of wood frame construction when both surfaces are resiliently furred. Furs lath $\frac{3}{8}$ " from framing.

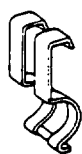
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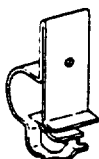
R-2



R-5



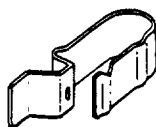
100



200



400



500

RESILIENT CLIP R-5 is used on masonry walls or for face attachment over sound deadening board. ROCKLATH Plaster Base is resiliently furred out $\frac{1}{2}$ " from face of masonry or backing board.

RESILIENT CLIP NO. 100 is used to resiliently fur $\frac{3}{4}$ " cold rolled channels from $1\frac{1}{2}$ " runner channels in suspended ceiling construction. Alternate clips on each channel are reversed. Lath is furred $1\frac{1}{4}$ " from runner channel.

RESILIENT CLIP NO. 200 attaches $\frac{1}{4}$ " pencil rods to wood studs or joists, thus floats metal lath $\frac{1}{2}$ " free of framing members when lath is wire tied to rods. On walls, rods are snapped into clips; on ceilings, clips are slipped onto rods. Clips are attached with 13-ga. $1\frac{1}{4}$ " lathing nails.

RESILIENT CLIP NO. 400 is snapped over outer flanges of TRUSSTEEL Studs, $\frac{1}{4}$ " pencil rod is snapped into protruding tongue of clip, and metal lath wire tied in place $\frac{1}{2}$ " from stud face.

RESILIENT CLIP NO. 500 provides furring and resilient attachment of metal lath on masonry surfaces. A $\frac{3}{4}$ " channel is wire-tied inside protruding tongue of the clip and metal lath is tied to channel, thus is furred out $\frac{3}{4}$ " from face of masonry.

BB013 0244

80 PRODUCTS: Fasteners

FASTENER SELECTOR GUIDE—ROCKLATH PLASTER BASES

Framing	Max. Frame Spacing C. to C.	Attachment	Fastener Spacing C. to C.
½" ROCKLATH Plaster Base			
wood	16"	Nails—13 ga., 1½" long, ¼" flat head, blued Staples—16 ga. galv. flattened wire, flat crown ⅛" wide, ½" divergent legs R-1 & R-2 Clips	4 per 16" width of lath 1 per 16"
USG metal stud	16"	Screws—USG 1", Type S	2 per 16" width, 2" from edges
TRUSSTEEL stud	16"	TL-1 clips TR-1 resilient clips (& accessories)	16" along stud
metal nailing stud	16"	Nail or staple as recommended by stud manufacturer	4 per 16" width
¼" channel	16"	BRACE-TITE clips (& accessories)	1 per 16" width
USG metal furring channel	16"	Screws—USG 1", Type S	3 per 16" width, 1" from edges & center
½" ROCKLATH Plaster Base			
wood	24"	Nails—13 ga., 1½" long, ¼" flat head, blued Staples—16 ga. galv. flattened wire, flat crown ⅛" wide, 1" divergent legs	5 per 16" width of lath

FASTENER SELECTOR GUIDE—USG METAL LATH

Framing	Attachment	Fastener Spacing C. to C.
	Nails—4d common, driven to ¾" penetration and bent over to engage 3 strands or through the nb	6"
Wood Studs	Nails—1" roofing nail ⅛" head, engaging 2 strands or through the nb	6"
	Staples—1", 14 ga. wire staples, engaging 2 strands or a nb	6"
	Nails—1½", 11 ga. barbed roofing nail, ⅛" head, engaging 2 strands or a nb	6"
Wood Joists	Nails—1½", 11 ga. barbed roofing nail, ⅛" head, engaging 2 strands or a nb	6"
Steel Studs, Channels or Rods	No. 18 ga. tie wire	6"
Nailing Studs	Nail or staple as recommended by manufacturer of the member	6"

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USG LATH ATTACHMENT CLIPS—PRODUCT DATA

Product	Clips Per 100 Sq. Yds. Surface (1)	Shipping Unit (Pcs.)	Wt./ M Pcs. (Lbs.)
BRIJOINT Clip B-1	350	½" - 500	38
	350	½" - 400	37
BRIJOINT Clip B-2	(2)	500	55
BRACE-TITE Field Clip BT-1	550-600(3) 750-800(4)	500	55
BRACE-TITE Starter Clip BT-1	(5)	500	21
TRUS-LOK Field Clip TL-1	550-600	1000	26
TRUS-LOK Starter Clip TL-2	(6)	500	15
TRUS-LOK Drive-In Clip	(6)	500	22
MS-1 Clip	550-600	1000	22
USG Bracing Clip	(7)	500	14
Ceiling Runner Clip	(8)	500	10
Resilient Clip TR-1	550-600	250	68
Resil. Starter-Finisher Clip R-SF	(6)	250	22
Resilient Clip R-1	550-600	250	68
Resilient Clip R-2	(2)	250	68
Resilient Clip R-5	550-600	200	64
Resilient Clip No. 100	(9)	500	56
Resilient Clip No. 200	(10)	500	44
Resilient Clip No. 400	(11)	1000	27
Resilient Clip No. 500	500-510	500	78

(1) Quantity based on stud spacing of 16" o.c. unless otherwise noted. (2) 1 ea. 16" of angle corner. (3) ½" chan. frame 16" o.c. (4) ½" chan. frame 12" o.c. (5) 1 clip at each chan. frame and starter lath juncture. (6) 1 ea. 16" at bottom edge of first course—may be used on top edge of last course—adaptable to varying thicknesses of board. (7) 1 ea. lath at temp. bracing channel—2 at each chan. end. (8) 2 ea. lath. (9) 350 clips req'd. with furring chan. 12" o.c.—275 clips req'd. with fur. chan. 16" o.c. (10) 600 req'd. with clips spaced 16" o.c. along stud—750 req'd. with clips spaced 12" o.c. along stud. (11) 775 req'd. with clips spaced 12" o.c. along stud—600 req'd. with clips spaced 16" o.c. along stud.

USG SCREWS are the recommended means of attaching ROCKLATH Plaster Base in certain applications and are also used for attaching large-size IMPERIAL Plaster Base and RED TOP Radiant Heat Plaster Base.

For application of single layer ½" ROCKLATH Plaster Base to USG metal studs, or furring channel USG 1" Type S Bugle Head Screws are used. For attaching metal door frames to steel studs, USG ½" Type S-12 Pan Head Screws are used; for steel studs to metal runners, USG ¾" Type S Pan Head Screws. See general screw data—pages 36, and 38.



BBO13 0246

BASECOAT PLASTERS AND APPLICATION

Basecoat plasters are expected to be uniform, plastic and free-spreading. They must be easily mixed and must provide high coverage while setting to maximum hardness and greatest possible strength.

For the beauty and durability of which plaster is capable, requirements should be followed as to the number of coats applied. Three-coat work is necessary on all metal lath and on edge-supported gypsum lath used in ceilings; three-coat work is desirable on all gypsum lath; two-coat work is acceptable on unperforated gypsum lath when properly supported and on masonry plaster bases (PYROBAR Tile, rough concrete block, clay tile, or porous brick).

In preparing for plastering, consideration should be given to the selection of materials not only for compatibility but for the quality of the structure to be plastered. It is wise to upgrade plastering specifications when possible.

Following are general recommendations listed in order of preference. No. 1 in each case can be expected to produce the highest quality results:

BASECOAT PLASTER OVER METAL LATH

Scratch Coat	Brown Coat
1. STRUCTO-BASE (1) Plaster, sanded 100:2	STRUCTO-BASE Plaster, sanded 100:3
2. Wood Fiber, neat or sanded up to 100:1	Wood Fiber, sanded up to 100:1
3. Wood Fiber, neat, or sanded up to 100:1	RED TOP Gypsum Plaster, sanded 100:2
4. Wood Fiber, neat, or sanded up to 100:1	STRUCTO-LITE Plaster (sand float finish only)
5. RED TOP Gypsum Plaster, sanded 100:2	RED TOP Gypsum Plaster, sanded 100:3
6. RED TOP Gypsum Plaster, perlited 100:2	RED TOP Gypsum Plaster, perlited 100:2 (sand float finish only)

(1) Verify availability with your local U.S.G. Sales representative.

BASECOAT PLASTER AGGREGATES OVER GYPSUM LATH

Select Plaster from Technical Data Chart according to requirements and aggregate preference below.

- | | |
|-----------------------|--------------------------|
| 1. Sand | 3. Job-mixed perlite |
| 2. Mill-mixed perlite | 4. Job-mixed vermiculite |

Note: Lightweight aggregate should not be used on a construction where sound isolation is a consideration.

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RED TOP Wood Fiber Plaster

A gypsum plaster containing fine particles of selected wood fiber, normally requiring only the addition of water. When used over masonry or gypsum lath or as a brown coat on metal lath, 1 cubic foot of sand per 100 lbs. of plaster should be added.

Wood Fiber Plaster can be applied to all standard lath and masonry surfaces and is recommended as a scratch coat for metal lath. Outside masonry walls should be furred prior to plastering to prevent seepage and condensation.

Wood Fiber, neat, weighs approx. $\frac{1}{4}$ less than a sanded gypsum basecoat, has nearly twice the compressive and tensile strength of sanded plaster and generally provides greater fire resistance than normally sanded gypsum plaster at a slightly higher cost. Complies with ASTM C-28 and Fed. Spec. SS-P-402 Type W.

RED TOP Gypsum Plaster

This is a gypsum basecoat requiring the addition of an aggregate, to be used on approved plaster bases. It is supplied as either fibered (recommended for scratch coat on metal lath) or unfibered, in three types:

- (1) REGULAR: use with sand aggregate, hand application.

BB013 024B

84 PRODUCTS: Basecoat Plasters

(2) LW: use with lightweight aggregate, hand application.

(3) Machine Application: for use with sand or lightweight aggregate. When used with perlite aggregate and machine applied, vertical lift should not exceed 30 ft. and hose length 150 ft. All three comply with ASTM C-28 and Fed. Spec. SS-P-402 Type N.

STRUCTO-BASE Plaster

Developing higher strength than conventional plasters, this gypsum basecoat plaster is highly recommended for such areas as schools, hospital corridors, handball courts, etc., or wherever a high-strength basecoat is needed. Complies with Fed. Spec. SS-P-402 Type N, and ASTM C-28, Gypsum Neat Plaster, including a strength requirement of 2800 psi min.

STRUCTO-LITE Gypsum Plaster

A mill-mixed perlite aggregate gypsum plaster that requires the addition of only water at the job site. It is formulated in four types: *Regular*—for use over gypsum lath, hand application; *Masonry*—for use on high suction unit masonry base only, hand application; *Regular for Machine Application*—for use over gypsum lath; *Masonry for Machine Application*—for high-suction unit masonry.

STRUCTO-LITE weighs less than half as much as a sanded basecoat, provides three times the thermal insulation of sanded plaster and offers excellent fire protection. Over-all cost is comparable to job-mixed lightweight aggregate plaster. Complies with ASTM C-28, Gypsum Ready-Mixed Plaster. Same machine application limits as for RED TOP Gypsum Plaster—perlite mix.

Portland Cement-Lime Plaster

Required for interior use where high moisture conditions exist such as steam rooms, dairies, showers, etc.; also used as an exterior basecoat for stucco. A portland cement-lime plaster is prepared on the job in the following proportions:

SCRATCH COAT: 1 sack portland cement, 2 sacks USG MORTASEAL Lime, 7½ cu. ft. sand; 2 lbs. fiber (over metal lath or stucco mesh).

BROWN COAT: 1 sack portland cement, 2 sacks MORTASEAL Lime, 9 cu. ft. sand.

FINISH COAT: ORIENTAL Exterior Stucco (mill-mixed) or a float or texture-finish plaster.

With portland cement-lime plaster, scratch and brown coats require curing with water after set. Self-furring metal lath must be used over smooth dense surfaces, gypsum lath or

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gypsum block. Control joints should be provided to compensate for the shrinkage of the portland cement plaster during drying. A Keenes Cement-Lime Putty Plaster cannot be used over a portland cement basecoat.



Application of RED TOP Basecoat Plasters

The plaster basecoat is the most important element of the plastered wall; therefore it is necessary to select the proper basecoat plaster and apply it in an approved manner.

TWO-COAT WORK: over gypsum lath and masonry apply the basecoat with sufficient material and pressure to form a good bond to the base and to cover well; then double back to bring the plaster out to grounds, straighten to a true surface with rod and darby without the use of additional water, and leave rough to receive the finish coat.

THREE-COAT WORK: apply scratch coat with sufficient material and pressure to form good full keys on metal lath and a good bond on other bases, then cross-rake. After the scratch coat has set firm and hard, apply the brown (second) coat, bring out to grounds and straighten to a true surface with rod and darby without the use of additional water. Leave rough to receive the finish coat.

Important Job Precautions

EQUIPMENT AND STORAGE OF MATERIALS: all successful plaster jobs require adequate equipment: mortar boxes, mortar boards, scaffolding and tools. Ample scaffolding should be provided to permit continuous application of both basecoat and finish plasters for a complete panel of wall or ceiling. Keep all mixing tools clean by washing in clean water only. To keep stored plaster dry, stack on planks raised off ground and away from damp walls or floors.

HEATING: plaster must not be applied to surfaces that contain frost. A minimum temperature of 55°F. should be maintained for an adequate period prior to, during, and after

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86 PRODUCTS: Basecoat Plasters

application of the plaster. In cold, damp or rainy weather, properly regulated heat should be provided but precautions must be taken against rapid drying before set has occurred. This prevents "dry-outs."

VENTILATION: As soon as the plaster has set, free circulation of air should be provided to carry off excess moisture and prevent "sweat-outs." After plaster has set, heating should be continued to insure as rapid drying as possible. In hot, dry weather, protect the plaster from wind and from drying unevenly or too rapidly before set has taken place. If glazed sash are not in place, exterior openings in the building should be screened with cheesecloth or similar material.

Application over Concrete

SURFACE PREPARATION: monolithic concrete surfaces should be brush-cleaned of all dust, loose particles and other foreign matter. Remove all laitance and efflorescence by washing with a 10% solution of commercial muriatic acid and water, then rinsing well with clear water. Remove grease or form oil by wiping with naphtha spirits. A high-quality plaster bonding agent should be applied to all surfaces according to manufacturer's directions.

BASECOAT PLASTERS—TECHNICAL DATA

Product and Mix	Compressive Strength Psi—Dry (1)	Weight Lbs./Cu. Ft.—Dry	Bag Size (Lbs.)	Coverage/Ton Plaster (Sq. Yds.) (2)		
				Gypsum Lath	Metal Lath	Unit Masonry
STRUCTO-LITE (regular)	600-800	50	80	135-145	70-80(3)	130-140
Wood Fiber neat	1500-2000	82	100	85-95	45-55	100-110
Wood Fiber (sand) 100:1	1200-1600	97	100	125-145	65-75	100-110
STRUCTO-BASE (sand) 100:2	2800-3200	124	100		90-105	155-170
IMPERIAL (Basecoat) neat	3000-4000	107	80	360-470		300-400
RED TOP mixed with— (Sand)						
100:2	750-1100	107				
100:2½	650-850	108		200-220	105-120	175-190
100:3	550-750	109				
(Perlite)						
100:2	600-800	48	50 to			
100:3	450-600	41	100	180-190	80-95(3)	145-155

(1) Average Laboratory Test Results. Figures may vary slightly for products from individual plants. Tested in accordance with ASTM C472.

(2) Grounds (including finish coat): Gypsum lath— $\frac{1}{2}$ " (face of lath), metal lath— $\frac{1}{4}$ " (back of lath), unit masonry— $\frac{1}{4}$ ", IMPERIAL Plaster— $\frac{1}{2}$ ".

(3) Lightweight aggregated plasters are not recommended over metal lath when the finish coat is to be smooth troweled.

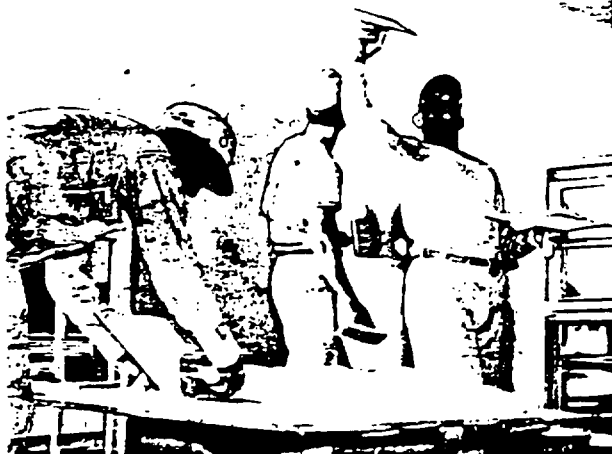
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VENEER PLASTERS

Today's plastering includes: high-strength veneer plasters—IMPERIAL Plaster Basecoat with DIAMOND Plaster Finish (an extra hard finish) and specially fortified heat-resistant RED TOP Radiant Heat Plaster. See Chapter 2 for complete description and application of these products.

FINISH PLASTERS AND APPLICATION

Finish plasters serve as a leveling coat over the basecoat to provide a durable surface with the required resistance to abrasion. Some finishes are used as a base for decoration while others provide the final finished surface themselves.



There are several types of gypsum finish plasters, some requiring the addition of water only and others which are a blend of gypsum, lime and water, or of gypsum, lime, sand and water. They are selected according to job requirements for texture, color, hardness, sound absorption and for compatibility with the basecoat.

Since the finish plaster coat comprises about 75% of the visible room area, it is important to select high-quality materials, mix them properly and use according to directions.

BB013 0252

88 PRODUCTS: Finish Plasters

USG FINISH PLASTERS—TECHNICAL DATA

Product	Finish Texture	Physical Properties	Gauging to Lime, (Dry Wt.)	Wt. per Bag	Sq. Yds. per Ton (1)
ORIENTAL Interior Finish	Float or Texture Finish	Hard and Resistant to Abrasion	neat	100	250-300 1/4"
STRUCTO-GAUGE and Lime Putty	Smooth Trowel	Extremely Hard and Resistant to Abrasion	100 lbs. gauging 100 lbs. lime	100 50	300-375
		Hard and Resistant to Abrasion	100 lbs. gauging 200 lbs. lime	100 50	335-400
DIAMOND Finish	Smooth Trowel	Hard and Resistant to Abrasion	neat	50	390-445
Keenes Cement-Lime Putty	Smooth Trowel	Hard and Resistant to Abrasion	400 lbs. Keenes 100 lbs. lime	100 50	260-340
		Med. Hard and Resistant to Abrasion	200 lbs. Keenes 100 lbs. lime	100 50	285-400
Gauging Plaster Lime Putty	Smooth Trowel	Standard	50 lbs. gauging 100 lbs. lime	100 50	390-465
Keenes Cement, Lime Putty and Sand	Float Finish	Hard	100 lbs. Keenes 50 lbs. lime 400 lbs. sand	100 50	250-300
Gauging Plaster, Lime Putty and Sand	Float Finish	Standard	50 lbs. gauging 100 lbs. lime 400 lbs. sand	100 50	250-300
ORIENTAL Exterior Stucco	Float or Texture Finish	Extremely Hard and Resistant to Abrasion	neat	100	150-200 1/4"

(1) 1/4" thick except as noted

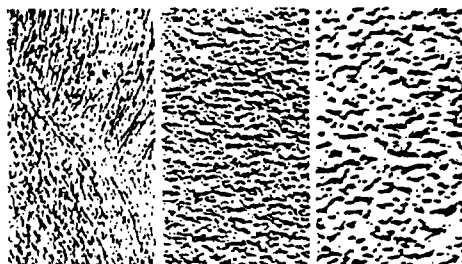
MONOTRON SURFACE HARDNESS—GAUGING PLASTERS

(Kilograms required to force a 10 mm. diameter steel ball 0.1" into plaster face)

Gauging/Lime Ratio	STRUCTO-GAUGE	Regular Gauging	Keene's Cement Regular	Quick-trowel
1:4	27	24	14	19
1:2	48	34	19	25
1:1	105	51	27	37
2:1	162	74	34	51
4:1	206	96	40	63

Bold faced figures indicate recommended proportioning.

BB013 0233



Trowel finish Float finish Spray finish Texture finish

TROWEL FINISHES: used where a smooth, easily maintained surface is desired, often as a base for paint or other wall coverings. The degree of hardness, porosity, and polish is determined by the materials and application techniques used. When a smooth-trowel gauged lime putty finish is used over a basecoat containing lightweight aggregate on any plaster base, it is necessary to add at least 50 lbs. of fine silica sand or $\frac{1}{2}$ cu. ft. of perlite fines per 100 lbs. of gauging plaster to improve the compatibility of the finish with the basecoat.

FLOAT OR SPRAY TEXTURE FINISHES: provide pleasing, durable finishes where surface textures are desired. They are recommended over all types of gypsum basecoats and are the most desirable finishes from the standpoint of crack-resistance. The surface texture is easily controlled and can be produced by spray application, power float, or a variety of hand tools.

OTHER TEXTURE FINISHES: many pleasing and distinctive textures are possible using various techniques in finishing. Finishes may range from an extremely fine stipple to a rough, heavy or coarse texture. Variety is limited only by the imagination of the designer or the ingenuity of the applicator.

ORIENTAL Interior Finish

This is a factory-prepared white finish containing properly graded aggregate to insure easy-working qualities and uniformity in results. It requires no further decoration and may be applied to produce many types of surfaces ranging from very fine sandfloat finish to a heavy texture. It is highly resistant to abrasion because of its great hardness and is uniform in color. To eliminate need for further surface decoration, color may be added to the plaster mix.

Mixing and Application

Add clean water only and hoe the plaster into the water. Allow to soak 20 or 30 min. and mix thoroughly to a smooth, creamy, easy-working consistency. This plaster must be applied to a set, "half-green" basecoat of gypsum plaster. If the

BB013 0254

90 PRODUCTS: Finish Plasters

basecoat is exceptionally dry, it should be sprayed uniformly with clean water the night before finishing.

Apply by hand in a two-coat double-back operation. Scratch in a thin coat well ground into the base and double back with a second coat, filling out to a true, even surface. The surface can be floated with a sponge, sponge rubber or carpet float. Do not use water while floating.

The finish can be applied in any desired texture except a smooth trowel finish; also can be spray-applied. For uniform appearance, spray finishes must be applied over a smoothly troweled level finish plaster surface.

DIAMOND Finish Plaster

A new pre-mixed interior finish that provides exceptional surface hardness, greater crack resistance and excellent trowelling features. See Chapter 2 for complete description and application.

RED TOP Concrete Finish

Mill-prepared plaster for leveling and texturing interior monolithic concrete surfaces which have been treated with a high-quality bonding agent for bonding gypsum plaster or gauged lime putty directly to interior monolithic concrete surfaces.

RED TOP Concrete Finish is an exclusive spray-textured finish that is economical both in initial cost and application. The spray-on coat eliminates need for further decoration.



Spray application of RED TOP Concrete Finish

BB013 0255

Mixing and Application

Mix RED TOP Concrete Finish using clean water and clean equipment. Machine-mix to a thin consistency and allow to stand a minimum of 30 min. Re-mix to a smooth consistency before using. Concrete Finish can be soaked the day before use, if desired, and remixed to a plastic consistency just before using.

Use highly gauged mix (approx. 20% RED TOP Gauging) to fill in and level deep irregularities and allow to set. For the leveling coat, gauge (approx. 15% RED TOP slow-set Gauging) only sufficient material to permit application and final troweling in 20 to 25 min.

Grind a thin coat into the bonding agent and previously applied fills, and double back for a level surface. Trowel two or three times to a level surface.

SPRAY TEXTURE FINISH: allow leveling coat to dry before applying spray texture. Mix RED TOP Concrete Finish to a creamy consistency, using clean water only. In applying, use a hand texturing gun, or small mechanical texturing machine having an orifice size and air pressure sufficient to produce a fine, uniform texture. Spray all areas in a uniform pattern, crossing surface in four directions (up and down; side to side).

Allow Concrete Finish to dry naturally; furnish heat and ventilation in cold or slow-drying weather.

ORIENTAL Exterior Stucco

ORIENTAL Exterior Stucco is a pre-mixed, water-resistant finish for use over exterior portland cement-lime basecoats only. This material is available in 10 designer colors and white for hand application. Use only white for spray application. It is suitable for application on new work or for remodeling and is an economical means of beautifying in two ways: with texture and color.



Machine spray

Dashed and troweled

Hand float

92 PRODUCTS: Exterior Stucco

This finish is plastic, easy to apply and permanently durable and can be worked in a number of textures: rough coat, stipple, sponge or fine-grained float finish.

Mixing and Application

HAND APPLICATION: ORIENTAL Exterior Stucco needs only the addition of water for mixing. Use clean water and measure accurately. Do not add anti-freeze, waterproofing compounds or sand. Hoe the stucco into the water and allow to soak approximately 15 min. Then hoe thoroughly to a smooth consistency. Mix each batch for the same length of time to insure color uniformity and mix only enough material for 3 hours' use.



Spraying portland cement base for ORIENTAL Exterior Stucco

Apply ORIENTAL Exterior Stucco only over a portland cement-lime and sand basecoat that is level but left rough under the darby, or broomed and properly cured. Water-spray basecoat to provide a uniformly damp "half-green" surface. Remove loose and projecting particles from the basecoat. Then apply a thin coat well ground into the base and completely covering it. Double back and fill out to a uniform surface about $\frac{1}{4}$ " thick, covering total area in one operation to eliminate jointings. Trowel three or four times before starting to texture.

For a float finish, use a cork, wood, carpet or sponge rubber float and work the surface to an even texture, free from blemishes, as the material stiffens and starts to set. Floating must be done without the use of additional water.

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MACHINE APPLICATION: ORIENTAL Exterior Stucco (white only) may be applied in a single-coat or two-coat operation. Excessive mixing water should not be used as this may result in "lime bloom."

One-Coat Application: Spray-apply material to basecoat to uniform thickness of approximately $\frac{1}{8}$ ". Work from wet edges to complete an entire unbroken area in one continuous operation to eliminate joinings.

Two-Coat Application: Apply first coat with a trowel as in hand application. After troweling uniformly level, apply textured second coat by machine-spraying to a total thickness of approx. $\frac{1}{4}$ ".

After setting, fog-spray surface with water periodically for several days to cure the finish and help to prevent glazed spots and "lime bloom." Apply as much water as is readily absorbed. The frequency of spraying will depend on the weather.

GAUGING PLASTERS AND APPLICATION

Lime, when used alone as a finish plaster, does not set, is subject to shrinkage when drying and lacks a hard finish. Therefore, gauging plaster is blended into the lime putty in the proper proportions to provide controlled set, early hardness (see Monotron Surface Hardness table page 88) and strength, and to prevent shrinkage cracks when used as a finish coat.

High-strength Keenes and USG STRUCTO-GAUGE Gauging Plaster are to be used only over sanded or wood fiber basecoat plasters. Over lightweight aggregated basecoats use white or regular gauging plaster that is properly aggregated.

USG GAUGING PLASTERS—TECHNICAL DATA

Product	Set Time with Lime Putty (Min.)	Bag Size (Lbs.)
CHAMPION (white)	quick set 20-30	100 50
STAR (white)	slow set 40-60	100 50
RED TOP Gauging (local-gray)	slow set 45-60	100
RED TOP Gauging (local-gray)	quick set 20-30	100
RED TOP regular Keenes Cement (white)	180-360	100 50
RED TOP quick trowel Keenes Cement (white)	60-120	100 50
STRUCTO-GAUGE (white or light gray)	slow set 60-75 quick set 30-40	100

BB013 0258

94 PRODUCTS: Gauging Plasters



CHAMPION, STAR and RED TOP Gauging Plasters

RED TOP Gauging Plasters are carefully ground and screened to proper particle sizes to make the plasters quick-soaking and easily blended with lime putty. CHAMPION (quick-set) and STAR (slow-set) are white gauging plasters for finish work. RED TOP Gauging is slightly darker in color and is available in quick-set (QS) and slow-set (SS). These plasters are also available with added perlite fines and are designated as "Quality," for use over lightweight aggregated basecoat plasters.

Mixing and Application

Add gauging plaster to lime putty in proportions of 1 part dry gauging plaster by weight to 2 parts dry lime by weight or 1 part dry gauging by volume to 3 parts lime putty by volume. To mix, form a ring of lime putty on the mixing board. The volume of putty used depends on the wall or ceiling area to be covered. A hod of lime putty weighs approximately 100 lbs., a 12-quart bucket of lime putty about 35 lbs. (50 lbs. dry lime equals 100 lbs. lime putty). After forming the putty ring, pour clean water into the center of the ring in correct proportions: 6 qts. of water to 100 lbs. of lime putty; 2 qts. of water to each 12-qt. bucket of lime putty. Next, sift "slow" or "quick" set gauging plaster into water; 25 lbs. gauging plaster to one hod of lime putty. Thoroughly wet the gauging plaster and blend the materials *thoroughly* to prevent gauging "streaks" and provide uniform density.



Sift gauging plaster into water

Mix to blend thoroughly

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To protect against finish coat check or map-cracking, add $\frac{1}{2}$ cu. ft. perlite fines or 50 lbs. silica sand to every 100 lbs. of gauging used. This addition is necessary when applying smooth troweled finishes over lightweight aggregate basecoats. Mill-aggregated "Quality" gauging plasters are generally available and eliminate the need for on-the-job measuring.

Apply the gauged lime putty over a partially dry basecoat. Scratch in a thin coat, well ground into the basecoat, and double back with a second coat, filling imperfections. After the basecoat has absorbed most of the excess water from the finish, trowel to densify the surface. As final set takes place, water-trowel the surface to provide a dense, smooth surface.

STRUCTO-GAUGE Gauging Plaster

This is a new, high-strength gypsum finishing plaster designed for use with lime putty to produce an easily applied finish of extreme hardness. It is available in "Quick Set" (30 to 40 min.) and "Slow Set" (60 to 75 min.) and complies with ASTM C-28 for gypsum gauging plaster and Fed. Spec. SS-P-402 Type G and has the added property of a compressive strength of at least 5000 lb. psi when tested in accordance with this specification.

Finish hardness may be altered by varying the proportions of lime putty and STRUCTO-GAUGE. Since the material cannot be retempered, use regular Keenes Cement when retempering is a factor. STRUCTO-GAUGE may be used for wall and ceiling finishes as in residential bathrooms, kitchens and where surfaces of extreme hardness and durability are required such as hallways or traffic areas in hospitals or schools. It is not recommended for use where excessive or continued moisture conditions exist. Application must be over high-strength sanded or wood-fibered gypsum basecoats or IMPERIAL Basecoat only.

Mixing and Application

For a "hard finish," mix in proportions of 100 lbs. dry hydrated lime (200 lbs. of lime putty) to 100 lbs. STRUCTO-GAUGE. For a "medium hard" finish, mix in proportions of 200 lbs. dry hydrated lime (400 lbs. of lime putty) to 100 lbs. STRUCTO-GAUGE.

Apply like regular gauging over a partially dry gypsum basecoat. Scratch in the thin coat, well ground into the base, and immediately double back with second coat, filling imperfections. Water-trowel to a smooth, hard finish, free of all blemishes. Continue troweling until final set has taken place. Clean tools and equipment after each mix.

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RED TOP Keenes Cement

A high-strength white gypsum plaster used with finish lime putty for extremely hard, dense surfaces. It is the only gypsum plaster that can be retempered. Made in two types: Type I or regular, slow setting (3-6 hours); Type II or quick troweling, setting (1-2 hours). Quick-troweling Keenes must be used with a minimum of 25 lbs. dry hydrated lime per 100 lbs. of Keenes. Both products comply with ASTM C-61 and Fed. Spec. SS-P-00410 Type I and II.

Keenes Cement-Lime Finish is similar in many respects to a lime gauged finish except that Keenes Cement, instead of gauging plaster, is used in varying proportions depending on the hardness required and is generally used as a float finish. If a smooth trowel hard finish is desirable, use STRUCTO-GAUGE Gauging Plaster. Keenes Cement is for interior use over sanded or wood-fibered gypsum basecoats. Do not apply smooth troweled finish over lightweight aggregate basecoats.

Mixing and Application

KEENES CEMENT-LIME FINISH: for medium hard finish, mix in proportion of 100 lbs. lime putty (50 lbs. of dry hydrated lime) to 100 lbs. Keenes Cement. For a hard finish, use 50 lbs. lime putty (25 lbs. of dry hydrated lime) to 100 lbs. Keenes Cement. Apply the finish coat over a set basecoat that has been broomed and is partially dry. Spray with water if surface is too dry but do not soak. Scratch in a thin coat and then double back with a second coat to a true surface. Trowel with water to a smooth, glossy finish, free from blemishes. Continue troweling until finish has set.

SAND FLOAT FINISH: a commonly used, hard float finish which may be satisfactorily colored. Mix in proportions of 100 lbs. Keenes Cement to 50 lbs. dry lime and 400 lbs. sand, with or without lime-proof colors. Apply in same manner as indicated for Keenes Cement-Lime Finish but instead of the final troweling, use a wood, cork, sponge or felt-covered float to bring the sand particles to the surface to produce a pleasing, durable sand finish.

FINISHING LIMES AND APPLICATION

The purpose of finishing lime is to provide bulk, plasticity and ease of spread for the finish coat. Made from specially selected limestone of high purity, the most popular limes come from the dolomitic fields in northwestern Ohio. Finish lime produced in this area has excellent working qualities and is widely demanded.

There are three types of finishing limes: (1) double hydrate, (2) normal hydrate, and (3) quicklime. Each material requires different handling for slaking or soaking in order to produce a good finishing lime putty.

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FINISH LIMES—TECHNICAL DATA

Brand	Type Material	U.S.G. Mfg. Mill	Size Container	Putty Preparation	Approximate Coverage Per Ton
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DOUBLE HYDRATED FINISH LIME

IVORY	Dolomitic Double Hydrate	Genoa, Ohio	50 lbs.	None (Use immediately)	500-700 Yds.
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HYDRATED FINISH LIME

GRAND PRIZE	Dolomitic Hydrate	Genoa, Ohio	50 lbs.	Soak 16 hrs.	500-700 Yds.
RED TOP	Dolomitic Hydrate	Genoa, Ohio	50 & 25 lbs.	Soak 16 hrs.	500-700 Yds.
RED TOP	High Calcium Hydrate	New Braunfels, Texas	50 lbs.	Soak 16 hrs.	500-700 Yds.

FINISH QUICKLIME

RED TOP	High Calcium Quicklime	New Braunfels, Texas	50 lbs.	Soak 16 hrs.	800-1000 Yds.
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IVORY Double Hydrated Lime

This finishing lime immediately develops high plasticity when mixed with water and does not require overnight soaking. It mixes easily by hand or mechanical means, is easy to apply and has excellent spreading qualities.

IVORY Double Hydrated Finish Lime is over 92% hydrated and eliminates harmful delayed hydration, expansion and separation in walls. This material, properly gauged and troweled, produces a hard, glossy finish. It complies with Fed. Spec. SS-L-351 Type F and ASTM C-206 Type S.

Mixing and Application

Machine mixing equipment must be clean. Place 5½ to 6 gal. clear water per 50 lb. bag of IVORY Hydrated Lime in mixer.

BB013 0262

98 PRODUCTS: Finish Limes

Using a motor-driven, propeller-type mixer, the complete mixing of lime putty takes 2 to 3 min. and results in a high-quality, easy-working putty. Machine-mixed putty is plastic and coverage is increased from 10 to 15%. With a paddle-type mixer, the mixing time is about 15 min.

HAND-MIXING: for immediate use, place 5½ to 6 gals. of water per 50 lbs. IVORY Double Hydrated Lime in mixing box. Add IVORY Lime to water and hoe sufficiently to eliminate lumps. Screen putty through an 8-mesh screen before using.

OVERNIGHT SOAK: place water hose in bottom of a level soaking box. Run water continuously while sifting IVORY Double Hydrated Lime through screen into water. When lime is soaked in this manner, there should be a small amount of excess water over top of lime. If excess water remains on the surface the following morning, absorb excess water by screening in additional IVORY Lime, allow to soak a few minutes, then blend into putty by hoeing.

RED TOP and GRAND PRIZE Hydrated Limes

These finishing limes are hydrated during manufacture so that only the addition of water and soaking are necessary to bring material to full plasticity. They are economical, easy-working, uniform, white and plastic. Both products conform to Fed. Spec. SS-L-351 Type F and ASTM C-6, Type N.

Mixing and Application

MACHINE MIXING: produces a smoother more plastic putty, easier to use and with better coverage. Use approximately 6 gal. of water to each 50 lb. bag of RED TOP or GRAND PRIZE Hydrated Finishing Lime. Mix lime and water to a soupy consistency and then pour into soaking box. Soak mix for a minimum of 16 hrs. to develop maximum workability and plasticity. Screen mix through 8-mesh hardware cloth to assure smooth, lump-free putty.

HAND MIXING: slowly sift RED TOP or GRAND PRIZE Hydrated Lime into water in soaking box. Allow material to take up water for about 20 to 30 min. and then hoe briskly to mix thoroughly. Let mix soak for minimum of 16 hrs. to develop full workability and plasticity. For use, screen through 8 mesh hardware cloth and mix with desired gauging plaster that meets job requirements.

RED TOP Finish Quicklime

A high-calcium finishing lime, RED TOP Finish Quicklime produces lime putty that is very plastic and economical to use because of its greater yield. It requires 16 hrs. of soaking and must be handled carefully to prevent burns or clothing damage. Meets Fed. Spec. SS-Q-351 Type C and ASTM C-5.

BB013 0263

Mixing and Application

In slaking RED TOP Finish Quicklime, use approximately 15 gals. clean water per 50 lbs. quicklime and 18 gals. per 60 lbs. of quicklime. Sift quicklime into the water and hoe immediately, working thoroughly and breaking up all hot spots. Continue hoeing until boiling action stops (about 15-20 min.) and then run material into a water-tight aging box.

Soaking or aging of slaked quicklime is necessary to insure complete slaking of all particles, to permit putty to cool before mixing, to develop its full plasticity and to permit the putty to stiffen for easier hodding to gauging board. Allow finely ground and pulverized quicklime to soak at least 16 hrs. before using.

Select proper gauging putty for job requirements and mix with the RED TOP Finish Quicklime putty.

Hot and Cold Weather Precautions—Finish Lime

IN COLD WEATHER: a few precautions will result in improved quality and easier working. Where weather and water are cold, lime develops better plasticity when soaked overnight. The best conditions are a warm room and water over 50° F.

It is important to note that in cold weather the lime putty-gauging mixture requires a longer time to set. Therefore, gauging content should be increased or quick-set gauging added to offset the slower setting time.

Proper heat and ventilation are musts. Windows should be opened slightly so that moisture-bearing air moves out of the building. Fast drying after setting is essential to a hard finish.

Many cold weather problems with finish lime are a direct result of improper basecoat conditions. Finish should go over a set, fairly dry basecoat. Since the basecoat will dry slowly in winter, heat and ventilation are needed. The water retentivity of lime putty, plus a cold, "green" base, does not provide enough suction to remove excess moisture. Blistering and cracking can occur due to slow set or the lime may work back through set of the gauging.

IN HOT WEATHER: precautions include proper soaking of lime putty. When the sun is hot, hydrated lime requires ½ to 1 gal. more water per 50 lbs. The water should be cool—not over 60° F. Soaking of putty in shade prevents undue water evaporation and helps to prevent curdling and loss of spreading properties. Avoid soaking for periods longer than two or three days.

For application of lime putty-gauging finish plaster, make sure that basecoat is set and partially dry. If applied over a dried out basecoat, water will be drawn from the finish coat resulting in severe check-cracking. Spray the basecoat before finish coat application and trowel finish coat until final set.

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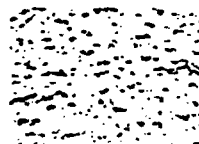
ACOUSTICAL PLASTERS

The main function of acoustical plaster is to absorb sound and reduce noise level. A wide selection of pleasing finishes combined with medium to high light reflection is available. Low in initial cost, they provide greater sound absorption per dollar than most other commonly used acoustical materials. Basically mineral, they are incombustible and provide an added measure of fire safety whenever used.

USG ACOUSTICAL PLASTERS—TECHNICAL DATA

Product	Finish	NRC (1)	Light Reflectance (2)	Bag Size (Lbs.)	Coverage/ Ton (Sq. Yds.)(3)
HI-LITE	stippled	.60	80%	40	250-290
	stipple perforated	.60	77%		
AUDICOTE	machine textured	.55	Satin White 65% Spec. White 70%	38	350-400

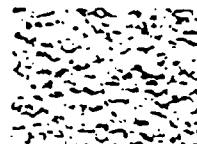
- (1) Noise reduction coefficient—from standard tests at a recognized laboratory. Care must be taken to mix the material to specified consistencies and apply to uniformly full grounds.
 (2) Light reflectance from tests at an independent recognized laboratory.
 (3) Coverage based on 1/2" thickness; amounts shown will vary depending upon method of application. When ordering, specify application method and sq. yds. to be covered.



Stippled



Stipple-perforated



Machine textured

HI-LITE Acoustical Plaster

This lime base acoustical plaster is pure white, making it particularly suitable for use in schools and office buildings where light reflectance is of importance. It can be used in areas of high humidity because of its high moisture resistance; also resists spreading of rust stains. HI-LITE plaster develops its acoustical properties by mechanical opening of the surface by stippling and perforating. When perforated, this acoustical plaster can be painted without loss of sound absorption qualities.

Mixing and Application

Mix by machine. Add approx. 33 qts. water per bag of HI-LITE Plaster and mix until mortar weighs 15 to 17 lbs. net per 12-qt. pail (about 10-15 min. depending on mixer speed). Prepare 1 hour's supply of plaster at a time.

8729-61088



Stippling HI-LITE
Acoustical Plaster



Perforating is done
after stippling

Application over metal lath, gypsum lath or masonry bases (except monolithic concrete) requires a full scratch coat and brown coat of gypsum plaster that has been cross-raked. Where basecoat resistance to high humidity is required, USG HI-LITE Acoustical Plaster may be applied over a full, cross-raked Portland cement-lime basecoat. For the first coat of acoustical plaster, apply over a set and dry, partially dry or semi-"green" basecoat.

Scratch in hard $\frac{1}{8}$ " and double back to a total thickness of $\frac{3}{8}$ ". Use a wood or serrated metal darby for a true, uniform, roughened surface and allow plaster to dry overnight. Apply finish coat $\frac{1}{8}$ " thick, working from wet edge to avoid joinings.

STIPPLE FINISH: after surface sheen has disappeared (15-30 min.), stipple with a rice root stippling brush. Work on areas around doors and windows first since they dry faster.

PERFORATING: for a stipple-perforated finish, perforate about 30 min. after stippling (when surface is hard enough to give clean perforations). Use perforator with stainless steel prongs and hold so that prongs are at right angles to plaster surface. Perforate about $\frac{3}{16}$ " deep, 500 per sq. ft.

AUDICOTE Acoustical Plaster

A low-cost material for machine or hand application, used over properly prepared gypsum or portland cement basecoats, monolithic concrete or stable, prefabricated concrete units. Available in Satin White and Special White, the uniform texture when spray-applied is ideal for use on large continuous surfaces. It is fire-resistant, may be decorated with minor reduction in sound absorption and can be economically refinished with a spray coat of AUDICOTE.

BB013 0266

102 PRODUCTS: Acoustical Plasters

Mixing and Application

MACHINE MIXING is the recommended method. For first coat, use about 55 qts. clean water per bag of AUDICOTE. For machine-applied finish coat, use more water—70 to 90 qts.—depending on machine used and finish desired. More water produces a finer texture. For hand-applied finish coat, mix with about 55 qts. water per bag. Add plaster to water and mix for at least 5 min.

HAND MIXING: requires about 48 qts. water per bag. Hoe the mix to develop even consistency, free of lumps.

MACHINE APPLICATION: apply first coat 7/16" thick, level with darby and point up with trowel for a smooth, even coat. Allow to dry partially and apply 1/4" thick finish coat.

HAND APPLICATION: for the first coat, apply AUDICOTE 3/4" thick. Level with darby to smooth, level base, allow to dry partially and apply 1/4" thick finish coat. After finish coat has taken up sufficiently, it may be stippled, stipple-perforated, floated, darbied or troweled for the desired finish.

Painting Acoustical Plasters

Remove dust and dirt with vacuum cleaner. First coat: 1 part TEXOLITE Standard Paint to 1 part water by volume. Second Coat (if required): 1 part TEXOLITE Standard Paint to 2 parts water by volume.

Use Binks Model 18 spray gun-66 SS (.070 orifice) with 30-40 lbs. pressure in gun and 20-30 lbs. on paint. Hold nozzle 14" to 18" from work and cover in one pass. Allow overnight drying between coats or longer in humid weather.

SPECIAL PLASTERS

U.S.G. produces a number of special plasters, among them **RED TOP Moulding Plaster** and **RED TOP Casting Plaster**.

USG SPECIAL PLASTERS—TECHNICAL DATA

Product	Bag Size (Lbs.)	Approx. Cu. Ft. per 100-lb. Bag
RED TOP Moulding Plaster	50 100	1.5
RED TOP Casting Plaster	100	1.5

BB013 0267

RED TOP Moulding Plaster

Used for specialized work such as ornamental trim or running cornices, the grind of RED TOP Moulding Plaster is very fine, to bring out details when used neat for cast work. For running cornice work, add a small amount of lime putty to add plasticity and to act as a lubricant for the template.

RED TOP Casting Plaster

RED TOP Casting Plaster is like moulding plaster but has finer particle size. This gives smoother castings—important in casting fine plaques and art statuary. It is highly plastic and has great surface hardness and strength. For mixing, add only water.

RED TOP Partition Tile Cement

This is a specially prepared gypsum cement, used with sand and water, for setting interior partition units of PYROBAR Gypsum Tile or clay tile. RED TOP Partition Tile Cement makes an easy-working, economical mortar for column fire-proofing coverings. It provides definite set, fine bedding and early high-strength qualities that insure strong, rigid joints for any non-load bearing partition.

MIX RED TOP PARTITION TILE CEMENT in a clean mortar box. Use 1 part cement to 3 parts sand by weight and add clean water to bring to the right working consistency. Add sand to comply with ASTM Specs. Do not retemper tile mortar.

RED TOP Retarder and RED TOP Accelerator

RED TOP Retarder and RED TOP Accelerator are available for use with plaster when required by job or climate conditions. When used in excess, setting and drying problems can arise. Avoid especially use of too much retarder which can weaken the plaster finish.

SOUND CONTROL PRODUCTS

Adequate sound control is one of the fastest growing requirements in today's buildings. The public has become sufficiently "noise-conscious" to demand effective measures to control unwanted sound in both commercial and residential construction. With its advanced research, U.S.G. has been a leader in developing new systems and products for efficient, low-cost sound control for plastered walls and ceilings in all types of new construction and remodeling.

THERMAFIBER Sound Attenuation Blankets

These are semi-rigid, paperless, spun mineral fiber blankets of uniform dimension and controlled density. When inserted

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in the partition cavity from floor to ceiling, these blankets help provide excellent fire ratings and substantially increase STC ratings of partitions. Sound Attenuation Blankets in partitions in some assemblies obtain an STC rating as high as 55.

THERMAFIBER Insulating Wool (Regular) Blankets

These blankets consist of mineral fibers mechanically formed into a uniform mat of definite dimension and controlled density. One side is enclosed with a strong asphalted paper which also forms nailing flanges. The breather side is enclosed in a durable fire-resistant, porous kraft paper; open-faced batts are available if required. This is a top-efficiency product providing an STC rating as high as 56 for sound isolation in partition systems. See Chapter 4 for sound test data.

THERMAFIBER Blanket Data

Type	Thickness	Width (Inch)	Length (Feet)
Sound Attenuation	1" 1½" or 2"	16 or 24	4
Regular	2" or 3"	15, 19, or 23	4, 8, or 24

NOTE: Check local conditions for package size and content.

USG Wood Fiber Sound Deadening Board

A ½" thick, 4' wide, low-density board, it is used with R-5 clips, ROCKLATH base and plaster to reduce sound transmission through a partition. This structural board is nailed to 2x4 wood studs and provides a resilient base for the R-5 clips. Limited to interior uses only. Lengths: 4', 8', 10' and 12', packaged: 6 pcs. per bdl., weight: 750 lbs. per M sq. ft.

PAINT PRODUCTS

USG Paints comprise a complete line of latex, alkyd, oil and texture products specially formulated for plaster and other surfaces—made by the company that knows walls and ceilings best. Included are sealers, primers and other surface preparation products; interior flat finishes, matching enamels and texture paints that are especially effective on veneer plaster ceilings. Recommended applications to plaster are listed in the Selector Guide on following page.



Roller application

Spray application

BB013 0269

SELECTOR GUIDE TO USG PAINT PRODUCTS

Type of Finish Desired	Special Surface Treatment		Finish Product—Description	Thin-ners	Method Application	Hours Drying Time		One Gal. Coverage (Sq. Ft.)
New Work	Redecorating	Touch				Recoat		
PLASTERED INTERIOR WALLS								
Velvet	TEXOLITE Primer-Sealer	None	GRAND PRIZE Latex Wall Paint	NR/w	B1, R1, S1	½	24	450
Flat	TEXOLITE Primer-Sealer	None	PRO KYD Alkyd Flat	NR/ms	R1, S1, B1	1	24	400
Flat	TEXOLITE Primer-Sealer	None	USG Alkyd Flat Enamel	NR/ms	B1, R1, S1	1	24	400
Semi Gloss	USG Alkyd Primer-Sealer	USG Alkyd Enamel Undercoat	USG Satin-Lustre Enamel	NR/ms	S1, B2, R2	3	24	450-500
Gloss	USG Alkyd Primer-Sealer	USG Alkyd Enamel Undercoat	DIAMOND Lustre Enamel	NR/ms	S1, B2, R2	3	24	450
Epoxy Glaze	USG Penetrating Sealer	ACREPOX Finish	ACREPOX Finish	SS/USG	S1, B2, R2	4	8	190-220
PLASTERED INTERIOR CEILINGS								
Flat	USG Alkyd Primer-Sealer	USG Alkyd Primer-Sealer	PRO-KYD Alkyd Flat	NR/ms	B1, R1, S1	1	24	400
Flat	TEXOLITE Primer-Sealer	None, or TEXOLITE Primer-Sealer	Any USG latex paint shown for int. walls	—	—	—	—	—
Rough Texture	None (smooth where required)	None (smooth where required)	IMPERIAL QT Texture Finish	W	S only	24	not rec.	—

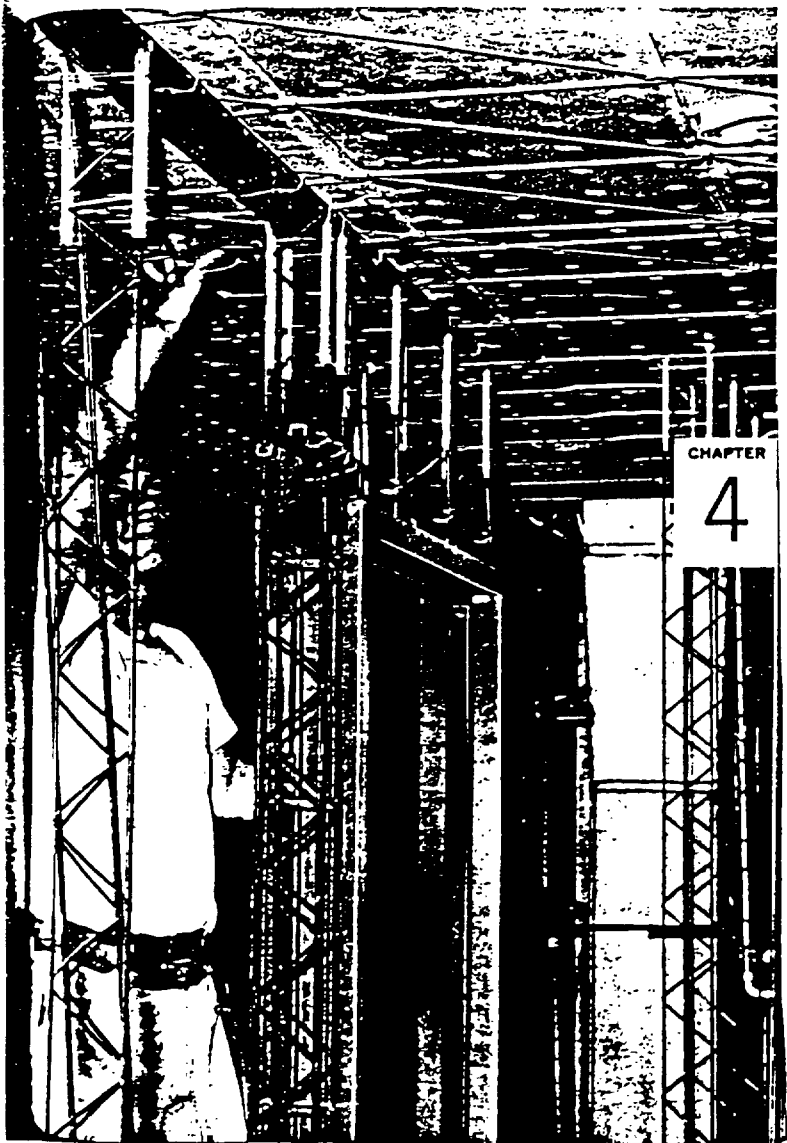
NOTES: "Drying Time" and "Coverage" estimates are based on average conditions. Touch = furniture can be returned to living areas.
 Abbreviations, Method of Application: B = brush, R = roller, S = spray, T = trowel; 1, 2, 3 = order of preference.
 Abbreviations, Thinners: NR/w = Not recommended, use water sparingly; NR/ms = Not recommended, use mineral spirits if needed; SS/USG = Special Solvent manufactured by U. S. Gypsum.

Paint Selector: PRODUCTS 105

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CHAPTER 4
Systems and
Performance Data

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CHAPTER

4

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CHAPTER 4

Systems and Performance Data

PARTITION, WALL AND CEILING SYSTEMS

United States Gypsum has developed a complete line of partition, wall furring and ceiling systems. A system consists of necessary components that, when erected, will offer the functions desired to provide attractive appearance and meet building requirements.

Each of these systems has been engineered to provide different characteristics of structural stability, fire rating, sound transmission loss or other factors. Maximum crack resistance is built in; insulation value and vapor barriers also are included in some combinations. All systems are planned to offer constructions that are lightweight, space saving and easy to install.

This section describes the types of systems, their advantages and methods of construction. See Chapter 3 for complete information on products mentioned.

METAL STUD PARTITIONS

These partitions are strong, lightweight, non-load bearing assemblies consisting of wire web-type TRUSSTEEL Studs or channel-type USG Metal Studs anchored to floor and ceiling runners. This framing is covered with IMPERIAL Plaster Base (one or two layers), ROCKLATH Plaster Base or metal lath—depending on particular needs—and plastered as specified. See Chapter 3 for complete description of materials and accessories used in these systems.

Metal stud partitions are ideal space-saving dividers within units, economical corridor partitions and, in certain cases, highly sound-resistant party walls (see details under specific headings). Among their advantages are the following:

ECONOMY: low material cost, speed of installation and versatility of the system provide construction cost comparable to that of any partition of same thickness.

LIGHTWEIGHT: the completed systems weigh appreciably less than masonry partitions of the same thickness.

FIRE RESISTANCE: up to 2 hr. fire-resistance rating.

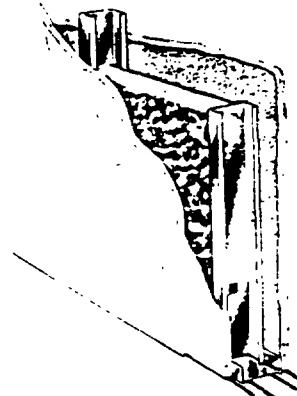
SOUND RESISTANCE: STC as high as 52; suitable for party wall with some combinations.

STRENGTH: resists racking; withstands normal impact loads.

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110 SYSTEMS: Metal Stud-IMPERIAL Partition

Metal Stud-IMPERIAL Base Partition (Single Layer)



This system consists of lightweight steel channel studs set into floor and ceiling runners. Sound attenuation blankets are placed between studs if specified and each side of the framing is faced with $\frac{1}{2}$ " or $\frac{3}{4}$ " IMPERIAL Plaster Base. Either IMPERIAL Plaster Finish is applied in a single-coat system, or IMPERIAL Plaster Basecoat is used in two-coat application as a base for DIAMOND Finish, STRUCTO-GAUGE Gauging Plaster and lime, or Keenes-lime-sand float finish.

This construction is ideal for interior partitions in office and industrial buildings, high-rise apartments, hotels, motels and similar construction.

There are three stud and runner widths: $1\frac{3}{8}$ ", $2\frac{1}{2}$ " and $3\frac{3}{8}$ " with allowable partition heights of 8'-6", 11'-0" and 14'-6" respectively. Chase wall height limit is 10'-0".

Installation

First step is to align metal floor and ceiling runners. To improve sound control characteristics, apply a non-hardening caulking material as specified for ceiling or partition perimeters. Fasten runners with $\frac{1}{2}$ " concrete stub nails or power-driven anchors spaced not over 24" o.c. Secure to suspended ceilings by wire ties or other positive fastening not more than 16" o.c. Position studs not over 16" o.c. to engage with floor and ceiling runners.

Place studs in direct contact with all door frame jambs, abutting partitions, partition corners and existing construction elements. Fasten these studs to floor and ceiling runners using positive screw attachment or a USG Metal Lock Fas-

BB013 0274

tener (see Chapter 5). Grouting of door frames is always recommended and is required where heavy or oversize doors are used (see Chapter 5 for grouting information). When necessary, splice studs with at least 3" nested lap secured with 2 screws through each flange or by wire ties 1" from each stud end.

Where stud is to directly abut exterior wall and there is a possibility of condensation or water penetration through the wall, place an asphalt strip between stud and wall surface.

Over metal doors and borrowed light frames, place a section of runner track horizontally with a web-flange bent at each end. Fasten with one positive attachment per flange. At the location of vertical joints over the door frame header, position a cut-to-length stud extending to the ceiling runner.

Apply single layer IMPERIAL Plaster Base, face out, with long dimension at right angles to framing members. Ends and edges must abut over stud flanges. Use base of maximum practical length to reduce number of end joints and arrange joints on opposite sides of partition so that they occur at different studs. For horizontal application of base, space USG 1" Type S Screws max. of 12" o.c. in field of base and 12" o.c. staggered along abutting end joints. In optional vertical application of the plaster base, space screws max. of 12" o.c. in the field of the plaster base and 8" o.c. staggered along vertical abutting edges.



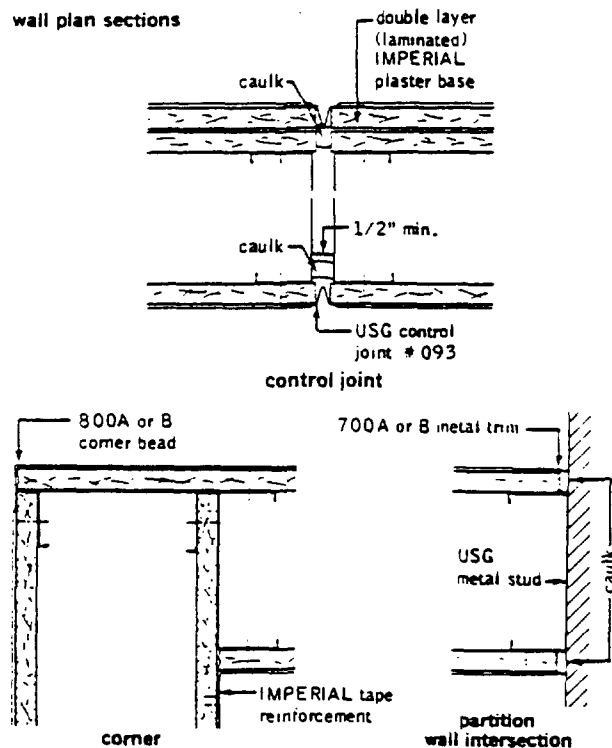
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Metal Stud-IMPERIAL Base Partition (Double Layer)

This partition has a 2 hr. fire rating with $\frac{1}{2}$ " IMPERIAL Plaster Base Type X and a sound rating up to 52 STC. These features, in addition to its high strength and abrasion resistance, make it especially suitable for use in schools, hospitals and for party walls in dormitories or apartment buildings.

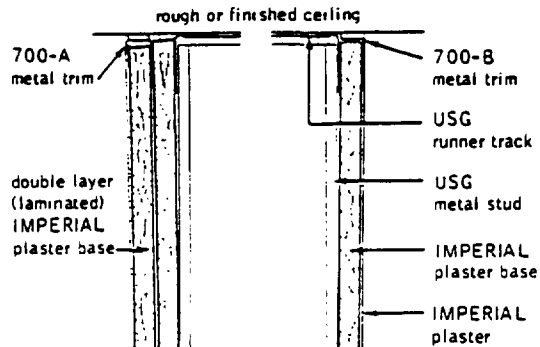
Installation

Apply $\frac{1}{2}$ " or $\frac{3}{4}$ " IMPERIAL Plaster Base to metal stud framing in vertical position. Attach inner plaster base layer with USG 1" Type S Screws spaced 24" o.c. and the outer layer of plaster base, with joints offset with USG 1 $\frac{1}{2}$ " Type S Screws, 12" o.c. For maximum STC rating runner tracks and end studs must be caulked each side as well as perimeter of second layer of plaster base. Also, 1" THERMAFIBER Sound Attenuation Blanket should be stapled to back of plaster base, one side, leaving no voids. Apply IMPERIAL Joint Reinforcing Tape the full length of joints, following procedures in Chapter 2.

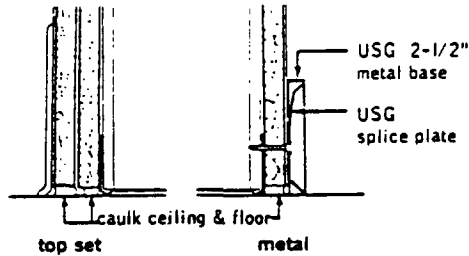
wall plan sections

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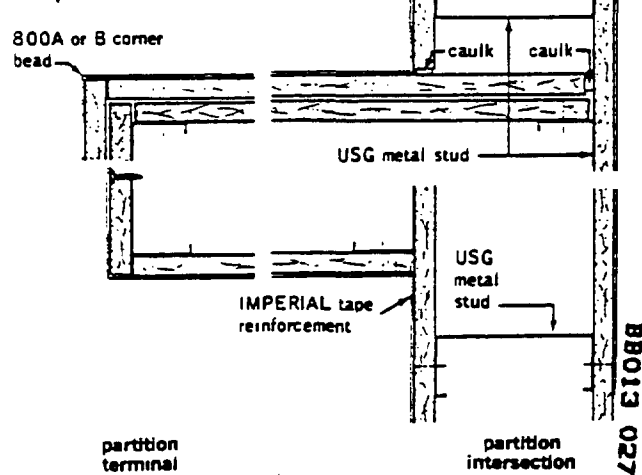
ceiling attachment



floor attachment & base



wall plan sections



114 SYSTEMS: Metal Stud-IMPERIAL Partition

Plaster Application

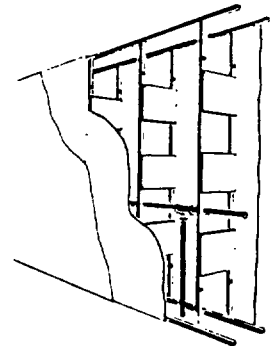
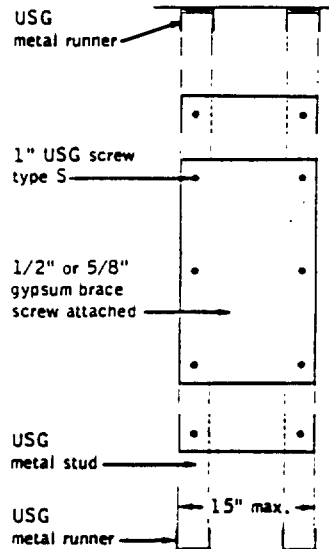
Apply IMPERIAL Plaster Finish to a min. of 1/16" and max. 3/32" finished thickness. Embed tape and fill beads with a tight, thin coat and allow to set. Then scratch in a tight, thin coat and double back to the full thickness, filling the voids



and imperfections. When surface is firm, finish troweling using water sparingly.

FOR TWO-COAT APPLICATION, use IMPERIAL Plaster Basecoat and complete plastering as outlined in Chapter 2.

Chase Wall Partitions



Chase walls, as vertical shafts encasing the usual plumbing supply and wastelines, vent ducts and electrical conduits, require more free space than can be provided within the usual partition assembly.

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The metal stud chase wall may be formed of two USG Studs bracketed together with 12" deep gussets of $\frac{1}{2}$ " or $\frac{3}{4}$ " IMPERIAL Plaster Base. Gussets should be spaced not to exceed 36" o.c. and securely attached to studs using three USG 1" Type S Screws. Limiting height for this chase wall is 10'.

Installation

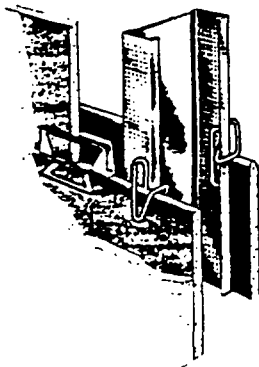
Align wall partitions accurately using a double row of floor and ceiling runners spaced to accommodate service installations. Attach runners 24" o.c. to concrete slabs with concrete stud nails or power-driven anchors and to suspended ceilings with toggle bolts or staples.

Position a double row of USG No. 158 Metal Studs opposite each other in pairs with flanges pointing in the same direction, and spaced no greater than 24" o.c. Anchor all studs to runner flanges with USG $\frac{3}{4}$ " Type S-12 Pan Head Screws. For studs located at partition intersections and corners, anchor to runner flanges with Metal Lock Fastener or positive screw engagement through each stud and runner flange.

Cross-brace between rows of studs with pieces of $\frac{1}{2}$ " or $\frac{3}{4}$ " IMPERIAL Plaster Base 12" deep and a width to fit between studs. Fasten to stud webs at quarter points in partition height with USG 1" Type S Screws spaced 8" o.c. in each stud web or a minimum of three screws per stud web. Apply single face layer or base layer of $\frac{1}{2}$ " or $\frac{3}{4}$ " IMPERIAL Plaster Base in vertical position.

Plaster as outlined for Single and Double Layer Metal Stud Systems, using beads, trim, and other required accessories.

Metal Stud-ROCKLATH Plaster Base Partition



This partition system consists of $\frac{3}{4}$ " ROCKLATH Plaster Base either plain or perforated, attached to steel channel framing

BB013 0279

116 SYSTEMS: Metal Stud-ROCKLATH Partition

with USG MS-1 Clips or USG Brand 1" Type S Screws. Either clip or screw attached, this system is an easily installed, incombustible, non-load bearing partition. It is especially suited for application where a strong plaster finish is required but speed and economy are also major factors.

The clip-attached combination forms a resilient base for the economical application of gypsum plaster and in some areas is the lowest-cost plaster system offering a 49 STC. The screw-attached combination offers strength and rigidity, and is especially suitable where adequate sound control plus the durability of plaster is important.

Installation

For framing, except spacing, follow specific directions in section on Metal Stud-IMPERIAL Plaster Base for layout, caulking and assembly of metal stud framing. For clip attachment or screw attachment space studs 16" o.c. Place a stud 2" from abutting partitions, partition corners, partition terminals and door or borrowed light openings.

Position ROCKLATH Plaster Base, face out, with the long dimension at right angles to the framing members. Stagger end joints in successive courses and have joints fall between studs. Make sure that the ROCKLATH is cut accurately to fit over electrical outlets and other openings.

FOR CLIP ATTACHMENT, fasten ROCKLATH with USG MS-1 Clips to studs spaced 16" o.c. and secure corners of lath with BRIDJOINT B-1 Clips.

FOR SCREW ATTACHMENT, fasten $\frac{3}{4}$ " ROCKLATH Plaster Base to studs spaced 16" o.c. with USG 1" Type S Screws spaced 2" from edges of ROCKLATH. Use an electric screw gun. Secure corners between studs with BRIDJOINT B-1 Clips.

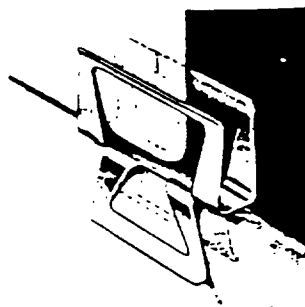
Apply gypsum plaster in the 2-coat method to $\frac{1}{2}$ " grounds. Stud spacing may be 24" o.c. but requires 3-coat plaster application for this wider stud spacing. See Chapter 3 for plastering directions and descriptions of trim accessories.

USG METAL STUD—PARTITION TECHNICAL DATA

Stud Width	Section Modulus	Partition Thickness	Maximum Height (1) (2)
1½"	.049 ⁽³⁾	3½"	3'
2½"	.086 ⁽³⁾	4½"	12'
3½"	.142 ⁽³⁾	5½"	16'
4" (3)	.156 ⁽³⁾	5½"	17'-3"

(1) Reduce ceiling height by 15% if lightweight aggregate basecoat is used. (2) For 24" stud spacing. (3) West Coast only.

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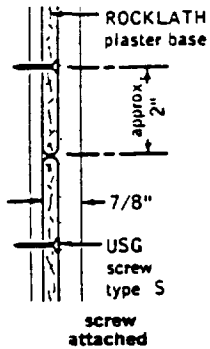
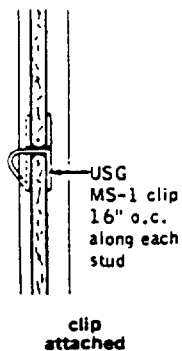


BRIDJOINT B-1 Clip

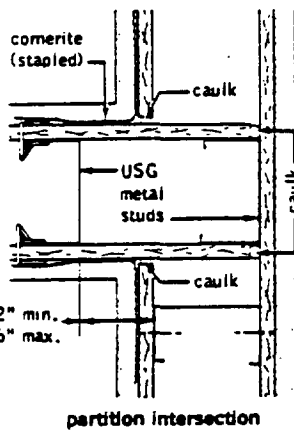
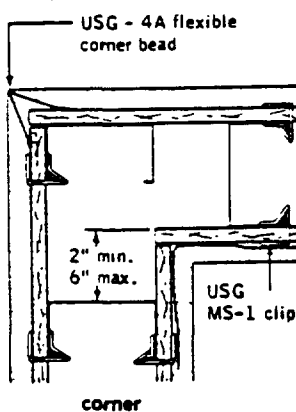
ROCKLATH edge joint



Screw application



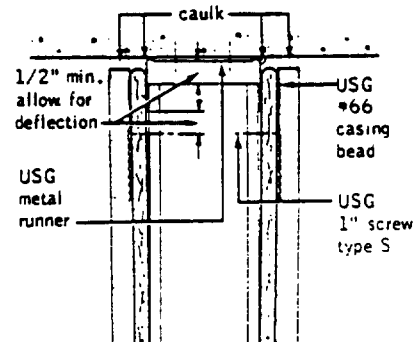
wall plan sections



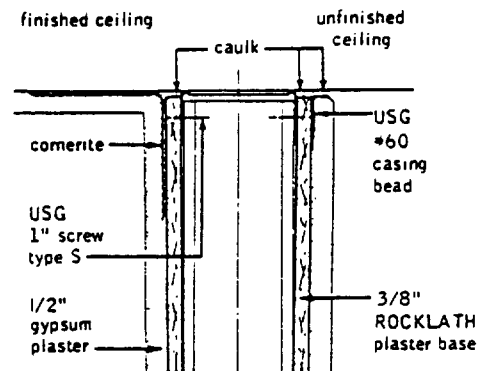
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118 SYSTEMS: Metal Stud-ROCKLATH Partition

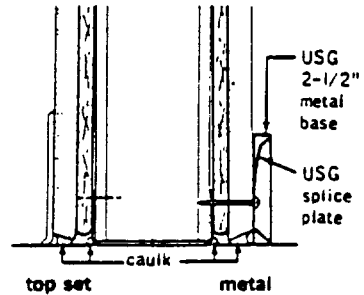
ceiling attachment



ceiling attachment

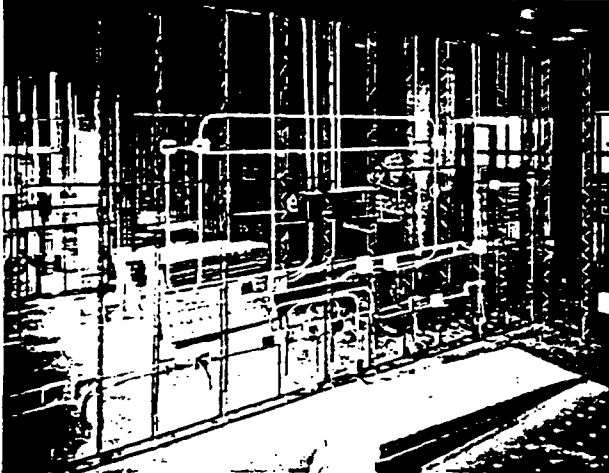


floor attachment & base



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TRUSSTEEL Stud Partitions



The TRUSSTEEL Stud Partition System is a strong, lightweight, non-load bearing assembly. Adaptable to virtually all types of construction, it is economical and easily erected. The system is often selected for school, hospital, apartment and office construction because of its high fire-resistance, excellent sound transmission loss ratings, and space for piping and wiring.

The open web of the truss design provides maximum free space for horizontal, vertical or diagonal placement of pipes or conduit. Web members can be cut to accommodate larger ducts and pipes without seriously impairing the strength of the partition.

TRUSSTEEL Studs provide a strong frame for resilient or direct attachment of $\frac{3}{8}$ " ROCKLATH Plaster Base (plain or perforated) or USG Metal Lath. The studs come in 5 widths to provide wall thicknesses to meet almost every job requirement. Some of the advantages of this system are:

VERSATILITY: studs are 1 $\frac{1}{2}$ ", 2 $\frac{1}{2}$ ", 3 $\frac{1}{4}$ ", 4" and 6" to provide a variety of partition widths.

LIGHTWEIGHT: partition assembly weighs about 11 lbs. per sq. ft. plastered with perlite aggregate plaster; 14 lbs. per sq. ft. with sand aggregate plaster.

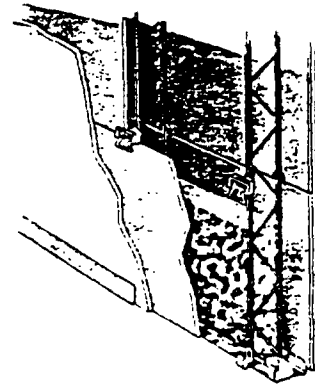
FIRE RESISTANCE: uses incombustible materials in various combinations to qualify for 1 and 2-hr. fire ratings.

SOUND RESISTANCE: as high as 52 STC possible; variations of materials allow ratings over 40 STC.

BB013 0283

120 SYSTEMS: TRUSSTEEL-ROCKLATH Partition

TRUSSTEEL Stud-Rocklath Base Partition



RESILIENT ATTACHMENT of $\frac{3}{8}$ " perforated ROCKLATH Plaster Base to $1\frac{1}{4}$ " TRUSSTEEL Stud framing reduces plaster cracking due to structural movement and with $\frac{1}{2}$ " gypsum-sand plaster provides a 1 hr. fire rating. With $3\frac{1}{4}$ " studs, $\frac{3}{8}$ " ROCKLATH Plaster Base and $\frac{1}{2}$ " gypsum-sand plaster, the STC is 52.

DIRECT ATTACHMENT of $\frac{3}{8}$ " ROCKLATH Plaster Base to TRUSSTEEL Stud framing produces a strong, lightweight partition assembly. With $2\frac{1}{4}$ " TRUSSTEEL Stud framing, $\frac{3}{8}$ " perforated ROCKLATH and $\frac{3}{4}$ " gypsum-perlite plaster, the fire rating is 2 hrs. With $1\frac{1}{4}$ " TRUSSTEEL Studs, $\frac{3}{8}$ " perforated ROCKLATH and $\frac{1}{2}$ " gypsum-sand plaster, the fire rating is 1 hr. and STC is 41.

Installation

Align USG Snap-In or Regular Runner Track and anchor to concrete slab using concrete stud nails or power-driven anchors spaced not over 24" o.c.

For anchoring to ceiling grillage, tie runners with a double strand of 18-ga. tie-wire spaced not more than 16" o.c.; to plaster or gypsum lath use toggle bolts or staples spaced not more than 24" o.c. For best sound control, caulk perimeter of ROCKLATH and plaster at floor line. Install THERMAFIBER Sound Attenuation Blanket to back of lath one side where indicated for desired rating.

In all fire-rated partitions, TRUSSTEEL Stud must be attached to the regular or snap-in runner track with TRUSSTEEL Stud

BB013 0284

Shoes at the ceiling. Snap-in runner track with studs cut accurately to lengths may be used for floor and ceiling attachment where the construction is non-fire-rated. This track may be used at the floor in fire-rated partitions.

With USG Regular Runner Track and Stud Shoes, the studs must be no more than 3" from ceiling; with USG Snap-In Runner Track, no more than 3/4" from ceiling. Place studs vertically, 16" o.c., and snap into runner tracks at floor and at ceiling secure with a pair of shoes crimped or wire-tied in place, using a double strand of 18-ga. tie wire. Locate a stud 2" from abutting partitions, partition corners, partition terminals and door or borrowed light openings.

FOR RESILIENT ATTACHMENT, start at the bottom with the long dimension of the 3/4" ROCKLATH Plaster Base at right angle to studs. Butt ends of ROCKLATH together and clip in place using Resilient Starter-Finisher Clip R-SF and Resilient Field Clip TR-1, spaced not to exceed 16" o.c. Stagger end joints between studs and align corners of lath with BRIDJOINT B-1 Field Clips.

FOR DIRECT ATTACHMENT of ROCKLATH Plaster Base, follow procedure for resilient attachment but use TRUS-LOK Starter Clips TL-2 for first course and TRUS-LOK Field Clips TL-1, spaced not to exceed 16" o.c., for succeeding courses. Fasten the finishing course of ROCKLATH with 1" No. 12 flat head self-tapping sheet metal screws, driven between vertical stud wires and spaces 8" from ceiling. Stagger ends of lath between studs and secure corners with BRIDJOINT B-1 Field Clips.

Plaster Application

Apply gypsum-sand or gypsum-perlite plaster to 1/2" grounds in two or three-coat application. See Chapter 3 for specific plastering directions.

TRUSSTEEL STUD—PARTITION TECHNICAL DATA

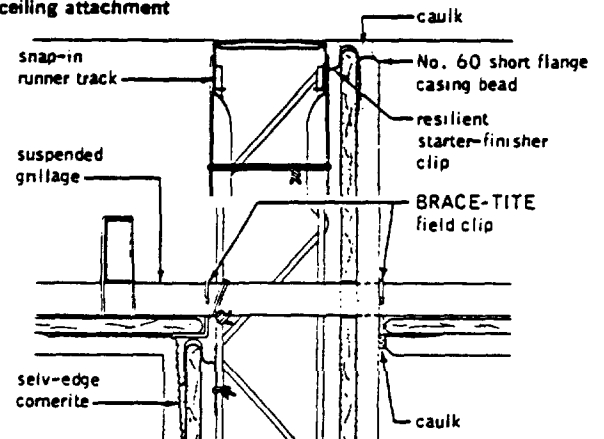
Stud Width	Section Modulus	Thickness Direct Att.	Thickness Resil. Att.	Maximum Height Studs 16" o.c.
1 3/4"	.0635 ³	3 3/4"	4 1/4"	9'
2 1/4"	.1056 ³	4 1/4"	4 3/4"	15'
3 1/4"	.1420 ³	5 1/4"	5 3/4"	21'
4"	.1825 ³	6"	6 1/4"	22'
6"	.277 ³	8"	8 1/4"	26'

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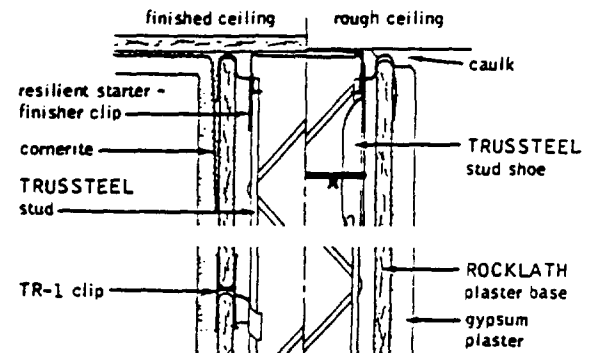
122 SYSTEMS: TRUSSTEEL-ROCKLATH Partition

resilient attachment

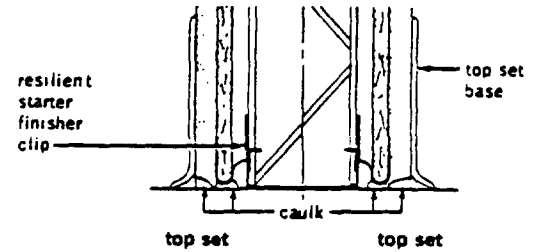
ceiling attachment



ceiling attachment

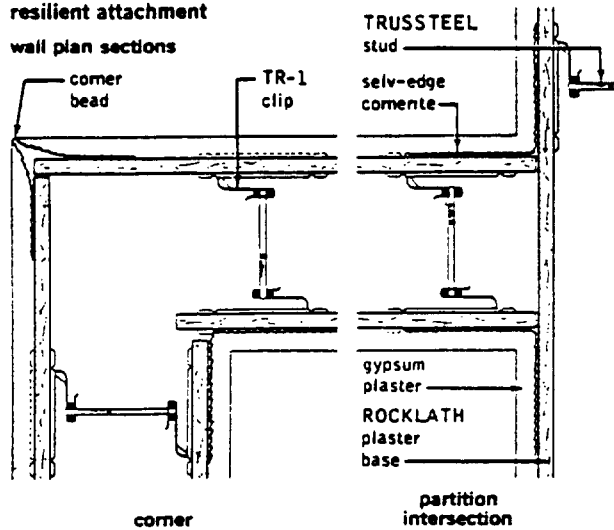


floor attachment & base

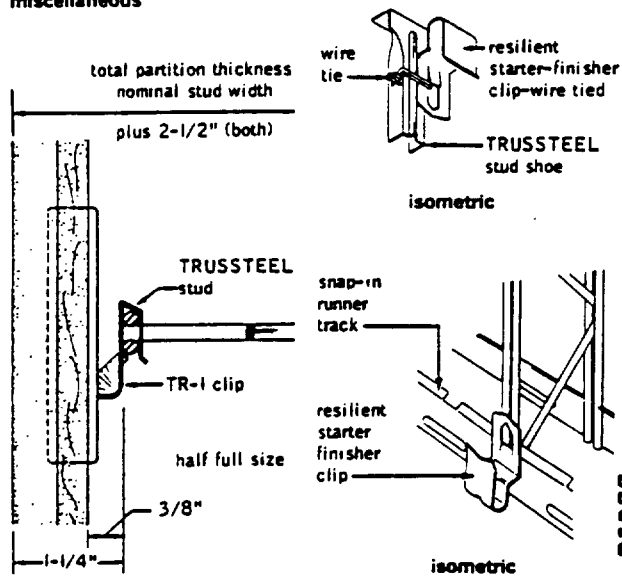


BB013 0286

resilient attachment
wall plan sections



miscellaneous

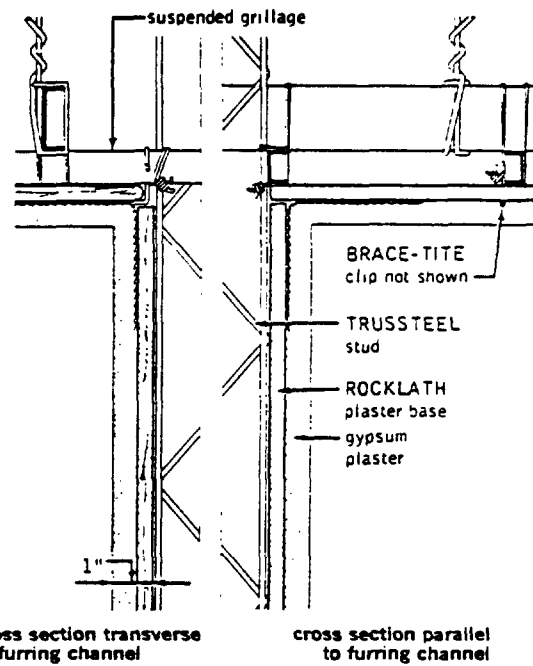


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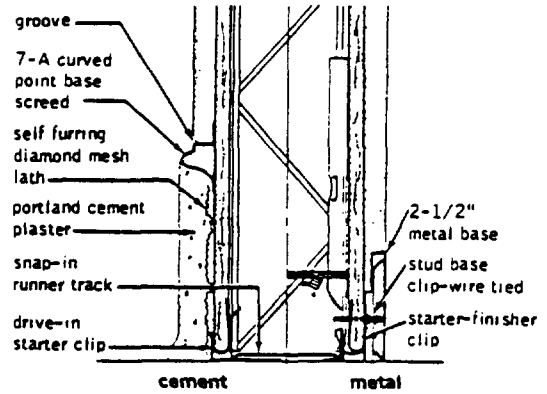
124 SYSTEMS: TRUSSTEEL-ROCKLATH Partition

direct attachment

ceiling attachment

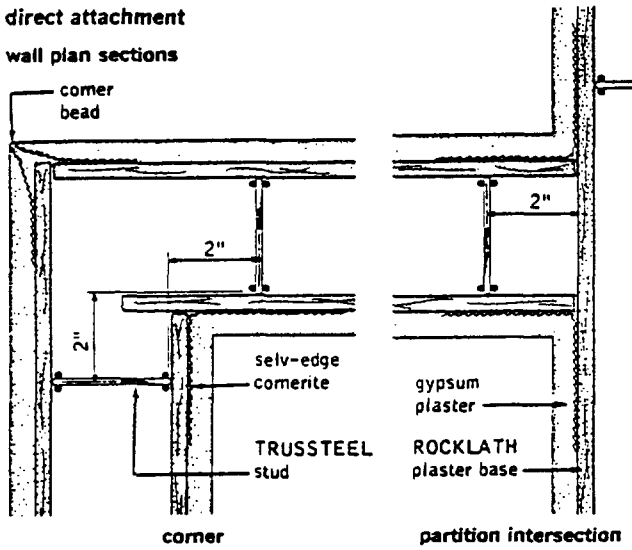


floor attachment & base

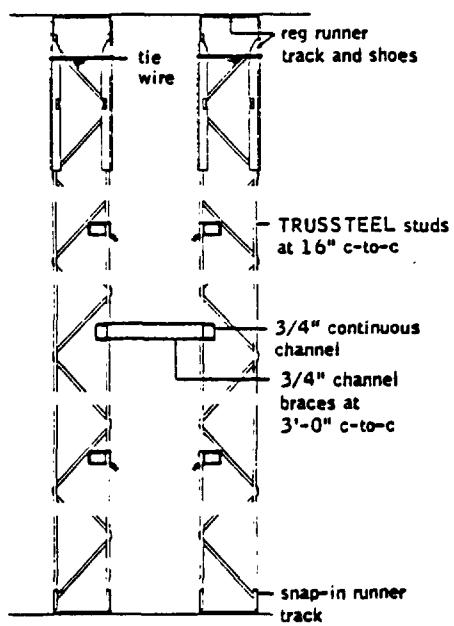


BB013 0288

direct attachment
wall plan sections

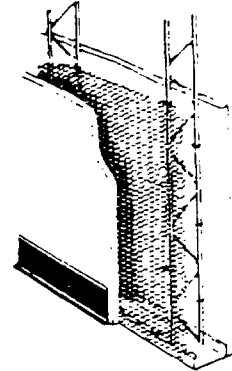


core wall framing



BB013 0289

TRUSSTEEL Stud-Metal Lath Partition



This partition system is readily adaptable to curved walls and special constructions as well as to conventional requirements. The mechanical keying and uniform reinforcing provided by the metal lath contribute to excellent over-all performance. The truss design of the studs allows a maximum of free space for encasing pipes, conduits or ducts horizontally, vertically or diagonally; studs may be cut and spliced easily without impairing the structural integrity of the assembly. The studs are attached to floor and ceiling by clips or runner tracks and stud shoes. Lath is either directly wire-tied to the stud or resiliently attached by means of USG Resilient Clips and $\frac{1}{8}$ " pencil rods. The assembly qualifies for 2 hr. fire rating (with wood fiber plaster sanded 100:1) and STC values as high as 50 with resilient attachment. Non-load bearing; stud spacing and limiting heights vary with type of metal lath and width of stud. Also used for furring and core wall construction.

Installation

FOR DIRECT ATTACHMENT of metal lath, follow general directions on TRUSSTEEL Stud framing assembly in section on TRUSSTEEL Stud-ROCKLATH System. Erect TRUSSTEEL Stud framing in accord with type of lath and limiting heights indicated in the table following.

TIE DIAMOND MESH LATH to stud flanges with 18-ga. tie wire at 6" intervals along each stud flange.

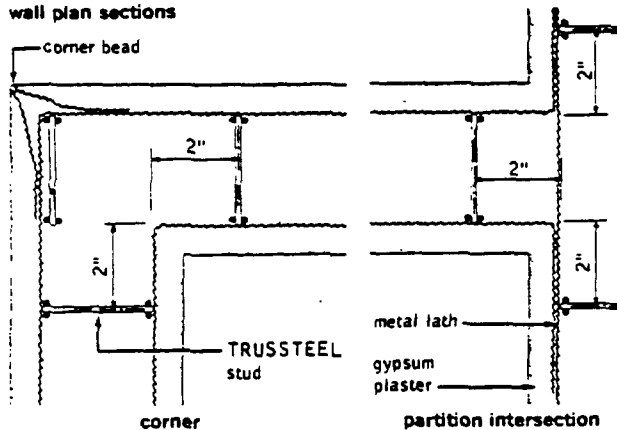
APPLY RIBLATH with rib projections against supports, and wire-tie to supports 6" o.c. Nest side and end ribs of lath and wire-tie between supports not to exceed 9" intervals. Stagger ends on all types of lath sheets so that lath on opposite sides and sheets below on the same side do not end on the same stud. Lace end laps or wire tie at 9" intervals.

TRUSSTEEL-Metal Lath Partition: SYSTEMS 127

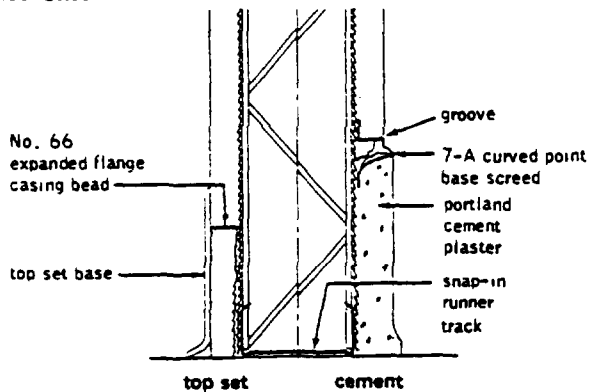
Plaster to $\frac{3}{4}$ " grounds using gypsum-sand 100:2, 100:3 mix in 3 coats. See Chapter 3 for plastering details.

direct attachment

wall plan sections



floor attachment & base



FOR RESILIENT CLIP ATTACHMENT, follow general procedures as for direct attachment, spacing studs not more than 16" o.c. Next, snap USG No. 400 Resilient Clips over the chords of studs, with clips located not more than 4" from floor and ceiling. Clip $\frac{1}{4}$ " pencil rods of ceiling height into small loops of resilient clips. Position USG 3.4 lb. Diamond Mesh Metal Lath with long dimension of sheets across supports with ends of lath lapped at least 1". See Metal Lath section in Chapter 1 for general application direction. Using 18-ga.

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128 SYSTEMS: TRUSSTEEL-Metal Lath Partition

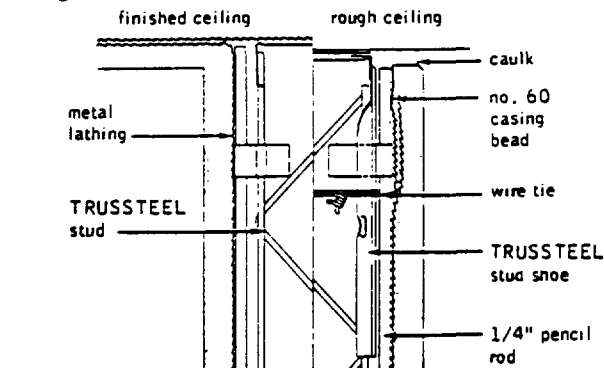
wire, tie lath to pencil rods and all supports at intervals not exceeding 6".

Plaster Application

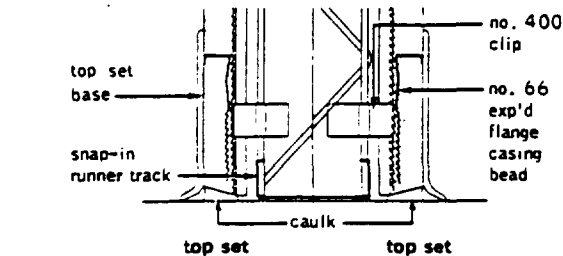
Plaster to ground thickness depending upon type of lath and stud spacing used (see table). Apply plaster in the three-coat method as described in Chapter 3.

resilient attachment

ceiling attachment



floor attachment & base



TRUSSTEEL STUD—PARTITION TECHNICAL DATA

Stud		Partition Thickness			Maximum Partition Heights		
Width	Section Modulus	Dia. Mesh or 1/2" Z-Riblath	Resilient Dia. Mesh	1/4" Riblath	Dia. Mesh Studs 16" o.c.	1/4" Riblath Studs 19" o.c.	1/4" Riblath Studs 24" o.c.
1 1/2"	.0635 ³	3 1/2"	4 1/2"	3 1/2"	9'	—	—
2 1/2"	.1056 ³	4"	5"	4 1/2"	15'	14'	9'
3 1/2"	.1420 ³	4 1/2"	5 1/2"	5 1/2"	21'	18'	13'
4"	.1825 ³	5 1/2"	6 1/2"	6"	22'	20'	16'
6"	.277 ³	7 1/2"	8 1/2"	8"	26'	24'	20'

Note: Diamond mesh and 1/2" Z-Riblath shown is based on 3.4-lb. per square yard of lath.

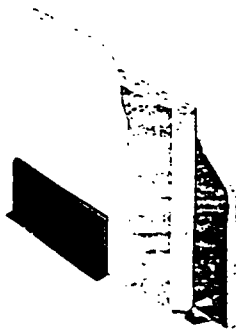
SOLID PLASTER PARTITIONS

These Solid Plaster Partition Systems are economical and space-saving while offering good strength, excellent fire resistance and acceptable sound isolation on area dividers. The monolithic plaster construction results in an extremely durable and easily decorated surface making any of these systems nationally accepted for use where strong, non-load bearing partitions are specified. The wide use of these systems in schools, dormitories, apartments and hotels shows that their many advantages are recognized by leading architects and builders. They are best used where few openings are required and special fitting or cutting is minimum.

There are five combinations of gypsum lath-plaster or metal lath-plaster solid partitions:

1. IMPERIAL Base-Solid
2. IMPERIAL Base-Double Solid
3. Solid Long Length ROCKLATH
4. Solid Studless Metal Lath
5. Solid Channel Stud Metal Lath

IMPERIAL Base-Solid Partition



Consisting of $\frac{3}{4}$ " IMPERIAL Plaster Base laminated to both sides of 1" USG Coreboard secured to floor and ceiling runners, this partition is finished with high-strength IMPERIAL Veneer Plaster that provides a beautiful, hard finish. Height limit is 10 ft.—thickness $2\frac{1}{4}$ ".

Advantages of the system are:

FIRE RESISTANCE: estimated fire rating of 2 hrs.

PERFORMANCE: ideal for areas requiring high strength and crack resistant features.

VERSATILITY: adaptable to most dimensions or modules—meets most normal design and job conditions.

BB013 0293

130 SYSTEMS: IMPERIAL-Solid Partition

ECONOMY: partitions go up fast. Finish can be rapidly applied by hand or machine.

Installation

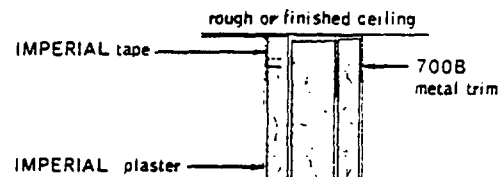
Snap chalk lines on floor and ceiling to mark partition locations. Fasten $\frac{3}{8}$ " x $1\frac{3}{8}$ " metal angle runner in place using concrete stub nails or power-driven fasteners spaced not over 24" o.c. Set all metal door frames before application of 1" coreboard and install borrowed light frames as coreboard erection proceeds.

Cut USG Coreboard to fit between floor and ceiling runners. Where conduit and outlet boxes occur, cut necessary openings. Install coreboard vertically with tongue edge leading and fasten with USG $1\frac{1}{4}$ " Type S Screws. Use two screws at top and two screws at bottom 2" from edges, to fasten coreboard to runners. At partition intersections or corners, use 10d nails to fasten coreboard. Nail along guiding center line, 24" o.c. After the coreboard has been installed, spot-grout the door frames where each jamb anchor clip is located (see Chapter 5 for details).

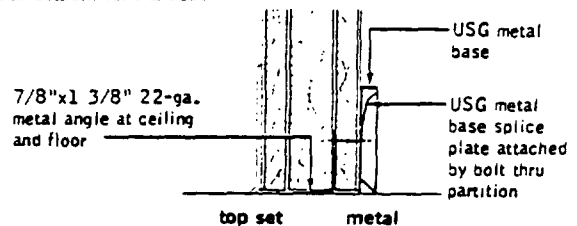
Cut the IMPERIAL Plaster Base to the full floor to ceiling dimension and strip-laminate (see page 49) to coreboard, arranging panels so that vertical abutting joints are at least 3" away from coreboard joints. For good adhesion use USG Type G Screws, spaced 2" from end and 4' o.c. in field of panel; 1" from ends and 3' o.c. along vertical edges and 2" from vertical edges. Drive with electric screw gun.

When adhesive has dried—about 48 hrs.—tape all joints and apply $\frac{1}{16}$ " to $\frac{3}{32}$ " IMPERIAL Veneer Plaster following directions in Chapter 2.

ceiling attachment

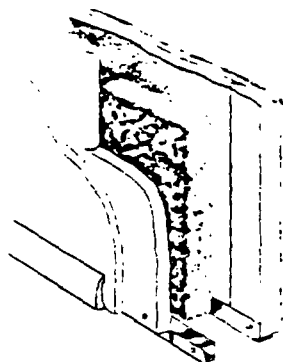


floor attachment & base



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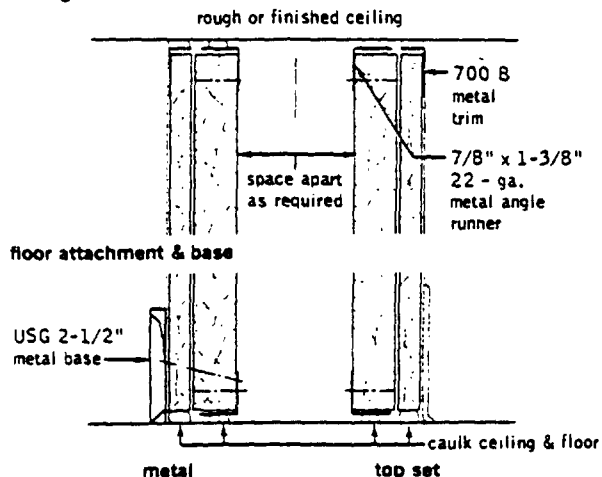
IMPERIAL Base-Double Solid Partition



Floor and ceiling runners for this double solid partition must be spaced not less than 1 $\frac{1}{4}$ " apart to provide 46 STC rating, and 3" apart for outstanding sound isolation of 55 STC. THERMAFIBER Sound Attenuation Blankets are stapled to the back of coreboard on one side of the latter assembly. It also serves as a chase wall. For runner attachment and coreboard erection, follow directions outlined for IMPERIAL Base-Solid Partition.

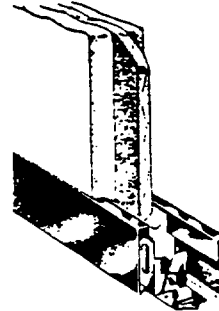
Laminate face layer of IMPERIAL Plaster Base to coreboard as described in Chapter 2. Follow taping and plastering directions in Chapter 2 for applying IMPERIAL Veneer Plaster.

ceiling attachment



BB013 0295

Solid Long Length ROCKLATH Partition



This partition assembly is an economical monolithic plaster construction, 2" to 2½" in thickness, which has been readily accepted for its space-saving features. ½", V-edge, Long Length ROCKLATH Plaster Base is held vertically by floor and ceiling runners and plastered on both sides. Temporary bracing is required until the assembly has been partially plastered. Limiting height is 10'.

This assembly is ideal for use wherever non-load bearing plastered partitions are desired and particularly where space-saving and economy are the most important factors. Its features are:

ECONOMY: saves time and money. Quickly estimated and easily erected. No waste, even on small jobs.

PERFORMANCE: used on many jobs with excellent results—few problems.

LIGHTWEIGHT: in structural design the dead load for 2" solid plaster partitions ranges from 11 to 16 lbs. per sq. ft., depending on the type of plaster aggregate used.

FIRE PROTECTION: constructed of incombustible components, this assembly has an established fire-resistance rating of 1 hr.

STRENGTH: a 240 ft.-lb. impact load concentrated at the center of a 2"x8'-0"x16'-0" panel failed to cause serious cracking. Additional strength and rigidity may be gained by increasing the plaster thickness.

Installation

Snap chalk lines to mark partition locations. For floor tracks use USG Metal Base and Double Base Clips or USG Floor Runner and Screed attached with stub nails or power-driven anchors at 24" o.c. Attach USG L-Type Ceiling Runner to grillage with double strand 18-ga. wire and to plaster or gypsum lath with toggle bolts or staples at 16" o.c.

Cut ½" Long Length ROCKLATH Plaster Base to size allowing

3-529-5198

$\frac{1}{4}$ " min. and $1\frac{1}{4}$ " max. clearance at ceiling. Erect vertically with the V-joint edges brought into close contact with the adjacent edge. Attach ROCKLATH to the floor runner or set in a groove of the grouted metal base and securely clip to the ceiling runner with two USG Ceiling Runner Clips per board. Wire-tie the ROCKLATH securely to the jamb inserts or door frames. Lath with cut vertical edges should be used only at the ends of partitions or at door frames and not in the central portion of the partition. Grout door and borrowed light frames as described in Chapter 5.

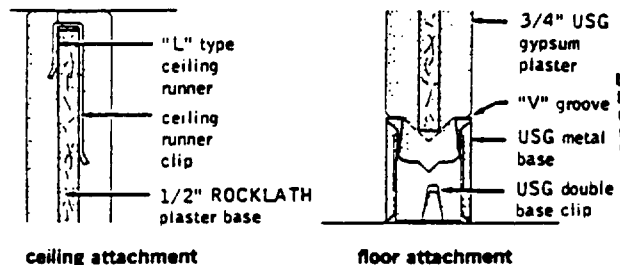
Temporary bracing should be not less than $\frac{1}{4}$ " c.r. channels placed horizontally and $1\frac{1}{2}$ " angle stiffener placed vertically. For partition up to 8'-6" height, place one horizontal brace near mid-height of the partition. For partitions over 8'-6" height, use two horizontal braces at third points. Use vertical stiffeners placed not over 6' o.c. on partitions over 6' in length. The horizontal channel should extend the full length of the partition and be fastened with USG Bracing Clip or securely wire-tied at the center of the lath and the ends of the channel. Wedge the vertical stiffeners at top and bottom and securely wire-tie to horizontal bracing. Keep bracing in place until the brown coat of plaster on the side opposite the bracing has set.

Set grounds to provide $\frac{3}{4}$ " min. plaster thickness, including $1/16$ " finish coat.

Plaster Application

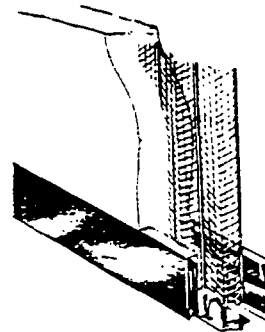
Plaster to grounds with 100:2-100:3 gypsum-sand plaster (for 1 hr. fire rating use 100:1-100:2 gypsum-sand plaster or gypsum-perlite at 100:2-100:3).

Apply scratch coat $\frac{3}{8}$ " thick—with max. set of 3 hrs.—to each side of the lath, both sides to be scratch coated within a 3-hr. interval. Cross-rake lightly in horizontal direction only. Apply brown coat to the unbraced side after scratch coat has set and partially dried (not less than 16 hrs.). After brown coat has set firmly (not less than 3 hrs.), carefully remove braces and brown coat the second side. Bring out brown coat to a true plane and leave rough. Apply finish coat plastering as described in Chapter 3.



134 SYSTEMS: Studless Metal Lath Partition

Solid Studless Metal Lath Partition



This partition assembly is an economical monolithic plaster construction, 2", 2½", or 2¾" in thickness, widely recognized for its space-saving and crack-resistance features. USG ¾" Riblath, attached at floor and ceiling by special runner, contributes vertical rigidity and reinforcement while providing an excellent lightweight plaster base. Nesting and wire-tying of ribs on adjacent sheets makes the riblath a nearly continuous reinforcing membrane which requires temporary bracing only until the partition has been plastered on one side. This is a non-load bearing partition with a limiting height of 10'.

This assembly is ideal for use wherever space saving and economy are the most important factors. Its features are:

ECONOMY: saves time—money. Easy to estimate; goes up fast.

PERFORMANCE: used in hotels and public buildings with excellent results—few application problems.

FIRE PROTECTION: constructed of incombustible components, this assembly has a 1 hr. fire-resistance rating.

STRENGTH: resists high impact loads without discernible cracking. Additional strength and rigidity may be gained by increasing the plaster thickness.

Installation

Install track to chalk lines snapped on floor and ceiling. The floor tracks are USG 2½" Metal Base and Double Base Clips or USG Floor Runner and Screed securely attached 24" o.c. For ceiling runners use USG L-Type Ceiling Runner attached 16" o.c. and located so that the USG ¾" Riblath will be positioned in the center of the partition. Attach to concrete with concrete stub nails or power driven anchors; to ceiling grillage with a double strand of 18-ga. tie wire; to plaster or gypsum lath with toggle bolts or staples.

Erect riblath vertically, attach to the floor runner or set in a groove of the grouted metal base and securely wire-tie 8" o.c.

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to the ceiling runner. Wire-tie the nested edges of sheets 12" o.c. and tie the riblath to jamb inserts or door frames. At all interior angles, form metal lath into the corners, carry out onto the abutting surface and adequately secure.

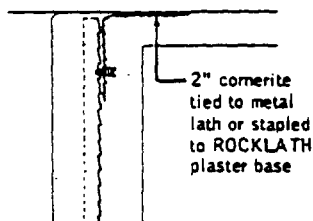
Finish partition terminals and cased openings with USG Partition Terminal, wire-tied securely in place.

Temporary bracing shall not be less than $\frac{3}{4}$ " c.r. channels placed horizontally near mid-height of the partition, tied to the riblath 24" o.c. and braced with $1\frac{1}{2}$ " angles placed vertically, not over 6' o.c. Wedge vertical braces at top and bottom and tie the horizontal $\frac{3}{4}$ " channel to hold lath in place.

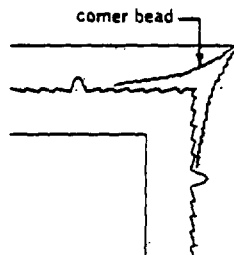
Plaster Application

First apply scratch coat to side opposite bracing, allow to set and partially dry. Next apply brown coat to full grounds on side opposite the bracing. Be sure plaster is completely set before removing bracing; then apply brown coat to full grounds on side previously braced. Apply conventional finish coats to both sides of partition. For normal application use 100:2 scratch coat and 100:3 brown coat. For 1 hr. fire rating use 100:2 scratch coat, 100:2 brown coat.

ceiling attachment

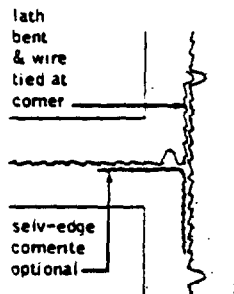
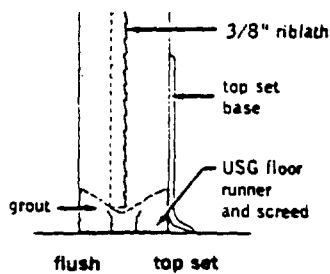


wall plan sections



corner

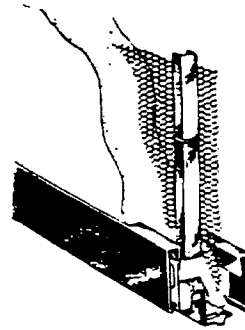
floor attachment & base



partition intersection

BB013 0299

Solid Channel Stud-Metal Lath Partition



Economical in construction, this partition has the advantage of higher fire ratings—2 hrs. with 3.4 lb. diamond mesh lath and perlited plaster. USG Cold Rolled Channels serve as permanent studs, 16" o.c., attached to floor and ceiling by special runners with the metal lath wire-tied to studs.

Metal lath for this assembly is available in two types: 2.5 lb. or 3.4 lb. diamond mesh lath; 2.75 lb. or 3.4 lb. Z-rib lath. The excellent mechanical keying properties and equal distribution of reinforcing provided by this plaster base give these assemblies high fire resistance and acceptable sound transmission loss ratings. For greater fire resistance or increased ceiling height, solid partitions thicker than 2" may be used. Features:

ECONOMY: easy to estimate and goes up fast. For small jobs, materials are readily available in dealer stocks.

PERFORMANCE: widely used in schools, dormitories, apartments and hotels with excellent results.

LIGHTWEIGHT: 12 to 23 lbs. per sq. ft. depending on type of plaster aggregate and plaster thickness used.

FIRE PROTECTION: constructed of incombustible components, this assembly has established fire ratings of up to 2 hrs.

SOUND ISOLATION: sound transmission loss considered satisfactory for normal requirements within offices, apartments and hotel units.

STRENGTH: highly resistant to impact damage. Additional strength and rigidity gained by increasing plaster thickness.

Installation

Snap partition lines on floor and ceiling. Fasten Z-type runner to ceiling. Attach double base clips—spaced 16" o.c.—to structural floor with concrete stub nails or power-driven fasteners.

USG COLD ROLLED CHANNELS