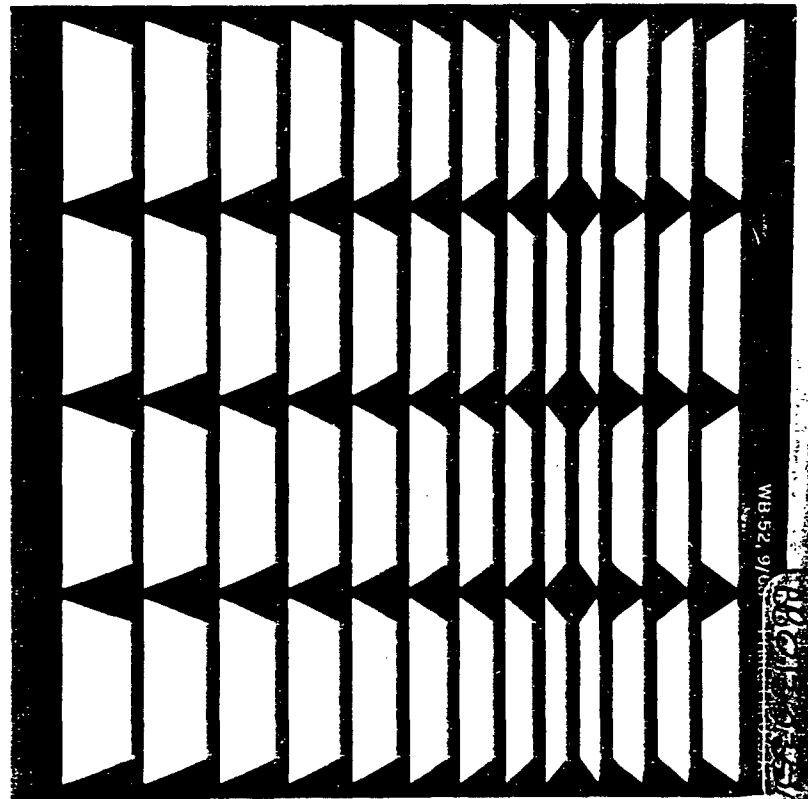


PLAINTIFF'S EXHIBIT

USG-2126

UNITED STATES GYPSUM

drywall
construction
handbook



WB-52, 9/08

UNITED STATES GYPSUM

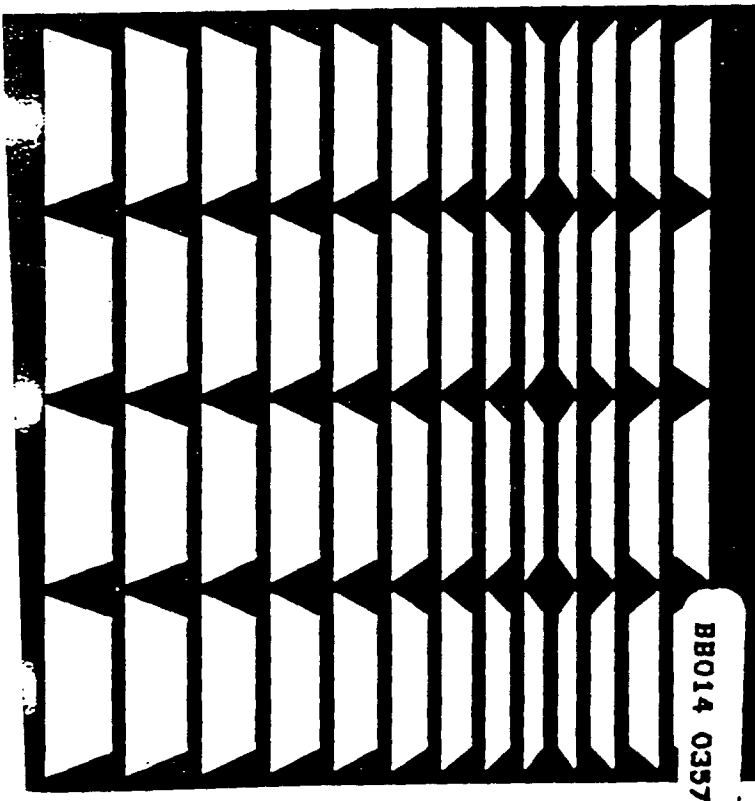
BOWMAN

EX 95

5th edition
(revised)

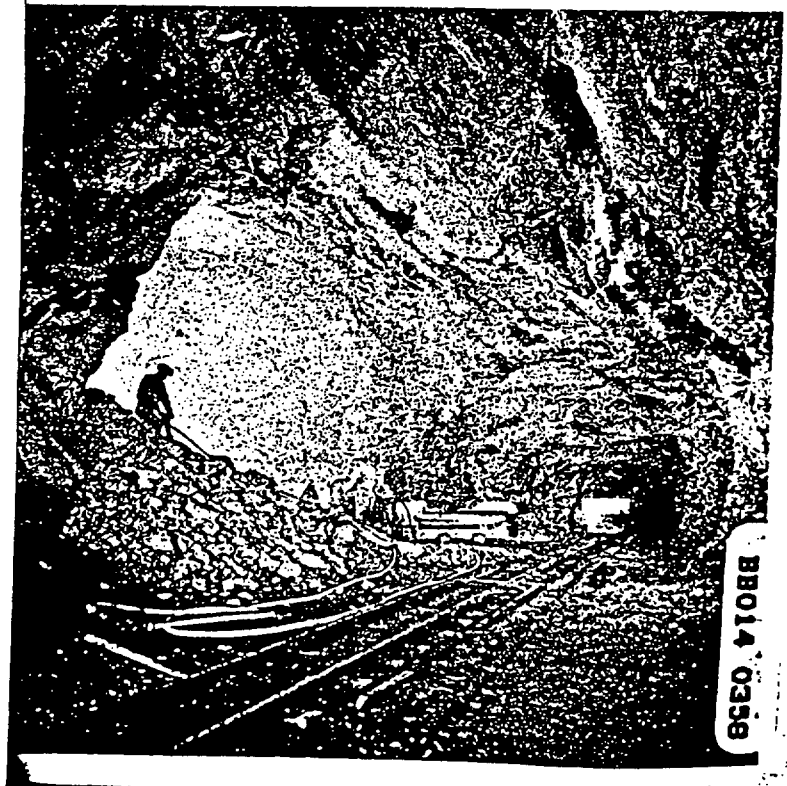
**drywall
construction
handbook**

price \$1.50



UNITED STATES GYPSUM COMPANY

101 S. Wacker Dr., Chicago, Ill. 60606, Dept. 122

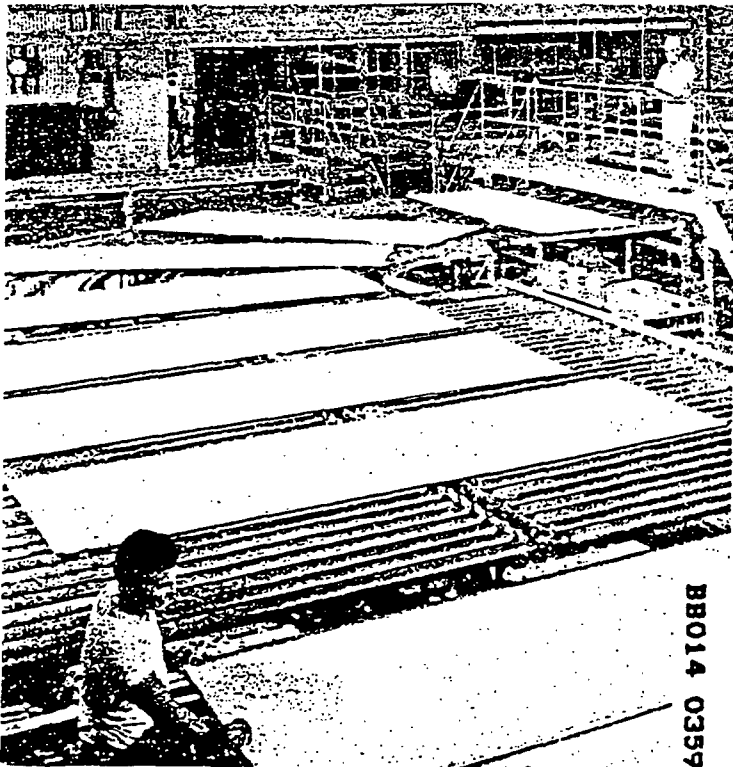


BB014 0358

gypsum drywall construction handbook

5th edition (revised)

TRADEMARKS: The following trademarks are owned and/or registered in the U.S. Patent Office by United States Gypsum Company, and are used throughout this handbook to designate particular products manufactured by that company: **USG** (metal products, gypsum coreboards, fiber boards, sheathing, adhesives, joint compounds, plaster, paints, acoustical sealant); **SHEETROCK** (gypsum wallboard, sealer, adhesives); **FIRECODE**, **BAXBORD**, **ULTRAWALL** (gypsum board); **PERF-A-TAPE** (joint treatment); **DURABOND** (joint treatment, adhesives); **DUR-A-BEAD**, **PERF-A-BEAD**, **ECONO** (corner reinforcement); **PYROBAR** (gypsum partition tile); **THERMAFIBER** (insulation products); **GRAND PRIZE**, **TEXOLITE**, **A-B TEX**, **PRO-KYD**, **ACREPOX**, **METAL COAT**, **DIAMOND** (paint products); **TEXTONE** (gypsum panels, paint products, moldings); **E-Z WALL** (partition system); **RED TOP**, **STRUCTO-BASE**, **STRUCTO-GAUGE**, **DIAMOND** (plaster); **ROCKLATH** (plaster base); **IMPERIAL** (plaster base, plaster); **IVORY** (lime).
Copyright 1970, United States Gypsum Company.



BB014 0359

... ABOUT THIS HANDBOOK

This Handbook of Gypsum Drywall Construction presents complete data on products and systems developed to simplify and speed construction, enhance appearance, and increase the use of gypsum drywall construction. It contains new data on partition, ceiling and fireproofing systems, and revised up-to-date information on tools, products, methods of installation and good construction practices. It is a complete and authoritative guide, valuable for both those with limited knowledge and those with broad experience in gypsum drywall construction.

HOW IT SERVES YOU

This handbook will serve as a quick and comprehensive reference for any drywall information you want:

Architects and Builders—Complete information on drywall systems, including descriptions, advantages, limitations and detail drawings.

Contractors and Dealers—Full data on all aspects of drywall products, tools, methods, including estimating and planning.

Applicators, experienced or beginners—Clear, concise illustrated instructions on all phases of drywall application from framing to finish.

Building Inspectors and Code Officials—Fire and sound test data; proper construction procedures for products which must be used together to meet fire and sound rating requirements.

TO FIND THE INFORMATION YOU WANT:

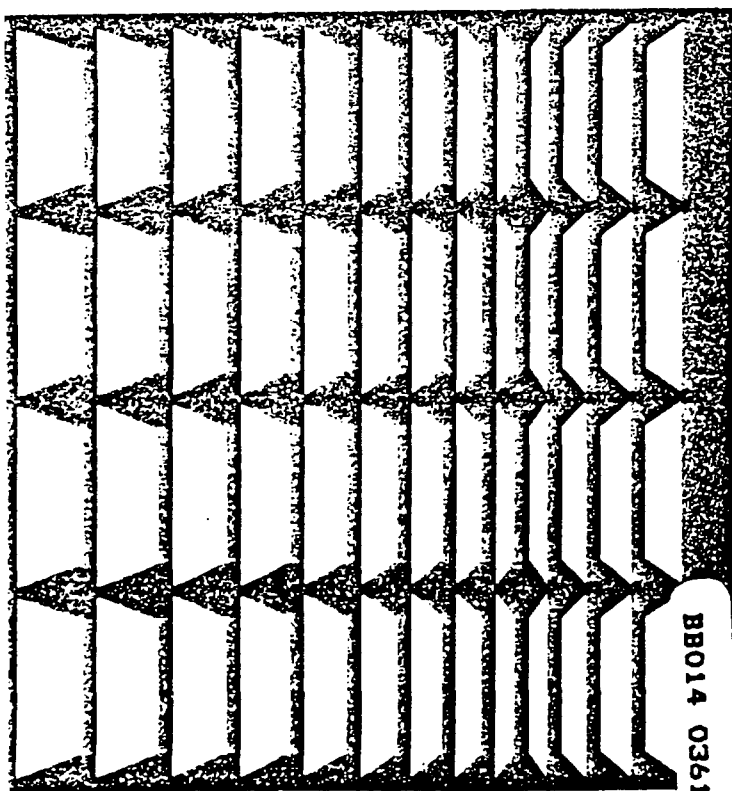
Use the fully cross-referenced index at the back. Or—check Table of Contents on page 5 to find the applicable chapter, then use the detailed table on the first page of that chapter to find the right page.

For example, if you want information on metal trim, it's in the index both as "Metal trim" and "Trim, metal." Also, the facing Table of Contents shows "Products" as Chapter 2 and the table of contents at the start of the chapter shows the page where metal accessories are found.

BB014 0360

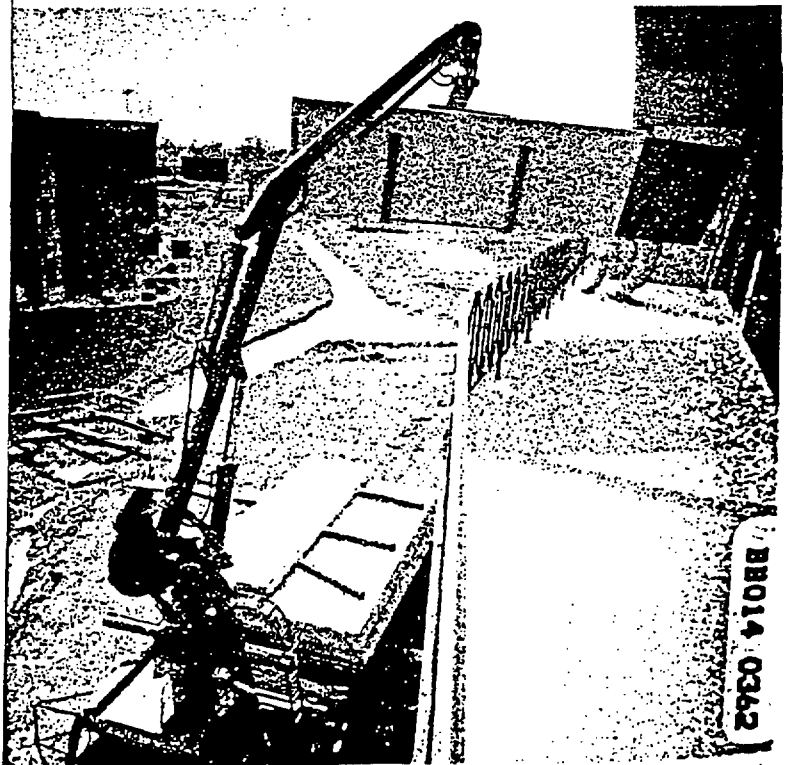
table of contents

chapter	title	page
1.	Drywall Characteristics and Practices	7
2.	Products	24
3.	Methods of Installation	66
4.	Systems	150
5.	Fire and Sound Ratings	236
6.	Drywall Problems and Remedies	252
7.	Tools	274
	Appendix	294
	Index	295

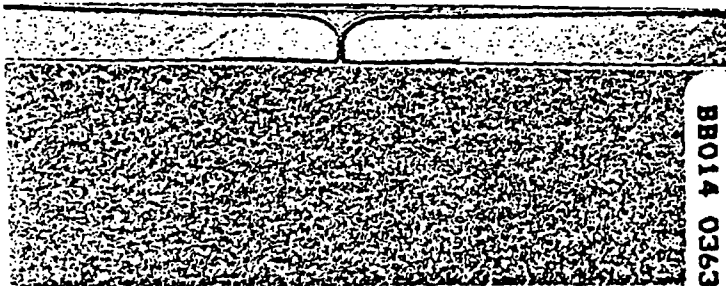
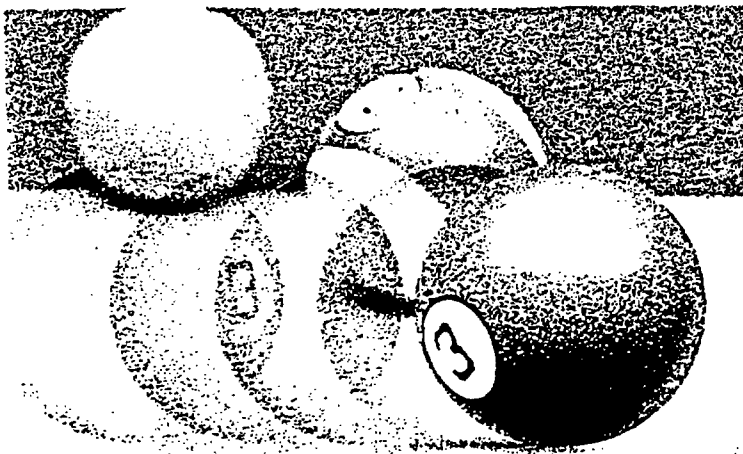


chapter 1

characteristics and practices



	page		page
Advantages of Gypsum		DESIGN	
Drywall Construction	9	RECOMMENDATIONS	13
Good Construction		Perimeter Isolation	
Practices	10	and Control Joints	13
JOB PRACTICES	10	Vapor Control	13
Framing Requirements	10	Insulation	14
Job Storage	11	Sound Control	16
Mechanical Handling	12	Fire Resistance	17
Temperature and		INSTALLATION	
Humidity Conditions	12	RECOMMENDATIONS	18
		Application	18
		Measuring	18
		Cutting	19
		Fastening	20
		Joint Treatment	21
		Decorating	23



BB014 0363

8 good practices/the drywall revolution

THE DRYWALL REVOLUTION

In the last two decades, gypsum drywall construction has revolutionized the building industry. A dynamic expansion is taking place—to the point that today more than 75% of all new residential buildings have sturdy, beautiful walls and ceilings of fire-resistant gypsum wallboard.

Within the last ten years, through leadership in research and development, United States Gypsum has introduced many new products and systems for drywall construction. These systems offer specialized sound control and fire resistance together with speed of installation, strength and low cost. Their wide acceptance in commercial, industrial and institutional construction follows the pattern of drywall's dominance in residential work.

The key product in this revolution is SHEETROCK Wallboard, the first and most widely used brand of gypsum wallboard. It is available with the scientifically developed eased-edge configuration of SHEETROCK SW—designed to resist joint ridging and cracking—as well as in various types of board to meet every wall and ceiling requirement.

SHEETROCK SW Wallboard, after extensive testing under supervision of an impartial engineering firm, has been certified superior at resisting ridging. SHEETROCK SW joint assemblies showed far greater flatness and strength than assemblies using ordinary tapered-edge wallboard.

SHEETROCK has its beginning in the ground as a gray to white-colored rock called gypsum. The basic ingredient of fireproof wallboards, gypsum is a non-metallic mineral composed of calcium sulphate chemically combined with water of crystallization. This "dry" water makes up approximately 20% of the weight of gypsum rock. It is this feature which gives gypsum its fire-resistive qualities and makes it so adaptable to the manufacture of wallboard.

After gypsum ore is mined or quarried (illustrated, page 2), it is crushed, dried, ground to flour fineness, and heated or calcined to drive off the greater part of the chemically combined water as steam. This calcined gypsum, or plaster of Paris, is then mixed with water and other ingredients and sandwiched between two sheets of specially treated paper to form a ribbon of SHEETROCK, as illustrated on page 3. After the gypsum core has set, the wallboard is cut to length, dried, pre-finished as required and packaged for shipment. The entire process is conducted in strict accordance with specifications to meet carefully controlled high quality standards.

Success and continued expansion in gypsum drywall construction depends on keeping standards of quality and appearance high while cutting construction time and costs to a minimum. U.S.G. has consistently been in the forefront of this effort, providing new materials to increase utility and lower cost; new systems with improved fire resistance and sound control; advisory services to promote better materials handling, market analysis and business management; specification and application information as a guide to good construction practices.

BB014 0364

advantages of gypsum drywall construction

Fire Resistant—Gypsum will not support combustion. Gypsum when exposed to fire behaves like a cake of ice when the flame from a blow torch is applied. The ice melts on the surface in contact with the flame while the opposite side remains cool. Similarly, the surface of gypsum wallboard opposite the flame remains at a relatively low temperature until the gypsum core is completely calcined.

Smooth Unbroken Surfaces—Now the new SHEETROCK SW System provides walls and ceilings of flawless beauty with the strongest joint ever developed. A U.S.G. Joint System reinforces and conceals the joints between panels.

Decoration—The strong, highly calendered face paper on SHEETROCK Wallboard is suitable for any type of decorative treatment such as paint, texture or wallpaper and permits repeated redecoration during the life of the building.

Pre-finished panels are available which require no painting or joint finishing. Walls are complete as soon as panels are installed. These fire-resistant panels have a durable finish that is easily maintained.

Minimum Moisture—SHEETROCK Gypsum Wallboard eliminates the use of tons of water on the job. Since excess moisture is not put into the building, the possibility of moisture damage is minimized.

Crack Resistance—The new SHEETROCK SW measurably reduces joint imperfections due to extremes in temperature and humidity. Bonded together with a U.S.G. Joint System, SHEETROCK panels form walls and ceilings that are exceptionally resistant to cracks caused by minor structural movement, vibrations or settlement.

Uniform Quality—SHEETROCK Gypsum Wallboard panels are factory-made products. The raw materials and the manufacture are carefully controlled.

Speed of Erection—The use of SHEETROCK Gypsum Wallboard permits earlier completion of construction—and earlier building occupancy.

Snug-Fitting Trim—The uniform thickness of each panel permits installation of wood or metal trim snug to wall surfaces.

Warp-Resistance—Expansion or contraction of SHEETROCK under normal temperature and humidity changes and resulting deformation are negligible.

BB014 0365

10 good practices/framing requirements

good construction practices

Two ingredients are required for a *quality drywall job*—quality products and skilled craftsmen correctly employing good construction practices. SHEETROCK Gypsum Wallboard, a U.S.G. Joint System and drywall accessories are top quality products designed to *work together*, job-proven and constantly improved. But without proper planning and correct installation by the applicator, the products by themselves cannot be expected to produce the desired quality results.

This section deals with the basic job practices, design and installation recommendations that should be followed in planning and completing the best possible job. These good construction practices can give the applicator 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.

job practices

framing requirements

The framing that will receive SHEETROCK Wallboard 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 should meet the requirements outlined in Chapter 3—Installation Methods and the minimum requirements of FHA, ALSC and local building codes.

Failure to observe these requirements will materially increase the possibility of fastener failure due to wood shrinkage and warping.

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 application of the gypsum wallboard.

Framing should be designed to account for shrinkage in wide dimensional lumber such as floor joists and headers. Wallboard surfaces may buckle or crack when firmly anchored across the flat grain of wide wood members as shrinkage occurs. With high exposed walls and cathedral type ceilings, regular or modified balloon framing should be used. With western or platform framing, the wallboard must either be floated over the wood member or provided with a control joint at the joist location.

FRAMING CORRECTIONS

If joists are out of alignment, 2"x6" leveling plates attached perpendicular to and across top of ceiling joists may be used.

BB014 0366

Toe nailing into joists pulls framing into true horizontal alignment and insures a smooth level ceiling construction.

Bowed or warped studs may be straightened by sawing the hollow sides at the middle of the bow and driving a wedge into the saw kerf until the stud is in line. Reinforcement of the stud is accomplished by securely nailing 1"x4" wood strips or "scabs" on each side of the cut (see photo).



job storage

If possible, SHEETROCK Wallboard should be ordered for delivery a day in advance of drywall application. Materials stored on the job for a long period of time are subject to excessive abuse. Wallboard, like millwork, is a finish material to be handled with care to avoid damage.

The SHEETROCK should be placed inside under cover and stacked flat on a clean floor in the centers of the largest rooms. It is often desirable to place the necessary number of pieces of SHEETROCK Wallboard in the location where they will be used. All materials used on the job should remain in their wrappings or containers until ready for actual use.

SHEETROCK planned for use on ceilings should be placed on top of pile for removal first. Avoid stacking long lengths on short lengths, as the weight of overhang of the longer board is apt to break the boards.

If flat storage space is not available an alternate method of short-term, on-the-job storage is placing the wallboard vertically against the framing with the long edge of the board horizontal. This method should not be used for long periods since vertical storage may deform the board. With this type of storage, some jobs cannot be stocked until electrical and plumbing installations are made.

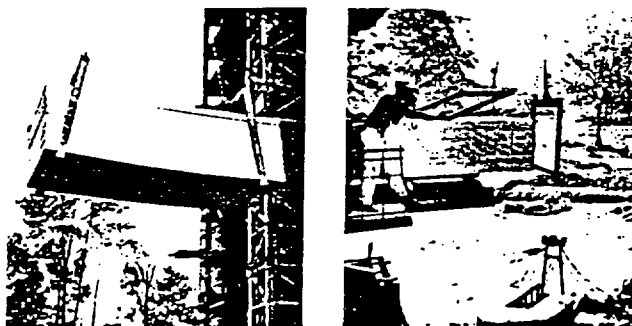
Caution should be exercised not to overload the framing members acting as a brace for this manner of storage, and not to overload floor space in a storage area when board is piled flat. There are so many variable conditions that, in general, outside storage of SHEETROCK Wallboard is not recommended.

BB014 0367

mechanical handling

When drywall construction moved into high-rise buildings, it brought with it the new challenge of moving large wallboard panels from the ground to the point of use many stories up. Materials handling on the job site can add cost and whittle away profit while the contractor scarcely knows where his money has gone. 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 with photos and step-by-step procedures of material handling methods used by contractors around the country are available. Contact your U.S.G. representative for help in



determining on-site handling costs and methods best suited to particular job conditions. Also see Chapter 7—Tools—for descriptions of handling equipment and available suppliers.

temperature and humidity conditions

In cold weather (outdoor temperatures less than 55° F.), controlled heat in the range of 55° to 70° F. must be provided. This heat must be maintained both day and night 24 hours before, during and after entire gypsum wallboard and joint treatment application and until permanent heating system is in operation or the building is occupied. Ventilation should be provided to eliminate excessive moisture. In glazed buildings, this may be accomplished by keeping windows open approximately 2" top and bottom (or side-pivoted windows approximately 4") to provide air circulation. In enclosed areas lacking in natural ventilation, temporary circulators should be used. Under slow drying condi-

tions, allow additional drying time between coats of joint compound. Avoid drafts during hot, dry weather to prevent too rapid drying of joint compound. Also see "Cold Weather Tips—Joint System Application," Chapter 3.

design recommendations

perimeter isolation and control joints

Drywall partitions, ceilings, column fireproofing and furring will not resist stresses imposed by structural movement, and are subject to dimensional variations due to changes in temperature and humidity. It is recommended that wallboard surfaces be isolated from all structural elements, except the floor, by control joints or other means where:

- a. a wallboard surface abuts any structural element or dissimilar wall or ceiling assembly.
- b. the construction changes within the plane of the partition, ceiling, furring or fireproofing.
- c. the basic interior or exterior wall contains a control or expansion joint.

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

Expansive ceiling areas should have control joints spaced not to exceed 50' in either direction. The continuity of wallboard and supports should be broken over control joints. Control joints may be positioned to intersect light fixtures, heating vents, air diffusers, etc., which are usually considered weak spots.

Exterior portland cement-lime stucco surfaces in the Metal Stud Curtain Wall System should be divided into panels with control joints spaced no more than 10' o.c. in either direction (30' o.c. for inside surface as shown above). The area of a separate section should not exceed 100 sq. ft. Sheathing and interior lath or wallboard should be broken behind control joints. Where vertical and horizontal joints intersect, the vertical joint should be continuous and the horizontal joint should abut it. Splices, terminals and intersections should be caulked with USG Acoustical Sealant.

See Chapter 3 for correct installation procedures for control joints and perimeter isolation.

vapor control

Condensation of moisture from the air occurs when the temperature of warm moist air is reduced and the cooler air is unable to hold as much water vapor. Condensation in exterior walls is a

BB014 0369

14 good practices/insulation

common cause of paint failure, warped siding and rotted studs and sills. Also, moisture penetration can reduce the effectiveness of wall and ceiling insulation. An efficient vapor barrier installed in walls and ceilings usually prevents this damage and is particularly important in climates with wide summer-winter temperature fluctuations—also in humid mild climates.

United States Gypsum has developed a number of products and systems designed to reduce moisture penetration and also provide significant insulating values. The outstanding resistance to vapor penetration of the bright aluminum foil laminated to the back of Insulating SHEETROCK Wallboard makes it an ideal material for condensation control, especially when installed with effective insulating materials.

The strong asphalt paper covering THERMAFIBER Regular Insulating Blankets and the aluminum foil encasing THERMAFIBER Silver Shield Blankets provide excellent vapor barriers. Polyethylene plastic film at least 4 mils thick is also satisfactory.

A vapor barrier should be located on the warm side of exterior walls and top floor ceilings to prevent moisture penetration into the construction. Care should be taken when erecting wallboard to see that the foil backing or other vapor barrier is not punctured or destroyed. When two vapor barriers occur in close proximity or within the same construction, such as in attics, crawl spaces or metal curtain wall construction, the space between the barriers should be vented to remove moisture which has penetrated the warm barrier.

insulation

Quality drywall construction today demands proper insulation of exterior wall surfaces, beams and columns to minimize the possibilities of partitions cracking and to reduce shadowing and spotting problems in exterior walls.

Steel and concrete beams and columns expand as temperatures rise and contract as temperatures drop. For example, a 50' length of concrete expands $\frac{3}{8}$ " in length as the temperature varies from -10°F to 90°F . These movements are transferred to the partitions which are indirectly attached to or supported by the framing. Exterior structural members should be properly insulated in addition to employing appropriate isolation and control joints to reduce the amount of expansion and contraction and the possibilities for partition cracking. See Chapter 6—Cracking Problems in High-Rise Structures for a full description of this condition.

Shadowing and spotting due to airborne dirt accumulation over screw heads is a potential problem whenever an exterior curtain wall or wall furring system is used. Photographing or shadowing over the furring members or studs resulting from dirt or smoke deposition may also occur, although less frequently. The problem is caused by a differential in temperature between the metal screws, metal studs or furring members and the surrounding wall-board surface during periods of low temperature. This results in

BB014 0370

a greater accumulation of dirt over screw heads and framing members than on the surrounding surface of wallboard. The intensity of the spotting or shadowing will vary directly with the temperature differential as well as with the amount of airborne dirt or smoke.

Because of the temperature and airborne dirt conditions over which United States Gypsum has no control, the Company cannot be held responsible for the surface blemishes that may result.

Where temperature, humidity and soiling conditions are expected to cause objectionable shadowing and spotting, one of the following alternates should be considered:

- a. Additional insulation should be provided to reduce the temperature differential between the metal components and the surrounding wallboard.
- b. For maximum resistance to shadowing and spotting, a separate chase wall construction is recommended. The interior wall surface should be separately framed with free-standing furring that is independent of the exterior walls.

The All-Weather Standards of the National Mineral Wool Association shown below give minimum insulation requirements for air-conditioned or electric-heated buildings.

All-Weather Standards—Wool Insulation

Building Section	Select Blankets Marked This Way	Installation Recommendations
Ceilings— Extreme Temp. Areas	R-24	With min. 1" air space between vapor barrier & ceiling
Ceilings— Moderate Temp. Areas	R-19	With min. 1" air space between vapor barrier & ceiling
Walls	R-11	Can substitute R-13 in extreme temperature areas
Floors	R-13	With min. 1" air space between vapor barrier & floor

NOTES: Ratings shown apply to floors over unheated spaces. Recommendations are subject to variation due to individual type of construction, amount and orientation of window area, sheltered location, capacity of heating and cooling equipment, etc.

In accordance with industry standards, THERMAFIBER Insulation products are labeled with each product's mass resistance (of insulation only), thickness and installed resistance. This installed resistance is the sum of mass resistance and resistance of adjacent air spaces or air surfaces which may exist. All manufacturers' mineral wool insulation products marked with the same Installed Resistance Number have the same insulation value regardless of individual thickness.

BB014 0371

sound control

The partitions, floors and ceilings of a building provide resistance to transmission of airborne and structure-borne sound. Their efficiency as sound barriers is dependent upon several factors that concern drywall construction:

1. **Mass**—The heavier the construction, the greater its resistance to sound transmission.
2. **Isolation**—The separation of opposite surfaces of a construction will improve sound isolation. Surfaces may be separately supported with no structural connections between them or may be resiliently mounted to common supports.
3. **Damping**—The addition of sound attenuation wool within the construction effectively dissipates sound energy by converting it to heat.
4. **Leaks**—Cracks, penetrations or any openings, however small, readily conduct airborne sound.
5. **Flanking Paths**—Sound is transmitted along the path of least resistance which is usually through the structure and around sound barrier walls and floor-ceilings.

GUIDELINES FOR SOUND-CONTROL CONSTRUCTION

1. Wall and ceiling construction should provide approximately the same degree of sound control through each assembly. Where a drywall partition is used for sound isolation, the construction should extend from slab to slab. Sound can travel through a suspended acoustical ceiling, up and over a partition attached to a suspended ceiling and into other areas.
2. Doubling the mass (weight) of a partition improves sound attenuation by about 5 decibels (db).
3. Doubling the width of air space between free-standing partition diaphragms improves sound attenuation by about 5 db.
4. Do not substitute materials in a sound control system as this may reduce the attenuation performance.
5. THERMAFIBER Sound Attenuation Blankets placed in the partition cavity greatly improve the performance only if the system is resilient, as with RC-I Channels or metal studs.
6. For effective sound control, an assembly must be airtight—perimeters and all penetrations must be sealed with acoustical caulk such as USG Acoustical Sealant. Enough sound can leak through a 1-sq. in. hole in a 100-sq. ft. partition to lower the performance approximately 10 STC points.
7. Electrical outlet boxes and similar penetrations such as heat outlets on opposite sides of a sound control partition should be separated by at least one stud space and should not be directly connected. Caulk the back and sides of electrical boxes and the perimeter of all penetrations.

8. Back-to-back bathtubs and recessed medicine cabinets can reduce sound control performance. Provide a wall surface between bathtubs and use surface-mounted cabinets.

9. Hollow-core doors are ineffective in retarding the transmission of sound between rooms. If required in sound walls, doors should have solid cores and seals at the perimeters.

10. Continuous ceilings over sound control partitions provide a flanking path for sound. Install expansion joints in the ceiling at intersection with partitions to decouple ceiling areas. With an open plenum, retard flanking with THERMAFIBER Blankets laid directly on the ceiling and extending 4 to 5 ft. out from the partition.

11. Conduit, recessed light fixtures, heat ducts and other services rigidly secured to a resiliently attached diaphragm will negate its sound-isolating property by "short circuiting" the decoupling.

12. Air chambers at plumbing valves and individual waste stacks for separate apartments will alleviate much irritating plumbing noise.

13. Noise-producing appliances and fixtures (dishwashers, garbage disposals, water closets, exhaust and furnace blowers) should be isolated from the structure with resilient mounts and flexible service leads.

fire resistance

Building codes establish fire endurance requirements for various building elements that provide an acceptable level of safety to life and property. A fire resistance rating denotes the length of time a given partition, floor-ceiling or column assembly can resist passage of intense heat and flames, while supporting the imposed design loads.

Fire ratings are based on specific components and details of assembly and not on the ceiling or partition membrane alone. Products used in fire-rated assemblies are regularly tested for uniformity and compliance and are specifically listed in systems specifications and labeled for easy recognition by field inspectors.

Construction of fire-rated assemblies should be preceded by carefully reading the test report for specific details of assembly. If this construction is not followed, changes may adversely affect the result. Any deviation in construction or substitution of materials from those described in the test report, therefore, should be carefully considered in advance.

Construction to meet certain fire requirements will vary with the type of building. The hazards in an apartment building will obviously be different—and more complex—than in a single-family unit. It is important that the building code be studied to determine specific requirements; then suitable fire-rated assemblies and necessary construction details may be selected.

18 good practices/wallboard application

These are some important fire-resistance details for apartment construction:

- Where pipes, wires, ducts, utility lines, etc. pass through floors or vertical shafts, caulk holes to reduce draft or path for flame.
- Carry flooring and sub-flooring to walls. Caulk all openings that remain.
- Cover entire area behind tubs, sinks, cabinets, soffits, etc. with wallboard so that there are no openings in the wall surface. Build soffits and position cabinets and plumbing fixtures over the unbroken surface. Place heating ducts outside framing and enclose with furring and gypsum wallboard.

installation recommendations

general recommendations for applying SHEETROCK wallboard

Application—The following recommendations are for SHEETROCK wallboard applied to wood and metal framing:

- Ceiling panels should be installed first.
- SHEETROCK Wallboard panels should be cut so as to slip easily into place.
- All joints should be loosely butted together. Boards should never be forced into position.
- Tapered edges, except at angles, should always be placed next to one another.
- Butt ends should never be placed next to a tapered edge. (SHEETROCK Wallboard is tapered and wrapped along the long dimension to facilitate joint treatment. Exposed ends (butts) along the short dimension are not tapered.) Wherever possible, SHEETROCK should be applied horizontally and in lengths to span ceilings and walls without end (butt) joints. If butt joints occur, they should be staggered and located as far from the center of walls and ceilings as possible.
- All ends and edges of SHEETROCK Wallboard must be supported on framing members, except edges at right angles to framing in horizontal application and face layer of Double-Layer application and where end joints are to be back-blocked and floated. For description of Back-Blocking, see Chapter 3.
- If metal trim is to be installed around edges, doors, or windows, determine if trim is to be installed on framing prior to application of wallboard. Refer to Chapter 2 for description of products and to Chapter 3 for description of installations.

BB014 0374

measuring & cutting/good practices 19

- Wallboard surfaces should not be firmly anchored across the flat grain of wide dimensional lumber such as floor joists and headers. Wallboard should be floated over these members or provided with a control joint to handle wood shrinkage. See Chapter 3 for description of installation.

Measuring—All measurements must be accurate. Two measurements should be made as a check, one on the other. In addition, this procedure will usually warn applicator of partitions or door frames that are out of plumb so that allowances in cutting may be made. A 12-foot steel tape rule is recommended. All tools for measuring and cutting are illustrated and described in detail in Chapter 7—Tools.

Cutting—Straight line cuts across full width or length of board are made by scoring face paper, snapping core of board, and then cutting back paper. The common tool used to score and cut gypsum wallboard is a Stanley wallboard trimming knife. Regardless of type used, blade should always be kept sharp so that score will be made through paper into core of gypsum wallboard.

Use of a straight edge is recommended. An aluminum 4-foot T-square, ruled on both sides, facilitates clean, straight cuts.



Score paper on face of board with cutting knife, using a straight edge as a guide.



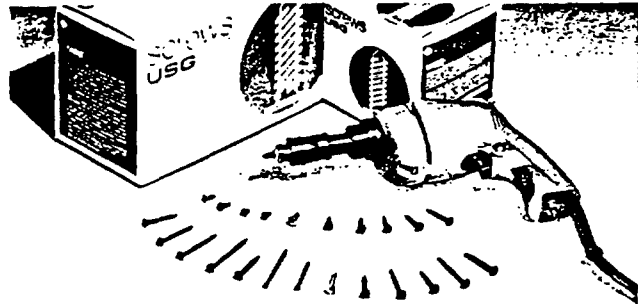
Break the gypsum core of SHEETROCK by snapping or bending away from the scored paper side. Complete cutting by running knife through back paper from above or below.



Smooth cut edges with a rasp, coarse sandpaper or metal lath wrapped around a block of wood, or trim with a cutting knife.

BB014 0375

20 good practices/fastening



Fastening—SHEETROCK Wallboard is fastened to wood framing with either nails or screws. Traditionally, nails have been the sole fastening means for wallboard constructions, but use of the USG Brand Screw—Type W is the best known insurance against fastener pops caused by loosely attached board. 1¼" USG Brand Screws—Type W are applied with a positive-clutch electric power-driven screwdriver equipped with an adjustable screw depth control head and a Phillips bit.

Extensive comparison tests have shown the superiority of the screw over the GWB-54 annular ring nail, itself the most effective of nail fasteners. Compared to the nail, the screw offers:

- Over 100% greater withdrawal resistance.
- Over 100% greater "push-off" resistance.
- Reduced incidence of loose board.
- Increased coating protection against rust.
- Reduced fastener head defects, resulting in fewer call-backs.
- Tighter attachment of SHEETROCK Wallboard to framing.
- Fewer fasteners, less spotting and joint compound needed.
- Elimination of paper tearing and core fracturing associated with nailing.

Alternate methods for fastening wallboard to wood framing:

1. **Double Nailing System**—for minimizing defects due to loosely nailed wallboard by placing second nails within 2" of first nails.



BB014 0376



2. Adhesive Nail-on System—A continuous bead of DURABOND 200 or 300 Stud Adhesive is applied to framing plus supplementary nailing; improves bond strength by 50% to 100%, greatly reduces face nailing needed.

Drywall screws are the accepted fasteners for attaching wallboard to light-gauge steel studs and channels. Intensive engineering research has produced the USG Brand Type S Screw—a fastener clearly superior to the conventional drywall screw. The Hi and Lo double lead threads and reduced shank diameter produce these added features:

- More gripping area—greater holding power.
- 35%-50% faster penetration—more screws driven per day.
- 40% less driving torque—reduced operator fatigue—screw guns last longer.
- . . . plus self-drilling, self-tapping, milled drilling point.
- patented bugle head.

Specifications for recommended nails and drywall screws are given in Chapter 2—Products. The spacing of fasteners is included in the description of each type of wallboard application in Chapter 3. For fastener specifications used in specific drywall systems, see Chapter 4 or consult the official test report.

general recommendations for joint treatment

The growth of drywall construction in the building industry is due largely to the development and improvement of joint finishing methods. U.S.G., the originator and developer of modern joint treatment, is continuing to perfect products with overall qualities that provide the best, most uniform finished result. The most recent of these are USG Brand Joint Compounds, a complete new group of non-casein type powder compounds, that are ready to use as soon as mixed; SHEETROCK SW Wallboard, with an exclusive eased-edge design, and DURABOND 90 Joint Compound, which to-

BB014 0377

22 good practices/joint treatment

gether offer stronger joints and reduced imperfections in finishing. DURABOND 90 Joint Compound is used to pre-fill the V-joint formed by the rounded edges of SHEETROCK SW; conventional taping and finishing complete the joint.

In spite of all a manufacturer does to produce quality products, satisfactory appearance and performance on interior walls and ceilings are in the hands of the applicator. The quality of his work determines how well wallboard joints are reinforced and concealed and fastener heads covered. His planning and skill will determine the quality of the finished surface.

Occasionally, during construction, problems arise which are beyond the control of the manufacturer. Nevertheless, through his experience, the manufacturer has developed improved products and methods of use to overcome recurrent problems. The dry-wall applicator can save time, trouble and expense by observing proper precautions and, in the event that difficulties arise, by making a complete and frank appraisal of his work. The following are precautionary measures designed to prevent problems.

Check Compatibility—All USG Brand Compounds are compatible with each other, including USG Ready-Mixed Joint Compound-All Purpose. USG Brand Compounds may be used over hardened DURABOND Joint Compound and DURABOND 90. Most casein-based joint compounds, including PERF-A-TAPE Joint Compounds made by U.S.G., are not compatible with the USG Brand Joint Compounds; and problems may result if any attempt is made to mix them together or use them successively on the same joint.

Protect Materials—Store joint treatment in a dry place and rotate stocks; age and dampness affect the working qualities of this material. Protect Ready-Mixed Compounds from freezing.

Check Working Surfaces—Gypsum wallboard must be firmly attached to framing members without cutting the surface paper or fracturing the core of the board. Make certain each board forms a true, even alignment at each joint. Check width and depth of taper in the board.

Mix Carefully—Use clean containers and mixing tools. Follow directions for mixing the particular joint compound shown on the package. Use clean drinkable water for mixing. Add powdered compounds to the water. *Do not over-thin compound with water.*



Pre-fill to edge only.



Avoid heavy fills.

BB014 0378

Pre-Fill to Edge Only—On SHEETROCK SW Wallboard, pre-fill joints with DURABOND 90 Joint Compound and remove excess material from flat surfaces (beyond rounded edges).

Avoid Heavy Fills—Embedded tape should have joint compound completely surrounding it *but not more than 1/16"* thickness under the feather edge.

Use Three Coats—Three coat work is essential for quality results.

Dry Properly—Allow joint compound to dry properly before applying second and third coats or decorating. Because it hardens chemically, the DURABOND Joint System will perform better than other types under slow drying conditions. Avoid rapid drying. Do not over-thin compound.

Maintain Equipment—Keep mechanical equipment in perfect working order and replace parts at the slightest sign of wear.

Follow the complete application procedures outlined in Chapter 3. Joint treatment product descriptions and specifications are found in Chapter 2.

general recommendations for decorating

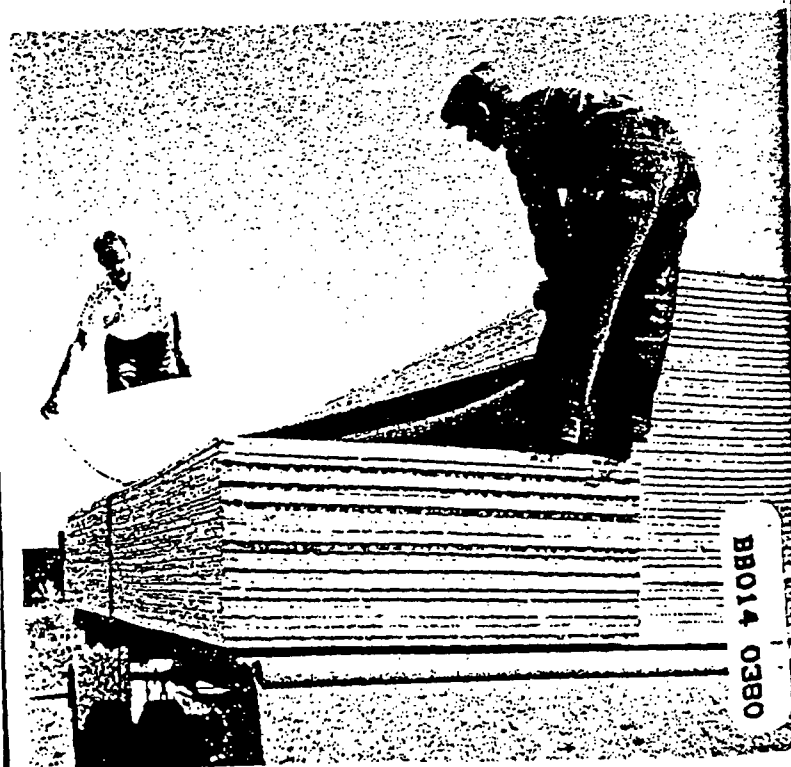
Quality drywall construction merits equally good decoration, and the wise applicator will recommend paints that enhance the appearance of his finished job. For smooth walls U.S.G. specifically developed SHEETROCK Sealer and TEXOLITE Primer-Sealer to lay the nap of face paper raised by sanding. Either will give a satisfactory base coat for SHEETROCK Finish Coat, GRAND PRIZE or TEXOLITE Alkyd Latex Paint, and other quality interior finishes. U.S.G. also manufactures a full line of texturing materials to meet the preference of every customer. Refer to Chapter 2 for the Selector Guide to U.S.G. Paint Products.

Good practices for decorating require that:

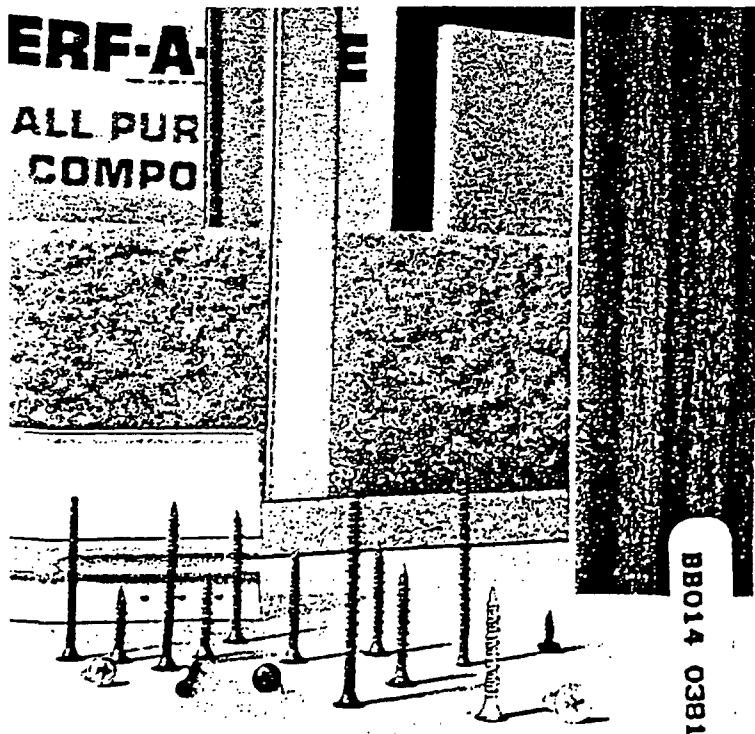
1. All surfaces, including joint treatment compounds, must be dry, sound, clean, free of dust, grease or oil.
2. Paints should be delivered in original unopened containers and protected from damage and tampering.
3. All materials should be used according to instructions.
4. Wallboard joints and fasteners should be treated with a U.S.G. Joint System in accordance with directions.

chapter 2

products



	page		page
SHEETROCK		STRUCTURAL	
WALLBOARD	26	ACCESSORIES	43
PREDECORATED		Metal Studs and Runners	43
PANELS	31	Channels—Cold Rolled, Resilient, Furring	45
TEXTONE Vinyl Gypsum		DEMOUNTABLE	
Panels	31	COMPONENTS	47
ULTRAWALL Panels	34	SOUND CONTROL AND	
COREBOARD AND		INSULATION PRODUCTS	48
BACKING PRODUCTS	34	Sound Attenuation	
USG Coreboard	34	Blankets	48
Gypsum Studs and Ribs	35	Insulating Blankets	48
BAXBORD Backing		Sound Deadening Board	48
Board	35	Rigid Plastic Foam	49
Gypsum Sheathing	36	Sealants	49
USG Exterior Gypsum		FASTENERS, ADHESIVES	50
Ceiling Board	37	JOINT SYSTEM	
Gypsum Partition Tile	38	PRODUCTS	58
WALLBOARD		TEXTURE FINISHES	62
ACCESSORIES	39	PAINT SELECTOR	64
Corner Beads	39		
Drywall Trims	39		
Control Joints	40		
TEXTONE Moldings	42		



QUALITY PRODUCTS FOR DRYWALL CONSTRUCTION

There is only one SHEETROCK—the interior wall and ceiling surface developed and improved by United States Gypsum. It is the product which has dominated the “drywall” revolution in residential construction. Systems using SHEETROCK wallboard have now gained the same acceptance in commercial building.

SHEETROCK is manufactured in seven different forms for special purposes. Complementing these is the industry's broadest line of metal accessories, fasteners, adhesives, joint treatment products and paints to provide complete partition and ceiling assemblies for dozens of specific applications.

The products described and illustrated in this section are the basic materials recommended by United States Gypsum Company for gypsum drywall construction. These materials are designed to meet the essential requirements of economy, speed of installation, strength, fire resistance, and ease of decoration which are characteristic of quality drywall. U.S.G. drywall methods and materials are the result of years of experience in the field of building materials. They have been developed to achieve the optimum results based on extensive laboratory tests and job-proven performance. The United States Gypsum Company trademark is your assurance of a product of proven quality to meet your construction needs.

United States Gypsum maintains special wallboard sales representatives to consult with contractors, architects and dealers on wallboard products and systems and their application to special job problems and conditions. They may be reached through the nearest U.S.G. sales office (listed inside back cover) or by directing inquiries to United States Gypsum, Dept. 147-2, 101 S. Wacker Dr., Chicago, Illinois, 60606.

SHEETROCK wallboard

DESCRIPTION

SHEETROCK is a mill-fabricated gypsum wallboard composed of a fireproof gypsum core encased in a heavy manila-finished paper on the face side and a strong liner paper on the back side. The face paper is folded around the long edges to reinforce and protect the core, and the ends are square-cut and finished smooth.

SHEETROCK Wallboard complies with Federal Specification SS-L-30c; ASTM C36.

ADVANTAGES

Interior walls and ceilings built with SHEETROCK have a durable surface suitable for most types of decorative treatment and for repeated decoration during the life of the building. The joints between adjacent boards may be reinforced and concealed with

BB014 0382

SHEETROCK wallboard/products 27

a U.S.G. Joint System, or may be featured by leaving exposed or covering with a decorative moulding.

Drywall Construction—mill-fabricated boards eliminate excessive moisture in construction.

Fire Resistance—Up to 2 hours for partition. 3 hours for floor-ceiling and 4 hours for column fireproofing constructions have been obtained. See Chapter 5 for fire resistance ratings and related construction.

Sound Control—SHEETROCK Wallboard is a vital component in partition and floor-ceiling systems having excellent sound resistive properties. See Chapter 5 for sound ratings.

Crack Resistance—Exceptionally resistant to cracks caused by minor frame movement, vibration or settlement.

Quickly and Easily Applied—keeps construction costs low.

Readily Decorated—with paint, texture, or wallpaper.

Warp Resistant—under normal atmospheric changes.

Availability—27 strategically located U.S.G. operating plants produce and/or stock the gypsum board materials described here. Five warehouse facilities, in addition to these plants, increase the total distribution and service efficiency to major markets and rural areas from coast to coast. All standard or specialty gypsum board products are readily available upon short notice.

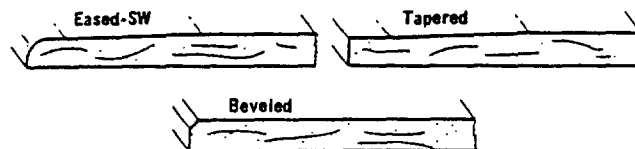
GENERAL LIMITATIONS

1. Not recommended where exposure to moisture is extreme or continuous.
2. Must be adequately protected against wetting when used as a base for ceramic or other wall tile (see Insulating SHEETROCK limitation). SHEETROCK W/R Wallboard is the recommended product for this purpose.
3. Maximum framing spacing: $\frac{1}{2}$ " and $\frac{5}{8}$ " SHEETROCK Wallboard is designed for framing centers from 16" to 24"; $\frac{3}{8}$ " SHEETROCK, on centers up to 16". When $\frac{1}{2}$ " or $\frac{5}{8}$ " SHEETROCK Wallboard is applied across framing on 24" centers and wallboard joints reinforced, headers are not required.
4. Nail application of SHEETROCK over $\frac{3}{4}$ " wood furring applied across framing is not recommended since the relative flexibility of the furring under impact of the hammer tends to loosen nails already driven. Furring should be 2"x2" minimum.
5. The application of SHEETROCK over an insulating blanket, that has first been installed continuously across the face of the framing members, is not recommended. Blankets should be recessed and the blanket flanges attached to sides of studs or joists.

BB014 0383

TYPES OF SHEETROCK WALLBOARD

Types of Edges



SHEETROCK SW Wallboard is United States Gypsum's revolutionary new development to minimize ridging or beading and other joint imperfections. Its exclusive eased-edge design helps to compensate for twisted framing, offset joints, poor framing alignment, damaged board edges, and extremes of temperature and humidity. One of drywall's foremost advances in 40 years, the SHEETROCK SW Wallboard system produces the strongest joint ever developed.

This is accomplished by pre-filling joints with multi-purpose DURABOND 90 Joint Compound, a new formulation which chemically hardens in about one hour, providing maximum bond and minimum shrinkage. The new edge contour eliminates the need to crown joints, and generally no more compound is required than with regular wallboard. Taping and other application procedures are conventional.

Except for the eased edge, SHEETROCK SW is tapered like, and otherwise identical to, regular tapered edge wallboard. Made in three thicknesses:

- $\frac{3}{8}$ ", recommended for the finest single layer drywall construction. The greater thickness provides increased resistance to fire exposure and transmission of sound.
- $\frac{1}{2}$ ", for single layer application in new residential construction.
- $\frac{5}{8}$ ", lightweight, applied principally in the double wall system and in repair and remodel work. Not recommended over metal framing.

Width: 4'; length: 8', 9', 10', 12' or 14'; edges: rounded, tapered; finish: ivory manila paper, suitable for paint or other decoration.

Tapered Edge SHEETROCK has long edges tapered on the face side in order to form a shallow channel for the joint reinforcement which provides smooth, continuous wall and ceiling surfaces. Made in the same thicknesses as SHEETROCK SW Wallboard and in one other thickness:

- $\frac{1}{4}$ ", a lightweight, low-cost utility board, used as a base layer for improving sound control in double-layer metal and wood stud partitions and for use over old wall and ceiling surfaces. Width: 4'; length: 8', 10'; edges: tapered; finish: ivory manila paper, suitable for paint, wallpaper or other decoration.

Fire hazard classification of SHEETROCK Wallboard is: flame spread, 15; fuel contributed, 15; smoke developed, 0.

BB014 0384

SHEETROCK SW FIRECODE Wallboard, made in $\frac{3}{8}$ " and $\frac{1}{2}$ " thicknesses, combines all the advantages of Regular SHEETROCK with additional resistance to fire exposure—the result of a specially formulated mineral core.

$\frac{1}{2}$ " FIRECODE "C" Wallboard makes possible fire ratings in floor-ceiling constructions previously obtained only with $\frac{3}{8}$ " gypsum wallboard. In accordance with Underwriters' Laboratories tests, certain partition, floor-ceiling, and column fireproofing constructions afford 45-minute to 4-hour fire resistance ratings. These products are used in 3-hour floor and ceiling, 2-hour wall and 2, 3 and 4-hour column fireproofing constructions as listed by Underwriters' Laboratories (see Chapter 5).

Limitations in addition to General Limitations for SHEETROCK Wallboard: (1) In order to attain fire resistance ratings, the construction of the partition and/or floor and ceiling assemblies must be in accordance with the respective Underwriters' Laboratories, Inc., panel designs. See Chapter 4—Systems, for description of panel constructions. (2) Maximum spacing of frame members: 24" c. to c.

Width: 4'; length: 8', 9', 10', 12' or 14'; edges: rounded, tapered; finish: ivory manila paper, suitable for paint, wallpaper or other decoration.

Insulating SHEETROCK Wallboard is made by laminating a sheet of bright aluminum foil on the back surface of SHEETROCK Wallboard. It is effective as a vapor barrier for exterior walls and ceilings when applied (1) with foil surface next to the studs in single layer application, or (2) as the base layer (with foil surface next to the studs) in the double layer system. A significant thermal insulating value is achieved when SHEETROCK is installed with the aluminum foil facing an air space of $\frac{3}{4}$ " minimum. The metal foil reduces outward heat flow in winter, and inward heat flow in summer.

Insulating SHEETROCK also provides an efficient vapor barrier



BB014 0385

30 products/W/R wallboard

which resists the passage of moisture vapor through the exterior wall and roof construction. The possibility of condensation within an exterior wall and resulting exterior paint failures is minimized. Meets ASTM requirements for a vapor permeability not exceeding 0.30 perm.

Limitation: do not use as a base for ceramic or other tile. Thickness: $\frac{3}{8}$ ", $\frac{1}{2}$ " and $\frac{5}{8}$ ". Sizes, edges and finish are same as for SHEETROCK SW and regular Tapered Edge SHEETROCK.

Thermal resistance (R) value
Insulating SHEETROCK Wallboard (1)

Thickness	$\frac{1}{2}$ "	$\frac{5}{8}$ "
wall application	3.93	4.04
ceiling application		
summer conditions	4.92	5.03
winter conditions	2.73	2.84

(1) Resistances based on inside still air film, board thickness and one reflective surface facing a $\frac{1}{4}$ " min. still air space.

SHEETROCK W/R Gypsum Wallboard is a water-resistant gypsum wallboard that provides an excellent base for the adhesive application of ceramic, metal, and plastic tile. 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. It was developed for application in bathrooms, powder rooms, kitchens, utility rooms, and other high-moisture areas. SHEETROCK W/R Gypsum Wallboard is easily recognized because of its distinctive green face.

In addition to its use as a superior tile base in new construction, SHEETROCK W/R Wallboard is a cost-saver in modernization work. It permits new tilework to be installed over existing surfaces without tearing out old walls.

Limitations: adherence to recommendations concerning sealing exposed edges, painting, tile adhesives, framing and installation is necessary for satisfactory performance (see Chapter 3). Not recommended for use as an exterior soffit or in other exterior areas subjected to sustained high humidity and moisture conditions.

Available in plain core, $\frac{1}{2}$ " and $\frac{5}{8}$ " thickness; also in $\frac{5}{8}$ " SHEETROCK W/R FIRECODE "C" Wallboard for applications where a 1-hour fire rating is desired—listed under UL Label Service R-1319-84 with following design numbers applicable: 5-1 hr., 16-1 hr., 4-2 hrs. and 11-2 hrs. Width: 4'; length: 8', 10' or 12'; edges: tapered; finish: green treated manila paper, suitable for receiving tile, paint or wallpaper.

SHEETROCK Brand W/R Spray Sealant is applied to all raw cut edges and nail heads of special SHEETROCK Water-Resistant Gypsum Wallboard used in high-moisture room areas—thus protecting the gypsum core from moisture penetration. Packaged in aerosol spray container for fast, easy application: twelve 16-oz. cans per ctn.; weight: 14 lbs.

BB014 03B6

Table I. SHEETROCK Wallboard Specifications

Thickness	Type	Edge	Width	Approx. Weight Lbs. per MSF
3/4"	Regular	Rounded or Tapered	48"	2,375
	FIRECODE	Rounded or Tapered	48"	2,475
	FIRECODE "C"	Rounded or Tapered	48"	2,475
	Insulating	Rounded or Tapered	48"	2,400
	FIRECODE Insulating	Tapered	48"	2,500
	W/R	Tapered	48"	2,375
	W/R FIRECODE "C"	Tapered	48"	2,475
1/2"	Regular	Rounded, Tapered, or Beveled	48"	1,875
	FIRECODE	Tapered	48"	1,975
	FIRECODE "C"	Rounded or Tapered	48"	1,975
	Insulating	Rounded or Tapered	48"	1,900
	FIRECODE Insulating	Tapered	48"	2,000
	W/R	Tapered	48"	1,875
3/8"	Regular	Rounded, Tapered, or Beveled	48"	1,475
	Insulating	Tapered	48"	1,500
1/4"	Regular	Tapered	48"	1,097

predecorated panels

TEXTONE Gypsum Panels come in six groups of standard and custom products to make up United States Gypsum's comprehensive line of factory laminated vinyl-faced wallboards. With a newly broadened range of color, pattern and texture, TEXTONE Panels enable the contractor to capitalize on the sweeping popularity of vinyl wall coverings in commercial and residential uses.

All styles of TEXTONE Gypsum Panels give the customer the important advantages of factory lamination over job application of vinyl material to wallboard. There the vinyl can be laminated with proper adhesives, under controlled conditions of heat and pressure. Thus expensive fabric backing is not necessary. TEXTONE Standard Panels offer this economy.

The savings realized through use of factory-finished vinyl wallboard panels can be applied to upgrade the partition function. The fast-rising costs of job lamination are eliminated, and a lighter weight material may be used with equal results. Better adhesion, and hence better snag resistance, result. This is of particular significance where walls take heavy abuse.

Even before the partition is installed, the vinyl surface has passed two professional inspections—one by the vinyl maker, the other by the wallboard producer—to assure the customer of quality wall and covering material.

TEXTONE Standard Panels, stocked in most U.S.G. plants, have a rugged 8-mil unbacked vinyl film that is printed and embossed for texture or grain effect, then factory-laminated to 1/2" SHEETROCK Wallboard. This provides long-lasting resistance to stains and scuffs, plus ready washability. All panels except wood-

32 products/predecorated wallboard

grains have beveled edges which form a pleasing "V" groove at the joint; no further treatment needed. Woodgrains are square-edged. The regular gypsum core provides fire resistance.

The coordinated line of Standard panels offer a range of 17 harmonizing colors and textures. They include 8 solid colors in a subtle stipple finish, four linen finishes, a special fissured Golden Travertine pattern, and four realistic woodgrains with or without a grooved, random planking like fine wood paneling. The panels are adaptable to any U.S.G. drywall partition system (Chapter 4), including wood-framed, metal framed and laminated types. Adhesive, nail or screw attachment is used—matching aluminum moldings are available. Panels also are ideal for resurfacing, by nailing or adhesive application.

Thickness: $\frac{1}{2}$ "; width 4'; lengths 8', 9' or 10'. Other thicknesses available on special order.

TEXTONE Gypsum Panels meet Federal Specification SS-L-30c, ASTM C36-64. May be produced on special order with fabric supported vinyl to meet Federal Specification CCC-W-408, Type I and II.

Limitation: Only DURABOND 200 or 300 Stud Adhesive should be used to apply TEXTONE Gypsum Panels to wood or metal framing or furring; DURABOND 500 or 600 Contact Adhesive should be used for application to gypsum wallboard, masonry or other sound surface. Because of the potential incompatibility between vinyl-surfaced wallboard and solvent-based adhesives, United States Gypsum cannot be responsible for problems arising from the use of either its adhesives with vinyl-surfaced wallboard manufactured by others, or its vinyl-surfaced wallboard applied with adhesives made by others.

TEXTONE Vinyl Wallcovering, a supported vinyl film, 54" wide, with a 1.3-oz per sq. yd. cotton backing, is available separately in limited quantities to provide a commercial match with Standard TEXTONE Panels colors, textures and patterns on adjacent walls and columns.

TEXTONE Smoothwall Panels have a factory-laminated fabric-backed vinyl film surface. Extra vinyl flaps at each long panel edge permit job-fabricated flush joints with nearly invisible butt seams in vinyl facing. Available in same colors and textures as TEXTONE Standard Panels. Film is backed with cotton sheeting; weighs 8 oz. per sq. yd. Flaps: 2" wide one side; 4" wide other side. Fire hazard classification: flame spread 25, fuel contributed 15, smoke developed 10. Thickness: $\frac{1}{2}$ ", width: 48", length: 8', 9', or 10'.

TEXTONE Virectex, Virectex-T and Virectex Panels couple the advantages of factory lamination with a cloth-backed vinyl facing weighing 12 to 24 oz. per sq. yd. A selection of some 363 colors and 16 different patterns is offered in the three products.

BB014 03BB

TEXTONE Vicrtex Panels come in 290 colors and 14 deep-relief patterns including straw cloth, burlaps, linens, fine net weaves, heavy stipples, travertines, woodgrain effects; fabric backing of 4.8-oz. per sq. yd. drill cloth, 68x40 weave and count.

TEXTONE Vicrtex-T Panels offer a choice of 38 colors in two patterns, all treated with stain-resistant 1/2-mil polyvinyl fluoride DuPont TEDLAR® film for added durability and easier cleaning; fabric backing of 2.1-oz. per sq. yd. cotton sheeting, 48x42 weave and count.

TEXTONE Vicrwall Panels are available in 35 colors, two lower-priced patterns, consisting of a durable 7.5-mil vinyl film with fabric backing of 2.1-oz. per sq. yd. cotton sheeting, 48x42 weave and count.

Manufactured in a minimum quantity of 3,600 sq. ft. per color, these panels come with beveled edge (except square-edge woodgrains), 24" and 48" widths, lengths as specified, in following thicknesses: 3/8", 1/2" or 5/8" for plain core; 1/2" for SHEETROCK FIRECODE "C"; 3/8" for SHEETROCK FIRECODE. Partitions faced with this material thus can meet fire ratings with specially fortified wallboard (see Chapter 4).

Vicrtex and Vicrwall are registered trademarks of L. E. Carpenter & Co.

TEXTONE Custom Gypsum Panels extend the selection of U.S.G. vinyl-faced wallboard panels by a further 77 colors in the nine vari-textured patterns. Like TEXTONE Standard Panels, the Custom Panels come with a surface of 8-mil laminated unbacked vinyl film, but are manufactured in a minimum order of 12,000 sq. ft. per color and texture.

The complete range of custom colors offered in each pattern includes three life-like new woodgrains, plus 21 colors in the Stipple design, 12 in Looma, 10 in Belgique, 6 in Travertine, 8 in Espania, and 17 in Kelley. TEXTONE Custom Panels are available with beveled edge for all patterns except the woodgrains which are square edge. In 48" width, 8, 9 and 10-ft. lengths, in following thicknesses: 3/8", 1/2" or 5/8" for plain core, 1/2" for SHEETROCK FIRECODE "C", 3/8" for SHEETROCK FIRECODE.

Table I-A. Fire Hazard Classification (1)

TEXTONE Panels type	flame spread	fuel contributed	smoke developed
Standard(2)	36	13	35
Smoothwall(2)	25	15	10
Vicrtex(3)	15-25	5-10	0-10
Vicrtex-T	15	10	0
Vicrwall	20	5	0
Custom(2)	36	13	35

(1) Vinyl surface film tested in accordance with ASTM E84. (2) Film attached to gypsum board. (3) Varies depending on vinyl film used. See U.S.G. Architectural Technical Folder on TEXTONE Gypsum Panels.

BB014 0389

34 products/predecorated wallboard & coreboard

ULTRAWALL Panels are a popular selection for economical but attractive paneling in home recreation rooms and other wall surfaces. They combine the fire protection of a gypsum core with the beauty of a coated paper surface that is embossed with wood pores to simulate fine natural wood paneling. The panels have actual indented V-grooves that give the appearance of continuous random plank paneling when applied. There's no harmful warping, shrinking, splintering—no finishing in application, and no redecorating in future. The finish may be treated with clear or opaque coatings if additional protection is desired. In maintenance, the panels wipe clean with a damp cloth.

Matching colored nails are used for inconspicuous nailing; panels also may be adhesively applied to a gypsum board base layer or directly to wood studs or furring strips. Matching aluminum moldings are available for joints and corners. Joints are virtually indistinguishable and normally are left exposed.

Thickness: $\frac{3}{8}$ " ; width: 4'; length: 7', 8', 9' or 10'; edges: square; finish: Walnut, Cherrywood, Bombay Teak, Light Oak, Rosewood.

Table II. Predecorated Panel Specifications

Thickness	Type	Edge	Width	Approx. Weight Lbs. per MSF
$\frac{1}{2}$ "	TEXTONE Standard	Beveled (1)	48"	1,950 (2)
$\frac{3}{8}$ ", $\frac{1}{2}$ ", $\frac{5}{8}$ "	TEXTONE Vicrtex, Vicrtex-T, Vicrwall	Beveled (1)	24" & 48"	1,950 (2)
$\frac{3}{8}$ ", $\frac{1}{2}$ ", $\frac{5}{8}$ "	TEXTONE Custom	Beveled (1)	48"	1,950 (2)
$\frac{3}{8}$ "	ULTRAWALL	Square	48"	1,500

(1) Woodgrains are square edge. (2) Weight for $\frac{1}{2}$ " thickness, plain core.

coreboard and backing products

1" USG Coreboard is a solid gypsum board product fabricated for use with the USG Solid, Double Solid and Triple Solid Partitions (see Chapter 4 for construction details). Additional layers of gypsum board are generally laminated to the coreboard to provide the completed wall assembly. When used in conjunction with the 2" Solid, Double and Triple Solid Partitions, coreboard is manufactured with an integrally formed "V" T & G edge. USG Coreboard, as used with semi-solid partitions, is available in 1"x24" panels prescored either 6" or 8" o.c. Coreboard strips are then easily snapped and separated from this master unit. Thickness: 1"; width: 24"; edges: "V" T & G or square; length: 8', 9', 10' and 12' (prescored—7'8" lengths only); finish: gray paper, not suitable as an exposed surface.

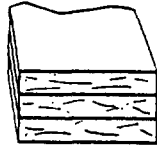
Types of Edges



BB014 0390



gypsum rib
1" x 6"



gypsum stud
1½" x 6"

USG Gypsum Studs and Ribs are made in two thicknesses and stock lengths to serve as non-load bearing internal members of four USG Studwall and Ribwall partition systems. The 1½"x6" Gypsum Stud is factory-laminated from one layer ¾" SHEETROCK Gypsum Wallboard sandwiched between two layers of ½" SHEETROCK, and is used in the USG Studwall #258 and #278 partition (see Chapter 4) as well as in the USG Ribwall #368 partition. The 1"x6" Gypsum Rib is snapped and separated on the job from stock lengths of 1"x24" USG Coreboard prescored 6" o.c., and is used in the USG Ribwall #418 dry-wall partition. PERF-A-TAPE Joint Compound-Taping or DURABOND 500 Mastic Contact Adhesive is used in laminating studs and ribs to base layer or face panels.

BAXBORD Gypsum Backing Board is a low cost, easy-to-handle gypsum board encased on both sides with strong gray paper, made in three thicknesses:

¾" **BAXBORD**, for use as a base for the job-laminated Double Layer SHEETROCK Wallboard Partition system. It may also be used as a base for acoustical tile when applied perpendicular to wood joists spaced not over 16" o.c.

½" **BAXBORD**, the recommended base for adhesively or mechanically applied acoustical tile. It may be screw applied to the USG Metal Furring Channel; nailed to metal furring members or nailable steel joists; or nailed to wood framing.

¾" **BAXBORD FIRECODE**, for use as a base for adhesive or mechanical application of acoustical tile in one-hour fire-rated systems. "V" tongue and groove edges minimize air and dirt infiltration.

Limitations: (1) In order to attain fire resistance ratings with ¾" **BAXBORD FIRECODE** backing board, the construction must be in accordance with the floor or roof and ceiling design listed by Underwriters' Laboratories, Inc. (see Chapter 5). (2) Where ½" or ¾" **BAXBORD** is to be used as acoustical tile base, store acoustical tile and base in a dry area protected from the elements. Provide flat, solid support during storage. Take necessary precautions to prevent condensation in the storage area and within the structure in which the acoustical base is applied.

Finish: gray paper, not suitable as an exposed surface.

Insulating BAXBORD Gypsum Backing Board is made in the same three thicknesses as standard **BAXBORD**, but with

36 products/backing board & sheathing

aluminum foil laminated to the back surface. It functions as a vapor barrier and as thermal insulation in the same manner as Insulating SHEETROCK Wallboard. Widths, edges and face side finish are identical with standard BAXBORD (above); length: 8'.

Table III. Backing Board Specifications

Thickness	Type	Edge	Width	Length	Approx. Weight Lbs. per MSF
3/8"	BAXBORD	"V"-T&G	24"	8'	2.375
	BAXBORD FIRECODE	"V"-T&G	24"	8'	2.475
	BAXBORD FIRECODE	Square	48"	8'	2.475
	BAXBORD FIRECODE Insulating	Square	48"	8'	2.500
	BAXBORD Insulating	"V"-T&G	24"	8'	2.400
	BAXBORD FIRECODE Insulating	"V"-T&G	24"	8'	2.500
1/2"	BAXBORD	Square	24"	8'	1.875
	BAXBORD	"V"-T&G	24"	8'	1.875
	BAXBORD	Square	48"	8', 12'	1.875
	BAXBORD Insulating	"V"-T&G	24"	8'	1.900
	BAXBORD Insulating	Square	24", 48"	8'	1.900
3/4"	BAXBORD	Square	24"	8'	1.475
	BAXBORD	Square	48"	8', 12'	1.475
	BAXBORD Insulating	Square	24", 48"	8'	1.500
1"	Coreboard	"V"-T&G	24"	Various	4.150
	Coreboard (Prescored 6" & 8")	Square	24"	Various	4.150

FIRECODE Sheathing is a fireproof gypsum board with an asphalted gypsum core encased in specially formulated brown water-repellent paper on both sides and long edges. Its weather resistance, water repellence, fire resistance and low applied cost make it a popular choice for use in garden apartments and light construction as well as in homes.

FIRECODE Sheathing is an ideal base for a wide range of exterior finishes—masonry veneer, wood clapboard and aluminum siding, wood and asbestos shingles, and stucco—applied by fastening through the sheathing into the framing. Used over wood framing or 20-ga. USG Metal Studs in Exterior Curtain Wall System (see Chapter 4).

Available in two types: 24" wide, 8' length, with V-shaped T&G long edges, normally applied horizontally, and 48" wide, 8' and 9' lengths, with square edges applied vertically to meet FHA requirements for omission of corner bracing in wood frame construction. Other features:

Fire Protection—The asphalted gypsum core is incombustible and will not transmit high temperatures until completely calcined. **FIRECODE Sheathing** is the only commonly used type of sheathing that is fire resistant.

Weather Resistance—The heavy brown paper covering actually sheds water permitting open storage on the job and exposure on the framing. Building paper not required except where codes

require it over all sheathing. Complies with water resistance requirements of ASTM designation C79-52. Tight joints minimize wind and rain penetration.

Low Applied Cost—Sheathing is quickly cut or scored and snapped, waste is negligible, application faster than with plywood or wood sheathing.

Structural Strength—Superior in bracing and stiffening. Tests have shown lateral distortion of only .498" under a racking load of 1,850 lbs.

Insulation Value—Possesses thermal conductance of 2.86, thermal resistance of 0.35. Combined with THERMAFIBER Insulating Wool blankets in an exterior wall assembly, a low "U" factor of .11 can be obtained in a wood framed assembly and .06 in a metal stud curtain wall.

Vapor Permeability—Average of 27.3 perms permits escape of moisture, minimizing rotting of framing. For effective vapor control, should be used in combination with foil-backed SHEETROCK Wallboard or BAXBORD Backing Board, or with THERMAFIBER Silver Shield Insulating Wool.

Limitations: (1) Not to be considered a vapor barrier. (2) Exterior finishes—wood siding, wood furring strips, stuccomesh, wall ties, etc.—must be secured to the framing by fastening through the sheathing. (3) Not recommended as a base for ceramic tile—use SHEETROCK W/R Wallboard. (4) With 2'x8' size, diagonal corner braces should be installed at all external corners.

Table IV. FIRECODE Sheathing Specifications

Thick- ness	Type Edge	Size	Approx. Wt. Lbs. per MSF	Insul. Value	Meets Federal Specs.
1/2"	T&G	2'x8'	2,000	.35(k)	SS-L-30c, Type Z
1/2"	Sq.	4'x8'	2,000	.35(k)	SS-S-276
1/2"	Sq.	4'x9'	2,000	.35(k)	ASTM C79 FHA Tech. Circ. No. 12 (4'x8' and 4'x9' sizes only)

USG Exterior Gypsum Ceiling Board is a new weather-resistant board designed for use on the soffit side of eaves, canopies and carports and other exterior applications with indirect exposure to the weather. It is incombustible, is simply scored and snapped for quick application, and offers excellent paintability. Most important are its sag and water-resistance advantages—which independent tests have shown to be better than exterior grade plywood and structural laminated paper board.

Installed conventionally in wood and metal-framed soffits (see Chapter 3); batten strips recommended over butt joints; backing strips required for small vent openings. Can be identified by its brown back paper and light beige, water-repellent face paper; available in 1/2" thickness, 4' widths and 8', 9', 10', 12' and 14' lengths; also available in foil-backed version for extreme humidity conditions.



PYROBAR Gypsum Tile is a precast kiln dried gypsum tile that is easily laid up with gypsum mortar to make non-load bearing column fireproofing and interior partitions. A base of 2" solid or 3" hollow PYROBAR with SHEETROCK FIRECODE Wallboard facing affords a fire-resistance rating of 4 hours as column fireproofing.

PYROBAR is machine molded into large lightweight units 12"x30" in size. It is easily cut, handled and quickly installed using RED TOP Partition Tile Cement and sand as mortar. Units weigh 30% to 50% less and require fewer joints and mortar than other commonly used masonry units. PYROBAR Tile complies with ASTM C52, Fed. Spec. SS-T-00316a.

Thickness: 2" solid, 3" hollow for column fireproofing; 3" solid and 3", 4" and 6" hollow for partitions.

Table V. PYROBAR Gypsum Tile—Specifications

Product	Approx. Tile Wt. (psf)	RED TOP Partition Tile Cement (100-lb. bags/MSF)	Sand (cu. ft./MSF)
2" solid	10	5	15
3" solid	14.5	8	24
3" hollow	10	8	24
4" hollow	12.5	10	30
6" hollow	20.5	15	45

wallboard trim accessories

USG trim accessories—corner reinforcements, casing beads, metal trims, control joints and decorative moldings—enjoy the industry's top acceptance because of their dependability and continual improvement in design.

BB014 0394

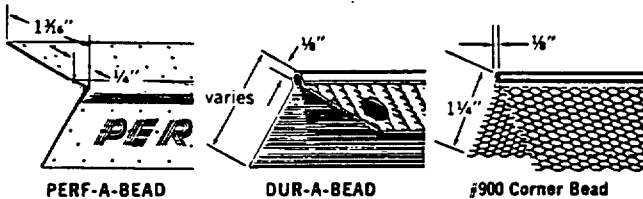
CORNER BEAD

USG corner reinforcements provide true and straight lines for smooth finishing at outside wallboard corners. The exposed bead also helps prevent damage from impact.

No. 100 **PERF-A-BEAD** is a metal corner reinforcement formed of galvanized steel with **PERF-A-TAPE** wings 1-3/16" wide. Easily applied with U.S.G. joint compounds; provides lasting protection for external corners.

DUR-A-BEAD is an all-metal heavy gauge hot dipped galvanized steel reinforcement for protecting external corners. It is nailed to framing through gypsum wallboard and concealed with U.S.G. joint compounds for smooth, finished corners. Available in two flange widths: No. 101 1"x1"; No. 103 1 1/4"x 1 1/4". Also available in lighter gauge **ECONO** models: Standard 15/16"x15/16"; No. 102 1"x1 1/4"; No. 103 1 1/4"x1 1/4"; No. 104 1 1/8"x1 1/8".

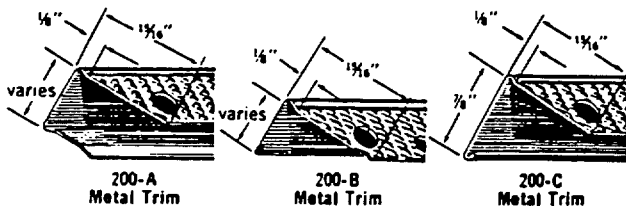
No. 900 **Corner Bead** is a galvanized steel external corner reinforcement with 1 1/4" wide fine-mesh expanded flanges. Nailed or stapled to framing through wallboard; provides superior key for joint compounds and eliminates shadowing.



METAL TRIM

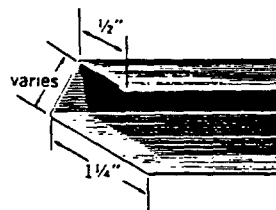
USG Metal Trims provide maximum protection and neat finished edges to gypsum wallboard at window and door jambs, at ceiling angles and at intersections where wallboard abuts other materials. Easily nailed through the channel and wallboard into the framing. Eliminates precision cutting and mitering with simply butted joints. Finished with U.S.G. joint compounds (except No. 400 series). Made in three types, ten sizes:

No. 200 series—steel casing, includes No. 200-A U-shaped channel in 1/2" and 3/8" sizes; No. 200-B L-shaped angle edge trim without back flange to simplify application, in 1/2" and 3/8" sizes; No. 200-C L-shaped trim, requires slotted jamb for in-

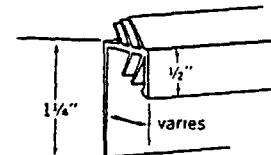


BB014 0395

40 products/trim & control joints



400 Series
USG Metal Trim

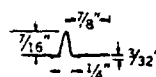


USG P-1
Vinyl Trim

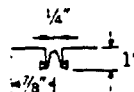
stallation in most cases, open "V" edge of flange inserts into kerf to make trim adjustable for use with $\frac{3}{8}$ ", $\frac{1}{2}$ " and $\frac{5}{8}$ " gypsum wallboard.

No. 400 series—reveal type all-metal trim, requires no finishing compound, includes No. 400 in $\frac{3}{8}$ " size, No. 401 in $\frac{1}{2}$ " size, No. 402 in $\frac{5}{8}$ " size.

USG P-1 Vinyl Trim is a reveal type, white plastic trim with flanges and web of rigid vinyl and integral flexible vinyl fins that compress on installation. Fins form permanent flexible seal to effectively block sound, replace caulking, provide structural stress relief at wallboard perimeter. Fits tightly over wallboard edge; requires no finishing compound; paints easily; includes P-1A in $\frac{1}{2}$ " size, P-1B in $\frac{5}{8}$ " size.



USG Control Joint #093



USG Control Joint #100

CONTROL JOINTS

USG Control Joints are designed to relieve stresses of expansion and contraction transverse to the joint in large ceiling and wall areas. Made from roll-formed zinc with a $\frac{1}{4}$ " open slot that is protected with plastic tape which is removed after finishing. Highly resistant to corrosion in interior and exterior uses.

USG Control Joint No. 093—used for interior applications from floor to ceiling in long partitions and wall furring runs and from door header to ceiling or from wall to wall in large ceiling areas. Staple-applied to wallboard face; finished with joint compound.

USG Control Joint No. 100—used in Metal Stud Curtain Wall System to minimize cracking in exterior stucco surfaces.

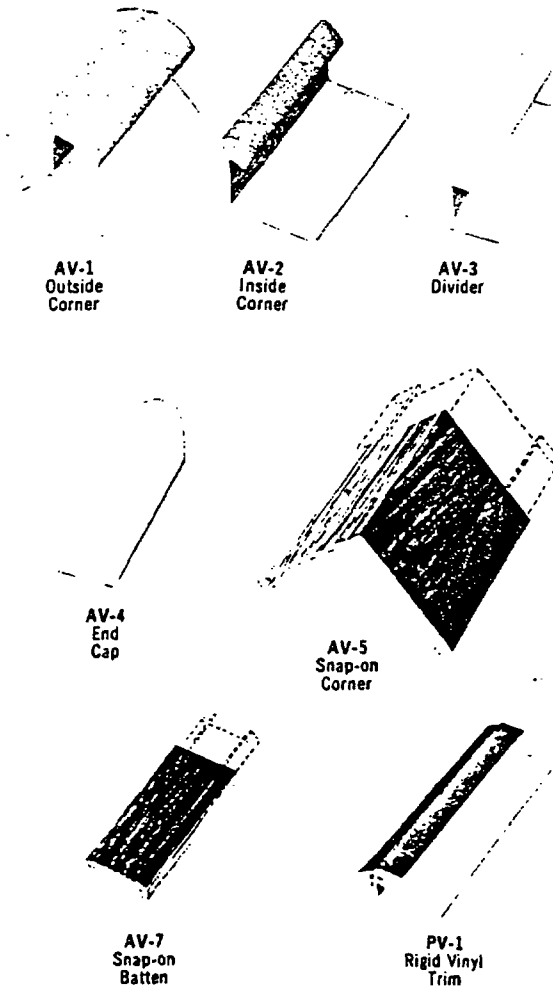
BB014 0396

Table VI. Wallboard Trim Accessories Specifications

Product	Length	Pcs. per Ctn.	Lin. Ft. per Ctn.	Approx. Wt. Lbs./MLF
No. 100 PERF-A-BEAD (200' ctns.)	6' 8" 8'	30 25	200 200	55
No. 100 PERF-A-BEAD (1000' ctns.)	6' 8" 8'	150 125	1,000 1,000	55
No. 101 DUR-A-BEAD (200' ctns.) 1"x1" Flange	6' 8" 6'10" 8', 10'	30 30 25, 20	200 205 200	114
No. 101 DUR-A-BEAD (500' ctns.) 1"x1" Flange	6' 8" 6'10" 8' 10'	75 75 63 50	500 513 504 500	114
No. 103 DUR-A-BEAD 1 1/4"x1 1/4" Flange	8' 10'	63 50	504 500	147
ECONO STD. 1 1/2"x1 1/2" Flange	8'	63	504	100
ECONO No. 102—1 1/4"x1" Flange	8'	63	504	120
ECONO No. 103 1 1/4"x1 1/4" Flange	8' 10'	63 50	504 500	135
ECONO No. 104—1 1/4"x1 1/4" Flange	8'	63	504	120
No. 900 Corner Bead	8' 10'	60 60	480 600	90
No. 200-A 1/2" USG Metal Trim U-shaped	7' 8' 10'	50 50 50	350 400 500	108
No. 200-A 3/4" USG Metal Trim U-shaped	7' 8' 10'	50 50 50	350 400 500	118
No. 200-B 1/2" USG Metal Trim L-shaped	7' 8' 10'	50 50 50	350 400 500	87
No. 200-B 3/4" USG Metal Trim L-shaped	7' 8' 10'	50 50 50	350 400 500	94
No. 200-C USG Metal Trim L-shaped	7' 10'	50 50	350 500	106
No. 400 1/2" USG Metal Trim Reveal Type	7' 8' 9' 10'	50 50 50 50	350 400 450 500	149
No. 401 1/2" USG Metal Trim Reveal Type	7' 8' 9' 10'	50 50 50 50	350 400 450 500	157
No. 402 3/8" USG Metal Trim Reveal Type	7' 8' 9' 10'	50 50 50 50	350 400 450 500	165
USG P-1A Vinyl Trim Reveal Type	8' 9' 10'	50 50 50	400 450 500	100
USG P-1B Vinyl Trim Reveal Type	8' 9' 10'	50 50 50	400 450 500	105
USG Control Joint #100	10'	25	250	216
#093	8'	30	240	116
#093	10'	25	250	116

BB014 0397

TEXTONE MOLDINGS



TEXTONE Moldings cover joints and protect corners, thus enhance beauty and durability of predecorated panel installations. Made of precision extruded aluminum in permanently bonded finishes to match finishes of $\frac{3}{8}$ " ULTRAWALL and $\frac{1}{2}$ " TEXTONE Standard Vinyl Panels; also available for $\frac{3}{8}$ " wallboard. Seven shapes—Divider, Inside Corner, Outside Corner, End Cap, 2-piece Snap-on Outside Corner, 2-piece Snap-on Batten, Rigid Vinyl Trim. Length: 8' and 10'; easily cut and mitered.

BB014 039B

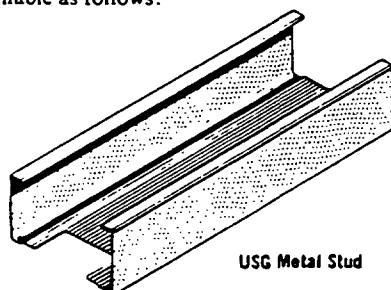
structural accessories

U.S.G. leads the industry in the development and acceptance of structural components for drywall 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 wire.

USG runners, metal base and base clips provide secure anchorage, alignment and installation economies for various drywall 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 channel type, complete with runner tracks and screws as needed; hat-shaped and U-shaped furring and resilient channels, and an adjustable wall furring bracket.

It is important that light-gauge metal components such as metal studs and runners, furring channels and resilient channels be given adequate protection in the warehouse or on the job site against rusting caused by moisture. In marine areas such as the Caribbean, Florida and the Gulf Coast where chloride as well as sea salt is present in combination with excessively high humidity, it is recommended that components be used which offer increased protection against corrosion.

USG Interior Metal Studs are non-load bearing channel type studs roll formed from galvanized steel, designed for screw attachment of $\frac{1}{2}$ " and $\frac{5}{8}$ " SHEETROCK Wallboard in USG Metal Stud Partitions and column fireproofing and as framing in drywall ceilings (see Chapter 4 for construction details). One end of each stud is notched (except the $1\frac{1}{2}$ " stud) and a punched hole is located about 12" from each end (24" from end in some parts of the country) to facilitate pipe and conduit installation—also available with keyhole cutouts in selected markets. Packaged: 10 pcs. per bdl.; available as follows:



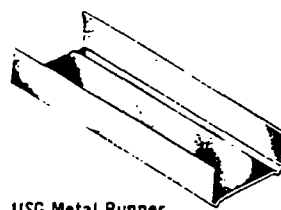
USG Metal Stud

Designation	Width	Length	Wt. Lbs./MLF
-158 Standard	1½"	8, 9'	338
-212 Standard	2¼"	8', 9', 10', 12'	398
-358 Standard	3½"	8', 9', 10', 12', 16'	475
-400 Standard	4"	8', 9', 10', 12', 16'	501
-600 Standard	6"	Up to 16'(1)	651

(1) Not stocked; made to order only.

BB014 0399

44 products/metal studs & runners



USG Metal Runner



1 1/2" x 3/4"—24 ga.
Metal Angle Runner

USG Metal Runners are roll-formed galvanized steel channel-type sections designed to receive USG Metal Studs and to secure various types of U.S.G. partitions to floor and ceiling. Runners are unhemmed, available with either a 1" or 1 1/4" leg—the latter for use where metal snap-on base is attached to runners with clips. Length: 12'; packaged 10 pcs. per bdl., available as follows:

Designation	Width	Wt. Lbs./MLF
#158—1" leg	1 1/4"	244
#212—1" leg	2 1/2"	304
#358—1" leg	3 3/4"	381
#400—1" leg	4"	407
#600(1)—1" leg	6"	582

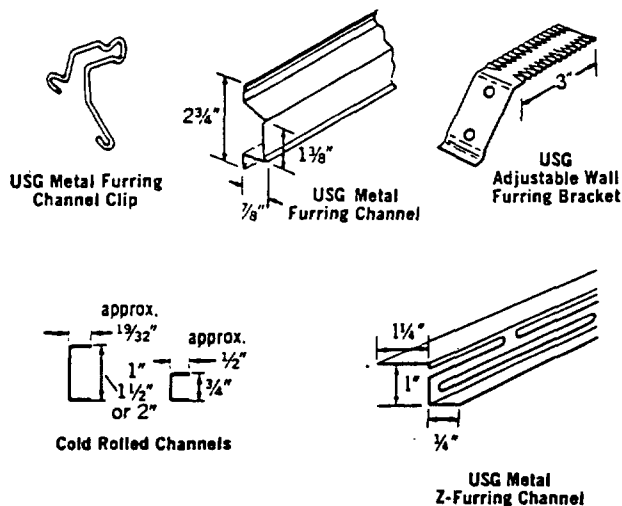
(1) Not stocked; made to order only.

USG 20-ga. Metal Studs and Runners are strong non-load bearing components of USG exterior curtain wall systems. Gypsum sheathing on the outside, gypsum drywall or plaster base on the inside are screw attached to the channel-type studs, which are roll-formed from galvanized steel. Studs are screw attached to runners at top and bottom. Studs and runners are available in three widths—2 1/2", 3 3/4" and 6"—studs in lengths up to 28'; runners (designed with 1" unhemmed leg) in 10' and 12' lengths. These items are not stocked; made to order only. For properties and limiting heights in exterior curtain walls, see Chapter 4.

Size	Width	Wt. Lbs./MLF	
		Stud	Runner
#212—20 ga.	2 1/2"	767	655
#358—20 ga.	3 3/4"	918	805
#600—20 ga.	6"	1,250	1,124

USG Metal Angle Runners are 1 1/2"x3/4"x24-ga. galvanized steel angle sections used to secure 1" coreboard at floor and ceiling in USG Solid, Double Solid and Triple Solid Partitions. Length: 10'; packaged: 10 pcs. per bdl.; weight: 217 lbs. per MLF.

BB014 0400



USG Z-Furring Channels are used to mechanically attach rigid foam insulation and SHEETROCK Wallboard to monolithic concrete and masonry walls. Made of galvanized steel; face width: $1\frac{1}{4}"$; furring depth $1"$; length: 8'-6"; packaged: 25 pcs. per bdl; weight: 213 lbs./MLF.

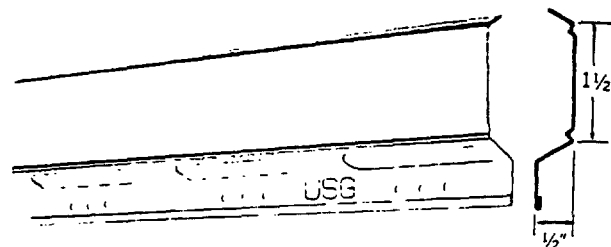
USG Metal Furring Channels are ceiling and wall furring channels made of galvanized steel designed for attachment of $\frac{1}{2}"$ and $\frac{3}{8}"$ SHEETROCK Wallboard with USG Brand Hi-Lo Screws Type S. Face width: $1\frac{3}{8}"$; furring depth: $\frac{7}{8}"$; length: 12'; packaged: 10 pcs. per bdl; weight: 292 lbs. per MLF.

USG Furring Channel Clips are made of galvanized wire and used in attaching Metal Furring Channels to $1\frac{1}{2}"$ cold-rolled runner channels. They are installed on alternate sides of the carrying channels; where clips cannot be alternated, wire tying is recommended. Packaged: 500 pcs. per ctn., weight: 36 lbs. per M pcs.

USG Cold-Rolled Channels, made of 16-ga. steel, are used for furring, and in suspended ceilings and partition construction. Available either galvanized or black asphaltum painted. Sizes: $\frac{3}{4}"$, with $\frac{1}{2}"$ flange; $1\frac{1}{4}"$, with $19/32"$ flange; 2", with $19/32"$ flange. Lengths: 16' and 20'; packaged: 20 pcs. per bdl. $\frac{3}{4}"$ size, 10 pcs. per bdl. $1\frac{1}{4}"$ and 2" size; weight: $\frac{3}{4}"$ -300 lbs. per M lin. ft., $1\frac{1}{4}"$ -500 lbs./MLF, 2"-629 lbs./MLF.

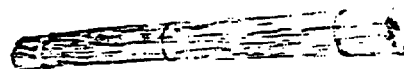
BB014 0401

46 products/metal accessories

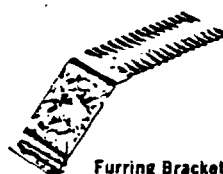


RC-1 Resilient Channel

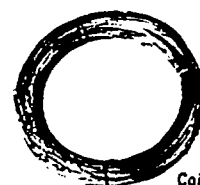
RC-1 SHEETROCK Resilient Channel is a galvanized steel channel which provides for resilient attachment of gypsum wall-board to wood framing. Widely used to improve sound transmission loss in partitions and ceilings of garden-type apartments, motels and other structures. Prepunched holes 4" o.c. in the flange facilitate screw fastening to framing members; SHEETROCK is attached to channel by USG Brand Hi-Lo Screws Type S. Width: 2 3/4"; depth: 1 1/2"; length: 12'; packaged: 20 pcs. per bdl.; weight: 220 lbs. per MLF. *Limitation:* must not be installed beneath highly flexible wood floor joists. RC-1 Channels are attached to ceilings with 1 1/4" USG Brand Screws Type W or S—nails must not be used; see Wood Framing Requirements Chapter 3.



Hank Wire



Furring Bracket



Coil Wire

USG Adjustable Wall Furring Brackets are used for attaching 3/4" furring channels and Metal Furring Channels to exterior masonry walls. Made of 20-ga. galvanized steel with serrated edges, they are wire-tied to horizontal stiffeners, 24" o.c., in braced furring systems: fur out board 1/4" to 2 1/4" plus channel depth. Packaged: 500 pcs. per ctn., weight 52 lbs. per M pcs.

USG Galvanized Tie and Hanger Wire—9-ga. wire, for hanging 1 1/2" and 2" runner channels in suspended ceilings is available in 50 lb. coils. 16-ga. and 18-ga. soft annealed wire, used for wall furring to tie furring channels to runner channels in ceiling construction, is available in 50-lb. coils and 25-lb. hanks (28" straight lengths).

BB014 0402



demountable partition components

A full line of specially designed accessories and trim, made from corrosion-resistant aluminum, steel and plastic, is available for the exclusive USG Demountable Partition Systems. These simplified, coordinated components offer complete flexibility in use with virtual 100% reusability in movable partitions of ceiling, cornice and bank rail height.

Individual wall sections are erected from 2½" interior metal studs set in metal runners and faced with ½" TEXTONE vinyl-faced panels or regular SHEETROCK Wallboard, 4' wide.

Panel joints are concealed with anodized aluminum battens and corners having decorative plastic inserts or snap-on moldings with permanently bonded finishes to match TEXTONE Standard Panels. Either recessed-flush type or thin-reveal type base made from anodized aluminum or high impact black vinyl plastic may be used. Several types of aluminum wall-ceiling trim including picture molding are available.

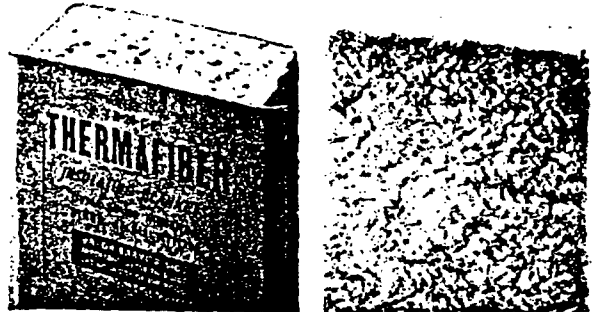
Aluminum accessories for trimming 1¾" doors are furnished in plain straight lengths, in sets of two jamb sections for full height doors or in sets of two jamb sections and one header section pre-punched for right hand or left hand opening 3'x6'8" and 3'x7'0" doors.

Glazing posts, glazing rails and covers, and other glazing accessories are available for use with 7/32" and ¼" thick glass.

Where a fire rating is not required, an alternate labor-saving construction is available using the following one-piece, multi-function aluminum components: H-Stud and Trim, Interior-Exterior Corner, Recessed Ceiling Runner and Trim.

Aluminum components are extruded sections with a satin finish and a corrosion-resistant natural anodized coating. Steel parts are all galvanized to resist corrosion and minimize galvanic action with aluminum. Plastic components are compression molded or extruded from high impact vinyl plastic except batten inserts and glazing spline which are flexible extruded polyethylene plastic.

BB014 0403



sound control and insulation 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 all types of new construction and remodeling.

THERMAFIBER Sound Attenuation Blankets are paperless, semi-rigid mineral fiber blankets of uniform dimension and controlled density especially developed for efficient sound barrier use. When inserted in the partition cavity from floor to ceiling, these blankets help provide excellent fire ratings and substantially improve STC ratings of partitions. Easily handled and cut; simple to install. Fire hazard classification: flame spread 25, fuel contributed 20, smoke developed 0. Blankets meet Fed. Spec. HH-I-521-D Type 1. Thickness: 1", 1½", 2"; width: 16" and 24"; length: 48".

THERMAFIBER Sound Control (Regular) 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.

Used in wood framed partitions, ceilings and floors for improved sound resistance and insulation. Blankets meet Fed. Spec. HH-I-521-D Type 1. Thickness: 2" and 3"; width: 15", 19", 23"; length: 4', 8', 24'.

USG Wood Fiber Sound Deadening Board, a ½" thick, 4' wide, low-density board, is used behind gypsum wallboard to reduce sound transmission through a partition (see Chapter 5 for technical data). This structural board is easily nailed to 2x4 wood studs and provides a resilient base for the application of wallboard. Limited to interior uses only. Gypsum board face layer must be permanently nailed. Not recommended as a base layer in radiant heated ceilings. Lengths: 4', 8', 10' and 12', packaged: 6 pcs. per bdl., weight: 750 lbs. per M sq. ft.

USG Mineral Fiber Sound Deadening Board is a $\frac{1}{2}$ " thick, 4' wide incombustible rigid type board used behind gypsum wallboard to reduce sound transmission through a USG Metal Stud partition. Lengths: 8' and 9', packaged: 6 pcs. per bdl., weight 1030 lbs. per M sq. ft.

THERMAFIBER M-S Blankets are specially designed for insulating exterior furring and curtain wall assemblies which utilize metal studs. They are flangeless, open-faced on breather side and made slightly wider than normal to give snug friction fit between studs. Require a separate vapor barrier such as Insulating SHEETROCK or a 4 mil polyethylene film. Blankets meet Fed. Spec. HH-1-521-C Type 1 Class B. Thickness: 2", 3", 3 $\frac{1}{2}$ "; width: 16" and 24"; length: 48" and 96".

Plastic Foam Insulations are low density, self-extinguishing rigid boards having high strength and good resistance to water and water vapor. Used in drywall exterior wall furring systems, they are bonded directly to masonry surfaces and provide an excellent base for SHEETROCK Wallboard. Boards are lightweight, non-flaking, non-irritating; easily handled and installed. Manufactured by Dow Chemical Company. Available in four types: **STYROFOAM® SM** and **STYROFOAM FR**, extruded polystyrene; **DORVON® FR-100**, molded expanded polystyrene; **THURANE®** urethane rigid foam insulation. Physical properties and specifications:

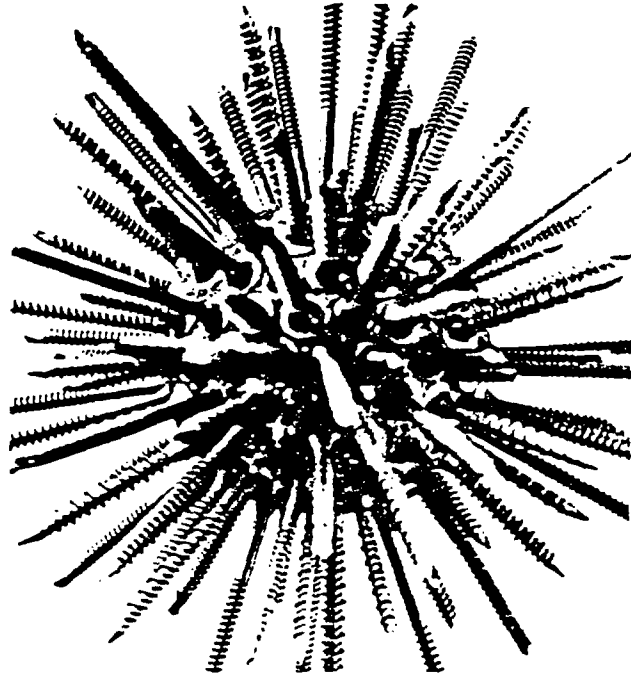
Table VII—Plastic Foam Insulation—Specifications

	STYROFOAM SM	STYRO- FOAM FR	DORVON FR-100	THURANE
Density—pcf	2.2	1.8	1.0	1.9
Water Vapor Transmission— perm-inch	0.60	1.0	3.0	1.5
Thermal Conductivity—"k"(1)	0.20	0.26	0.26	0.15
Thickness—in.(2)	$\frac{1}{4}$, 1, 1 $\frac{1}{4}$, 1 $\frac{1}{2}$, 2	1, 1 $\frac{1}{2}$, 2	1, 1 $\frac{1}{2}$, 2	$\frac{1}{4}$, 1, 1 $\frac{1}{2}$, 2
Width—in.	24	16 24	16, 24, 48	16, 24, 48
Length—ft.	8	9 8	8	4, 8, 9

(1) Btu-in./sq. ft.—hr. °F. at 75° average mean temperature.

(2) Greater thicknesses are available.

Sealants—USG Acoustical Sealant is a resilient non-hardening, non-skinning compound used to improve acoustical performance of drywall construction. It is applied around cut-outs, under runners and around the perimeter of partitions and ceilings to prevent leaks and transmission of airborne sound. Caulking should have flexibility to absorb slight movement and maintain an airtight seal without adhesive failure. It needs to be long-lasting, non-staining, non-bleeding and easily applied with mechanical or pneumatic caulking apparatus.



fasteners and adhesives

USG Brand Screws are the result of many years of development aimed at producing the best possible attachment of SHEETROCK Wallboard to steel, wood or gypsum supports simply and quickly. A complete line of 22 different special, self-drilling, self-tapping steel screws have been made available to improve construction systems and simplify installation methods. All dry-wall screws are highly corrosion resistant and have a Phillips head recess for easy installation with a special bit and power-driven screw driver. Wallboard is fastened to: 25-ga. (max.) steel framing with Type S screws, 12-ga. (max.) steel framing with Type S-12 screws, wood framing with Type W screws, gypsum studs and coreboards with Type G screws and adhesive.

The special patented bugle head used when attaching wallboard spins the face paper into the cavity under the screw head and produces a uniform depression free of fuzz for proper and easier spotting. Defects due to excessive or improper nail dimpling are eliminated. Other head designs are available for the assembly of metal framing and installation of wood and metal trim.

Type S screws have a patented milled drilling point and special Hi-Lo threads that provide greater holding power, 35% to 50% faster penetration with 40% less driving torque than conventional drywall screws. These factors mean more screws can be driven

BB014 0406

per day and screw guns last longer. Special threads are also provided on Type G and Type W screws to speed installation and provide excellent holding power in gypsum or the varied woods used in framing.

The ability of drywall screws to pull the gypsum wallboard 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 7) are used. An adjustable screw depth control assures uniformity of penetration, protects the face paper, minimizes core fracturing.

Although "fastener pops" caused by loose wallboard are eliminated, screws will not prevent "pops" due to excessive wood shrinkage or warping and twisting of framing. Correct selection and proper use of the screw recommended for the specific application is most important. Regardless of the attachment method used satisfactory results also depend on meeting proper framing, heating and ventilating requirements (see Chapter 1).

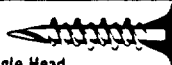
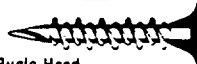
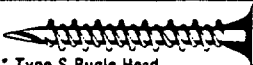
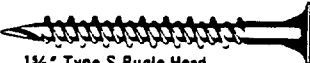
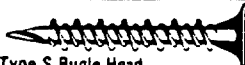
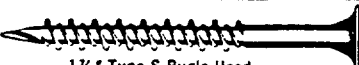
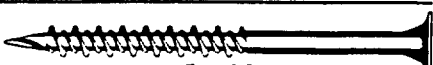
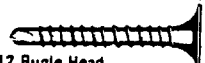
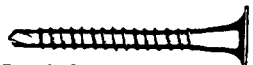
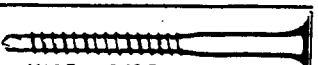
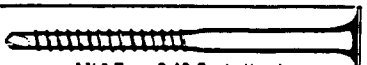
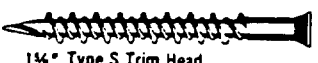
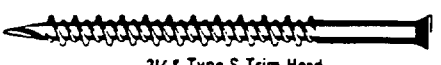
Table VIII—USG Brand Screw Specifications

Description			Packaging			
			#1 Bulk with Bits			#3 Packages†
Length	Type	Head	M qty.	Lbs. wt.	No. of bits	M qty. Lbs. wt.
Base Screws						
¾"	S	Bugle	24	72	2	3 8½
1"	S	Bugle	16	53	2	2 6
1¼"	S	Bugle	16	57	2	2 7
1½"	S	Bugle	16	61	2	2 7½
1¾"	S	Bugle	16	66	2	2 7
1¾"	S	Bugle	8	44½	2	1 5½
1¾"	S	Bugle	8	47½	2	2 12*
2¼"	S	Bugle	4	30	2	1 7½*
Specialty Screws						
1¼"	S	Trim	8	36	4	2** 9*
2¼"	S	Trim	8	53	4	2** 13*
¾"	S	Pan	24	54	2	5 11*
¾"	S-12	Pan	24	54	2	5 11*
½"	S-12	Pan	12	40	2	3 10*
½"	S-16	Pan(1)	—	—	—	3 10
1"	S-12	Bugle	16	52	2	2 6½
1¼"	S-12	Bugle	16	61	2	2 7½
1¾"	S-12	Bugle	8	44	2	1 5½
1¾"	S-12	Bugle	8	47	2	2 12*
1¼"	W	Bugle	16	60	2	2 8½
1¼"	G	Bugle	8	45	2	2 11*
Finishing Screws						
¾"	S-18	Oval(1)	16	64	2	2** 8
1¼"	S	Bugle(1)	16	61	2	1 4

(1) Cadmium Plated. †Also available in No. 2 Master Cartons, 4 or 8 pkgs. per ctn., same no. bits as in bulk. **Includes 1 bit per 2M screws. Single asterisks denote screws supplied in 4 pkgs. per Master Carton.

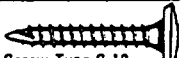
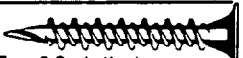
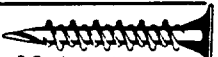
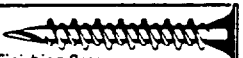
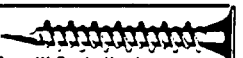
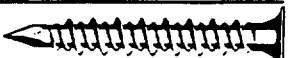
BB014 0407

SELECTOR GUIDE FOR USG BRAND SCREWS

Fastening Application	Fastener Used
GYPSUM BOARD TO INTERIOR METAL FRAMING (1)	
$\frac{1}{2}$ " single layer wallboard to interior studs, runners, channels	$\frac{1}{4}$ " Type S Bugle Head 
$\frac{3}{8}$ " single layer wallboard to interior studs, runners, channels	1" Type S Bugle Head 
$\frac{1}{2}$ " double layer wallboard to interior studs, runners, channels	1 $\frac{1}{4}$ " Type S Bugle Head 
$\frac{3}{4}$ " double layer wallboard to interior studs, runners, channels	1 $\frac{3}{4}$ " Type S Bugle Head 
1" coreboard to metal angle runners in solid partitions	1 $\frac{1}{4}$ " Type S Bugle Head 
$\frac{1}{2}$ " wallboard through coreboard to metal angle runners in solid partitions	1 $\frac{3}{4}$ " Type S Bugle Head 
$\frac{3}{4}$ " wallboard through coreboard to metal angle runners in solid partitions	2 $\frac{1}{4}$ " Type S Bugle Head 
GYPSUM BOARD TO 12-GA. (MAX.) METAL FRAMING	
$\frac{1}{2}$ " and $\frac{3}{4}$ " wallboard and gypsum sheathing to 20-ga. studs and runners	1" Type S-12 Bugle Head 
USG Self-Furring Metal Lath through gypsum sheathing to 20-ga. studs and runners	
E-Z WALL Panels to studs and runners	1 $\frac{1}{4}$ " Type S-12 Bugle Head
$\frac{1}{2}$ " and $\frac{3}{4}$ " double layer gypsum wallboard to 20-ga. studs and runners	1 $\frac{1}{4}$ " Type S-12 Bugle Head 
Multi-layer gypsum board to 20-ga. studs and runners	1 $\frac{1}{4}$ " Type S-12 Bugle Head 
WOOD TRIM TO INTERIOR METAL FRAMING	
Wood trim over single layer wallboard to interior studs, runners	1 $\frac{1}{4}$ " Type S Trim Head 
Wood trim over double layer wallboard to interior studs, runners	2 $\frac{1}{4}$ " Type S Trim Head 

BB014 0408

SELECTOR GUIDE FOR USG BRAND SCREWS

Fastening Application	Fastener Used
METAL STUDS TO DOOR FRAMES, RUNNERS	
Interior metal studs to runners	1/2" Type S Pan Head 
Interior metal studs to door frame jamb anchor clips 20-ga. studs to runner Other metal-to-metal attachment (12-ga. max.)	1/2" Type S-12 Pan Head 
Interior metal studs to door frame jamb anchor clips (heavier shank assures entry in clips of hard steel)	1/2" Type S-12 Pan Head 
Strut studs to door frame clips, rails and other attachments in E-Z WALL partitions	1/2" Type S-16 Pan Head Cadmium Plated 
TRIM AND ACCESSORIES TO METAL FRAMING	
Door hinges and trim to door frame Aluminum trim to metal framing (screw matches hardware and trim)	1/4" Finishing Screw Type S-18 Oval Head Cadmium Plated 
Metal base splice plates through wallboard and runner	1 1/4" Type S Bugle Head 
Batten strips to interior metal studs in demountable partitions	1 1/4" Type S Bugle Head 
Aluminum trim to interior metal framing in Demountable and E-Z WALL partitions	1 1/4" Finishing Screw Type S Bugle Head Cadmium Plated 
GYPSUM BOARD TO WOOD FRAMING	
1/2", 5/8" and 3/4" single layer wallboard to wood framing	1 1/4" Type W Bugle Head 
RC-1 RESILIENT CHANNEL TO WOOD FRAMING	
Screw attachment required for ceilings, recommended for partitions	1 1/4" Type W, 1/4" or 1" Type S Bugle Head (see details above)
For fire rated construction	1 1/4" Type S Bugle Head (see details above)
GYPSUM BOARD TO GYPSUM BOARD	
Multi-layer adhesively laminated gypsum to gypsum partitions (not recommended for double layer 1/2" wallboard)	1 1/2" Type G Bugle Head 

Notes: (1) Includes USG Interior Studs, Metal Runners, Metal Angle Runners, Metal Furring Channels, RC-1 Resilient Channels. If channel resiliency makes screw penetration difficult, use screws 1/8" longer than shown to attach wallboard to RC-1 channels. For 20-ga. Metal Studs and Runners, always use Type S-12 screws. For steel applications not shown, select a screw length which is at least 1/8" longer than total thickness of materials to be fastened. USG Brand Screws are manufactured under U.S. Patent Nos. 2,871,752; 3,056,234; 3,125,923; 3,207,023; 3,221,588.

BB014 0409

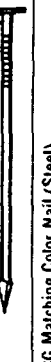
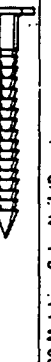
Wallboard Nails have been vastly improved since the relationship of wood shrinkage to nail popping was discovered. Nails have been developed to concentrate maximum holding power over the shortest possible length—notably the annular ring type nail which has about 20% greater holding power than a cement-coated cooler type nail of the same length. However, under lengthy, extreme drying conditions, such as a cold dry winter, resulting wood shrinkage may cause fastener pops even with the annular ring nail (see Wood Shrinkage, Chapter 6).

As with screws, specification of the proper nail for each application is extremely important, particularly for fire-rated construction. Nails used in drywall construction should comply with performance standards adopted by the Gypsum Drywall Contractors International Gypsum Association and ASTM Specifications C380 or C514. The nails shown below comply with these performance standards. Nails, except USG Matching Color Nails, are not available from U.S.G.

SELECTOR GUIDE FOR WALLBOARD NAILS

Fastening Applications	Fastener Description	Nail Spacing C. to C. (1)	Approx. Lbs. Nails Req'd per MSF SHEETROCK
$\frac{1}{4}$ " and $\frac{1}{2}$ " SHEETROCK Wallboard: $\frac{1}{4}$ " and $\frac{1}{2}$ " BXBORD Gypsum Backing Board to wood frame (2) (3)	1 $\frac{1}{4}$ " GWB-54 Annular Ring Nail 12 $\frac{1}{2}$ ga.; $\frac{1}{4}$ " dia. head with a slight taper to a small fillet at shank; bright finish; medium diamond point; meets ASTM C380 	7" ceiling 8" walls	5 $\frac{1}{4}$
$\frac{1}{4}$ " SHEETROCK Wallboard to wood frame (3)	1 $\frac{1}{4}$ " Annular Ring Nail (Same as GWB-54 except for length) 	7" ceiling 8" walls	5 $\frac{1}{4}$
$\frac{1}{4}$ " SHEETROCK FIRECODE Wallboard face layers to lagged wood studs over $\frac{1}{2}$ " USG Wood Fiber Sound Deadening Board	2 $\frac{1}{4}$ " 7d Gypsum Wallboard Nail Cement Coated, 13 ga., $\frac{1}{4}$ " dia. head 	7" walls (face layer)	9

BB014 0410

1/2" and 3/4" SHEETROCK Wallboard over existing surface, wood frame	1 1/2" 6d Gypsum Wallboard Nail Cement Coated, 13 ga., 1/4" dia. head 	7" ceiling 8" walls	6 1/4
1/2" SHEETROCK FIRECODE Wallboard to wood frame	1 1/2" 6d Gypsum Wallboard Nail Cement Coated, 13 ga., 1/4" dia. head 	6" ceiling 7" walls	6 1/4
1/2" SHEETROCK FIRECODE "C" Wallboard to wood frame	1 1/2" 5d Gypsum Wallboard Nail Cement Coated, 13 1/2 ga., 1 1/4" dia. head 	6" ceiling 7" walls	5 1/4
1/2" ULTRAWALL Panels —to wood frame (3) —over existing surface, wood frame (3)	1 1/4" USG Matching Color Nail (Steel) 	8" walls	1 1/2
	1 1/4" USG Matching Color Nail (Steel) 	8" walls	4 1/2
3/4" SHEETROCK FIRECODE Wallboard; 3/4" BXBORD FIRECODE Gypsum Backing Board to steel nailing channel	1 1/4" Felter Annular Ring Nail 11 ga., 3/16" dia. head 	6" ceiling	6
TEXTONE Vinyl Panels (17 finishes) to wood frame (3)	1 1/4" USG Matching Color Nail (Brass) 	8" walls	2 1/2
	1 1/4" USG Matching Color Nail (Brass) (Special Order)	8" walls	4 1/2

NOTES: (1) Spacing shown are for single layer application without adhesive. (2) See Wood Framing Requirements and Healing Recommendations, Chapter 1. (3) Nails shown for this application are also the proper size for use with adhesive.

BB014 0411

56 products/drywall adhesives

USG Drywall Adhesives make an important contribution to wallboard attachment where the finest room interiors are desired. Their use greatly reduces the nail or screw fastening otherwise required, thus saves labor on spotting and sanding—also minimizes nail pops and joint ridging.

PERF-A-TAPE Joint Compound-Taping is recommended for laminating gypsum wallboard to gypsum backing board in multi-layer partitions and ceilings. It is a dry powder product, applied by spreader, requiring mixing and temporary fastening in application; qualifies for fire-rated construction.

Newly developed, ready-to-use, **DURABOND Adhesives** are available in five types for specific applications:

DURABOND 200 Stud Adhesive—a solvent-base material, applied in $\frac{3}{8}$ " beads, for wallboard application to wood or metal framing. May be used with Insulating (foil-backed) **SHEETROCK Wallboard**. Bridges minor framing irregularities; requires minimum field fasteners on ceilings; meets ASTM C557 67.

DURABOND 300 Stud Adhesive—a water-base material, applied in beads, for wallboard application to wood and metal framing and polystyrene rigid foam insulation. Requires a minimum of temporary fasteners in field of board. May be used with Insulating (foil-backed) **SHEETROCK Wallboard**. Meets ASTM C557 67. Protect from freezing.

DURABOND 400 Paneling Adhesive—a water-base material, for application of prefinished wall paneling to wood or metal framing or existing wall surfaces. Applied in $\frac{3}{8}$ " beads. Long "tack" period allows board adjustment after erection. Provides tight bond when impacted; requires no field fasteners. Protect from freezing.

DURABOND 500 Mastic Contact Adhesive—a water-base adhesive for laminating gypsum wallboard and backing boards to monolithic concrete, concrete block, wood fiber sound deadening board, expanded polystyrene or urethane rigid foam insulation and existing wall surfaces in non-fire rated construction. Strips applied with an Ames spreader, or notched metal spreader having four $\frac{1}{4}$ "x $\frac{1}{4}$ " minimum notches spaced no more than 2" o.c. Allows board adjustment after erection; provides excellent bond after impacting. Field fasteners not required when panels are prebowed. Protect from freezing.

DURABOND 600 Liquid Contact Adhesive—a water-base adhesive for laminating gypsum wallboard in non-fire rated double layer systems. Spray or roller applied. Bonds tightly with impacting. Ceiling lamination only requires a minimum of permanent fasteners. Protect from freezing.

NOTE: Because of the potential incompatibility between vinyl-surfaced wallboard and solvent-based adhesives, United States Gypsum cannot be responsible for problems arising from the use of either its adhesives with vinyl-surfaced wallboard manufactured by others, or its vinyl-surfaced wallboard applied with adhesives made by others.

BB014 0412

Table IX. USG Adhesive Specifications

Type Adhesive	Item	Items per Package	Gross Wt. Lbs./Pkg.
PERF-A-TAPE Joint Compound—taping	25 lb. bag	1 bag	25½
DURABOND 200	5 gal. can ¼ gal. ctdgs.	1 can 12 ctn.	50 32
DURABOND 300	5 gal. can ¼ gal. ctdgs.	1 can 12 ctn.	47 32
DURABOND 400	5 gal. can 1/10 gal. ctdgs. ¼ gal. ctdgs.	1 can 24 ctn. 12 ctn.	52 23 32
DURABOND 500	5 gal. can	1 can	41
DURABOND 600	5 gal. can	1 can	44

Selector Guide For Drywall Adhesives

Application & Description	Features
SHEETROCK Wallboard to BAXBORD Gypsum Backing Board or SHEETROCK base layer PERF-A-TAPE Joint Compound—Taping—mixed with water, applied with spreading tool	Tight bond; permits adjustment of boards after contact; temporary fastening required; qualifies for fire-rated construction
SHEETROCK Wallboard to USG Sound Deadening Board PERF-A-TAPE Joint Compound—Taping—mixed with water, applied with spreading tool	Excellent bond; supplemental fastening required
SHEETROCK Wallboard or TEXTONE Gypsum Panels to wood or metal framing DURABOND 200† or 300, 400 applied with cartridge gun in continuous ¼" beads	50% to 100% greater bond strength than with conventional fastenings. Eliminates all field nails on walls; all but one temporary fastener per framing member on ceilings
SHEETROCK Wallboard or TEXTONE Panels to SHEETROCK base layer, wood studs DURABOND 600, 500, 200, 300 To SHEETROCK or wood- or mineral-fiber board, wood or metal studs DURABOND 500, 200, 300	Bonds tightly with impact. On walls, fasteners are spaced 16" o.c. at top and bottom as required. Ceiling lamination requires permanent fasteners at each corner, 48" o.c. at edges. Impacted at 16" intervals
SHEETROCK Wallboard or rigid foam insulation to masonry or concrete; SHEETROCK to rigid foam base. Also for solid and semi-solid systems DURABOND 500, 200, 300	Allows wallboard adjustment after erection. Provides excellent bond after impacting

†Bold numbers show recommended adhesives; other numbers show suitable substitutes.

BB014 0413



joint treatment products

DESCRIPTION

Today's complete U.S.G. joint treatment line includes both ready-mixed and powder-type joint compounds, fiber reinforcing tape suitable for application by either hand tools or mechanical taping tools. In addition to conventional joint finishing and fastener spotting, certain of these products are designed for repairing cracks, patching, spackling, back-blocking, and for laminating layers in gypsum wallboard double-layer systems.

A complete new group of non-casein type powder compounds—known as **USG Brand Joint Compounds**—has been added to the previous two lines of powder products. The new formulations are ready for use as soon as mixed, compared to the 30-minute or longer soak of casein type compounds, are stable in wet mix consistency, have smoother application properties and are free of ammonia odor.

The two established powder product lines are the casein type **PERF-A-TAPE Joint Compounds**, still the industry's standard of excellence, and **DURABOND Joint Compounds** designed for quick hardening and one-day finishing. In these powder lines, USG Brand and PERF-A-TAPE Compounds are offered in taping, topping and all-purpose type formulations, DURABOND in taping and multi-purpose.

BB014 0414

All products are manufactured to meet ASTM Standard C-474-64 and C-475-64 and Federal Specification SS-J-570A Type I for joint compounds only, Type II for tape only, Type III for combined joint compound and tape.

ADVANTAGES

In U.S.G. joint compounds, these qualities of superiority have been developed:

Excellent Bond—holds tight under normal conditions.

Smoother Joints—joints harden out flatter; low shrinkage and tight cohesion reduce sanding to minimum; allow faster preparation for decorating.

Smooth Working—easy mixing, excellent slip, ample wet mix life; no alkali burning of paint.

In PERF-A-TAPE Reinforcement, both comparative tests and long field usage have established these performance advantages:

Strength—greatest cross tensile strength, producing joints as strong as the board itself.

Crack Resistance—chamfered edges are wafer-thin for easy embedding, greater holding power to resist edge cracking.

Natural Bond—tape truly adheres to compound; spark perforations minimizes photographing; tape has least longitudinal stretch; is pre-creased for easier folding.

Use of U.S.G. joint treatment brings the important added advantage of dealing with a single manufacturer who is responsible for all components of the finished wall or ceiling—all made by U.S.G. to work together.

GENERAL LIMITATIONS

1. For interior use only; not intended for use on wood or wood fiber products (except in certain lamination applications—see PERF-A-TAPE Joint Compound below).
2. Bagged products require protection against moisture.
3. Each compound coat must be dry before next is applied. Completed joint treatment must be thoroughly dry before proceeding with decoration.

PERF-A-TAPE Reinforcement is a strong fiber tape specially designed with chamfered edges feathered thin. Special cross-fibered paper has great strength both with and across the grain of paper. Many small random perforations allow rapid air escape during embedding. Highly crack resistant. Lightly pre-creased for corner application. Available in 60', 250', 600' rolls.

USG BRAND JOINT COMPOUNDS

These non-phosphoprotein (non-casein type) powder compounds possess virtually all the desirable features of conventional casein-bound products, but in addition provide greater stability of wet mix consistency and savings in mixing time. Not compatible with PERF-A-TAPE Joint Compounds, but they may be used over DURABOND and USG Ready-Mixed Joint Compounds.

BB014 0415



USG Joint Compound-Taping is designed for embedding tape and for first fill coat on metal beads, trim and fasteners; also used for patching plaster cracks. Outstanding bond and resistance to tape cracking.

USG Joint Compound-Topping is a smooth-sanding material for second and third coats over taping compound. Produces excellent feathering and superior finishing results.

USG Joint Compound-All Purpose incorporates good taping and topping characteristics in single product, for use where finest results of the specialized compounds (above) are not necessary. Also has good texturing properties.

PERF-A-TAPE JOINT COMPOUNDS

These are the phosphoprotein (casein type) powder products which have long predominated in the marketplace. They are noted for qualities of easy mixing, smooth working, ample working time, controlled minimum shrinkage and no alkali burning of paint. They should not be used in combination with non-casein or hardening type joint compounds.

PERF-A-TAPE Joint Compound-Taping gives outstanding service in embedding tape, and as first fill coat over metal corners, trim and fasteners. Also used for patching plaster cracks, for laminating double-layer wallboard and in U.S.G. Back-Blocking System (see Chapter 3).

PERF-A-TAPE Joint Compound-Topping, used for finishing over PERF-A-TAPE Compound-Taping, is preferred for its workability, smoothness, paintability and long working life. Available either pigmented or unpigmented.

PERF-A-TAPE Joint Compound-All Purpose brings the convenience of single-package joint treatment; does an adequate job of embedding, topping, texturing, spray coating and skim coating.

DURABOND JOINT COMPOUNDS

These powder products were developed to cut drying time and provide faster finishing of drywall interiors, even under slow drying conditions. Rapid hardening and low shrinkage permit same-day finishing and usually next-day decoration. Superior bond is another outstanding feature. They are not compatible with casein-type compounds.

DURABOND Joint Compound-Taping is a polyindurate type material for embedding tape and metal accessories; also ideal for heavy fills because it chemically hardens in 3 to 6 hours. Virtually unaffected by high humidity and changes in humidity. *Limitation:* not to be used as finishing coat; must always be completely covered with final application of **USG Joint Compound-Topping or All Purpose**, or **USG Ready-Mixed Joint Compound-All Purpose**.

DURABOND 90 Joint Compound-Multi-Purpose is the required prefill material for **SHEETROCK SW** rounded-edge wall-board, creating the strongest joints ever developed. Its 1 to 2-hour hardening time also makes it an ideal alternate to **DURABOND Joint Compound-Taping** in applications where quicker finishing and minimum shrinkage are desired. A polyindurate type material.

READY-MIXED COMPOUNDS

USG Ready-Mixed Joint Compound-All Purpose, a vinyl-base formulation widely used for embedding and finishing, comes pre-mixed with a creamy, lump-free plasticity that produces excellent slip and bond. Available in either machine or hand tool consistency; on-the-wall cost averages the same as with powder compounds. Recommended for finishing **SHEETROCK SW** Wall-board joints over **DURABOND 90** pre-fill coat; also used in repairing plaster cracks in interior plaster and masonry not subject to moisture. *Limitations:* container must be protected from freezing; not recommended for laminating.

COVER COAT Drywall Compound is a vinyl-base product, designed for filling and smoothing monolithic concrete ceilings and columns located above grade—no extra bonding agents needed. Supplied in ready-mixed form (sand can be added), easily applied with drywall tools in two or more coats. Dries to a fine white surface usually making further decoration unnecessary—if desired, **COVER COAT** is followed with **SHEETROCK Sealer** or **TEXOLITE Primer-Sealer**. *Limitations:* not to be applied over moist surfaces or surfaces likely to become moist (by condensation or otherwise), on ceiling areas below grade, on surfaces which project outside the building, or on other areas which might be subject to moisture, freezing, efflorescence, pitting or popping.

BB014 0417

62 products/joint treatment specifications

Table X. Joint Treatment Product Specifications

Product Description	Items per Package	Gross Wt. Lbs./Pkg.
PERF-A-TAPE Reinforcing Tape		
—500' roll	10/ctn.	28
—250' roll	20/ctn.	28½
—60' roll	24/ctn.	10
USG Brand Joint Compound (powder)—		
25-lb. bag		
—taping, topping or all-purpose	1	25½
PERF-A-TAPE Joint Compound (powder)—		
25-lb. bag	1	25½
—taping, topping or all-purpose		
—taping compound also in 5-lb. box	10/ctn.	55
DURABOND Joint Compound (powder)—		
25-lb. bag	1	25½
—taping, topping or multi-purpose		
USG Ready-Mixed Joint Compound—		
All Purpose (paste)		
—5-gal. can	1	67
—4-gal. corrugated carton	1	53
—5-gal. corrugated carton	1	65
—5-gal. plastic pail	1	68
—1-gal. can	4/ctn.	58
COVER COAT Compound (paste)—		
5-gal. corrugated carton	1	68
USG Ready-Mixed Joint System		
—100' tape, 1 gal. compound(1) in container	2/ctn.	30
PERF-A-TAPE Joint System		
—250' tape, 18 lb. compound(1) in bag	1	20
—60' tape, 4½ lb. compound(1) in box(2)	10/ctn.	55

(1) All Purpose Compound

(2) Furnished with or without 1 plastic knife per box.

interior texture finishes

U.S.G., the unchallenged leader in texture finishes, offers the industry's broadest line. These outstanding paste and powder products are leading the resurgence of interior decoration.

USG Texture I—a ready-to-use latex emulsion paint embodying a fine aggregate to produce a slight sand-finish effect combined with light texture. One coat covers fine cracks, blemishes. Quick-drying, 7 ready-mixed colors.

USG Texture II—flat ripple finish in a latex emulsion. Contains no sharp aggregate, can produce fine textures ranging from "orange-peel" effect to smooth rounded stipple. Conceals moderate imperfections, normally requires no sealer. Quick-drying, washable, recoatable. 7 ready-mixed colors.

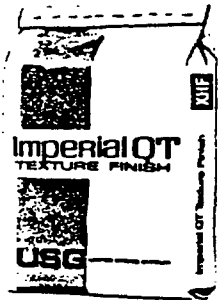
Other paste textures available: **USG Texture VII**, sanded latex drywall surfacer; **USG Texture VIII**, drywall spray surfacer; **USG Texture IX**, heavy-bodied latex; **USG Texture XI**, latex paste stipple; **USG Sanded Paste Stipple**, alkyd resin compound.

BB014 0418

IMPERIAL QT Texture Finish—aggregated powder, produces acoustical finish appearance on ceilings; provides no acoustical correction. Excellent bonding qualities; helps conceal surface defects. Spray-applied in coarse, medium or fine texture. White only. First coat of PRO-KYD Alkyd Flat Wall Paint recommended.

TEXTONE Paint—the king of textures, especially adapted to heavy stipples, deep textures and a wide range of applications. For hand application; insoluble and durable. Useful for refinishing wallboard surfaces, producing stone or antique effects, stencil work; unequalled for concealing wall blemishes. White only, but can be tinted with TEXOLITE Standard or coated with most paints.

Other powder textures include **USG Texture Paint**, for medium heavy to medium light stipples; **A-B TEX Texture Paint** and **USG Spray Texture** for fog coats, light stipples and orange-peel textures; **USG Texture XII**, spray-applied sand finish for drywall.



BB014 0419

SELECTOR GUIDE TO USG PAINT PRODUCTS

INTERIOR WALLS—GYPSUM BOARD				FINISH PRODUCT USED			
Type of Finish Desired	Special Surface Treatment	Redecorating	Description	Thinners	Method Application	Hours Drying Time Touch Recoat	One Gal. Coverage (Sq. Ft.)
Velvet	SHEETROCK Sealer TEXOLITE Primer-Sealer	SHEETROCK Finish Coat GRAND PRIZE Paint	SHEETROCK Finish Coat GRAND PRIZE Paint	NR/w NR/w	BI, RI, SI BI, RI, SI	1/2 1/2	450 450
Flat	SHEETROCK Sealer GRAND-PRIZE Latex Semi-Gloss Enamel	Prime if needed Self-priming	PRO-KYD Alkyd Flat GRAND PRIZE Latex Semi-Gloss Enamel	NR/ms NR/w	RI, SI, BI SI, BI, RI	3 1/2	400 450
Gloss	USG Alkyd Wall Primer-Sealer	USG Alkyd Enamel Undercoat	DIAMOND Lustre Enamel	NR/ms	SI, BI, R2	3	450
Epoxy Glaze	USG Epoxy Enamel or ACREPOX Finish	USG Epoxy Enamel or ACREPOX Finish	USG Epoxy Enamel or ACREPOX Finish	SS/USG	SI, B2, R2	4	190-320
Sand Float Texture Orange-peel to Ripple Texture	None None	None None	USG Texture I USG Texture II	NR/w NR/w	BI, RI BI, RI, SI	1/2 1	200 200
Heavy Stipple or Period Texture	As required	As required	TEXTONE; then GRAND PRIZE Paint	W	B, R, O	1	9-36/lb.
Medium Light to Medium Heavy Texture	Usually none	None	USG Texture Paint; then GRAND PRIZE Paint (also 2 finishes below)	W	B, R, O	1	27-54/lb.
Medium Light to Very Light Text.	Usually none	None	A-B TEX or USG Spray Texture	W	B, R, S, O	1	27-54/lb.
Sand Finish	None	None	USG Texture VII or XII (Drywall Surfacers)	W	S	1	20-35 lb.
INTERIOR METAL (FERROUS) TRIM							
Flat (Water Thinned)	METAL COAT Iron Oxide Primer	None, if free of rust	GRAND PRIZE Latex Wall Paint	NR/w	BI, SI, R2	1/2	450
Gloss (Solvent Thinned)	METAL COAT Iron Oxide Primer	None, if free of rust	METAL COAT Enamel	NR/ms	BI, SI, R2	2	600

BB014 0420

INTERIOR WOOD TRIM

Semi-Gloss	USG Alkyd Enamel Undercoat	USG Alkyd Enamel Undercoat	USG Satin-Lustre Enamel	NR/ms	SI, BI, R2	3	24	450-500
Gloss	USG Alkyd Enamel Undercoat	USG Alkyd Enamel Undercoat	DIAMOND Lustre Enamel	NR/ms	SI, BI, RI	3	24	450
Flat	USG Alkyd Primer-Sealer	None—dull gloss	PRO-KYD Alkyd Flat	NR/ms	RI, SI, BI	1	24	400
Gloss or Satin Finish Clear	USG Sanding Sealer	USG Sanding Sealer	USG Satin Finish Varnish or USG Polyurethane Clear Finish	NR	B only	2	12	500

INTERIOR CEILINGS—GYPSUM BOARD

Flat (Med. Scrub)	None, or TEXOLITE Primer-Sealer	None	USG Super Ceiling White	NR/w	BI, RI, S2	1/2	8	250
Flat (High Scrub)	TEXOLITE Primer-Sealer	GRAND PRIZE Latex Wall Paint	GRAND PRIZE Latex Ceiling White Paint	NR/w	BI, RI, SI	1/2	8	450
Textured	USG Texture I, II, VII, or XII	USG Texture I, II, VII, or XII	Any of above finishes for wallboard	see above	see above	see above	see above	see above

EXTERIOR CEILINGS—GYPSUM BOARD

Low Lustre			USG Low-Lustre House Paint	NR/ms	B only	2	24	450
Medium Lustre	Dry, clean, apply one coat	IMPERIAL House Primer #894, 1 or 2 coats finish paint	USG Latex House Paint	NR/w	BI, RI, SI	1/2	8	400
Gloss			IMPERIAL Gloss House Paint	NR/ms	BI, SI, R2	12	48	450

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, O=other; 1,2,3=order of preference. 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; W=water per directions.

BBO14 0421

chapter 3

methods of installation

	page
WALLBOARD	
Types of Application	68
Planning the Job	69
Horizontal vs. Vertical Application	69
Framing Member Spacing	70
Wood Framing Requirements	70
Estimating Materials	71
Application Recommendations	74
FASTENING	
Screw Application	74
Nail Application	75
Adhesive Nail-On Application	77
Adhesive Application—Multi-Layer	80
Application Methods	83
Single Layer	83
Floating Interior Angle	85
Back-Blocking	86
Double Layer	89



	page		page
SPECIALTY BOARDS		Texture Finishes	118
Predecorated Wallboard	91	SPECIAL APPLICATIONS	120
TEXTONE Smoothwall Panel	93	Curves and Arches	121
TEXTONE Moldings	96	Resurfacing	123
SHEETROCK W/R Wallboard	97	Exterior Ceilings, Soffits	124
ACCESSORIES		Gypsum Sheathing Application	126
Metal Trim	100	Wood and Metal Runner Attachment	127
Control Joints	103	Sound Deadening Board and Wool	128
JOINT TREATMENT	104	Caulking	131
Mixing Joint Compounds	106	Perimeter Isolation	135
Hand Tool Application	109	Door Frames, Windows	138
Mechanical Tool Application	112	Fixture Installation	143
USG Ready-Mixed Compound	113	Aluminum	149
DURABOND Joint Compounds	113		
Cold Weather Tips	114		
COVER COAT Compound	117		



BB014 0423



types of application

SHEETROCK Wallboard provides a variety of durable, fire-resistant easily decorated surfacing materials for interior walls, ceilings, and partitions. SHEETROCK may be applied in one or two layers directly to wood framing members, to metal studs or channels or to gypsum studs, ribs or backing boards.

Single Layer Application—This basic construction is used to surface 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—Consists of a face layer of SHEETROCK applied to a base layer of gypsum, wood fiber or mineral fiber board that is directly attached to framing members. This construction offers greater strength and higher resistance to fire and sound transmission. Walls and ceilings so constructed are highly resistant to cracking, easy to decorate. They minimize the possibility of fastener "pops" and discoloration over fastener heads.

Fastening Methods—Wallboard is applied by several alternate methods depending on the type of supports and materials used:

1. **Single Nailing**—conventional attachment for wood framing.
2. **Double Nailing**—for minimizing defects due to loosely nailed wallboard.
3. **Adhesive Nail-on**—continuous bead of DURABOND 200 or 300 Stud Adhesive applied to wood framing plus supplemental nailing; improves bond strength, greatly reduces face nailing needed.
4. **Screw Attachment**—USG Brand Screws are the best known insurance against fastener pops caused by loosely attached board. Recommended in wood frame application; required with drywall systems employing metal framing.
5. **Adhesive Attachment**—the latest advancement for producing the finest room interiors. Usually requires only supplemental fasteners to attach face layers to gypsum studs, ribs or backing boards. Reduced nail or screw fastening required saves spotting and sanding labor; minimizes nail pops and joint ridging.

planning the job

Advanced planning by the drywall applicator can mean savings in time and material cost and a better appearing job. Proper planning will result in the most effective use of material, the elimination of unnecessary joints, and the location of required joints at the least conspicuous places. Try to span the whole wall or ceiling from corner to corner with one sheet of wall-board. Use the longest practical lengths obtainable. This will keep butt joints to a minimum. End joints, when they occur, should be staggered.

In double layer construction, joints occurring in the face layer are offset at least 10" from parallel joints in the base layer. The layout of the base layer must be planned to account for this offset and still provide optimum joint finishing conditions and efficient use of materials in the face layer as mentioned above.

HORIZONTAL VS. VERTICAL APPLICATION



SHEETROCK Wallboard may be applied horizontally (long edges of the board at right angles to the framing) or vertically (long edges parallel to framing). Fire rated partitions generally require vertical application; see fire test for specific details.

Horizontal application is generally better because it offers the following advantages:

1. Reduces lineal footage of joint treatment up to 25%.
2. Strongest dimension of board runs across framing members.
3. Bridges irregularities in alignment and spacing of framing members.
4. Better bracing continuity—each panel ties more framing members together.
5. Joints on walls are at a convenient height for the finishing operation with a U.S.G. joint system.

For wall application, if ceiling height is 8'2" or less, horizontal layout of SHEETROCK panels 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

BB014 0425

70 installation methods/wood framing

practical. For ceiling application, use whichever method will result in fewer joints.

In double layer construction on ceilings, apply base layer boards horizontally, at right angles to framing members; apply face layer either vertically or horizontally with joints offset. On walls apply base layer boards vertically with edges centered on framing members; apply face layer horizontally. Exception: When using predecorated TEXTONE Vinyl Panels or ULTRAWALL Panels for face layer on walls, apply base layer horizontally at right angles to studs.

FRAMING MEMBER SPACING

SHEETROCK may be applied directly over wood studs, joists and rafters, or assembled with metal and gypsum components into systems that provide excellent sound and fire resistant construction.

Maximum spacings for wood framing members to receive SHEETROCK wallboard are shown in the tables below. Spacings for systems components are shown in the descriptions of the various systems, Chapter 4.

Wallboard Thickness	Location	Application Method	Maximum Spacing Framing Members
Single Layer Application			
$\frac{3}{8}$ "	Ceilings(4)	Horizontal	16" o.c.
$\frac{3}{8}$ "	Sidewalls	Horizontal or Vertical	16" o.c.
$\frac{1}{2}$ "	Ceilings(4)	Vertical	16" o.c.
$\frac{1}{2}$ "		Horizontal	24" o.c.
$\frac{1}{2}$ "	Sidewalls	Horizontal or Vertical	24" o.c.
$\frac{5}{8}$ "	Ceilings(4)	Vertical	16" o.c.
$\frac{5}{8}$ "		Horizontal	24" o.c.
$\frac{5}{8}$ "	Sidewalls	Vertical or Horizontal	24" o.c.
Double Layer Application (1)			
$\frac{3}{8}$ "(2)(3)	Ceilings(4)	Horizontal	16" o.c.
$\frac{3}{8}$ "(2)(3)	Sidewalls	Horizontal or Vertical	24" o.c.
$\frac{1}{2}$ " & $\frac{3}{8}$ "	Sidewalls	Horizontal	24" o.c.
$\frac{1}{2}$ " & $\frac{3}{8}$ "	Ceilings(4)	Horizontal or Vertical	24" o.c.

NOTES: (1) Framing member spacing for single layer construction applies to both base and face layers when adhesive is not used. (2) Adhesive must be used for $\frac{3}{8}$ " wallboard double layer application. (3) Wallboard $\frac{1}{2}$ " thick is not recommended as base layer applied to metal framing. (4) Up to 6" of wool insulation may be applied resting on SHEETROCK Wallboard ceilings, provided the maximum framing member spacing is not exceeded and joints are finished.

WOOD FRAMING REQUIREMENTS

Wood framing meeting the following minimum requirements is necessary for proper performance of all gypsum wallboard fasteners:

1. Framework should meet the minimum requirements of FHA, ALSC and local building codes.
2. Framing members should be straight, true, of uniform dimen-

BB014 0426

sion. Studs and joists must be in true alignment: bridging, fire stops, soil pipes, etc., must not protrude beyond framing.

3. All framing lumber should be of a good grade for the intended use, and 2"x4" nominal size or larger should 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 time of gypsum wallboard applications.

5. Do not attach gypsum wallboard to extremely soft framing members.

Failure to observe these minimum framing requirements, which are applicable to screw, nail and adhesive 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 tendencies 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 wallboard. Provide heat in winter or during damp conditions at a uniform temperature in the range of 55° to 70°F. Provide ventilation to remove excess moisture.

ESTIMATING MATERIALS

Wallboard—From practical experience professional estimators have developed many methods of determining footage required to complete various types of jobs. Basically, these methods stem from the simple principle of "scaling a plan," and determining the length and width and ceiling height of each room on the plan. Frequently, door and window openings are "figured solid" with no openings considered. Exceptions may be large picture windows and large door openings. From these dimensions the estimator determines the square footage of each room. The footage of each room is added to determine total footage required. From these figures, the lengths of gypsum wallboard needed may be determined.

Plan to use the longest practical length of SHEETROCK wallboard that will span the ceiling and wall area. This will reduce butt joints to a minimum or eliminate them entirely. When estimating walls adjacent to sloping ceilings, plan carefully so that there will be a minimum of waste. Refer to Chapter 2—Products—for available lengths of each type wallboard.

For the convenience of the drywall applicator, the Rapid Room Measure Table shown on the next page gives the total area in sq. ft. (4 walls and the ceiling) of rectangular rooms with 8' ceiling heights. For net footage deduct openings.

BB014 0427

RAPID ROOM MEASURE TABLE*
COMPUTATIONS FOR 8' CEILING HEIGHTS. THIS TABLE FOR SQUARE FEET SOLID MEASURE
(For Net Footage Deduct Openings)

	2'	3'	4'	5'	6'	7'	8'	9'	10'	11'	12'	13'	14'	15'	16'	17'	18'	19'	20'	21'	22'	23'	24'	25'	26'	27'	28'	29'	30'
2'	36	72	108	144	180	216	252	288	324	360	396	432	468	504	540	576	612	648	684	720	756	792	828	864	900	936	972	1008	1044
3'	72	108	144	180	216	252	288	324	360	396	432	468	504	540	576	612	648	684	720	756	792	828	864	900	936	972	1008	1044	1080
4'	108	144	180	216	252	288	324	360	396	432	468	504	540	576	612	648	684	720	756	792	828	864	900	936	972	1008	1044	1080	1116
5'	144	180	216	252	288	324	360	396	432	468	504	540	576	612	648	684	720	756	792	828	864	900	936	972	1008	1044	1080	1116	1152
6'	180	216	252	288	324	360	396	432	468	504	540	576	612	648	684	720	756	792	828	864	900	936	972	1008	1044	1080	1116	1152	1188
7'	216	252	288	324	360	396	432	468	504	540	576	612	648	684	720	756	792	828	864	900	936	972	1008	1044	1080	1116	1152	1188	1224
8'	252	288	324	360	396	432	468	504	540	576	612	648	684	720	756	792	828	864	900	936	972	1008	1044	1080	1116	1152	1188	1224	1260
9'	288	324	360	396	432	468	504	540	576	612	648	684	720	756	792	828	864	900	936	972	1008	1044	1080	1116	1152	1188	1224	1260	1296
10'	324	360	396	432	468	504	540	576	612	648	684	720	756	792	828	864	900	936	972	1008	1044	1080	1116	1152	1188	1224	1260	1296	1332
11'	360	396	432	468	504	540	576	612	648	684	720	756	792	828	864	900	936	972	1008	1044	1080	1116	1152	1188	1224	1260	1296	1332	1368
12'	396	432	468	504	540	576	612	648	684	720	756	792	828	864	900	936	972	1008	1044	1080	1116	1152	1188	1224	1260	1296	1332	1368	1404
13'	432	468	504	540	576	612	648	684	720	756	792	828	864	900	936	972	1008	1044	1080	1116	1152	1188	1224	1260	1296	1332	1368	1404	1440
14'	468	504	540	576	612	648	684	720	756	792	828	864	900	936	972	1008	1044	1080	1116	1152	1188	1224	1260	1296	1332	1368	1404	1440	1476
15'	504	540	576	612	648	684	720	756	792	828	864	900	936	972	1008	1044	1080	1116	1152	1188	1224	1260	1296	1332	1368	1404	1440	1476	1512
16'	540	576	612	648	684	720	756	792	828	864	900	936	972	1008	1044	1080	1116	1152	1188	1224	1260	1296	1332	1368	1404	1440	1476	1512	1548
17'	576	612	648	684	720	756	792	828	864	900	936	972	1008	1044	1080	1116	1152	1188	1224	1260	1296	1332	1368	1404	1440	1476	1512	1548	1584
18'	612	648	684	720	756	792	828	864	900	936	972	1008	1044	1080	1116	1152	1188	1224	1260	1296	1332	1368	1404	1440	1476	1512	1548	1584	1620
19'	648	684	720	756	792	828	864	900	936	972	1008	1044	1080	1116	1152	1188	1224	1260	1296	1332	1368	1404	1440	1476	1512	1548	1584	1620	1656
20'	684	720	756	792	828	864	900	936	972	1008	1044	1080	1116	1152	1188	1224	1260	1296	1332	1368	1404	1440	1476	1512	1548	1584	1620	1656	1692
21'	720	756	792	828	864	900	936	972	1008	1044	1080	1116	1152	1188	1224	1260	1296	1332	1368	1404	1440	1476	1512	1548	1584	1620	1656	1692	1728
22'	756	792	828	864	900	936	972	1008	1044	1080	1116	1152	1188	1224	1260	1296	1332	1368	1404	1440	1476	1512	1548	1584	1620	1656	1692	1728	1764
23'	792	828	864	900	936	972	1008	1044	1080	1116	1152	1188	1224	1260	1296	1332	1368	1404	1440	1476	1512	1548	1584	1620	1656	1692	1728	1764	1800
24'	828	864	900	936	972	1008	1044	1080	1116	1152	1188	1224	1260	1296	1332	1368	1404	1440	1476	1512	1548	1584	1620	1656	1692	1728	1764	1800	1836
25'	864	900	936	972	1008	1044	1080	1116	1152	1188	1224	1260	1296	1332	1368	1404	1440	1476	1512	1548	1584	1620	1656	1692	1728	1764	1800	1836	1872
26'	900	936	972	1008	1044	1080	1116	1152	1188	1224	1260	1296	1332	1368	1404	1440	1476	1512	1548	1584	1620	1656	1692	1728	1764	1800	1836	1872	1908
27'	936	972	1008	1044	1080	1116	1152	1188	1224	1260	1296	1332	1368	1404	1440	1476	1512	1548	1584	1620	1656	1692	1728	1764	1800	1836	1872	1908	1944
28'	972	1008	1044	1080	1116	1152	1188	1224	1260	1296	1332	1368	1404	1440	1476	1512	1548	1584	1620	1656	1692	1728	1764	1800	1836	1872	1908	1944	1980
29'	1008	1044	1080	1116	1152	1188	1224	1260	1296	1332	1368	1404	1440	1476	1512	1548	1584	1620	1656	1692	1728	1764	1800	1836	1872	1908	1944	1980	2016
30'	1044	1080	1116	1152	1188	1224	1260	1296	1332	1368	1404	1440	1476	1512	1548	1584	1620	1656	1692	1728	1764	1800	1836	1872	1908	1944	1980	2016	2052

*angular rooms with 8' ceiling height—no openings.

BB014 0428

Joint Treatment—For pre-filling "V"-grooves formed by abutting, rounded edges of SHEETROCK SW Wallboard, about 3 lbs. of DURABOND 90 Joint Compound-Multi-Purpose are required per M sq. ft. of wallboard.

For applying all U.S.G. joint systems, approximately 50 lbs. of joint compound and 370 ft. of PERF-A-TAPE reinforcing are required to finish 1000 sq. ft. of SHEETROCK Gypsum Wallboard.

The following table may be used when determining the quantities of joint treatment products needed for each job:

**Estimator for Joint System Products
(Tape and Compound Separate)**

With This Amount of SHEETROCK Gypsum Wallboard	Use This Amount of Compound	Or—This Amount of Ready-Mixed Compound	And This Amount of Tape
100 sq. ft.	5 lbs.	1 Gal.	1—60' roll
200 sq. ft.	10 lbs.	1 Gal.	2—60' rolls
300 sq. ft.	15 lbs.	2 Gals.	2—60' rolls
400 sq. ft.	20 lbs.	2 Gals.	3—60' rolls
500 sq. ft.	25 lbs.	3 Gals.	3—60' rolls
600 sq. ft.	30 lbs.	3 Gals.	1—250' roll
700 sq. ft.	35 lbs.	4 Gals.	1—250' roll
800 sq. ft.	40 lbs.	4 Gals.	1—250' roll & 1—60' roll
900 sq. ft.	45 lbs.	1—5 Gal. Drum	1—250' roll & 1—60' roll
1000 sq. ft.	50 lbs.	1—5 Gal. Drum	1—250' roll & 2—60' rolls

Screws—For applying single layer SHEETROCK Wallboard to wood framing approximately 1100 ea. of 1¼" USG Brand Screws—Type W are required per M sq. ft. of wallboard.

Fastener usage for other assemblies varies with the construction and spacing and is shown in the system description, Chapter 4.

Nails—Usage for nails is shown in the Selector Guide for Wallboard Nails, Chapter 2.

Caulking—The approximate lineal footage of caulking bead per gallon of USG Acoustical Sealant is: 375 to 400 for ¼" bead, 180 for ⅜" bead, 100 for ½" bead.

Adhesive—The following table shows the amount of adhesive needed per 1,000 sq. ft. of laminated wallboard surface:

Product	Apprex. Quantity per M Sq. Ft.
DURABOND 500	5 gals.
DURABOND 600	3.5 gals.
PERF-A-TAPE Joint Compound—Taping	55 to 60 lbs. (A)

(A) Quantity shown is for sheet lamination. Estimate one-half this amount for strip lamination.

BB014 0429

application recommendations



SCREW APPLICATION

USG Brand Screws are applied with a positive-clutch electric power tool, commonly called an electric screwdriver, equipped with adjustable screw depth control head and a Phillips bit. The use of screws provides a positive mechanical attachment of wallboard to wood and metal framing with fewer fasteners and less spotting. Here is shown correct use of electric screwdriver:

Set Screwdriver—Set adjustment for proper screw depth on scrap wallboard and framing. Screw head must be driven slightly below face of board 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 Screw—Magnetic tip holds drywall screw for driving. Bit tip does not rotate until pressure is applied to wallboard during application.

Enter Screw Straight—Firm hand grip on electric screwdriver is important for straight line of entry. Screw must enter perpendicular to board face for proper performance. Drive screws at least $\frac{1}{8}$ " from ends or edges of wallboard to provide a uniform dimple not over $\frac{1}{32}$ " deep.

Operate electric screwdriver constantly during usage. When screw head is driven solidly against wallboard, screwdriver head will automatically stop turning and a positive clutch will disengage drive head. Remove screwdriver instantly or the motor will re-engage and chew up screw head or force it below surface of wallboard. When driving Hi-Lo screws, start with a vigorous thrust and continue with arm follow-through until the clutch cuts off. The electric screwdriver technique is relatively simple and a proficiency with the tool can be developed after a few hours' use. For description of USG Brand Screws, see Chapter 2; for screw spacing, see pertinent U.S.G. system, Chapter 4.

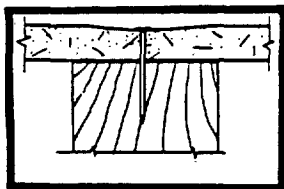
BB014 0430

NAIL APPLICATION

1. Drive nails at least $\frac{3}{8}$ " from ends or edges of SHEETROCK wallboard.
2. Position nails on adjacent ends or edges opposite each other.
3. Begin nailing from *center* of wallboard and proceed toward outer ends or edges.
4. When nailing, apply pressure on wallboard adjacent to nail being driven to insure that wallboard is secured tightly on framing member.
5. Drive nails with shank perpendicular to face of board.
6. Use a WAL-BOARD hammer or crowned-head hammer.
7. With last blow of hammer, seat nail so head is in a slight uniform dimple formed by last blow of hammer.

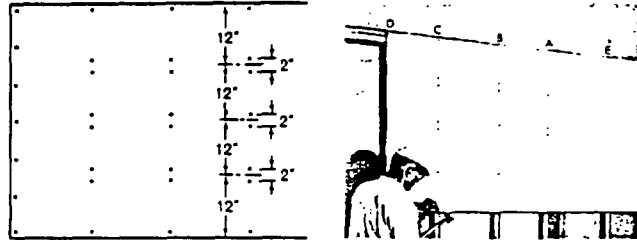
Do not break paper at nail head or around circumference of dimple by over-driving. A nail set should not be used. Maximum depth of dimple should not exceed $\frac{1}{32}$ ".

For nail description, see Chapter 2; for spacing, see pertinent U.S.G. system, Chapter 4.



BB014 0431

76 installation methods/double nailing



DOUBLE NAILING APPLICATION

In the double nailing method for attaching wallboard to wood framing, space the first nails 12" o.c. along the supports in the field of the board. Drive second nails about 2" from the first. Use single nails around the board perimeter (see drawing).

This application method helps prevent loose board and resultant nail pops that may occur when wallboard is not applied correctly and pushed tight against the framing. This method will not reduce the incidence or severity of nail pops due to wood shrinkage. (See Chapter 6 for data on lumber shrinkage.)

INSTALLATION

Ceilings: Starting in center of board and working toward edges and ends, hold the board tight against the ceiling joists and attach with nails spaced approximately 12" o.c. Drive secondary nails 2" to 2½" from first nails. Use single nails around the board perimeter. At ends space nails no more than 7" o.c.

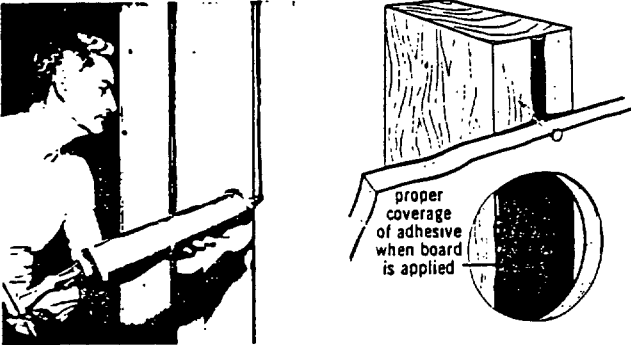
Sidewalls: Illustration shows the correct double nailing procedure for sidewall application. Attach first board to top plate by driving single edge nails at points A, B, C, etc. Hold board tight against studs and apply nails in field of board in the number sequence indicated. Drive second nails within 2" to 2½" of the first. Use single nails around the board perimeter. Space end nails no more than 8" o.c.

Note: After second nails are applied, it may be necessary to restrike and drive home first nails which appear loose and do not hold wallboard tight. Check all nails for proper dimple.

ADHESIVE NAIL-ON APPLICATION

In the adhesive nail-on method a continuous bead of DURABOND 200 or 300 Stud Adhesive is applied to the face of wood framing with a cartridge gun. Gypsum wallboard is applied and attached

BB014 0432



with only a minimum number of supplementary fasteners compared to conventional fastening methods (see next page for fastener spacing required). Spacing of framing members is the same as that used for conventional attachment.

Advantages of the adhesive nail-on system using DURABOND 200 or DURABOND 300 are:

- Reduces up to 75% of the fasteners that cause most of the problems.
- Stronger than conventional nail application—
Up to 100% more tensile strength.
Up to 50% more shear strength.
- Unaffected by moisture, high or low temperature; vermin-resistant.
- Reduces loose board caused by improper fastening.
- Bridges minor framing irregularities.
- Will not stain or bleed through most finishes.

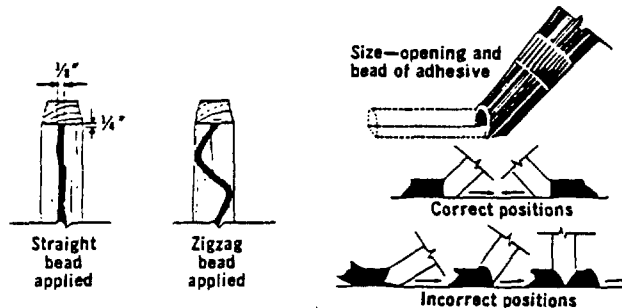
INSTALLATION

All surfaces to receive adhesive should be free of dirt, grease, oil or other foreign material. To facilitate flow, store adhesive at approximately 70°F. for 24 hours prior to use. The adhesive should be kept in the original unopened container prior to use, or enclosed to prevent evaporation of volatile materials. Unused portions of water-base adhesive remaining in can should be resealed or covered with a film of water to retard evaporation of thinners. Remove water before reusing.

Adequate ventilation should be provided during use to remove fumes emitted from the volatile agents in the solvent-base adhesive. Normal precautions (for a flammable material) should be employed regarding proximity to fire, sparks, or smoking before volatile materials are evaporated.

BB014 0433

78 installation methods/adhesive nail-on



Adhesive is applied with a Drywall Adhesive Applicator—Model A-3 for bulk loading from 5 gal. cans, Model A-2M for 1/4 gal. cartridges. For description of tools, see Chapter 7; for adhesives, Chapter 2.

Proper nozzle opening and gun position (see sketch) are required to obtain the right size and shape of bead for satisfactory results. Initial height of bead over framing should be 3/8" and of sufficient volume to provide 1/16" thickness of adhesive over the entire support.

Apply adhesive in a continuous 3/8" bead in the center of the attachment face and to within 6" of the ends of all framing members. Where two pieces of wallboard meet on a framing member, apply a serpentine or zigzag bead with an 8" repeat pattern permitting adhesive to contact both panels. Do not apply adhesive to members such as bridging, diagonal bracing, etc. into which no supplemental fasteners will be driven. Adhesive is not required at inside corners, top and bottom plates, bracing or fire stops and is not ordinarily used in closets.

Place wallboard shortly after adhesive bead is applied and fasten immediately, using proper screw or nail. After board has been applied, impact by hand along each stud or joist to insure good contact at all points.

Where fasteners at vertical joints are objectionable, panels may be prebowed and adhesively attached with fasteners at top and bottom only. Prebow board by stacking face up with ends resting on 2x4 boards or other blocks and center of panels resting on floor. Allow to remain overnight or until panels have a 2" permanent bow.

BB014 0434



To insure a good bond, no more DURABOND 200 Stud Adhesive should be applied than can be covered in 15 minutes; no more DURABOND 300 Stud Adhesive than can be covered in 30 minutes. If adhesive is left exposed to the air for longer periods, the volatile materials will evaporate causing surface hardness that prevents a full bond.

Remove excess DURABOND 200 Adhesive from the surface of the wallboard (except predecorated boards), exposed finished surfaces and tools with naphtha, white gasoline or kerosene. Use water to remove excess DURABOND 300 Adhesive.

Allow adhesive to dry at least 24 hours before joint treatment.

Fastener Spacing— DURABOND 200 or 300 Stud Adhesive

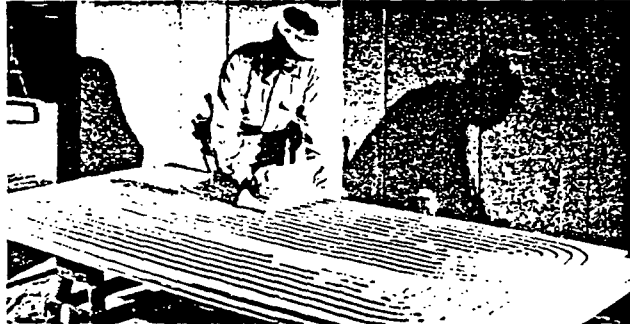
Ceilings—Horizontal Application: Fasten at each framing intersection and 16" o.c. at each board end. One temporary field fastener per framing member required at mid-width of board. This fastener must be removed at the end of 24 hours.

Ceilings—Vertical Application: Space fasteners 16" o.c. along board edges and at each framing intersection on ends. Space temporary fasteners 24" o.c. on intermediate supports. These temporary fasteners must be removed at the end of 24 hours.

Walls—Horizontal Application: Same as Ceilings—Horizontal Application above, except that no field fasteners are required.

Walls—Vertical Application: Same as Ceilings—Vertical Application above, except that no fasteners are required on intermediate supports. Where fasteners at the vertical joints of the panel are objectionable, prebore the gypsum wallboard and apply fasteners 16" o.c. only at the top and bottom of the panel.

BB014 0435



ADHESIVE APPLICATION—MULTI-LAYER

In adhesive application, SHEETROCK Wallboard or predecorated ULTRAWALL or TEXTONE Vinyl Panel face layers are job-laminated to a base layer of gypsum boards, gypsum studs or ribs or sound deadening boards.

Attachment of the face layer to the base layer with PERF-A-TAPE Joint Compound-Taping requires temporary support or supplemental fastening while drying; provides a tight bond, permits leveling and adjustment of boards after contact, and is used generally in fire and sound-rated construction. DURABOND 500 and 600 Contact Adhesives are ready-mixed—are used for specific applications.

When base layer is sound deadening board, the face layer of gypsum wallboard is attached using permanent face layer fasteners top and bottom of panel. Permanent face nailing in field of panel is required for a fire rating. For details on fire ratings, see Chapter 5; for construction data and applicable laminating procedure, see pertinent U.S.G. system, Chapter 4.

INSTALLATION—PERF-A-TAPE JOINT COMPOUND-TAPING (used as a laminating adhesive)

Directions for Mixing

- Mix PERF-A-TAPE Joint Compound-Taping in a clean metal container, using a sturdy mixing paddle (see Chapter 7—Tools).
- Use clean, drinkable water for mixing; follow quantities shown on bag.
- Pour all water into a container of suitable size, then sift powder into the water, stirring continuously.
- Mix for approximately 1½ minutes, to make sure all compound is uniformly damp and mixture is smooth.
- Allow mix to stand for a 30 minute soaking period and stir vigorously for approximately one minute to break down any lumps before use.
- The consistency of adhesive can be adjusted by adding small amounts of powder or water. Wet mix may be held for up to 24 hours by covering with a small amount of water.

BB014 0436

Application—Face Layer—With PERF-A-TAPE Joint Compound-Taping and DURABOND 500 or 600 Adhesives, the face layers are attached by spreading the adhesive over the entire surface of the wallboard sheet, **sheet lamination**; or by applying PERF-A-TAPE or DURABOND 500 Adhesive in vertical strips, **strip lamination**.

Sheet Lamination is suitable for horizontal or vertical application of wallboard on walls and ceilings where the entire back surface of the face layer comes into contact with the base layer. Precut and prefit face panels as required and apply PERF-A-TAPE or DURABOND 500 Adhesive in beads $\frac{3}{8}$ " wide at base and $\frac{1}{2}$ " high and spaced $1\frac{1}{2}$ " to 2" o.c. with an Ames laminating spreader or a notched metal spreader blade. Spread adhesive uniformly over entire back surface of face panel to extreme edges. If using DURABOND 600, apply with spray or short-nap roller. Laminate face layer to base layer using moderate pressure and temporary nails, temporary supports, or USG Brand Screws Type G (see below for application details). Wipe off any adhesive forced out at edges. After laminating compound has thoroughly dried (usually 24 to 48 hours), remove temporary nails and shoring. Allow Type G screws to remain for later joint treatment.

In horizontal application, face layer end joints may occur on or between framing members. When end joints occur between framing members, follow back-blocking surface alignment procedure (see details this chapter), using wood supporting strips to assure alignment.

Three methods for providing face layer support are:

1. **Temporary Nailing—**Use nails that have at least $\frac{3}{4}$ " penetration into the framing to provide support for the face layer every 16" to 24". A double headed scaffold nail to which large fiber or wood washers are applied, stucco furring nails, or 6d cooler type nails backed up by gypsum board blocks (used as washers) may be used.

Where nails without gypsum blocks are used, place a thin wood block under claw hammer head when pulling nails to prevent damage to face layer. Properly dimple nail holes before applying joint treatment.

2. **Temporary Supports—**Provide temporary bracing or shoring that gives support to the face layer every 16" to 24".

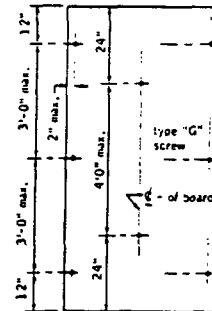
3. **USG Brand Screws—**Permanently attach face boards with $1\frac{1}{2}$ " USG Brand Screws Type G. Using screws assures positive attachment while the adhesive dries and provides flush even face layer joints often not provided by temporary nailing. The $1\frac{1}{2}$ " Type G screw is not intended for use with $\frac{3}{8}$ " double wall or a combination $\frac{1}{2}$ " and $\frac{3}{8}$ " double wall construction or with sound deadening board base layers.

Apply adhesive just prior to face panel erection in order not to wet the base layer and reduce holding power of the screw. Press face layer firmly against base layer with one hand when driving screw. Adhesive should be thin enough to flow and level out as screw is driven.

BB014 0437

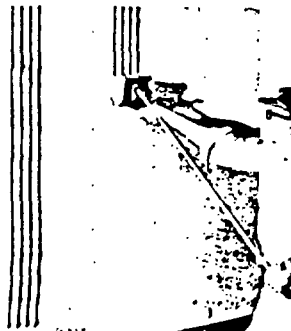
82 installation methods/strip lamination

Place screws along vertical edges and in the field of the board as follows: (a) space screws along vertical edges within 2" of the joint, no further than 12" from either end and no more than 36" o.c.; (b) space screws in the field of the board along the centerline of panel, within 24" of either end and no more than 48" o.c. (see detail below).



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. When used with supplemental Type G drywall screws, strip lamination provides flush even edge joints and positive attachment when the adhesive is drying that is superior to temporary nailing. This method 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 approximately $\frac{3}{8}$ " wide at the base and $\frac{1}{2}$ " high spaced $1\frac{1}{2}$ " to 2" o.c. The adhesive is applied most easily with a 7" or 10" Ames laminating head. Permanently attach face boards to base layer or core units with $1\frac{1}{2}$ " USG Brand Screws Type G located so they penetrate the adhesive strips (see description above for installation of Type G drywall screws).



BB014 043B

application methods



SINGLE LAYER APPLICATION

The following procedures apply to the installation of single layer SHEETROCK Wallboard to conventional wood framing in residential construction. The fastening may be any one of several attachment methods (see page 74 for details); however, the USG Brand Screw Type W, designed specifically for this use, virtually eliminates loose attachment of gypsum boards. For recommended thickness of wallboard, method of application (horizontal or vertical) and spacing of framing, refer to Planning the Job, found earlier in this chapter. For complete information on fire and sound resistant assemblies, refer to Chapter 5.

Apply gypsum wallboard so the ends and edges occur over framing members, except when joints are at right angles to the framing members as in horizontal application or when the end joints are to be back-blocked (see page 86). To minimize end joints, use wallboard of maximum practical lengths. When end joints occur, they should be staggered. Joints on opposite sides of a partition should be so arranged as to occur on different studs.

SHEETROCK Wallboard should be applied first to the ceiling and then to the walls. If Insulating SHEETROCK Wallboard is used, apply with foil side against framing. Adjacent boards should be brought into contact but should not be forced into place. Abutting ends and edges and holes for pipes and electrical fixtures should be accurately cut and neatly fitted.

Usually two men are required to work on a ceiling. Fasten wallboard with screws or nails starting from the center of wallboard and working toward the ends and edges. While fasteners are being driven, the wallboard should be held in firm contact with the framing or joists. When single fasteners are used, attach wallboard to framing with screws spaced not to exceed 12" o.c. or with nails spaced not to exceed 7" o.c. Drive fasteners at least $\frac{3}{8}$ " from edges and ends of wallboard to provide a uniform dimple not over $\frac{1}{32}$ " deep.

Apply wallboard to the sidewalls after the ceilings are erected. Where horizontal construction is used on walls, top wall panel

BB014 0439

84 installation methods/single layer

is applied first and butted against ceiling. When vertical application is used, sidewall should be spanned from ceiling to floor by single length of SHEETROCK Wallboard.

Vertical application should be used where ceiling height is over 8'2" or where this method reduces waste and joint treatment.

On sidewalls, maximum fastener spacing for screws is 16" o.c. for framing spaced 16" o.c., 12" o.c. for framing spaced 24" o.c. For nails, maximum spacing is 8" o.c.

Where openings occur, use SHEETROCK Wallboard of sufficient length to span wall areas, covering the openings. If joints occur near an opening, however, the wallboard should be applied so vertical joints are centered, if possible, over door opening. No vertical joints, at any rate, should occur within 8" of external corners of windows, doors, or similar openings except at interior or exterior angles within the room and when control joints are used. Door and window openings usually can be cut out after SHEETROCK is applied.

After installation, pound on walls and ceilings to detect loose nails or screws, and push on board adjacent to fasteners to see if there is movement. If loose fasteners are detected, drive them tight. Whenever nails or screws have punctured paper, hold board tight against framing and install another fastener properly, approximately 1½" from screw or nailhead which punctured paper and remove the faulty fastener. When nailing wallboard to second side of a partition, check opposite side for fasteners loosened by pounding and drive them tight again.

With platform framing and sidewall expanses exceeding one floor in height, float the wallboard over second floor joists using RC-1 SHEETROCK Resilient Channels (see Chapter 4 for application). As an alternate, install a horizontal control joint between wallboard panels at the junction of the bottom of top plates and the first floor studs (see Control Joint Installation described later in this chapter). Do not fasten wallboard to the wide face of joists or headers.

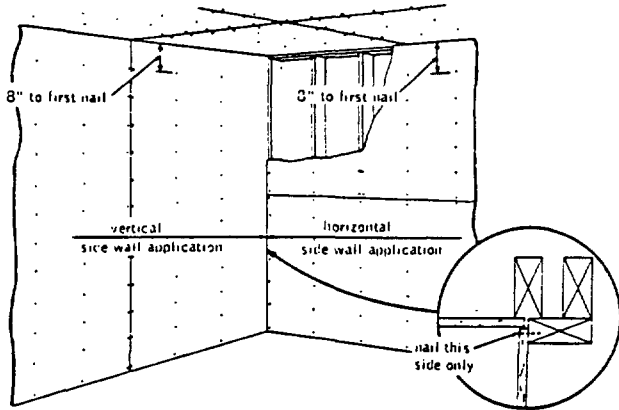
WOOD FURRING

Apply SHEETROCK Wallboard to wood furring strips as follows: Furring strips over wood framing must be 2"x2" (nominal) minimum size (may be nom. 1"x4" if wallboard is screw attached). Where SHEETROCK is applied parallel to furring strips securely attached to masonry walls, furring strips should be 2"x3" or 1"x3" (nominal) minimum size; where long edges of SHEETROCK Wallboard are applied across furring, strips should be 2"x2" or 1"x2" (nominal) minimum size. Spacing of furring strips should follow recommendations in table on Framing Member Spacing found earlier in this chapter. Fasteners for application of SHEETROCK over wood furring on masonry walls should not penetrate through furring strip into masonry.

Note: Application of SHEETROCK over 1"x1" (nominal) wood furring applied across framing members is not recommended since the relative flexibility of furring prevents proper fastening and tends to loosen nails or screws already driven.

BB014 0440

FLOATING INTERIOR ANGLE APPLICATION



The floating interior angle method of applying gypsum wallboard effectively reduces angle cracking and nail pops resulting from stresses at intersections of walls and ceilings. Certain fasteners are eliminated at all interior angles, both where walls and ceilings meet and where sidewalls intersect.

Ceilings—Apply SHEETROCK Wallboard to ceilings first. Follow standard framing practices for corner fastening. Fit wallboard snugly at all angles.

Horizontal Application—Use conventional single nail or screw application where end of board abuts a wall intersection. Where long edges of board are parallel with the intersection, apply the first nail or screw nominally 7" from wall. Use conventional fastening in remainder of ceiling area.

Vertical Application—Use conventional single nail or screw application where long edges of board abut a wall intersection. Where ends of board are parallel to an intersection, apply the first nail or screw nominally 7" from the wall. Use conventional fastening in the remainder of the ceiling area.

Sidewalls—Apply all wallboard to maintain firm contact at the ceiling line and to provide support to ceiling boards previously installed. Along the horizontal angle, apply the first nail or screw nominally 8" from ceiling intersection. At all vertical angles, omit only the corner fastening of the board that is first applied and overlapped in the angle. Nail or screw the overlapping board in conventional manner. Use conventional fastening in remainder of sidewall area.

Double Nailing—When double nailing is used with a floating interior angle, follow above spacing on first nail from intersection and use double nailing in rest of area. Conventional framing and ordinary wood back-up or blocking at vertical internal angles must be provided.

BB014 0441

BACK-BLOCKING APPLICATION

Back-Blocking is a system designed to minimize an inherent joint deformation ("ridging") in single layer gypsum wallboard construction, which sometimes occurs under a combination of adverse job and weather conditions. The Back-Blocking System, developed by United States Gypsum Company, has been widely used for years and produces outstanding results. This system is patented (Pat. No. 2,736,929) and may be used under a non-exclusive license agreement, readily available upon request.

Back-Blocking consists of laminating cut-to-size pieces of SHEETROCK Wallboard to the back surface of the wallboard directly behind the joints, providing reinforcement to resist stresses which cause ridging.

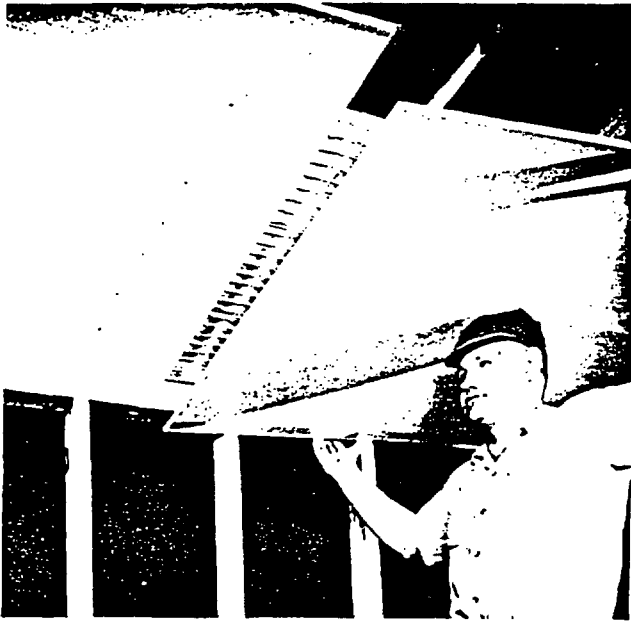
Back-Blocking long edge joints on SHEETROCK SW Wallboard is not required, but floating and Back-Blocking of all end joints, on both sidewalls and ceilings is recommended. End joints on both sidewalls and ceilings may be tapered by the Back-Blocking method at the discretion of the owner, architect or applicator.



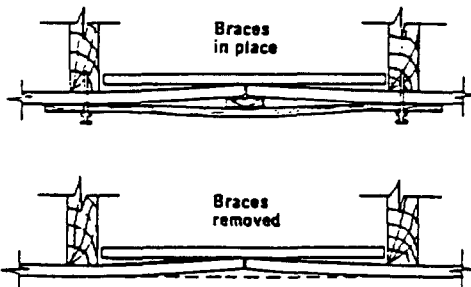
A. Backing blocks, 8" wide and long enough to fit loosely between joists, are spread with PERF-A-TAPE Joint Compound-Taping. Apply adhesive in beads $\frac{1}{2}$ " high, $\frac{3}{8}$ " wide at the base spaced $1\frac{1}{2}$ " o.c.



B. Apply wallboard horizontally with long edges at right angles to joists. Place backing blocks along full length of edge and ends of board. Floating of end joints makes it easier to form a good joint over a twisted stud or joist.



C. Immediately after all blocks are in place, erect the next board which has been previously cut. Butt ends loosely. One man can complete nailing the board while another cements and places the blocks.

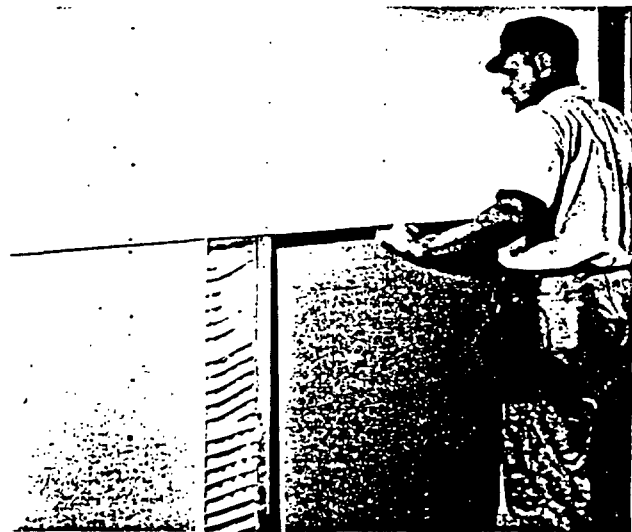


D. Cross section shows how floated end joint is tapered and back-blocked. Brace is temporarily nailed over wood strip (top drawing) which depresses ends of boards. When strips are removed, tapered formation remains as shown in bottom drawing. (Sequence continued on next page.)

BB014 0443



E. Position sidewall blocks between studs and hold flush with face by wallboard strips which have been recessed against sides of studs. Blocking must be flush or slightly behind nailing face of studs.



F. After wallboard panel is nailed in place, immediately butt adjacent panel over backing block. Stagger end joints between upper and lower courses of panels.

BB014 0444



DOUBLE LAYER APPLICATION

The following procedure applies to the installation of a double layer of gypsum wallboard to conventional wood framed walls and ceilings in residential construction. SHEETROCK Gypsum Wallboard face layers are job-laminated to a base layer of BAXBORD Gypsum Backing Board that is attached to the framing. Because the construction minimizes the use of mechanical fasteners in the face layer, finer appearance is the result—together with greater strength and, with PERF-A-TAPE Joint Compound-Taping as the adhesive, higher fire and sound resistance (see Chapter 5 for details). Generally this construction consists of two layers of $\frac{3}{8}$ " gypsum wallboard but other thicknesses may be used to achieve additional values. For thickness of wallboard, applicable spacing of framing and methods of application see Planning the Job, found earlier in this chapter.

MATERIALS

Base Layer— $\frac{3}{8}$ " BAXBORD Gypsum Backing Board in 4'x8' panels is especially designed for double layer system. BAXBORD is economical, easy to handle, and available plain or with aluminum foil on one surface to provide a vapor barrier and reflective insulation on exterior walls and top floor ceilings. (Regular $\frac{3}{8}$ " SHEETROCK Wallboard may be used as an alternate to BAXBORD for base layer.)

Face Layer— $\frac{3}{8}$ " Regular SHEETROCK or predecorated ULTRAWALL Panels in woodgrained finish. Alternate: $\frac{1}{2}$ " TEXTONE Vinyl Panels in a variety of patterns.

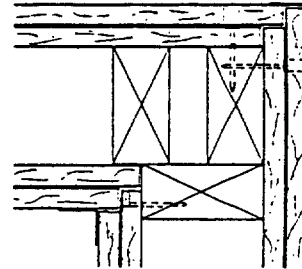
Fasteners—for $\frac{3}{8}$ " base layer— $1\frac{1}{4}$ " USG Brand Screws Type W, $1\frac{1}{4}$ " GWB-54 nails, 4d gypsum wallboard nails, or power driven staples. Staples should be 16 ga. flattened galvanized wire, $\frac{1}{2}$ " wide, 1" long, with divergent points. For temporary support of face layer, use nails of sufficient length to penetrate a minimum of $\frac{3}{4}$ " into nailing member, 6d cooler type nails, double-headed scaffold nails, stucco furring nails, or temporary bracing or shoring.

Adhesive—PERF-A-TAPE Joint Compound-Taping, or DURABOND 500 or 600 Contact Adhesive.

Joint Treatment—Select a U.S.G. joint system.

BB014 0445

90 installation methods/double-layer



Corner detail

INSTALLATION

Base Layer Ceilings—Apply BAXBORD Backing Board horizontally on ceiling first with long edges perpendicular to framing members. End joints may occur on or between framing members and should be offset from face layer joints by at least 10".

Base Layer Walls—Apply BAXBORD with long edges parallel to and centered on framing members (vertically). Exception: for predecorated face layers, apply base layer horizontally.

Attachment—Fasten base layer wallboard with power-driven drywall screws, nails or power-driven staples spaced not to exceed the following:

- a. Drywall screws: 16" o.c. on framing spaced 16" o.c., 12" o.c. on framing spaced 24" o.c.
- b. Single nails and staples: 7" o.c. on ceilings, 8" o.c. on walls. If staples are used, drive staple with crown at right angles to long dimension of framing member except where paper bound edges fall on framing members; then drive staples parallel to edges. Drive staple so crown bears tightly against BAXBORD but does not cut paper.

c. Double nails: 12" o.c. Follow recommendations in Double Nailing Application found earlier in this chapter.

Face Layer Ceilings and Walls—Apply face layer first either vertically or horizontally depending on whichever results in the least waste and joints; offset joints at least 10". Apply wallboard to walls horizontally except with predecorated ULTRAWALL or TEXTONE Vinyl Panels.

Attachment—Adhesively apply face panels with PERF-A-TAPE Joint Compound-Taping or DURABOND 500 or 600 Adhesive (see Adhesive Application directions found earlier in this chapter).

DOUBLE LAYER CORNER DETAILS

On the inside corner, only the overlapping BAXBORD panel—not the face panel—is nailed to framing. A floating type corner results when joint is reinforced with a U.S.G. joint system.

On the outside corner, only the SHEETROCK Wallboard—not the BAXBORD—is nailed to the framing. At locations shown, use temporary nails or permanent nails penetrating framing approximately $\frac{3}{4}$ " and countersunk. Finish corner with metal corner bead and joint treatment.

BB014 0446