

# Manufactured Housing Handbook

**Expanded Second Edition**  
**Includes Use of Mechanical Finishing Tools**



## Introduction

United States Gypsum Company offers a complete line of SHEETROCK® MH Brand products designed to meet the needs of the Manufactured Housing industry. ULTRA-BASE™ ceiling panels, for example, are specially strengthened to provide better performance than standard gypsum panels while reducing the weight of the home. TUF-SET™ compounds are available in a variety of setting times to accommodate the requirements of different manufactured housing assembly lines.

U. S. Gypsum's MH products, however, are just one part of a time-tested product family that includes numerous panels, trims, and finishing products used in Manufactured Housing construction. All of these products are backed by USG's reputation and experience to ensure the performance required by the demanding environment of the assembly-line.

As part of its continuing commitment to serve the needs of the Manufactured Housing industry, U. S. Gypsum has created this installation guide to address the special problems, procedures, and products of the MH construction environment. In addition to product descriptions and detailed installation instructions, this publication includes quick-reference tools listing finishing tips, common problems and their solutions, basic cautions, and industry terminology. These helpful sections can be found at the back of the guide.

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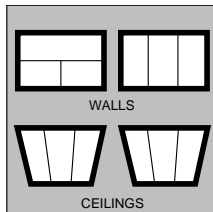
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### Perpendicular or Parallel Application

Panels may be applied perpendicular (long dimension across studs or joists) or parallel (long dimension parallel to studs or joists).

Perpendicular application using 12'-16' panel lengths is ideal for walls because linear footage of joints is minimized. If possible, span the entire wall or ceiling from corner to corner. To minimize joints, use the longest-length panels available and offset all end joints in adjacent rows.



### SHEETROCK® MH Brand Gypsum Base Board

is a superior grade, 5/16" panel specifically designed to accept laminated vinyl film before installation. The panel is shear-wall rated and for use on both shear and nonshear walls, and also carries a Class A Surface Burning Rating for use as wall liner in HUD Code home-furnace and water-heater rooms.

### SHEETROCK® MH Brand Gypsum Panels (TUF-BASE™)

are designed to meet the needs of the manufactured housing industry. They have an extra-tough core to provide superior structural performance during construction and in transit. Classified by Underwriters Laboratories Inc. as to shear resistance and surface burning characteristics. The 4'-wide panels are available in 3/8", 1/2", and 5/8" thicknesses.

### SHEETROCK® MH Brand Gypsum Ceiling Board (ULTRA-BASE™)

is a lightweight, sag-resistant ceiling product specifically designed to meet the manufactured housing industry's need for weight reduction, structural integrity, and speed of installation. A revolutionary new technology permits this 1/2" board to offer significantly improved sag resistance when compared with standard 5/8" gypsum board, while reducing the weight in the average home by 500-700 pounds. ULTRA-BASE Ceiling Board is recommended for attachment with long edges parallel to framing (spaced up to 24" o.c.) to speed manufacturing and eliminate butt joints, facilitating finishing. ULTRA-BASE Ceiling Board resists sagging even with parallel application, insulation loading, and wet texturing applied in a hot and humid environment. Board is 4' wide and cut to your specified lengths. **Caution:** No gypsum panel product will resist sagging if exposed to excessive moisture for prolonged periods. Also, excessively long drying times will result in problems with the ceiling finish, such as joint banding and staining. This requires careful attention during the production process. Moisture from the interior finish should be removed from units as quickly as possible through the use of ventilation equipment. Supplemental heat or dehumidification may be required. Do not enclose or seal units before all finishes are completely dry.

### SHEETROCK® Brand Regular Gypsum Panels

have long edges tapered on the face side to form a shallow recess to receive joint compound and tape. Made in four thicknesses: 1/4", 3/8", 1/2", and 5/8". (The 1/4" thick panel should not be applied as a single layer but only to cover existing wall and ceiling surfaces.)

### SHEETROCK® Brand 1/4" Flexible Gypsum Panels

are designed for the easy construction of curved surfaces. Curved partitions provide an attractive way to soften the hard lines of flat wall dimensions, and add sophistication to any design. SHEETROCK Brand 1/4" Flexible Gypsum Panels are lightweight and more flexible than standard 1/4" panels, while retaining the same strength and fire resistance.

### SHEETROCK® Brand Gypsum Panels, Water-Resistant,

provide a water-resistant base for the adhesive application of ceramic and plastic tile and plastic-faced wall panels. Not recommended for ceilings or for single-layer resilient attachment where tile is to be applied.

### SHEETROCK® Brand Gypsum Panels, FIRECODE® Core,

combine all the advantages of regular panels with additional resistance to fire exposure. Consult local building codes for fire resistance requirements.

### SHEETROCK® Brand Foil-Back Gypsum Panels

provide an effective vapor retarder for walls and ceilings when required. Not to be used in high moisture areas.

### Type W Bugle Head Screws

attach single-layer gypsum panels to wood framing. Screws provide greater holding power than wall-board nails, minimize popping, and help prevent damage to the panel.

### SHEETROCK™ Brand Paper Faced Metal Drywall Bead and Trim

requires no nailing. Excellent for use with setting-type compounds for quicker finishing and decoration, this product provides superior resistance to edge-cracking and chipping. Available in a variety of dimensions and profiles, including inside and outside corners, both 90° and bull-nose styles. Specially designed trims for coves, vaulted ceilings, and other applications are also available, as are nail-on versions of this bead and trim. See J996 for a complete listing.

### DUR-A-BEAD® Corner Bead

is a galvanized steel reinforcement for protecting external corners.

### No. 200-B Metal Trim

is an L-shaped casing that provides protection and a neat finished appearance around window and door openings. Available for 1/2" and 5/8" gypsum panels.

## Finishing Products

### Joint Tape

Joint tape may be made of paper or fiberglass mesh. Each type has its place in manufactured housing.

### Fiberglass Versus Paper Tape

Because of the nature of assembly-line production, fiberglass mesh tapes and setting-type compounds have been developed for the manufactured housing industry. When paper tape and a drying-type compound are used for joint finishing, the water in the compound temporarily weakens the tape, creating a joint that only achieves strength after drying fully. If a finished section is moved before the compound is completely dry (as is likely to happen on an assembly line), the possibility of cracking is greatly increased.

For this reason, it is recommended that fiberglass tape be used for finishing flats. (This tape is self-adhesive, which will also simplify and speed the finishing process.)

For areas such as corners and wall/ceiling intersections, the use of paper tape is recommended.

### SHEETROCK® MH Brand Joint Tape (TUF-TAPE™)

is a fiberglass tape made with a cross-fiber construction that resists cracking, shrinking, tearing, stretching, and distortion. It is self-adhesive for easy application. Designed for use with SHEETROCK Setting-Type Joint Compounds.

### SHEETROCK® Brand Joint Tape

is a high strength paper tape which is lightly precreased for corner application and designed specifically for use with SHEETROCK Setting- or Drying-Type Joint Compounds to provide optimum performance.

### Joint Compounds

There are numerous joint compounds available, each with its own advantages and limitations. Many different qualities, including ease of sanding, resistance to humidity, ease of mixing, and feathering properties should be evaluated.

In general, however, joint compounds can be categorized according to drying or setting type, and as powdered or ready-mixed. Understanding these major groupings will help you to choose the best compound for the finishing task at hand.

### Drying Versus Setting

Drying-type compounds, which contain water, must be allowed to dry completely in order to ensure creation of a strong joint. The time needed for thorough drying may not be available in an assembly-line environment. If finished sections are moved before joints have dried completely, cracking may result. Drying-type compounds are available in both powder and ready-mixed forms. They can only be used with paper tape.

Ready-mixed joint compounds are convenient to use, because the mess and mixing associated with powders are eliminated.

Setting-type compounds harden chemically for quicker finishing and joint strength, and are available in a variety of setting times. This makes them especially suited to assembly-line production. They can be used with both paper and fiberglass joint tape. **Caution:** Painting and texturing are not recommended before compound has set (hardened). For best decorating results, once joint compound has set, apply a prime coat of SHEETROCK® Brand First Coat or an undiluted, good-quality interior latex flat wall paint with a high solids content. Allow prime coat to dry before painting or texturing. Note: Vapor retarder (VR) paints may be used in place of the drywall primer. However, experience has shown that certain VR paint formulations interfere with the setting action of joint compounds. This will lead to low strength, and can cause stress cracking. Make sure the joint compound is fully set before applying VR paints.

### SHEETROCK® MH Brand Setting-Type Joint Compound (TUF-SET™ High Early Strength 15, 20, 30, 45)

is a specially formulated compound that provides higher early strength than standard setting compounds. This high "green" strength offers additional resistance to cracking during the construction process.

### SHEETROCK® MH Brand Setting-Type Joint Compound (TUF-SET™ 15, 20, 30, 45, 60, 90, and 210)

is a high-strength, chemically hardening powder that sets quickly, provides strong bond with low shrinkage, and ensures excellent check-crack resistance. Available in a variety of setting times.

### SHEETROCK® MH Brand Lightweight Setting-Type Joint Compound (TUF-SET™ Lite 15, 20, 30, 45, 60, 90, and 210)

is an easy-sanding formulation that is ideal for second coats (over TUF-TAPE and TUF-SET) or wherever sanding is required. Available in a variety of setting times.

### SHEETROCK® Brand Lightweight Setting-Type Joint Compound (EASY SAND™ 20, 45, or 90)

is an easy-mixing, smooth-applying, quick-hardening, easy-sanding joint compound with low shrinkage and superior bonding. Ideal for patching projects.

### SHEETROCK® Brand All-Purpose Ready-Mixed Joint Compound

is used for embedding paper tape, for finishing coats, and for fill coats over metal corner bead, trim, and fasteners.

### SHEETROCK® Brand Ready-Mixed Lightweight All Purpose Joint Compound (PLUS 3™)

offers all the benefits of SHEETROCK Brand All-Purpose Ready-Mixed Joint Compound with three exclusive advantages: less weight, less shrinkage, and easier sanding. Only two coats required over metal corner bead and trim; sands easily; bonds well.

## Decorating Products

### Priming

#### **SHEETROCK® Brand First Coat**

is a flat latex paint specially formulated to provide an excellent first (prime) coat over gypsum panels. Conventional sealers help eliminate porosity variations, but typically won't correct texture variations.

Conventional paint primers, on the other hand, help correct texture differences but usually will not equalize porosity. First Coat is unique because it minimizes both texture and porosity differences for easy, problem-free decorating. Not intended as a finish coat, and is not a vapor-retardive coating.

### Textures

#### **Aggregated Versus Unaggregated Textures**

Aggregated textures contain clearly visible particles that "stand out" when dry for a texturing effect similar in appearance to acoustical ceiling finish. Unaggregated texture does not contain such particles; its final appearance is determined largely by the method of application.

#### **SHEETROCK® MH Brand Aggregated Ceiling Spray Texture (TUF-SPRAY™ Medium and Coarse)**

produces a handsome simulated acoustical ceiling finish (with no acoustical correction). It mixes easily, offers excellent coverage with low aggregate bounce-back during spraying, and masks minor surface defects. Available in medium and coarse.

#### **SHEETROCK® MH Brand Unaggregated Spray Texture (TUF-TEX™)**

is an unaggregated texture for use on interior walls and ceilings in manufactured housing. It can be easily applied using spray equipment, brush, or roller, and produces a variety of texture patterns from bold spatter/knockdown to light orange peel.

#### **SHEETROCK® Brand Ceiling Spray Texture (QT)**

is available aggregated with perlite, polystyrene, or poly/perlite, and in fine, medium, and coarse versions. It offers excellent hide and firmness, and dries to a white finish.

#### **SHEETROCK® Brand Wall and Ceiling Spray Textures (Aggregated and Unaggregated)**

produce a variety of texture patterns from bold spatter/knockdown to fine orange peel. Provide superior coverage and help conceal minor substrate defects. Application by spray and/or hand-tooled by broad knife, brush, or roller, depending on pattern desired.

#### **SHEETROCK® Brand Wall and Ceiling Texture (Multi-Purpose)**

is an unaggregated texture coating for producing fine to medium texture patterns (such as fine orange peel and crowsfoot-stipple finishes) on walls and ceilings. Textured effect obtained by brush, roller, or spray application. Helps conceal minor surface defects.

#### **SHEETROCK® Brand Wall and Ceiling Spray Texture (Sand Finish Texture 12)**

is a powder product producing a fine sand finish on walls and ceilings. Combines easy mixing, fast drying, excellent coverage, and good concealment. Apply by spray application only. An ideal base for wall paints; may be left unpainted on ceilings.

#### **SHEETROCK® Brand Wall and Ceiling Texture Paints**

are also available in ready-mixed form, including Sand Finish Texture 1, Ripple Finish Texture 2, and TEXOLITE Sanded Paste Stipple.

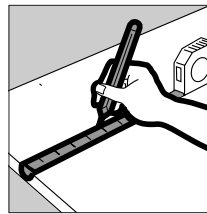
For a complete description of all the textures and finish products available from USG, please consult United States Gypsum Company publication SA933.

## Preparing the Panels

Read all instructions through before installing gypsum panels. Prepare a plan for each assembly to be constructed, and ensure that you have the right sizes of board, sorted in the right quantities, to avoid extra handling. A rolling cart at the assembly can be easily loaded from a fork lift in the material aisle, then moved up and down the fixture as needed to reduce the carrying required.

### 1 Marking

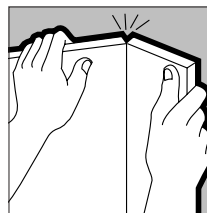
Measure and mark panel size desired.



### 2 Cutting

Line up straightedge with the marks and hold firmly against the panel. Draw pencil line as guide for scoring. Score through paper and lightly into the core with a sharp utility knife.

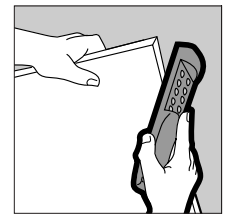
To break the panel core, securely grasp the board edges on both sides of the score line and snap board with a quick, firm movement.



Use utility knife with sharp blade for scoring. Complete cutting by running knife through back paper for the length of the panel and snapping back to face.

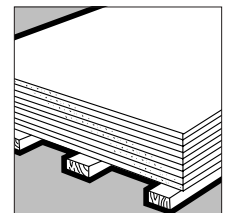


After cutting the panel, smooth the cut edge with a rasp. Be sure to keep edge as square as possible. Always wear a dust mask when sanding or rasping.



#### Tip

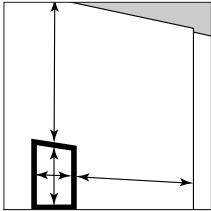
Gypsum panels are heavy and may bend or snap under their own weight. Be sure panels are properly supported prior to scoring.



## Attaching the Panels

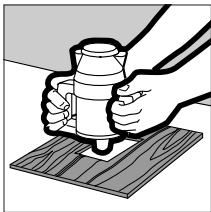
### 3 Cutouts

For openings such as doors, windows, electrical outlets, and switch boxes, measure across from the point where the side edge of the panel will rest to the near and far sides of the required opening. Then measure from the point where the top or the bottom edge of the panel will fall to the top or bottom of the opening.



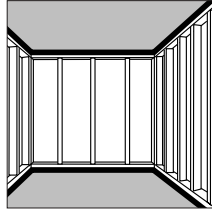
Mark the outline of the opening at the appropriate position on the gypsum panel. A template made from thin plywood is useful for repetitive cutouts.

Cut with a heavy-duty router using either a bushing or bearing to follow a template or a plunge bit with an integral guide to follow the framing in large openings.



### 4 Framing

Prior to panel attachment, inspect framing to ensure that the face of the framing is straight. Warped or crooked framing should be replaced.

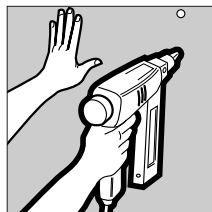


### 5 Mechanical Attachment

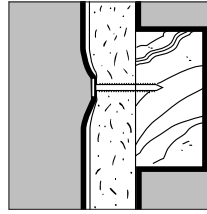
#### Nail Attachment

Pneumatic nailing equipment may be used for attaching gypsum panels if the gun is equipped with a depth-limiting stop. Do not rely on air-pressure adjustments to control nail depth.

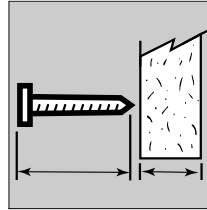
Hold panel tight against framing. Nail in a pattern that works the gypsum panel flat against the framing. Begin with restrained edges and ends and work outward toward open areas. Space nails maximum of 7" apart on ceilings, 8" on walls, and at least 3/8" from ends and edges of panels.



Seat nail so head is in a shallow dimple (1/32") in the face of the drywall.



For 1/4", 3/8", and 1/2" thick panels, use 1-1/4" annular ring drywall nails. For 5/8" panels, use 1-3/8" annular ring drywall nails.

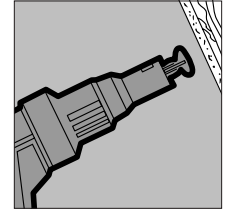


Drive nails in straight, not at an angle. Do not overdrive or countersink nails. This results in breaking the face paper or fracturing the gypsum core. If a nail happens to go in crooked, hold the panel tight against the framing and drive a second nail in about 2" from the nail that punctured the paper. Then drive the first nail in below the surface of the board.

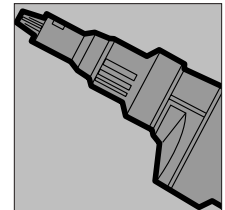


#### Screw Attachment

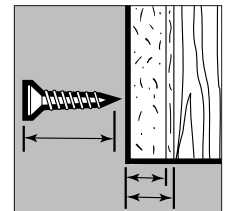
Space screws maximum of 12" apart on ceilings, 16" on walls, and at least 3/8" from ends and edges of panels. Sink screws to just below the panel surface, leaving the paper intact.



Use an electric or pneumatic screwgun equipped with an adjustable screw depth control head and Phillips bit. Drive screws in straight, leaving the screwhead slightly (1/32") below the face of the gypsum board. Be careful not to overdrive screws. Breaking the face paper greatly lessens the holding power of the screw.

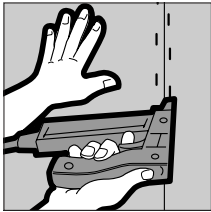


On 3/8" and 1/2" thick panels, use 1-1/4" screws; on 5/8" thick panels, use 1-5/8" Type W Bugle Head Screws for superior holding power and high resistance to popping due to wood shrinkage.



### Staple Attachment

Drywall can be secured using staples; however, wide-crown fasteners are difficult to conceal during finishing. Use minimum 7/16" crown staples with 1-1/8" legs for 1/2" and 3/8" gypsum board, and with 1-1/4" legs for 5/8" board. Space staples 7" o.c. for walls and ceilings.

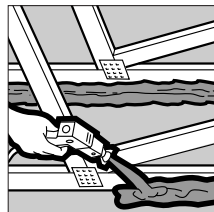


### 6 Adhesive Attachment

The use of adhesive to attach gypsum panels to wood framing can reduce, or, in some cases, eliminate the number of mechanical fasteners required. The table below provides general guidelines for the spacing of mechanical fasteners used in conjunction with adhesives. The recommendations of the adhesive manufacturer must be followed.

**Caution:** Certain wall and ceiling assemblies in a manufactured home are designed to resist wind and transportation loads. These assemblies must be constructed in accordance with the specifications outlined in the test report chosen by the design engineer. General guidelines do not apply to these assemblies.

A urethane foam adhesive is available for attaching gypsum panels to wood framing. A two-component urethane adhesive is spray-applied to the intersection between the side of the framing member and the back of the gypsum panel. Immediately after spraying, the urethane foams in place to create a fillet-type of bond. Mechanical fasteners are not typically required when using this method. Take precautions to avoid framing displacement during the foaming process. Contact the adhesive manufacturer for equipment requirements and installation instructions.



Select the proper adhesive for specific job requirements. Make sure that framing is clean, sound and free from oil, dirt or contamination. Apply adhesive and fasteners per instructions on adhesive cartridge. Do not use adhesive alone to secure panels unless specifically recommended by the adhesive manufacturer.



### Maximum Fastener Spacing Gypsum Panel Constructions—Wood Framing

Construction Type	Fastener Type	Location	Maximum Fastener Spacing Gypsum Panels	
			in.	mm
Single Layer— Mechanically Attached	nails	ceilings	7	178
		sidewalls	8	203
	screws	ceilings	12	305
		sidewalls	16	406
Single Layer— Adhesively Attached	nails/ screws	ceilings (perpendicular)	16" or 406 mm o.c. at ends, edges—1 field fastener per frame member at mid-width of board	
		ceilings (parallel)	16" or 406 mm o.c. along each edge and 24" or 610 mm o.c. along intermediate framing	
		walls (perpendicular)	16" or 406 mm o.c. at ends, edges—1 field fastener per frame member at mid-width of board	

### Gypsum Wallboard Installation

General recommendations for gypsum panels applied to wood framing:

- Cut boards so that they touch but are not forced into position. Butt all joints loosely.
- Whenever possible, place tapered or wrapped edges next to one another.
- Whenever possible, apply boards perpendicular to framing and in lengths that will span ceilings and walls without creating end (butt) joints. If butt joints do occur, stagger and locate them as far from the center of walls and ceilings as possible.
- Support all ends and edges of gypsum board on framing, except long edges at right angles to framing and where end joints are to be floated between frame members and back-blocked.
- When fastening, apply hand pressure on panel next to fastener being driven to ensure panel is in tight contact with framing member.

- If metal trim is to be installed around edges, doors, or windows, determine if trim is to be installed before panel application.
- Do not anchor panel surfaces across the flat grain of wide dimensional lumber such as floor joists and headers. Float panels over these members or provide a control joint to compensate for wood shrinkage.

**Measurements**—All measurements must be accurate. Make two measurements as a check. Measure across the diagonal corners of wall and ceiling framing laid out on the assembly fixture. This procedure will usually warn of assemblies that are out of square. Then, framing corrections can be made before the board is attached.

**Cutting**—Make straight-line cuts across full width or length of board by scoring the face paper, snapping the board core, and then cutting the back paper. The common tool used to score and cut gypsum board is a utility knife with replaceable blade. Regardless of the type of knife used,

its blade should be kept sharp so that the score will be made through the paper and into the gypsum core without tearing or rolling up the paper.

SHEETROCK Brand Gypsum Panels should not be exposed to excessive or continuous moisture or extreme temperature (maximum continuous temperature less than 125 °F). Specially formulated SHEETROCK Brand Panels, Water-Resistant, are recommended for areas periodically exposed to high moisture. For areas subject to direct or continuous exposure to moisture, and as a base for

ceramic tile, DUROCK® Brand Cement Board is recommended.

## 7 Ceilings

Ensure that the ceiling assembly fixture is clean, flat, and square. Lay out the gypsum panels in accordance with the design of the home. Take precautions to avoid damaging the face, edges, and ends of the gypsum panel during layout.

The Gypsum Industry generally recommends perpendicular installation for ceiling board. However, at the discretion of the home manufacturer, ceiling board

### Maximum Support (Studs, Joists, Channels, Furring) Spacing for Gypsum Panels:

Panel Thickness <sup>(1)</sup>	Location	Application Method <sup>(2)</sup>	Max. Support Spacing o.c. (in.)	
			in.	mm
<b>Single-layer application—TUR-BASE or Regular Gypsum Panels</b>				
3/8" (9.5 mm)	ceilings <sup>(3)</sup>	perpendicular <sup>(4)</sup>	16	406
	sidewalls	parallel or perpendicular	16	406
1/2" (12.7 mm)	ceilings	parallel	16	406
		perpendicular	24 <sup>(5)(6)</sup>	610
5/8" (15.9 mm)	ceilings <sup>(6)</sup>	parallel	16	406
		perpendicular	24	610
	sidewalls	parallel or perpendicular	24	610

### Single-layer application—1/2" SHEETROCK MH Brand Gypsum Ceiling Board, ULTRA-BASE

1/2" (12.7 mm)	ceilings <sup>(1)</sup>	parallel or perpendicular	24	610
	sidewalls	parallel or perpendicular	24	610

(1) A 5/8" thickness is recommended for the finest single-layer construction, providing increased resistance to fire and transmission of sound; 1/2" is standard for single-layer application in new residential construction. (2) Long-edge position relative to framing. (3) Not recommended below unheated spaces. (4) Not recommended if water-based texturing material is to be applied. (5) Max. spacing 16" if water-based texturing material to be applied. (6) If 1/2"

SHEETROCK MH Brand Gypsum Ceiling Board (ULTRA-BASE) is used, max. spacing is 24" o.c. for parallel application with weight of unsupported insulation not exceeding 2.2 psf. When water-based texturing materials are used, environmental controls must be in place to adequately dry interior finishes and reduce high ambient humidity.

**Application method:** "Parallel" and "perpendicular" refer to the position of the paper-wrapped edge of the gypsum panel.

**Limitations on 3/8" panels:** 3/8" gypsum panels shall not be used for ceilings below unheated spaces or as a substrate for water-based finishes.

**Limitations on regular 1/2" panels:** 1/2" gypsum panels shall not be used in ceiling applications when truss spacing exceeds 16 in. o.c. and water-based finishes are applied.

**ULTRA-BASE Ceiling Board:** 1/2" SHEETROCK MH Brand Gypsum Ceiling Board (ULTRA-BASE) is recommended for ceiling applications when water-based finishes are specified.

**CAUTION:** Continuous film poly-vapor barriers used in conjunction with wet-texturing will increase the tendency of the board to sag. Alternative vapor barriers should be used when texturing is specified.

may be installed parallel if adequate measures are taken to prevent board sag. Board sag is caused by exposure to moisture from finishing products, high ambient humidity, and insulation loading on the back of the board. Humidity/moisture control requires adequate ventilation in the plant to remove moisture introduced during finishing. Supplemental heat and dehumidifiers may be required to remove moisture.

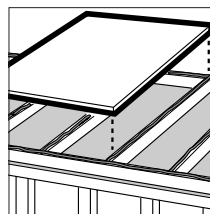
Assemble the roof structure over the gypsum panels and attach the gypsum panels to the framing using the specified mechanical or adhesive fastening schedule.

Do not extend the gypsum ceiling board between the roof end rail and the perimeter bearing walls. Use a wood compression strip to carry the load.

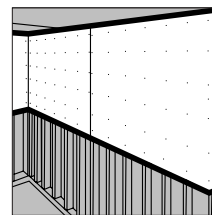
## 8 Walls

Apply panels horizontally or vertically to framing so as to minimize the amount of joint work required.

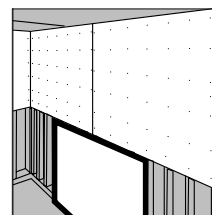
- a For gypsum board attached on the assembly table, take precautions to avoid wiping adhesive off the framing as panels are slid into place. Do not allow the gypsum board to extend beyond the plates or wall ends.



- b For boards installed with the walls in the unit (back paneling)—if applied horizontally, install top row first. Position first panel tight against the installed ceiling panel and fasten to studs. Space nails or staples maximum 8" apart along framing, screws 16" apart, starting at the restrained edge or end of the panel and working outward toward the free end. Cut panels accurately so that they do not have to be forced into place.



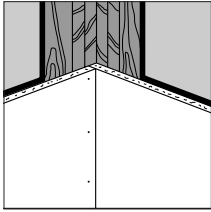
Apply lower row of panels so that tapered edges meet with those of top row. Vertical joints should be staggered. Avoid vertical joints directly above or below the corner of a window, door, or other opening for best decorating results.



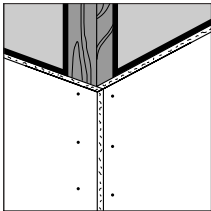


### Tips

To join panels at an inside corner, butt the second panel against the first and fasten the end of the second to a stud.

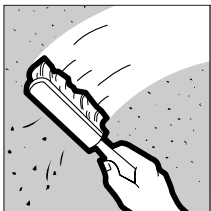


To join panels at an outside corner, lap the end of the second board over the end of the first, and fasten both panel ends to their common stud.

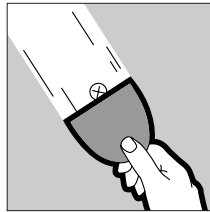


## 9 Drywall Inspection and Preparation

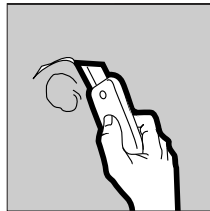
After drywall installation, inspect the surface you are going to finish. Drywall panels must be firmly attached to the framing, properly lined up, butted together, and not damaged. Remove any drywall dust or other particles from the wall. Tape and joint compound will not adhere well to dusty surfaces. This can result in joint cracking, and may cause the tape to separate from the joint.



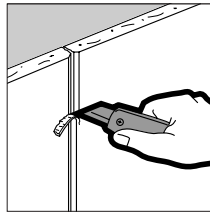
Make sure that your fasteners are properly seated by drawing a clean knife over each fastener. If you hear a metallic ring, drive the fastener below the surface. Be careful not to break the face paper.



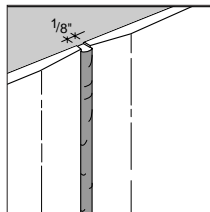
Remove any loose paper, and cut out any soft spots or bulges in the board.



Butt joints, where cut board edges meet, should be cut with a "V" groove to remove fuzzed paper.



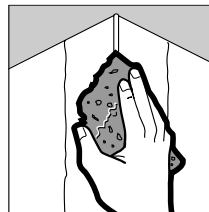
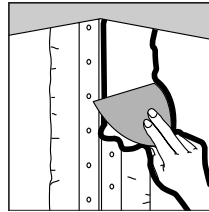
Deep holes and gaps larger than 1/8" should be prefilled with joint compound before finishing.



## 10 Corner Bead and Metal Trim

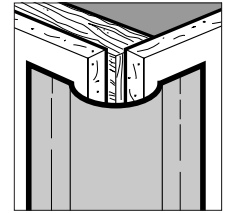
### SHEETROCK™ BRAND Paper Faced Metal Bead and Trim

Apply compound to both sides of corner, extending 2" on each side. Cut bead to desired length. Align tightly, pressing firmly to set bead. Be careful not to bend. Use taping knife to embed bead firmly into the joint compound by running the knife at a 45° angle over the corner with even pressure. Remove excess compound using the knife to eliminate any air bubbles under the paper. Allow to dry. Keep the nose of the bead clean with a slightly damp sponge.

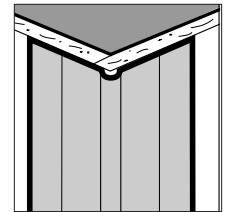


### Tips

When bullnose bead is to be applied to an outside corner, the drywall panels forming the corner should not be overlapped. This will permit the rounded bead to fit snugly around the corner. (For inside corners, no special alignment of panels is necessary to accommodate bullnose bead.)

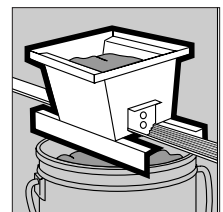


If regular right-angle bead is to be used for an outside corner, the boards should overlap as usual.

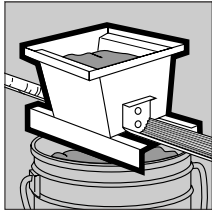


Application of paper-faced metal bead will be quicker and easier if you apply compound to the bead using a hopper. This is a simple piece of equipment that spreads compound on the bead as you pull it through the hopper's specially designed openings or gates. For best results, you should place the hopper on a plastic pail to collect any excess compound. Cut "V" shapes out of the pail on both sides so that the bead can enter and exit smoothly as you push it through the hopper.

The hopper has two differently shaped gates. One is for right-angle bead, and one is for bullnose bead.



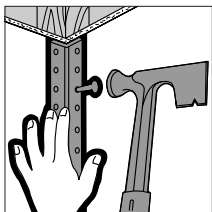
Always be sure to place the hopper so that the gate on the exit side (where the bead, with compound applied, will leave the hopper) matches the profile of the bead.



For more information on the many sizes and styles of SHEETROCK Brand Paper Faced Metal Bead and Trim, please refer to publication J996. For additional instructions on installation, see publication J1124.

#### **Dur-A-BEAD® Corner Reinforcement**

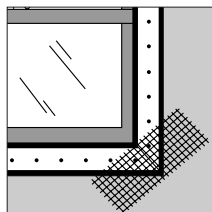
Apply Dur-A-BEAD Corner Reinforcement to all exterior corners of walls, soffits, and window returns. Hold bead firmly against corner and nail bead through small holes every 9" along flange. Start at the midpoint of the bead and work out toward the two ends. The fasteners on the flanges should be directly opposite one another, not staggered. Make sure that nails penetrate framing members. Drive all nails below nose of corner bead and tightly into flange so that joint compound will cover smoothly and evenly. Be careful not to dent the metal. Screw attachment is not recommended.



Install USG Metal Trim where gypsum panels butt window or concrete block. Nail trim every 9" through small holes in flange. Make sure that nails penetrate framing members.

#### **Mitering**

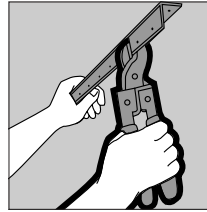
To miter corner bead for trimming around windows or skylights, begin with a bead section approximately 3" longer than the section being covered. Starting at one end, using tin snips, cut the outside flange at a 45° angle down to the nose of the bead. From this point on the nose, cut the inside flange at 90°. Hold the bead against the section of wall and mark the length on the inside flange. Cut the inside flange at 90° up to the nose of the bead. Cut the outside flange at 45° down to this point on the nose. The outside flanges should be longer than the inside. Repeat this process for the remaining sections.



Crossstaping of mitered corners (diagonal application of tape, as shown above) is recommended. this prevents cracking that can be caused by movement of the two sections of bead.

#### *Tips*

The easiest way to trim a corner bead to the correct length is to cut through the flanges with tin snips one flange at a time, bend, and snap at the nose of the bead.



When pushing the bead onto the corner, be careful that the flanges do not spread beyond a 90° angle; this will make it hard to cover them with joint compound.



The steps that follow are general guidelines for mixing joint compounds and texture products. For detailed information concerning proportions, mixing methods, and cautions, please refer to product packaging.

#### **11 Mixing Dry Powder Joint Compounds and Texture Products**

Always add powder to drinkable water at room temperature (about 55-70 °F). Make sure that your tools and mixing equipment are clean. Refer to package instructions for exact proportions of powder and water.



Mix thoroughly by hand or using a power mixer, as indicated on packaging. If you are power-mixing, use a mixing paddle designed for joint treatment and textures, and use a drill with a maximum speed of 450 rpm.

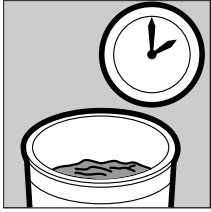


Scrape unmixed material from sides of container and mix again.



## Finishing Panels

Permit to soak for the time indicated on the product package.



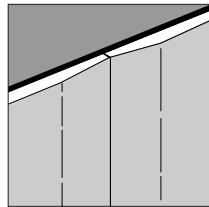
Remix thoroughly to an even consistency.



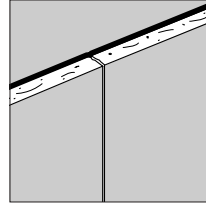
The amount of finishing work required depends on the skill of the applicator and the desired appearance of the final unit. Textured surfaces typically require fewer joint treatment coats. Smooth drywall finish requires more steps, higher applicator skills, and special primers.

It is also important that you understand the differences among the three main types of joints you will be treating. Corners, also called angles, are easy to identify. These are the joints that occur where two panels meet at an angle, as in the corner of a room. Joints that occur where two panels meet in the same plane are known as flats. There are two kinds of flats: tapered joints and butt joints.

Tapered joints occur where the finished edges of two boards meet. The tapers pressed into the boards provide a depression so that the tape and joint compound won't create a bump—known as a crown—above the surface of the board.



Butt joints occur where the cut edges of two panels butt together. Because there are no tapers at butt joints, the tape and compound will automatically lie on top of the surface of the board. This means that butt joints are always naturally crowned, and will require a slightly different finishing procedure.

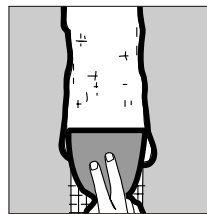


We recommend using a fiberglass mesh tape, such as TUF-TAPE, for finishing flat, tapered joints, and a paper tape, such as SHEETROCK Brand Joint Tape, for butt joints and corners.

### 12 First Coat, Flat Joints

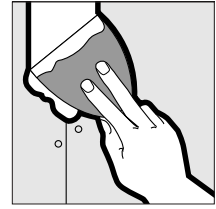
#### Fiberglass Mesh Tape (such as SHEETROCK MH Brand Joint Tape—TUF-TAPE)

Apply tape centered over the joints and press in place using a 6" joint knife. Apply SHEETROCK MH Brand Setting-Type Joint Compound over the tape using sufficient pressure to force the compound through the tape into firm contact with the gypsum board.

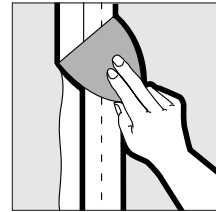


#### Paper Tape (such as SHEETROCK Brand Joint Tape)

Start with butt joints. Apply an even, thin coat of setting-type joint compound for the length of the joint with a 6" finishing knife.



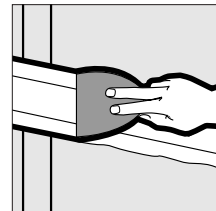
Center and lightly press tape into wet joint compound with fingers. Draw 6" knife firmly along joint to tightly embed tape. Be sure there is sufficient joint compound under tape to prevent blistering of the tape.



While embedding the tape, remove excess joint compound from edge and apply as a thin coat over the tape.

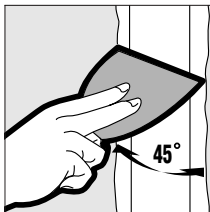


To finish tapered joints, follow same procedure. Tape should overlap tape applied to butt joints.

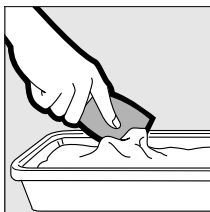


### Tips

For best result apply medium pressure and hold knife at a 45° angle to panel.



To apply joint compound neatly, dip the knife and strike excess compound from the sides of the knife to keep the material centered.

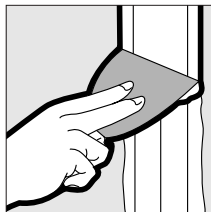


Keep the blade clean, especially of dried bits of compound, to avoid leaving scratches in the wet joint compound as you draw the knife over it. Discard any compound containing dried bits of material. Clean blade by drawing it over edge of pan.



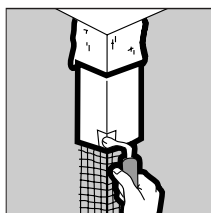
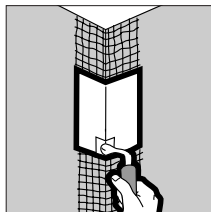
While embedding tape, draw the knife slowly along the length of the tape to provide an even distribution of joint compound. If additional coats of compound will be applied, small scratches and streaks need not be smoothed out. Do not crown the joints.

Setting compounds (except for TUF-SET Lite and EASY SAND) are extremely hard after curing and cannot be sanded.



### 13 First Coat, Inside Corners Using Fiberglass Tape

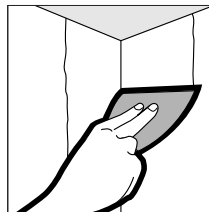
Fold the tape in half lengthwise and push the tape into the corner; unfold against the drywall and press in place using an inside-corner trowel. Apply compound with a joint knife using sufficient pressure to force the compound through the tape into firm contact with the board.



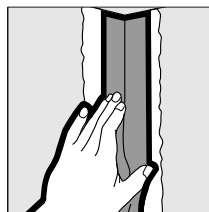
**CAUTION:** It is difficult to fold fiberglass tape to achieve a straight interior corner. In addition, the use of fiberglass tape can cause a buildup of compound in the corner that will result in cracking later on. Therefore, the use of paper tape in corners is recommended. As an alternative, paper-faced metal bead can also be used for corner reinforcement.

### Using Paper Tape

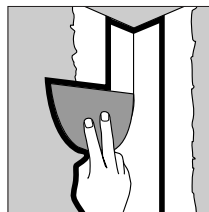
Use a 6" joint finishing knife to apply a thin layer of SHEETROCK MH Brand Setting-Type Joint Compound on both sides of corner. Extend compound slightly beyond area to be covered by tape.



Fold tape along center crease and lightly press into position with your fingers.



Tightly embed tape as with other joints.

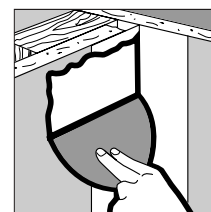


### Tip

When you are finishing an inside corner with tape, it is helpful to identify the closed and open sides of the corner, and to treat them differently. At an inside corner, the edge of one board butts up against the face of the other board, leaving a narrow opening. When you run your taping knife down the butted board, the blade can be aligned firmly against the face of the other panel. That

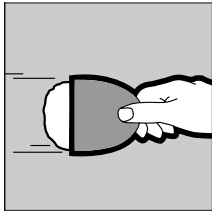
makes this closed side easier to finish. On the open side, in contrast, your knife will tend to slip into the crack between the two boards. This means that there is a danger of cutting through the tape and compound on the open side during finishing. For this reason, it helps to follow a special sequence of steps for finishing the two sides of an inside corner.

Once you have applied the tape to an inside corner and embedded it firmly, go back and apply a coat of compound only over the closed side of the joint. Remember that you are using a nonsandable compound, so that it is important to finish the closed side of the corner as smoothly as possible. (Applying a coat of compound to the closed side at this point gives it time to set before you return to work on the open side. This will help prevent the marring of tape and compound that can occur at the gap between the two boards.)

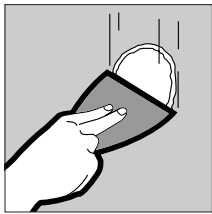


### 14 First Coat, Fasteners

For each fastener depression, apply SHEETROCK MH Brand Setting-Type Joint Compound with 6" knife. Holding the blade almost flush with the panel, draw the joint compound across a fastener head and the dimple surrounding it.

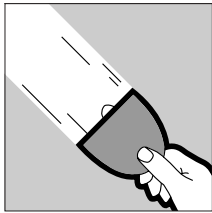


Then raise the knife blade to a more upright position and scrape off excess with a second stroke at a right angle to the first stroke. Compound should be level with panel surface.



*Tip*

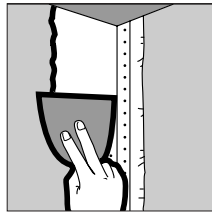
To determine if fasteners are properly seated prior to finishing, draw clean knife over each fastener. If metallic ring occurs, drive fastener below surface, being careful not to break paper.



**15 First Coat—Bead and Trim**  
**Paper-Faced Metal Corner Bead and Trim (Tape On)**

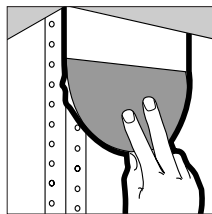
Using a 6"-8" tapping knife, apply a coat of SHEETROCK MH Brand Setting-Type Joint Compound to both sides of the corner. Keep this coat as smooth as possible, feathering it out 5"-6" on each side. Let dry. Sand sides lightly where necessary. L-Trim and Reveal Trim are finished in a

similar manner, except that only one side is finished.



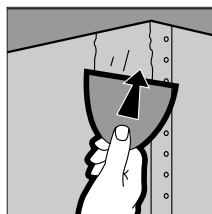
**Other Types Metal Corner Bead and Trim**

Apply SHEETROCK MH Brand Setting-Type Joint Compound with 8" knife onto one flange of the corner bead. Work down the entire length of the bead. Hold knife at 45° angle and smooth compound—one edge of knife riding the metal, the other on the surface of the panel. Compound should extend onto panel a minimum of 4". Repeat application for other flange. Use same application method for metal trim.



*Tip*

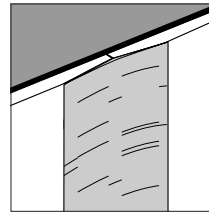
After filling first flange, the metal corner edge may have some lumps of joint compound. To remove, run 8" blade up the bead while also moving it to the side. In this way, the compound is continuously moved aside as it is scraped off.



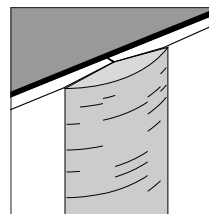
**16 Second Coat, Flat Joints and Fasteners**

*Tips*

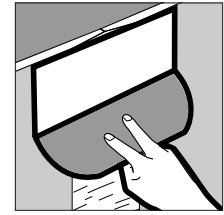
At this stage of finishing, tapered joints and butt joints need to be treated differently. Because tapered joints provide a depression for the tape and compound, there is a danger that the depression will remain incompletely filled, resulting in a starved joint.



Butt joints, on the other hand, are naturally crowned, because the tape and compound have to be placed above the surface of the board. Excess compound will result in a crowned joint.

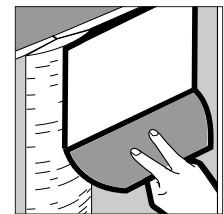


To prevent starved and crowned joints, two different techniques of applying joint compound are used. These are known as "centering" and "splitting." You should center a tapered joint by first running the knife down the center, then up one side, then down the other, then down the middle again. This will ensure that the depression created by the tapers will be filled.



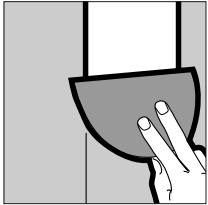
The tapered joint should then be feathered, with the compound spread out very thin at the edges. To feather, press down on the edge of the knife that is furthest from the joint, and lift the other edge very slightly.

When treating a butt joint, the goal is to make the joint's natural crown as invisible as possible. This is accomplished by finishing the sides of the joint so that the slope from the center of the joint down to the level of the board is extremely gradual. The technique used to achieve this effect is known as "splitting the joint," because you treat the sides first, then wipe down the middle. On each side, use the feathering technique to make sure that the thickness of the compound changes as gradually as possible.

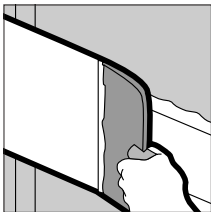


## Flat Joints

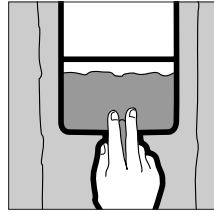
Allow the first coat to set completely and to dry as much as possible before proceeding. Scrape off bumps, ridges, and other imperfections with knife. Be careful not to damage surface of the gypsum board.



Apply SHEETROCK MH Brand Lightweight Setting-Type Joint Compound (TUF-SET Lite) or SHEETROCK Brand Lightweight Setting-Type Joint Compound (EASY SAND) to tapered joints using an 8"-10" knife the length of the joint.

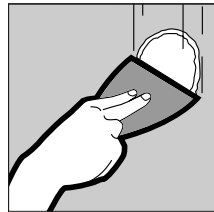


Apply pressure to knife edge farthest from the joint and lift the other edge just slightly above surface. Draw knife down joint. Repeat for opposite edge. This technique is called feathering. Joint compound should extend beyond first coat for a total width of 7" or 8". Apply a 7"-8" coat of joint compound to each side of butt joints and feather. Compound should extend beyond first coat for a total width of 14"-16".



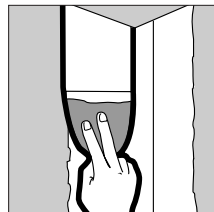
## Fasteners

Apply a second coat to fasteners in same manner as first coat.



## 17 Second Coat, Inside Corners

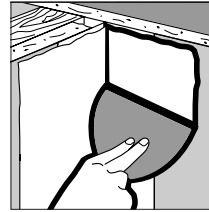
Allow the first coat to set completely and to dry as much as possible before proceeding. Apply SHEETROCK MH Brand Lightweight Setting-Type Joint Compound (TUF-SET Lite) on one side using a 6" knife for the length of the corner. Scrape off any compound that laps onto the second side. Feather out beyond first coat and allow to dry. After first side is dry, apply compound on other side and feather.



## Tip

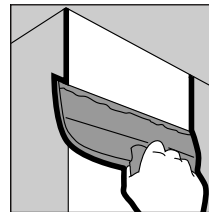
If you followed the tip for the first coat on inside corners, you have already finished the closed side of the corner with a nonsandable setting-type compound. At this point, you can finish the open side with a sandable compound (such

as TUF-SET Lite or EASY SAND Joint Compound) as well as touching up the closed side as needed. Be sure to feather out the edges of the compound (away from the corner).



## 18 Second Coat, Outside Corners and Metal Trim

Allow the first coat to set completely and to dry as much as possible before proceeding. Apply second coat of SHEETROCK MH Brand Lightweight Setting-Type Joint Compound (TUF-SET Lite) with 8"-10" knife, feathering slightly beyond first coat.

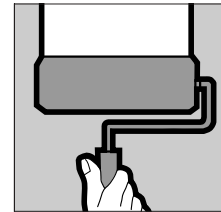


If you do not intend to texture the panels you are finishing, skip steps 19-24. Go to the "Smooth Drywall Finishing" section and begin with step 25 for instructions on applying a third coat.

The instructions that follow describe various methods of creating textured finishes on walls and ceilings. If you are using a smooth finish for your drywall surfaces, please skip ahead to the section entitled "Smooth Drywall Finishing."

## 19 Preparation

For best results, apply a prime coat of SHEETROCK Brand First Coat after joint compound has set. Allow prime coat to dry before applying texture.



## 20 Choosing a Texture Product

Texture products are available in machine-applied and hand-applied types.

### Machine-Applied Types

Aggregated powder textures are spray-applied to an even thickness for fast, complete coverage. Textures are obtained with various aggregates in suitable binders. They are used to produce fine to bold, heavy, acoustical-look finishes. Unaggregated types, also spray-applied, produce finer textures, ranging from light spatter and fog-and-spatter to medium-light finishes such as orange peel or flat. Heavier designs such as spatter and spatter/knockdown may also be produced.

### Hand-Applied Types

These include topping and all-purpose compounds, plus multipurpose and ready-mixed textures. Offer a good range of texture

appearances, including crowsfoot and stipple designs.

#### **CAUTION**

Heavy water-based textures may result in sagging of gypsum board ceilings under the following conditions: high humidity, improper ventilation, and/or board application to framing and insufficient board thickness for span between supports.

Heavy-texture finish has two detrimental effects. It not only wets the face paper, but adds to the dead load that must be borne by the gypsum panel. A heavy texture, when wet, weighs as much as 1/4 lb. per sq. ft. Even more important is the added moisture provided by application of this material. Complete drying of texture products should normally occur within a 24-hour period. In hot-humid or cold-humid conditions, or in areas with insufficient ventilation, complete drying could take 2 to 3 days. Note: Application of primer is to equalize the surface porosity and to provide a uniform color. Primers are not intended to reduce sag potential.

### **21 Checking Equipment**

Spraying with a pole gun usually involves three hoses: (1) material-feed hose (supplies material to nozzle); (2) atomization hose (supplies air pressure to gun and to "mechanical man"); (3) "mechanical man," a manual valve for controlling feed pump. Taping the hoses together eases handling. Hoses usually are available in 50 ft. lengths and should be checked periodically and repaired as required, since damaged hoses can cause poor results in application.

#### **Tips**

- For mixing, use a clean mixing vessel equipped with a variable-speed agitator.
- Do not overthin texture materials as poor adhesion, lack of hide, and texture pattern variation may result.
- Intermixing with other compounds is not recommended unless specified.
- Provide minimum 55 °F air, water, package, material, and substrate temperature during and after application.
- Avoid drafts while applying, but provide ventilation after application to aid drying.
- For comfort, use a respirator and protect eyes while spraying.
- Do not use unvented gas or oil heaters.
- Application in high-humidity areas is not recommended.

### **22 Mixing**

Inspect mixing tanks and clean out any rust or soured material. Mix spray texture first, since it requires more mixing time to be lump-free.

To mix powder texture products, start with slightly less water than recommended on bag and slowly add material to water while agitating. Do not overload mixing motor (causing it to slow). Disperse all ingredients completely; add remaining water according to bag directions, and allow mix to stand 20 minutes before use. Textures should be mixed at a heavier consistency than needed for spraying, then thinned to spraying consistency.

#### **CAUTION**

Do not use hot water for mixing. Hot water will cause lumping in the mix, and will not provide any benefit to the texturing operation.

To thin a paste product—that is, ready-mixed texture—use a heavy-duty electric drill fitted with a suitable mixing paddle. Operate at not over 450 rpm with drill paddles completely submerged at all times. Mix until compound has a creamy texture, then add water to obtain proper consistency for texture effect desired. Add water in 1/2-pint increments and stir after each addition.

### **23 Application**

On piston pumps, the larger the pump, the easier the pumping. It is difficult to give hard and fast rules for pumping pressures since there are many variables. Consistency of the texturing material, length and size of hose, condition of hose and pump, and pumping height all determine the air pressure.

On a Roto-Stator, the motor should be running at about half-speed, with the machine in second gear. The variables listed above determine the speed and gear setting.

Nozzle size of the material-feed orifice for QT spray texture finishes should never be over 1/2 in. diameter, preferably 3/8 in. or even 5/16 in.

At start of spraying, make adjustments to mix consistency according to bag directions. When proper mix consistency has been determined, adjust air and material feed pressures as needed to

obtain preferred spraying characteristics.

These adjustments should be made while spraying material back into the mixing tank and not onto the surface to be textured. When starting to spray, always take care to have atomization air pressure "on" before turning on material feeds. To activate pump, turn on "mechanical man."

At this point, you can tell if the material is pumping normally and has good atomization. If no adjustments are necessary, spray the surface. Keep air pressure as low as possible while maintaining good spray pattern. Do not exceed recommended coverage, since color differences may show through, or a lighter texture may result. When spraying is completed or temporarily interrupted, always turn off "mechanical man" (pump), then close material feed, and, finally, turn off atomization pressure.

#### **Pumping Precautions**

Material flow in both single- and multi-piston pumps is controlled by poppet or ball valves. The valves are made of steel, rubber, or plastic—the pistons of rubber or plastic—both parts are subject to wear and possible damage. Whenever pumping problems such as a pressure loss occur, it is advisable to check the valves and pistons for wear or damage *before* altering the texture mix.

#### **CAUTION**

With all types of pumping equipment, material having either vermiculite or perlite aggregate has a tendency to stiffen while being

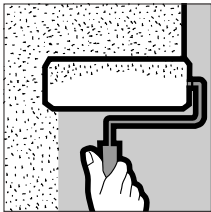
pumped. Both aggregates have a tendency to absorb extra mix water when under pressure. If stiffening occurs, extra water—but not in excess of recommended amounts—should be added to the mix until the desired consistency is obtained at the hose discharge. There is no stiffening under pressure with sand aggregate.



## 24 Patterning

### General

Certain texture products can be hand textured following initial application with spray equipment, brush, roller, or trowel. For high productivity, spray-apply the texture material; then, while it is still wet, use the appropriate hand tools to create the desired pattern.



A string-wrapped roller produces an attractive striated-stone effect, while cross-rolling gives an additional interesting squared pattern. For finer designs and textures use a small brush, roller-stipple, whisk broom, crumpled paper, comb, sponge, or similar item. Flattening raised portions of wet material provides further variations. Texture products may also be scored to represent block, tile, or cut stone outlines.

The guidelines that follow will help you to create some of the most popular texture patterns.

### Fog and Spatter Pattern

Application—Spray.

Equipment—Binks 18D gun or equivalent, equipped with a #53 fluid nozzle and R-21 fan cap. Procedure—Mix products to a thin, latex-paint consistency. For a good fog coat, which is always the first application, atomizing air should be approximately 60 psi and material feed pressure approximately half the atomizing pressure. When spraying, apply in long even strokes with no wrist action, holding gun perpendicular to and approximately 36 in. from surface. Apply material as uniformly as possible, avoiding lap marks. After fog coat has been applied, allow about 10 to 15 minutes for surface to partially dry, then apply spattering by removing the R-21 fan cap and reducing atomizing air to approximately 15 psi and material feed to approximately 10 psi. While applying spatter coat, move spray gun in a rapid random fashion, standing about 6 ft. from surface. The size of the spatters depends upon personal preference.

### Orange Peel Pattern

Application—Spray.

Equipment—Same as for fog coat. Procedure—Same as for fog coat, except that atomizing air pressure should be 40 psi and material feed pressure approximately 20 psi. When applying, follow same procedure as for fog coat, but use slightly more material to give a good orange peel pattern. The degree of orange peel pattern depends upon the amount of material applied to the surface.

### Knockdown Pattern

Application—Spray.

Equipment—Pole gun, hopper, or Binks 18D gun with plunger. Knockdown Procedure—Apply as spatter, but use material at heavy latex-paint consistency. After spattering surface, wait about 10 to 15 minutes, then very lightly flatten only tops of spatters with flat blade or flat hand trowel. Again, size of spatters depends upon pressures used.

### Skip-Trowel Pattern

Application—Hand.

Equipment—Wide hand trowel. Procedure—Use slightly thicker texture consistency than for knockdown. For ease of skip troweling, add grade 30 sand into the mix. Dip trowel into mud pan filled with texture. Lightly run the trowel across wallboard, allowing the texture to “skip” across the surface. The silica sand works as a screed guide. Rerun the trowel across the surface to even.

Alternatively, spray-apply a spatter coat, using material thinned to spray-application consistency and mixed with sand as above. Reduce the atomizing pressure; do not cover as heavily as for spatter/knockdown pattern. Wait approximately 10 to 15 minutes, then use a blade as in the knockdown procedure, but applying more pressure.

### Crowsfoot Pattern

Application—Spray or roll or hand stomp.

Equipment—Single-round or double-round texturing brush. Procedure—Mix texture to a consistency thicker than that of latex paint but thinner than that of joint compound. Spray- or roll-apply a

uniform coating across the substrate or use the texture brush to “stomp” a base coat of texture over the surface. Allow material to partially dry to a dull, wet, finish; then “stomp” the surface with the texture brush to create the desired crowsfoot or stippled finish. For best results, prewet the texture brush with texture.

### Roller Patterns

Application—Roller.

Equipment—Long nap roller or special roller covers. Procedure—Mix texture to a consistency thicker than that of latex paint but thinner than that of joint compound. Spray- or roll-apply desired texture to surface. While the texture is wet, use a specialty roller to impart the desired pattern to the surface (a variety of specialty rollers for creating different texture patterns is commercially available). Flattening raised portions of the wet material provides further variation.

### Swirl Pattern

Application—Spray or roller.

Equipment—4 to 8 inch wallpaper brush. Procedure—Mix texture to a consistency similar to that of moderately thick latex paint. Apply a uniform coating of texture to the surface. Use wallpaper brush to generate a series of circular “swirls” in a row across the surface. Apply the next row of swirls so that it partially overlaps the preceding set of swirls.



## Smooth Drywall Finishing

### Glitter Effects

Sparkle, particularly under artificial light, can be added to ceilings for unusual and interesting effects with the use of glitter. Glitter comes in 1/32 to 1/16 in. cuts in silver, gold, blue, red, fuschia, or green, and is applied with hand-cranked or air-powered guns. Application usually consists of embedding glitter in the freshly applied ceiling texture while surface is still wet. Depending on effect desired, figure 1 lb. of glitter per 500 sq. ft. of ceiling.

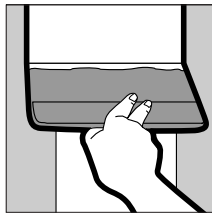
If you have applied texture to your panels, skip the following instructions for completing a smooth finish. Go to step 28 for storage and cleanup information.

### Smooth Drywall Finishing

If you have skipped the Texturing section because you wish to create a smooth drywall finish, the steps that follow will guide you through the completion of the smooth-finishing process.

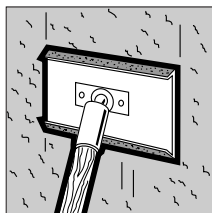
### 25 Third Coat, Flat Joints and Fasteners

Allow second coat to dry as completely as possible. If necessary, remove imperfections with knife or sandpaper. Apply a thin finishing coat of SHEETROCK MH Brand Lightweight Setting-Type Joint Compound (TUF-SET Lite) or SHEETROCK Brand Lightweight Setting-Type Joint Compound (EASY SAND) with a 12" knife to the flat joints and a 6" knife to the fastener heads. Press knife firmly so joint compound fills depressions but does not significantly add to thickness. Feather edges at least 2" beyond second coat.



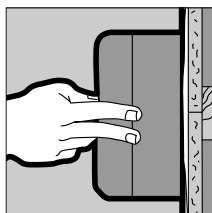
#### Tips

Do not sand unless it is necessary. If you do sand, use fine-grit sandpaper on fully dry compound, and be careful not to scuff the gypsum panel paper to minimize surface touch-up requirements.



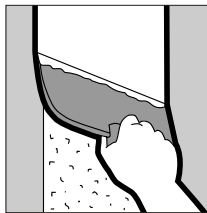
Before applying the final coat, check to see if tapered joints are level with surface. Hold the 10" blade across the joint, straight out from the wall. If the blade can be rocked across the joint, the joint is crowned. It must be hidden by feathering the final coat out as far as possible.

Use the "splitting" technique (described in the section on second coats) to make the slope of the compound from the crown to the surface of the board as gradual as possible.



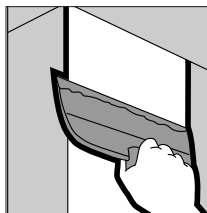
When applying earlier coats, minor depressions and grooves

were not a problem. However, do not leave any during the application of this final coat or they will mar the finished surface.



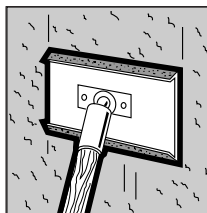
### 26 Third Coat, Outside Corners and Metal Trim

Allow second coat to dry as completely as possible. Sand lightly if necessary. Apply third coat of SHEETROCK MH Brand Lightweight Setting-Type Joint Compound (TUF-SET Lite) with 10" knife, feathering slightly beyond second coat.



### 27 Sanding

Allow third coat to dry. Lightly sand imperfections in finished joints, corners and over fastener heads. Carefully remove sanding dust with damp sponge.



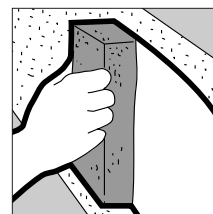
#### Tip

Use a fine-grit sandpaper in a tool designed for drywall sanding so you don't dig into the joint compound. For best results, use #120-grade or finer sandpaper

(#200 grade or finer mesh cloth) when sanding conventional-weight all-purpose joint compounds. For topping and light-weight joint compounds, use #150-grade or finer sandpaper (#220-grade or finer mesh cloth). Avoid roughening the surface paper when sanding. If you do roughen it by accident, repair the damage by applying a little joint compound with a 6" knife.

### Wet Sanding

When only minimal sanding is needed, try wet sanding with a sponge. It eliminates dust and does not scuff the surface paper. Use a small-celled polyurethane sponge similar in appearance to carpet padding. Saturate sponge and wring to prevent dripping. Rub joints to remove high spots, using as few strokes as possible. Clean the sponge frequently during use.

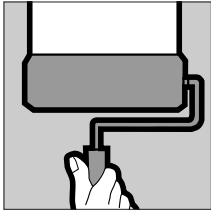


### 28 Storage and Cleanup

Before storing unused drying-type joint compound, clean sides and lid of container so no dried compound falls into the mixture. Level drying-type joint compound surface with knife and cover container tightly. If storing for a long time, cover surface of joint compound with approximately 1/2" of clean water and cover container. Do not store in direct sunlight or where freezing conditions may occur. Pour off water before using stored joint compound. Clean tools with warm, soapy water.

### 29 Priming

Prior to painting, apply SHEETROCK Brand First Coat or a flat latex paint as a prime coat. Follow the manufacturer's recommendations. For best results, use airless spray equipment. Closely follow equipment manufacturer's instructions and all safety precautions.



### 30 Painting

After prime coat is dry, apply a good quality interior paint. Follow the recommendations on the container.

## Using Mechanical Finishing Tools

Manual methods of joint finishing are easy and reliable, and can be used in any situation. Learning these methods is also the best way to gain an understanding of the art of finishing, and to develop a feeling for finishing tools and materials.

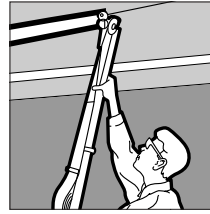
If you tape and finish large areas of drywall, however, it may be to your advantage to learn how to use mechanical drywall tools. These tools help to increase productivity, and can also make your work more consistent. (They remain only part of the solution, however; hand tools still pick up where mechanical tools leave off.)

Mechanical drywall tools are available from a variety of manufacturers. Each version operates a little differently, and applicators have their own preferences. The explanations that follow are general guidelines for different tool types; for more detailed information on the use, maintenance, and cleaning of a specific tool, you should refer to the instructions provided by the manufacturer.

The section below describes the design and use of the most popular mechanical finishing tools. Following this overview are some sample procedures that show how you can combine different tools to accomplish a finishing task.

#### Automatic Taping Tool

An automatic taping tool is used to apply tape to joints mechanically. The taping tool places a measured amount of compound on the tape; applies the tape to the wall; and cuts the tape to the correct length.



#### Preparation

To use an automatic taping tool, you must first install the drywall tape and fill the taping tool with compound.

Generally, a standard-width paper tape like SHEETROCK Brand Joint Tape should be used in automatic taping tools. If the tape is too wide, it will not fit properly into the tool; if it is too narrow, it may cause jamming.

To install the tape, remove the retaining wire and place the roll of tape on the spindle. Feed the tape through the tape guide, with the back side of the tape facing down, so that the tape curls over the drive wheel.

You can fill the taping tool with compound using a hand pump with a gooseneck attachment. Attach the gooseneck to the pump by placing a pump gasket on the pump housing, over the protruding studs. Place the gooseneck over the studs and tighten the hex nuts firmly to prevent leaking.

The hand pump should be placed in a standard five-gallon pail containing joint compound that is well mixed and lump-free. If the pump is new or freshly cleaned, prime the pump by pouring 1/2 cup of water into the outlet (once the pump is full of compound, no further priming is needed).

Before attaching the taping tool to the gooseneck, make sure that the taping tool's gate control lever is in

the closed position. Pump material until compound exits the nozzle. Place the automatic taping tool on the gooseneck, seating it firmly. Move the pump handle to transfer compound from the pail to the automatic taping tool.

#### Tips

When filling a taping tool with compound, keep the mud pail full to avoid pumping air into the tool. To avoid overfilling the taping tool, place your fingers in the open end of the tube while filling it. Stop pumping when the piston reaches your fingers (this will be about 9 pumps for an empty taping tool).

When the taping tool is filled with compound, remove it from the gooseneck. Stand the taping tool on end and move the gate valve control lever to engage the drive mechanism. Turn the key, located on the drive gear sprocket, until compound covers the leading edge of the joint tape. (This step is required after each loading of the taping tool.)

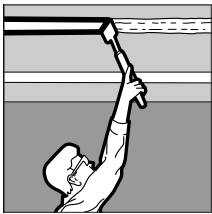
#### General Operation

To use the taping tool, push it along the joint you wish to tape. Hold the tool with one hand on the control tube, and the other at the bottom of the compound tube. The taping tool will dispense compound onto the tape and paste the tape to the wall.

At the end of the joint, you must come to a complete stop and pull a handle—connected to a built-in blade—that will cut the tape to the appropriate length. Then, advance the taping tool with the wheel against the wall until the tape and compound appear.

Always run the taping tool at a slight angle, with only one wheel resting on the surface. If both wheels contact the surface, compound will drip from the sides of the tape.

After applying tape and compound with an automatic taping tool, always wipe down the joint manually using the appropriate drywall knife. This will ensure that the tape is flat and securely embedded.



#### Tips

To get the feel of the automatic taping tool, run it first without compound. This makes the tool lighter, and allows you to practice the cutting operation. It is important to stop movement of the taping tool completely during cutting (if you don't stop completely during both strokes, the blade will jam the tape). If a tape jam does occur, it will be much simpler to remove without compound. Practicing the unjamming process without compound will make it easier for you to unjam the tape during regular operation.

It is best to tape the butt joints first, then the tapered joints, and finally the inside corners.

#### Vertical Joints

To tape a vertical joint, place the taping tool at the bottom of the joint, parallel to and slightly above the floor. Lead with the head of the taping tool as soon as possible to make tracking easier. Remember to roll with only one wheel in contact with

the wall until about 3" from the top. Stop completely, cut the tape, and roll to the end of the joint on both wheels.

To start the next joint, move the drive wheels against the surface of the wall, starting the compound flow, while advancing the tape with the control tube.

#### Horizontal Joints

To tape horizontal joints, advance the joint compound and about 1-1/2" of tape by pushing forward on the control tube while rolling the drive wheels on the wall.

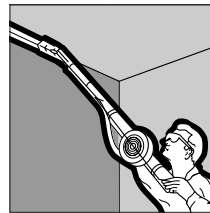
Roll along the joint, stopping about 2-1/2" from the end of the joint; cut the tape. Roll out the last 2-1/2" of tape while feeding tape with the control tube. This will apply compound to the beginning of the tape for the next joint.

#### Ceilings

For ceilings, use both drive wheels for the first 4"-6" of tape to secure it to the ceiling. Then tilt the automatic taping tool toward you at a slight angle, leaving only one drive wheel on the drywall surface. Walk backwards, leading with the head of the tool.

#### Inside Corners

To tape inside angle joints, position the taping tool so that it bisects the angle, with both wheels running in contact with the adjacent wall surfaces. Move the taping tool in a straight line with the creaser wheel extended (use the trigger located near the trailing end of the automatic taping tool). The extended creaser wheel pushes the tape securely into the angle.



Avoid twisting the taping tool. As soon as possible, begin operating the tool at a 45° angle to the joint. This will help prevent tape "creeping."

#### Corner Roller

After joint tape and compound have been applied to an inside angle (corner), the corner roller is used to embed the tape firmly into the compound. The rollers in the tool embed and smooth the tape while forming a sharp corner.

For best results, start in the middle of the joint and work toward both ends, using light pressure. Then repeat the procedure using firm pressure. This will force the excess compound from under the tape, preparing the angle for the corner finisher.

#### Corner Finisher or Angle Head (With Pole Handle)

The corner finisher, also known as an angle head, is used to smooth the compound in a corner, leaving a uniform finish. This tool is designed to wipe down and feather both sides of an angle in one pass. It is used after the corner roller to wipe down the excess compound left when the tape is embedded.

To use the corner finisher, you must first attach it to the detachable pole handle. If necessary, set the finisher's spring tension.

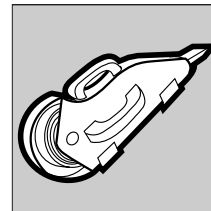
To smooth compound over the tape, seat the tool at the beginning of the joint. Applying firm pressure, move the tool along the joint. Make sure that the open end is pointing in the direction of movement, and that the handle leads the corner finisher.

After using the corner finisher, you should detail corner and ceiling angle intersections using a drywall knife.

The corner finisher or angle head is also used in conjunction with the corner pump or angle applicator to apply a finishing coat over the angles.

#### Banjo

This tool offers an alternative method of applying tape and compound. It is simpler to use and less expensive than the automatic taping tool.



The banjo has a hinged side panel for hand-loading compound into the tool, and an adjusting slide to control the amount of compound dispensed onto the tape.

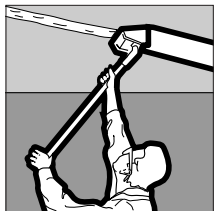
To apply tape, hold the banjo with one hand while pulling tape through the tool with the other hand.

As the tape emerges from the banjo, compound will adhere to one side. Lay the compound-covered side against the joint while continuing to pull tape through the banjo as you move the tool along the wall.

At the end of the joint, you must cut the tape against an attached blade.

### Flat (Box) Finishers

Finishing boxes are used to apply joint compound to flat taped joints. They come in a variety of widths, up to 12", to serve a variety of purposes. (For instance, a 7" box might be used to apply a bedding coat, a 10" box to apply a finish coat, and a 12" box to apply a skim coat.)



The box is controlled with specially designed handles available in various lengths (including long handles suitable for working overhead on ceiling joints). As you apply pressure to the box handle, compound is pushed onto the wall. The lever on the handle end will lock the box at the desired angle. The box may also have an adjustment wheel to control the amount of crown left by the box; you may need to experiment with the adjustment wheel to find the optimum setting for a particular task.

Load the box with joint compound through the opening behind the blade, using a hand pump and a box adapter or "nipple."

### Ceiling Joints and Horizontal Wall Joints

To apply compound, position the flat box at the end of the joint being finished and apply pressure with the handle to start the flow of compound. The tool should be positioned so that the wheels are leading and the blade trailing. Draw the flat box steadily

along the joint while applying even pressure with the handle. This will dispense the compound at a steady rate. The handle should lead the box, except at the ends of joints.

Near the middle of the joint, lock the angle of the box by pulling on the lever, and gradually decrease pressure while moving the box from the surface in a sweeping motion.

Reversing position, begin again at the other end of the joint. Draw the box along until you have passed the previous stopping point. To achieve a smooth joint, a double pass is sometimes necessary.

Again, decrease pressure and sweep the box away from the surface.

### Vertical Wall Joints

To finish a vertical wall joint, start from the bottom and move upward, covering the joint as high as is comfortable, to a height of about 30".

Lock and sweep the box from the surface and begin again at the top of the joint. Draw the box down the joint until you reach the previous stopping point. Lock and sweep the box from the surface, joining the two finished sections.

### Door and Window Openings

For door and window openings, always work from the corner, moving toward the opening. Just before the wheels reach the opening, lock the box, lift the wheels, and sweep the box away from the wall.

### Angle Applicator or Corner Pump (With Corner Finisher)

An angle applicator or corner pump is used in conjunction with a corner finisher to apply a uniform layer of

joint compound over the previous coat in an inside corner. This combination of tools allows you to apply a consistent finishing coat to both sides of the angle at once.



Attach the corner finisher to the angle applicator, then fill the angle applicator using a hand pump attached to a box-filler adapter. Keeping the corner finisher head over the edge of the joint compound bucket, pump until the applicator is full.

Because the angle applicator is a pressure-controlled tool, it is important that you apply even pressure when using it. Hold the applicator with both hands, one near the end of the handle and the other close to the applicator. When the corner finisher is placed in the corner, all blades should be flush with the sides of the angle. The applicator and corner finisher should be centered in the angle being finished, with no tilt to either side.

For easiest operation, keep the handle at a 45° angle, and the corner finisher set flush in the angle.

### Vertical Angles

To finish a vertical angle, position the corner finisher (attached to the angle applicator) near the bottom of the vertical angle, with the blade end closest to the floor. Applying even pressure, pull up about 3"-4" and sweep the corner finisher away from the angle.

Turn the angle applicator around and position the corner finisher in the top of the angle. Pull it down through the top of the compound applied in the first stroke, and sweep it away from the angle.

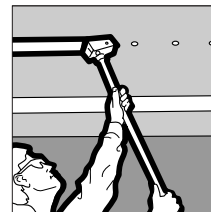
### Horizontal Angles

For a horizontal angle, position the corner finisher (attached to the angle applicator) in one corner of the angle. Apply even pressure to the applicator and pull it toward the opposite corner. Near the end of the opposite corner, sweep the corner finisher away from the angle.

Turn the angle applicator around, position it in the opposite corner, apply even pressure, and pull it through the end of the compound applied in the first stroke. Sweep the angle applicator away from the angle.

### Nail Spotter

The nail spotter is a small box that is used for filling fastener depressions. It works best when all fasteners are set at the correct depth. As the box is dragged down a row of fasteners, a thin layer of compound fills the holes. The attached blade smooths the compound.



The nail spotter can be filled with compound using a pump and adapter.

To finish a row of fasteners, set the box at the desired angle to the handle, and position the nail spotter against the wallboard at the begin-

ning of the row. Draw the spotter smoothly along the entire row, applying moderate pressure to force the compound onto the wallboard surface. The blades of the nail spotter will skim off excess compound, leaving a slight crown directly over each dimple.

After passing over the last dimple, gradually break contact with the surface using a sweeping motion. This will result in properly filled dimples without leaving excess compound to be removed by hand.

#### **Hand Pump**

A hand-operated pump is used to transfer compound into mechanical tools from the pail. It comes with different attachments to fit the various types of tools that may be used. You may also wish to fill your pan using the pump when doing handwork.

A screen in the intake opening of the pump filters particles in the compound. Use a coarse screen with taping compound, and a fine screen with finish compound. If pumping becomes difficult, scrape off the particles that have accumulated on the screen.

#### **Drill with Figure 8 Drywall Mixing Bit**

For mixing compound, a 7 amp, 450 max. rpm drill with a figure-8-type drywall mixer bit is effective. The heavier amp drill does not wear out as quickly as lesser amp drills, and the figure 8 paddle mixes quickly and thoroughly. Faster drills may whip more air into the mix, resulting in craters in the compound when it is applied.

#### **Hand Stomper**

This tool provides an alternative to electric drills for mixing. The hand stomper, which looks like an over-

sized potato masher, is especially handy for making slight adjustments to the thickness of a mix. It is also useful for scraping down compound from the sides of the bucket, and for moving compound to the bottom of the bucket so that air is not sucked into the intake of the pump. A long-handled stomper may also be used to move compound from the bucket into a banjo or pan.

### **Procedures for Joint Finishing Using Mechanical Tools**

#### **1 Choosing Materials**

When choosing joint tape and compound for use in mechanical drywall tools, always consult the tool manufacturer's recommendations. If you decide to use a setting-type joint compound, bear in mind that this type of compound sets fairly quickly, and will cause clogging if allowed to harden inside of your tools. Prompt and frequent cleaning is required when setting-type compounds are used with mechanical taping tools.

#### **2 Drywall Inspection and Preparation**

Inspect and prepare surface as described in the section on hand finishing. That is: set fasteners below surface of panels; ensure that panels are tightly attached to framing; cut away any soft spots or bulges; remove torn or loose face paper; cut butt joints in a "V" groove. Brush away all dust and other foreign materials.

#### *Tip*

Mechanical tools operate more smoothly when you move quickly. Be sure to eliminate any potential obstacles that may slow your progress or create dangerous situations. Drywall scrap should be

removed from the working area, along with any other material or tools that may have been left on the floor. It is easy to trip over something while you are concentrating on the wall or ceiling you are finishing.

#### **3 Mixing**

Mix the chosen joint compound in accordance with the manufacturer's instructions. Be sure to use the amounts of water and compound indicated on the joint compound package.

#### *Tips*

Always give ready-mixed compound a quick initial mix before adding water; compound varies in its initial thickness.

For fill coats on corner bead, add only a small amount of water.

For taping or finish coats with mechanical tools, the compound should be very thin. Add almost a quart of water per bucket.

Always add your water gradually, in half-pint increments, until the desired thickness is reached.

Check viscosity by lifting the mixer from the compound and watching the mixture drip from the tool. For a final viscosity determination, pass a knife blade through the mix and observe how the compound flows back together.

When mixing powder compounds, sift powder into the water while agitating with the mixer. A thick initial mix will provide shear to break down lumps. After a short soak time, adjust the mix to the desired consistency.

#### **4 Prefill**

Prefill all gaps over 1/8" wide.

Prefilling makes for stronger joints and a better finished surface. The time spent on prefilling will be made up during later stages, because wiping down will be easier, and finish coats will dry more quickly.

#### **5 Taping (Automatic Taping Tool Method)**

Make sure that the prefill material has set. Check the consistency of your compound to ensure that it will pump easily into the automatic taping tool. Thin with water if needed. Pump compound into the automatic taping tool from the pail using a hand pump and gooseneck attachment.

Apply joint tape and compound to the butt joints first. Wipe down with a flexible 8" knife, removing excess compound.

Apply tape to the tapered joints next.

Last, apply tape to the inside corners. The creaser wheel on the automatic taping tool folds tape into the corner.

When the inside corners have been taped, use the corner roller to press the tape into the corner. Then, pass a 2"-3" corner finisher (attached to its pole handle) over the corner, leaving a uniform coat of compound over the tape (except at the ends).

Remove any excess compound using a hand knife.

Before applying subsequent coats, fill fastener depressions using a hand knife or nail spotter.

## 6 Finishing

When the taping coat is dry, use a 7"-10" box finisher to apply the next coat of compound on flat joints. Allow the compound to dry, then sand lightly.

Apply the finish coat, using a 12" box for flat joints, and a 2"-3" corner finisher (attached to the corner pump or angle applicator) for inside corners.

Apply a finish coat to fasteners.

Scrape away excess compound and fill in voids using a hand knife. Sand as needed.

### Alternative Method (Banjo)

The banjo offers an alternative finishing method that is especially good for small jobs.

First, apply tape and compound to joints using the banjo.

Before applying subsequent coats, fill fastener depressions using hand knife or nail spotter.

When the taping coat has dried, apply a fill coat of compound using hand tools. Allow to dry and sand lightly.

Apply a final coat of compound using a 12" box for flat joints and a 3" corner finisher (attached to corner pump or angle applicator) for inside corners.

Scrape away excess compound and fill in voids using a hand knife. When compound is dry, sand lightly as needed.

## 7 Maintenance and Cleanup

Never permit setting-type compound to harden inside a tool; this will make the tool difficult or impossible to clean. Water does not prevent the chemical hardening of setting-type compounds. For drying type compound, if you will not be using a tool for more than 5 minutes, place it in a bucket of water. Keeping tools clean is important, because dried material built up on and inside tools will hinder their operation. Keep moving parts on mechanical tools lubricated with oil. Blades on these tools are replaceable, and need to be changed regularly. For specific instructions on maintenance, consult the tool manufacturer's recommendations.

Use of cleaning station equipment makes the cleaning of mechanical drywall tools quicker and easier, particularly when setting-type compounds are used. USG offers SHEETROCK™ Cleanser (available through the cleaning station manufacturer) to aid in the cleansing process.

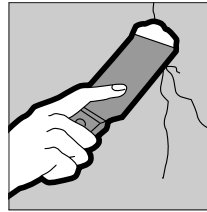
## Repairing Damaged Panels

### 1 Patching Dents, Holes, Popped Nails and Cracks

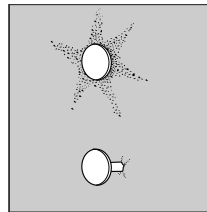
- a To repair a dent, sand and then fill with lightweight setting-type joint compound. Let harden. Add second coat if necessary. Sand and prime when dry.



- b To repair a small hole or crack, wipe area clean. Fill with lightweight setting-type joint compound, using a putty knife. Let harden. Add second coat if necessary. Sand and prime when dry.

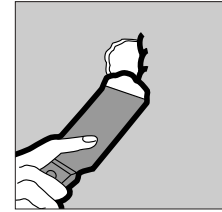


- c To repair a popped nail, drive and dimple new nail 1-1/2" from popped nail. Drive and dimple popped nail. Cover with lightweight setting-type joint compound. Sand and prime when dry.

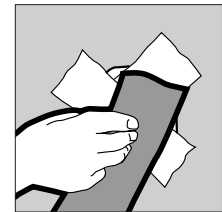


### 2 Patching Medium Holes

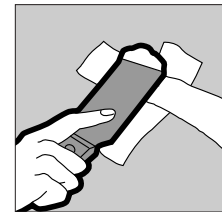
- a Apply generous amounts of lightweight setting-type joint compound around edges and coat the perimeter of hole.



- b Crisscross two or three strips of joint tape over opening and embed tape in joint compound. Let harden.

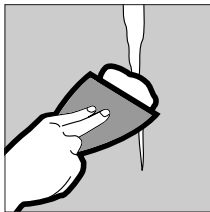


- c Apply coat of joint compound over taped area. Let harden and apply second coat; sand and prime when dry.

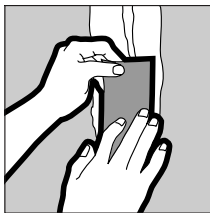


### 3 Repairing Large Cracks (approx. 1/8")

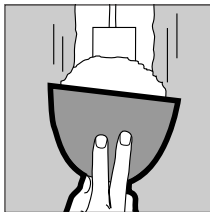
- a Apply compound to crack with 5" finishing knife.



- b Embed tape in compound to bridge crack. Draw knife firmly over crack to tightly embed tape. Let compound harden.



- c Apply compound over tape with knife. Let harden and apply second coat of compound if necessary. Sand and prime when dry.



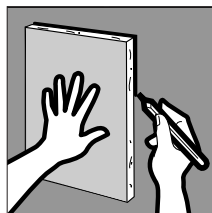
### 4 Repairing Stress Cracks

Cracks in drywall are usually caused by movement in the underlying structure. These cracks generally radiate out from door and window openings. At times, such cracks will reoccur after they have been filled with joint compound. In this situation, the use of a flexible sealant (such as SHEETROCK® Brand Acoustical Sealant) is recommended.

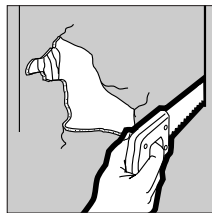
- a Clean the loose material from the stress crack.  
b Fill with SHEETROCK Brand Acoustical Sealant.  
c Retexture and repaint.

### 5 Repairing Large Holes (over 2") or Water-Damaged Areas

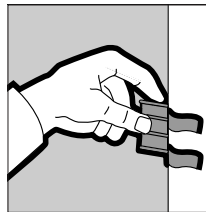
- a Cut a piece of new drywall that is slightly larger than the damaged area. Hold this replacement section of drywall over the area to be repaired and trace around it with a pencil.



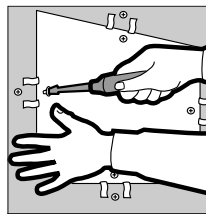
- b Cut out damaged panel section using the outline you have traced. Use a utility knife along the studs and a keyhole saw between the studs. Remove section with a hammer and remove old screws or nails.



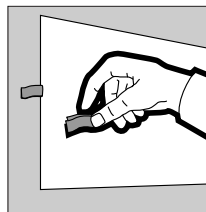
- c Slip drywall repair clips onto the edge of the damaged wall. Position screws about 3/4" in from the edge and centered between the tabs. This will line up the screws with perforations in the clips. Screw through wall into each drywall repair clip.



- d Place new piece of drywall into place and hold it firmly against the drywall clips. Screw through new drywall into each drywall repair clip, positioning screw opposite the screw holding the clip in place and about 3/4" from edge.

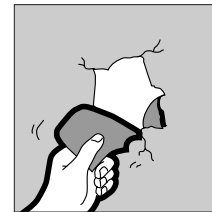


- e Remove tabs from each drywall repair clip. Apply compound and tape to all four section sides. Do not overlap tape. Apply second and third coats of joint compound, allowing each coat to harden before applying next coat and feathering out from previous coats. Sand and prime when dry.

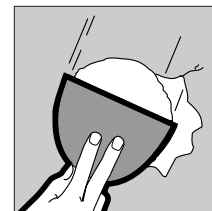


### 6 Torn Gypsum Panel Face Paper

Peel and remove loose face paper.



Apply a skim coat of joint compound with a joint-finishing knife to damaged area and feather to get a smooth finish. Let dry and apply second coat if necessary. Sand and prime when dry.



## Tips for Successful Finishing

- Drywall should be clean of foreign material (such as drywall dust) prior to application of tape and joint compound. Tape and joint compound applied over dusty surfaces will not adhere adequately to the drywall paper. This can result in joint cracking and tape delamination.
- Mix joint compound according to bag directions. Joint compound consistency greatly affects the joint strength of the finished system. Overthinning of the joint compound can cause joint cracking.
- The set time of the joint compound is affected by mix consistency, mixing time, and water temperature. A loose initial mix of the joint compound and/or the use of cold water will lengthen set time. A heavier initial mix and/or the use of hot water will shorten the joint compound set time. Excessive drill-mixing of setting-type joint compounds will also cause compound to set more quickly.
- Push joint compound through mesh tape. Inadequate contact of the compound to the drywall surface will result in cracking of the joint or delamination of tape from the drywall.
- Joint compound should be allowed to set prior to force drying with fans or heaters. Force drying of the joint compound prior to set will result in strength loss, delayed shrinkage, and starved appearance at the joint.
- Allow the joint compound to set prior to application of vapor barrier and texture. Application of the vapor barrier prior to setting of the joint compound will retard the setting of the joint compound and contribute to joint cracking.
- Keep application tools clean. Small pieces of dry compound or texture can dislodge from the tools and prevent smooth application of the compound.
- Keep mixing equipment clean. Set compound from previous batches of material will cause the new batch to set more quickly. This will reduce working time available and can lead to wasted material.

## Problems and Remedies

### Joints—Center Cracking

*Cause:* Abnormal stress buildup resulting from structural deflection or racking.

*Remedy:* Relieve stress. Provide adequate isolation and retape, feathering joint compound over broad area to disguise buildup.

*Prevention:* Provide proper isolation from structure to prevent stress buildup. Use a setting compound that hardens before the assembly is moved from the finishing station.

*Cause:* Joint compound applied over dusty surfaces.

*Remedy:* Remove loose tape and compound. Retape area, feathering joint compound over broad area to disguise buildup.

*Prevention:* Clean drywall of foreign material (such as drywall dust) prior to application of tape and joint compound. Tape and joint compound applied over dusty surfaces will not adhere adequately to drywall paper. Joint cracking and tape delamination may result.

*Cause:* Joint compound overthinned.

*Remedy:* Retape area, feathering joint compound over a broad area to disguise buildup.

*Prevention:* Mix joint compound according to bag directions. Joint compound consistency greatly affects the joint strength of the finished system. Overthinning of the joint compound can cause joint cracking.

*Cause:* Joint compound not pushed through mesh tape; compound not in contact with drywall.

*Remedy:* Remove tape and loose compound if necessary. Retape area, feathering joint compound over a broad area to disguise buildup.

*Prevention:* Make sure compound pushes through mesh tape and is in contact with drywall. Overlap runs when boxing to ensure contact of compound with drywall.

*Cause:* Setting-type joint compound force dried prior to setting.

*Remedy:* Remove tape and loose compound if necessary. Retape area, feathering joint compound over a broad area to disguise buildup.

*Prevention:* Allow joint compound to set prior to force drying with fans or heaters. Force drying of the joint compound prior to set will result in strength loss.

*Cause:* Joint compound not allowed to set prior to application of vapor barrier and texture. Application of vapor barrier prior to setting action of joint compound can retard the set of the compound dramatically.

*Remedy:* Scrape off any unset joint compound. Retape area, feathering joint compound over a broad area to disguise buildup.

*Prevention:* Allow joint compound to set prior to application of vapor barrier and texture. This will ensure the highest possible wet strength.



## Problems and Remedies

### Joints—Corner Cracking

*Cause:* Too much compound applied over tape at apex of angle.

*Remedy:* After compound is completely dry, smooth out excess compound at apex. Fill only hairline cracks with compound. Do not apply additional compound, which will build up.

*Prevention:* Keep excess compound from corner, leaving only a small amount of compound—or none—in apex.

*Cause:* Slitting or scoring reinforcing tape during application. May result from use of improper tool.

*Remedy:* If crack extends through tape, retape and finish.

*Prevention:* Use proper tool for corner treatment.

### Joints—Shadowing

*Cause:* Underfilled joint during application or delayed shrinkage (shadow on the joint centerline).

*Remedy:* Remove texture and fill joint flush with the board surface with lightweight setting compound. Prime and retexure or repaint.

*Prevention:* Review application process. Ensure that adequate compound is applied to make the joint flush with the board surface. Use a setting compound with a shorter set time to eliminate delayed shrinkage.

*Cause:* Crowned joint—excessive compound application above the surface of the gypsum panel (shadow to the side of the board taper).

*Remedy:* Remove texture; apply setting-type joint compound to both sides of the joint to feather out the bulge over 18 inches or more. Retexure and repaint.

*Prevention:* Review application

process. Check tools for excessive bowing or knife edge wear. Leave compound flush with the board surface.

*Cause:* Thin line of compound bulging out over the center of the joint (narrow shadow to one side of joint centerline).

*Remedy:* Remove texture (try to scrape down the high spot if possible) and feather out the ridge over 10". Retexure and repaint.

*Prevention:* This condition is called "hydraulic ridging," and results when the applicator tries to fill the board taper in one pass when there is a gap between the underlying panels. The ridge forms behind the taping tool during application. If gaps occur between gypsum panels during assembly, prefill these gaps with quick-setting compound. Allow the compound to harden before filling the board taper.

### Texture Finishes—Mixing

*Problem:* Lumping of wet mix.

*Cause:* Too much water added to initial mix, making lumps difficult to break up, and/or material that has remained unmixed below the level of the mixer shaft.

*Prevention:* Initial mix should use 2 to 2-1/2 gallons of water per bag, less than the total water recommended. After mixing to a lump-free consistency, let material soak for the recommended time, then add remaining water.

*Problem:* Slow solution time.

*Cause:* Insufficient soaking time and/or use of very cold water.

*Prevention:* Allow materials to soak for an extended period after the initial mix, especially in cold water. Always use drinkable, room temperature water (at least 55 °F).

*Problem:* Mix wet or too thin.

*Cause:* Overdilution and/or excessive water used during the initial mix. Also, insufficient soak time in cold water (this can delay thickening, giving the user a false impression of low viscosity).

*Prevention:* Use recommended amount of water to ensure proper consistency. Allow materials to soak for an extended period when using cold water.

### Texture Finishes—Application

*Problem:* Excessive aggregate fallout.

*Cause:* Excessive air pressure at nozzle and/or holding spray gun too close to surface being sprayed.

*Prevention:* Use proper spray pressure for type of material to be sprayed. Hold spray gun at a proper distance (4 ft. minimum) from the surface to prevent excessive bounce and fallout of aggregate.

*Problem:* Flotation of aggregate.

*Cause:* Overdilution of mix and/or lack of mixing after water is added to control consistency.

*Prevention:* Add the correct amount of water as directed on the bag to ensure the proper suspension of materials in the mix. Make certain that water is blended thoroughly into the mix.

*Problem:* Poor coverage (mileage) with spray finishes.

*Cause:* Not enough water being added to bring texture material to proper spray viscosity and/or improper application, such as moving spray gun too slowly, overloading spray surface, or using incorrect spray pressures and/or spray gun adjustment.

*Prevention:* Add proper amount of

water as directed on bag. Use correct spray gun pressures and application technique to ensure uniform texture with optimum coverage.

*Problem:* Poor hide.

*Cause:* Overdilution of mix, causing reduction in wet and dry hiding power. Insufficient water in spray finishes causes poor material atomization, resulting in surface show-through. Also can be caused by overextending material, choosing incorrect spray pressures, or moving the spray gun too fast.

*Prevention:* Use the proper amount of water as directed on bag. Use correct spray gun pressures and application technique to ensure uniform texture. Crosshatch the spray pattern for an even appearance, and to fill in all voids.

*Problem:* Poor bond or hardness.

*Cause:* Overdilution of job mix results in thinning out of binder in the texture. Contamination or intermixing with other materials can destroy bond power.

*Prevention:* Add proper amount of water as stated in the bag directions. Always use clean mixing vessel and water. Never intermix with other products or additives, except those recommended by the manufacturer.

*Problem:* Unsatisfactory texture pattern.

*Cause:* Improper spray pressures, air/material mix, or worn spray equipment (fluid or air nozzle). Also, improper spray consistency of mix or improper spraying technique.

*Prevention:* Use recommended amount of water to ensure proper spraying consistency. Check and

adjust air/material mix and fluid and air nozzles. Use proper equipment and application techniques to achieve the best results. Make sure equipment is in good working condition; replace when necessary.

*Problem:* Unsatisfactory pumping properties.

*Cause:* Mix is too heavy; pumping equipment is worn, or of insufficient size or power.

*Prevention:* Use recommended amount of water to ensure proper spraying consistency. Use equipment recommended by the manufacturer that is matched for the area to be sprayed. Make sure equipment is in good working condition; replace when necessary.

*Problem:* Texture buildup.

*Cause:* Texture applied over high suction joint (surface not primed); allowing too much time between roller, brush, or spray application and hand-texturing operation. Overdiluted texture will produce texture buildup over a joint.

*Prevention:* Prime the entire surface with SHEETROCK Brand First Coat or an interior flat latex paint having a high solids content. Use the correct amount of water when mixing the texture material. In hand-texturing operations, allow for time between application and final texturing steps.

*Problem:* Poor color match, ceiling and sidewall.

*Cause:* Overspray on ceilings when walls are sprayed with a different texture or with paint products from different manufacturers.

*Prevention:* Be careful not to allow overspray of paint products. In all drywall homes, paint ceilings and

walls with the same brand of finish paint.

### Finished Surface

*Problem:* Joint show-through.

*Cause:* Overthinned or inadequate coverage with texturing material will not hide the normal contrast between the joint compound and the gypsum panel surface. Texturing over an unprimed substrate can also result in joint show-through.

*Prevention:* Use correct amount of water when mixing texture material and apply at recommended rate of coverage until joint is concealed. Prior to texturing, prime entire surface with SHEETROCK Brand First Coat or an interior flat latex paint having a high solids content.

*Problem:* White joint banding over gypsum panel substrate.

*Cause:* High suction joint causes a porosity variation, which often appears lighter in color than the gypsum panel surface.

*Remedy:* Allow texture to dry completely, and paint entire surface.

*Prevention:* Prior to initial decorating, prime the entire surface with SHEETROCK Brand First Coat or an interior flat latex paint having a high solids content.

*Problem:* Joint darkening.

*Cause:* Application over damp joint compound, especially in cold, humid conditions.

*Remedy:* Allow texture to dry completely, and paint entire surface.

*Prevention:* Allow joint treatment to dry completely, then prime the entire surface with SHEETROCK Brand First Coat or an interior flat latex paint having a high solids content.

## Basic Cautions

- The hardening action of setting-type joint compounds cannot be delayed or prevented by dilution with water.
- Joint compounds and textures should not be applied over moist surfaces or surfaces likely to become moist, on below-grade surfaces, or on surfaces projecting to the outside of the structure, unless protected from direct exposure to moisture.
- SHEETROCK MH Brand Setting-Type Joint Compound (TUF-SET) is very difficult to sand smooth after drying. Smooth it before it hardens, or while it is in a hardened but still-damp state. Where better sanding ability is required, use SHEETROCK MH Brand Lightweight Setting-Type Joint Compound (TUF-SET Lite).
- Water-based finishes may result in sagging of gypsum board ceilings under these conditions: high heat and humidity, cold damp conditions, improper ventilation and/or board application to framing, and insufficient board thickness for span between supports.
- All finishing materials must be dry prior to sealing the units, or, where required, prior to removing ventilation and supplemental heat. Failure to do this will result in board sag, surface defects, and weak joints.
- Excessive water dilution of texture finishes causes check cracking, poor bond, and lack of hide.
- Do not intermix texture finishes with any products except those approved by the manufacturer.
- Application of texture products over unprimed, improperly prepared, or incompletely dried surfaces may cause discoloration problems.
- Unless texture finishes are applied at the recommended coverage rate, check cracking from excessive thickness or poor hide from too thin a coating can occur.
- When applying joint compounds and texture finishes, maintain minimum air, water, mix, and surface temperature of 55 °F (13 °C) until dry.
- Failure to protect stored joint compounds and texture finishes from temperature extremes, moisture, and free water can cause material to become unusable.
- Failure to rotate stock of joint compounds and texture finishes causes material to age. Use of aged material may produce erratic results.
- Follow good safety and industrial hygiene practices during handling and installing of all products and systems. Take necessary precautions and wear the appropriate personal protective equipment as needed. Read material safety data sheets and related literature on products before specification and/or application.

## Glossary of Terms

**Additive**—Any substance added in small quantities to improve the performance properties desired in joint compound and texture products.

**Adhesion**—The bonding forces between two surfaces.

**Aggregate**—Inert granular material, such as polystyrene, perlite, pumice, or sand, used to create an aesthetic effect in texture finishes.

**All-Purpose Compound**—A joint compound that is suitable for use in all joint treatment applications.

**Atomization**—Breaking up of material at the spray gun tip/orifice.

**Banding**—Also called “photographing,” “striping,” “tracking,” etc. When dry, the area over the joint is a different color from that of the field area. Usually caused by a difference in porosity between the joint compound and the gypsum board.

**Binders**—Raw materials that bind, cement, or hold a joint compound or texture product together, while promoting adhesion of the product to the surface on which it is applied.

**Break Down**—(1) How well a material mixes into a homogeneous, lump-free mixture. (2) Loss of consistency or viscosity.

**Cohesion**—Forces that bind the particles within a product or a surface.

**Compatibility**—Ability of one product or surface to mix with or adhere properly to another.

**Coverage**—The amount of surface area covered by a particular product, usually described in square feet per pound. Also known as mileage or yield.

**Cracking**—Generally, the splitting of a film surface. The following terms are used to denote the nature and extent of this defect:

*Hair Cracking:* Very fine surface cracks that do not penetrate the top coat, and occur erratically and at random.

*Check Cracking:* Fine surface cracks and breaks that do not penetrate to the underlying surface, and are distributed over the surface, giving the semblance of a fine pattern.

*Craze Cracking:* resembles check cracking, but the cracks and breaks are broader and deeper.

*Alligator/Crocodile Cracking:* A drastic type of craze cracking that produces a pattern resembling the hide of an alligator or crocodile.

*Mud Cracking:* A severe condition characterized by a broken network throughout the surface, and which has penetrated to the substrate.

**Cratering**—The formation of small bowl-shaped depressions in a texture or paint film.

**Drag**—Also “ragging” or “tearing.” When wiping material with a trowel or broad knife, the material pulls and sticks on the tool, leaving a torn, rough edge or surface.

**Dry Hide**—Ability of material to visually hide a substrate when dry.

**Drying Time**—Period of time required for all water to evaporate from a product.

**Drying-Type**—Refers to joint compounds that contain water. These compounds must be used with paper joint tape, and allowed to dry completely for full strength to be achieved.

**Dryness**—Degree of change as a liquid-containing product becomes a solid material, due to the evaporation of the liquid from the product. Various stages of drying are described by the qualifying terms used below.

*Dust Dry:* When dust no longer adheres to the surface.

*Hard Dry:* When drying has reached the stage at which a subsequent coat of the same material can be applied.

*Surface Dry:* When a product is dry on the surface but is wet, soft, or tacky underneath.

*Touch Dry:* When a very slight pressure with the fingers does not leave a mark or reveal stickiness.

*Tack Free:* Free from stickiness, even under pressure.

*Dry to Handle:* When the product is sufficiently hardened to be handled without damage.

**Edge-Crack Resistance**—Ability of finished joint compound to resist cracking along the edges of the reinforcing tape.

**Feathering**—Process of smoothing the outermost edge of the joint compound during application.

**Flat Spots**—Areas of an aggregated surface having a lesser amount of aggregate.

**Functional Filler**—Inert material used as a bulking agent to add body in joint compound and texture products.

**Halo**—Texture pattern that leaves a different color or appearance around the perimeter of a ceiling.

**Holidays**—Also called “voids.” Skipped or missed areas that are left uncoated.

**Latex**—Originally a natural rubber emulsion, the term “latex” now applies to a stable dispersion of a polymer substance in an aqueous medium.

**Melt Back**—Shrinkage or softening/rounding of a spray texture pattern.

**Mix Life**—Also “wet life” or “pot life.” Length of time a powder-type joint compound or texture product will be usable after being mixed.

**Mixability**—Ease of mixing of powder-type products.

**Powder-Type**—Dry products that are mixed with water prior to use.

**Racking**—Forcing out of plumb of structural components, usually by wind, seismic stress, or thermal expansion/contraction.

## Glossary of Terms

**Ready-Mixed**—Wet products (that is, factory made) that are premixed and ready to use.

**Sandability**—Ease of sanding to a smooth finish.

**Set Time**—Period of time required for chemically setting-type compounds to become hard/stiff.

**Setting-Type**—Refers to joint compounds that harden by chemical action. These compounds permit faster finishing, and may be used over self-adhesive fiberglass joint tape.

**Shelf Life**—Length of time a dry powder or ready-mixed product can be stored.

**Shrinkage**—A depression in a surface caused by the evaporation of the volatile portion of a product.

**Slip**—Ease of application having low resistance for tool drag.

**Spray Rig**—Term describing a complete texture spray system, including the mixer, pump, compressor, and spray gun.

**Stability**—Uniformity of product over time and despite changes in environmental conditions.

**Surging**—Not pumping material at a steady rate.

**Taping Compound**—Special joint compound for embedding tape and for the first coat over the tape.

**Tear Drops**—Spherical spray texture droplets or spatters that have run slightly, resulting in a tear-drop appearance.

**Topping Compound**—Special joint compound for finishing coats over a taped joint.

**Vapor Retarder**—Material used to retard the flow of water vapor through walls and other spaces where this vapor may condense at a lower temperature.

**Volatile**—Materials that will evaporate.

**Wet Hide**—Ability of material to visually hide a substrate when wet.

**Wet Tack**—Ability of wet joint compound to stay in place on surface and tools during application.

## Sales Offices

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**United States Gypsum Company**  
125 South Franklin Street  
P.O. Box 806278  
Chicago, IL 60680-4124  
A Subsidiary of USG Corporation

**(800) USG-4YOU (874-4968)**  
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