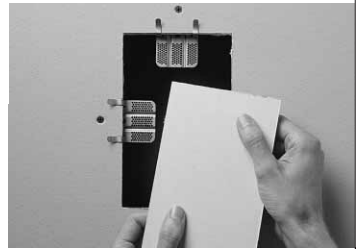


Problems, Remedies & Preventive Measures



Chapter 11 discussed problems associated with gypsum construction, many of which are beyond the control of contractors working from construction documents.

Other problems, resulting from improper job conditions and application practices, are the direct responsibility of the contractor and are controllable. In this chapter these problems as well as corrective remedies and preventive measures are discussed.

Drywall Construction

Almost invariably, unsatisfactory results show up first in the areas over joints or fastener heads. Improper application of either the board or joint treatment may be at fault, but other conditions existing on the job can be equally responsible for reducing the quality of the finished gypsum board surface.

To help determine the cause of a problem, what follows is a physical description of each defect along with a discussion of the factors causing unsatisfactory results. Also provided is a checklist that identifies possible causes for the irregularity as well as an index to the numerically listed problems, causes, remedies and preventions. By checking each numerical item listed for the defect, the exact problem cause can be determined and corrected.

Note that, because the proper installation procedures for FIBEROCK Brand products sometimes vary from the procedures used to install conventional drywall panels and gypsum base, the problems and remedies will vary as well. See the most current literature on FIBEROCK Brand Panels for recommendations to avoid installation problems.

Description of Defect

Fastener Imperfections A common defect, which takes on many forms. May appear as darkening, localized cracking; a depression over fastener heads; pop or protrusion of the fastener or the surface area immediately surrounding the fastener. Usually caused by improper framing or fastener application.

Joint Defects Generally occur in a straight-line pattern and appear as ridges, depressions or blisters at the joints, or darkening over the joints or in adjacent panel areas. Imperfections may result from incorrect framing or joint treatment application, or climatic conditions if remedial action has not been taken.

Loose Panels Board does not have tight contact with framing, rattles when impacted or moves when pressure is applied to the surface. Caused by improper application of panels, framing out of alignment or improper fastening.

Joint Cracking Appears either directly over the long edge or butt ends of boards, or may appear along the edge of taped joints. Often caused by structural movement and/or hygrometric and thermal expansion and contraction, or by excessively fast drying of joint compounds.

Field Cracking Usually appears as diagonal crack originating from a corner of a partition or intersection with structural elements. Also seen directly over a structural element in center of a partition. May originate from corners of doors, light fixtures and other weak areas in the surface

created by the penetration. Caused by movement described previously. Also, see Door and Window Openings on page 86 for use of control joints to minimize cracking.

Angle Cracking Appears directly in the apex of wall-ceiling or interior angles where partitions intersect. Also can appear as cracking at edge of paper reinforcing tape near surface intersections. Can be caused by structural movement, improper application of joint compound in corner angle or excessive build-up of paint.

Bead Cracking Shows up along edge of flange. Caused by improper bead attachment, faulty bead or joint compound application.

Wavy Surfaces Boards are not flat but have a bowed or undulating surface. Caused by improper board fit, misaligned framing, hygrometric or thermal expansion. Also see Handling and Storage on page 94 and Chapter 13 for proper procedure to keep boards flat before installation.

Board Sag Occurs in ceilings, usually under high-humidity conditions. Caused by insufficient framing support for board; board too thin for span; poor job conditions; improperly installed or mislocated vapor retarder; use of unsupported insulation directly on ceiling panels; or improperly fitted panels. Refer to appropriate chapters for proper job ventilation, storage and frame spacing, particularly with water-based texture finishes.

Surface Defects Fractured, damaged or crushed boards after application may be caused by abuse or lumber shrinkage. Also, see Discoloration below.

Discoloration Board surface has slight difference in color over joints, supports or fasteners. Caused by improper paint finishing, uneven soiling and darkening from aging or ultraviolet light.

Water Damage Stains, paper bond failure, softness in board core or mildew growth are caused by sustained high humidity, standing water and improper protection from water leakage during transit and storage. See page 94 and Chapter 13 for proper handling, storage and environmental conditions.

Checklist for Drywall Problems

To find the specific cause for a problem described above, check, on the following pages, all numerical references listed in the particular category.

Fastener imperfections	5, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18
Joint defects	1, 5, 6, 7, 11, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31
Loose panels	5, 8, 9, 10, 12, 13, 14, 15, 16, 17, 18
Joint cracking	5, 9, 20, 21, 22, 26
Field cracking	6
Angle cracking	20, 22
Bead cracking	20
Wavy surfaces	5, 8, 22
Board sag	5, 7, 14
Surface defects	2, 6, 28, 29, 30, 31
Discoloration	27, 28, 29, 30
Water damage	2, 4

Drywall Panel Problems

1. Panels— Damaged Edges

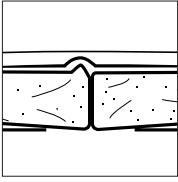


Fig. 1

Cause: Paper-bound edges have been damaged or abused; may result in ply separation along edge or in loosening of paper from gypsum core, or may fracture or powder the core itself. Damaged edges are more susceptible to ridging after joint treatment (Fig. 1).

Remedy: Cut back any severely damaged edges to sound board before application.

Prevention: Avoid using board with damaged edges that may easily be compressed or can swell upon contact with moisture. Handle gypsum panels with reasonable care.

2. Panels— Water-Damaged

Cause: During transit or storage, water has damaged panels from heavy rain, floods, broken pipes, etc. Water-damaged panels may be subject to scuffing and may develop paper bond failure or paper delamination from the gypsum core after application. They also may easily warp and deform. Dissolved glue from bundling tapes may damage board faces and cause them to stick together. If stored wet, may be subject to mould. Prolonged soaking or exposure to water can soften gypsum core and destroy bond of the paper to the core.

Remedy: The amount of water exposure and the length of time exposed are both critical factors in preventing excessive losses. As soon as possible, dry wet board completely before using. Moisture damage delamination should not be present after thorough drying. Paper that is not totally bonded when the panel is moist often will reestablish its bond when panel is completely dry. If delamination exists after thorough drying, remove loose paper and patch area with SHEETROCK Brand, DURABOND, SYNKO FAST-SET or PRO-SET Setting-Type Joint Compounds. Replace board if there is extensive loose paper. Handle board cautiously and re-pile with bundles separated by spacer strips of gypsum board. Check incoming board for water stains or dampness. Protect carefully during shipment and storage. Do not erect damp panels; this may result in paper bond failure. Replace boards that have soft cores.

Prevention: Protect from high moisture conditions of any kind.

3. Panels— Paper Delamination

Cause: Manufacturing conditions, water damage.

Remedy: Manufacturing conditions or water damage causing delamination often can be treated as above. If board is received on job with paper delaminating, inspect delivery to determine extent of damage. Do not install or finish prior to contacting a CGC representative. If delamination is minor, peel back paper to where it soundly bonds to board and treat with joint compound (ready-mix or setting-type).

Prevention: Protect from water damage.

4. Panels— Mould

Cause: Mould can occur on almost any surface. Gypsum panels that have become wet for any reason are susceptible to possible mould growth if not dried quickly, usually within 48 hours.

Remedy: Ordinary soap and water may be used to clean minor affected surfaces. Proper ventilation and/or heat should be used to thoroughly dry the affected area. Remove and dispose of panels with excessive mould growth. See Chapter 13 for more information on dealing with mould growth. Mould growth may occur again if proper conditions are not maintained.

Prevention: Keep gypsum panels and the job site area as dry as possible to prevent mould spores from blooming.

**5. Panels—
Improperly
Fitted**

Cause: Forcibly wedging an oversize panel into place bows the panel and builds in stresses preventing it from contacting the framing (Fig. 14, page 352). The result: following fastening, a high percentage of fasteners on the central studs probably will puncture the paper. May also cause joint deformation.

Remedy: Remove panel, cut to fit properly and replace. Fasten panels so that the board hangs flat against framing without binding against previously installed panels or framing. Apply pressure to hold panel tightly against framing while driving fasteners.

**6. Panels—
Surface
Fractured After
Application**

a. **Cause:** Heavy blows or other abuse has fractured finished wall surface; too large a break for repair with joint compound.

Remedy 1: Cut a square-shaped section around damaged area with a utility knife or keyhole saw, (Fig. 2) then cut a plug of the same dimensions from a sound gypsum panel. Slip SHEETROCK Brand Drywall Repair Clips onto all four edges of the prepared hole and screw attach (Fig. 3). Mount replacement section and screw attach to clips (Fig. 4). Remove repair clip tabs (Fig. 5) and finish all four sides with joint tape and compound. Apply and feather out second and third coats, sand and prime.



Fig. 2

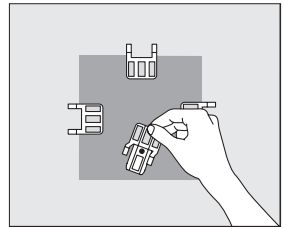


Fig. 3

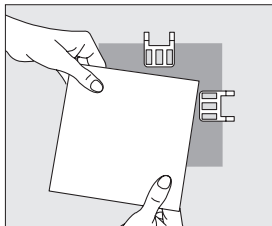


Fig. 4

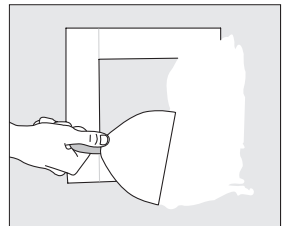


Fig. 5

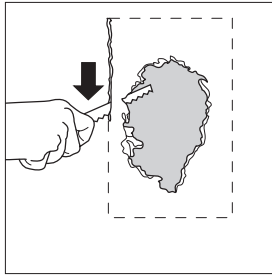


Fig. 6

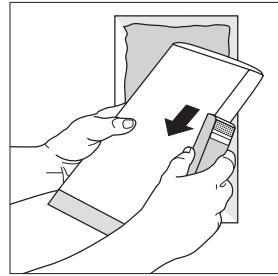


Fig. 7

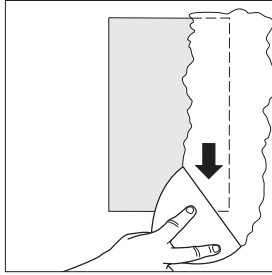


Fig. 8

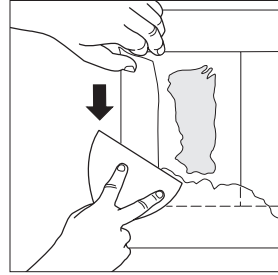


Fig. 9

Remedy 2: Cut a square-shaped or triangular section around damaged area, with a utility knife or keyhole saw (Fig. 6); use a rasp or sanding block to slope edges inward at 45°. Cut corresponding plug from sound gypsum panel, sand edges to exact fit (Fig. 7). Butter edges (Fig. 8) and finish as a butt joint with joint compound (Fig. 9).

Remedy 3: An alternate repair technique (sometimes referred to as “California patch,” “butterfly patch” or “hot patch”) involves cutting a corresponding plug approximately 38 mm (1-1/2”) wider and longer than the cutout in the wall. Next, score through the back paper and core, snap the core and then peel the core away from the face paper so that an overlapping section remains around the perimeter of the plug. The plug is then edged with joint compound and inserted into the damaged area, and the overlapping face paper is used in lieu of tape for finishing with joint compound. Although this may be an acceptable method for certain applications, it provides a repair which is weaker and more difficult to finish than the methods noted above, because the patch will remain above the existing plane of the wall or ceiling. Also, this technique should not be used to repair fire-rated walls.

- b. Cause:** Attaching panel directly to flat grain of wide-dimensional wood framing members such as floor joists and headers. Shrinkage of wood causes fracture of board.

Remedy: As above, where appropriate, or repair as for joint ridging.

Prevention: To provide a flexible base to allow for movement of framing, attach Resilient Channel to framing members and apply panels. Allow 12 mm (1/2”) space at bottom edges of board for movement. Or attach

board directly to studs but allow 6.4 mm (1/4") separation between panels, and install Zinc Control Joint No. 093 (see single-layer application on page 105).

- c. **Cause:** Knife scoring beyond corner of cutout for electrical boxes, light fixtures and door and window openings produces cracks in panel surface.

Remedy: Repair cuts with joint compound and tape before finishing.

Prevention: Stop score marks at corners, cut openings accurately.

- d. **Cause:** Abnormal stress buildup resulting from structural deflection or racking discussed previously.

Remedy: Relieve stress, provide adequate isolation and retape, feathering joint compound over board area to disguise buildup.

Prevention: Provide proper isolation from structure to prevent stress buildup.

- e. **Cause:** Excessive stresses resulting from hygrometric and/or thermal expansion and contraction discussed previously.

Remedy: Correct unsatisfactory environmental conditions, provide sufficient relief. Retape, feathering joint compound over board area.

Prevention: Correct improper job conditions and install control joints for relief in long partition runs and large ceiling areas (see pages 165-167).

7. Panels— Ceiling Sag after Installation

- a. **Cause:** Too much weight from overlaid insulation; exposure to sustained high humidity; vapor retarder improperly installed or wetting causes ceiling panels to sag after installation. Also caused by installing board that is too thin for framing space.

Remedy: Remove sagged board or fur ceiling using Resilient Channels; apply another layer of board. (Leveling of surface with joint compound, will not correct problems resulting from improper framing, unusual weight loads or recurring high moisture conditions.)

Prevention: Follow recommended frame spacing and attachment procedures and use recommended products only. Use SHEETROCK Brand Interior Ceiling Board, sag-resistant, where available. See "Ceiling Sag Precautions" on page 321.

- b. **Cause:** Water-based textures wet face paper and weaken gypsum core, causing ceiling panels to sag after installation.

Remedy: Same as above.

Prevention: See Chapter 3 for proper frame spacing and application procedures. See "Ceiling Sag Precautions" on page 321.

Framing Problems

8. Framing— Members Out of Alignment

Cause: Due to misaligned top plate and stud, hammering at points "X" (Fig. 10) as panels are applied on both sides of partition will probably result in nailheads puncturing paper or cracking board. Framing members more than 6 mm (1/4") out of alignment with adjacent members make it difficult to bring panels into firm contact with all nailing surfaces.

Remedy: Remove or drive in problem fasteners and only drive new fasteners into members in solid contact with board.

Prevention: Check alignment of studs, joists, headers, blocking and plates before applying panels, and correct before proceeding. Straighten badly bowed or crowned members. Shim out flush with adjoining surfaces. Use adhesive attachment.

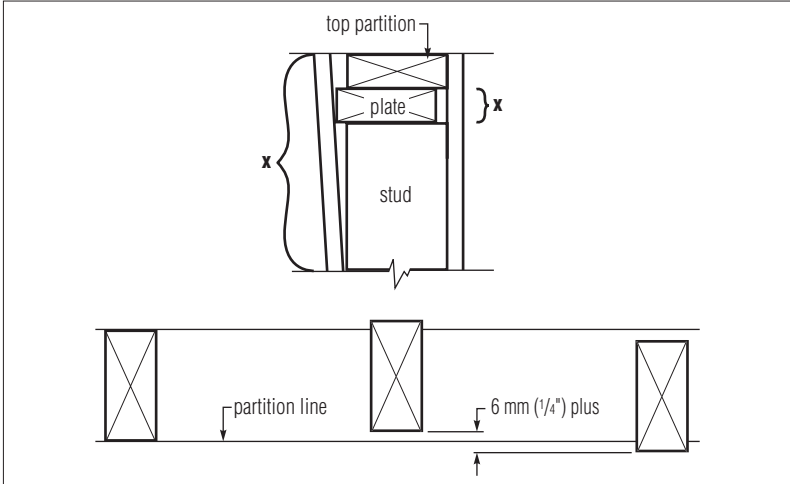


Fig. 10

**9. Framing—
Members
Twisted**

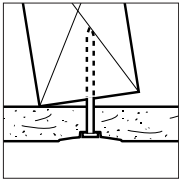


Fig. 11

Cause: Framing members have not been properly squared with plates, presenting angular nailing surface (Fig. 11). When panels are applied, there is danger of puncturing paper with fastener heads or of reverse twisting of member as it dries out, with consequent loosening of board and probable fastener pops. Warped or wet dimension lumber may contribute to deformity.

Remedy: When moisture content in framing has stabilized after one heating season, remove problem fasteners and re-fasten with carefully driven Type W screws.

Prevention: Align all twisted framing members before board application. Also, see wood framing requirements on page 65.

**10. Framing—
Protrusions**

Cause: Bridging, headers, fire stops or mechanical lines have been installed improperly so as to project beyond face of framing, preventing panels from contacting nail surface (Fig. 12). Result will be loose board, and fasteners driven in area of protrusion will probably puncture face paper.

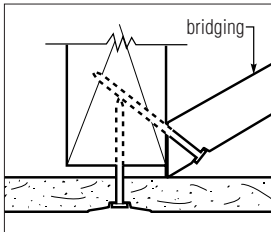


Fig. 12

Remedy and Prevention: Same as for Framing—Members Twisted, above.

11. Framing (Steel)—Panel Edges Out of Alignment

Cause: Improper placement of steel studs or advancing in the wrong direction when installing panels can cause misalignment of panel edges and give the appearance of ridging when finished.

Remedy: Fill and feather out joint with joint treatment.

Prevention: Install steel studs with all flanges pointed in the same direction. Then install panels by advancing in the direction opposite the flange direction (Fig. 13).

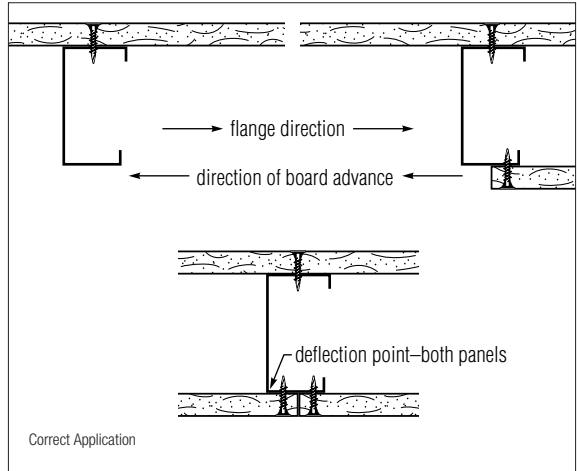


Fig. 13

Fastener Problems

12. Fasteners—Puncturing of Face Paper

Cause: Poorly formed nailheads, careless nailing, excessively dry face paper or soft core, lack of pressure during fastening. Nailheads that puncture paper and shatter core of panel (Fig. 15) have very little grip on board.

Remedy: Remove improperly driven fastener, hold panel tightly to framing and properly drive new fastener.

Prevention: Correction of faulty framing (see previous Framing Problems) and properly driven nails produce tight attachment with slight uniform dimple (Fig. 16). Nailhead bears on paper and holds panel securely against framing member. Use proper fastener or adhesive application. Screws with specially contoured head are best fastener known to eliminate cutting and fracturing. If face paper becomes dry and brittle, its low moisture content may aggravate nail cutting. Raise moisture content of board and humidity in work area.

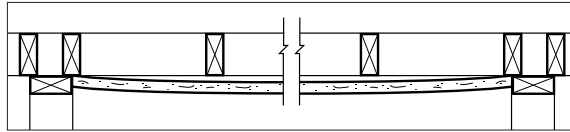


Fig. 14

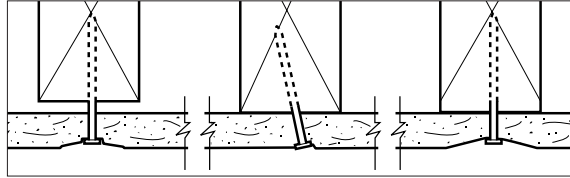


Fig. 15

Fig. 16

13. Fasteners— Nails Loosened by Pounding

Cause: Applying panels to the second side of a partition can loosen nails on opposite side (lack of hand pressure during fastening). Particularly true when lightweight, soft lumber, undersized studs or furring are used.

Remedy: Check panels for tightness on the partition side where panels were first applied. If looseness is detected, strike each nailhead an additional hammer blow, being careful to not overdrive the nail.

Prevention: Use proper framing. Type W screws or adhesive application.

14 Fasteners— Unseated Nails

Cause: Flexible or extremely hard framing or furring does not permit nails to be properly driven. May result from undersized framing members, type of wood used, supports that exceed maximum allowable frame spacing or lack of hand pressure during fastening.

Remedy: Replace nails with 32 mm (1-1/4") Type W screws.

Prevention: Use proper framing (see Chapter 2), Type W screws or adhesive application. Apply pressure to hold panel tight against framing while driving fasteners.

15. Fasteners— Loose Screws

Cause: Using the wrong type screw for the application or an improperly adjusted screw gun results in a screw stripping or not seating properly.

Remedy: Remove faulty fastener and replace with a properly driven screw.

Prevention: Use screws with combination high/low threads for greater resistance to stripping and pullout; set screw gun clutch to proper depth.

16. Fasteners— Nail Pops From Lumber Shrinkage

Cause: Improper application, lumber shrinkage or a combination of both. With panels held reasonably tight against framing member and with proper-length nails, only severe shrinkage of the lumber normally will cause nail pops. But if nailed loosely, any inward pressure on panel will push nailhead through its thin covering pad of compound. Pops resulting from 'nail creep' (movement of nail resulting from lumber

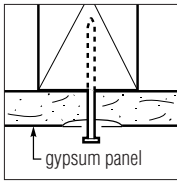


Fig. 17

shrinkage) occur when shrinkage of the wood framing exposes nail shank and consequently loosens panel (see Lumber Shrinkage on pages 333-334).

Remedy: Repairs usually are necessary only for pops which protrude 0.13 mm (0.005") or more from face of board (Fig. 17). Smaller protrusions may require repair if they occur in a smooth gloss surface or flat-painted surface under extreme lighting conditions. Those that appear before or during decoration should be repaired immediately. Pops that occur after one month's heating or more are usually caused wholly or partly by wood shrinkage and should not be repaired until near end of heating season. An often effective procedure for resetting a popped nail is to place a 100 mm (4") broad knife over the nail and hit with hammer to seat flush with surface. A more permanent method is to drive proper nail or Type W screw about 38 mm (1-1/2") from popped nail while applying sufficient pressure adjacent to nailhead to bring panel in firm contact with framing. Strike popped nail lightly to seat it below surface of board. Remove loose compound, apply finish coats of compound and paint.

Prevention: Proper nail application; use of lumber meeting framing requirements (see page 65); attachment with Type W screws or by adhesive application (see Chapter 3).

17. Fasteners— Panels Loosely Fastened

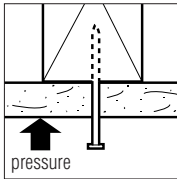


Fig. 18

Cause: Framing members are uneven because of misalignment or warping; lack of hand pressure on panel during fastening. Head of fastener alone cannot pull panel into firm contact with uneven members. Also, see Panels—Improperly Fitted.

Remedy: With nail attachment, during final blows of hammer, apply additional pressure with hand to panel adjacent to nail (Fig. 18) to bring panel into contact with framing.

Prevention: Correct framing imperfections before applying panels; for a more solid attachment, use 32 mm (1-1/4") Type W screws or use adhesive method (see Chapter 3). Apply pressure to hold panel tightly against framing while driving fasteners.

18. Fasteners— Bulge Around Fastener

Cause: Overdriving fasteners, driving them with the wrong tool or failing to hold board firmly against framing while driving fasteners can puncture and bulge face paper and damage core of board. Following application of joint compound or texture finish that wets the board paper can result in board bulging or swelling around fastener.

Remedy: Drive screw fastener close to damaged area, clean out damaged paper core, repair with DURABOND, SYNKO FAST-SET or sandable SHEETROCK 90 or SYNKO PRO-SET Setting-Type Joint Compounds, and refinish.

Prevention: Use correct tool and drive fasteners properly. Also, see Fasteners—Panels Loosely Fastened.

Joint Problems

19. Joints— Blisters in Tape

Cause: Insufficient or overly thin compound was used under the tape; tape was not initially pressed into good contact with the compound;

overly thick (dry) compound was used; or too much compound was forced from under tape by application of excessive tool pressure when embedding.

Remedy: Open up blistered area by slitting tape. Fill cut with joint compound and press tape back in place with knife blade. When dry, smooth to level finish.

Prevention: Provide sufficient compound under entire tape.

20. Joints— Edge Cracking

- a. **Cause:** After joint treatment, straight narrow cracks along edges of tape result from: too rapid drying because of high temperature accompanied by low humidity or excessive drafts; improper application, such as overdilution of joint compound; use of wrong compound (topping instead of taping); excessive joint compound under tape; failure to follow embedding with a thin coat over tape; or cold, wet application conditions, which also may cause poor bond.

This problem, difficult to see when it first occurs, may not be discovered until decoration begins. However, the cause can be attributed to some aspect of the taping operation.

Remedy: Especially under hot, dry and/or drafty conditions, carefully examine all joints after taping applications have dried; repairs are more economical at this stage. Cut away any weakly bonded tape edges. Fill hairline cracks with cut shellac (2-to 3-lb.); groove out larger cracks with sharp tool; coat with shellac and allow to dry, then refill with joint compound; or cover cracks with complete joint treatment, including reinforcing tape; feather to surface level with plane of board.

Prevention: Use either DURABOND, SYNKO FAST-SET or sandable SHEETROCK 90 or SYNKO PRO-SET Setting-Type Joint Compounds, which have the built-in resistance to cracks. Place shielding devices over room openings to prevent drafts. Do not apply joint treatment over hot surfaces. Dampen floors if extra low room humidity condition is suspected. During cold weather, control heat at min. 13°C (55°F) and supply good ventilation. Avoid practices listed under “Cause,” above.

- b. **Cause:** After joint treatment, cracks along edges of corner bead or trim can result from the same unsatisfactory conditions listed above for tape. Also can be caused by impact on the bead.

Remedy: Remove applied joint compound. Securely fasten corner bead or trim to framing beneath panels. Refinish bead with joint compound.

Prevention: Use SHEETROCK Brand Paper Faced Metal Tape On Bead and Trim, which eliminates edge cracking.

21. Joints— Center Cracking

- a. **Cause:** Abnormal stress buildup resulting from structural deflection or racking discussed previously.

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.

- b. **Cause:** Excessive stresses resulting from hygrometric and/or thermal expansion and contraction discussed previously.

Remedy: Correct unsatisfactory environmental conditions. Provide sufficient relief; retape, feathering joint compound over broad area.

Prevention: Correct improper job conditions and install control joints for relief in long partition runs and large ceiling areas (see pages 165-167).

22. Joints— Angle Cracking

- a. **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 or no compound in apex.

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

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

Prevention: Use proper tool for corner treatment.

- c. **Cause:** Structural movement from two separate supports or framing members, which react independently to applied loads. Often occurs in wall-ceiling angles where wall is attached to top plate and ceiling is attached to floor or ceiling joists running parallel to top plate.

Remedy: Remove fasteners closer than 150 mm (6") from angle, retape and finish.

Prevention: Use "Floating Interior Angle" application described on page 130.

- d. **Cause:** Structural or thermal movement resulting from two dissimilar materials or constructions.

Remedy: Remove tape, provide relief, finish with appropriate trim and caulk as required.

Prevention: Use channel-type or angle edge trim over gypsum board where two dissimilar surfaces interface.

- e. **Cause:** Excessive paint thickness; application of paint under poor conditions.

Remedy: Correct unsatisfactory job conditions. Scrape away cracked paint. Fill and feather with joint compound. Prime and paint.

Prevention: Provide proper job conditions. Apply recommended thickness of prime and finish coats of paint.

23. Joints— High Crowns

Cause: Excessive build-up of compound over joint; compound not feathered out beyond shoulders, improper bedding of tape; framing out of alignment or panel edges not tight against framing; improper adjustment of tools; misuse of or worn tools.

Remedy: Sand joints to flush surface. Take care to avoid scuffing paper by oversanding.

Prevention: Embed tape properly, using only enough compound to cover tape and fill taper depression or tape itself at butt joints; feather compound wide enough to conceal.

**24. Joints—
Excessive
and/or Delayed
Shrinkage**

Cause: (1) Atmospheric conditions—slow drying and high humidity; (2) Insufficient drying time between coats of compound; (3) Excessive water added in mixing compound; (4) Heavy fills. When a second coat of joint compound is applied over compound that has not yet dried, the first coat will dry more slowly and shrinkage will occur later than is typical. This slow shrinkage is termed “Delayed Shrinkage.”

Remedy: See “Starved Joints,” below.

Prevention: Allow each coat of joint compound to dry thoroughly before applying succeeding coat, or use a low-shrinkage DURABOND, SYNKO FAST-SET or sandable SHEETROCK or SYNKO PRO-SET Setting-Type Joint Compounds.

**25. Joints—
Starved Joints**

Cause: This is a form of delayed shrinkage caused chiefly by insufficient drying time between coats of compound. May also be caused by insufficient compound applied over tape to fill taper, overthinning or oversmoothing of compound. Shrinkage usually progresses until drying is complete.

Remedy: Use fast-setting DURABOND, SYNKO FAST-SET or sandable SHEETROCK or SYNKO PRO-SET Setting-Type Joint Compounds or reapply a full cover coat of heavy-mixed compound over tape. Since this is heaviest application, most shrinkage will take place in this coat, making it easier to fill taper properly. Finish by standard procedure.

Prevention: Allow each coat of joint compound to dry thoroughly before applying succeeding coat, or use a low-shrinkage DURABOND, SYNKO FAST-SET or sandable SHEETROCK or SYNKO PRO-SET Setting-Type Joint Compounds.

**26. Joints—
Ridging**

Cause: All building materials grow or shrink in response to changes in temperature and humidity. When they are confined to a specific space, such as gypsum panels in a partition or ceiling, they are put under stress, either compression or tension, depending on the temperature or humidity conditions. These stresses are relieved when the panel bends outward in the region of the joint. Once this bending takes place, the system takes a set and never returns to normal. It becomes progressively worse with each change of temperature or humidity. This progressive deformation appears as a continuous ridge along the length of joint, with a uniform fine, ridge-like pattern at the center.

Remedy: (1) Let ridge develop fully before undertaking repairs; usually six months is sufficient. Make repairs under average room conditions; (2) Smooth ridge down to reinforcing tape without cutting through tape. Fill concave areas on either side of ridge with light fill of compound. After this is dry, float very thin film of compound over entire area; (3) Examine area with strong sidelighting to make certain that ridge has been concealed. If not, use additional feathering coats of compound. Redecorate. Ridging can recur, but is usually less severe. Continuous wetting will aggravate condition.

Prevention: Where available, use SHEETROCK Brand Gypsum Panels, SW Edge, with the exclusive rounded edge designed to prevent ridging. Follow general recommendations for joint treatment (see Chapter 1) and approved application procedure, which includes back-blocking and laminated double-layer application to minimize potential ridging problems (see Chapter 3). Pay particular attention to temperature, ventilation, consistency of compound, prompt covering coat over tape, minimum width of fill, finish coats and required drying time between coats.

Finishing Problems

27. Finish— Discoloration

- a. **Cause:** Differences in suction of panel paper and joint compound may lighten paint color or change gloss or sheen in higher-suction areas; most common when conventional oil-based paints are used. Also caused by texture differences between the face paper and finished joint compound or by overthinning of paint. May also occur over fasteners in ceilings subjected to severe artificial or natural side lighting. Suction differences may also cause greater amounts of texturing material to be deposited over high-suction areas, causing color differences when viewed from an angle. Before painting, face panel paper may be darkened from exposure to sunlight.

Remedy: Redecorate.

Prevention: Before painting or texturing, apply a prime coat of SHEETROCK Brand First Coat, SYNKO PRE-COAT or undiluted interior flat latex paint with high solids content. Avoid roughening surface paper when sanding joint compound. Use strong job lights parallel to the surface to ensure a flat acceptable joint compound finish prior to priming, texturing and/or painting.

- b. **Cause:** The use of preservatives in paint formulation. As the scientific community learns more about health hazards, additives to many products are changed or eliminated. Mercury, for example, was banned for use in paints in August, 1990. Some of these additives could cause a reaction resulting in an off-color appearance.

Remedy: A high-quality finish coat or coats will, generally, produce an acceptable finish.

Prevention: A good quality primer SYNKO T.I.P.S., PRE-COAT or SHEETROCK Brand First Coat and finish paint coat properly applied according to the paint manufacturer's recommendations will prevent most discoloration problems.

28. Finish— Gloss Variation With High Gloss Paints

- Cause:** Differences in suction of panel paper and joint compound, or texture differences between the face paper and finished joint compound (as stated in #27-a). Problem is accentuated by strong side lighting with slight angle of incidence to ceiling or wall surface.

Remedy: Redecorate.

Prevention: Before painting with a high gloss paint, apply a skim coat of joint compound over the entire wall surface or use a veneer plaster system. If skim coating is not done, the next best preventative measure is to apply a prime coat of SHEETROCK Brand First Coat or SYNKO PRE-COAT.

-
- 29. Finish—
Joint Darkening** **Cause:** This condition occurs most commonly with color-tinted paint rather than white. Most severe when applied in humid weather when joints have not fully dried.
- Remedy:** Apply a prime coat of SHEETROCK Brand First Coat, SYNKO T.I.P.S. or PRE-COAT and repaint. Repaint only after all surfaces are thoroughly dry.
- Prevention:** Be sure joints are thoroughly dry before painting (see “Drying Time” on pages 176).
-
- 30. Finish—
Shadowing** **Cause:** Temperature differentials in outside walls or top-floor ceilings causes collection of airborne dust on colder spots of interior surface. Results in photographing or shadowing over fasteners, furring or framing. Most severe with great indoor-outdoor temperature variation.
- Remedy:** Wash painted surfaces, remove spots with wallpaper cleaner, or redecorate surfaces. Change air filters regularly.
- Prevention:** Use double-layer application with adhesively applied face layer. Use separately framed free-standing interior wall surface and insulate in void to reduce temperature difference between steel or wood components and panels.
-
- 31. Finish—
Decorating
Wallboard
Damaged by
Over-Sanding** **Cause:** Paper fibers of the exposed gypsum panel surface are scuffed and raised by over-sanding of the joints or use of sandpaper that is too coarse.
- Remedy:** Correct severe paper fiber raise with a light skim coat of a drying-type joint compound. Minor fiber raise may be treated by light sanding with very fine sandpaper or wiped down with a damp sponge or cloth.
- Prevention:** Good finish work with compound, feathered edges, etc. reduces the need for sanding, in general, limiting exposure to this kind of problem.

Veneer Plaster Construction

Many problems associated with veneer plaster construction have the same cause, remedy and prevention as with drywall systems. Similarity of problems appears in application of the base, framing irregularities, cracking due to structural movement, hygrometric and thermal expansion and fastener imperfections. The additional problems that follow are those specifically relating to veneer plaster finish construction. If solutions to your problems in veneer plaster construction are not described, check similar problems for drywall construction found earlier in this chapter.

Application Problems

-
- 1. Mixing—
Foaming Action
in Mixer** **Cause:** Use of CGC Plaster Accelerator—Alum Catalyst as an accelerator when limestone aggregate is used.
- Remedy:** None. Dispose of batch.
- Prevention:** Use moulding plaster or quick-set gauging plaster as an accelerator when limestone aggregate is used. Or use sand aggregate.

Also, avoid entraining air from mixing with high-speed mixing paddle or wrong kind of paddle.

-
- 2. Setting Time—Variable Set Time Within Batch**
- Cause:** Insufficient or excessive mixing.
Remedy: None. Dispose of batch.
Prevention: Use proper drill speed; follow recommended mixing times (see pages 206-207).
-
- 3. Slow Set—IMPERIAL and DIAMOND Interior Finish Plaster/ Basecoat**
- a. **Cause:** High air and mixing water temperature, in excess of 38°C (100°F).
Remedy: Proper use of accelerator.
Prevention: Avoid extremes of air and water temperatures.
- b. **Cause:** Contaminated mixing water or contaminated sand.
Remedy: None.
Prevention: Use drinkable water only.
- c. **Cause:** Excessive use of retarder.
Remedy: None. Dispose of batch.
Prevention: Follow recommendations for mix proportions and use of additives.
-
- 4. Quick Set—IMPERIAL and DIAMOND Interior Finish Plaster/ Basecoat**
- a. **Cause:** Low air and water temperature below 4°C (40°F).
Remedy: None. Dispose of batch.
Prevention: Avoid extremes of air and water temperatures.
- b. **Cause:** Contaminated mixing water; dirty mixing equipment.
Remedy: None. Dispose of batch.
Prevention: Use drinkable water only. Clean set plaster residue from equipment after each batch. Always use clean mix equipment.
- c. **Cause:** Excessive use of accelerator.
Remedy: None. Dispose of batch.
Prevention: Follow recommendations for mix proportions and use of additives.
-
- 5. Quick Set—IMPERIAL Finish Plaster and DIAMOND Interior Finish Plaster Only**
- Cause:** Contamination; excessive use of aggregate and/or accelerator.
Remedy: None. Dispose of batch.
Prevention: Use drinkable water. Clean set plaster residue from equipment after each batch. Always use clean mix equipment. Follow recommendations for mix proportions and use of additives.
-
- 6. Workability—Stiff Working**
- Cause:** Mixing action has improper or insufficient shear.
Remedy: None. Use remainder of batch, if at all workable.
Prevention: Follow recommendations for mixing time, drill speed and type of mixing paddle (see pages 206-207).

In-Place Problems

- 7. Bond Failure—Delamination of Finish Coat**
- Cause:** Basecoat not left rough and open (rough for mechanical key and open as in porous); finish coat not properly scratched into basecoat to have necessary keying.
- Remedy:** Remove loose material, brush basecoat thoroughly, apply bonding agent and refinish.
- Prevention:** Follow application recommendations (see Chapter 6).
-
- 8. Bond Failure—DIAMOND Interior Finish Plaster**
- Cause:** Application over faded (not normal blue color) gypsum base.
- Remedy:** Remove loose material, brush base clean, apply bonding agent and refinish.
- Prevention:** Do not store or apply base where it will be exposed to sunlight for an extended time. Where exposed, spray faded base with CGC Accelerator–Alum Catalyst or CGC Plaster Bonder before finish is applied (see No. 9 below).
-
- 9. Sun-Faded Gypsum Base**
- Cause:** Exposure of gypsum base to sunlight for an extended period of time.
- Remedy:** When used with lime-containing plaster, such as DIAMOND Brand Interior Finish Plaster, sunfaded GRAND PRIX Plaster Base face paper should be treated with CGC Accelerator–Alum Catalyst or CGC Plaster Bonder. This precaution is unnecessary when applying products that do not contain lime (IMPERIAL Brand finish Plaster, IMPERIAL Brand Basecoat Plaster and DIAMOND Brand Veneer Basecoat Plaster). For alum catalyst solution treatment, pour 1.3 kg (3 pounds) of CGC Accelerator–Alum Catalyst slowly into 4 L of water and mix thoroughly. Allow the solution to stand until any undissolved material has settled, then strain solution into tank-type sprayer (such as garden sprayer). Spray solution onto faded GRAND PRIX Brand Plaster Base face paper so that it is wet but not soaked. 4 L of solution should treat 70 m² (750 sq. ft.) of GRAND PRIX Plaster Base. Begin finish plaster application before face paper treated with alum solution is completely dry. Caution: Alum treatment shortens setting time of DIAMOND Brand Interior Finish Plaster.
- Prevention:** See Problem No. 8.
-
- 10. Cracks—Joint Cracking**
- a. Cause:** IMPERIAL Tape overlapped at joint intersections.
- Remedy:** Large cracks: apply SHEETROCK Brand Joint tape and SHEETROCK or SYNKO CLASSIC or SYNKO LITE Line Brand Ready-Mixed Joint Compound (All Purpose or Taping) over the cracks. Minor cracks: flush out area with SHEETROCK or SYNKO CLASSIC or SYNKO LITE Line Brand Ready-Mixed Joint Compound (All Purpose or Taping).
- Prevention:** Avoid overlapping tape at all joint intersections, including those at angles.
- b. Cause:** Improper steel stud placement. Veneer Plaster base application advanced in wrong direction relative to flange direction.
- Remedy:** Repair with SHEETROCK Brand Joint Tape and CGC or SYNKO CLASSIC or SYNKO LITE Line Brand Ready-Mixed Joint Compound (All Purpose or Taping).

Prevention: Install steel studs with all flanges pointing in same direction. Arrange veneer plaster base application so lead edge of base is attached to open edge of flange first (see Framing (Steel)—Panel Edges Out of Alignment on page 351).

- c. **Cause:** Overly rapid drying conditions.

Remedy: Repair with SHEETROCK Brand Joint Tape and SHEETROCK Brand Ready-Mixed Compound (All Purpose or Taping).

Prevention: Liberally sprinkle floor with water to raise humidity. Use SHEETROCK Brand Joint Tape and SHEETROCK Brand Setting-Type (DURABOND or SYNKO PRO-SET) Joint Compound on all joints. Allow compound to dry thoroughly before applying finish. Where steel stud framing is used, apply SHEETROCK Brand Joint Tape and SHEETROCK Brand Setting-Type (DURABOND or SYNKO PRO-SET) Joint Compound.

- d. **Cause:** IMPERIAL Tape with steel framing.

Remedy: Repair with SHEETROCK Brand Joint Tape and SHEETROCK or SYNKO CLASSIC or SYNKO LITE Line Brand Ready-Mixed Compound (All Purpose or Taping).

Prevention: Use only SHEETROCK Brand Joint Tape and SHEETROCK Brand Setting-Type Joint Compound (DURABOND or PRO-SET).

11. Cracks— Field Cracking

Cause: Veneer plaster base installed with vertical joints extending from corners of door and window openings.

Remedy: Apply SHEETROCK Brand Joint Tape and SHEETROCK Brand Setting-Type (DURABOND) (PRO-SET) Joint Compound; then finish with CGC SHEETROCK or SYNKO CLASSIC or SYNKO LITE Line Brand Ready-Mixed Joint Compound (All Purpose or Taping). Prime and seal. This is a cosmetic treatment; there is no guarantee that cracks will not reopen.

Prevention: Install Zinc Control Joint No. 093 or cut base to fit around openings with joints centered above openings, not at corners.

12. Cracks— Craze and Map Cracking

Cause: Veneer plaster application too thin. Also can be caused by too rapid drying.

Remedy: Apply spackling putty. Prime and seal.

Prevention: Apply recommended thicknesses for both one- and two-coat work. Avoid excessive ventilation, which may cause rapid drying. When weather is hot and dry, sprinkle floor with water to raise humidity.

13. Blemishes— Blistering

- a. **Cause:** Loose paper on veneer plaster base as a result of improper cutting or from “peelers” caused by careless handling.

Remedy: Cut and remove unbonded paper, apply bonding agent if gypsum core is exposed, and refinish.

Prevention: Follow proper handling and cutting procedures.

- b. **Cause:** Troweling too early and lack of absorption; excessive material buildup.

Remedy: Minimize troweling and allow finish to become firm. Finish trowel over freshly set surface to eliminate blisters.

Prevention: Apply material in uniform thickness with minimum amount of troweling to produce smooth surface.

**14. Blemishes—
Joint
Ridging and
Beading**

Cause: Joints not preset; excessive ventilation and poor heat control. Most likely to occur with one-coat applications.

Remedy: Repair with CGC, FORMULA 1 Brand or SYNKO CLASSIC or SYNKO LITE Line Ready-Mixed Compound (All Purpose or Taping).

Prevention: Preset all joints before veneer plaster finish application; keep ventilation to minimum and control heat. In extremely hot, dry weather use SHEETROCK Brand Joint Tape and DURABOND Setting-Type Joint Compound as alternative joint reinforcement.

**15. Blemishes—
Spalling at
Exterior Corners**

Cause: Use of solid-flange drywall corner bead.

Remedy: Remove all loose material and corner bead. Install expanded-flange corner bead and refinish.

Prevention: Use expanded-flange corner bead.

**16. Stains—
Staining and
Rusting**

Cause: Use of improper fasteners, or exposed, improperly prepared metal trim.

Remedy: Apply rust-locking primer over stains.

Prevention: Use recommended coated fasteners (see Chapter 1). Apply rust-locking primer to all exposed metal.

**17. Soft, Weak
Surface—
Dryouts**

Cause: Too rapid drying conditions.

Remedy: Fog-spray surface with water or alum solution to provide setting action. When set, apply CGC Brand or SYNKO CLASSIC or SYNKO LITE Line Ready-Mixed Joint Compound (All Purpose or Taping) for acceptably smooth surface.

Prevention: Avoid extending set and/or temperature and humidity conditions, which cause rapid drying.

**18. Soft, Weak
Surface—
Crumbly Areas**

Cause: Use of excessive amount of sand aggregate and/or retarder.

Remedy: Treat soft areas with penetrating sealer.

Prevention: Allow minimum ventilation; use recommended amounts only of aggregate or retarder. Avoid prolonged set.

Cement Board Construction

DUROCK Brand Cement Board Systems require careful adherence to published installation procedures and high standards of workmanship.

**1. Interior
Tile System—
Surface
Fractured**

Cause: Heavy impact punctures from moving equipment or vandalism. Holes resulting from previous fixture attachment.

Remedy: Where tile can be removed without damaging the DUROCK Brand Cement Board—remove damaged tile by cutting and chipping tile. Scrape or grind bond coat down to skim coat. Tape any cracks with DUROCK Brand Tape. Reset tile and grout.

Where tile cannot be removed without causing excessive damage to the Durock Brand Cement Board, remove the damaged section by cutting through the tile and Durock Brand Cement Board. Install additional framing, screw attaching to existing framing at the same plane behind edge of existing surface, so that the perimeter of existing and new panels will be supported. Cut a patch of Durock Brand Cement Board that closely fits the opening. Apply a generous amount of organic adhesive to the edges of existing and new panel. Install panel and attach to framing with appropriate fasteners. Smooth and level adhesive at panel joints. Let adhesive cure for 24 hours before setting and grouting new tile.

-
- 2. Delamination— Basecoat or Mortar** **Cause:** Improper mixing procedures or improper basecoating techniques.
Remedy: Remove all material that is not properly bonded to the Durock Brand Panel surface. Apply a bonding agent such as Larsen's WELD-CRETE; then reapply basecoat to the area.
Prevention: Always use the proper amount of clean potable water when mixing the material. Too much water will significantly reduce the bond strength of the material. Apply the material using a scratch and double back method. The tight scratch coat keys the material into the Durock Brand Panel surface.
-
- 3. Delamination— Tile and Thin Brick** **Cause:** Allowing the mortar to skin over before setting the tile or brick. Not back-buttering the tile.
Remedy: Scrape the mortar from the Durock Brand Panel surface. Apply a bonding agent to the Durock Brand Panel surface and allow to dry. Apply fresh mortar to the Durock Brand Panel and back-butter the tile and push into place.
Prevention: Do not allow the mortar to skin over. Back-butter the tile, slide into place, and beat in to ensure 100% coverage.

Texture Finishes

CGC texturing materials offer a wide range of decorative yet practical finishes. Properly used, they can provide interest and variety in decoration while covering minor defects in the base surface. However, certain working conditions, application techniques or equipment problems can cause unsatisfactory results. The following list describes the problem, probable cause, remedy and prevention for particular situations.

Mixing Problems

-
- 1. Mixing— Lumping of Wet Mix** **Cause:** Too much water added to initial mix, making lumps difficult to break up.
Remedy and Prevention: Initial amount of water added to mix should be slightly less than recommended. After lumps are broken up, add remaining water.

-
2. **Mixing—
Slow Solution
Time** **Cause:** Insufficient soaking and/or use of very cold water.
Remedy and Prevention: Allow materials to soak for up to two hours, as necessary, if using cold water.
-
3. **Mixing—
Wet Mix Too
Thin** **Cause:** Addition of excessive water during initial mix. Also, insufficient soaking time in cold water.
Remedy and Prevention: Use recommended amount of water to ensure proper consistency. Allow materials to soak up to two hours, if necessary, when using cold water.
-

Application Problems

-
4. **Application—
Excessive
Aggregate
Fallout in
Spraying** **Cause:** Excessive air pressure at nozzle; holding gun too close to surface being sprayed.
Remedy and Prevention: Use proper air pressure for type of material to be sprayed. (Consult appropriate CGC Data Sheet for recommended air pressure.) Hold spray gun at proper distance from surface to prevent excessive bounce or fallout of aggregate.
-
5. **Application—
Flotation of
Aggregate** **Cause:** Overdilution of job mix and/or lack of adequate mixing after water is added to control consistency.
Remedy and Prevention: Add correct amount of water as directed on bag to ensure proper suspension of materials in mix. Make certain that water is blended into mix.
-
6. **Application—
Poor Coverage
with Spray
Finishes** **Cause:** Not enough water to bring texture material to proper spray viscosity and/or improper application, such as moving spray gun too slowly, overloading spray surface and using incorrect spray pressures.
Remedy and Prevention: Add proper amount of water as directed on bag. Use correct spray gun pressures and application technique to ensure uniform texture with maximum coverage.
-
7. **Application—
Poor Hide** **Cause:** Overdilution of mix causing reduction in hiding power. Insufficient water in spray finishes causes poor material atomization, resulting in surface show-through. Also caused by overextending material or choosing incorrect spray pressures.
Remedy and Prevention: See above.
-
8. **Application—
Poor Bond or
Hardness** **Cause:** Overdilution of jobmix results in thinning out of binder in texture. Contamination or intermixing with other than recommended materials can destroy bonding power.
Remedy and Prevention: Add proper amount of water as stated in bag directions. Always use clean mixing vessel and water. Never intermix with other products (except materials as recommended).

- 9. Application—
Stoppage of
Spray Equipment** **Cause:** Contamination of material or oversize particles can cause clogging of spray nozzle orifices. Also caused by using incorrect nozzle size for aggregate being sprayed.
Remedy and Prevention: Prevent contamination during mixing. Use correct nozzle for aggregate size of texture material.
- 10. Application—
Unsatisfactory
Texture Pattern** **Cause:** Improper spray pressure and/or worn spray equipment, either fluid or air nozzle. Also improper spraying consistency of mix and/or spraying technique.
Remedy and Prevention: Use recommended amount of water to ensure proper spraying consistency. Handle spray equipment correctly to achieve best results. Make certain that spray accessories are in good working condition; replace when necessary.
- 11. Application—
Unsatisfactory
Pumping
Properties** **Cause:** Mix too heavy. Pump equipment worn or of insufficient size and power to handle particular type of texture.
Remedy and Prevention: Use recommended amount of water to ensure proper spraying consistency. Make sure that equipment is in good repair and capable of pumping heavy materials.
- 12. Application—
Texture
Build-Up** **Cause:** Texturing over a high-suction drywall joint (surface not properly primed) and/or allowing too much time between roller or brush application and texturing operation. Overdilution of texture material will produce texture build-up over joint.
Remedy and Prevention: Before texturing, apply a prime coat of SHEETROCK Brand First Coat or SYNKO QUICK DRY or undiluted, interior flat latex paint with high solids content. Use correct amount of water when mixing texture material. Allow safe time interval between application and final texturing.

Finish Surface Problems

- 13. Finish
Surface—
Poor Touchup** **Cause:** Touchup of a textured surface to completely blend with the surrounding texture is extremely difficult. A conspicuous touchup is caused either by texture or color variance.
Remedy: Perform touchup operation with extreme care; otherwise, re-texture entire wall or ceiling area.
- 14. Finish
Surface—Joint
Show-Through** **Cause:** Overthinned or overextended texturing material does not adequately hide the normal contrast between joint and gypsum panel paper. Also caused by improperly primed surface.
Remedy: Use correct amount of water when mixing texture material and apply at recommended rate of coverage until joint is concealed.
Prevention: Before texturing, apply a prime coat of SHEETROCK Brand First Coat or SYNKO QUICK DRY or undiluted, interior flat latex paint with high solids content.

- 15. Finish Surface—White Band or Flashing Over Gypsum Panels**
- Cause:** High-suction gypsum panel joint causes a texture variation, which often appears as a color contrast.
- Remedy:** Allow texture to dry, and paint entire surface.
- Prevention:** Before texturing, apply a prime coat of SHEETROCK Brand First Coat or SYNKO QUICK DRY or undiluted, interior flat latex paint with high solids content.
-
- 16. Finish Surface—White Band or Flashing Over Concrete**
- Cause:** Damp concrete surface on which leveling compound has dried completely can produce results similar to those of high-suction joint.
- Remedy:** Allow texture to dry, and paint entire surface.
- Prevention:** Allow concrete to age for at least 60 days for complete dryout. Before texturing, apply a prime coat of SHEETROCK Brand First Coat or SYNKO QUICK DRY or undiluted, interior flat latex paint with high solids content.
-
- 17. Finish Surface—Joint Darkening**
- Cause:** Application over damp joint compound, especially in cold and/or humid conditions.
- Remedy:** Allow texture to dry completely, and paint entire surface.
- Prevention:** Allow joint compound to dry completely before priming and texturing. Before texturing, apply a prime coat of SHEETROCK Brand First Coat or SYNKO QUICK DRY or an undiluted, interior flat latex paint with high solids content.

Conventional Plaster Construction

All CGC basecoat and finish plasters are carefully manufactured and thoroughly tested before shipment. Along with the functional characteristics offered, CGC plasters are carefully formulated for use under normal, prevailing weather conditions and with aggregates commonly used in the market.

Plasters are adversely affected by aging and abnormal storage conditions, use of the wrong aggregate and improper proportioning, all of which may affect the set, hardness and working properties of the material. Most plaster problems result from the following situations:

1. Adverse atmospheric and job conditions.
2. Set conditions too fast or slow.
3. Poor quality and incorrect proportioning of aggregate.
4. Improper mixing, application or thickness of basecoat or finish.
5. Incorrect lathing practices.
6. Dirty or worn mixing or pumping equipment.

Basecoat and finish coat plasters are so closely interrelated that problems pertaining to their use are treated together. No attempt is made here to discuss problems that might occur due to structural deficiencies. These were covered previously in this chapter. Plaster problems are classified under the specific existing condition. These are discussed in order, in the following groups:

1. Plaster cracks.
2. Blemishes.
3. Color variations and surface stains.
4. Weak, soft walls.
5. Bond failure.
6. Other problems.

Cracking Problems

Connecting vertical, horizontal cracks at somewhat regular intervals, often in stepped pattern; also diagonal in appearance.

Material: Plaster over metal or gypsum lath.

- a. Cause:** Plaster too thin, insufficient plaster grounds.

Remedy: Patch.

Prevention: Apply plaster to proper thickness.

- b. Cause:** Weak plaster (through dryout or slow set).

Remedy: Spray with alum solution to accelerate set.

Prevention: Add accelerator to plaster mix to bring setting time to normal range.

- c. Cause:** Excessive use of aggregate.

Remedy: Patch.

Prevention: Use proper proportions of aggregate and plaster.

- d. Cause:** Failure to use Striplath reinforcement at potential weak points.

Remedy: Cut out, reinforce and repair.

Prevention: Install proper reinforcing.

- e. Cause:** Expansion of rough wood frames.

Remedy: Remove plaster and lath as necessary. Seal frames and patch.

Prevention: Seal frames. Cut basecoat along grounds prior to set. Install control joints over frames.

Material: Plaster over unit masonry.

- a. Cause:** Structural movement of masonry units.

Remedy and Prevention: Correct masonry construction, provide movement relief, patch.

Material: Plaster over brick, clay tile or concrete block at door openings.

- a. Cause:** Poor lintel construction, improper frame construction.

Remedy: Patch.

Prevention: Use proper frame and lintel construction with self-furring metal lath reinforcement.

Fine cracks, random pattern, generally 25 to 76 mm (1" to 3") apart. Includes shrinkage cracks, crazing, alligatoring, chip cracks.

Material: Gauged lime-putty finish over gypsum basecoat, used with any plaster base.

- a. Cause:** Insufficient gauging plaster-shrinkage of lime. Insufficient troweling during setting. Applied finish too thick. Basecoat too wet or too dry and too little or too much suction.

Remedy: Apply spackling putty and primer-sealer.

Prevention: Use sufficient gauging plaster, trowel sufficiently or properly condition basecoat before applying finish.

Fine cracks, irregular pattern, generally 150 to 350 mm (6" to 14") apart; map cracking.

Material: Trowel finishes over gypsum basecoat—unit masonry plaster base.

- a. Cause:** Finish coat applied too thick.

Remedy: Patch.

Prevention: Apply finish coat to 1.6 mm (1/16") thickness but not more than 3 mm (1/8").

- b. Cause:** Improper timing of final troweling.

Remedy: Patch.

Prevention: Water-trowel as final set takes place (not before) to provide dense, smooth surface.

- c. Cause:** Retempering gauged lime putty.

Remedy: Discard batch; make up new gauge.

Prevention: Gauged lime putty should not be retempered once it has started final set.

Random pattern, usually less than 300 mm (12") apart, called map, shrinkage or fissure cracking.

Material: Basecoat over masonry.

- a. Cause:** High suction of masonry base.

Remedy: If bond to base is sound and cracks are open 1.6 mm (1/16") or more, fill by troweling across cracks with properly aggregated plasters. If bond is sound, finish over fine cracks with highly gauged trowel finish or float finish. If curled at edges and bond is unsound, remove and reapply using proper plaster method.

Prevention: Wet masonry with water to reduce suction before basecoat application.

- b. Cause:** Under-aggregating of basecoat; slow set.

Remedy: Same as above.

Prevention: Use 85 L (3 cu. ft.) of aggregate per 45 kg (100 lb.)

gypsum plaster (see Chapter 8 for proper proportion of aggregates). Discontinue use of job-added retarder and accelerator, if necessary, to obtain proper set.

c. Cause: Dryout condition.

Remedy: Spray basecoat either with water or alum solution to thoroughly wet plaster. Proceed same as above.

Prevention: In hot, dry weather, protect plaster from drying too rapidly before set. Spray plaster during set time if necessary.

Cracking at wall or ceiling angles.

Material: Plaster over gypsum lath.

a. Cause: Thin plaster.

Remedy: Cut out and patch.

Prevention: Follow correct application procedure.

b. Cause: Failure to use Cornerite reinforcement.

Remedy and Prevention: Same as above.

Blemishes

Water-soluble, powdery crystals on surface, generally white but may be colored. Can be brushed off.

Material: Basecoat and finish plaster over concrete block or clay tile.

a. Cause: Efflorescence. As masonry units dry, water-soluble salts from units or mortar joints leach out and are deposited on the plaster surface.

Remedy: After plaster surfaces are thoroughly dry, brush off efflorescence, apply oil-based sealer and paint.

Prevention: On interior walls, eliminate source of moisture, remove efflorescence before plastering; decorate with oil-based sealer and paint. On exterior walls, eliminate moisture source, fur out, lath and plaster.

Pops or peak-like projections which fall out and create little craters or pits; often with final radial cracks.

Material: Gauged lime-putty finish.

a. Cause: Unslaked lime in mortar which slakes and swells after it is applied.

Remedy: Remove core of "pops" and patch after popping has ceased.

Prevention: Allow sufficient soaking time for RED TOP hydrated lime or use SNOW DRIFT double-hydrated lime.

b. Cause: Contamination from foreign matter.

Remedy: Same as above.

Prevention: Eliminate source of impurity.

Material: Gypsum basecoat and finish.

- a. **Cause:** Lumpy or undissolved retarder added on job. Retarder lumps swell or “pop” when wet.

Remedy: Cut out spots and patch.

Prevention: Completely disperse retarder before adding to mix water; mix well to distribute retarder throughout plaster.

Blisters in finish coat occur during or immediately after application.

Material: Gauged lime-putty finish.

- a. **Cause:** Base too green (wet); insufficient suction; too much water used in troweling.

Remedy: After finish has set, trowel with very little water.

Prevention: Do not apply finish over green basecoat.

- b. **Cause:** Finish too plastic.

Remedy: Same as above.

Prevention: Add small amount of very fine white sand to putty or increase amount of gauging plaster.

Excess material (slobbers) on finish surface.

Material: Gauged lime-putty finish.

- a. **Cause:** Improper joining technique, excessive or improper troweling leaves excess material on finished surface.

Remedy: Scrape off excess material before decoration. Seal surface when plaster is dry.

Prevention: Previously applied finish should be cut square for completion of finish. Avoid excessive troweling at joining.

Peeling paint.

Material: Gauged lime-putty finish.

- a. **Cause:** Paint applied over wet plaster.

Remedy: Scrape off peeled paint, allow plaster to dry, and redecorate.

Prevention: Be sure plaster is dry before decorating, and use a breather-type paint.

- b. **Cause:** Weak finish. Plaster worked through set.

Remedy: Scrape off peeled paint, patch and decorate.

Prevention: Do not retemper or trowel finish after set.

Color Variations and Surface Stains

Streaks and discoloration.

Material: Lime finishes, gauged with gauging plaster or Keenes Cement.

a. **Cause:** Lime and gauging plaster not thoroughly mixed.
Remedy: Seal and decorate.

Prevention: Follow recommended mixing procedures.

b. **Cause:** Too much water used in troweling.

Remedy: Same as above.

Prevention: Apply as little water as possible in troweling.

c. **Cause:** Dirty tools or water.

Remedy: Same as above.

Prevention: Wash tools and use clean water.

Light and dark spots.

Material: Float finish.

a. **Cause:** Improper technique or too much water used in floating.

Remedy: Seal and paint to get uniform color.

Prevention: Follow recommended application procedures.

b. **Cause:** Spotty suction on basecoat which was dampened unevenly by throwing water on with a brush rather than by spraying with a fine nozzle.

Remedy: Same as above.

Prevention: Dampen basecoat uniformly using a fine spray.

Light or flat spots in light-color paint.

Material: Oil-based paint over gauged lime-putty finish.

a. **Cause:** Surface painted too soon after plastering (alkali in lime saponifies paint); paint pigments not limeproof.

Remedy and Prevention: Apply primer-sealer and repaint.

Material: Any colored paint over any plaster finish.

b. **Cause:** Non-uniform absorption results in uneven surface gloss and coloration.

Remedy and Prevention: Apply primer-sealer and repaint.

Yellow, brown or pink staining—yellowing.

Material: Any lime-putty finish over any basecoat and plaster base; generally occurs while surface is damp.

a. **Cause:** Contaminated aggregate.

Remedy: Apply primer-sealer and repaint.

Prevention: Use clean aggregate.

- b. **Cause:** By-product of combustion from unvented fossil fuel space heaters.

Remedy: Same as above.

Prevention: Vent heaters to outside.

- c. **Cause:** Tarpaper behind plaster base; creosote-treated framing lumber; tar or tar derivatives used around job; sulphur or chemical fumes.

Remedy: Same as above.

Prevention: Use asphalted paper. Remove source of air contamination.

Rust.

Material: Plaster over any plaster base.

- a. **Cause:** Rusty accessories; or any protruding metal.

Remedy: Apply rust-locking primer-sealer and decorate.

Prevention: Use accessories made of zinc alloy or with hot-dip galvanizing. Do not use accessories that show rust prior to installation.

Soft, Weak Walls

Soft, white, chalky surfaces, occurring during hot, dry weather, usually near an opening.

Material: Gypsum basecoat over any plaster base.

- a. **Cause:** Dryout. Too much water has been removed before plaster can set.

Remedy: Spray with alum solution or plain water to set up dryout areas.

Prevention: Screen openings in hot, dry weather; spray plaster during set; raise humidity by sprinkling floor with water.

Soft, dark, damp surfaces occurring during damp weather.

Material: Gypsum basecoat over any plaster base.

- a. **Cause:** Sweat-out. Too little ventilation allows water to remain in wall for an extended period after plaster set. Some plaster has redissolved.

Remedy: Dry walls with heat and ventilation. If sweat-out condition continues, there is no remedy; remove and replaster.

Prevention: Properly heat and ventilate during plastering.

Soft, dark, damp surfaces, occurring in freezing weather.

Material: Gypsum basecoat over any plaster base.

- a. **Cause:** Frozen plaster.

Remedy: If plaster freezes before set, no remedy except to remove and replaster.

Prevention: Close building, supply heat.

General condition; soft, weak walls; not spotty or due to slow set.

Material: Gypsum basecoat over any plaster base.

- a. **Cause:** Too much aggregate or fine, poorly graded aggregate.

Remedy: No remedy; remove and replaster.

Prevention: Use properly graded aggregate and correct proportioning.

Weak plaster.

Material: Gypsum basecoat.

- a. **Cause:** Extremely slow set.

Remedy: Spray with alum solution to accelerate set.

Prevention: Add accelerator to plaster mix to bring setting time within normal range.

Material: Gauged lime-putty finish over any basecoat.

- a. **Cause:** Too little gauging with insufficient troweling; retempering; basecoat too wet.

Remedy: No remedy; remove and replaster.

Prevention: Use proper ratio of gauging to lime putty. Do not retemper plaster. Trowel adequately to ensure desired hardness.

Bond Failure

Basecoat separation.

Material: Gypsum basecoat over gypsum or metal lath.

- a. **Cause:** Too much aggregate; plaster application over frost on lath; freezing of plaster before set; addition of lime or portland cement; excessive delay in plaster application after mixing; extremely slow set; retempering.

Remedy: No remedy except to replaster.

Prevention: Provide proper job conditions during plastering. Follow correct mixing and application procedures.

Brown coat separation from scratch coat.

Material: Gypsum basecoat plasters.

- a. **Cause:** Weak scratch coat.

Remedy: None; remove and replaster.

Prevention: Use proper aggregate amount. Avoid retempering.

- b. **Cause:** Failure to provide mechanical key in scratch coat.
Remedy: Roughen scratch coat and replaster.
Prevention: Cross-rake scratch coat to provide rough surface for brown coat.
- c. **Cause:** Dryout of scratch coat.
Remedy: Water-spray scratch coat for thorough set before brown coat application.
Prevention: Provide proper job conditions during plastering; screen openings in hot, dry weather. Water-spray plaster during set. Raise humidity by sprinkling floor with water.

Finish coat separation.

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- Material:** Gauged lime-putty finish applied over gypsum brown coat.
- a. **Cause:** Brown coat too smooth, too dry, wet or weak; finish improperly applied.
Remedy and Prevention: Strip off finish, correct condition of brown coat and replaster.
 - b. **Cause:** Frozen finish coat.
Remedy and Prevention: Remove finish, provide sufficient heat during plastering, reapply finish.
 - c. **Cause:** Incomplete hydration of finish lime.
Remedy and Prevention: Remove finish; using properly proportioned double-hydrated lime or a prepared finish, reapply finish.

Other Problems

Slow Set—see Soft, Weak Walls.

Quick Set—plaster sets before it can be properly applied and worked.

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- Material:** Gypsum basecoat over any plaster base.
- a. **Cause:** Dirty water, tools or mixing equipment; excessive use of accelerator.
Remedy: Discard material as soon as it begins to stiffen; do not retemper.
Prevention: Use clean water, tools and equipment.
 - b. **Cause:** Mixing too long.
Remedy: See above.
Prevention: Reduce mixing time.
 - c. **Cause:** Poor aggregate.
Remedy: See above.
Prevention: Use clean, properly graded aggregate or add retarder.
 - d. **Cause:** Error in manufacture.

Remedy: See above. Send samples to manufacturer's representative.

Prevention: Add retarder.

- e. **Cause:** Machine-pumping and application that exceed limits of time and distance pumped for plaster being used.

Remedy: See above.

Prevention: Add retarder. Use plaster designed for machine application.

Erratic Set—lack of uniformity in set.

Material: Gauged lime putty over gypsum basecoat.

- a. **Cause:** Variable temperature.

Remedy and Prevention: Maintain uniform job temperature. In cold weather, heat building to min. 13°C (55°F).

Works hard or short, loses plasticity and spreadability. Does not carry proper amount of aggregate.

Material: Gypsum basecoat over any plaster base.

- a. **Cause:** Aged or badly stored plaster.

Remedy: Obtain fresh plaster and mix equal parts with aged plaster or use less aggregate.

Prevention: Use fresh plaster.

- b. **Cause:** Over-aggregating.

Remedy: None.

Prevention: Use proper proportioning.

Material: Gauged lime putty over gypsum basecoat.

- a. **Cause:** Aged lime, partially carbonated; warehoused too long or improperly.

Remedy: None.

Prevention: Use fresh material.

- b. **Cause:** Improper soaking, slaking. Low temperature during putty preparation.

Remedy: None.

Prevention: Use proper lime-putty preparation procedure. Do not soak at temperatures below 4°C (40°F).

Soupy Lime—too fluid for proper gauging and application.

Material: Lime putty.

- a. **Cause:** Incorrect soaking.

Remedy: None.

Prevention: Follow directions for type of lime being used.

- b. Cause:** Cold weather, cold mixing water.

Remedy: None.

Prevention: The gelling action of lime is retarded when material is soaked in temperatures less than 4°C (40°F) with cold water. Use warm water to quicken gelling.

Lime material too lumpy for proper blending with gauging plaster.

Material: Lime putty.

- a. Cause:** Old lime.

Remedy: None.

Prevention: Use fresh lime.

- b. Cause:** Damp lime.

Remedy: None.

Prevention: Protect lime from moisture on job and in storage.

- c. Cause:** Incorrect soaking.

Remedy: None.

Prevention: Follow soaking directions for type of lime used.

- d. Cause:** Excessive evaporation.

Remedy: Add proper quantity of water and allow to soak.

Prevention: Cover lime box with tarpaulin to reduce evaporation.