

# Wallboard Finished Appearance, Managing Expectations and Best Practices

A current design trend for residential and commercial buildings is the use of “open” interior spaces. Glass curtain walls, large expanses of windows, skylights and high ceilings can flood interior surfaces with strong natural light. The drywall construction trade is challenged by these design trends to provide building owners with surfaces that are aesthetically acceptable and pleasing in appearance. Increased lighting that is cast upon a drywall surface, artificial or natural, can accentuate even slight surface variations, blemishes and imperfections in the materials or workmanship.

The development of visual acceptance standards for finished drywall surface inspections has been elusive. The old axiom “beauty is in the eye of the beholder” reflects the aesthetic qualities of a finished drywall surface; what is pleasing and acceptable to one individual may be unacceptable to another. Because of this high degree of subjectivity, it is necessary to: 1) understand the aesthetic limitations of a finished and decorated drywall surface and 2) establish expectations with a building owner early in the construction process. These are two of the most effective and important steps that should be taken to satisfy the owner when the project is completed.

In addition to design professionals who develop project specifications and select appropriate materials on behalf of their client, numerous other construction professionals bring the owner’s building to life with their talents and skills. This document highlights key areas of the drywall construction process and lists “best practices” for each professional involved, practices that when followed have been documented to improve the finished drywall appearance and significantly increase the chances of providing aesthetically acceptable drywall surfaces for the building owner. Note that this is not an all encompassing list, but rather features items that can have the most influence on the final finished appearance and owner satisfaction.

## Architect/Design Professional Best Practices

### **Determine the owner’s expectations for wall and ceiling finishes and match material specifications for those expectations.**

Architects, general contractors and building owners frequently anticipate a higher level of finish than the drywall subcontractor can provide with conventionally finished drywall surfaces. Consider the use of USG conventional or veneer plaster finish systems for high-value spaces and for owners with high expectations. Conventional plaster systems are the best choice to attain a uniform, monolithic, blemish-free, smooth surface. USG veneer plaster systems offer a more monolithic surface with improved appearance compared to conventionally finished drywall surfaces.

### **Clearly explain to the owner the finished appearance limitations of wall and ceiling surfaces constructed with drywall.**

A common misconception regarding drywall finishing is that joint finishing compounds should be applied flush or flat to the surface to conceal gypsum panel joints, fasteners and trim accessories. This practice does not properly conceal the panel and increases the likelihood of joints and fasteners showing through the decorated finish. A proper conventionally finished drywall surface is not truly monolithic in appearance. The application of joint compound in graduated arcs over the joints, fasteners and trims is the best method to minimize their appearance. Depending on: 1) the skill level of the drywall finishers, 2) the type and angle of light illuminating the surfaces, and 3) the paint quality, sheen and color, distinct shadows at the joints may be visible, even when completed by the most highly skilled professionals available in the industry.

### **Specify an appropriate level of gypsum board finish, consistent with the owner’s expectations, from *Recommended Levels of Gypsum Board Finish*, published by the Gypsum Association in their document GA-214-10.**

The GA-214-10 document is intended to assist specification writers and architects to more precisely describe the finish of walls and ceilings prior to the application of paints and other wallcoverings, encourages competitive bidding of suitably finished surfaces and enhances the appearance of the final decorative treatment. Note that the chosen level of finish from this document clearly defines the work processes to be completed by the drywall finishing contractor, but does not guarantee a visual outcome. Consider development of a “Surfaces Finish Schedule,” where the most critically lighted surfaces or surfaces that are most prominently exposed in the building space receive the highest level of finish. Other surfaces can receive lower levels of finish consistent with lighting exposure conditions and expectations.

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**Specify an appropriate level of paint finish from the Drywall Finishing Council document *Recommended Levels of Paint Finish over Gypsum Board*.**

The recommended level of paint finish over drywall surfaces varies depending on their location in the structure, the type of paint applied, the level of gypsum board finish achieved prior to the final decoration, and the type of illumination striking the surface. The selection and use of a Level 5 paint finish system combined with the Level 5 gypsum board finish is the most effective method to minimize joint and fastener photographing and provides the most uniform final finish.

**Consider the use of drywall texture finishes.**

Texture-finish products are an excellent method for masking minor imperfections and diffusing light across the wall and ceiling surfaces. A wide variety of visually appealing surface finishes, from subtle to heavy, can be created with texture-finish products using stipple brushes, pattern devices, rollers, floats, trowels and finishing knives.

**Specify on the project plans the location of all control joints for the gypsum surfaces.**

The location and detailing of control joints is the responsibility of the design professional. The proper use of control joints will accommodate stresses within and placed upon the gypsum membranes and minimize the chances for development of cracks and joint ridges. See *The Gypsum Construction Handbook* for information on the proper placement and installation of control joints.

**Emphasize, in the project specifications, the requirement for proper environmental conditions during and after drywall hanging, finishing and decorating activities.**

Uncontrolled environmental conditions and fluctuations are a root cause of many finished appearance problems and a primary cause of joint cracks and joint ridges. Ideally, the interior building space should be weathertight and environmental conditions should approximate normal occupancy conditions. For wood-framed construction, before gypsum board application begins, the moisture content of framing components should be allowed to adjust as closely as possible to the level the components will reach in service.

**In advance of the drywall work and for the benefit of all stakeholders, construct a jobsite visual standard (mock-up) of the gypsum panel wall/ceiling assembly to establish finished appearance expectations of the selected finishing and paint system.**

The visual standard should be representative of the wall and ceiling configuration and finished lighting to be used in the building. After completion and evaluation of the mock-up, clearly communicate to all parties involved what the finished appearance expectations are and how finished appearance acceptance inspections will be conducted.

**Conduct frequent job inspections during and after the following work processes: framing erection, gypsum panel installation, joint finishing work and final decoration.**

Frequent and timely inspections determine whether the manufacturer's and project specifications are being followed and if good workmanship is being practiced.

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**General Contractor Best Practices**

**Provide proper environmental conditions during and after drywall hanging, finishing and decorating activities.**

Temperature, humidity and airflow should remain constant, 24/7, and match occupancy conditions as closely as possible. Uncontrolled and fluctuating environmental conditions during and after construction are a root cause of many finished appearance problems and a primary cause of joint cracks and joint ridges.

**Allow adequate time in the construction schedule for the drywall and painting contractors to perform the required work at a level that is consistent with high-quality results.**

Aggressive job schedules can lead to shortcuts which can compromise the finished appearance.

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## Drywall Contractor Best Practices

### Framing and Drywall Hanging Activities.

Install all framing members and gypsum panels so that, after application, the panel surfaces will be on an even plane. To help achieve this, apply boards so that the leading edge of each board is attached to the open or unsupported edge of a steel-stud flange. After finishing and painting, uneven gypsum panel joints can create shadows when exposed to critical lighting.

All gypsum panels should be tight and secure against the framing members or underlying substrate. Loose panels will create “fastener pops” and joint cracks.

Butt panel joint edges and ends loosely. Ends should be separated slightly and not touch. In conjunction with poor environmental conditions, panels that are butted too tightly are more likely to develop a visible joint ridge or bead after painting.

Consider hanging gypsum panels with the long tapered edges parallel with the direction of the light source. This helps to mask the appearance of the joint. Note that certain fire-rated partitions may not allow installation of the panels in this manner.

Use the longest and widest practical panels available to minimize the number of joints.

Drywall screws should be driven to penetrate just below the gypsum panel surface without breaking the surface paper. After finished painting, overdriven fasteners can contribute to finished appearance issues, such as visible depressions over the affected fastener heads.

Properly install control joints as detailed on the construction documents, including perimeter relief details. Improperly installed or missing control joints will not allow for relief of stresses within or placed upon the gypsum membrane, resulting in cracks.

### Drywall Finishing Activities.

Closely inspect the drywall and correct any deficiencies before beginning finishing work.

In order to minimize the chances of development of ridges at butt joints, bevel the gypsum panel ends approximately 1/8" at a 45° angle with a utility knife to remove any loose paper from the end. Pre-fill this recess with setting-type compound and allow to set before joint taping.

When finishing drywall joints, fasteners and trims, do not apply joint compound flush or flat to the panel surface, but rather use graduated arcs to prevent the appearance of recesses or ridges. Otherwise, the recesses or ridges that result may be visible under critical lighting or other conditions.

Allow each coat of ready-mixed joint compound to dry thoroughly before applying the following coat. This allows all shrinkage of the applied coat to occur before following coats are applied.

To minimize sanding, apply joint compound as smoothly as possible. Do not sand compound flush to the panel surface. Avoid roughening or damaging the panel face paper when sanding—the raised damaged fibers may be visible after painting. Avoid excessively coarse or larger-sized abrasive media that may leave visible scratches in the joint compound. Wet sanding with a damp sponge is less likely to scuff or damage the gypsum panel surface. Remove all sanding dust prior to painting or decorating.

The gypsum panel surface should be skim coated with a conventional weight joint compound to improve joint and fastener concealment, especially where gypsum panel surfaces will be subjected to severe artificial or natural side lighting, or be decorated with gloss paint (egg shell, semigloss or gloss). Skim coating fills imperfections in joint work, smooths the paper texture and provides a uniform surface for decorating by equalizing the suction and texture differences between the drywall face paper and the finished joint compound. As an alternative to skim coating, or when a Level 5 finish is required, use SHEETROCK® Brand TUFF-HIDE™ primer-surfacer.

Properly maintain all drywall finishing tools by performing regular maintenance and repair. Replace worn tools and parts as needed.

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## Painting Contractor Best Practices

Ensure all sanding dust has been removed from the surfaces to be painted.

Priming should be done before texturing or finish painting begins. If the drywall surfaces have been skim coated, priming should also be completed prior to finish painting.

If SHEETROCK TUFF-HIDE primer-surfacer has been used by the drywall finishing contractor, finish painting can begin. If not, either SHEETROCK® Brand First Coat primer or undiluted interior latex flat wall paint with high solids content is recommended for the first (prime) coat.

Effective methods for achieving a visually uniform surface are: 1) spray application of primers and finish paints, immediately followed by back rolling or 2) roller application using good roller techniques, such as finishing in one direction. Use roller types and naps recommended by the paint manufacturer.

Closely follow the paint manufacturer's recommendations and architectural specifications for number of coats, mil thickness of each coat, drying times between coats, sanding between coats, proper environmental conditions, etc.

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## Final Surface Inspections

### If a Jobsite Visual Standard Has Been Established:

If a jobsite visual standard (mock-up) of the gypsum panel wall/ceiling assembly has been constructed and used to establish finished appearance expectations, final inspections are relatively easy to perform. The finished surfaces are inspected and compared to the appearance of the agreed-upon jobsite standard.

Inspection lighting should be representative of normal lighting conditions in intensity and location. Consider the effects of window treatments and other decorative finishes that could affect lighting and viewing. A normal viewing position should be used for the inspection. This is defined as a viewing position at any angle provided it is established at a minimum distance of five feet perpendicular from the surface to be inspected. The inspection evaluation is then conducted without magnification, with normal lighting from the normal viewing position.

### If a Jobsite Visual Standard Has Not Been Established:

Without the benefits of a constructed jobsite standard, final inspections are more subjective. The Painting and Decorating Contractors of America (PDCA) industry association has developed a standard for defining a "properly painted surface." This standard is intended to help the inspector determine if the painted surface is acceptable as it relates to common visual paint and paint application deficiencies.

The PDCA Standard P1-09 defines a "properly painted surface" as "uniform in appearance, color, texture, hiding and sheen. It is also free of foreign material, lumps, skins, runs, sags, holidays, misses, or insufficient coverage. It is also a surface free of drips, spatters, spills or overspray caused by the Painting and Decorating Contractor's workforce. In order to determine whether a surface has been 'properly painted' it shall be examined without magnification at a distance of thirty-nine (39) inches or one (1) meter, or more, under finished lighting conditions and from a normal viewing position."

In addition to the deficiencies related to paint coatings and the paint application process listed in PDCA Standard P1-09, common visual drywall material and drywall contractor workmanship deficiencies can also be added. These deficiencies include cracks, dents, dimples, dings, gouges, grooves, rough paper texture, scratches and tool marks.

It is the intent of the PDCA standard combined with the common drywall-related deficiencies to provide objectivity into the finished appearance evaluation process. Deficiencies that can be observed under the standard's stated lighting, viewing and distance parameters should be considered deficiencies in need of corrective action to bring the surface up to the level of an acceptable finished appearance.

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## Resources

For additional information, refer to the following resource documents:

### ASTM C840-01:

*Standard Specification for Application and Finishing of Gypsum Board.* American Society for Testing and Materials, West Conshohocken, PA.

### DWFC:

*Method for Inspecting Interior Joint Treated Gypsum Panel Surfaces.* Drywall Finishing Council Incorporated, Garden Grove, CA.

*Recommended Levels of Paint Finish over Gypsum Board.* Drywall Finishing Council, Garden Grove, CA.

*Recommended Surface Treatment for Finishing Gypsum Board to Attain a Level 5 Finish.* Drywall Finishing Council, Garden Grove, CA.

[dwfc.org](http://dwfc.org)

### GYPSUM ASSOCIATION:

GA-214-10: *Recommended Levels of Gypsum Board Finish.* Gypsum Association, Washington, DC.

GA-216-10: *Application and Finishing of Gypsum Panel Products.* Gypsum Association, Washington, DC.

[gypsum.org](http://gypsum.org)

### PDCA P1-09:

*Touch-Up Painting and Damage Repair: Financial Responsibility and Definition of a Properly Painted Surface.* Painting and Decorating Contractors of America, Fairfax, VA.

[pdca.org](http://pdca.org)

### USG:

*The Gypsum Construction Handbook*, Sixth Edition, published by R.S. Means Company, Inc. United States Gypsum Company, Chicago, IL.

Data Sheet J2010/11-10: *Finishing and Decorating Gypsum Panels.* United States Gypsum Company, Chicago, IL.

Data Sheet J564/8-03: *Finishing and Decorating Gypsum Panels; Critical Light Conditions.* United States Gypsum Company, Chicago, IL.

Brochure SA-920/7-07: *Plaster Systems.* United States Gypsum Company, Chicago, IL.

[usg.com](http://usg.com)

