Recommended Paint Systems Applied Over Gypsum Board, Glass Mat and Fiber-Reinforced Gypsum Panels

1. SCOPE

This document describes and recommends terminologies and various types of paint finish as the final decoration over new interior gypsum panel surfaces. The recommended paint systems applied over gypsum panel wall and ceiling surfaces varies depending on several factors. The location within the structure, the level of gypsum panel finish specified prior to final decoration and the type of illumination on the surface will determine the minimum paint system required. All materials are to be used in accordance with applicable codes, specifications and manufacturer recommendations.

2. TERMINOLOGY

The following definitions are applicable to this document.

back rolling: A method where freshly applied paint (wet) is smoothed out with a roller to even the appearance and improve uniformity of the paint coating. Note: The roller shall be wet but not dipped at each application. The intent is not to apply more paint or to take paint from the surface, but to even out the sprayed applied paint evenly onto the surface.

coat: A layer of paint, varnish, lacquer or other material that is applied and then allowed to dry. To back roll or apply a wet-on-wet film still constitutes a single coat. – **MPI**

critical lighting: A condition whereby interior surfaces are flooded by natural or artificial lighting at an oblique angle; such as lighting from large expanses of windows, glass curtain walls, skylights, or surface-mounted light fixtures. - **ASTM**

flat / matte paint: A paint material specifically manufactured to produce maximum 5 Gloss Units (GU) at 60° and maximum 10 Gloss Units (GU) at an 85° angle when measured using a gloss meter.- **MPI**

gloss: A subjective term used to describe the relative amount and nature of mirror like (specular) reflection.

hiding: The degree or ability of an opaque coating, applied in a uniform film, to cover, mask or obscure the substrate to which it is applied, or the colors underneath. Hiding power is provided by the paint's pigment. - **MPI**

hold-out: The property that provides a low porosity surface which reduces the penetration of subsequently applied coatings. This improves the gloss and color uniformity of finishing coats. -**MPI**

joint photographing: The shadowing of the finished joint areas through the surface decoration. Synonym telegraphing. - **GA-214**

non-flat paint - A paint material specifically manufactured to produce greater than 5 Gloss Units (GU) at 60° and greater than 10 Gloss Units (GU) at an 85° angle when measured using a gloss meter.

normal lighting conditions: Normal lighting conditions are described as those in place when the project is finished. This includes, but not limited to, design lighting (e.g. wall washers, spots and floods, etc.) and natural lighting.

normal viewing position: The normal viewing position shall be at any angle provided it is established at a minimum distance of five feet perpendicular from the surface to be viewed.

paint: Any pigmented liquid, liquefiable, or mastic composition designed for application to a substrate as a thin layer which is converted to an opaque solid film after "drying or "curing". Used for protection, decoration or identification, or to serve some functional purpose, such as filling or concealing surface irregularities.

paint flashing: Uneven gloss or color in a dried paint surface usually resulting from absorption and/or physical texture variation across or through the decorated substrate.

primer: A paint coating designed to provide adequate adhesion and meet the special requirements of the surface**.** The first complete coat of a painting operation.

properly painted surface: A surface that is uniform in appearance, color, and sheen. It is one that is free of foreign material, lumps, skins, runs, sags, holidays, misses, strike-through, or insufficient coverage. It is a surface that is free of drips, spatters, spills, or overspray which a contractor's workforce may cause. Compliance to meeting the criteria of a "Properly painted surface" shall be determined when viewed without magnification at thirty-nine inches or more under normal lighting conditions and from a normal viewing position. – **PDCA**

topcoat: The finish coat(s) of a coating system, formulated for appearance and/or environmental resistance. – **PDCA**

3. MINIMUM PAINT SYSTEMS OVER GYPSUM PANELS IN CONJUNCTION WITH GA-214 RECOMMENDED LEVELS OF FINISH FOR GYPSUM BOARD, GLASS MAT, AND FIBER REINFORCED GYPSUM PANELS

TABLE 1

Gloss/Sheen	Gloss Level	Gloss Units (GU) @ 60°	Gloss Units (GU) @ 85°
Flat / Matte	1	5 GU max.	10 GU max.
↓	2	10 GU max.	10 - 25 GU
↓	3	10 - 25 GU	10 - 35 GU
↓	4	20 - 35 GU	35 GU min.
↓	5	35 - 70 GU	
↓	6	70 - 85 GU	
High Gloss	7	85 GU min.	

Source: MPI Gloss and Sheen Standards

GA-214 LEVEL	Minimum Paint System – New Construction
LEVEL 0	*Typically specified in temporary construction or whenever the final decoration has not been determined.*
Paint System:	None
LEVEL 1	*Typically specified joint treatment in smoke barrier applications and areas not normally open to public view such as plenum areas above ceilings, attics, and other areas where the assembly would generally be concealed.*
Paint System:	None
Note:	Where uniformity of color is desired; Minimum one coat of primer or MPI Gloss-1 paint (flat/matte) may be applied. See Table 1 for defined gloss range.

GA-214 LEVEL	Minimum Paint System – New Construction
LEVEL 2	*Typically specified where gypsum panel products are used as a substrate for tile; may be used in garages, warehouse storage or other similar areas where surface appearance is not a concern.*
Paint System:	None
Note:	Where uniformity of color is desired; Minimum one coat of primer or MPI Gloss-1 paint (flat/matte) may be applied. See Table 1 for defined gloss range.
LEVEL 3	*Typically specified in appearance areas which are to receive heavy- or medium-texture finishes (spray or hand applied) before final painting, or where heavy-duty/commercial grade wallcoverings are to be applied as the final decoration. The design professional shall specify the mock-up procedure and mock-up construction details within the project documents. This level of finish is not recommended for smooth wall designs or applications where light textures, non-continuous textures, or lightweight wallcoverings are applied.*
Paint System:	Apply one coat of primer and one coat of MPI Gloss-1 paint (flat/matte). See Table 1 for defined gloss range**.**
Note:	Jobsite mock-up(s) shall be used to determine acceptance of the finish within the building, including final job verification that the overall aesthetics and physical performance meet the established job expectations under normal lighting conditions at a normal viewing position.
LEVEL 4	*Typically specified in appearance areas where smooth wall designs are decorated with flat paints, light textures, non-continuous textures, or wallcoverings are to be applied. The design professional shall specify the mock-up procedure and mock-up construction details within the project documents. This level of finish is not recommended where non-flat or dark/deep tone paints are applied.*
Paint System:	Apply one coat of primer and two coats of MPI Gloss-1 paint (flat/matte). See Table 1 for defined gloss range.
Note:	Jobsite mock-up(s) shall be used to determine acceptance of the finish within the building, including final job verification that the overall aesthetics and physical performance meet the established job expectations under normal lighting conditions at a normal viewing position.
LEVEL 5	*Typically specified in appearance areas where smooth wall designs are decorated with non-flat paints (i.e., sheen/gloss) or other glossy decorative finishes, dark/deep tone paints are applied, or critical lighting conditions occur. The design professional shall specify the mock-up procedure and mock-up construction details within the project documents. This level of finish is the most effective method to provide a uniform surface and minimize the possibility of joint photographing and/or fasteners showing through the final decoration.*
Paint System:	Apply one coat of primer and two coats of MPI Gloss-1 through Gloss-7 paint (flat/matte to high gloss). See Table 1 for defined gloss ranges.
Note:	Jobsite mock-up(s) shall be used to determine acceptance of the finish within the building, including final job verification that the overall aesthetics and physical performance meet the established job expectations under normal lighting conditions at a normal viewing position.

4. COMMENTS

Application: Industry experience demonstrates that an effective method for achieving a visually uniform surface for both the primer and topcoat is spray application immediately followed by back rolling or roller application using good roller techniques, such as finishing in one direction and using roller types and naps recommended by the paint manufacturer. Paint shall be applied to the dry film thickness and application conditions specified by the paint manufacturer and shall conform to the requirements of a **"**properly painted surface" as defined by PDCA standard P1.

Environmental Conditions - Painting: Follow the paint manufacturer's recommendations.

Environmental Control: Temperature, humidity, and airflow should remain constant, and as close to occupancy conditions as possible. The potential for finishing and decorating problems is minimized when job environmental conditions match occupancy environmental conditions. Controlling and maintaining environmental conditions is key. Changes and/or fluctuations in temperature, humidity, and airflow can have a profound adverse effect.

Lighting – Finishing Operations: Interior lighting used on the jobsite during construction and finishing/decorating operations should be more critical in angle and intensity than lighting encountered under normal lighting conditions during inspection or after the structure is occupied. When using this lighting practice areas that require additional detailing are generally accentuated making it easier to identify and correct during the finishing and decorating operations. However, such lighting should not be used to evaluate the flatness of the surface. See Comments under "Lighting – Inspection".

Lighting - Inspection: Interior lighting for inspection lighting shall be representative of normal lighting conditions in intensity and location when the structure is occupied. See Comments "Lighting – Finishing Operations" and Terminology "normal lighting conditions" and "normal viewing position".

Number of paint coats: The number of paint coats required depends on several factors, including primer selection, gloss level of the topcoat(s), color selection of the topcoat(s) and the manufacturer's recommendations.

Primer: Within this document, it is recommended that the primer should be specifically formulated to equalize the porosity and texture variations present over the interior joint treated gypsum panel surface.

Primer & Paint Selection: An important factor is the durability/compatibility of the paint system applied over the gypsum panel substrate. Manufacturers produce various paint grades and types. When the level of gypsum panel finish is known, and the paint system selected, consult with the paint manufacturer to determine if the paint products selected will yield the desired performance level and quality of finish. Note: It is recommended that jobsite mock-ups (required per GA-214) and benchmark samples (PDCA standard P5) are used to determine acceptance. The completed mockup should be assessed not only for appearance, but also for durability to ensure that the end user's expectations are met.

Texture: Dimensional effect that becomes an integral part of the substrate. Note: Topcoat materials used as a texture shall be referred to the appropriate level of paint finish.

Visual Uniformity: As the gloss of the topcoat(s) of finish paint increases, joint photographing, substrate blemishes, and spot repairs may become more noticeable producing inconsistencies across the surface.

5. RESOURCES

DWFC. Method for Inspecting Interior Joint Treated Gypsum Panel Surfaces - Drywall Finishing Council, Incorporated.

DWFC. Recommended Specification for Preparation of Gypsum Board Surfaces Prior To Texture Application - Drywall Finishing Council, Incorporated.

GA-214. Recommended Levels of Finish for Gypsum Board, Glass Mat, and Fiber-Reinforced Gypsum Panels - Gypsum Association.

MPI. Glossary of Terms - The Master Painters Institute.

PDCA. Craftsman's Manual and Textbook - Painting and Decorating Contractors of America.

PDCA. Standard P1. Touch-Up Painting and Damage Repair - Financial Responsibility - Painting and Decorating Contractors of America.

PDCA, Standard P5. Benchmark Sample Procedures for Paint and Other Coating Systems - Painting and Decorating Contractors of America.

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