

Environmental Conditions

For Application and Finishing of Interior Gypsum Board:

Maintaining the interior temperature and humidity levels (environmental conditions) in compliance with the manufacturers' recommendations and ASTM requirements are critical to achieving an acceptable appearance and performance of Gypsum Board. Conversely, improper environmental conditions will lead to schedule delays, joint bond failure, delayed shrinkage, ridging, nail pops, joint flashing, board sagging and etc.

Terminology:

Gypsum Board - the generic name for a family of sheet products consisting of a noncombustible core primarily of gypsum, with paper surfacing

Gypsum Panel Products - the general name for a family of sheet products consisting essentially of gypsum

Joint Treatment - application of joint tape and compound to the joints between gypsum boards

Ready Mix - a factory-prepared compound ready to be used without the addition of water

Setting Type - a compound that hardens by a chemical reaction and increases in strength through drying

General:

The following recommendations have been put in place to ensure that gypsum board and gypsum panel products perform as intended. With the understanding that jobsite conditions vary based on a number of factors, the following information is agreed upon by industry professionals as the standard limitations to follow. Where manufacturers' recommendations differ, follow their recommendations.

Protection:

- Gypsum panels shall be protected from the direct exposure to rain, snow, sunlight, or other excessive weather conditions.
- Ready-mixed joint compounds shall be protected from freezing, exposure to extreme heat, and direct sunlight.
- Gypsum panel products shall not be exposed to water or continuous high humidity conditions.
- Gypsum panel products shall not be exposed to sustained temperatures of more than 125°F (52°C) for extended periods of time.

Attachment Surfaces:

- Lumber must be kept dry during storage and installation, moisture content of lumber should not exceed 15% at the time of gypsum board application.
- Wood sheathing shall not exceed 15% moisture content at the time of gypsum board application.

Temperature Guidelines:

- When materials are being mixed or used for joint treatment or for laminating gypsum panel products the room temperature shall be maintained at not less than 50° F (10° C) for a period beginning not less than 48 hours before mixing or application and shall be maintained until completely dry.
 - Note: WCC has found good results when the minimum temp of 50° F (10° C) is maintained continuously thereafter until permanent heating system is in operation or until building occupied. The potential for finishing and decorating problems is minimal when job environmental conditions are controlled.
- Although not intended for production type work, setting type compounds may be helpful in cold weather applications but should not be applied in temperatures below 45° F (7° C).
- The room temperature shall be maintained at not less than 40°F (4° C) for mechanical application of gypsum panel products and at not less than 50°F (10° C) for adhesive application of gypsum panel products and for joint treatment, texturing, and decoration unless otherwise specified by the manufacturer.
- When a temporary heat source is used the temperature shall not be more than 95°F (35°C) in any given room or area.
- When propane type heaters are used, the extra humidity that they produce shall be removed.
- Adequate and continuous ventilation shall be provided in the working area during the installation and the drying or setting period. In certain climates, such as coastal or area subject to high humidity or moisture, ventilation must be accomplished by mechanical means such as fans and dehumidification units.

Joint Treatment Under Extreme Weather Conditions:

- **Hot/Dry Weather:**
 - Work the shortest practical lengths of joint at a time to compensate for evaporation and the shorter workability time.
 - Setting –type compounds have a higher resistance to edge cracking caused by hot, dry weather.
 - Avoid adding excess water to compounds to extend their work time; excess water will only increase the possibility of shrinkage.
- **Wet/Humid Weather:**
 - Allow each coat of joint compound to thoroughly dry before adding subsequent coats.
 - Reference Table 1 for drying rates rather than relying on moisture meters or visual observations to check for joint dryness.
- **Cold Weather:**
 - Provide heat, joint treatment should not be applied to cold or damp surfaces.
 - Refer to the above “Temperature Guidelines” section for cold weather temperature recommendations.

Table 1
 DRYING TIME - JOINT COMPOUND UNDER TAPE¹

Relative Humidity	Temperature, °F (°C)							
	32 (0)	40 (4)	50 (10)	60 (16)	70 (21)	80 (27)	90 (32)	100 (38)
98%	53D	38D	26D	18D	12D	9D	6D	4½D
97%	37D	26D	18D	12D	9D	6D	4½D	3¼D
96%	28D	21D	14D	10D	7D	5D	3½D	2½D
95%	25D	17D	12D	8D	6D	4D	2¾D	2D
94%	20D	14D	10D	7D	5D	3¾D	2¼D	41H
93%	18D	12½D	9D	6D	4D	2¾D	2D	36H
92%	15D	11D	8D	5D	3½D	2½D	44H	32H
91%	14D	10D	7D	4¾D	3¾D	2¼D	40H	29H
90%	13D	9D	6D	4½D	3D	49H	36H	26H
85%	10D	6D	4D	3D	2D	34H	25H	18H
80%	7D	4¾D	3¾D	2¼D	38H	27H	19H	14H
70%	4½D	3½D	2¼D	38H	26H	19H	14H	10H
60%	3½D	2½D	42H	29H	20H	14H	10H	8H
50%	3D	2D	36H	24H	17H	12H	9H	6H
40%	2½D	44H	29H	20H	14H	10H	7H	5H
30%	2¼D	38H	26H	18H	12H	9H	6H	4½H
20%	2D	34H	23H	16H	11H	8H	5½H	4H
10%	42H	30H	21H	14H	10H	7H	5H	3½H
0%	38H	28H	19H	13H	9H	6H	4½H	3H

¹ For evaporation of 10lbs. (45.37 kg) of water per 250 ft (76.2 m) of tape, corresponding to 1/16" to 5/64" (1.6 to 2.0 mm) wet compound thickness under the tape. Thicker or thinner coats of compound will affect drying times in proportion to the wet compound thickness. These drying times apply when the exposed surface of the tape is bare or nearly bare, and when adequate ventilation is provided. A heavy coat of compound over the tape will lengthen the drying time.

References:

- ASTM C-840-11
- GA-216-2013
- GA-236-13
- Gypsum Construction Handbook, Sixth Edition
- NWCB TD 300-100 Guide Specification for Gypsum Wallboard
- NWCB TD 300-103 Gypsum Wallboard and Winter Weather
- NWCB TD 300-111 Ridging in Gypsum Wallboard
- NWCB TD 300-300 Recommended Procedures for Judging Gypsum Wallboard
- NWCB TD 300-301 Recommended Levels for Finishing of Gypsum Board