



## GYPSUM ASSOCIATION

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# WATER-RESISTANT GYPSUM BACKING BOARD FOR CERAMIC TILE IN WET AREAS (GA-239-04)

NOTE: Consult the water-resistant gypsum backing board manufacturer for specific recommendations regarding the use of water-resistant gypsum backing board in wet areas.

Water-resistant gypsum backing board (see ASTM C 1396/C 1396M, *Standard Specification for Gypsum Board*), commonly called “green board” because of the color of its face paper, is specially designed and formulated to serve as a base for ceramic and similar tile in areas subject to occasional water or moisture such as tub and shower enclosures, kitchens, and utility rooms. The core, face paper, and back paper are formulated and manufactured to resist the effects of moisture and humidity.

Water-resistant gypsum backing board contains additives in its core that provide water resistance and its face and back paper are treated to limit water absorption; however, *water-resistant* gypsum backing board is NOT WATER-PROOF. Water-resistant gypsum backing board shall NOT be used in critical areas of high humidity such as around hot tubs, steam rooms, indoor swimming pools, saunas, or gang showers.

Care must be taken to ensure that the installation is done in strict accordance with the recommendations of the manufacturers of the materials being used. Following the “best practices” below will minimize the potential for water intrusion and will help ensure satisfactory performance for many years. Deviation from these recommendations can result in water entry into the system and subsequent deterioration of the bond between the ceramic tile and the gypsum board.

### Design and Construction Considerations

When showers are located next to an exterior wall, the wall shall be designed and constructed to prevent moisture condensation on the interior side of the wall. The ventilation system shall be designed to remove excess moisture from the air in the area during shower use and for a sufficient period of time after use to allow for proper drying of wet surfaces. An air change rate of at least 5 air changes per hour is suggested. Window sills, ledges, seats, or other horizontal surfaces within a shower enclosure shall be designed to allow for proper drainage.

### Preparation

Before beginning the application of water-resistant gyp-

sum backing board to walls or partitions, the framing shall be inspected for proper spacing and alignment. Framing shall be spaced not more than 24” (610 mm) o.c. and all interior angles shall be reinforced with framing to provide rigid corners. Framing shall be shimmed or furred as needed so as to align the inside face of the lip of the fixture flush with the face of the gypsum board.

Where framing is spaced more than 16” (406 mm) o.c., or where ceramic tile is more than 5/16” (8 mm) thick, blocking shall be installed between the studs. Blocking shall be located 1” (25 mm) above the top of the tub or receptor and at the midpoint between the base and the ceiling. Regardless of framing spacing, suitable blocking, headers, or supports for tub and other plumbing fixtures and for soap dishes, grab bars, towel bars, and similar items shall be installed. Plumbing fixtures shall be properly installed, securely attached, and adequately supported.

Water-resistant gypsum backing board used as a base for tile in wet areas shall not be foil-backed and shall not be applied over a vapor retarder. Where water-resistant gypsum backing board is the substrate for ceramic tile on exterior walls requiring a vapor retarder, the vapor retarder should be created on the face of the gypsum board substrate by the application of a uniform skim coat, not less than 1/32” (0.8 mm) thick, of water base Type I ceramic tile adhesive (ANSI A136.1) over the water-resistant gypsum backing board. Allow the skim coat to set or cure before applying the adhesive bond coat and installing the tile. Tests by an independent testing laboratory conducted in accordance with ASTM E 96 dry cup method, Procedure A, determined an average water vapor transmission rate of 0.29 Perms (17 ng/Pa•s•m<sup>2</sup>) for this application method.

On exterior walls where the tile covers less than the full wall surface a vapor retarder can be provided on the interior surface by applying a vapor retarder paint or primer over the area not covered by the tile. Apply the vapor retarder paint or primer in accordance with the paint manufacturer’s recommendations.

### Application Of Water-Resistant Gypsum Backing Board

Water-resistant gypsum backing board shall be applied in accordance with GA-216, *Application and Finishing of Gypsum Board*, or the manufacturer's recommendations. The gypsum board shall be positioned so that the paper-bound edge is adjacent to and 1/4" (6 mm) above the rim of the shower pan or tub. The gypsum board shall not be applied with a cut end or edge adjacent to the tub or shower pan lip or rim. The 1/4" (6 mm) space between the paper bound edge of the gypsum board and the rim of the shower pan or tub shall be void and shall not be allowed to become bridged by caulk or tile adhesive.

All tapered edge joints shall be finished flush with the surface of the gypsum board with setting-type joint compound and tape. Joint compound shall not be applied to inside corners or to fastener heads in the field of the gypsum board. All cut edges at inside corners, butt joints, and openings around pipes and fixtures shall be coated with a waterproof flexible sealant or organic adhesive complying with ANSI A136.1, Type I. A smooth skim coat of organic adhesive complying with ANSI A136.1, Type I, shall be applied over the entire surface to which ceramic tile is to be applied. The skim coat shall be allowed to cure before proceeding with tile application. A properly applied skim coat of organic adhesive will provide a vapor retarder on the room side of the wall eliminating the need for an additional vapor retarder within the wall.

### Application Of Ceramic Tile

Ceramic tile shall be applied to walls in accordance with *Installation of Ceramic Tile with Organic Adhesives or Water Cleanable Tile Setting Epoxy Adhesive*, ANSI A108.4. Tile shall be applied so as to cover fully the wall surface down to the top surface or edge of the finished shower floor, return, or tub and shall overlap the top lip of the receptor, sub-pan, or tub. Tile shall be applied to the full specified height for a distance of not less than 4 in. (100 mm) beyond the outside face of the tub or receptor. Areas beyond an outside corner are excluded. Gypsum board window sills and jambs in shower or tub enclosures shall be covered to a height not less than that specified for the wall.

For tubs without shower heads, tile shall extend not less than 6 in. (150 mm) above the rim of the tub.

For tubs with shower heads, tile shall extend not less than 5 ft (1500 mm) above the rim of the tub or 6 in. (150 mm) above the height of the shower head, whichever is higher.

In shower stalls, tile shall extend not less than 6 ft (1800 mm) above the shower dam or 6 in. (150 mm) above the height of the shower head, whichever is higher.

Grout shall be applied in accordance with *Installation of Grout in Tilework*, ANSI A108.10. A sealant shall be applied to the grout after it has set and cured.

A good high-quality mildew resistant silicone sealant shall be applied to all inside corners and at the tile/tub (or tile/shower pan) interface.

### Penetrations

Mixer valves, faucets, tub spouts, shower head, grab bars and any other item that penetrates through the tile or that is mechanically attached through the tile to the framing shall be properly sealed. Escutcheon plates shall be sealed to the tile assembly with a mildew resistant sealant.

The installation of curtain rods, draperies, and splash guards shall be such as to prevent the flow of water onto adjacent unprotected surfaces and to prevent further migration into the tile system.

### Maintenance

Proper maintenance and repair of tiled surfaces in wet areas will help assure continued performance of the system. This maintenance includes, but is not limited to, resealing the grout periodically, as recommended by the grout or sealant manufacturer, repairing cracked grout, replacing damaged tile, and periodic replacement of deteriorating caulk. Periodic cleaning with proper cleaning agents and soaps shall be part of the maintenance program; neutral soaps are recommended to prevent conditions favorable to mildew growth which can damage caulk or grout. A neutral (water) rinse shall be used following the application of bleach or other cleaning agents designed to inhibit or remove bacterial or fungal growth.

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