

Selecting water-resistant interior panels

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WHEN MOISTURE IS PRESENT, DRYWALL CAN DEVELOP PROBLEMS.

DRYWALL IS COMPRISED PRINCIPALLY OF GYPSUM AND PAPER, TWO MATERIALS THAT ARE ADVERSELY AFFECTED BY THE PRESENCE OF WATER. TWO OTHER PANEL PRODUCTS, SHEETROCK BRAND GYPSUM PANELS, WATER-RESISTANT (W/R), AND DUROCK MULTI-PURPOSE CEMENT BOARD, CAN MINIMIZE PROBLEMS ASSOCIATED WITH MOISTURE. THE QUESTION IS, WHEN DO YOU NEED W/R PANELS AND WHEN DO YOU NEED CEMENT BOARD?

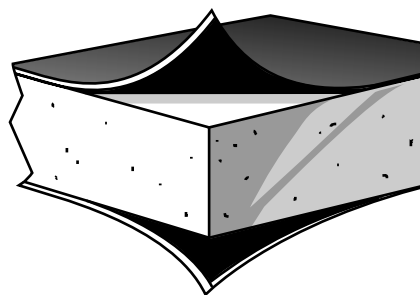
Ceramic tile has long been a material of choice for use in bathrooms, kitchens, swimming pools, and other generally accepted "wet" areas. It provides a glazed, easily cleaned, and sanitary surface.

Through the first half of this century, ceramic tile was installed over a full bed coat of portland cement plaster in order to provide a durable, long-lasting tile substrate. The total system was comprised of materials that were certainly not detrimentally affected by water intrusion.

As gypsum drywall became more of a factor in the residential construction market, the extra expense of applying ceramic tile over a cement plaster bed coat became a budget problem. Gypsum panels as a substrate for ceramic tile were a natural. However the natural negative reaction between gypsum products and water was a big deterrent. Initial installation specifications for gypsum drywall as a ceramic tile substrate required the panels to be full size sheets to eliminate butt joints, a minimum 1/2" thick, and applied horizontally with the paperbound edge down toward the tub, shower receptor, or pan. A minimum

1/4" clearance or space was required between the edge of the wallboard and the tub, receptor, or pan to prevent capillary migration of water.

The gypsum drywall then had to be "waterproofed." This could be accomplished by one of two methods:



Water-resistant characteristics of SHEETROCK brand W/R Gypsum Panels include water-repellent face and back paper and water-resistant core.

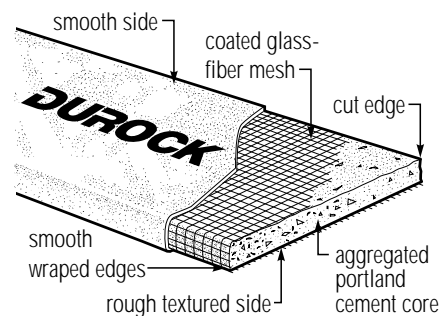
1. Skim coat—with the flat edge of a trowel a full 1/16" skim coat of an approved grade of tile adhesive was applied evenly to the entire surface to receive the tile. It was applied to the bottom edge of the wallboard and was to fill the cut-out spaces around soap dishes, pipes, towel bars, etc. This coating was allowed to stand at least 24 hours. After the skim

coating had hardened so that it would not be grooved by the notches of a trowel, a bedding coat was applied over the lip of the tub forming a water dam behind the bottom edge of the tile.

2. Sealer—a waterproof sealant could be applied in lieu of the adhesive skim coat. It had to be specifically made for the purpose, and compatible with the tile adhesive. A heavy brush application of sealer was necessary, and included sealing all edges of cut-outs—and then the cut-outs were caulked with waterproof, nonhardening caulking compound.

The key to success of the drywall substrate for ceramic tile was to provide a surface that was impervious to free water intrusion and to provide seals against that occurrence at penetrations.

In the mid 1960's U. S. Gypsum introduced a product called SHEETROCK brand



DUROCK Multi-Purpose Cement Board.

Gypsum Panels, Water-Resistant (W/R). This innovative gypsum product addressed the fact that water and gypsum were not friendly neighbors. The face and back papers were specially treated to provide water repellency and the core was treated with a water-resistant emulsion. The added water resistance eliminated the need for the extra skim coat of adhesive or the waterproof sealant. The face paper was made with a green color for product identity simplification to represent water-resis-

tance, and the industry saw the birth of “green board.”

Deterioration complaints due to water intrusion behind the ceramic tile dropped dramatically with the introduction of SHEETROCK brand W/R Gypsum Panels. But the new product was not the full answer to water deterioration problems. If the ceramic tile grout cracks and lets water get behind the W/R gypsum panels, the W/R gypsum panels will eventually fail.

Portland cement basecoats have a long history of positive performance with ceramic tile finishes. Portland cement and

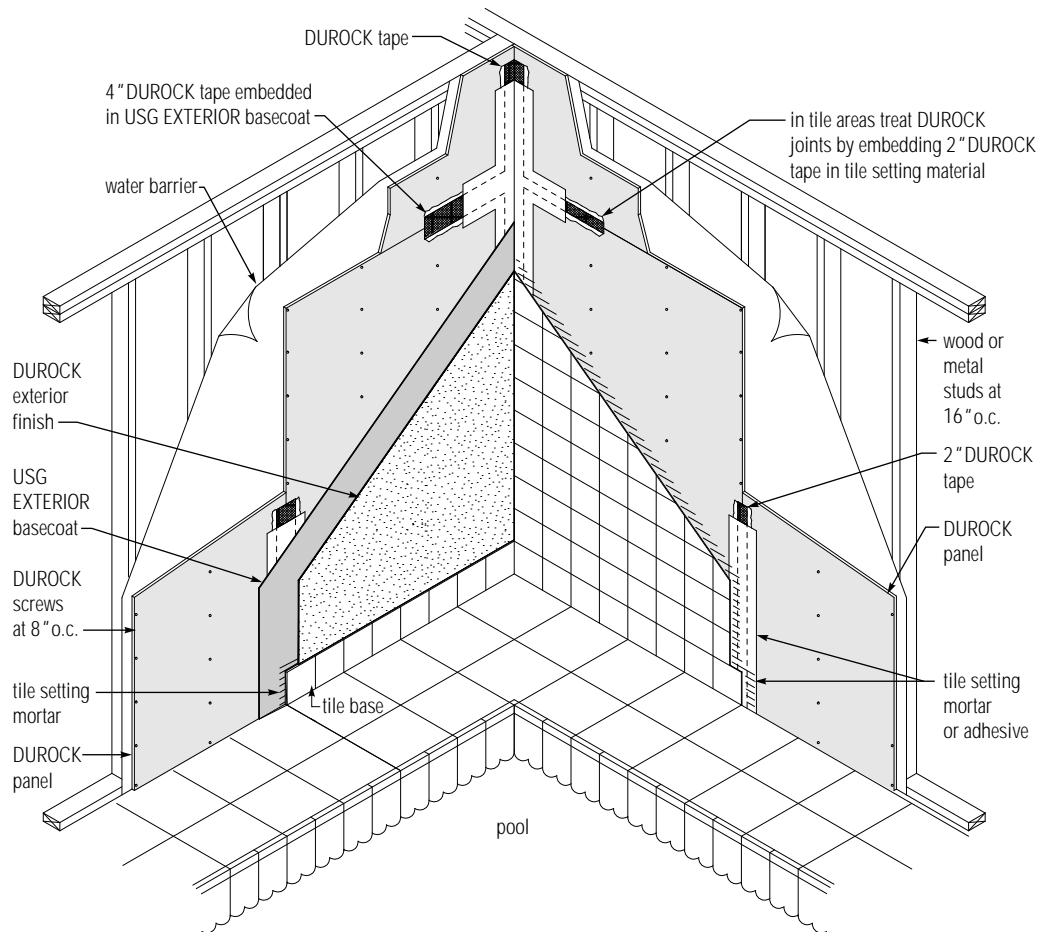
water are compatible—the water certainly doesn’t “hurt” the cement. What would be more natural than a board product like gypsum board made from portland cement? Hence DUROCK Multi-Purpose Cement Board.

Since the portland cement composition of DUROCK Multi-Purpose Cement Board provides a material that can be exposed continuously to water without deterioration, it is ideal for extreme moisture-presence applications (see sidebar article on page 11). SHEETROCK brand W/R Gypsum Panels can still be used in certain situations, particularly where exposure to water

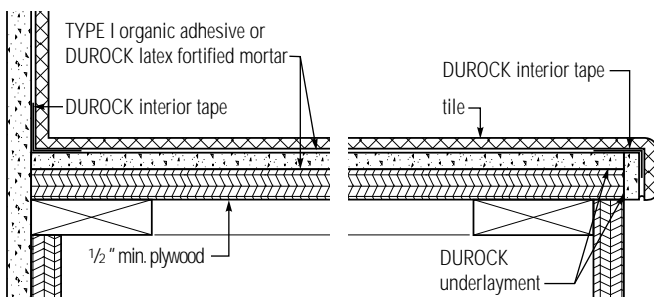
is occasional and indirect, i.e., residential applications.

Installing cement board

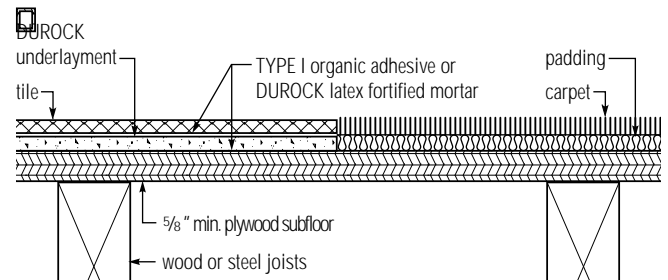
Installing and maintaining a substrate for application of ceramic tile is now possible without concern for water deteriorating the substrate. Both surfaces of DUROCK Multi-Purpose Cement Board can be used for application of ceramic tile. Typically the smooth side is used when type 1 organic adhesive is the choice for tile installation and the textured side used for thin-set type mortars. Cement board substrates are equally adapted to use on floors, which of



Counter tops



Floors, interior-wood or steel joists



Note: For floor and counter top applications, use latex fortified mortar for heavy tiles, such as quarry pavers, button-back and floor tiles over 6" x 6" size.

course is not a good application for gypsum substrates.

DUROCK Cement Board provides a superior base for the application of ceramic tiles to walls, ceilings, and floors.

DUROCK Cement Board satisfies the important criteria that should be considered in selecting a tile substrate:

1. The panel must have adequate strength and stiffness, in a wet and dry condition, to resist deformation under design loads when applied to framing at specified spacings.
2. The panel should be easy to handle, cut, and fasten. The panel, specified fasteners, and spacings must be capable of carrying the weight of the tile, mortar, grout, board, wind, or other service loads.
3. The panel must provide the required shear bond strength to secure the tile to the board, be dimensionally stable, freeze/thaw and fire resistant, and not delaminate, swell, soften, or deteriorate when exposed to water.
4. The panel should have national code acceptance and be recognized by the Tile Council of America (TCA) and the Ceramic Tile Institute (CTI) to assure the user that it meets the requirements of all the major code bodies and industry standards.

DUROCK Multi-Purpose Cement Board is accepted by all the Model Building Codes. Also, there are local code jurisdictions that are addressing the desirability of a cement board substrate via code restrictions. Many major builders and developers specify DUROCK Multi-Purpose Cement Board routinely as an assurance of long-term performance. Note that it is important that DUROCK Wood or Steel Screws be used to attach the board to framing to avoid the possibility of failure due to fastener pull-through.

W e t a r e a s e l e c t o r

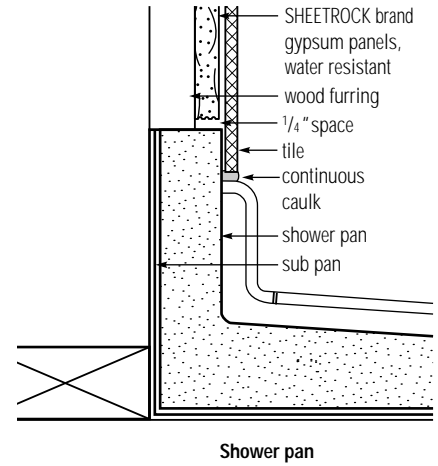
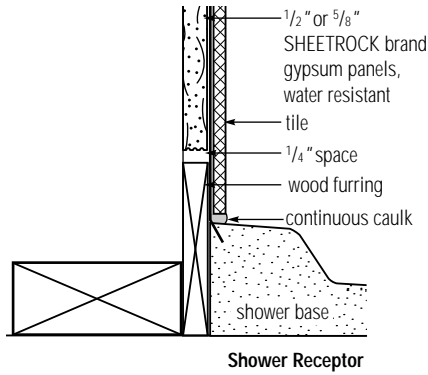
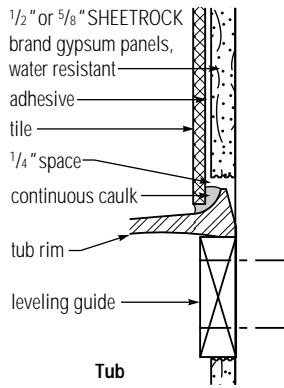
DUROCK Multi-Purpose Cement Board is the best selection for a ceramic tile substrate for areas known to have wet conditions. That would include tub and shower enclosures, gang showers, janitor's closets, spas, indoor swimming pools, etc.

Regular SHEETROCK brand Gypsum Panels should not be used in any areas that are regularly subjected to moisture or even damp air. However, SHEETROCK brand Gypsum Panels, Water-Resistant, receive special treatments during manufacture that make the product less susceptible to water damage when used in areas receiving minor contact with water. SHEETROCK brand Gypsum Panels, Water-Resistant, can be considered as an economical, basic water-resistant material for use in areas such as the walls outside a tub and shower enclosure, powder rooms, and residential kitchens.

It should be noted, however, that SHEETROCK brand Gypsum Panels, Water-Resistant, are a gypsum product and long-term success in wet areas is dependent on maintaining an effective seal between the tile surface and the gypsum core of the panels. Failure of the grout or sealants, or high levels of continuous moisture, can spell disaster.

Combinations of DUROCK Multi-Purpose Cement Board and SHEETROCK brand Gypsum Panels, Water-Resistant, can also be specified. For instance, in office and commercial buildings the toilet rooms could use a 3-foot high band of DUROCK Multi-Purpose Cement Board from the floor up, with SHEETROCK brand Gypsum Panels, W/R, above that. This would provide protection against intrusion of water from mopping and cleaning operations.

Wet area selector table		
Application	SHEETROCK brand Gypsum Panels, Water-Resistant	DUROCK Multi- Purpose Cement Board
Bathrooms (non-wet areas)	Good	Excellent
Powder Rooms	Good	Excellent
Residential Kitchens	Good	Excellent
Locker Rooms	Good	Excellent
Bathroom Tub & Shower Enclosures	Fair	Excellent
Utility or Laundry Rooms	Fair	Excellent
Gang Showers	Poor	Excellent
Janitor's Closets	Poor	Excellent
Spas, Jacuzzis and Saunas (adjacent walls/floors)	Poor	Excellent
Floors (wet or dry areas)	No	Excellent
Indoor Swimming Pools (adjacent walls/floors)	No	Excellent
Counter Tops	No	Excellent



Installing water-resistant gypsum panels

1. If necessary, fur out studs around shower receptacle so that the inside face of lip of fixture will be flush with gypsum panels face.
2. Install appropriate blocking, headers or supports for tub and other plumbing fixtures, and to receive soap dishes, grab bars, towel racks, or similar items.
3. Do not use vapor retarders between water-resistant panels and framing.
4. Install receptors before panels are erected. Shower pans or receptors should have an upstanding lip or flange at least 1 inch higher than the water dam or threshold at the entry to the shower.
5. After tub, shower pan, or receptor is installed, place a temporary 1/4 inch spacer around lip of fixture. Cut panels to the required sizes and make the necessary cutouts. Before installing panels, apply thinned ceramic tile mastic to all cut or exposed panel edges at utility holes, joints, and intersections.
6. Install the panels perpendicular to the studs with the paper-bound edge abutting the top of the spacer strip. Fasten the panels.

7. For tile 5/8 inches thick or less, panels may be installed with stud adhesive to wood or steel framing. Apply one 3/8 inch bead to stud faces, two beads on studs where two panels meet. Drive nails or screws around the perimeter.
8. In double layer applications, both layers must be SHEETROCK brand Gypsum Panels, Water-Resistant.
9. In areas to be tiled, treat all fastener heads with SHEETROCK Setting-Type (DURABOND 45 or 90) or Lightweight Setting-Type (EASY SAND 45 or 90) Joint Compound. Use the same joint compound with SHEETROCK Joint Tape to finish joints.
10. For areas not to be tiled, embed tape with SHEETROCK Setting-Type (DURABOND 45 or 90) or Lightweight Setting-Type (EASY SAND 45 or 90) Joint Compound in the conventional manner.
11. Grout all tile joints carefully to avoid water leakage through the tile plane.

Product selection

Selecting the appropriate substrate for wet areas depends on many factors, including cost, use of the space, how much moisture will be present, how often moisture will be present, how expensive the tile to be installed over it is and whether fire or sound ratings are required in the assembly. The table on page 11 shows some kinds of wet applications and which is the appropriate product for each. ■

For more information about DUROCK Multi-Purpose Cement Board and SHEETROCK brand Gypsum Panels, Water-Resistant, write to Editor, FORM & FUNCTION, 125 South Franklin Street, Chicago, IL 60606-4678 and request SA932 DUROCK Multi-Purpose Cement Board and WB634 SHEETROCK brand Gypsum Panels, Water-Resistant.

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