

USG  
Tile &  
Flooring  
Solutions

USG DUROCK  
Cement Board

**USG DUROCK® BRAND**  
CEMENT BOARD SYSTEMS

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# USG DUROCK® BRAND CEMENT BOARD SYSTEMS

## USG DUROCK® BRAND CEMENT BOARD

USG Durock® Brand Cement Board offers architects, builders and tile contractors a strong, water-durable tile base for tub and shower areas. Also an ideal underlayment for tile on floors and countertops in new construction and remodeling. Board is readily applied over wood or steel framing spaced 16" o.c. with corrosion-resistant wood or steel screws or hot-dipped galvanized roofing nails. After joints are treated, ceramic wall or floor tile is applied using latex-fortified mortar or Type I organic adhesive.

USG Durock® cement board is preferred by many applicators as a base for directly applied finishes, tile, stone and thin brick used in building exteriors.

## USG DUROCK™ BRAND TILE BACKER SCREWS

Corrosion-resistant; 8-gauge; wafer heads with countersinking ribs to prevent strip-out; self-drilling points. USG Durock™ Brand Tile Backer Screws for wood framing come in three lengths: 1-1/4", 1-5/8" and 2-1/4". USG Durock™ tile backer screws for steel framing can be used with steel framing where steel thickness is from 14- to 20-gauge; they come in two lengths: 1-1/4" and 1-5/8". Both wood and steel screws have heads a minimum of 0.40" in diameter; their driving recess is a No. 2 "Phillips" design.

## USG DUROCK™ BRAND TILE BACKER TAPE

Alkali-resistant glass-fiber tape reinforces joints to provide a strong, continuous surface. Each roll 2" x 50', 2" x 250' or 4" x 150'.

## FEATURES AND BENEFITS OF USG DUROCK® BRAND CEMENT BOARD

### DUAL SURFACE

Although both sides of USG Durock® cement board are suitable for either mastic or thin-set mortar applications, the following is offered as a guide:

- Smooth side for mastic applications; increases adhesive coverage
- Textured surface enhances bonding, reduces tile slip with mortar applications

### DIMENSIONAL STABILITY

- Low thermal and hygrometric expansion helps prevent cracking
- Will not swell, soften, decay, delaminate or disintegrate in water

### FIRE RESISTANCE

- Noncombustible panel
- Assemblies with 1/2" USG Durock® cement board have achieved one- and two-hour fire-resistance ratings

### CONVENIENT SIZES

- May be ordered in sizes to meet job requirements (see table of sizes and packaging)

### VERSATILITY

- Provides a smooth, sound base for glass and ceramic mosaics; ceramic and quarry tile; lugged tile; thin stone tile; and thin brick
- Adaptable for fences, mobile home skirting, agricultural buildings, garage wainscoting and various exterior synthetic stucco systems

## LIMITATIONS

1. Designed for positive or negative uniform loads up to 60 psf. For complete information on the use of USG Durock® Brand panels in exterior systems, consult uniform load table on Page 3 for applicable positive or negative uniform loads on wall systems.
2. Wall applications: Maximum stud spacing: 16" o.c. (24" o.c. for cavity shaft wall assembly). Framing shall be designed (based on stud properties alone) not to exceed L/360 deflection for tile and thin brick, L/240 for direct-applied exterior finish systems. Maximum fastener spacing: 8" o.c. for wood and steel framing; 6" o.c. for ceiling applications.
3. Floor applications: Maximum joist spacing 24" o.c. The subfloor system should be designed with a minimum deflection limit of L/360 for the span. Some finish materials may require a more rigid subassembly (such as large format tile and natural stone products). In these cases, follow the manufacturer's minimum requirements. The subfloor should be APA Span-Rated Plywood or OSB with an Exposure 1 classification or better with tongue and groove or back blocked at the unsupported edges.
4. In exterior applications, USG Durock® cement board should not be left uncovered for a period of time exceeding 90 days. Discoloration or staining may occur due to exposure to the elements and will not affect performance of the panel.
5. Brittle coatings, such as epoxy coatings, are not recommended for use with USG Durock® cement board. USG Durock® cement board is intended for use with tile, thin brick and exterior stucco coatings only.
6. Maximum dead load for ceiling system is 7.5 psf.
7. Steel framing must be 20-gauge equivalent or heavier.

**LIMITATIONS CONT.**

8. Do not use drywall screws or drywall nails. Do not use drywall joint tape.
9. Do not use 1/4" USG Durock® cement board for wall or ceiling applications.
10. Do not use USG Durock® cement board with vinyl flooring.
11. USG Durock® cement board is not designed for use as a structural panel.
12. Maximum installed weight of the finish system should not exceed 15 psf.
13. USG Durock® cement board panels should not be used in areas where they are exposed to temperatures that exceed 200°F.
14. In locations close to salt water or other challenging environments, design professionals should consider the use of stainless steel fasteners.
15. Do not use lightweight setting-type joint compounds or ready-mix joint compounds directly over USG Durock® cement board.

**PRODUCT DATA**

**Material:** Formed in a continuous process of aggregated Portland cement slurry with polymer-coated, glass-fiber mesh completely encompassing edges and back and front surfaces

**Edges:** Formed smooth

**Ends:** Square cut

**SIZES AND PACKAGING**

Type	Size (thickness x width x length) <sup>a</sup>	Units (pcs) <sup>b</sup>
USG Durock® Brand Cement Board	1/4" x 3' x 5'	60
	1/2" x 32" x 5'	50
	1/2" x 3' x 5'	50
	1/2" x 32" x 8'	30
	1/2" x 4' x 8'	40
	5/8" x 3' x 5'	40
	5/8" x 4' x 8'	32

**Note:** (a) Other lengths available. Contact your USG Representative. (b) Shipped in packaging units as shown.

**TECHNICAL DATA**

Property	Unit of Measure	ASTM Test Method	5/8" USG Durock® Brand Cement Board	1/2" Cement Board	1/4" Underlayment
<b>Flexural strength</b>	psi	C947	> 480	> 750	> 1000
<b>Indentation strength</b>	psi	D2394	> 1250	> 1250	> 1250
<b>Shear bond strength</b>	psi	ANSI A118.4	> 50	> 50	> 50
<b>Water absorption</b>	<20% by wt. 24 hrs.	C473	15	15	15
<b>Nail-pull resistance</b>	lb. (0.4" head diameter, wet or dry)	C473	> 90	> 90	—
<b>Weight</b>	psf	C473	3	2.4	< 1.9
<b>Freeze/thaw resistance</b>	procedure B, number of cycles with no deterioration	C666	100	100	100
<b>Mold resistance</b>	—	G21	Rating 0, No growth	Rating 0, No growth	Rating 0, No growth
		D3273	10/10	10/10	10/10
<b>Noncombustibility</b>	Pass/Fail	E136	Pass	Pass	Pass
<b>Surface-burning characteristics</b>	flame/smoke	E84	0/0	0/0	0/0
<b>Thermal</b>	"R"/k value	C518	.49/1.27	0.39/1.27	—
<b>Standard method for evaluating ceramic floor tile installation systems</b>	Passes cycles 1-6	C627	Light commercial	Light commercial	Light commercial
<b>Minimum bending radius</b>	ft. (requires special framing details available upon request)	—	6	6	—

**UNIFORM LOAD  
—1/2" USG DUROCK®  
BRAND CEMENT  
BOARD**

Stud Spacing	Fastener Spacing	Design Wind Load (1/240)	Design Wind Load (1/360)
12" o.c.	8" o.c.	45 psf	45 psf
	6" o.c.	60 psf	60 psf
16" o.c.	8" o.c.	33 psf	30 psf
	6" o.c.	45 psf	30 psf
24" o.c. (for shaft wall assemblies only)	8" o.c.	13 psf	9 psf
	6" o.c.	13 psf	9 psf

**STANDARDS**

USG Durock® cement board exceeds ANSI standards for cementitious backer units (CBU). See ANSI A118.9 for test methods and specifications for CBU and ANSI A108.11 for interior installation of CBU. Exceeds industry standards as an exterior substrate for exterior finishes. Exceeds ASTM C1325 standards for nonasbestos fiber-mat reinforced cementitious backer units.



**PARTITIONS**

One-Hour Fire-Rated Construction		Non-Load-Bearing, Steel Framed		Acoustical Performance	
Construction Detail	Description	Test Number	STC	Test Number	
	<ul style="list-style-type: none"> <li>• 1/2" USG Durock® Brand cement board</li> <li>- 3-1/2" 20-gauge steel studs 16" o.c.</li> <li>- 3" ROXUL mineral wool AFB</li> <li>• 5/8" USG Sheetrock® Brand Firecode® Gypsum Panels, one side</li> </ul>	<b>U433</b>		<b>USG-040901</b> Based on 4" C-H studs 25-gauge	

Two-Hour Fire-Rated Construction		Non-Load-Bearing, Steel Framed		Acoustical Performance	
Construction Detail	Description	Test Number	STC	Test Number	
	<ul style="list-style-type: none"> <li>• 1/2" USG Durock® Brand cement board and 1/4" ceramic tile</li> <li>• Base layer 1/2" USG Sheetrock® Brand Firecode® C Gypsum Panels</li> <li>- 3-5/8" 20-gauge steel studs 16" o.c.</li> <li>- 3" Thermafiber® SAFB™</li> <li>- Face layer joints taped</li> <li>• Alternate design two layers 1/2" USG Sheetrock® Brand Firecode® C gypsum panels, one side</li> </ul>	<b>U433</b>	56	<b>SA-851016</b> Based on alternate design	
			58	<b>SA-851028</b>	

One-Hour Fire-Rated Construction		Chase Walls, Steel Framed		Acoustical Performance	
Construction Detail	Description	Test Number	STC	Test Number	
	<ul style="list-style-type: none"> <li>• Face layer 1/2" USG Durock® Brand cement board</li> <li>• Base layer 5/8" USG Sheetrock® Brand Firecode® gypsum panels or sheathing, or USG Fiberock® panels</li> <li>- 3-1/2" 20-gauge structural studs 16" o.c.</li> <li>- 3" mineral wool batt</li> <li>• 5/8" USG Sheetrock® Brand Firecode® Gypsum Panels opposite side</li> </ul>	<b>UL Des U473</b>			

One-Hour Fire-Rated Construction		Load-Bearing, Wood Framed		Acoustical Performance	
Construction Detail	Description	Test Number	STC	Test Number	
	<ul style="list-style-type: none"> <li>• 1/2" USG Durock® Brand cement board and 1/4" ceramic tile</li> <li>- 2 x 4 wood studs 16" o.c.</li> <li>- 3-1/2" Thermafiber® SAFB™</li> <li>- Joints taped</li> <li>• Alternate design 5/8" USG Sheetrock® Brand Firecode® gypsum panels, one side</li> </ul>	<b>UL Des U329</b>	37	<b>USG-840404</b>	
			40	<b>USG-830314</b>	
	<ul style="list-style-type: none"> <li>• 1/2" USG Durock® Brand cement board</li> <li>- Base layer 15/32" plywood</li> <li>- 2 x 4 wood studs 16" o.c.</li> <li>- 3" Thermafiber® SAFB™</li> <li>- Joints taped and treated</li> <li>• 5/8" USG Sheetrock® Brand Firecode® gypsum panels, other side</li> </ul>	<b>U303</b>			

Two-Hour Fire-Rated Construction		Chase Walls, Steel Framed		Acoustical Performance	
Construction Detail	Description	Test Number	STC	Test Number	
	<ul style="list-style-type: none"> <li>• 1/2" USG Durock® Brand cement board and 1/4" ceramic tile</li> <li>- Two rows 2 x 4 wood studs 16" o.c. on 2 x 8 common plate</li> <li>- 3-1/2" Thermafiber® SAFB™ both cavities</li> <li>- Joints taped</li> <li>- Load-bearing up to 50% allowable design load</li> </ul>	<b>WHI-495-0505 0508</b>	50	<b>SA-840523</b>	

**ROOF/CEILINGS**

One-Hour Fire-Rated Construction		Steel Truss		Acoustical Performance	
Construction Detail	Description	Test Number	STC	Test Number	
	<ul style="list-style-type: none"> <li>• 5/8" USG Sheetrock® Brand Firecode® gypsum panels</li> <li>- RC-1 channels or equivalent</li> <li>- Joints finished</li> <li>- Steel roof deck</li> <li>- Steel truss 48" o.c.</li> <li>• Roof covering and roof insulation over 1/2" USG Durock® Brand cement board or 1/2" USG Sheetrock® Brand gypsum panels</li> </ul>	<b>UL Des P521, P525, 527, 529</b>			



FLOOR/CEILINGS

Two-Hour Fire-Rated Construction		Dimensional Lumber, Wood Framed		Acoustical Performance		
Construction Detail	Description	Test Number	STC	ITC	Test Number	
	<ul style="list-style-type: none"> <li>• Two layers 5/8" USG Sheetrock® Brand Firecode® C gypsum panels</li> <li>- 8" x 8" ceramic tile</li> <li>• 1/2" USG Durock® Brand cement board</li> <li>• 1" USG Sheetrock® Brand gypsum liner panels</li> <li>- 1/2" plywood</li> <li>- 2 x 10 wood joist 16" o.c.</li> <li>- 3" mineral wool batt</li> <li>- RC-1 channel or equivalent</li> </ul>	UL Des L541	52		RAL-IN-89-5	
			58		RAL-TL-89-145	
				51		RAL-IN-89-7
			59		RAL-TL-89-146	
			60		RAL-TL-89-141	
			62		RAL-IN-89-8	

EXTERIOR WALLS

Two-Hour Fire-Rated Construction		Steel Framed, Non-Load-Bearing		Acoustical Performance		
Construction Detail	Description	Test Number	STC	ITC	Test Number	
	<ul style="list-style-type: none"> <li>• 1/2" USG Durock® Brand cement board</li> <li>• Base layer 1/2" USG Sheetrock® Brand Mold Tough® Firecode® C gypsum panels, both sides</li> <li>- 3-5/8" 20-gauge minimum steel studs 16" o.c.</li> <li>- 3" Thermafiber® SAFB™</li> <li>• Alternate design, double-layer 1/2" USG Sheetrock® Brand Firecode® C gypsum panels, interior</li> </ul>	UL Des U474				

One-Hour Fire-Rated Construction		Steel Framed, Non-Load-Bearing		Acoustical Performance		
Construction Detail	Description	Test Number	STC	ITC	Test Number	
	<ul style="list-style-type: none"> <li>• 1/2" USG Durock® Brand cement board</li> <li>• Base layer 5/8" USG Sheetrock® Brand Mold Tough® Firecode® C gypsum panels</li> <li>- 3-1/2" 20-gauge steel load-bearing studs 16" o.c.</li> <li>- 3" Thermafiber® SAFB™</li> <li>• 5/8" USG Sheetrock® Brand Mold Tough® Firecode® C gypsum panels, interior side</li> </ul>	UL Des U473				

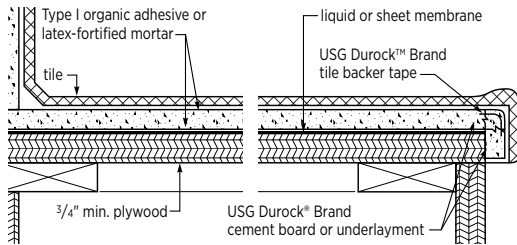
One-Hour Fire-Rated Construction		Wood Framed, Load-Bearing		Acoustical Performance		
Construction Detail	Description	Test Number	STC	ITC	Test Number	
	<ul style="list-style-type: none"> <li>• 1/2" USG Durock® Brand cement board, interior side</li> <li>- 15/32" plywood</li> <li>- 2 x 4 wood studs 16" o.c.</li> <li>- 3" Thermafiber® SAFB™</li> <li>- Joints finished</li> <li>• 5/8" USG Sheetrock® Brand Firecode® gypsum panels or USG Securock® Brand glass-mat sheathing panels, other side</li> </ul>	UL Des U303				

One-Hour Fire-Rated Construction		Wood Framed, Load-Bearing		Acoustical Performance		
Construction Detail	Description	Test Number	STC	ITC	Test Number	
	<ul style="list-style-type: none"> <li>• 1/2" USG Durock® Brand cement board and 1/4" ceramic tile exterior</li> <li>- 2 x 4 wood studs 16" o.c.</li> <li>- 3-1/2" Thermafiber® SAFB™</li> <li>• 5/8" USG Sheetrock® Brand Firecode® gypsum panels</li> <li>- Optional veneer plaster</li> </ul>	UL Des U329				

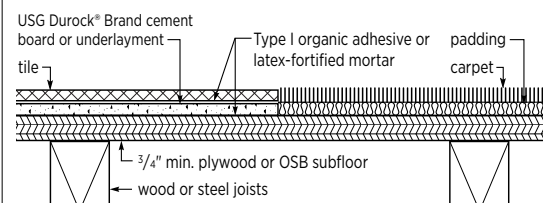
**Notes:** USG Durock® Brand cement board, 5/8" thick, may be substituted for 1/2" cement board panels in all assemblies listed above. USG Fiberock® 5/8" thick or USG Durock™ Brand Glass-Mat Tile Backerboard 5/8" thick, may be substituted for 1/2" USG Sheetrock® Brand Firecode® C gypsum panels, or 5/8" USG Sheetrock® Brand Firecode® gypsum panels, in all assemblies listed above. Where thermal insulation is shown in assembly drawing, the specific product is required in the assembly to achieve the stated fire rating. Fiberglass insulation cannot be substituted for Thermafiber® insulation. Where the wall is exposed to moisture, use a moisture-resistant barrier behind the cement board.

1. Steel framing must be 20-gauge or heavier.
2. Estimate based on 25-gauge steel studs.

**Countertops**

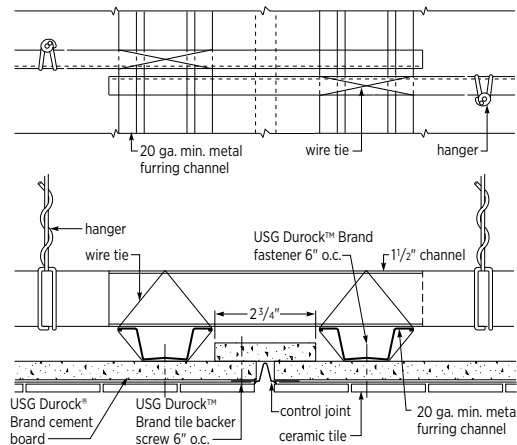


**Floors, interior—wood or steel joists**

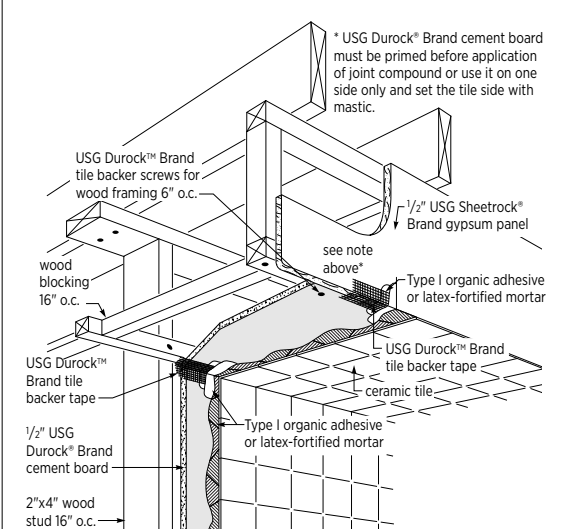


**Note:** For bonding cement backerboard to plywood subfloor, use Type I organic adhesive or latex-fortified mortar that is suitable for this kind of application. For application of various types of tiles to cement backerboard on floors or countertops, contact the tile manufacturer for the appropriate type of tile-setting mortar.

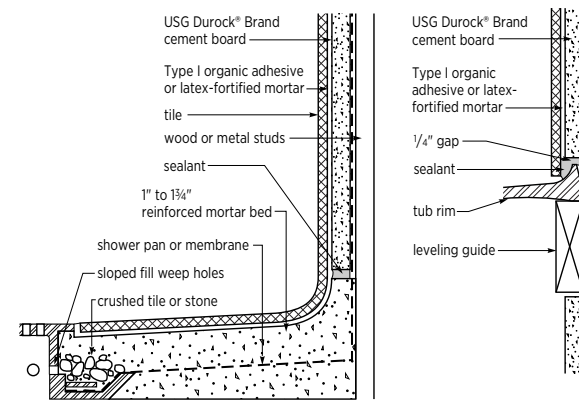
**Suspended ceiling detail**



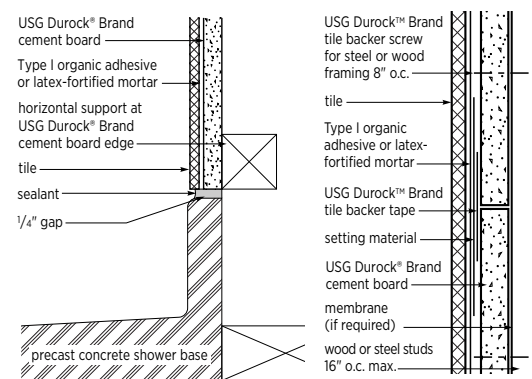
**Wood soffit framing**



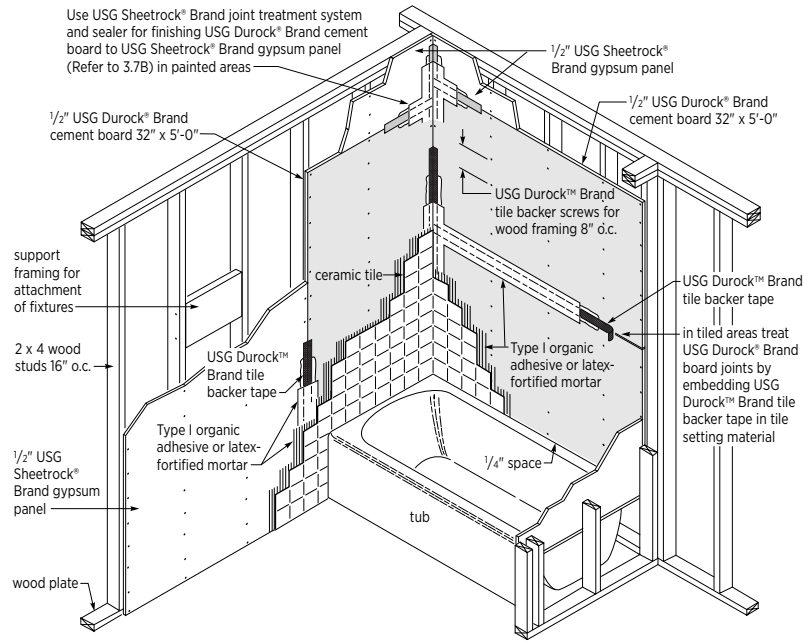
**Tub and shower—single layer board**



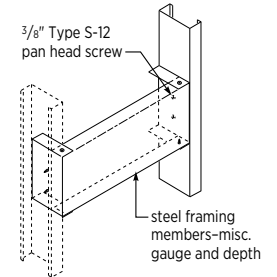
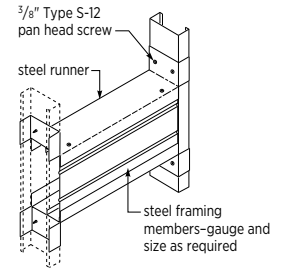
**Walls, interior and exterior—wood or steel studs**



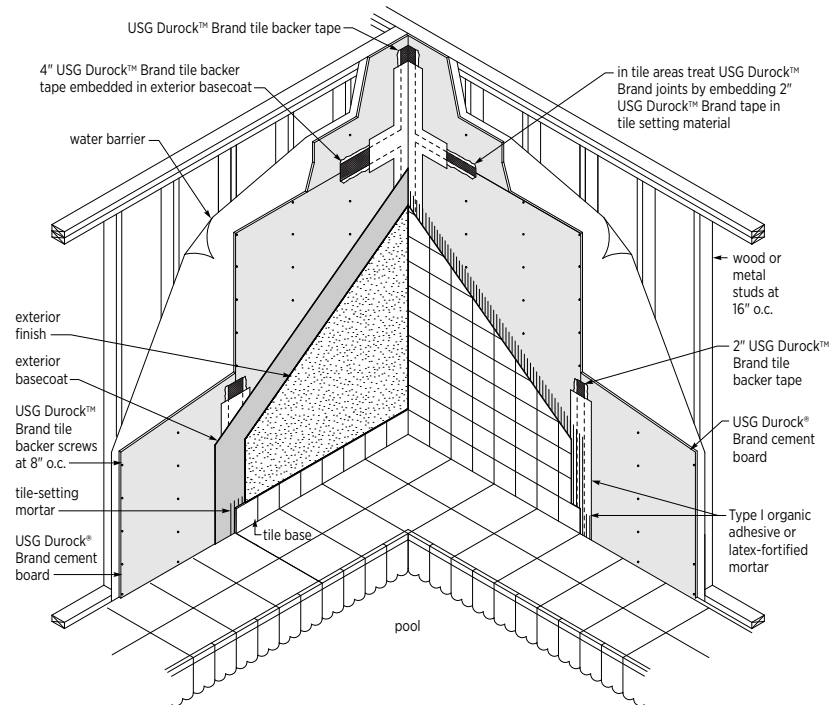
**Typical bathtub installation**



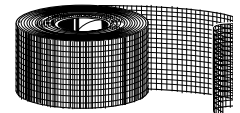
**Fixture attachment—steel framing**



**Typical swimming pool installation (tile or exterior finish)**



**USG Durock™ Brand alkali-resistant tape**



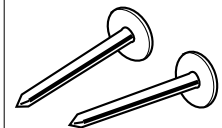
**USG Durock™ Brand tile backer screws for wood framing**



**USG Durock™ Brand tile backer screws for steel framing**



**Hot-dipped galvanized roofing nails**



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### **1. System Performance**

Systems covered herein have been tested and evaluated for use as described. For other system applications, consult your local representative.

All details, specifications and data contained in this literature are intended as a general guide for using USG Durock® cement board systems. These products must not be used in a design or construction of any given structure without complete and detailed evaluation by a qualified structural engineer or architect to verify suitability of a particular product for use in the structure.

Information in this publication should be used only for USG Durock® cement board systems, as physical properties of competitive products may vary. USG assumes no liability for failure resulting from the use of alternative materials or improper application or installation of USG Durock® cement board systems as specified herein.

USG will provide building officials and design professionals upon written request with test certification for published fire, sound and structural data covering systems constructed with Company products and assembled to meet performance requirements of established test procedures specified by various agencies.

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### **2. Expansion and Contraction**

Wall surfaces should be isolated with surface control joints (sometimes referred to by the industry as expansion joints) or other means where:

- (a) A wall abuts a structural element or dissimilar wall or ceiling.
- (b) Construction changes within the plane of the wall.
- (c) Tile and thin-brick surfaces exceed 16'. Surface control joint width should comply with architectural practices.

Location of building control joints is the responsibility of the design professional/architect. Steel framing at building control joints that extend through the wall (with top and bottom runner tracks broken) should have 1-1/2" cold-rolled channel alignment stabilizers spaced a maximum of 5' o.c. vertically. Channels should be placed through holes in the stud web of the first two adjacent studs on both sides of the joint and securely attached to the first adjacent stud on either side of the joint.

USG Durock® cement board should be separated at all surface and building control joints. Where vertical and horizontal joints intersect, the vertical joint should be continuous and the horizontal joint should abut it. Splices, terminals and intersections should be caulked with a sealant complying with architectural practices and sealant manufacturer recommendations. Do not apply tile or finishes over caulked sealed expansion joints.

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### **3. Water Management**

USG Durock® cement board is vapor permeable and does not deteriorate in the presence of water. For interior applications, if a vapor retarder or waterproof construction is specified, a separate barrier must be applied over or behind the USG Durock® cement board. If waterproofing is desired, use USG Durock™ Brand Tile Membrane or USG Durock™ Waterproofing Membrane. See USG literature piece CB492 for USG Durock™ tile membrane product information. See USG literature piece CB595 for USG Durock™ waterproofing membrane product information.

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### **4. Swimming Pool Enclosures**

USG Durock® cement board systems may be used for the walls and ceilings around indoor swimming pools. Consideration shall be given to adequate ventilation in plenums and corrosion protection of metal hangers and framing members.

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### **5. Soffits and Ceilings**

USG Durock® cement board systems finished with ceramic tile, thin brick and textured finish may be used on properly vented soffits and ceilings with USG Durock™ Brand tile backer screws spaced 6" o.c. max. A qualified structural engineer should evaluate design including uplift bracing.

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### **6. Steam Rooms and Saunas**

For steam rooms and saunas where temperatures exceed 120°F for extended periods, use latex-fortified Portland cement mortar; do not use organic adhesive.

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### **7. Abuse-Resistant Partitions**

USG Imperial® finish plaster and USG Diamond® interior finish plaster can be applied over USG Durock® cement board to provide a high-impact-resistant wall. See USG publication SA920 for specifications.

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### **8. Window and Door Openings**

All windows, door openings and termination points must be properly flashed and caulked.



## SPECIFICATIONS

### PART 1: GENERAL

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#### 9. Smooth Side/Rough Side

USG Durock® cement board has a smooth side and a rough side. Although both sides of USG Durock® cement board are suitable for either mastic or thin-set mortar applications, as a general guide, use the smooth side for mastic applications and the rough side for mortar applications.

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#### 10. Shadowing and Spotting

When the outside temperature differs considerably from the building's interior temperature, airborne dirt can accumulate on the colder regions of walls, causing "shadowing" or "spotting," particularly over fasteners and framing. This is a natural phenomenon that occurs through no fault in the products.

Where temperature, humidity and soiling conditions are expected to cause objectionable blemishes, provide a thermal separation between the interior and exterior faces.

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#### 11. Leaching and Efflorescence

Latex leaching and efflorescence are natural phenomena that occur with the use of latex-modified mortars and grouts through no fault in the products. To help protect against their occurrence, follow current industry guidelines and recommendations. If efflorescence is present, use a stiff nylon brush to remove any loose material prior to installation of finishing system. Discoloration will not affect performance.

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#### 12. Panel Microcracking

USG Durock® cement board is formulated to develop fine microcracking (also called multiple cracking) in the panel. The microcracking process helps to evenly relieve the stored strain energy in the product due to handling and installation, external loads, and/or panel restrained movement. The presence of microcracks in the panel should not be considered a product defect.

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#### 13. Vapor Retarders

Humidity and temperature conditions may require a vapor retarder. Its location should be determined by a qualified mechanical engineer or architect to prevent moisture condensation within the wall.

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#### 14. Corrosion Protection

All architectural components, such as anodized-aluminum window frames, trims, flashings and casings, shall be protected from alkaline building materials such as cement board, Portland cement basecoats, mortars and grouts.

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#### 1.1 Scope

Specify to meet project requirements.

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#### 1.2 Qualifications

All materials, unless otherwise indicated, shall be manufactured by USG and shall be installed in accordance with its current printed directions.

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#### 1.3 Delivery and Storage of Materials

All materials should be delivered and stored in their original unopened package and stored in an enclosed shelter providing protection from damage and exposure to the elements. Even though the stability and durability of USG Durock® cement board is unaffected by the elements, moisture and temperature variations may have an effect on the bonding effectiveness of basecoats and adhesives. Store all USG Durock® cement board panels flat.

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#### 1.4 Environmental Conditions

In cold weather and during USG Durock® cement board panel and tile installation, temperatures within the building shall be maintained within the range of 40 to 100°F. Adequate ventilation shall be provided to carry off excess moisture.

**Interior Applications** The building shall be enclosed and the HVAC system operating so that wood framing shall reach the moisture content it will reach in service. Do not install board when the board is wet.

**Exterior Applications** In exterior applications, USG Durock® cement board should not be left uncovered for a period of time exceeding 90 days. Discoloration or staining may occur due to exposure to the elements which will not affect performance of the panel. Finishes, leveling/skim coats and basecoats shall not be applied to a USG Durock® cement board panel that is wet or frozen or that contains frost. After application, and for at least 24 hours, finishes, leveling/skim coats and basecoats shall be effectively protected from rain and excessive moisture.

In cold weather and during finish applications, USG Durock® cement board panel, skim or basecoat, mortar, finish material and air temperature must be at least 40°F, and must remain at this temperature or higher for at least 24 hours after application. Hot and dry weather may affect working time of leveling/skim or basecoat and finish materials. Under rapid drying conditions, dampening or light fogging of board, leveling/skim or basecoat surface may be required to improve workability.

### 1.5 Framing

Steel or wood wall framing to receive USG Durock® cement board panels shall be structurally sound, free from bow and in general compliance with local building code requirements. Damaged and excessively bowed studs shall be replaced before installation of USG Durock® cement board panels. Framing shall be designed (based on stud properties alone) not to exceed L/360 deflection for tile and thin brick, L/240 for Direct-Applied Exterior Finish Systems. Steel framing must be 20-gauge equivalent or heavier with corrosion-resistant metal coating equivalent to G60 hot-dipped galvanized. Exterior steel framing should be laterally braced.

### 1.6 Installation Practices

USG Durock® cement board panel should be cut to size with utility knife and straightedge. Power saw should be used only if equipped with a dust-collection device and a NIOSH/MSHA-approved respirator is worn. Contractors installing tile and tile-setting materials should always follow current ANSI specifications and TCNA guidelines.

### 2.1 Materials

#### A Cement Board

- USG Durock® cement board, 1/2" or 5/8" thickness, 32", 36" or 48" width x lengths of 4' to 10'; exceeds ANSI A118.9 and ASTM C1325 for cementitious backer units.
- USG Durock® cement board underlayment, 1/4" thickness, 3' width x 5' length, other sizes available.

#### B Joint Reinforcement—USG Durock™ tile backer tape (alkali-resistant), 2" x 50', 2" x 150', 2" x 250' or 4" x 150'.

#### C Fasteners

- USG Durock™ tile backer screws for steel framing (No. 8), 1-1/4" and 1-5/8" for 14- to 20-gauge steel framing; USG Durock™ tile backer screws for wood framing (No. 8), 1-1/4", 1-5/8" and 2-1/4" for wood framing.
- Nails (1-1/2" hot-dipped galvanized roofing nails).

#### D Subfloor—5/8" or 3/4" plywood or oriented strand board (OSB), 4' x 8' sheets, APA Span-Rated Plywood or OSB with an Exposure 1 classification or better.

#### E Adhesives/Mortars

Products compatible with alkaline or Portland cement-based USG Durock® cement board include, but are not limited to the following:

- Meeting ANSI A136.1 Type 1.
- Meeting ANSI A118.1: dry-set mortar mixed with acrylic latex additive.
- Meeting ANSI A118.4: latex Portland cement mortar.

#### F Grout

Products compatible with high pH-based USG Durock® cement board:

- Meeting ANSI A118.6 or ANSI A118.7 or ANSI A118.8.

#### G Tile—Tile shall meet ANSI A137.1.

#### H Membrane—USG Durock™ tile membrane, USG Durock™ waterproofing membrane, 15-lb. felt or 4-mil polyethylene membrane, if required, in accordance with local building codes.

### 3.1 Floors

**A Panel Application**—Laminate USG Durock® cement board to subfloor using Type 1 organic adhesive, latex-fortified mortar or dry-set mortar mixed with acrylic latex additive that is suitable for bonding cement backerboard to plywood subfloor, with 1/4" square-notched trowel for mortar, 5/32" V-notched trowel for adhesive. Place cement board with joints staggered from subfloor joints. Fit ends and edges closely but not forced together. Fasten to subfloor with 1-1/4" USG Durock™ tile backer screws for wood framing or 1-1/2" hot-dipped galvanized roofing nails spaced 8" o.c. in both directions with perimeter fasteners at least 3/8" and less than 5/8" from ends and edges. Drive nails and screws so bottoms of heads are flush with panel surface to ensure firm panel contact with subfloor. Do not overdrive fasteners. Prefill joints with tile-setting mortar or adhesive and then immediately embed USG Durock™ tile backer tape and level joints.

### 3.2 Walls

**A Framing**—Space wood and steel framing a maximum of 16" o.c. (24" o.c. for UL Design U459 or U415). The studs of freestanding furred walls must be secured to the exterior wall with wall furring brackets or laterally braced with horizontal studs or runners spaced 4' o.c. max. Laterally brace all steel-framed walls prior to the application of joint treatment.

**B Panel Application**—After tub, shower pan or receptor is installed, place temporary 1/4" spacer strips around lip of fixture. Precut board to required sizes and make necessary cutouts. Fit ends and edges closely but not forced together, leaving a 1/8" gap. Install board abutting top of spacer strip. Stagger end joints in successive courses. Fasten panels to framing with specified fasteners. Drive fasteners into field of panels first, working toward ends and edges. Hold panels in firm contact with framing while driving fasteners. Space fasteners maximum 8" o.c., with perimeter fasteners at least 3/8" and less than 5/8" from ends and edges. Drive nails and screws so bottoms of heads are flush with panel surface to ensure firm panel contact with framing. Do not overdrive fasteners. Approved fasteners include: USG Durock™ tile backer screws for steel framing (or equivalent), 1-1/4" and 1-5/8" for 14- to 20-gauge steel framing; USG Durock™ tile backer screws for wood framing (or equivalent), 1-1/4", 1-5/8" and 2-1/4" for wood framing. Nails (1-1/2" hot-dipped galvanized roofing nails). In double-layer walls where cement boards are installed over base-layer gypsum boards, apply a vapor-permeable water barrier over gypsum boards.

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- C Shaft Wall—Attach USG Durock® cement board over base layer of gypsum panels with 1-5/8" USG Durock™ tile backer screws for steel framing at 8" o.c. to studs. Since studs are at 24" o.c., laminate cement board to base layer of gypsum panels with a 4" wide strip of construction adhesive between studs. Apply adhesive with a 1/4" square-notched trowel.
  - D Exterior Walls—Attach USG Durock® cement board with corrosion-resistant screws spaced a maximum of 8" o.c. over framing spaced a maximum of 16" o.c. Apply a weather-resistive barrier and flashing behind the panels as required. Follow the exterior finish manufacturer's recommendations for application over USG Durock® cement board.
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### 3.3 Countertops

- A Base—Install minimum 3/4" APA Span-Rated Plywood or OSB with an Exposure 1 classification or better base across wood cabinet supports spaced maximum 16" o.c. Position ends and edges over supports.
  - B Membrane—Staple-attach USG Durock™ tile membrane, USG Durock™ waterproofing membrane, 15-lb. felt or 4-mil polyethylene film using 1/4" galvanized staples over plywood base.
  - C Panel Application—Secure USG Durock® cement board to plywood. Fasten to plywood with 1-1/4" USG Durock™ tile backer screws for wood framing or 1-1/2" hot-dipped galvanized roofing nails spaced 8" in both directions and around edges; fit ends and edges closely but not forced together, leaving a 1/8" gap.
  - D Joint Finishing—Prefill joints with latex-fortified mortar or Type 1 organic adhesive; completely embed USG Durock™ tile backer tape; and level all joints and outside corners.
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### 3.4 Ceilings

- A Framing—Ceiling joists, furring channels or strips must be spaced max. 16" o.c. Framing must be capable of supporting the total ceiling system dead load, including insulation, ceramic tile, bonding materials and cement board, with deflection not exceeding L/360 of the span. When steel framing is used, min. 20 ga. is required.
  - B Panel Application—Apply 1/2" USG Durock® cement board to framing with long dimension across framing. Center end or edge joints on framing and stagger joints in adjacent rows. Fit ends and edges closely, but not forced together, leaving a 1/8" gap. Fasten boards to steel framing with 1-1/4" USG Durock™ tile backer screws for steel framing spaced 6" o.c. and to wood framing with 1-5/8" USG Durock™ tile backer screws for wood framing spaced 6" o.c. with perimeter fasteners at least 3/8" and less than 5/8" from ends and edges. If necessary, provide additional blocking to permit proper attachment. Edges or ends parallel to framing shall be continuously supported.
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### 3.5 Joint Treatment Application

- A For Tile and Thin Brick—Prefill all USG Durock® cement board joints, and joints where USG Durock® cement boards abut other panels or surfaces such as gypsum board, with tile-setting mortar or adhesive, and then immediately embed tape and level the joints.
  - B For Dry Untiled Areas—For small areas where the USG Durock® cement board will not be tiled, such as a board extending beyond the tiled area and abutting another surface, treat joints as follows. Seal USG Durock® cement board with Type 1 ceramic tile adhesive. (Mix four parts adhesive with one part water.) Embed USG Sheetrock® Brand joint tape over joints and treat fasteners with USG Sheetrock® Brand Durabond® setting-type joint compound (45 or 90) applied in conventional manner. Flat trowel USG Sheetrock® Brand setting-type joint compound over board to cover fasteners and fill voids to a smooth surface. Finish joints with at least two coats USG Sheetrock® Brand ready-mixed joint compound. Do not apply ready-mixed or setting-type joint compound over unsealed board.
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### 3.6 Interior Ceramic Tile Application

- A Tile Application—Plan tile layout, then spread latex-modified thin-set mortar or Type 1 adhesive with trowel recommended by tile manufacturer held at 45° angle. Apply no more adhesive than can be covered in 20 to 30 minutes. Open time will vary according to temperature and humidity. NOTE: When applying over old ceramic tile, allow adhesive to set 10 to 15 minutes before applying new tile. Wall tiles may be set top down or bottom up. Press, do not slide, tiles and sheets of tile into adhesive. Maintain accurate joint alignment and spacing as tiles are positioned. Use wooden or rubber-faced beating block, tapped lightly with a mallet to level and ensure solid tile positioning. Check occasionally to ensure at least 95% adhesive transfer to back of tile. Avoid adhesive squeeze-up between tiles. It may be necessary to butter adhesive on backs of large pavers and quarry tile.  
**Note:** Contractors installing ceramic tile should always follow ANSI Specifications and TCNA Guidelines.
  - B Drying Time—Do not walk on floors for at least 48 hours unless walking boards or plywood sheets are used. To finish job, wait 24 hours after tile has been installed for walls and countertops, 48 to 72 hours for floors, before grouting.
  - C Grouting—Select, prepare and install grout in accordance with recommendations provided by grout manufacturers.
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### 3.7 Exterior Applications

- A Follow the exterior finish manufacturer's recommendations for finishes applied to USG Durock® cement board.
- B It is recommended that a weather-resistive barrier and flashing be installed behind USG Durock® cement board in direct-applied finish applications to provide a means for draining any intruding moisture safely from the exterior of the building.
- C Follow the manufacturer's recommendation, design professional or contract documents for proper sealants and flashings at openings such as windows and doors.



## WEBSITES

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

## TECHNICAL SERVICE

800 USG.4YOU (874-4968)  
[usg4you@usg.com](mailto:usg4you@usg.com)

## SAMPLES/LITERATURE

[samplit@usg.com](mailto:samplit@usg.com)

## CUSTOMER SERVICE

800 621-9523

### METRIC SPECIFICATIONS

USG Corporation, through its operating subsidiaries, will provide metric conversions on its products and systems to help specifiers match metric design sizes. In addition, some products are available in metric dimensions from selected manufacturing plants. Refer to SA100 *Construction Selector* for additional information and a Table of Metric Equivalents.

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Causes skin irritation. Causes serious eye damage. May cause an allergic skin reaction. May cause respiratory irritation. May cause cancer by inhalation of respirable crystalline silica. Do not handle until all safety precautions have been read and understood. Avoid breathing dust. Use only in a well-ventilated area, wear a NIOSH/MSHA-approved respirator. Wear protective gloves/protective clothing/eye protection. If swallowed, inhaled or skin irritation occurs, get medical attention. If on skin: Wash with plenty of water. If on eyes: Rinse cautiously with water for several minutes. Remove contact lenses and continue rinsing. Contaminated work clothing should not be allowed out of the workplace. Wash contaminated clothing before reuse. Dispose of in accordance with local, state and federal regulations.

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