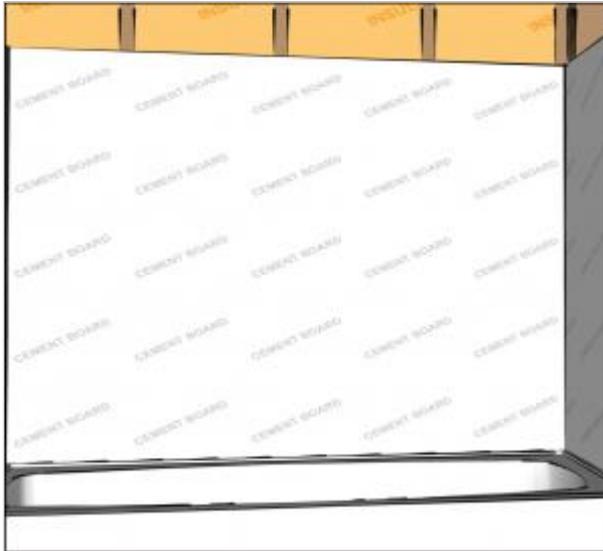


Cement Board Installed behind Tile and Panel Tub and Shower Enclosures

Last Updated: 03/29/2016

Scope



Install cement board behind tub and shower enclosures.

Install cement board or an equivalent moisture-resistant backing material on walls behind tub and shower enclosures composed of tile or panel assemblies with caulked joints.

- Don't use paper-faced backer board, i.e., paper-faced drywall, behind seamed tub and shower enclosures.
- Use an alternate approved product such as fiber-cement, fiber-reinforced gypsum, glass mat gypsum, or fiber mat-reinforced cementitious backer panels.
- If a monolithic tub and shower enclosure (e.g., fiberglass with no seams) is used, a paper-faced backer board can be use if it meets ASTM mold-resistant standards ([ENERGY STAR](#)).

See the [Compliance Tab](#) for related codes and standards requirements, and criteria to meet national programs such as DOE's Zero Energy Ready Home program, ENERGY STAR Certified Homes, and Indoor airPLUS.

Description

Moisture management is often thought of in terms of keeping exterior moisture outside of the building envelope. However, interior moisture management is just as important, with many of the same consequences if it fails. As with water seeping in from outside, unmanaged water inside the home can lead to a host of problems including mold, mildew, air quality issues, and even structural damage. Complicating matters are wet areas where water is intentionally brought into the home, such as bathrooms and kitchens.

Special protection is needed behind showers and tubs to prevent moisture from seeping into the wall structure. Use an appropriate waterproof or moisture-resistant backing material behind grouted tile or stone or segmented plastic or fiberglass tub and shower surrounds. Appropriate materials include cement board which has a cementitious core and glass mats on both sides to strengthen the board. Equivalent materials include coated glass mat which has a gypsum core with glass fibers sandwiched between fiberglass surface mats and fiber cement which is reinforced with wood fibers. Cement board comes in the same standard sheet sizes as regular gypsum board: both are 5 feet wide, which is also the width of a standard tub surround. Unless specifically manufactured as a waterproof product, cement board is water resistant but not waterproof. You must coat it with a fluid-applied waterproofing or apply a water-resistant barrier behind it that drains ([BSC 2009b](#)). Paper-faced gypsum board will not prevent moisture penetration and should not be used in wet areas ([BSC 2009a](#)). Non-paper-faced fiber-reinforced gypsum board, moisture-resistant gypsum board, or “green board” products are also not recommended behind tub surrounds ([BSC 2009a](#)).

When installing a shower or tub on an exterior wall, it is essential to air seal and insulate the wall cavity behind the shower and tub enclosure to prevent thermal bypasses that can result in moisture getting into the walls and cold tubs. The Building America Solution Center guide [Walls Behind Showers and Tubs](#) provides information on how to air seal and insulate behind a shower and tub.

How to Install Cement Board Behind Tub and Shower Enclosures

1. Check to make sure the wall frames are plumb. This will ensure that the cement board is plumb and that the ceramic tile or other surface finish will install correctly.
2. If the tub or shower is on an exterior wall, make sure that any piping or wiring penetrations through the walls behind the tub and enclosure are air sealed and that the wall cavities are insulated before installing cement board or equivalent. See [Walls Behind Showers and Tubs](#) for air sealing and insulating guidance.
3. Measure the area for the tub or shower surround.
4. Trim the cement board to fit the measured space. Use a circular saw fitted with an abrasive blade or a hand tool specific to the job and fitted with a carbide tip. Apply a fluid-applied waterproofing to the board including the edges.
5. If the tub or shower is on an exterior wall and the cement board will serve as an air barrier over the insulation, apply a thick bead of caulk to the surface of the exposed studs, wood blocking, and top and bottom plates. Nail or screw the thin-profile air barrier material to the studs.
6. Tape and mud any seams per manufacturer’s specifications.

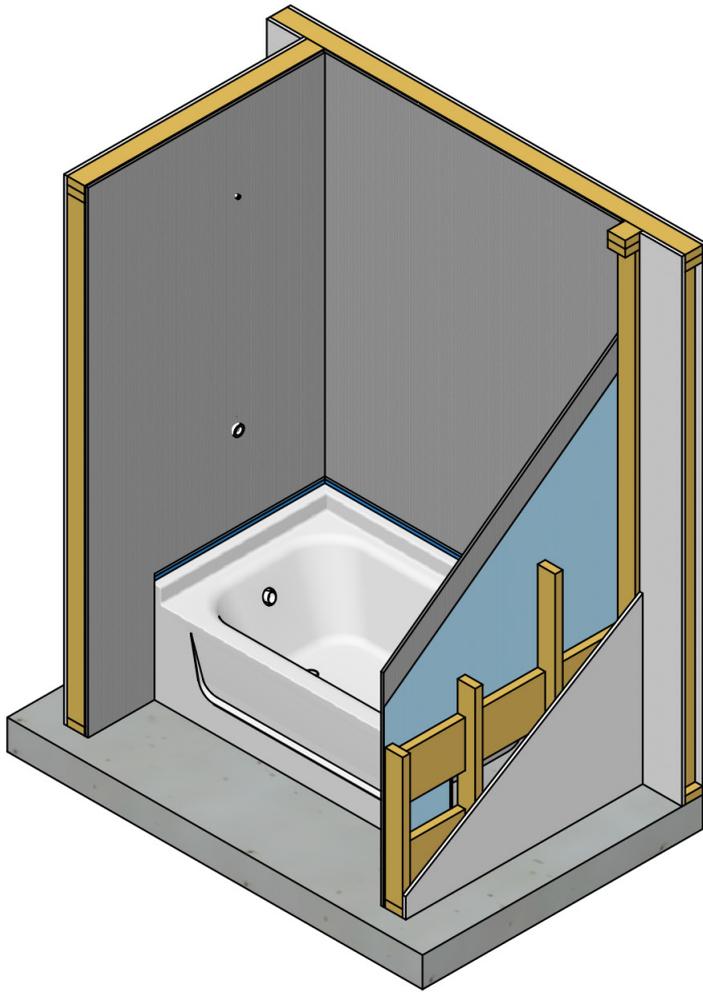


Figure 1 - Cement board (shown in dark grey) is installed behind a tub. 

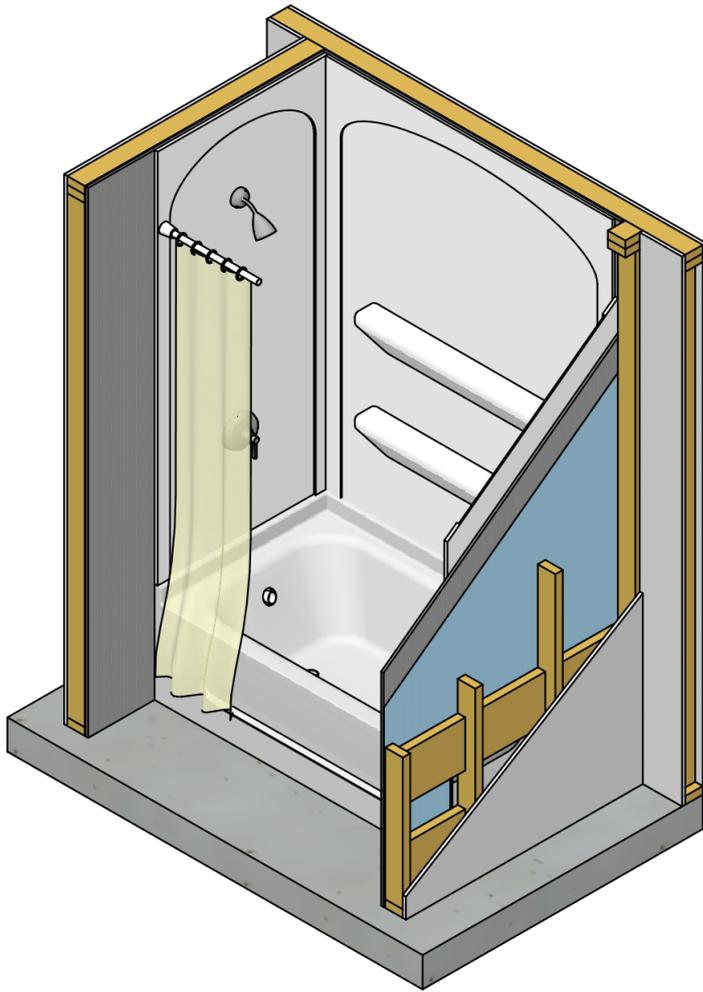


Figure 2 - Cement board (shown in dark grey) is installed behind an installed tub and shower surround. 

Ensuring Success

When installing a shower or tub on an exterior wall, it is essential to air seal and insulate the wall cavities behind the shower and tub enclosure to prevent thermal bypasses that can result in moisture, heating, and cooling problems. The Solution Center Guide [Walls Behind Showers and Tubs](#) provides information about how to air seal and insulate behind a shower and tub.

Cutting cement board requires tools different than those used for standard gypsum board; use abrasive saw blades or carbide-tipped cutters. Be sure that the framing is level and plumb before installing backer board to avoid alignment issues with premanufactured tub surrounds or tile.

Climate

No climate-specific information applies.

Training

Right and Wrong Images



Display Image: [ES_WMSBC_4.2_PG56_124b_32311_0.jpg](#)

Reference: [Water Management System Builder Checklist Guide](#)

Author(s): EPA

Organization(s): EPA

Guide describing details that serve as a visual reference for each of the line items in the Water Management System Builder Checklist.



Display Image: [ES_WMSBC_4.2_PG56_124b_32311_0.jpg](#)

Reference: [Water Management System Builder Checklist Guide](#)

Author(s): EPA

Organization(s): EPA

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Author(s): EPA

Organization(s): EPA

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Reference: [Water Management System Builder Checklist Guide](#)

Author(s): EPA

Organization(s): EPA

Guide describing details that serve as a visual reference for each of the line items in the Water Management System Builder Checklist.



Display Image: [ES_WMSBC_4.2_PG56_127e_32311_0.jpg](#)

Reference: [Water Management System Builder Checklist Guide](#)

Author(s): EPA

Organization(s): EPA

Guide describing details that serve as a visual reference for each of the line items in the Water Management System Builder Checklist.

CAD

None Available

Compliance

The Compliance tab contains both program and code information. Exact code language is copyrighted and may require purchase from the publisher. While we continually update our database, links may have changed since posting. Please contact our webmaster if you find broken links.

[ENERGY STAR Certified Homes](#)

ENERGY STAR Certified Homes (Version 3/3.1, Revision 08), Water Management System Builder Requirements

4. Water-Managed Building Materials:

4.2 Cement board or equivalent moisture-resistant backing material installed on all walls behind tub and shower enclosures composed of tile or panel assemblies with caulked joints. Paper-faced backerboard shall not be used.¹⁶

Footnotes:

(16) In addition to cement board, materials that have been evaluated by ICC-ES per AC 115 may also be used to meet this requirement. Monolithic tub and shower enclosures (e.g., fiberglass with no seams) are exempt from this backing material requirement unless required by the manufacturer. Paper-faced backerboard may only be used behind monolithic enclosures or waterproof membranes that have been evaluated by ICC-ES per AC 115, and then only if it meets ASTM mold-resistant standards ASTM D3273 or ASTM D6329.

Builders Responsibilities: It is the exclusive responsibility of builders to ensure that each certified home is constructed to meet these requirements. While builders are not required to maintain documentation demonstrating compliance for each individual certified home, builders are required to develop a process to ensure compliance for each certified home (e.g., incorporate these requirements into the Scope of Work for relevant sub-contractors, require the site supervisor to inspect each home for these requirements, and / or sub contract the verification of these requirements to a Rater). In the event that the EPA determines that a certified home was constructed without meeting these requirements, the home may be decertified.

ENERGY STAR Revision 08 requirements are required for homes permitted starting 07/01/2016.

[DOE Zero Energy Ready Home](#)

Exhibit 1: Mandatory Requirements. Certified under ENERGY STAR Qualified Homes Version 3.

[ICC-ES AC 115](#)

Acceptance Criteria for Waterproof Membranes for Flooring and Shower Lining. Available for download from ICC Evaluation Services. The criteria applies to liquid-applied and sheet membranes used as barriers to positive liquid water migration in load-bearing, bonded, thin-set installations of ceramic tile and dimension stone on floors, and as shower sub-pan lining.

[ASTM D3273-12](#)

Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber. Available from ASTM. The standard test method to determine the resistance of interior coatings to mold growth.

[ASTM D6329-98 \(2008\)](#)

Standard Guide for Developing Methodology for Evaluating the Ability of Indoor Materials to Support Microbial Growth Using Static Environmental Chambers. Available from ASTM. The guide describes an approach to evaluate the ability of a variety of material to support microbial growth using a small chamber method.

[2009 IRC, 2012 IRC, 2015 IRC](#)

Section R702.3.8 Water-resistant gypsum backing board. Gypsum board used as a base or backer for adhesive application of ceramic tile or other required nonabsorbent finish material must conform to ASTM C 1396, C 1178 or C1278. Use of water-resistant gypsum backing board is allowed on ceilings where framing spacing is 12 inches or less on center for ½-inch thick or 16 inches for 5/8-inch thick gypsum board. Water-resistant gypsum board cannot be installed over a Class I or II vapor retarder in a shower or tub compartment. Cut or exposed edges must sealed per manufacturer's recommendations. Section R702.3.8.1 Limitations. Water-resistant gypsum board cannot be used where it will be in direct water exposure or high-humidity areas.*

*Due to copyright restrictions, exact code text is not provided. For specific code text, refer to the applicable code.

More Info.

Access to some references may require purchase from the publisher. While we continually update our database, links may have changed since posting. Please contact our webmaster if you find broken links.

Case Studies

None Available

References and Resources*

1. [Air Barriers - Tub, Shower and Fireplace Enclosures](#)
Author(s): BSC
Organization(s): BSC
Publication Date: May, 2009
Brochure about creating an air barrier at tub, shower and fireplace walls.
2. [Backerboards - Winners against Water](#)
Author(s): Yost
Organization(s): Green Building Advisor
Publication Date: December, 2014
Article describing different kinds of water-resistant backer boards.
3. [DOE Zero Energy Ready Home National Program Requirements](#)
Author(s): DOE
Organization(s): DOE
Publication Date: August, 2015
Standard requirements for DOE's Zero Energy Ready Home national program certification.
4. [ENERGY STAR Certified Homes, Version 3 \(Rev. 08\) National Program Requirements](#)
Author(s): EPA
Organization(s): EPA
Publication Date: September, 2015
Document outlining the program requirements for ENERGY STAR Certified Homes, Version 3 (Rev. 08).
5. [Interior Water Management, Information Sheet 306](#)
Author(s): BSC
Organization(s): BSC
Publication Date: May, 2009
Brochure about indoor water management.
6. [Measure Guideline: Water Management at Tub and Shower Assemblies](#)
Author(s): Dickson
Organization(s): IBACOS
Publication Date: December, 2011
Report covering the fundamental waterproofing strategies for tub and shower assemblies.
7. [Water Management System Builder Checklist Guide](#)
Author(s): EPA
Organization(s): EPA
Publication Date: February, 2011
Guide describing details that serve as a visual reference for each of the line items in the Water Management System Builder Checklist.

*Publication dates are shown for formal documents. Dates are not shown for non-dated media. Access dates for referenced, non-dated media, such as web sites, are shown in the measure guide text.

Contributors to this Guide

The following Building America Teams contributed to the content in this Guide.

[Building Science Corporation](#), lead for the Building Science Consortium (BSC), a [DOE Building America Research Team](#)