



Low-slope technical update

Mark S. Graham

Vice President, Technical Services
National Roofing Contractors Association



1

Code update

Illinois is a “home rule” state

2

City of Chicago
chicago.gov → Dept of Buildings

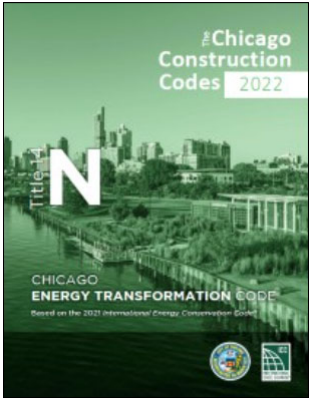





codes.iccsafe.org and search "Chicago"

3

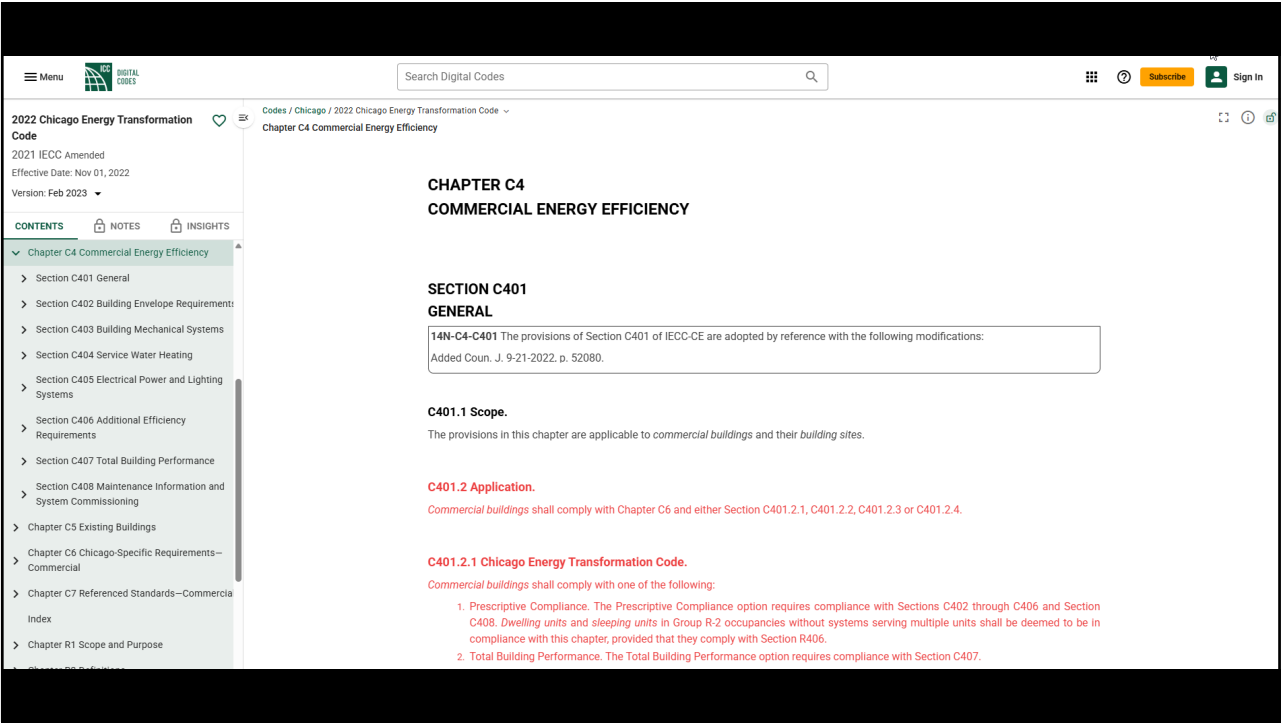
City of Chicago
chicago.gov → Dept of Buildings



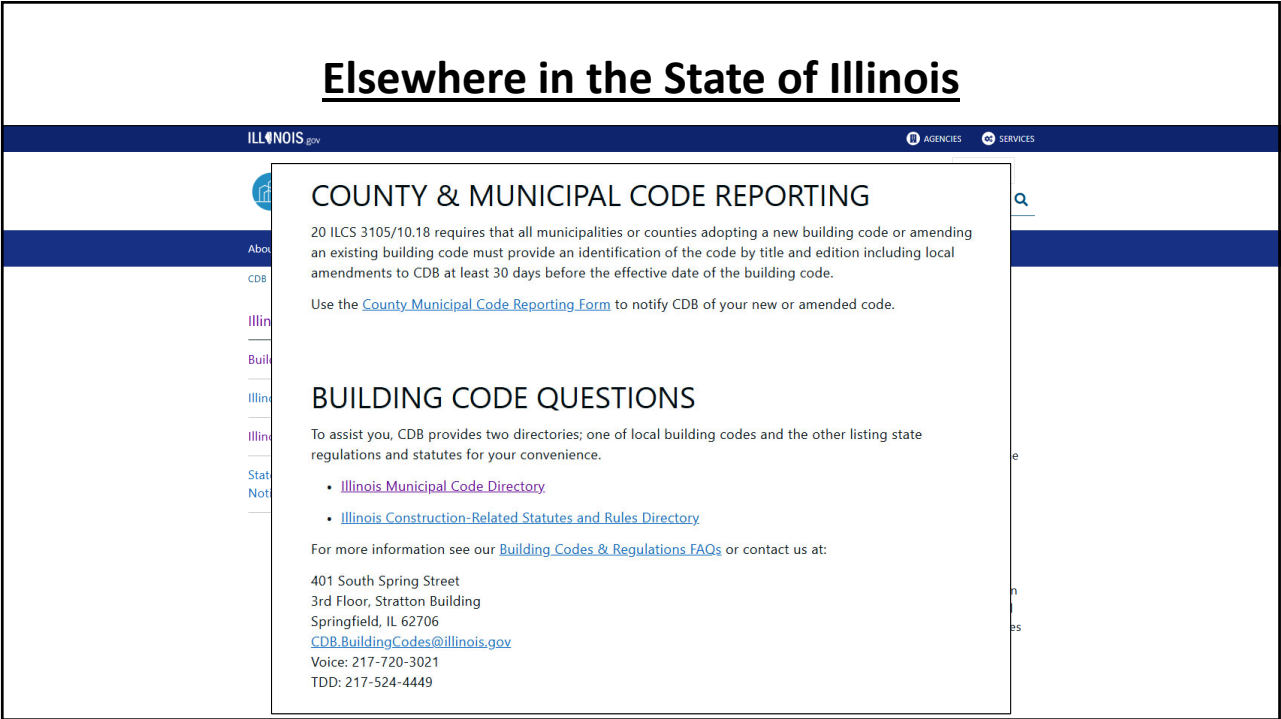
2021 IECC **amended**
Effective: November 1, 2022
Version: February 2023

<https://codes.iccsafe.org/content/CHIETC2022P1>

4



5



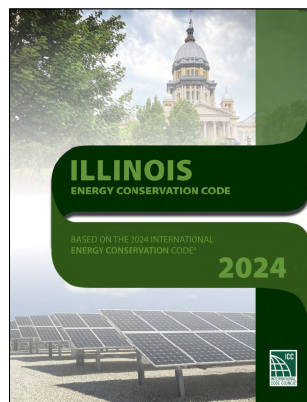
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Code Abbreviation	Edition Year	Local Modification Adopted	Effective Date	Last Updated
ISPSC	2021	Yes	1/15/2025	3/6/2025
NFPA 101	2021	Yes	1/15/2025	3/6/2025
NEC	2020	Yes	1/15/2025	3/6/2025
IMC	2021	Yes	1/15/2025	3/6/2025
IEBC	2021	Yes	1/15/2025	3/6/2025
IECC	2021	Yes	1/15/2025	3/6/2025
ISPC	2014	Yes	9/22/2015	4/23/2024
IPMC	2021	Yes	1/15/2025	3/6/2025
IFGC	2021	Yes	1/15/2025	3/6/2025
IRC	2021	Yes	1/15/2025	3/6/2025
IBC	2021	Yes	1/15/2025	3/6/2025
IFC	2021	Yes	1/15/2025	3/6/2025

7

State of Illinois, except the City of Chicago

cdb.illinois.gov → Illinois Codes



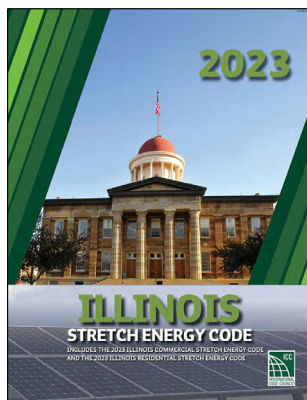
2024 IECC amended
Effective: November 30, 2025

<https://codes.iccsafe.org/content/ILECC2024P1>

8

Optional adoption for State of Illinois jurisdictions

cdb.illinois.gov → Illinois Codes



Draft 2024 IECC with enhancing amendments
Adopted in Evanston. Other adoptions pending

<https://codes.iccsafe.org/content/ILSEC2023P1>

9

IL SB 1742/Public Act 104-0121

Rooftop Safety for First Responders Act

Section 15. Survey.

(a) No later than January 1, 2027, and every 2 years thereafter, each municipality shall complete a survey of buildings in its jurisdiction that have skylights and other openings located in the plane of a low-sloped roof.

(b) The results of the survey shall be reported in a building inventory that shall be shared with local police

Public Act 104-0121

SB1742 Enrolled

LRB104 09745 BDA 19811 b

departments and local fire departments.

10

Section 10. Low-sloped roof edges and openings. All existing buildings, new construction, new roofs, roof replacements, and renovation projects that increase the area

Public Act 104-0121

SB1742 Enrolled

LRB104 09745 BDA 19811 b

of a home or business by more than 50% are subject to the following requirements:

(1) The edges of a low-sloped roof that adjoin a shaft or a court that is enclosed on all sides shall be provided with a parapet, extended masonry, or guard, or any combination thereof that meets the requirements of Section 1015 of the International Building Code.

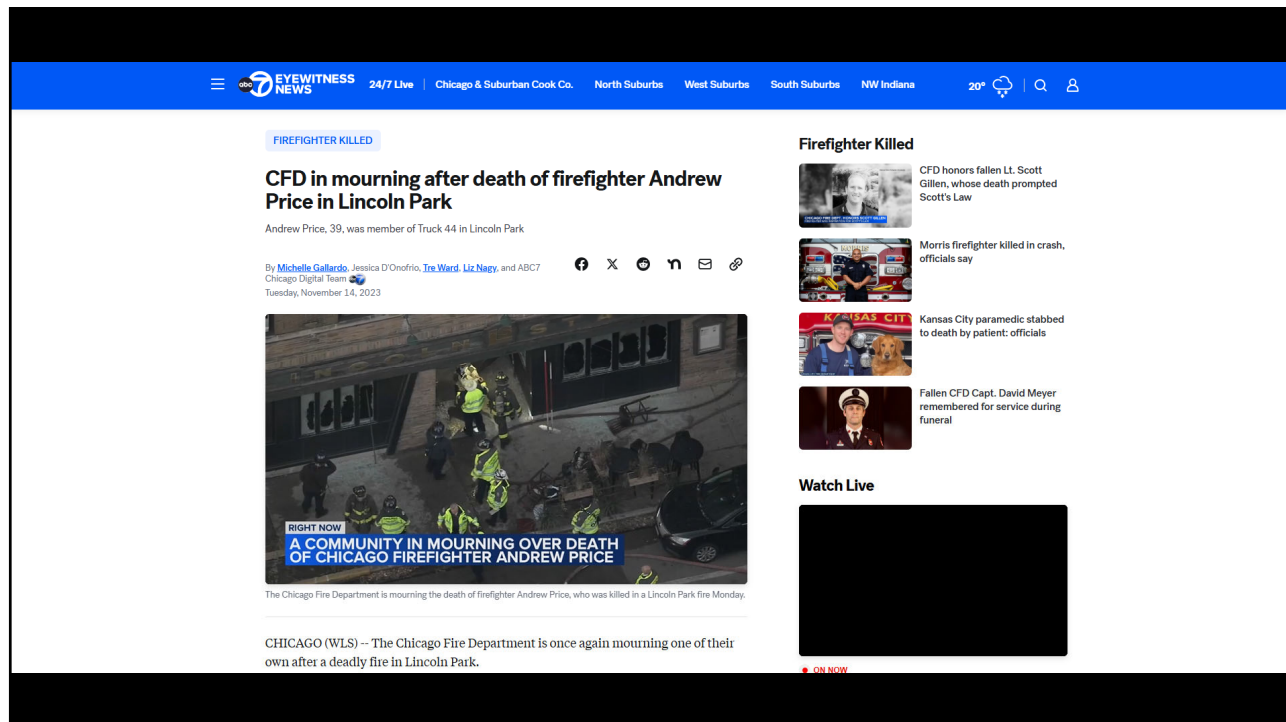
11

(2) All skylights and other openings located in the plane of a low-sloped roof that are not otherwise required to remain open and unobstructed by law shall be either:

(A) glazed with wired glass, plain glass, glass block, or polycarbonate plastic that is designed and constructed to withstand a minimum dynamic load test of no less than 400 pounds; or

(B) provided with a parapet, extended masonry, or guard, or any combination thereof, that meets the requirements of Section 1015 of the International Building Code.

12



13

Some code process “concerns”

- Increased use of a legislative route to adopt code modifications instead of the established code development process
- Specific roofing-industry segments opposing roofing contractors’ interests in the code development process:
 - Manufacturer associations (i.e., PIMA)
 - Some manufacturers

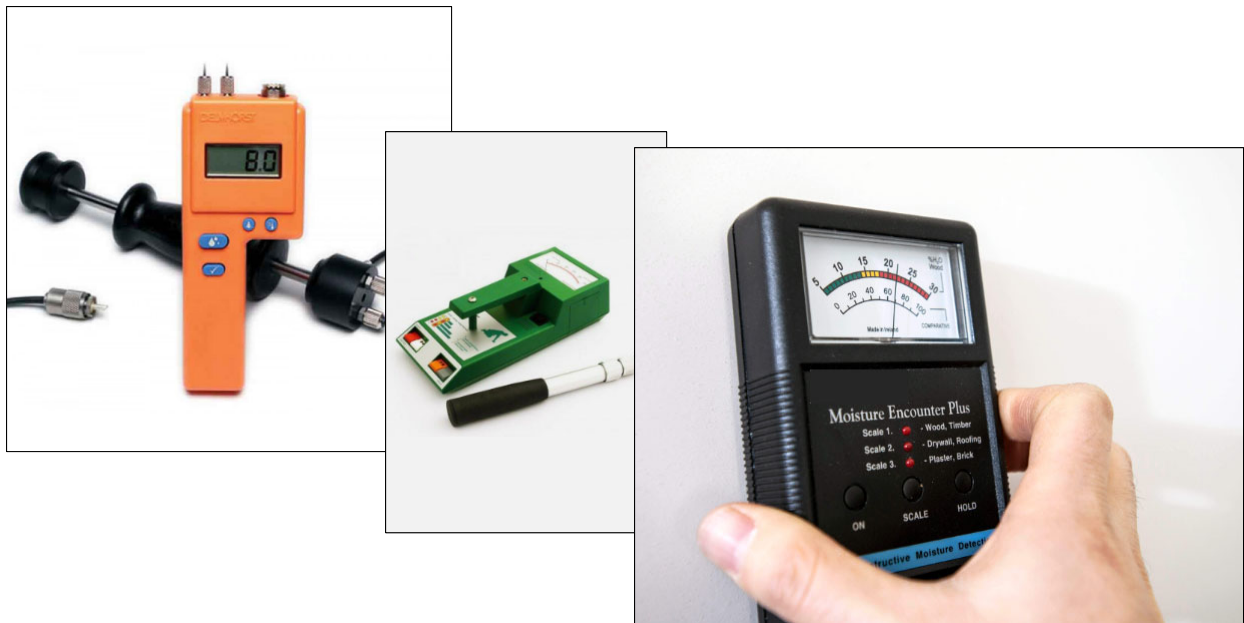
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Technical issues

Low-slope roofing

15

“Moisture” meter concerns



16

*These meters do not read moisture...
...they are reading relative conductivity, which can be
correlated to specific materials in specific conditions
when properly calibrated.*

17



Diving rod for dowsing

18

Considerations

“Moisture” meters

- Read/understand the instruction manual
- Understand device sensitivity
- Understand proper operating conditions
- Proper calibration/recalibration is critical
- Don’t overstate the meter’s capability
- Verify job-specific results with gravimetric analysis (e.g., ASTM C1616)

19

This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.

ASTM INTERNATIONAL Designation: C1616 – 25

Standard Test Method for Determining the Moisture Content of Organic and Inorganic Insulation Materials by Weight¹

This standard is issued under the fixed designation C1616; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ϵ) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 This test method will determine the moisture content, as a percentage of the dry weight of organic and inorganic insulation materials.

1.2 The values stated in inch-pound units are to be regarded as the standard. The values given in parentheses are for information only.

1.3 This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety, health, and environmental practices and determine the applicability of regulatory limitations prior to use.

1.4 This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.

2. Referenced Documents

2.1 ASTM Standards:²

C1608 Terminology Relating to Thermal Insulation

3. Terminology

3.1 Definitions—For definitions used in this specification, see Terminology C1608.

3.2 Symbols:

3.2.1 M —moisture content weight, percent.

3.2.2 W_i —initial specimen weight, lb (g).

3.2.3 W_{MF} —moisture-free specimen weight, lb (g).

4. Summary of Test Method

4.1 This test method is based upon weighing specimens of the insulation material and then drying the specimens by heating them in an oven to remove any moisture. Then the moisture content is determined using the calculation procedure in 9.1.

5. Significance and Use

5.1 Some insulation materials contain moisture, which will affect the thermal and other physical properties of the insulation.

6. Apparatus

6.1 Air-circulating Oven.

6.2 Scale (accurate to within 0.0011 lb (0.5 g)).

7. Sampling and Test Specimen Preparation

7.1 Test Specimen—The test specimen shall be of a size that can be conveniently tested in a drying oven but not less than 72 cubic inches in volume, except if required to be different by another test method or specification. One example of an acceptable specimen size would be 6 by 6 by 2 in. thick (150 by 150 by 51 mm).

8. Procedure

8.1 Four test specimens shall be tested. Cut or prepare the four specimens to meet the size requirements of 7.1.

8.2 Measure and record the specimens weight (W_i) immediately after the specimens are prepared to size. The specimens shall be weighed to the nearest 0.0011 lb (0.5 g).

8.3 Place the specimens in an air-circulating oven at a temperature specified in the material specification or at a temperature no higher than $230 \pm 10^\circ\text{F}$ ($110 \pm 6^\circ\text{C}$) for a minimum of 2 h. Cool the specimens to room temperature in a desiccator and measure their weight. Repeat the process until successive weights agree to within 0.2 % of the specimen weight obtained in the latest weighing. Record these weights as moisture free weight (W_{MF}).

¹ This test method is under the jurisdiction of ASTM Committee C18 on Thermal Insulation and is the direct responsibility of Subcommittee C18.03 on Insulation Properties and Moisture.

Current edition approved Sept. 1, 2025. Published October 2025. Originally approved in 2005. Last previous edition approved in 2018 as C1616 – 07 (2018). DOI: 10.1533/STC1616-25.

² For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at www.astm.org. For Annual Book of ASTM Standards volume information, refer to the standard's Document Summary page on the ASTM website.

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20

02 Product Overview

04 Architectural Specifications


05 Standards and Classifications

11 Sound Control Illustrations

14 Roof System Applications

17 Physical Properties

20 Recommendations and Limitations for Use

**DensDeck**
Roof Board

RECOMMENDATIONS AND LIMITATIONS FOR USE

The following recommendations and limitations, together with the delivery, storage, handling and other guidelines contained in this guide, are given to help ensure satisfactory performance from the Portfolio of DensDeck® Roof Boards. Failure to adhere to such recommendations and limitations may void the limited warranty provided by Georgia-Pacific Building Products for these products.

DensDeck® Prime Roof Board (1/2 in. (12.7 mm) and 5/8 in. (15.9 mm) only) and DensDeck® StormX® Prime Roof Board (5/8 in.) are backed with a limited warranty for up to 90 days of exposure to normal weather conditions when applied on vertical parapet walls. For additional details and warranty information for DensDeck® Roof Board Products, please go to DensDeck.com.

Georgia-Pacific Building Products does not warrant and does not provide specifications or instructions for any specific assembly or system utilizing DensDeck® Roof Board Products or any component in such assemblies or systems other than DensDeck® Roof Board Products. Any references to assemblies or systems are for illustration or general information only. Consult with the appropriate system manufacturer and/or design authority for system specifications and instructions. In case of conflicting recommendations, system manufacturers and/or design authorities should prevail.

Design

DensDeck® Roof Board Products are manufactured to act with a properly designed roof system following good roofing practices. The actual use of any DensDeck® Roof Board as a roofing component in any system or assembly is the responsibility of the roofing system's designing authority. Georgia-Pacific Building Products does not offer roofing system design services and neither warrants, nor is responsible for, any systems or assemblies utilizing DensDeck® Roof Board Products or any component in such systems or assemblies other than the Portfolio of DensDeck® Roof Boards.

The need for a separator sheet between DensDeck® Roof Board Products and the roofing membrane must be determined by the roof membrane manufacturer or roofing system designer.

Confirm any priming requirements of DensDeck® Roof Board Products with membrane manufacturer.

The entry of water vapor and its subsequent condensation can be detrimental to a roof's performance, including the performance of DensDeck® Roof Board Products. Vapor retarders can be used to control migration of water vapor into the roof system. Determining the need for a vapor retarder, its compatibility with other materials, such as structural concrete decks, and the details of its construction is the responsibility of the designer.

Application

For hot mopping asphalt or coal tar directly to DensDeck® Prime Roof Board, follow the manufacturer's recommended system application temperature guidelines and good roofing practices.

DensDeck® Prime Roof Board is the preferred substrate for torch application. However, the product **must be dry prior** to commencing installation of torch application.

- Ensure product is dry. Ensure proper torching technique.
- Maintain a majority of the torch flame directly on the roll.
- Minimize the heat applied to the roof board.
- When torching to DensDeck® Prime Roof Board or DensDeck® StormX® Prime Roof Board, field priming should not be required.

Installation

Apply only as many DensDeck® Roof Board Products as can be covered by a roof membrane system in the same day. DensDeck® Roof Board Products of any thickness do not require gapping. Board edges and ends should be butted tightly together. When installed on a structural metal deck, edge joints should be located on and parallel to top flutes, so that edges are supported. Independent evaluations have demonstrated that hot mopping to DensDeck® Roof Board Products is an acceptable method of bonding membranes.

For latest information and updates, Technical Service Hotline 1-800-225-4319 or DensDeck.com

CAUTION: For product fire, safety and use information, go to DensDeck.com

Rev. 08/25

21

02 Product Overview

04 Architectural Specifications


05 Standards and Classifications

11 Sound Control Illustrations

14 Roof System Applications

17 Physical Properties

20 Recommendations and Limitations for Use

**DensDeck**
Roof Board

RECOMMENDATIONS AND LIMITATIONS FOR USE

However, the product must be dry prior to commencing installation of hot asphalt application, with **free moisture content less than 1% using a moisture meter that has been set to the gypsum scale.**

- When using DensDeck® Roof Board, DensDeck® Prime Roof Board or DensDeck® ProFast™ Prime Roof Board, Georgia-Pacific Building Products recommends maximum asphalt application temperatures of 425 °F (218 °C) to 450 °F (232 °C). Application temperatures above these recommended temperatures may adversely affect roof system performance. Consult and follow roofing system manufacturer's specifications for full mopping applications and temperature requirements.
- Follow accepted roofing industry guidelines for full mopping applications such as EVT temperature guidelines, brooming and proper application rates of asphalt.

DensDeck® Roof Board, DensDeck® Prime Roof Board and DensDeck® ProFast™ Prime Roof Board may be flood mopped to a substrate followed by a flood mopped application of membrane using these guidelines:

- DensDeck® Prime Roof Board and substrate must be dry.
- Asphalt used to install DensDeck® Prime Roof Board should be allowed to cool prior to mopping base sheet to top of boards.
- Allow base ply to cool before mopping additional plies or cap sheet to limit the amount of direct heat that is applied to boards.

Moisture can cause blisters to form during hot mopping or torching to any substrate. Because DensDeck® Roof Board Products are relatively dense, any excess moisture will typically vaporize and travel upward into the interface between the membrane and substrate rather than dissipating within the board. In fully adhered single-ply or cold mastic bitumen systems, the evaporation of solvents may be restricted and may cause solvent blisters.

Moisture accumulation may also adversely affect the structural stability or bond of roofing system components, including DensDeck® Roof Board Products, and may significantly decrease wind uplift and vertical pull resistance in the system or assembly. DensDeck® Roof Board Products exposed to moisture may need to be evaluated for structural stability to assure wind-uplift performance.


Care should also be taken during installation to avoid the accumulation of moisture in the system. DensDeck® Roof Board Products must be covered the same day as installed. Avoid application of DensDeck® Roof Board Products during rain, heavy fog and any other conditions that may deposit moisture on the surface, and avoid the overuse of non-vented, direct-fired heaters during winter months. When roofing systems are installed on new poured concrete or lightweight concrete decks or when re-roofing over an existing concrete deck, a vapor retarder should be installed above the concrete to limit the migration of water from the concrete into the roof assembly. Always consult the roofing system manufacturer or design authority for specific instructions on applying other products to DensDeck® Roof Board Products.

Finally, care must be taken after installation to avoid and properly manage leaks and other water accumulation. Moisture vapor movement by convection must be minimized, and the flow of water by gravity through imperfections in the roof system must be controlled. After a leak has occurred, no condensation on the upper surface of the system should be tolerated, and the water introduced by the leak must be dissipated to the building interior in a minimum amount of time.

For latest information and updates, Technical Service Hotline 1-800-225-4319 or DensDeck.com

CAUTION: For product fire, safety and use information, go to DensDeck.com

22



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Moisture in Gypsum Panel Products

The number of inquiries to the Gypsum Association about water-damaged gypsum panels always increases during the winter, early spring, after hurricane season or after any other significant water exposure event. Answers to many of these questions are found in an Association document revised in 2019, GA-231 *Assessing Water Damage to Gypsum Board*.

Gypsum panels can occasionally be subjected to moisture. Sometimes, this exposure is unintentional and due to a flood or hurricane. On occasion, a panel is intentionally dampened so that it can be used to create a curved surface. In each case, gypsum panels must not be overexposed to excessive moisture levels.

Once exposed to moisture, a panel must be evaluated. It is the recommendation of the Gypsum Association and its member companies that panels exposed to water should always be replaced unless all of the following conditions are met:

- The source of the water is identified and eliminated.
- The water to which any gypsum panel was exposed was uncontaminated.
- The gypsum panels can be dried thoroughly before mold growth begins (typically 24 to 48 hours depending on environmental conditions).
- The gypsum panel is structurally sound and there is no evidence of rusting fasteners or physical damage to the framing that would diminish the physical properties of the gypsum panel or system.

All of this is immaterial, however, when it comes to panels that have been exposed to floodwater. Since floodwater is almost certainly contaminated with extremely high levels of bacteria and pollutants, the industry recommends that gypsum panels exposed to floodwater shall be replaced. The same is true if it is believed that a panel has been exposed to sewage or wastewater.

All of the above is contained in Gypsum Association document GA-231 *Assessing Water Damage to Gypsum Board*, along with recommendations for creating acceptable drying conditions and a list of additional information resources. Quite simply, if there is ever doubt about whether to keep or replace gypsum panels that have been exposed to water, replace them.

Beyond a flood or natural disaster, gypsum panels can be exposed to water in a number of ways, including improper installation, missing flashing, ruptured pipes, bathtub overflows, and general water leaks. The Association does periodically receive requests for instructions on how to establish the moisture content of gypsum panels if they have been subjected to potentially damaging levels of water exposure. These generally involve the use of moisture meters.

Moisture meters operate on the principle that the electrical resistance and dielectric properties of materials vary consistently with moisture content changes. Calibrating a moisture meter to a substance such as wood is relatively straightforward because wood has relatively uniform composition throughout the thickness. Moreover, calibration curves are often quite consistent for different species of wood, (i.e. between spruce, pine, or fir).

Using a moisture meter on gypsum panels presents a significantly different physical situation. In this case, volume includes two materials with quite different responses to moisture. It is important to recognize that, unlike lumber, a gypsum panel consists of an inorganic core comprising the bulk of panel thickness with thin paper or glass mat facers laminated to the front and back of the panel. The measurement volume includes a thin hygroscopic layer (in the case of a paper facer), and a much larger volume of inorganic mineral (the gypsum core). These materials have quite dissimilar moisture adsorption and electrical properties. As such, a moisture meter calibrated using the techniques commonly applied for wood can yield misleading results for quantifying the moisture content of a gypsum panel. Similarly, the facer of glass-mat gypsum panels affects moisture meters differently than the paper facer on gypsum board. Further, the hydrophobic additives incorporated in the paper and core of water- and mold-resistant gypsum panels can introduce even more complications.

Link



Designation: C1789 – 24

Standard Test Method for Calibration of Hand-Held Moisture Meters on Gypsum Panels¹

This standard is issued under the first designation C1789; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last approval. A superscript (e) indicates an editorial change since the last revision or approval.

1. Scope²

1.1 This test method applies to the calibration of hand-held moisture meters for gypsum board, glass faced gypsum panels and fiber-reinforced gypsum panels by means of electrical conductance and dielectric meters. The test uses wetted test specimens which are dried down in at least five (5) steps to determine the moisture content based on the weight loss in comparison to the dry weight. The test also supplies the ERH values for each of the drying steps.

1.2 This test method has not been evaluated for the influence of paint or wall covering materials on the indicated moisture content of a gypsum board or panel substrate.

1.3 The values stated in SI (metric) are to be regarded as standard. The values given in parentheses are mathematical conversions to inch-pound units that are provided for information only and are not considered standard.

1.4 This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety, health, and environmental practices and determine the applicability of regulatory limitations prior to use.

1.5 This international standard was developed in accordance with internationally recognized principles on standardization established in the *Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee*.

2. Referenced Documents

2.1 *ASTM Standards:*³

C473 Test Methods for Physical Testing of Gypsum Panel Products

C1177/C1177M Specification for Glass Mat Gypsum Substrate for Use as Sheathing

C1178/C1178M Specification for Coated Glass Mat Water-Resistant Gypsum Backing Panel

C1278/C1278M Specification for Fiber-Reinforced Gypsum Panel

C1396/C1396M Specification for Gypsum Board

D4442 Test Methods for Direct Moisture Content Measurement of Wood and Wood-Based Materials

D4444 Test Method for Laboratory Standardization and Calibration of Hand-Held Moisture Meters

2.2 *ASHRAE Standard:*⁴

2009 ASHRAE Handbook – Fundamentals, Chapter 1 – Psychrometrics, American Society of Heating, Refrigerating and Air-Conditioning Engineers

3. Terminology

3.1 *Definitions of Terms Specific to This Standard:*

3.1.1 *absolute humidity, a_h*—the ratio of the mass of water vapor to the total volume of the moist air sample.

3.1.2 *admittance, n*—inverse of impedance, a measure of how easily an electric current can flow through a material.

3.1.3 *conductance meters, n*—conductance meters are those that measure predominantly ionic conductance between points of applied voltage, usually dc.

3.1.3.1 *Discussion*—Conductance meters generally have pins that penetrate into the material being measured. Direct-current conductance meters are commonly referred to as “resistance” meters. Most commercial conductance meters are high-input impedance (about 10¹² Ω), wide-range (10¹ to 10¹⁰ Ω) ohmmeters. Their scales are generally calibrated to read directly in moisture content (oven-dry mass basis) for a particular calibration material and at a specific reference temperature.

3.1.4 *dew-point temperature, t_d* *n*—the temperature at which a sample of moist air being cooled at constant pressure and moisture content reaches 100 % relative humidity.

¹ This test method is under the jurisdiction of ASTM Committee C11 on Gypsum and Related Building Materials and Systems and is the direct responsibility of Subcommittee C11.01 on Specifications and Test Methods for Gypsum Products. Current edition approved April 1, 2024. Published April 2024. Originally approved in 2013. Last previous edition approved in 2018 as C1789 – 18 (2018). DOI: 10.1520/C1789-24.

² Five endorsed ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For a detailed list of ASTM standards volume information, refer to the standard's Document Summary page on the ASTM website.

³ Available from American Society of Heating, Refrigerating, and Air-Conditioning Engineers, Inc. (ASHRAE), 1791 Tullie Circle, NE, Atlanta, GA 30329, <http://www.ashrae.org>.

⁴ A Summary of Changes section appears at the end of this standard.

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1

24

2026 Trade Show & Seminars
Chicago Roofing Contractors Association

12

Considerations...

- Be extra cautious of handheld moisture meters
- The “dryness” of gypsum board products is somewhat unknown
- NRCA cautions mopped- or torch-application to gypsum board products

25

Polyiso. storage

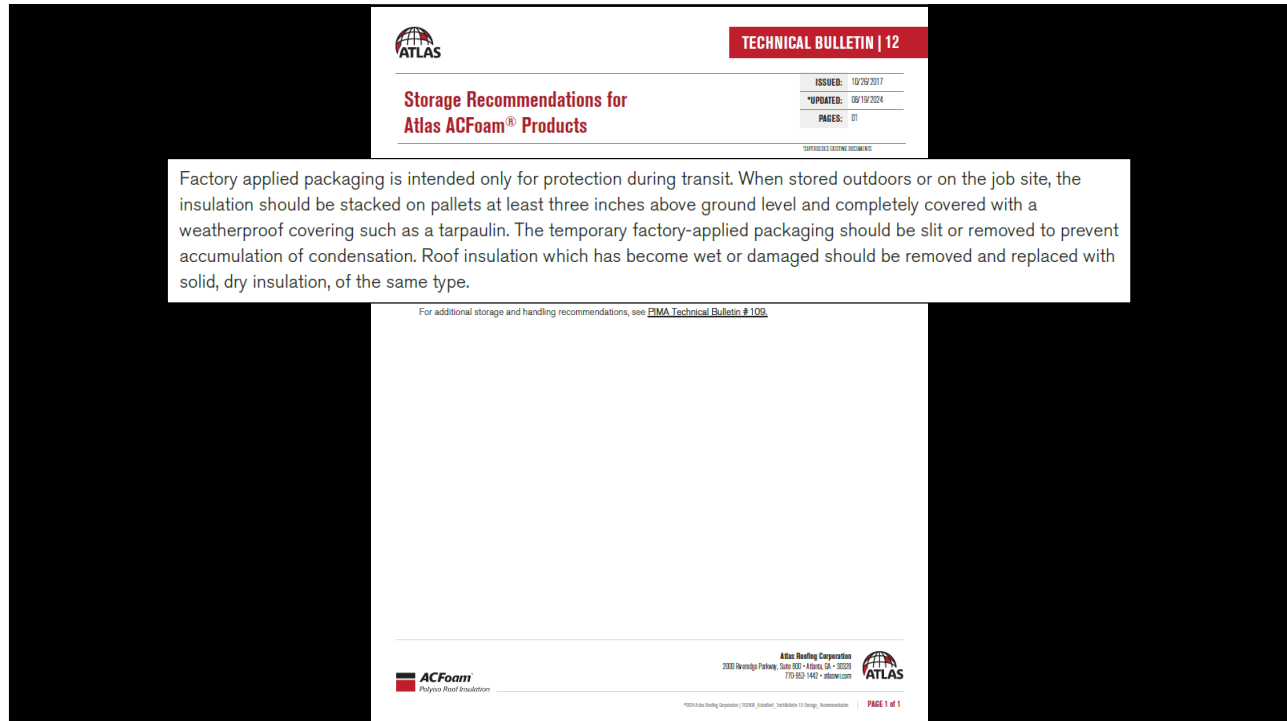
26



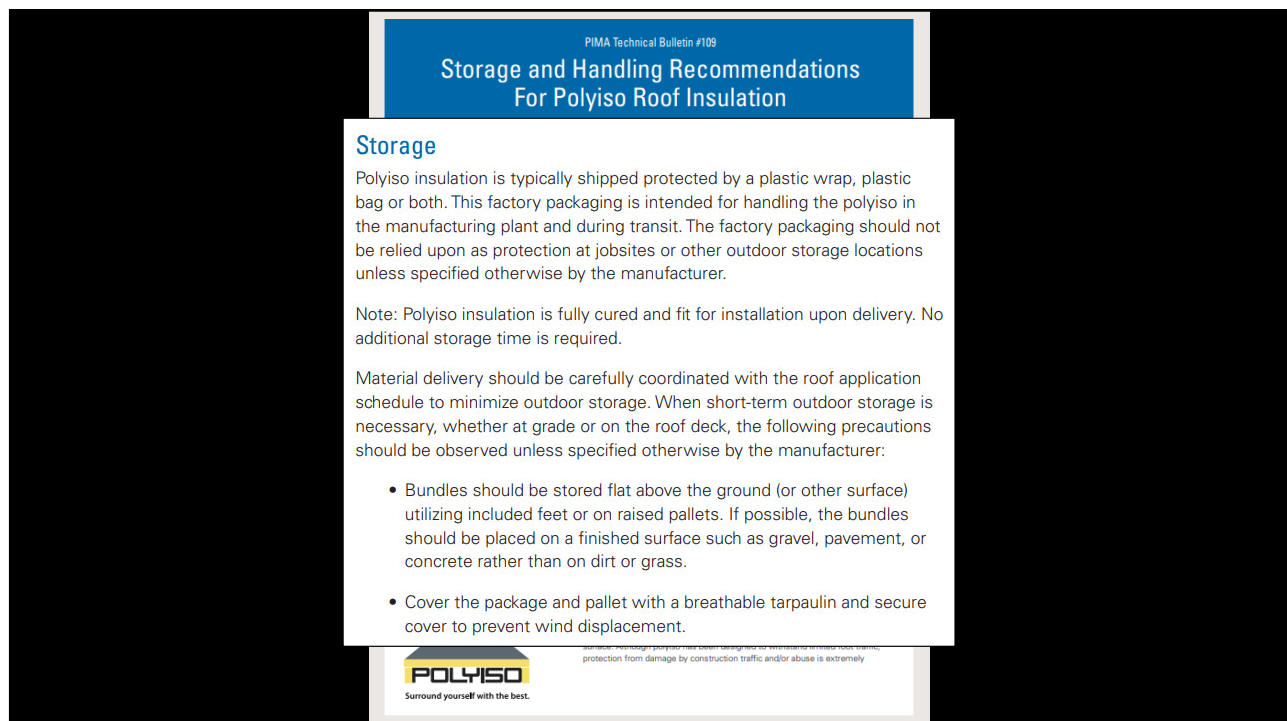
27



28



29



30



31



Rolling tarp system

32

Fastener issues

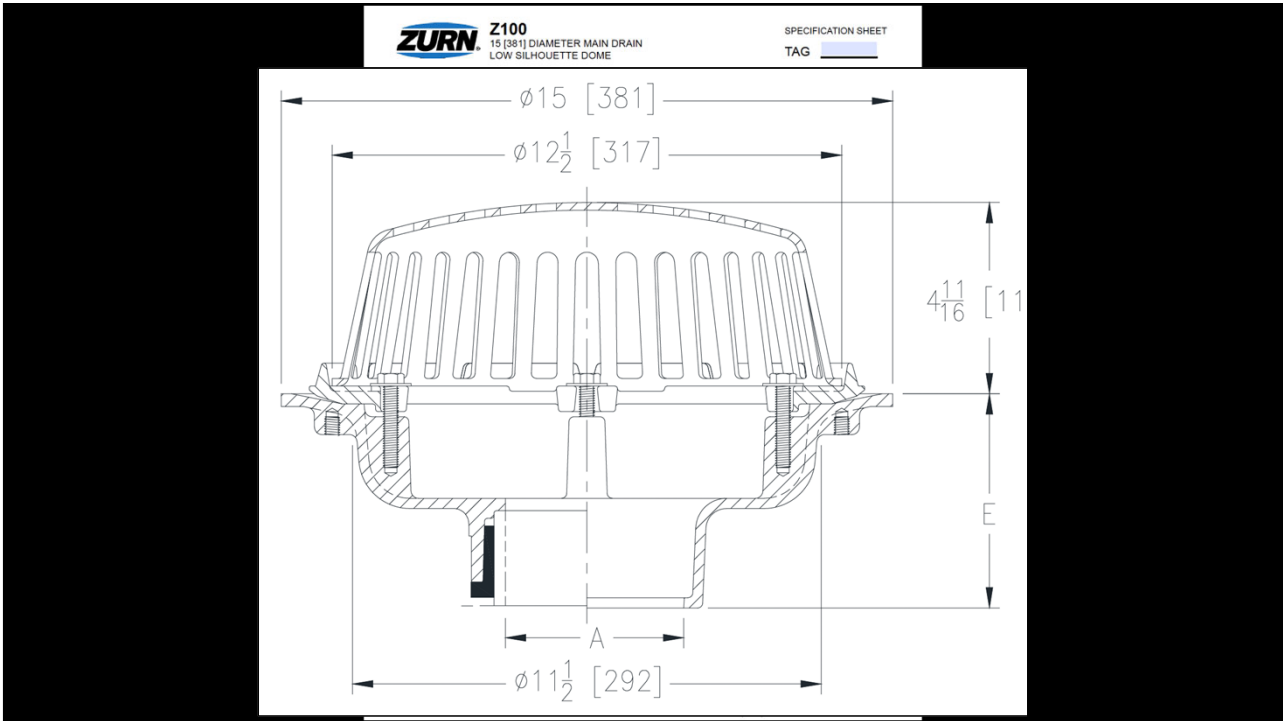
33



34

Roof drain issues

35



36



Membrane discoloration

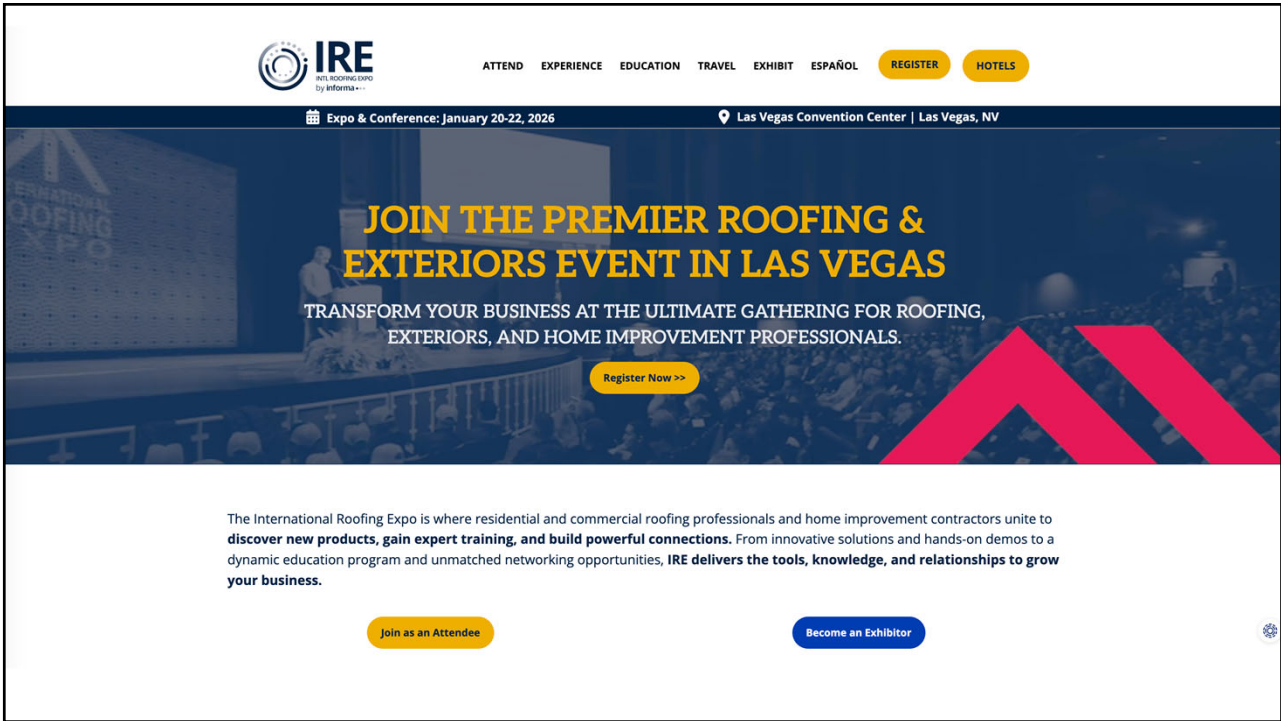
39




40



41



42

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Advanced Topics and Current Issues in Low-Slope Roofing



This advanced course builds on foundational knowledge of low-slope roofing systems, diving into critical topics such as ASCE 7 wind design, FM Global standards, hygrothermal analysis, and legal risk management. Participants will explore real-world case studies, learn to troubleshoot moisture and wind-related failures, and examine the implications of sustainability and rooftop innovations. With a focus on practical application and current industry standards, this course equips attendees to lead high-performance roofing projects in today's evolving built environment.

Learning Outcomes:

- Analyze and apply advanced wind design and moisture control strategies using ASCE 7, FM Global, and WUFI simulation tools.
- Evaluate legal risks, warranty limitations, and liability considerations in roofing projects.
- Assess the impact of sustainability trends, rooftop uses, and material performance on modern low-slope roof design.

Who Should Attend:

- Roofing contractors, architects, and owners' representatives seeking advanced technical knowledge.
- Forensic engineers and materials specifiers involved in failure analysis and system design.
- Product manufacturers and consultants aiming to stay ahead of evolving codes, certifications, and market demands.

Date	Format	ID	Fee	
 Mar 24-25, 2026	 Face-to-Face Madison, WI	D759	\$1,195	<div>ENROLL NOW</div>

43

Questions...

44

2026 Trade Show & Seminars
Chicago Roofing Contractors Association

22



Mark S. Graham
Vice President, Technical Services
National Roofing Contractors Association
Two Pierce Place, Suite 1200
Itasca, Illinois 60143


(847) 299-9070
mgraham@nrca.net
www.nrca.net

Personal website: www.MarkGrahamNRCA.com
LinkedIn: linkedin.com/in/MarkGrahamNRCA

45

Mark S. Graham
www.marksgraham.com

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46