Houston Area Roofing Contractors Association
February 14, 2023
Houston, TX

NRCA technical issues update

Mark S. Graham
Vice President, Technical Services
National Roofing Contractors Association
Rosemont, Illinois

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Topics

- Market conditions
- Imported plywood and OSB concerns
- Imported lumber concerns
- Synthetic underlayment
  - Water vapor transmission testing
- Ignition temperature research
- Vapor retarder adhesion testing
- Contractor-reported problems
- Questions and other topics

2

Market conditions and forecast

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ASPHALT ROOFING MANUFACTURERS ASSOCIATION

Media Contact
Amie Goscinski, ARMA Director of MarComm
443.640.1075 x1144 | agoscinski@asphaltroofing.org

ARMA Releases 2022 Q4 Report on Asphalt Roofing Product Shipments

2020: 161,416,435
2019: 146,605,438
2018: 143,453,436
2017: 151,098,256

Asphalt Roofing Product Shipments

Shipments (squares)	Q4 2022	Q4 2021	% Change	YTD 2022	YTD 2021	% Change
Shingles – U.S. (including individual shingles)	29,865,538	37,014,634	-19.3%	157,749,481	169,188,143	-6.8%
BUR base, ply, and mineral cap sheets – U.S. (not including saturated felts)	1,398,161	1,344,956	4.0%	7,055,363	6,587,255	7.1%
Modified Bitumen – U.S.	8,040,453	8,930,779	-10.0%	38,996,142	39,805,747	-2.0%
Shingles – Canada (including Individual shingles)	1,569,610	2,917,763	-46.2%	12,109,765	14,215,825	-14.8%

About ARMA:
The Asphalt Roofing Manufacturers Association (ARMA) is a trade association representing North America's asphalt roofing manufacturing companies and their raw material suppliers. The association includes the majority of North American manufacturers of asphalt shingles and asphalt low slope roof membrane systems. Committed to advances in the asphalt roofing industry, ARMA is proud of the role it plays in promoting asphalt roofing to those in the building industry and to the public.

Asphalt. The Roofing Solution.

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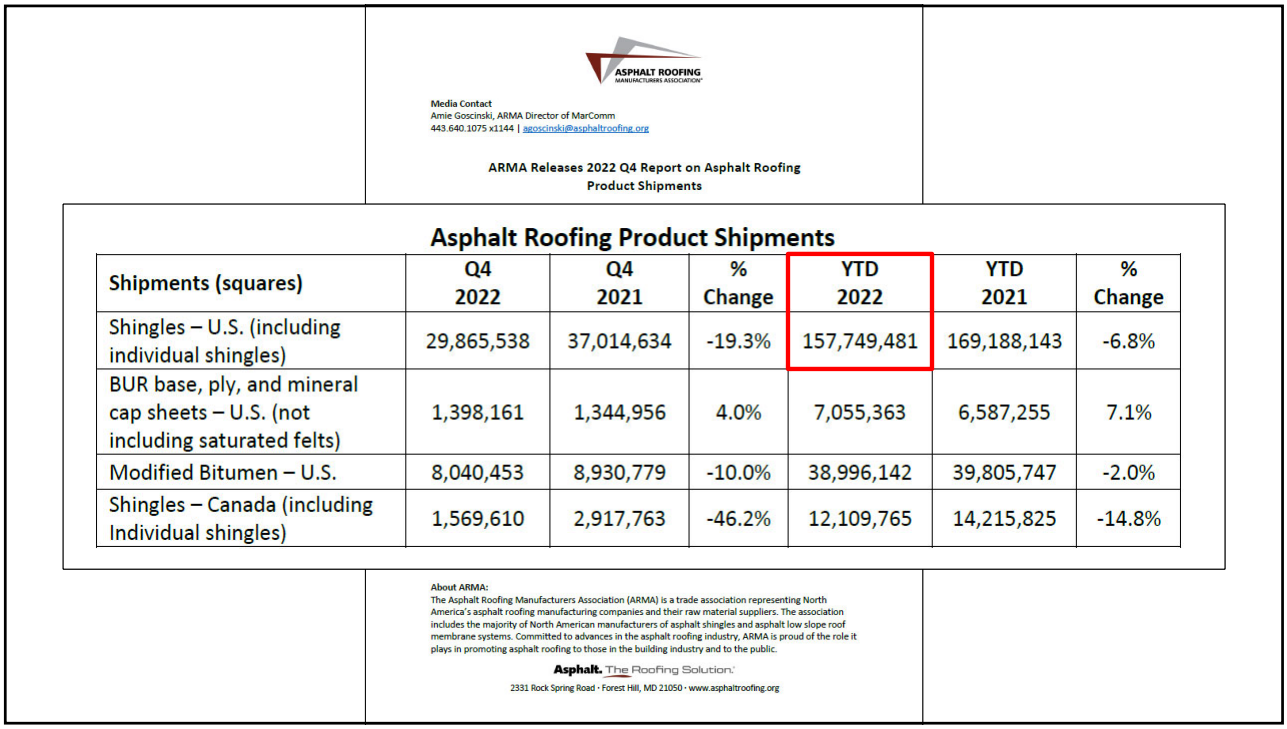

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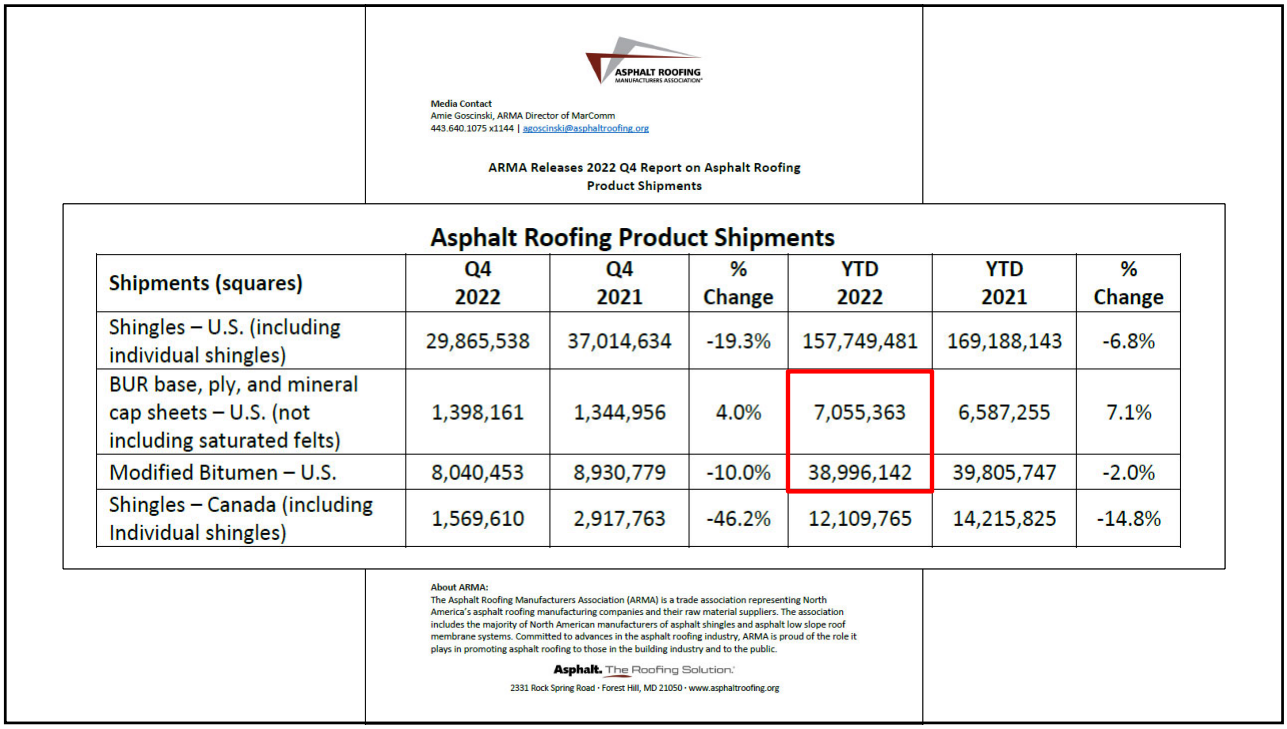

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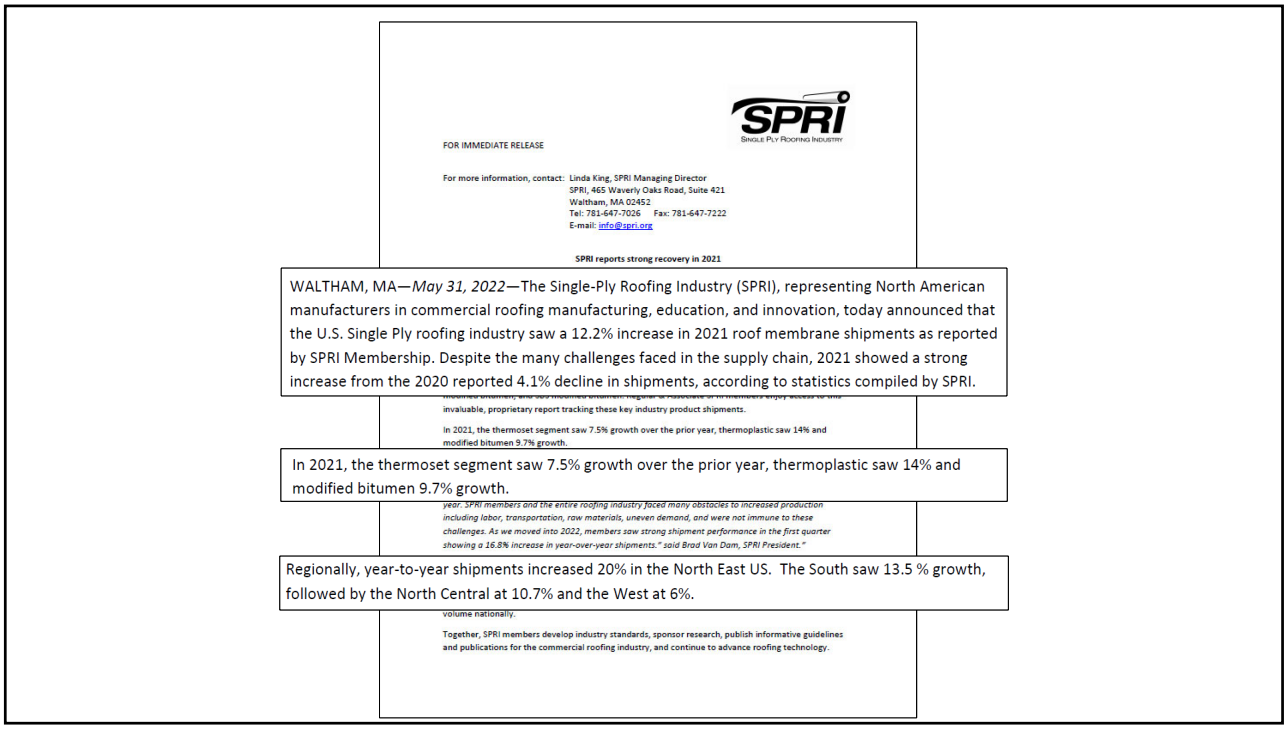

FOR IMMEDIATE RELEASE

For more information, contact: Linda King, SPRI Managing Director
SPRI, 465 Waverly Oaks Road, Suite 421
Waltham, MA 02452
Tel: 781-647-7026 Fax: 781-647-7222
E-mail: info@spri.org

SPRI reports strong recovery in 2021

WALTHAM, MA—*May 31, 2022*—The Single-Ply Roofing Industry (SPRI), representing North American manufacturers in commercial roofing manufacturing, education, and innovation, today announced that the U.S. Single Ply roofing industry saw a 12.2% increase in 2021 roof membrane shipments as reported by SPRI Membership. Despite the many challenges faced in the supply chain, 2021 showed a strong increase from the 2020 reported 4.1% decline in shipments, according to statistics compiled by SPRI.

invaluable, proprietary report tracking these key industry product shipments.

In 2021, the thermoset segment saw 7.5% growth over the prior year, thermoplastic saw 14% and modified bitumen 9.7% growth.

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year. SPRI members and the entire roofing industry faced many obstacles to increased production including labor, transportation, raw materials, uneven demand, and were not immune to these challenges. As we moved into 2022, members saw strong shipment performance in the first quarter showing a 16.8% increase in year-over-year shipments." said Brad Van Dam, SPRI President."

Regionally, year-to-year shipments increased 20% in the North East US. The South saw 13.5 % growth, followed by the North Central at 10.7% and the West at 6%.

volume nationally.

Together, SPRI members develop industry standards, sponsor research, publish informative guidelines and publications for the commercial roofing industry, and continue to advance roofing technology.

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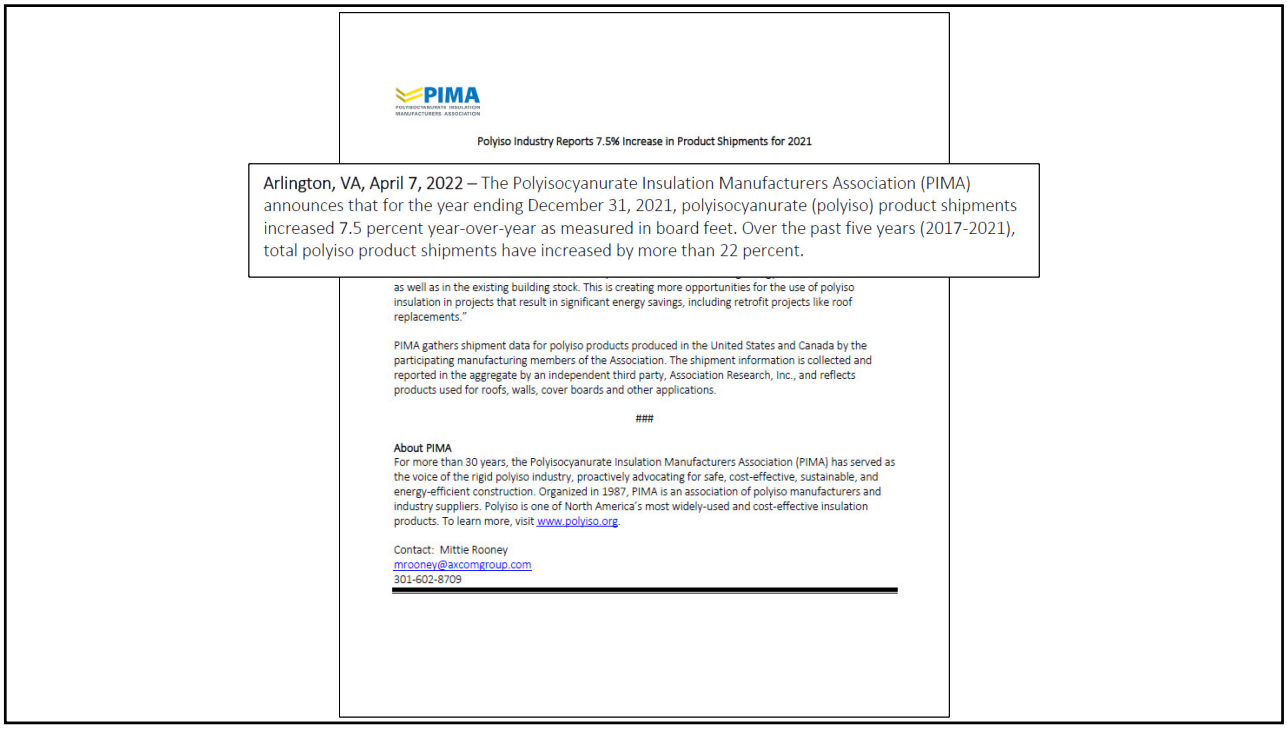

Polyiso Industry Reports 7.5% Increase in Product Shipments for 2021

Arlington, VA, April 7, 2022 – The Polyisocyanurate Insulation Manufacturers Association (PIMA) announces that for the year ending December 31, 2021, polyisocyanurate (polyiso) product shipments increased 7.5 percent year-over-year as measured in board feet. Over the past five years (2017-2021), total polyiso product shipments have increased by more than 22 percent.

as well as in the existing building stock. This is creating more opportunities for the use of polyiso insulation in projects that result in significant energy savings, including retrofit projects like roof replacements."

PIMA gathers shipment data for polyiso products produced in the United States and Canada by the participating manufacturing members of the Association. The shipment information is collected and reported in the aggregate by an independent third party, Association Research, Inc., and reflects products used for roofs, walls, cover boards and other applications.

###

About PIMA
For more than 30 years, the Polyisocyanurate Insulation Manufacturers Association (PIMA) has served as the voice of the rigid polyiso industry, proactively advocating for safe, cost-effective, sustainable, and energy-efficient construction. Organized in 1987, PIMA is an association of polyiso manufacturers and industry suppliers. Polyiso is one of North America's most widely-used and cost-effective insulation products. To learn more, visit www.polyiso.org.

Contact: Mittie Rooney
mrooney@axcomgroup.com
301-602-8709

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Link

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What to expect in 2023…

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Link

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Some Q4 results...

Market Index Survey for Reroofing

- 78%: Inquiries are equal to or greater than 2022
- 72%: Contracts are equal to or greater than 2022
- Indices (50 is the baseline):
  - Inquiries:
    - 43.8: Steep slope
    - 58.6: Low slope
    - 57.7: Combined
  - Contracts:
    - 43.3: Steep slope
    - 58.9: Low slope
    - 53.8: Combined

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Some comments…

- Interest rates and economic uncertainty are hampering the industry, particularly the steep-slope/residential segment
- Supply chain/product availability issues and material/product pricing have stabilized… with few exceptions
- Transportation/trucking is a major issue
- The worker shortage is serious… and limiting industry growth
- Contractors are warehousing far more materials/products
- Regulatory issues are of increasing concern… and cost.
- Local/regional high-wind and hail events are wildcards
- Global events and politics are an unknown… and a concern

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Imported lumber concerns

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RESEARCH+TECH

Considering substitutions

Be aware of potential consequences with product substitution

by Mark S. Graham

With ongoing shortages of building materials and products, substitutions have become more commonplace—but they can have unintended consequences. One issue that has arisen involves substituting European lumber for North American lumber, a decision that could result in unintended consequences.

The situation

At the start of the COVID-19 pandemic, wood product producers were operating under the same uncertainty as the rest of the world. Many mills curtailed production in anticipation of worker shortages and reduced demand. At the same time, many wholesale and retail lumber customers significantly reduced inventory levels. Also, because of the Great Recession, several mills had closed permanently. The American Wood Council reports between 2007 and 2017, mill closures in the South resulted in a lumber capacity loss between 1.7 to 2 billion board feet. Mill closures in the Pacific Northwest represented 10% of the area's mills.

Although the demand for wood products had dipped, it quickly rebounded during the pandemic because of increased remodeling projects and new housing starts spurred, in part, by low interest

20 professionalroofing.net SEPTEMBER 2021

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September 2021

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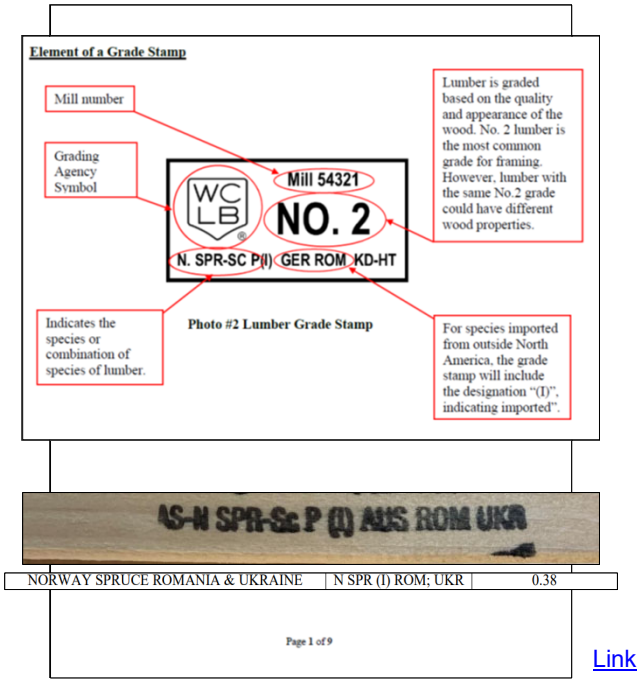
Element of a Grade Stamp

Mill number

Grading Agency Symbol

Lumber is graded based on the quality and appearance of the wood. No. 2 lumber is the most common grade for framing. However, lumber with the same No.2 grade could have different wood properties.

WCLB

Mill 54321

NO. 2

N. SPR-SC P(I) GER ROM KD-HT

Indicates the species or combination of species of lumber.

Photo #2 Lumber Grade Stamp

For species imported from outside North America, the grade stamp will include the designation "(I)", indicating imported".

AS-N SPR-Sc P (I) AUS ROM UKR

NORWAY SPRUCE ROMANIA & UKRAINE	N SPR (I) ROM; UKR	0.38

Page 1 of 9

Link

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Imported plywood and OBS concerns

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Standards for wood structural panels

International Residential Code, 2018 Edition

Plywood:

- U.S. Department of Commerce PS-1, “Structural Plywood”
- CSA Group O325, “Construction Sheathing”

Oriented-strand board (OSB):

- U.S. Department of Commerce PS-2, “Performance Standard for Wood-based Structural-use Panels”
- CSA Group O437, “Standards for OSB and Waferboard”

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Common, but not referenced in the Code

Plywood and OSB:

- APA-The Engineered Wood Association Standard PRP-108, "Performance Standards and Policies for Structural-Use Panels"

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Roof sheathing attachment

IRC 2018 Table 602.3(1), Rows 30-32 (minimum attachment):

- Panel edges:
  - 2½-inch-long 8d common nails at 6 inches o.c. at supported panel edges
- Intermediate supports:
  - 2½-inch-long 8d common nails at 12 inches o.c. at intermediate supports

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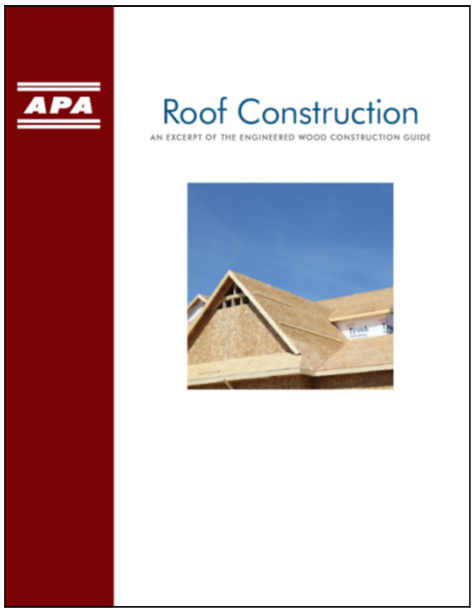

Link

APA Form E30, "Roof Construction"
--Roofing-specific excerpts from APA's *Engineered Wood Construction Guide* (102 pages)

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Concerns with Brazilian plywood

Applies to product shipped from January 1, 2016 through early 2022

Link

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PFS·TECO

PFS Corporation d/b/a PFS TECO
An Employee-Owned Company

NEWS RELEASE

For Immediate Release

For more information, contact:

Scott Drake
Office: (608) 839-1013
scott.drake@pfsteco.com

Court-Issued Permanent Injunction related to Brazilian Plywood

Cottage Grove, WI (May 31, 2022) — In September 2019, a group of US plywood manufacturers filed a complaint in the Southern District of Florida concerning PFS TECO's work as an accredited third-party agency in Southern Brazil. The complaint alleged that the PFS TECO certification mark should be considered false advertising because their group believes it is not possible for plywood made from pine grown in Southern Brazil to meet the requirements of US DOC Product Standard 1 (PS 1).

PFS TECO has tested and certified plywood in Brazil for over 20 years. PFS TECO has been accredited and reaccredited by International Accreditation Services, Inc. as an inspection and testing agency and Standards Council of Canada as a certification agency. The third-party certification system for building products involves the manufacturer taking responsibility for their product while the third-party agency's role is to be the impartial link between the manufacturer and the local building official's review of the application of the product. The certification mark is intended to inform the building official that the manufacturer has demonstrated they have the capability to comply with the product standard and they had third-party oversight at the time the product was manufactured. The referenced product type and grade in the mark are then used during the building official's inspection.

On May 23, 2022, PFS TECO and the U.S. Structural Plywood Integrity Coalition agreed on the terms of a permanent injunction to settle the ongoing dispute between them. On the following day, according to the terms agreed by the parties, the Judge issued a permanent injunction under which PFS TECO exits the certification market for PS 1 rated plywood in Southern Brazil. The case was settled before the jury trial took place and/or the Court has made any determination on the case's merits. Therefore, the federal district court has not made any determination concerning the accuracy of the plaintiffs' allegations concerning the "strength" of the Brazilian plywood bearing the PFS TECO stamps or what "wholesalers and retailers" must or should do regarding existing stocks of the labeled product.

Indeed, the injunction does not prohibit, limit, or restrain the sale and/or use of the products labeled with PFS TECO mark on or before May 31, 2022. The Injunction entered by the Court addresses only the future actions of PFS TECO. The Injunction was made without any findings of fact about the products that have been labeled. The injunction specifically does not order the removal or obliteration of any label applied to the product on or before May 31, 2022. The relevant injunction language states:

> "IT IS ORDERED AND ADJUDGED that, within seven (7) days of the entry of this Judgment, PFS TECO is ordered to revoke all of the PS 1 certificates and grade stamps that PFS TECO has issued to plywood mills located in southern Brazil by emailing a notice of PS 1 certificate revocation to each Brazilian licensee and to remove all revoked PS 1 certificates from the PFS TECO website."

608.839.1013 · 1507 Matt Pass · Cottage Grove, WI 53527
WWW.PFSTECO.COM

PFS TECO TESTED MARKS YOU CAN BUILD ON

PFS-TECO New Release

May 31, 2022

Link

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Conclusions and recommendations

Concerns with imported lumber and plywood and OSB sheathing

- Be cautious of newly-installed lumber and plywood and OSB
- You may want to check grade stamps
- Roof deck acceptance should be limited
- Prepare yourself for more roof deck replacement

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Synthetic underlayment

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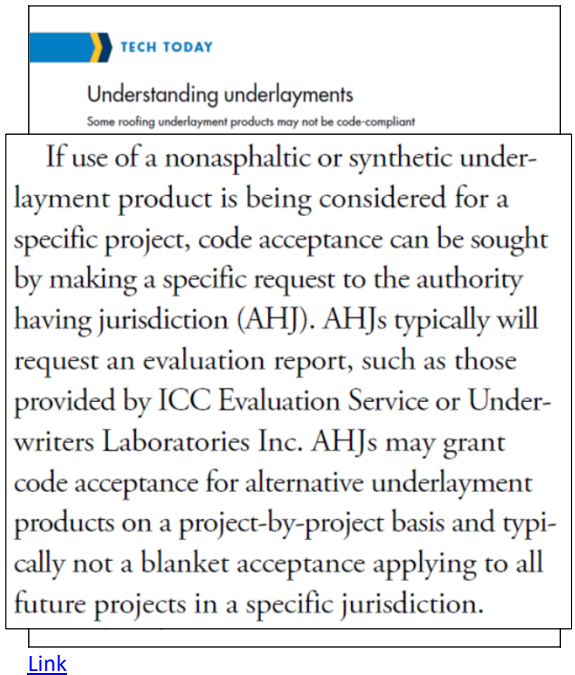

TECH TODAY

Understanding underlayments

Some roofing underlayment products may not be code-compliant

If use of a nonasphaltic or synthetic underlayment product is being considered for a specific project, code acceptance can be sought by making a specific request to the authority having jurisdiction (AHJ). AHJs typically will request an evaluation report, such as those provided by ICC Evaluation Service or Underwriters Laboratories Inc. AHJs may grant code acceptance for alternative underlayment products on a project-by-project basis and typically not a blanket acceptance applying to all future projects in a specific jurisdiction.

Link

Professional Roofing
December 2016

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RESEARCH+TECH

A new standard

Guidelines for synthetic underlayments

by Mark S. Graham

After more than eight years in development, in December 2020 ASTM International published the first U.S. product standard applicable to synthetic, steep-slope underlayment products. If you are involved with the design or installation of steep-slope roof systems, I encourage you to become familiar with this standard and begin to use it when specifying and procuring steep-slope underlayment products.

ASTM D8257

ASTM D8257, "Standard Specification for Mechanically Attached Polymeric Roof Underlayment Used in Steep Slope Roofing," addresses mechanically attached synthetic underlayment used in steep-slope roof systems.

The standard defines polymeric underlayment as a sheet material primarily composed of polymers for use as a secondary water-shedding layer on steep-slope roofs when installed below a primary roof covering.

The standard's objective is to provide a finished product that will be used as a water-shedding underlayment layer on steep-sloped roofs prior to and after the installation of a primary steep-slope roof covering.

26 professionalroofing.net JULY/AUGUST 2021

Professional Roofing

July/August 2021

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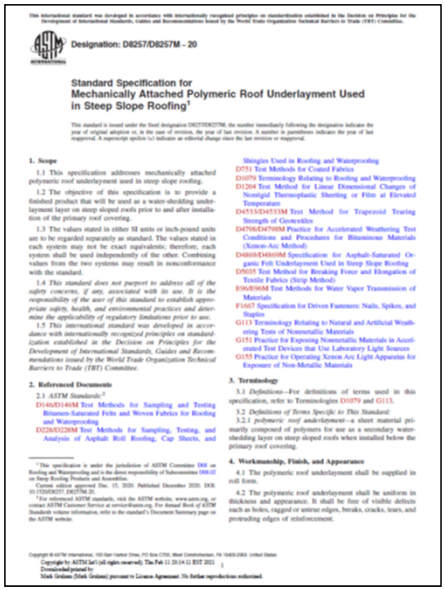

Designation: D8257/D8257M - 20

Standard Specification for Mechanically Attached Polymeric Roof Underlayment Used in Steep Slope Roofing[1]

1. Scope

2. Referenced Documents

3. Terminology

4. Workmanship, Finish, and Appearance

ASTM D8257, "Standard Specification for Mechanically Attached Polymeric Roof Underlayment Used in Steep Slope Roofing"

Published in December 2020

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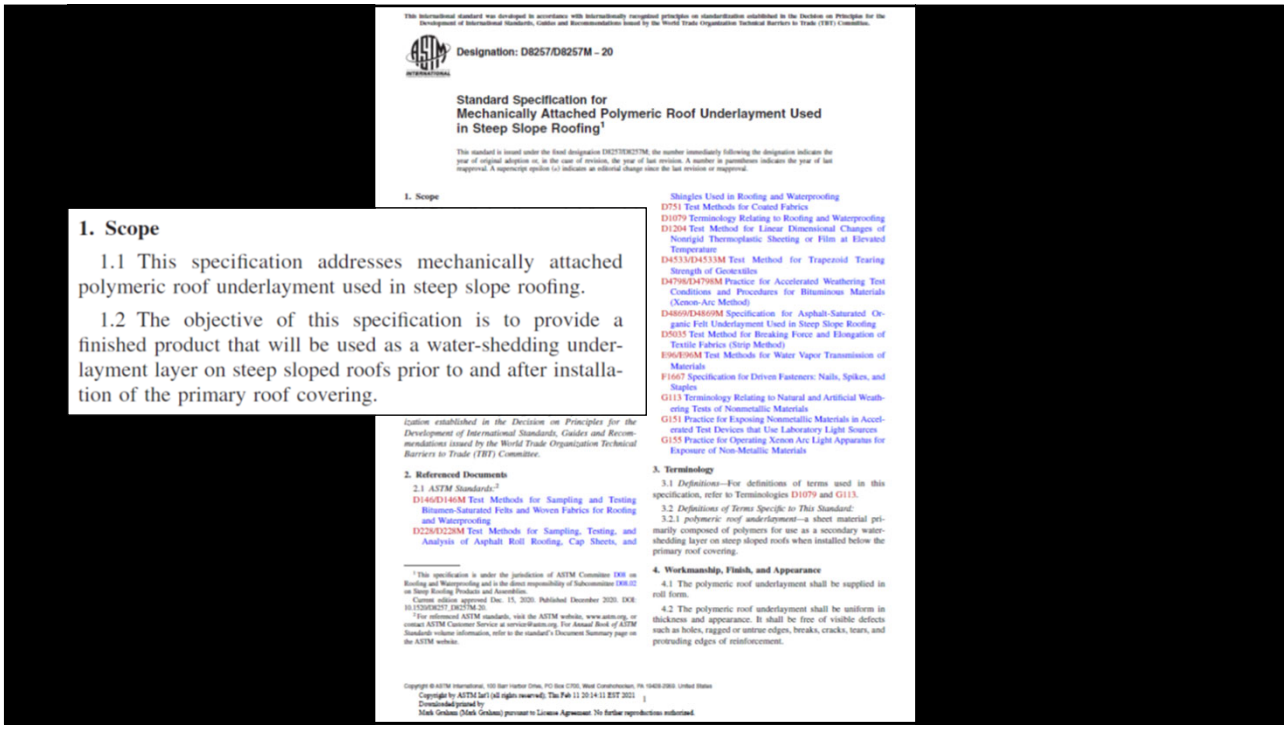

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Standard Specification for
Mechanically Attached Polymeric Roof Underlayment Used in Steep Slope Roofing[1]

This standard is issued under the fixed designation D8257/D8257M; 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. Scope

1.1 This specification addresses mechanically attached polymeric roof underlayment used in steep slope roofing.

1.2 The objective of this specification is to provide a finished product that will be used as a water-shedding underlayment layer on steep sloped roofs prior to and after installation of the primary roof covering.

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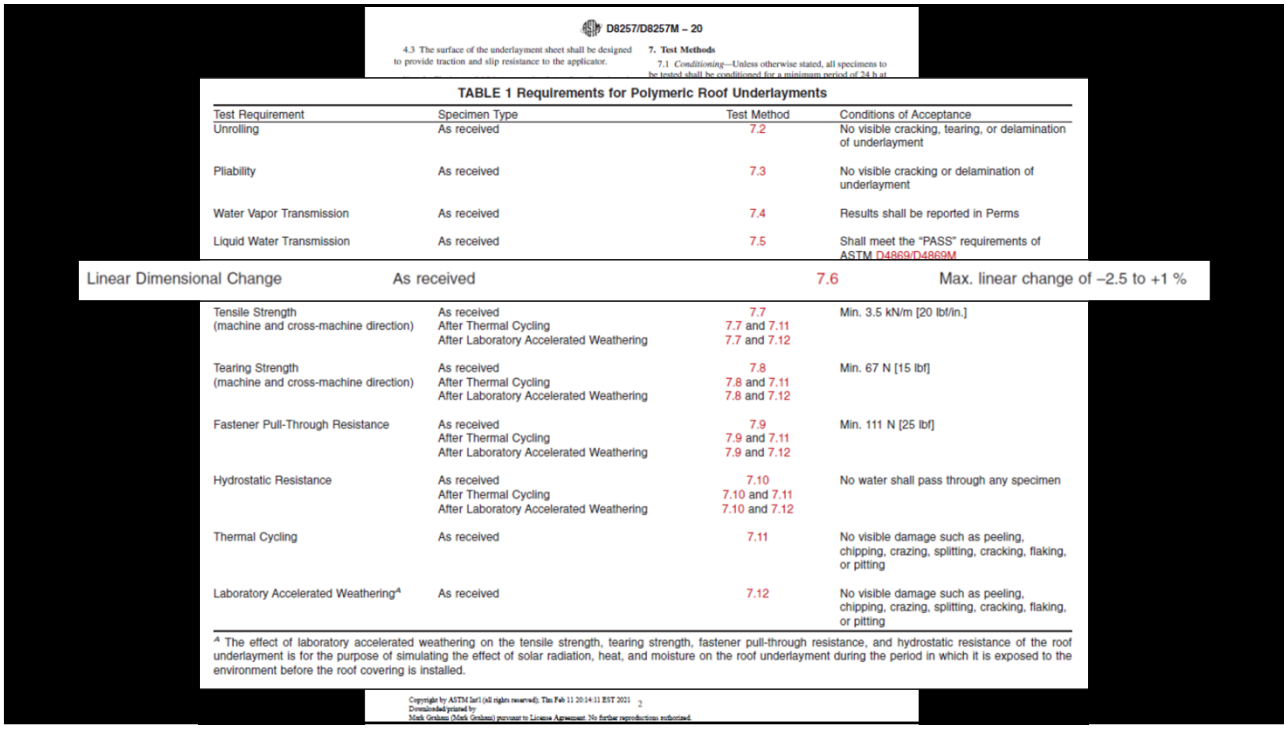

D8257/D8257M – 20

4.3 The surface of the underlayment sheet shall be designed to provide traction and slip resistance to the applicator.

7. Test Methods

7.1 *Conditioning*—Unless otherwise stated, all specimens to be tested shall be conditioned for a minimum period of 24 h at

TABLE 1 Requirements for Polymeric Roof Underlayments

Test Requirement	Specimen Type	Test Method	Conditions of Acceptance
Unrolling	As received	7.2	No visible cracking, tearing, or delamination of underlayment
Pliability	As received	7.3	No visible cracking or delamination of underlayment
Water Vapor Transmission	As received	7.4	Results shall be reported in Perms
Liquid Water Transmission	As received	7.5	Shall meet the "PASS" requirements of ASTM D4869/D4869M
Linear Dimensional Change	As received	7.6	Max. linear change of –2.5 to +1 %
Tensile Strength (machine and cross-machine direction)	As received After Thermal Cycling After Laboratory Accelerated Weathering	7.7 7.7 and 7.11 7.7 and 7.12	Min. 3.5 kN/m [20 lbf/in.]
Tearing Strength (machine and cross-machine direction)	As received After Thermal Cycling After Laboratory Accelerated Weathering	7.8 7.8 and 7.11 7.8 and 7.12	Min. 67 N [15 lbf]
Fastener Pull-Through Resistance	As received After Thermal Cycling After Laboratory Accelerated Weathering	7.9 7.9 and 7.11 7.9 and 7.12	Min. 111 N [25 lbf]
Hydrostatic Resistance	As received After Thermal Cycling After Laboratory Accelerated Weathering	7.10 7.10 and 7.11 7.10 and 7.12	No water shall pass through any specimen
Thermal Cycling	As received	7.11	No visible damage such as peeling, chipping, crazing, splitting, cracking, flaking, or pitting
Laboratory Accelerated Weathering[A]	As received	7.12	No visible damage such as peeling, chipping, crazing, splitting, cracking, flaking, or pitting

[A] The effect of laboratory accelerated weathering on the tensile strength, tearing strength, fastener pull-through resistance, and hydrostatic resistance of the roof underlayment is for the purpose of simulating the effect of solar radiation, heat, and moisture on the roof underlayment during the period in which it is exposed to the environment before the roof covering is installed.

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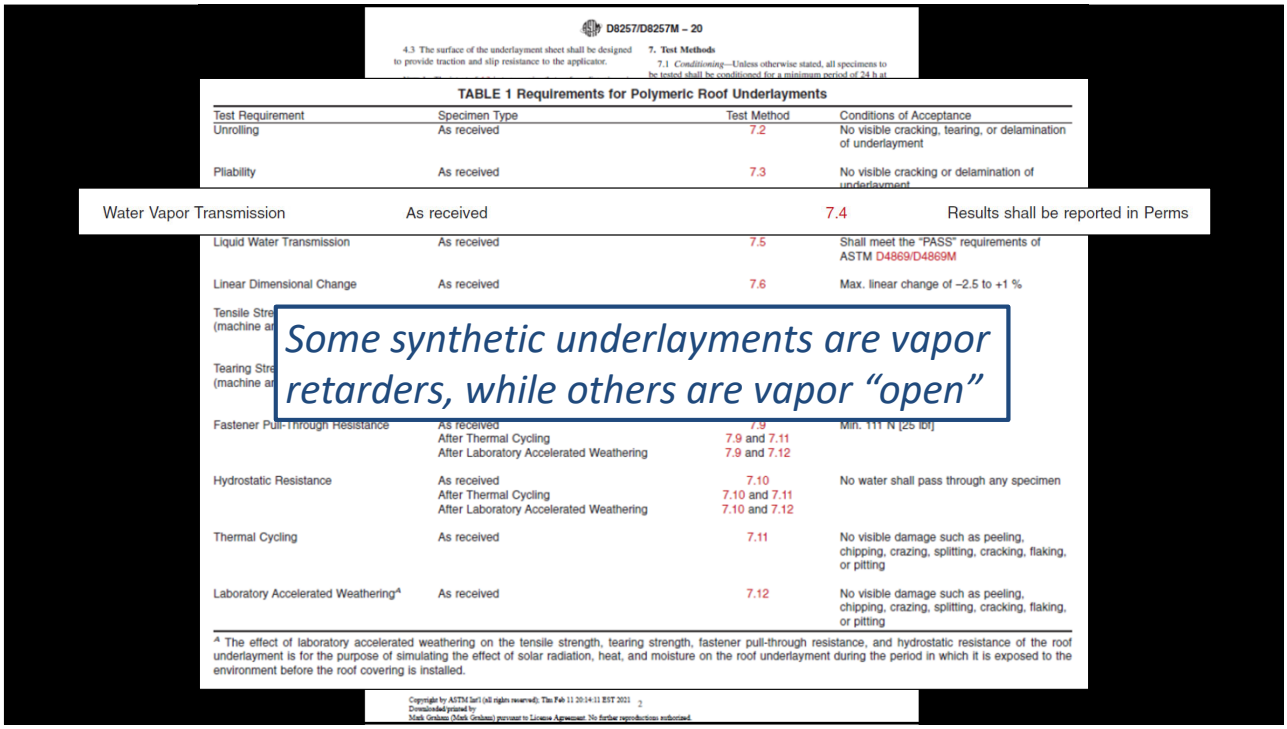

D8257/D8257M – 20

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Some synthetic underlayments are vapor retarders, while others are vapor "open"

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Measurement of a vapor retarder's effectiveness

Classification	Permeance[1]
Class I vapor retarder	0.1 perm or less
Class II vapor retarder	1.0 perm or less and greater than 0.1 perm
Class III vapor retarder	10 perm or less and greater than 1.0 perm

[1] Permeance determined according to ASTM E-96 Test Method A (the desiccant method or dry cup method)

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VAPOR PERMEABILITY PROVIDES

TEST MATERIAL	PERMEANCE RATING
Asphalt shingles – individual	0.9
#15 felt	7.0
Breathable synthetic	9.5
Nonbreathable synthetic	0.1
7/16-in. OSB decking	1.0

TEST MATERIAL	PERMEANCE RATING
OSB, #15 felt, Classic® shingles	0.31
OSB, Fiberglas™-reinforced felt, Classic® shingles	0.32
OSB, nonbreathable, Classic® shingles	0.27

IIBEC (formerly RCI) *Interface*
December 2011

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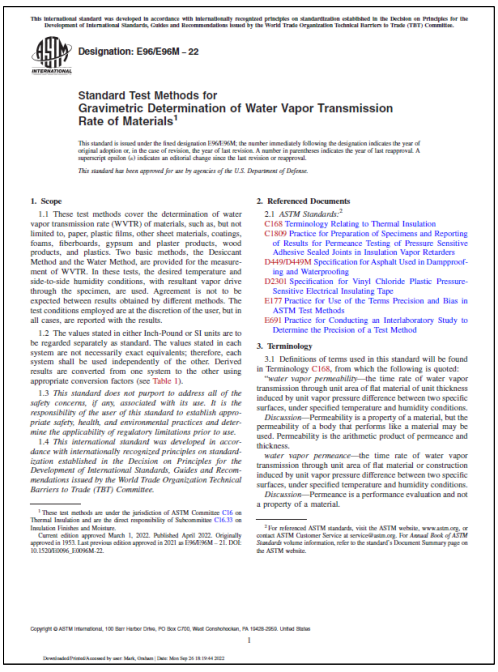

This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade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

Designation: E96/E96M – 22

Standard Test Methods for
Gravimetric Determination of Water Vapor Transmission
Rate of Materials[1]

This standard is issued under the fixed designation E96/E96M; 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.

This standard has been approved for use by agencies of the U.S. Department of Defense.

1. Scope

1.1 These test methods cover the determination of water vapor transmission rate (WVTR) of materials, such as, but not limited to, paper, plastic films, other sheet materials, coatings, foams, fiberboards, gypsum and plaster products, wood products, and plastics. Two basic methods, the Desiccant Method and the Water Method, are provided for the measurement of WVTR. In these tests, the desired temperature and side-to-side humidity conditions, with resultant vapor drive through the specimen, are used. Agreement is not to be expected between results obtained by different methods. The test conditions employed are at the discretion of the user, but in all cases, are reported with the results.

1.2 The values stated in either Inch-Pound or SI units are to be regarded separately as standard. The values stated in each system are not necessarily exact equivalents; therefore, each system shall be used independently of the other. Derived results are converted from one system to the other using appropriate conversion factors (see Table 1).

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]

C168 Terminology Relating to Thermal Insulation
C1809 Practice for Preparation of Specimens and Reporting of Results for Permeance Testing of Pressure Sensitive Adhesive Sealed Joints in Insulation Vapor Retarders
D449/D449M Specification for Asphalt Used in Dampproofing and Waterproofing
D2301 Specification for Vinyl Chloride Plastic Pressure-Sensitive Electrical Insulating Tape
E177 Practice for Use of the Terms Precision and Bias in ASTM Test Methods
E691 Practice for Conducting an Interlaboratory Study to Determine the Precision of a Test Method

3. Terminology

3.1 Definitions of terms used in this standard will be found in Terminology C168, from which the following is quoted:

"*water vapor permeability*—the time rate of water vapor transmission through unit area of flat material of unit thickness induced by unit vapor pressure difference between two specific surfaces, under specified temperature and humidity conditions.

Discussion—Permeability is a property of a material, but the permeability of a body that performs like a material may be used. Permeability is the arithmetic product of permeance and thickness.

water vapor permeance—the time rate of water vapor transmission through unit area of flat material or construction induced by unit vapor pressure difference between two specific surfaces, under specified temperature and humidity conditions.

Discussion—Permeance is a performance evaluation and not a property of a material.

[1] These test methods are under the jurisdiction of ASTM Committee C16 on Thermal Insulation and are the direct responsibility of Subcommittee C16.33 on Insulation Finishes and Moisture.

Current edition approved March 1, 2022. Published April 2022. Originally approved in 1953. Last previous edition approved in 2021 as E96/E96M – 21. DOI: 10.1520/E0096_E0096M-22.

[2] For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@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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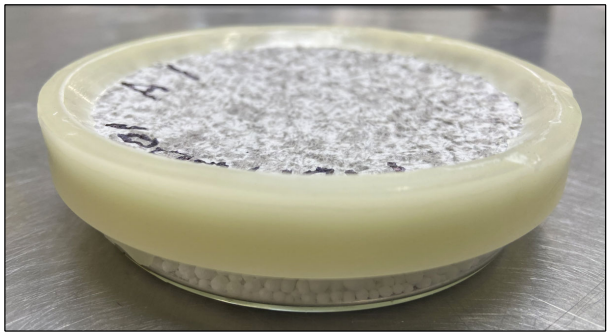
ASTM E96, "Standard Test Methods for Gravimetric Determination of Water Vapor Transmission Rate of Materials"



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ASTM E96 Procedure A results

NRCA permeance testing of asphalt shingle roof assemblies

Sample	Water vapor permeance (Perms)
7/16” OSB sheathing	1.4
15/32” CDX plywood sheathing	0.9

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ASTM E96 Procedure A results -- continued

NRCA permeance testing of asphalt shingle roof assemblies

Sample	Water vapor permeance (Perms)
Non-breathable synthetic underlayment	0.02
Breathable synthetic underlayment	0.5

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ASTM E96 Procedure A results -- continued

NRCA permeance testing of asphalt shingle roof assemblies

Sample	Water vapor permeance (Perms)
Non-breathable synthetic underlayment over 7/16” OSB sheathing	0.03
Non-breathable synthetic underlayment over 15/32” CDX plywood sheathing	0.05
Breathable synthetic underlayment over 7/16” OSB sheathing	0.50
Breathable synthetic underlayment over 15/32” CDX plywood sheathing	0.22

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ASTM E96 Procedure A results -- continued

NRCA permeance testing of asphalt shingle roof assemblies

Sample	Water vapor permeance (Perms)
Laminated asphalt shingle over non-breathable synthetic underlayment over 7/16” OSB sheathing	0.05
Laminated asphalt shingle over non-breathable synthetic underlayment over 15/32” CDX plywood sheathing	0.04
Laminated asphalt shingle over breathable synthetic underlayment over 7/16” OSB sheathing	0.40
Laminated asphalt shingle over breathable synthetic underlayment over 15/32” CDX plywood sheathing	0.09

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ASTM E96 Procedure A results -- continued

NRCA permeance testing of asphalt shingle roof assemblies

Sample	Water vapor permeance (Perms)
Laminated asphalt shingle over non-breathable synthetic underlayment over 7/16” OSB sheathing	0.05 0.10 with nail
Laminated asphalt shingle over non-breathable synthetic underlayment over 15/32” CDX plywood sheathing	0.04 0.10 with nail
Laminated asphalt shingle over breathable synthetic underlayment over 7/16” OSB sheathing	0.40 0.50 with nail
Laminated asphalt shingle over breathable synthetic underlayment over 15/32” CDX plywood sheathing	0.09 0.18 with nail

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“Preliminary” conclusions

NRCA permeance testing of asphalt shingle roof assemblies

- There is a potential for condensation development at the roof deck level when using synthetic underlayment
- Functional below-deck ventilation is (even more) important for mitigating condensation development at the roof deck level when using synthetic underlayment

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MRCA/NRCA ignition temperature research

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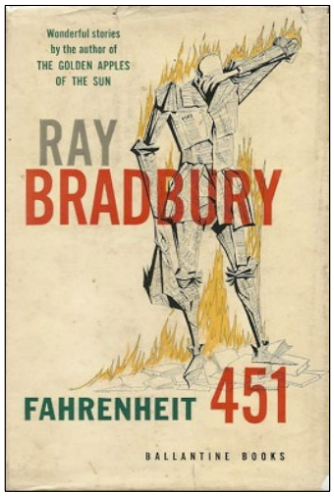

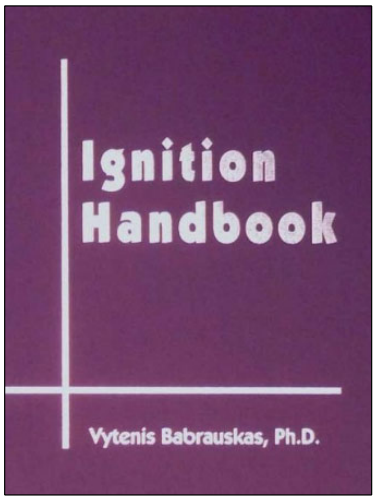

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Some known roof application temperatures

Mopping bitumen:

- EVT: 375 F to 455 F (typ.)
- Flash point: 525 F (min.)

Hot-air welding:

- Equipment settings up to 600 C (1,112 F)

Torch application:

- Blue flame: 3,596 F
- Yellow/orange flame: 1,800 F

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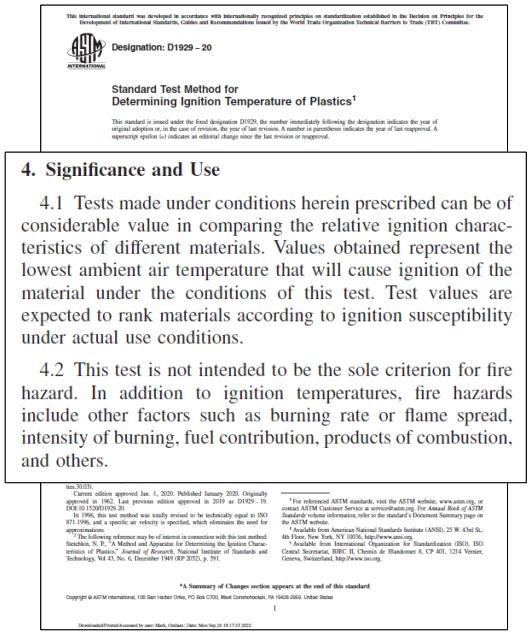

Designation: D1929 – 20

Standard Test Method for
Determining Ignition Temperature of Plastics[1]

4. Significance and Use

4.1 Tests made under conditions herein prescribed can be of considerable value in comparing the relative ignition characteristics of different materials. Values obtained represent the lowest ambient air temperature that will cause ignition of the material under the conditions of this test. Test values are expected to rank materials according to ignition susceptibility under actual use conditions.

4.2 This test is not intended to be the sole criterion for fire hazard. In addition to ignition temperatures, fire hazards include other factors such as burning rate or flame spread, intensity of burning, fuel contribution, products of combustion, and others.

ASTM D1929, "Standard Test Method for Determining Ignition Temperature of Plastics"

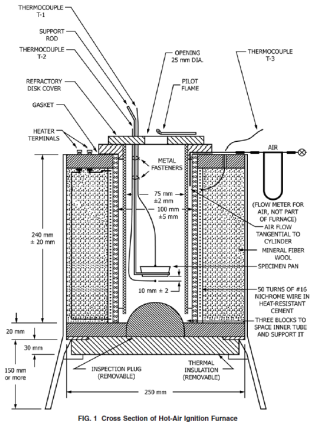

FIG. 1 Cross Section of Hot-Air Ignition Furnace

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ASTM D1929 results

Sample	Test result
Extruded polystyrene	865 F
HD polyiso with glass facer	865 F
Wood fiberboard	875 F
Polyiso with coated glass facer	895 F
Perlite board	905 F
Expanded polystyrene	910 F
Polyiso with cellulose/glass facer	920 F
Cellular glass with facer	965 F
Mineral fiber board	1,040 F
Gypsum-fiber board	Greater than 1,740 F
Gypsum board with coated fiberglass facer	Greater than 1,740 F
Cellular glass (no facer)	Greater than 1,740 F

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Recommendations

- When hot-air welding or torching roofing products, realize the relative differences in ignition temperatures of various insulation substrates
- Share this information/concept with field workers

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Vapor retarder adhesion testing

Moisture-related issues with concrete roof decks

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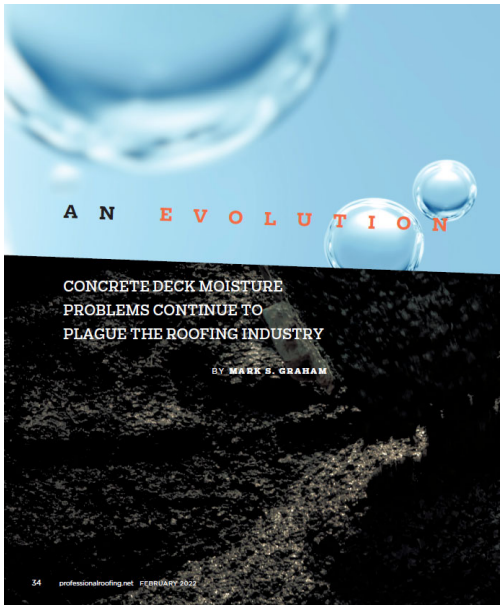

Link

Professional Roofing

February 2022

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NRCA recommends designers specify and adhered vapor retarder… but isn't adhesion of the vapor retarder a concern?

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What we tested

Vapor retarder adhesion testing

- 2-ply asphalt BUR membrane
- Manufacturer A-SA vapor retarder
- Manufacturer B-SA vapor retarder
- Manufacturer C-SA vapor retarder
- Manufacturer D-SA vapor retarder

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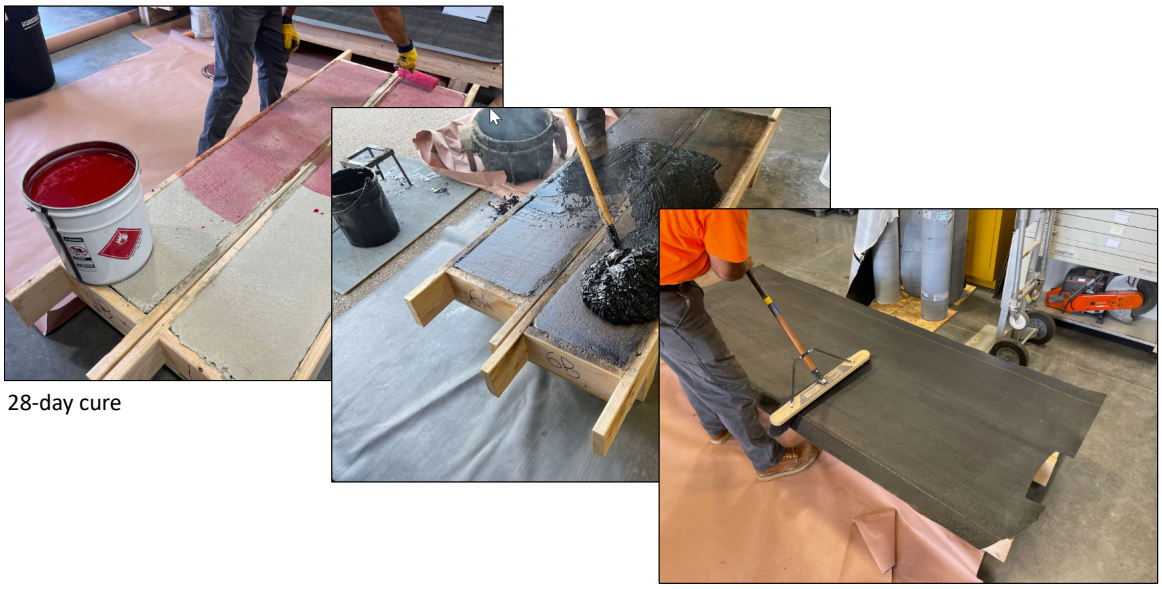

28-day cure

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Sample conditioning

After vapor retarder application

- Conditioned for 60-days
- One set of each at standard laboratory conditions
- Other set of each at a 30 F temperature differential
  - The temperature differential creates an upward vapor pressure drive

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Test results

Vapor retarder adhesion

Sample	Tested pull resistance		Difference	
	Lab. conditions 60-day conditioning (Average of 5 specimens)	Vapor drive 60-day conditioning (Average of 5 specimens)	Differential	Percent differential
2-ply built-up membrane	1,421 psf	833 psf	-588 psf	-41%

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Conclusions

Vapor retarder adhesion

- Results vary
- For 4 of 5 samples, vapor drive conditioning resulted in lower values, but Manufacture 3-SA VR is higher
- All results greater than 90 psf (i.e., FM 1-90)

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"Preliminary" recommendations

Vapor retarder adhesion

- Designers should specify vapor retarders after considering vapor retarder adhesion both at the time of application and in-service.
- Manufacturers should incorporate some form of vapor drive conditioning assessment in their product development and assessment and make that information available to specifiers.
- The vapor drive conditioning used in this testing is one possible assessment method.

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Contractors' recently-reported problems

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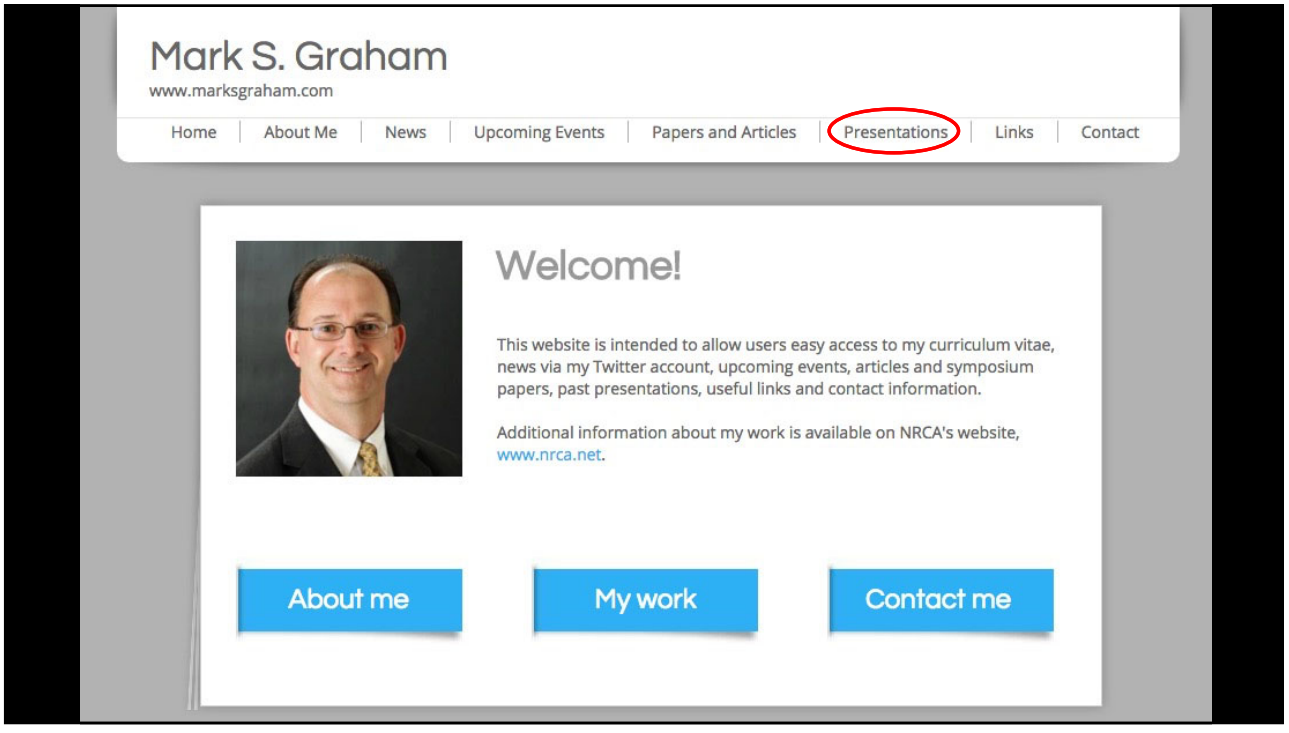

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Mark S. Graham
Vice President, Technical Services
National Roofing Contractors Association
10255 West Higgins Road, 600
Rosemont, Illinois 60018-5607

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

Twitter: @MarkGrahamNRCA
Personal website: www.MarkGrahamNRCA.com

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