Is the Science All Wet?

Strategies for Surviving a Daubert Challenge in Construction Cases Involving Water Leakage and Consequential Damages

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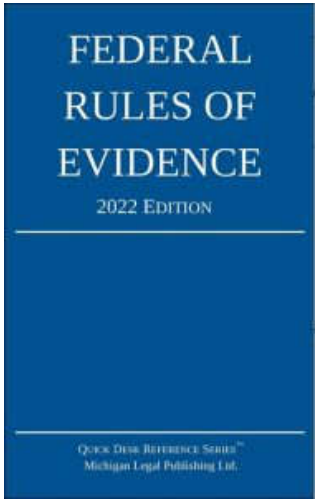
Leakage: Not simple or obvious

- Multitude of materials used in envelopes
- Unlimited building construction configurations
- Differing principles of water management
- Air/Water/Vapor contributions
- Variations in exposure conditions
- Compounding sources of leakage

Federal Rules of Evidence 702

A witness who is qualified as an expert by knowledge, skill, experience, training, or education may testify in the form of an opinion or otherwise if:

(a) the expert's scientific, technical, or other specialized knowledge will help the trier of fact to understand the evidence or to determine a fact in issue;
(b) the testimony is based on sufficient facts or data;
(c) the testimony is the product of reliable principles and methods; and
(d) the expert has reliably applied the principles and methods to the facts of the case.



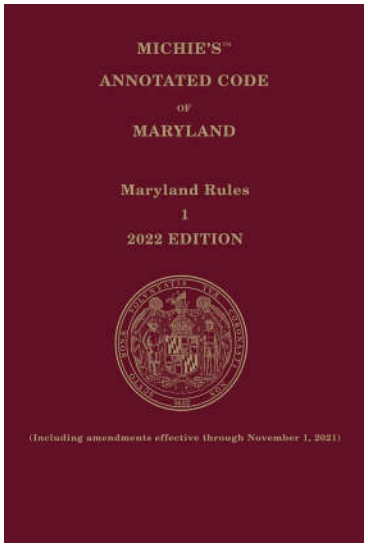
Md. Rule 5-702 Testimony by Experts

Expert testimony may be admitted, in the form of an opinion or otherwise, if the court determines that the testimony will assist the trier of fact to understand the evidence or to determine a fact in issue. In making that determination, the court shall determine:

(1) whether the witness is qualified as an expert by knowledge, skill, experience, training, or education,

(2) the appropriateness of the expert testimony on the particular subject, and

(3) whether a sufficient factual basis exists to support the expert testimony



Rochkind v. Stevenson, 471 Md. 1, 236 A.3d 630 (2020)

Maryland adopted the Daubert standard as the governing standard by which trial courts were to admit or exclude expert testimony because it was a flexible approach and the adoption of Daubert streamlined the evaluation of scientific expert testimony under Md. R. 5-702 as adopting Daubert eliminated the duplicative analysis and permitted trial courts to evaluate all expert testimony—scientific or otherwise—under Rule 5-702

Motorola Inc. v. Murray, 147 A.3d 751 (D.C. 2016)

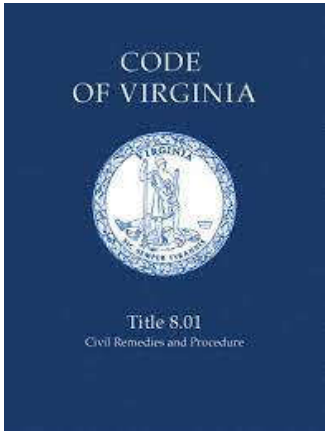
The court adopted Fed. R. Evid. 702, replacing the Dyas/Frye test, to govern the admissibility of expert testimony because Rule 702, with its expanded focus on whether reliable principles and methods had been reliably applied, stated a rule that was preferable to the Dyas/Frye test in that the ability to focus on the reliability of principles and methods, and their application, was a decided advantage that would lead to better decision-making by juries and trial judges alike.

§ 8.01-401.3 Opinion testimony and conclusions as to facts critical to civil case resolution

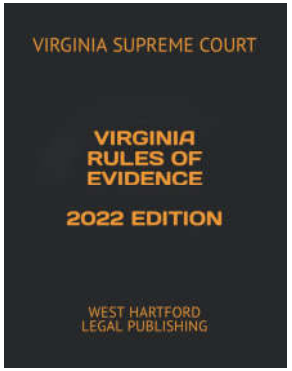
A. In a civil proceeding, if scientific, technical, or other specialized knowledge will assist the trier of fact to understand the evidence or to determine a fact in issue, a witness qualified as an expert by knowledge, skill, experience, training, or education may testify thereto in the form of an opinion or otherwise.

B. No expert or lay witness while testifying in a civil proceeding shall be prohibited from expressing an otherwise admissible opinion or conclusion as to any matter of fact solely because that fact is the ultimate issue or critical to the resolution of the case. However, in no event shall such witness be permitted to express any opinion which constitutes a conclusion of law.

C. Except as provided by the provisions of this section, the exceptions to the "ultimate fact in issue" rule recognized in the Commonwealth prior to enactment of this section shall remain in full force.



Va. R. Sup. Ct. 2:702
Testimony by Experts

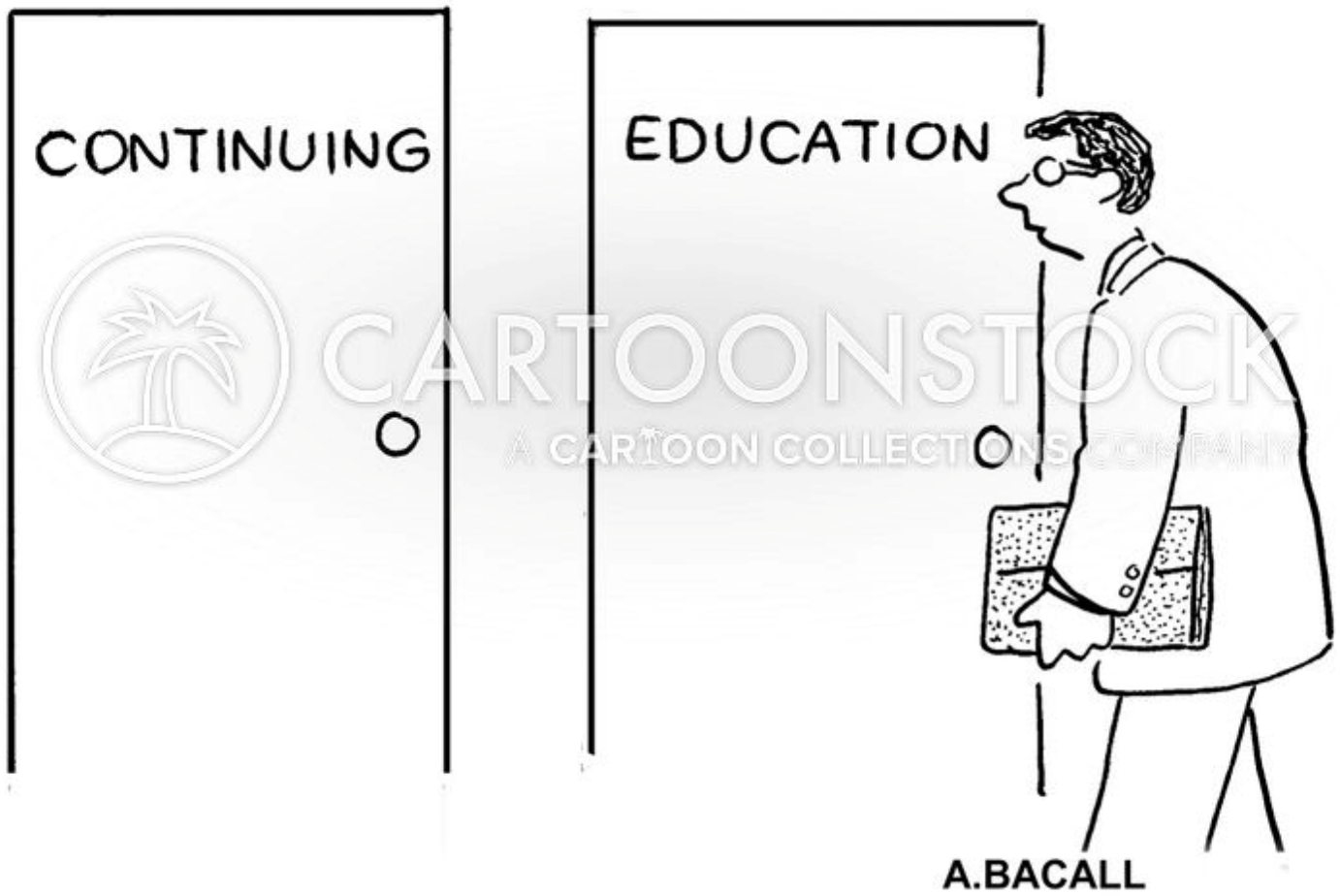


(a) ***Use of Expert Testimony*****.**

(i) In a civil proceeding, if scientific, technical, or other specialized knowledge will assist the trier of fact to understand the evidence or to determine a fact in issue, a witness qualified as an expert by knowledge, skill, experience, training, or education may testify thereto in the form of an opinion or otherwise.

(ii) In a criminal proceeding, expert testimony is admissible if the standards set forth in subdivision (a)(i) of this Rule are met and, in addition, the court finds that the subject matter is beyond the knowledge and experience of ordinary persons, such that the jury needs expert opinion in order to comprehend the subject matter, form an intelligent opinion, and draw its conclusions.

(b) ***Form of opinion*****.** Expert testimony may include opinions of the witness established with a reasonable degree of probability, or it may address empirical data from which such probability may be established in the mind of the finder of fact. Testimony that is speculative, or which opines on the credibility of another witness, is not admissible.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Washington, DC Cases

- Murray v. Motorola has been cited 18 times
- Nearly all of them are criminal cases
- Only civil case is a will contest in which physician was qualified and permitted to testify (Govan v. Brown, 228 A.3d 142 (D.C. 2020)).

Maryland Cases

***City Homes, Inc. v. Sumpter*, No. 1376, 2020 Md. App. LEXIS 1213**

(App. Dec. 21, 2020)

- Unreported
- Whether water caused paint to peel in a lead paint case
- Opinion from the doctor held admissible

***Park Sutton Condo., Inc. v. Johns*, No. 603, 2022 Md. App. LEXIS 138**

(App. Feb. 23, 2022)

- Unreported
- Expert permitted to testify as to the source of mold because he visited appellee's condominium on two occasions, completing an inspection and took samples of what he believed to be mold growth. Based on these visits, he responded to hypotheticals and opined on the source of the mold.

DAUBERT ET UX., INDIVIDUALLY AND AS GUARDIANS AD LITEM FOR DAUBERT, ET AL. *v.* MERRELL DOW PHARMACEUTICALS, INC.

CERTIORARI TO THE UNITED STATES COURT OF APPEALS FOR THE NINTH CIRCUIT

No. 92–102. Argued March 30, 1993—Decided June 28, 1993

Daubert 509 U.S. at 592-3

The first inquiry asks "whether the reasoning or methodology underlying the testimony is scientifically valid."

Several non-dispositive factors should be considered in determining the reliability of a particular scientific theory or technique: whether it

(1) can be and has been tested;

(2) has been subjected to peer review and publication;

(3) has a known or potential rate of error; and

(4) has attained general acceptance in the pertinent scientific community.

Sources of Information for Applicable Methods of Test

- **ASTM E2128** "Standard Guide for Evaluating Water Leakage of Building Walls"
- **ASTM E2018** "Standard Guide for Property Condition Assessments: Baseline Property Condition Assessment Process"
- **SEI/ASCE 30** "Guideline for Condition Assessment of the Building Envelope"
- **IIBEC Manual of Practice**
- **AAMA 511** "Voluntary Guideline for Forensic Water Penetration Testing of Fenestration Products"

Sources of Information for Applicable Methods of Test

- **ASTM E2128** "Standard Guide for Evaluating Water Leakage of Building Walls"

Designation: E2128 – 17

Standard Guide for Evaluating Water Leakage of Building Walls[1]

This standard is issued under the fixed designation E2128; 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 guide describes methods for determining and evaluating causes of water leakage of exterior walls. For this purpose, water penetration is considered leakage, and therefore problematic, if it exceeds the planned resistance or temporary retention and drainage capacity of the wall, is causing or is likely to cause premature deterioration of a building or its contents, or is adversely affecting the performance of other components. A wall is considered a system including its exterior and interior finishes, fenestration, structural components, and components for maintaining the building interior environment.

2. Referenced Documents

2.1 *ASTM Standards:*[2]

C1601 Test Method for Field Determination of Water Penetration of Masonry Wall Surfaces

C1715/C1715M Test Method for Evaluation of Water Leakage Performance of Masonry Wall Drainage Systems

E331 Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference

E547 Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Cyclic Static Air Pressure Difference

Advantages of E2128

- A consensus industry standard
- Comprehensive methodology
- Addresses performance expectations
- Considers service history
- Includes multiple components and materials
- Focuses on interaction and adjoining elements
- Qualitative vs. Quantitative sampling

Limitations of E2128

- Limited to leakage of walls above grade
- Not based on conventional hypothesis testing and quantitative random sampling
- Investigator must be skilled in principals of physics, construction, and wall design
- Based on the premise that condition is known to leak
- Focus on recreating leak

The Sequence of Activities

Per ASTM E2128:

- **Review of project documents**
- **Evaluation of design concept**
- **Determination of service history**
- **Inspection**
- **Investigative testing**
- **Analysis**
- **Report preparation**

Hypothetical Application

- Multi-unit Condominium
- Visible stains on windows
- Coastal hurricane leaks
- Exterior masonry and stucco cladding
- Vinyl windows
- Plaster/Wall damage

E2128 Investigation Summary

- **Contract Documents:**
  - Typical window details (Head, Jamb and Sill)
  - Flanged windows shown
- **Submittals:**
  - Residential window
  - Box frame depicted in shop drawings
- **Code Approval Document:**
  - Max DTP 8 psf

E2128 Investigation Summary

- **Design Concept**
  - **Integration conflict**
  - **Improper service condition**
  - **Misaligned in wall**
  - **Fastener conflict**
  - **Brick-OK, Stucco-NG**
  - **Condensation not an issue**

E2128 Investigation Summary

- **Service History**
  - **Periodic leaks**
  - **Wind driven rain, windows leak**
  - **Sustained rain, carpet wet**
  - **Sealants replaced, no difference in leaks**
  - **All residents have some complaints**
  - **4 significant hurricanes since construction**

E2128 Investigation Summary

- Inspection
  - Stains on windows (S,E,N)
  - Drywall/frame damage under stucco windows
  - Sealants in good condition
  - Stucco cracked
  - Test cuts:
    - Brick - WRB sealed to window
    - Stucco - WRB not sealed to window

E2128 Investigation Summary

- **Investigative Testing**
  - **AAMA 511/NOAA records**
  - **Tests simulating actual events**
  - **Multiple elevations**
  - **Multiple window types**
  - **Isolate Window**
  - **Test both brick and stucco for leaks into perimeter of the window**

E2128 Investigation Summary

- **Conclusions:**
  - **Window insufficient to accommodate design wind event and leaked at pressures below actual imposed wind loads.**
  - **Installation in stucco systems incorrect allowing water to leak around window creating damage to wall system and interior finishes.**
  - **Alternative causes (condensation, interior leaks, etc.) not applicable.**
  - **Limited damage around brick veneer installation.**
  - **All windows to be replaced, stucco removed around and below windows to repair water damage.**

Daubert Challenge Satisfied?

(1) can be and has been tested

Yes, tested in accordance with E2128.

(2) has been subjected to peer review and publication

(3) has a known or potential rate of error

(4) has attained general acceptance in the pertinent scientific community

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Yes, E2128 is a published consensus industry standard.

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Daubert Challenge Satisfied?

(1) can be and has been tested	 **Yes, tested in accordance with E2128.**
(2) has been subjected to peer review and publication	 **Yes, E2128 is a published consensus industry standard.**
(3) has a known or potential rate of error	 **Yes, principles of qualitative sampling applied.**
(4) has attained general acceptance in the pertinent scientific community	

Daubert Challenge Satisfied?

(1) can be and has been tested	**Yes, tested in accordance with E2128.**
(2) has been subjected to peer review and publication	**Yes, E2128 is a published consensus industry standard.**
(3) has a known or potential rate of error	**Yes, principles of qualitative sampling applied.**
(4) has attained general acceptance in the pertinent scientific community	**Yes, methods and conditions of test developed from industry standards and investigative observations consistent with accepted construction practices.**

Case Law from Around the United States

- **MCFS & BB, Inc. v. Hartford Ins. Co.**, No. 3:21-cv-254-MMH-MCR, 2022 U.S. Dist. LEXIS 128043 (M.D. Fla. July 19, 2022)
- **Smith v. State Farm Fire & Cas. Co.**, No. 1:20-cv-225-TFM-B, 2021 U.S. Dist. LEXIS 225167 (S.D. Ala. Nov. 10, 2021)
- **Scheinfeld v. Lm Gen. Ins. Co.**, 472 F. Supp. 3d 1329 (N.D. Ga. 2020)
- **Steven J. Inc. ex rel. Fenton v. Landmark Am. Ins. Co.,** No. 1:14-CV-0474, 2015 U.S. Dist. LEXIS 80278 (M.D. Pa. June 22, 2015)
- **Greater Hall Temple Church of God v. S. Mut. Church Ins. Co.**, No. 2:17-cv-111, 2019 U.S. Dist. LEXIS 148594 (S.D. Ga. Aug. 30, 2019)

Window Class Action Suit

- Plaintiffs alleged “defective water management system” leading to “numerous leakage paths” and wood preservative was insufficient resulting in frame rot.
- Based opinion on data collected by expert’s site inspections, destructive testing, water testing, visits to manufacturing plants, and review of documents and industry literature in accordance with E2128.
- Data collected included approximately:
  - 500 Windows viewed
  - 350 Windows documentation of interior and exterior
  - 250 Windows documentation of wood sash components

Window Class Action Suit

- Performed two types of water tests: (1) a “spray rack test,” and (2) a “nozzle test”
  - Spray rack tests on 45 Windows from 13 homes finding some form of leakage in 67% of the tested Windows.
  - Conducted nozzle tests on 53 Windows from 11 homes, finding some form of leakage in 91% of the tested Windows.
- Experts visited multiple manufacturing plants, noting process inconsistencies with respect to the wood treatment.
- Reviewed for compliance with industry standard for wood treatment performance published by the Window and Door Manufacturers Association.

Window Class Action Suit

- Defendant filed a motion that the expert testimony was not admissible under Rule 702 and *Daubert v. Merrell Dow Pharm. Inc.*
  - argues opinions are based on flawed testing and insufficient data.
  - challenges qualifications on the sufficiency of the Windows' wood treatments
  - argues that opinions should be excluded due to spoliation of evidence

Window Class Action Suit

- Defendant argued opinions are unreliable because experts did not evaluate potential alternative causes of damage, such as installation errors, construction defects, or condensation.
  - E2128 assumes the building is known to leak
  - Based selection of windows for testing on initial evaluation on water stains being indicative of product defect leakage

- Daubert requires an expert to address obvious alternative causes and provide a reasonable explanation for dismissing specific alternate factors identified by the defendant." Id. (quoting Israel, 2006 WL 3196956, at *5).

Window Class Action Suit

- Defendant argued that the testing methods employed, while permitted under E2128, are not reflective of conditions the product was likely to have actually experienced.
  - Spray rack test performed in accordance with E1105
  - Interior test pressures in increments of DTP rather than actual pressures encountered
  - AAMA 511 not considered and weather data not acquired
  - Nozzle test utilized equipment from AAMA 501.2 but used lower pressure for diagnostic purposes
- Although arguments are somewhat incomplete (in this presenter's view), conclusion drawn was that testing was not performed to recreate conditions as required by E2128.

Window Class Action Suit

The court, therefore, concluded and held that the water testing "failed to comply with ASTM E2128 or any other identifiable standard. Consequently, any indicia of reliability associated with ASTM E2128—prior testing, peer review, and general acceptance in the scientific community—cannot be imputed to the experts' testing."

Window Class Action Suit

- Defendant argued that conclusions cannot be derived from the testing because the sample size was too small and biased.
  - Argued that sample size was not representative of entire 7.5 million windows.
  - Plaintiff relied upon qualitative versus quantitative sampling per E2128.
  - Sampling from named plaintiffs rather than windows selected from the entire population and selecting windows with visible signs of leakage creates sample bias.

Window Class Action Suit

Court finds that when an expert attempts to draw conclusions about an entire population from a sample-based analysis, "the sample[____] must be chosen using some method that assures the sample[____] [is] appropriately representative of the larger entity or population being measured." Allgood, 2006 WL 2669337, at *11. Plaintiffs have failed to show that this was done here.

Window Class Action Suit

- Experts conclude that “the preservative treatments Defendant used between 1997 and 2007 on the [Windows] were insufficient for their intended exposure.” Defendant again argues that sample size was not representative of entire product inventory.
  - Deficient manufacturing practices claimed were not relevant to the entire population (Temp. storage, Sinker stock, etc.)
  - Sampling not from entire population data, was not representative of all Windows
  - Experts not qualified to offer opinions (outside normal field of Civil Engineering and Architecture)

Daubert Challenge Satisfied?

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Yes, tested in accordance with E2128.

(2) has been subjected to peer review and publication

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(3) has a known or potential rate of error	**No, qualitative statistical sampling deemed not appropriate or reliable for entire populations in product defect applications. Potential sample bias.**
(4) has attained general acceptance in the pertinent scientific community	

Daubert Challenge Satisfied?

(1) can be and has been tested	✓ **Yes, tested in accordance with E2128.**
(2) has been subjected to peer review and publication	✓ **Yes, E2128 is a published consensus industry standard.**
(3) has a known or potential rate of error	✗ **No, qualitative statistical sampling deemed not appropriate or reliable for entire populations in product defect applications. Potential sample bias.**
(4) has attained general acceptance in the pertinent scientific community	✗ **No, expert applied principals of E2128 without first evaluating applied conditions**

Daubert Challenge Satisfied?

(1) can be and has been tested	✓	Yes, tested in accordance with E2128.
(2) has been subjected to peer review and publication	✓	Yes, E2128 is a published consensus industry standard.
(3) has a known or potential rate of error	✗	No, qualitative statistical sampling deemed not appropriate or reliable for entire populations in product defect applications. Potential sample bias.
(4) has attained general acceptance in the pertinent scientific community	✗	No, expert applied principals of E2128 without first evaluating applied conditions

Motion to exclude was upheld.

Questions