



National Fenestration Rating Council Incorporated

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FenStar® Certification Program Verification Testing Procedure
Manufacturer Guideline

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PREPARED BY:

National Fenestration Rating Council
6305 Ivy Lane, Suite 410
Greenbelt, MD 20770
Voice: (301) 589-1776
Fax: (301) 589-3884
Email: FCP@nfrc.org
Website: www.nfrc.org

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FOREWORD

The FenStar® Certification Program is the formal name of the EPA recognized certification program that performs third-party conformity assessment activities for window, door and skylight products. Products are submitted for ENERGY STAR® certification after ratings have been certified by the NFRC Product Certification Program (PCP). Window, door and skylight products that are evaluated to be ENERGY STAR qualified and that meet the requirements are officially certified as ENERGY STAR by The FenStar Certification Program.

The FenStar Certification Program is operated by the National Fenestration Rating Council Incorporated (NFRC). NFRC has developed and operates a uniform rating system for energy and energy-related performance of windows, doors, and skylights. The FenStar Certification Program is available only to active licensees in the NFRC Product Certification Program (PCP).

Through the FenStar Certification Program, manufacturers shall demonstrate their products meet all applicable ENERGY STAR performance parameters prior to being labeled as ENERGY STAR certified.

Products evaluated by The FenStar Certification Program must have been tested in an EPA-recognized laboratory.

If there are changes that affect the performance of the product with respect to the relevant ENERGY STAR program requirements, the partner must report these changes to The FenStar Certification Program and EPA. Further, the partner will demonstrate, through re-testing in an EPA-recognized laboratory, the product continues to meet the ENERGY STAR requirements to maintain its ENERGY STAR certification through The FenStar Certification Program.

Manufacturers authorize The FenStar Certification Program to share the results of any relevant testing or product review with EPA.

NFRC, specifically The FenStar Certification Program, is a certification body operating to the ISO/IEC 17065 standard.

The following referenced documents are indispensable for the application of The FenStar Certification Program. For undated references, the latest edition of the referenced document (including any amendments) applies. These are not auditable standards and are used solely for guidance.

- [*NFRC 700-2017: Product Certification Program.*](#)
- [*ANSI/NFRC 100-2017: Procedure for Determining Fenestration Product U-factors*](#)
- [*NFRC 102-2017: Procedure for Measuring the Steady-State Thermal Transmittance of Fenestration Systems*](#)
- [*ANSI/NFRC 200-2017: Procedure for Determining Fenestration Product Solar Heat Gain Coefficient and Visible Transmittance at Normal Incidence*](#)
- [*ANSI/NFRC 400-2017: Procedure for Determining Fenestration Product Air Leakage*](#)
- ENERGY STAR Directives:
https://www.energystar.gov/index.cfm?c=third_party_certification.tpc_directives

In order to participate in the Certification Programs, a Manufacturer/Responsible Party shall rate a product whose energy and energy-related performance characteristics are to be certified in accordance with mandatory NFRC rating procedures. At present, a Manufacturer/Responsible Party may elect to rate products for U-factor, SHGC, VT, AL, condensation resistance, or any other procedure adopted by NFRC, and to include those ratings on the NFRC temporary label affixed to its products or on the NFRC Label Certificate. U-factor, SHGC and VT, AL, and condensation resistance rating reports shall be obtained from a laboratory that has been accredited by NFRC in accordance with the requirements of the NFRC 701.

The FenStar Certification Program evaluates U-factor, SHGC and AL.

Products that are labeled with the NFRC Temporary and Permanent Label, or products that are listed on an NFRC Label Certificate in accordance with NFRC requirements, are considered to be NFRC-certified. Products that have been evaluated and certified by The FenStar Certification Program as ENERGY STAR must have the ENERGY STAR label as well.

The FenStar Program maintains a FenStar Program Certified Products Directory (FCPD), listing product lines and individual products selected by the Manufacturer/Responsible Party for which ENERGY STAR certification authorization has been granted.

NFRC owns all rights in and to each of the FS-1000, FS-1001, FS-1100, FS-1101, FS-1102, and each procedure, which is a component of FenStar®, as well as each of its registration marks, trade names, and other intellectual property.

For additional information on the roles of those entities associated with the NFRC PCP (IAs and laboratories and operation of the IA Program and Accreditation Program), see the NFRC 700 (PCP), NFRC 701 (LAP), and NFRC 702 (CAP) respectively.

National Fenestration Rating Council

6305 Ivy Lane, Suite 410

Greenbelt, MD 20770

Voice: (301) 589-1776

Fax: (301) 589-3884

Email: info@nfr.org

Website: www.nfr.org



DISCLAIMER

The use of The FenStar Certification Body does not constitute a warranty by the NFRC or The FenStar Certification Program regarding the energy performance properties of Windows, Doors, and Skylights. The rating indices are not an endorsement of, or recommendation for, any windows, doors, or skylights. The FenStar Certification program is not a merchant in the business of selling windows, doors, or skylights, and therefore, cannot warrant products as to their merchantability or fitness for a particular use.

The FenStar Certification Program therefore disclaims any and all liability, including but not limited to damages for personal or other injury, lost profits, lost savings or other consequential or incidental damages that may arise from or in connection with:

- A. Services provided by, decisions made by, or reports issued or granted by any ENERGY STAR Partner;
- B. Reliance on any FenStar Certified product description, specification, rating or test, whether appearing in a report, in a product Certificate of Authorization (CA) or a printed or electronic directory, or on a label; or
- C. The sale or use of any FenStar Certified windows, doors, or skylights.



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1. MANUFACTURER FVTP GUIDELINES

The scope of this document is to provide a FenStar® licensee the guidelines to properly navigate the FenStar Certification Program Verification Testing Procedure (FVTP) which is a requirement of The FenStar Certification Program in accordance with FS-1100. All product options certified through The FenStar Certification Program are subject to participation in verification testing.

The following are guidelines outlining the procurement of products, details regarding ordering and shipping, testing processes, and any actions associated with grading, reporting, and outcomes.

1.1 Product Procurement

Staff shall procure products from the licensee for verification testing through direct contact with the licensee representative. Licensees are responsible for the cost of producing, shipping, and all testing associated with verification test units.

The initial contact email may include the following information:

- A. The product line
- B. The model/series number
- C. NFRC standard size for the corresponding operator type
- D. The ENERGY STAR zone the product is required to meet
- E. Additional criteria, including but not limited to pane thickness, gap width, spacer type, Low-E locations, etc.

The licensee will have five (5) business days to confirm via participant checklist submittal, which product option is available for verification testing and provide the following information to staff:

- A. Product's Full CPD Number that will be built and shipped
- B. Product's expected manufacture date
- C. Product's expected ship date
- D. Product's expected arrival date at the designated laboratory
- E. Plant that will build and ship the product. The plant should be listed on the Schedule I and the product line should be associated with the plant on the Schedule II.
- F. If none of the products are available for procurement, the licensee shall contact staff immediately for further direction.
- G. The preferred lab for testing which may be mutually agreed upon by staff and the licensee. The FenStar Certification Program reserves the right to dictate the testing lab which will perform the verification testing. Unless otherwise stated by FenStar Staff, the licensee shall assume the requested testing lab has been approved.

- H. If the licensee has not responded with the required information after the allotted 5 business days, a second contact will be made via email. A third contact attempt via email and phone will be made before the licensee is reported to the EPA as being non-responsive. At which time the product line selected for FVT shall be suspended from the FenStar Certification Program until the test lab check-in form has been received by FenStar staff.

When the licensee confirms the product's availability, the licensee representative will place the order in a manner that ensures there is no interference or tampering of the product during the manufacturing of the test sample.

- A. If there is any delay in the ordering or shipping of the product, the licensee's representative shall contact staff to report the reason for the delay and a solution to resolve the delay, and if necessary updated manufacturing, shipping, and delivery dates.
- B. The licensee is expected to manufacture and ship the product to the laboratory within thirty (30) business days from the date of the product's confirmed availability.
- C. All FVTP products must have the proper NFRC temporary labels, permanent labels, and ENERGY STAR labels applied. In cases where the permanent label is not visible from the interior after product installation, the licensee shall identify to staff the location of the permanent label.
- D. When installation instructions are not attached to the product, the licensee shall provide staff with the product's online installation instructions.
- E. The air leakage requirement may be met by one of the following methods:
 - i. Air leakage rating shall be displayed on the NFRC temporary label; or
 - ii. Placing one of the following labels on the product:
 - (a) AAMA Gold Label
 - (b) Keystone Certifications, Inc. NAFS Structural Certification Label
 - (c) National Accreditation & Management Institute, Inc. (NAMI) NAFS Structural Certification Label
 - (d) WDMA Hallmark Certification Label

NOTE: The U.S. Environmental Protection Agency (EPA) may consider similar labels offered by other Certification Bodies on a case by case basis.

If the product has not been shipped within the time frame specified AND the licensee has not informed staff of the delay per Section 1.2.A, the licensee shall be notified, and the product line shall be suspended from the FenStar Certification Program until such time as the product is manufactured and shipped to the lab. Staff shall use the laboratory check-in, or lack thereof, as the means of determining if the product was manufactured and shipped within the specified

time frame. Staff shall not suspend a product line within 10 business days of the end of the original manufacturing and shipping date.

1.2 Verification Testing

- A. Upon receipt of the participant checklist supplied by the licensee, staff shall notify the laboratory of a FVTP unit and provide the anticipated arrival date. The laboratory shall provide staff with a tentative test date for the product within 2 business days of the notification.
- B. Upon receipt of the product, the laboratory shall determine the following and contact staff:
 - i. If the product is in good testing condition; there shall be no visibly observable damage to the product. Observed damage may void the testability of the product.
 - ii. The CPD number from the NFRC temporary label.
 - iii. The NFRC temporary label, permanent label, and ENERGY STAR label are all applied. If applicable, the approved Certification Body's air leakage labels are also applied correctly.
 - iv. The licensee's installation instructions are attached to the product if applicable.
- C. If the laboratory determines any of the above listed conditions are not met, the laboratory shall contact FenStar staff. Based on the information provided by the laboratory, staff will determine if the product is still acceptable for testing.
 - i. If the product is not acceptable for testing
 - (a) In cases where the product is damaged due to shipping, normal business practices shall be used to deal with the issue of obtaining another product for testing.
 - (b) All other identified non-compliance will be handled in accordance with Section 2.
 - (i) If a new product is required, the licensee representative shall confirm with staff the order date, manufacture date, ship date, and arrival date of the new product within five (5) business days.
 - (ii) Neither NFRC, ENERGY STAR, or The FenStar Certification Program are responsible for the cost to manufacture, ship, or test the product.
 - (c) NFRC will inform the EPA when the incorrect product type is sent twice in a row.
- D. If FenStar staff determine the product does meet the conditions listed above in Section 1.3.B:

- i. Upon the date of determining the product to be in good testing condition, in good faith, verification testing is expected to be conducted within 60 days of this date.
 - ii. Verification testing is a U-factor test that shall be conducted in accordance with NFRC 102 by the confirmed scheduled test date as provided by the laboratory.
 - iii. The laboratory shall provide a detailed report of the completed U-factor test to staff.
 - iv. FenStar staff will investigate the results and determine if the tested value is within the tolerances per Section 4 of FS-1100.
 - v. If verification testing is successful, the unit will proceed to the component evaluation portion of the FVTP.
 - vi. If verification testing U-factor results are outside of the established tolerances, staff will notify the licensee and EPA of the potentially unsuccessful test. The licensee shall follow the process in FS-1100, Section 4.4.1 *Potential Unsuccessful Test* and will either inspect the intact unit or continue with verification testing.
- E. At the direction of staff, the laboratory shall conduct the Component Evaluation (CE) per Section 3.2.2 of FS-1100.
- i. The CE is the manner to disassemble the test specimen to verify the product description.
 - ii. Upon completion of the CE, the laboratory shall provide a detailed report to FenStar staff.
 - iii. The CE is for reporting purposes only and has no weight on the verification performance grading results. Cases where the CE reveals that an incorrect product was tested may result in action based on Section 2.

1.3 Verification Grading / Reporting

Upon receipt of the detailed test report from the laboratory, staff shall conduct the final investigation and grading to determine the confirmed configuration's tested results versus the tolerances and conditions listed in Section 4 of FS-1100. Staff will determine if the verification test resulted in a successful or unsuccessful test.

- A. Successful verification test:
- Within two (2) business days of determining the grade, staff will issue to the licensee a Notice of Verification.
- B. Unsuccessful verification test:
- i. Thermal performance failures
 - (a) Units which do not meet the ENERGY STAR thermal performance requirements will be deemed a thermal failure
 - (b) Refer to Table 3, Table 4, and Table 5 in the FS 1100 document
 - (c) Failed units shall be reported to EPA

- ii. Non-Performance failures
 - (a) Units which are found to be not authorized for certification upon the completion of the testing will be considered a non-performance failure.
 - (b) Also applies to units which are unable to be tested before October 1st of the prescribed testing year due to the inability of the participant to supply a testable unit. Examples include but are not limited to:
 - (i) Units which are built incorrectly and not found on the Certification Authorization Report (CAR)
 - (ii) Units arriving damaged
 - (iii) Units missing labels and unable to be confirmed through the laboratory check-in process.

Within twenty (20) business days of receipt of the final report, staff will determine the final grade. Within two (2) business days of determining the final grade, staff will forward a Notice of Non-compliance for an unsuccessful test.

The Notice of Non-compliance will provide the performance results and the full test report for the unsuccessful test as applicable. Per EPA Directive 2011-06 FenStar staff shall report “failures” to EPA within two (2) business days after determining an unsuccessful test per tolerances listed in Section 4 of FS-1100. The Notice of Non-Compliance shall be issued to the licensee concurrently with the issuance of the notice of failure to the EPA/ENERGY STAR enforcement.

1.4 Compliance Action

- A. Licensee is subject to corrective actions per the EPA’s “Disqualification Procedures” document. At the request of the EPA, FenStar will assist in the handling of any EPA corrective actions. This may include, but is not limited to
 - i. Removing the failed product option and any additional affected product options from certification
 - ii. Supplying two test units the following year
 - iii. Recertifying units which have failed, should the participant choose to continue listing the unit(s) in the ENERGY STAR program.
 - iv. Testing the same unit which failed in the following test cycle
- B. If the thermal test results are received showing the unit’s U-Factor does not validate (fails) for ENERGY STAR, the licensee has the option to inspect a fully intact unit per Section 4.4.1 of FS-1100. By doing so, the licensee is accepting the thermal test result and acknowledging the test failure. The licensee is waiving the right to a FenStar appeal regardless of the results of any independent supplemental testing or research. The licensee shall retain the ability to appeal to ENERGY STAR. Refer to Section 5 of FS-1100.

- C. In the event the verification test is determined to be a non-performance failure the participant is subject to the EPA Compliance two-for-one test procedure. These tests are performed in the same fashion as any other FVT test. The compliance process requires the participant to send two total units in place of the originally requested unit. One unit from the originally selected product line, as well as one additional unit from a separate product line. The two-for-one testing will function outside of the required test allotment for which FenStar is responsible in the given test year. Non-compliance findings and final results will be supplied directly to EPA.
- D. When applicable, FenStar licensees will be required to address non-compliance in accordance with NFRC PCP.

1.5 FenStar Appeal Procedure

Please reference the FS-1100 document, Section 6, for a full explanation of the verification testing appeal process. If a licensee decides to inspect the fully intact product per section 1.5.C, the licensee waives the right to FenStar Certification Program Verification Testing appeal. The right to appeal the decision with ENERGY STAR is retained.

- A. Upon receipt of the Notice of Non-compliance, the licensee shall have a period of 15 days to appeal an unsuccessful test result by submitting a completed FVTP Appeal Form (electronic submission acceptable). The appeal shall set forth in reasonable detail the licensee's basis for contending that the Notice of Non-compliance is inaccurate or incorrect.
- B. If the licensee does not submit an appeal within 15 days of the receipt of the Notification of Non-compliance, the verification result shall be final and binding.

2. CATEGORIZATION OF NON-COMPLIANCE

This table provides examples of the most common non-compliance, method of contact, and potential solutions. This list is not intended to cover all non-compliance findings nor are the identified potential solutions the only solutions to resolve non-compliance.

ID	Labeling	Initial Contact	Potential Solution
L-1	The unit arrives for verification testing at the test lab missing certification labels. This may be one of, or include all of the following labels, NFRC Temporary, ENERGY STAR Temporary, or permanent label.	FenStar® staff. EPA is notified once testing is completed. The EPA compliance team may reach out once they are notified.	If the unit is confirmed to be ENERGY STAR® certified in the United States, and the correct product line, the test may proceed. The participant shall send electronic copies of the labels to FVT@nfrclab.org and physical copies to the lab If the unit is unable to be confirmed as ENERGY STAR certified, the testing shall be halted. A new unit shall be provided for testing.
L-2	The unit arrives for verification testing at the test lab showing incorrect information on the certification labels. This may be one of, or include all of the following labels, NFRC Temporary, ENERGY STAR Temporary, or permanent label.	FenStar® staff EPA is notified once testing is completed. The EPA compliance team may reach out once they are notified.	If the unit is confirmed to be ENERGY STAR® certified in the United States, and the correct product line, the test may proceed. The participant shall send electronic copies of the labels to FVT@nfrclab.org and physical copies to the lab If the unit is unable to be confirmed as ENERGY STAR certified, the testing shall be halted. A new unit shall be provided for testing.

ID	Labeling	Initial Contact	Potential Solution
L-3	NFRC Standard size outside IA permanent label certification for AWS	FenStar Staff	Staff shall work with the manufacturer to have an example of the label that would be applied if the unit was built to a size typically built within the certified size.
L-4	Canadian ENERGY STAR label applied due to Licensee's labeling system recognizing product's Canadian shipping destination	FenStar Staff EPA is notified once testing is completed. The EPA compliance team may reach out once they are notified.	If the unit is confirmed to be ENERGY STAR® certified in the United States, and the correct product line, the test may proceed. The participant shall send electronic copies of the labels to FVT@nfrc.org and physical copies to the lab If the unit is unable to be confirmed as ENERGY STAR certified, the testing shall be halted. A new unit shall be provided for testing.

ID	Component	Initial Contact	Potential Solution
Discovered Prior To Thermal Testing			
Pr-1	Different glazing configuration (Test unit arrived different from what was ordered)	FenStar Staff	If the unit is confirmed to be ENERGY STAR® certified in the United States, and the correct product line, the test may proceed. The participant shall send electronic copies of the labels to FVT@nfrc.org and physical copies to the lab If the unit is unable to be confirmed as ENERGY STAR certified, the testing shall be halted. A new unit shall be provided for testing.
Pr-2	Default door frame used in simulation	FenStar Staff	Staff will work with the participant to make this determination if necessary. The unit will proceed with testing as per usual.

ID	Component	Initial Contact	Potential Solution
	(Ex: product received has different frame than expected; however, product was simulated with default door frame.)		
Discovered Post Thermal Testing			
Po-1	Components differ from supplied drawings.	<p>FenStar Staff</p> <p>EPA may be notified once testing is completed. The EPA compliance team may reach out once they are notified.</p>	Study is considered completed. The lab shall provide all relevant information to FenStar Staff. Staff shall communicate the discrepancies to the Compliance Manager. Additional review and comparison of the unit to the simulations and drawings shall be required to determine if the unit is authorized for certification.
Po-2	Product not authorized for certification	<p>FenStar Staff</p> <p>EPA shall be notified once testing is completed. The EPA compliance team shall reach out once they are notified.</p>	Study is completed and graded as a non-thermal performance failure. EPA shall begin their compliance process.

ID	Results	Initial Contact	Potential Solution
R-1	Not within ENERGY STAR tolerance	<p>FenStar Staff</p> <p>EPA shall be notified once testing is completed. The EPA compliance team shall reach out once they are notified.</p>	FenStar staff shall complete the study and notify both EPA and the participant of the final results. Possibly initiate NFRC Compliance process.
R-2	Not within NFRC tolerance	FenStar Staff	Initiate NFRC Compliance process.