



ENERGY STAR® Qualified Manufactured Homes: Plant Certifier Requirements and Procedures

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Contents

Introduction 2

The Manufactured Housing ENERGY STAR Certifier 2

Certifier Capabilities and Qualifications 3

Certifier Responsibilities during the Plant Qualification Process 3

Developing Custom ENERGY STAR Packages 4

Helping the Plant Maintain ENERGY STAR Qualified Home Partner Status 5

Certifier Capabilities and Qualifications Affidavit: Application to Become an SBRA-approved
ENERGY STAR Manufactured Home Plant Certifier 7

ENERGY STAR Manufactured Home Plant Certification: Qualification to Produce
ENERGY STAR Qualified Homes 8

Quality Control Inspection Worksheet for ENERGY STAR Qualified Manufactured Homes 9

Introduction

Under a policy effective November 1, 2005, the U.S. Environmental Protection Agency (EPA) has made plant certification, third-party plant Certifier oversight and field performance verification for manufactured homes the responsibility of a National Quality Assurance Provider (QAP). EPA has designated the Systems Building Research Alliance (SBRA), formerly the Manufactured Housing Research Alliance (MHRA), as a QAP.

This document is intended for Manufactured Housing ENERGY STAR Certifiers (Certifier). It is a companion document to ***ENERGY STAR Qualified Manufactured Homes: Design, Manufacturing, Installation and Certification Procedures – Fourth Edition***¹ (the *Guidelines*) and should be read in conjunction with that publication. The Guidelines contain additional requirements for Certifiers.

This document provides information on:

- The responsibilities, capabilities and qualifications required of the Certifier.
- The Certifier's role during the plant qualification process.
- Approved computer analysis methods for developing special ENERGY STAR packages.
- The Certifier's role in helping a plant maintain ENERGY STAR partner status.
- Procedures for field testing of representative homes.

The requirements and procedures contained in this document are subject to revision to reflect experience with monitoring the ENERGY STAR program. The Certifier is responsible for staying up-to-date on program requirements and how they impact their responsibilities under the program. A current version of this document is available on the SBRA website: www.research-alliance.org/pages/es_certify.htm.

Where the term *Certifier* is used in this document, it includes the Certifier primary contact and the Certifier's employees or subcontractors engaged as the Certifier's representatives in the conduct of ENERGY STAR manufactured home plant certification activities.

The ENERGY STAR Manufactured Housing Certifier

In qualifying to produce ENERGY STAR qualified manufactured homes (HUD-code), plants are required to retain an independent, third-party energy expert, referred to as the ENERGY STAR Manufactured Housing Certifier. Each plant must have a Certifier of record at all times. Plants may change Certifiers, but must notify SBRA in writing upon doing so with the name of the new Certifier.

The Certifier's Role at a Glance

- Oversee the plant ENERGY STAR qualification process.
- Train plant production staff in ENERGY STAR techniques.
- Review and if acceptable, approve plant processes and the plant's ENERGY STAR-related documentation including ENERGY STAR qualified home designs, ENERGY STAR Site Installation Checklist, Quality Control Manual and the Manufacturer's Installation Manual.
- After initial plant certification, conduct ongoing quality control inspection and testing of a representative sample of completed homes.
- Participate in and contribute to periodic meetings of Certifiers conducted by SBRA regarding program quality control and oversight.

¹ All documents referenced herein are available on the SBRA website at www.research-alliance.org.

Certifier Responsibilities

Each certifying organization (Certifier) shall have one person responsible for the program who is the primary contact for SBRA. The primary contact person shall:

- Attend SBRA training sessions as required.
- Serve as the primary point of contact for the organization.
- Attend SBRA briefings held approximately three times per year. Attendance may be in person or via conference call.
- Have responsibility for the performance of their organization’s field representatives and for ensuring that their field representatives are properly trained and qualified in accordance with SBRA requirements.

The Certifier will ensure that its representatives are properly outfitted with well-maintained and calibrated equipment (for duct and shell leakage testing).

The Certifier shall serve as the primary contact and resource of first resort for their plants with regard to issues and questions about the program.

Certifier Capabilities and Qualifications

Each Certifier must be accredited by an EPA-approved Quality Assurance Provider (SBRA) to possess competency in the following areas:

Manufactured housing design, construction and installation methods.

Building science and diagnostics (e.g., is certified as a Home Energy Rating System (HERS) rater or is licensed as an engineer or architect).

Duct leakage and building shell leakage testing—specifically, duct and blower door tests.

Document preparation and record keeping.

Certifiers must have on file with SBRA an approved **Certifier Capabilities and Qualifications Affidavit: Application to Become an SBRA-Approved ENERGY STAR Manufactured Home Plant Certifier** (see page 7). This affidavit verifies that the Certifier possesses the necessary skills to perform the certification functions. It should be completed, signed and submitted to SBRA. If accepted, SBRA will countersign the application and return it to the Certifier. The Certifier shall provide a fully executed copy of this form to each of the plants.

SBRA may at any time and with cause revoke the approval of a Certifier. The Certifier and the plants for which they are listed as Certifier of Record will be notified in writing that the Certifier is no longer eligible to provide plant certification services under the ENERGY STAR program.

Certifier Responsibilities: Plant Qualification Process

This section describes the role of the Certifier during the plant qualification process. (Also refer to the **Guidelines** for more information about the plant certification process.)

The Certifier provides quality oversight services in the following areas:

Initial In-Plant Review

Verify that all proposed ENERGY STAR home designs comply with ENERGY STAR requirements.

Verify that the methods used to create and document any proposed custom ENERGY STAR home designs comply with ENERGY STAR requirements.

Verify that the Site Installation Checklist satisfactorily covers all installation-dependent construction elements of the home in keeping with ENERGY STAR requirements.

With regard to the ENERGY STAR guidelines, verify the accuracy and completeness of any custom third-party-approved design packages.

With regard to the ENERGY STAR guidelines, verify the accuracy and completeness of the Quality Control Manual.

Verify that the three duct leakage tests in the plant—measuring total air leakage—meet the ENERGY STAR requirements for the ENERGY STAR package(s) selected. To convert *total leakage* to *leakage to the outside*, Certifiers may assume that 50% of the leakage from a completed home goes to the outside or they may wish to test finished homes in advance to develop a ratio for the plant. Certifiers and plants should recognize that if this ratio differs for the plant's completed ENERGY STAR field test homes, additional duct sealing measures may be required. If the estimated leakage levels derived from the in-plant duct tests do not meet design specifications, verify that modifications have been made and that the homes' duct system(s) have been retested and comply with the above requirements.

Field Review

Inspect the installation of the three qualification homes and certify that the items on the Site Installation Checklist have been completed successfully. The qualification homes may be set up at the plant. If they are to become ENERGY STAR qualified homes at their final location, then a new site installation checklist must be completed at the time of final installation.

Verify that the duct pressurization tests on the qualification homes—measuring air leakage to the outside—comply with ENERGY STAR requirements. If levels do not meet design specifications, verify that modifications have been made, that the homes have been retested, and that they comply.

Verify the shell leakage tests on the qualification homes. If levels do not meet design specifications, verify that modifications have been made, that the homes have been retested, and that they comply.

Final In-Plant Review

Verify that any design changes identified through testing and visual inspection in the field are incorporated into the plant's third-party-approved design packages, the Quality Control Manual, and the Site Installation Checklist.

Verify that the plant's proposed process for collecting, tracking, and archiving documentation is consistent with the goals of the ENERGY STAR program.

Submit the Plant Qualification Form (see page 8) to the Quality Assurance Provider as documentation that the plant has been certified to produce ENERGY STAR qualified homes.

Certifier Responsibilities: Developing Custom ENERGY STAR Packages

An ENERGY STAR package is a unique combination of building elements, including building thermal envelope, specific duct and building shell leakage levels, space heating and cooling equipment type and efficiency, and hot water heater efficiency. These elements taken together assure that the home meets the ENERGY STAR requirements for home energy performance.

The *Guidelines* contain several pre-approved packages for each of the four ENERGY STAR climate regions. Certifiers have the authority to approve additional customized ENERGY STAR packages for plants so long as the packages are developed using SBRA-approved software. A list of approved software is available via the SBRA website.

The Certifier must review and approve all calculations and/or computer simulations used to identify a home as ENERGY STAR that are associated with each custom package submitted by the plant. The certifier and plant must keep on file a copy of the calculations and associated written approval(s).

Custom packages may be deemed acceptable if an energy consumption analysis shows that the estimated annual energy use of the proposed custom package is equal to or less than that of a current EPA-approved manufactured housing ENERGY STAR package for an otherwise identical home in the same location under identical conditions.

In general, custom packages may be used if the plant knows the future permanent location of the home. In the event that the orientation and/or site features (shading) are not known, then worst case orientation and shading is to be assumed.

Certifier Responsibilities: Helping the Plant Maintain ENERGY STAR Partner Status

After a plant has been qualified and has begun producing ENERGY STAR homes, the Certifier has an additional ongoing responsibility in assuring the plant is meeting ENERGY STAR requirements: spot checking performance by certifying the testing of randomly selected homes in the field.

To verify ongoing conformance with the program requirements, the Certifier is responsible for the following:

1. Determine when testing is required and the number of homes to test

In order to catch potential problems in the field at the earliest possible opportunity, the following testing schedule shall be applied:

Initial testing: At least one home shall be tested within 90 days of the signature date on the Site Installation Checklist for a plant's first ENERGY STAR qualified home (not including homes tested as part of the plant's qualification process).

Minimum number tested: At least 2% of all ENERGY STAR qualified homes completed by a plant per calendar year or a minimum of one home, whichever is greater, shall be tested. A home is *completed* when it has been installed at its permanent location and the Site Installation Checklist has been completed, signed, and returned to the plant.

Testing schedule: In each calendar year, the first field test must be completed within 90 days following the completion (checklist signature date) of the 5th home and every 50th additional completed home thereafter.

2. Select a representative sample of homes for testing

The Certifier monitors the plant's production of ENERGY STAR qualified homes by using SBRA web-based software, ***ENERGY STAR Information Manager***. Using ***Information Manager***, the Certifier will be able to monitor a plant's ENERGY STAR production levels and establish a testing schedule as follows:

The plant is responsible for maintaining information about ENERGY STAR homes in their ***Information Manager*** account. The Certifier is responsible for monitoring the data and initiating the process of field testing. It is the responsibility of the Certifier to notify the plant when it is time to conduct the quality control testing.

The Certifier shall make every effort to select homes representative of the type of ENERGY STAR qualified homes the plant has built (e.g., if the plant has labeled primarily double-section homes most of homes tested should also be double section). Homes selected for testing should represent as wide a cross-section as possible of the following:

- Housing types (single- and multi-section homes)
- Duct system types (overhead, under floor, in-line, perimeter)
- Production dates
- Retailers
- Installers; heating, ventilating, and air conditioning (HVAC) contractors; and trim-out crews

- Geographical regions
- ENERGY STAR climate regions and package numbers

If, in the opinion of the Certifier, a home has been modified by its owner following installation such that it no longer complies with ENERGY STAR requirements, then that home shall not be used as one of the quality control test homes and another home shall be selected.

The Certifier, plant or retailer may make arrangements with the homeowner to conduct the testing. Contact information for the homeowner and retailer should be available through **Information Manager**.

3. Inspect and test homes in the field

Once on site, the Certifier completes the **Quality Control Inspection Worksheet for ENERGY STAR Qualified Manufactured Homes** (the **Worksheet**).

The field inspection process includes the following steps:

Confirm that the home contains both the blue **EPA ENERGY STAR Qualified Home** label and the gray **SBRA quality assurance (QA)** label.

Visually inspect the home for compliance with ENERGY STAR requirements such as thermostat type and equipment efficiencies.

Verify compliance with the **Site Installation Checklist**.

Conduct a duct pressurization test on the sample home to measure leakage to the outside. If the leakage level does not meet design specifications, identify the root cause for non-compliance and determine whether the problem is isolated or systemic in nature. The Certifier should follow a duct pressurization test protocol provided by the test equipment manufacturer. A list of acceptable equipment manufacturers is listed on the SBRA website.

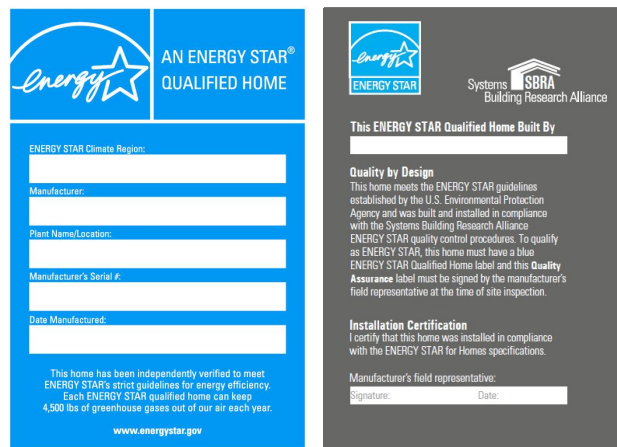
Conduct a shell leakage test on the sample home. If the shell leakage level does not meet design specifications, identify the root cause for non-compliance and determine whether the problem is isolated or systemic in nature. The Certifier should follow a shell leakage test protocol provided by the test equipment manufacturer. A list of acceptable equipment manufacturers is listed on the SBRA website.

Document all findings, including any discrepancies, on the **Worksheet** and submit the completed and signed **Worksheet** to SBRA and to the manufacturer.

4. Follow non-compliance procedures

In the event of non-compliance of any quality control test home, the following protocol shall apply:

- After documenting the failure(s) on the Worksheet, determine whether the failure was due to a systemic failure at the plant, or is an isolated case. Inform the plant and/or retailer as to corrective actions required. The home must then be repaired under the authority of the plant and re-tested by the Certifier.
- Within 45 days of the failure, select and test two additional homes of a similar type to the one that failed. If, in the judgment of the Certifier, the failure was set-up related, select homes installed by the same crew. If both homes pass, then resume remainder of quality control testing, if any.
- If one of the additional homes fails, then repeat Steps a and b on a second pair of homes. If one of the new homes fails, repeat Steps a and b again. If a failure is found in one or more of the third pair of homes, then cease testing and notify SBRA immediately.



Certifier Capabilities and Qualifications Affidavit

Application to Become an SBRA-approved ENERGY STAR Manufactured Home Plant Certifier

_____ hereby asserts that s/he meets or exceeds all required capabilities and
(Name of Certifier)
qualifications to provide plant certification services under the ENERGY STAR program as indicated by completing the
information on this form. In addition, _____ hereby states that s/he does not have financial
(Name of Certifier)
interests in or maintain any affiliation with a home manufacturer, retailer or installer, nor does s/he provide services
that might affect her or his capacity to evaluate compliance with the ENERGY STAR program and render reports of
findings objectively and without bias. Any employees or contractors performing services under the auspices of
_____ also meet these requirements.
(Name of Certifier)

Authorized Company
Representative: _____ Company: _____

Signature: _____ Date: _____

Address: _____

City: _____ State: _____ Zip: _____

Telephone: _____ Fax: _____

E-Mail: _____

Capabilities and Qualifications

MANUFACTURED HOUSING DESIGN, CONSTRUCTION AND INSTALLATION METHODS

(Must check all boxes below)

- Working knowledge of the Federal Manufactured Home Construction and Safety Standards
- Working knowledge of the plant production processes
- Working knowledge of the DAPIA/IPIA oversight processes
- Knowledge of manufactured home design, construction, installation, material use, and fabrication techniques

BUILDING SCIENCE AND ENERGY EFFICIENCY EXPERIENCE

(Must check at least one box below)

- Certified Home Energy Rating System (HERS) rater or provider
- Licensed Engineer or Architect

(Must check all boxes below)

- Hands-on experience conducting duct and whole-house air leakage measurements in manufactured (HUD-code) homes
- Experience and training in the principles of building science
- Experience and training in energy efficiency construction practices

DOCUMENT PREPARATION AND RECORD KEEPING

(Must check all boxes below)

- Working knowledge of the HUD-required documentation for manufactured housing
- Capability to maintain computer records and communicate via email

SUBMIT TO SBRA:

- SBRA fax number: 212-496-5389, or
- SBRA address: 1776 Broadway, Suite 2205, New York, NY 10019

If approved, SBRA will return a countersigned copy of this application to the certifier. The certifier shall provide a copy of the approved application to the plant.

SBRA Approval Signature: _____ Date: _____



ENERGY STAR Manufactured Home Plant Certification Qualification to Produce ENERGY STAR Qualified Manufactured Homes

_____ hereby certifies that _____,
(Name of Certifier) (Plant and Manufacturer Name)
located at _____,
(Address, City, State)
has demonstrated the capability
to consistently produce ENERGY STAR qualified manufactured homes and is therefore authorized to apply the
ENERGY STAR label to new homes manufactured under the terms and conditions of the ENERGY STAR program.

Certifier: _____ Company: _____

Signature: _____ Date: _____

Address: _____

City: _____ State: _____ Zip: _____

Telephone: _____ Fax: _____

E-Mail: _____

Plant contact person: _____ Title: _____

Telephone: _____ Fax: _____

Plant Requirements to Qualify for Producing ENERGY STAR Qualified Homes:

METHOD OF COMPLIANCE

(Must check one box below)

- Home designs comply with ENERGY STAR Package
- Computer Analysis (attached)

ENERGY STAR DESIGN FEATURES INCORPORATED IN PLANT QUALITY ASSURANCE PROCEDURES

(Must check all boxes below)

- Information included in third-party-approved package
- Information included in plant Quality Control Manual
- Information included in Manufacturer's Installation Manual

HOMES TESTED IN PLANT

(Must check all boxes below)

- Three (3) consecutive homes meet ENERGY STAR duct tightness requirements

SITE INSTALLATION CHECKLIST VERIFIED

(Must check all boxes below)

- Acceptable site installation checklist identifying field-installed items and processes that are part of the ENERGY STAR package verified during installation

HOMES TESTED IN FIELD

(Must check all boxes below)

- Three (3) consecutive homes meet ENERGY STAR requirements
- Any design changes recorded and used to update specifications in the third-party-approved package, Site Installation Checklists, Quality Control Manual and Installation Manual

ENERGY STAR INCORPORATED IN ROUTINE OPERATIONS

(Must check all boxes below)

- Corrective actions identified during tests implemented
- Key plant personnel trained on critical processes and procedures
- Unique features in ENERGY STAR third-party-approved packages are reviewed with plant's third-party design approval and inspection agencies
- Process in place for collecting, tracking and archiving documentation on ENERGY STAR qualified homes

SUBMIT TO SBRA

- Fax number: 212-496-5389, or
- Address: 1776 Broadway, Suite 2205, New York, NY 10019

(This form must be submitted to SBRA before the plant can produce ENERGY STAR qualified homes).

Serial No. _____

DESCRIPTION OF PROBLEMS/DISCREPANCIES AND REMEDIATION ACTIONS

Item number:	Discrepancy	_____

	Remediation	_____

Item number:	Discrepancy	_____

	Remediation	_____

Item number:	Discrepancy	_____

	Remediation	_____

Item number:	Discrepancy	_____

	Remediation	_____

