



Installer Badges Toolkit and Visualization Resources

2023 National Home Performance
Conference

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Learning Objectives

- ✓ Identify benefits and potential outcomes of using the U.S. Department of Energy's free Installer Toolkit
- ✓ Recognize how new visualization resources can be used at your organization
- ✓ Point out the key steps to using the Badges Toolkit and lessons learned from other implementers.

NREL's Weatherization Team

NREL provides technical assistance and research to support high-quality work and highly qualified workers in the weatherization and home performance industry.

- Maintaining technical specifications and tools
- Developing innovative approaches to strengthen workforce skills and qualifications
- Collaborating with training providers
- Fostering continuous improvement throughout WAP.



Technical

- Guidelines for Home Energy Professionals:
 - Standard Work Specifications
 - **Worker Credentials**
 - **Job Aids and Single-Family 3D House Tool**
- Weatherization Assistant Tool
- Research and analysis.



The Weatherization Assistance Program (WAP) aims to reduce energy costs for low-income households by increasing their home energy efficiency, while ensuring health and safety standards.



Programmatic

- Continuous Improvement Workshops
- WAP Administrative Trainings
- Stakeholder coordination.

<https://www.nrel.gov/state-local-tribal/weatherization.html>

Background

- Increased funding on the horizon:
 - Significant need to “scale up” and train Crew Leaders (CLs) and Retrofit Installer Technicians (RITs).
- Fiscal Year 2018: the RIT Job Task Analysis merged with CL
- 2019: the RIT badges were created as a voluntary resource.
 - 2020: Badge Toolkit updated added licensing and copyright
 - 2022: Visualization added:
 - Job Aids and Single-Family 3D House.
 - 2023:
 - Job aids translated to Spanish
 - ***Coming soon: manufactured housing 3D House***
 - ***Exploring the option of a centralized platform for Installer Badging.***

Background (Cont.)

- A credentialed workforce is in high demand.
- Staff entering the WAP and home performance industry must navigate a wide range of certifications.
- Getting started can be an intimidating and daunting task.
 - Prerequisites, written/field exams, travel, etc.
- Imagine a more flexible option...
 - Welcome to the Installer Badges Toolkit!



Installer Badges Toolkit

The Installer Badges Toolkit provides a flexible, customizable model for a competency-based apprenticeship approach to training and skills recognition across the home energy retrofit industry.

The National Renewable Energy Lab (NREL) and the U.S. Department of Energy (DOE) Weatherization Assistance Program (WAP) are collaborating with the home energy retrofit industry to support the development of skilled workers. The Installer Badges Toolkit provides a flexible, customizable, and voluntary approach to training and skills recognition for WAP implementers, utility programs, private sector workers, and contractors. It can be the basis of a competency-based Registered Apprenticeship, which offers greater flexibility and options for addressing talent development needs through apprenticeship, detailed here: <https://www.apprenticeship.gov/>.

A Flexible, Customizable Skills Verification Toolkit

The Installer Badges Toolkit consists of 25 Badges, each representing different energy efficiency tasks that an installer could perform on a home. Each Badge defines the desired outcome, criteria to verify, applicable material requirements, and references to SWS or other relevant standards. Workers earn Badges by completing each task and receiving approval from a qualified supervisor. To track progress, trainers or sponsors can provide workers with a physical Badges Passport or a digital badging platform.

The Badges provide a consistent approach to training by ensuring that installers in different regions are learning the same skills nationwide. Organizations can also customize the Toolkit by choosing only those Badges that are relevant to their program.

Whether workers earn Badges on the job with supervisor approval or at a training center, the work quality requirements are consistent. This allows workers to transfer applicable

Installer Badges

- Retrofit Installer Tasks (25 Badges)
- Examples:
 - Work Lead-Safe
 - Air Seal Attic Floor
 - Seal and Dam High-Temperature Heat Sources in Attic
 - Prep Attic Floor for Insulation
 - Treat Attic Hatch, etc.

Badge Toolkit Passport

- Pages for each Badge
- Supervisor or trainer record # of times a task is successfully completed
- Includes sample inspection checklists for each Badge.



Treat Attic Hatch

Desired outcome: Attic access door or hatches properly sealed and insulated to minimize heat loss or gain and prevent insulation from falling out of attic when accessed.⁷

- Rigid,⁸ durable attic hatch blocking/dam is installed in a permanent way;
- Dam will remain 2" taller than final attic insulation depth;
- Hatch is insulated to proper R-value (the maximum R-value structurally allowable, up to the final insulation level of surrounding attic);
- Insulation is durably attached to hatch;
- Access is weather-stripped or otherwise treated to prevent air movement when hatch is closed;
- Access closes with a "friction fit" or latch;
- Trim is air sealed with appropriate material; and
- Airtightness of hatch when closed has been verified with blower door and smoke (or infrared (IR), if temperatures permit).

JOB #	DATE	TECH SIGNOFF	INSPECTOR SIGNOFF

Air Sealing



Photo from NREL image gallery 28560



Photo from Cory Chovanec

Attic Prep and Insulation



Photo from Energy Resource Center



Photo from NREL image gallery 28767

Wall Insulation Measures



Photo from NREL image gallery 28786



Photo from NREL image gallery 17963

Subspace Measures



Photos from Energy Resource Center

Dam, Seal, and Insulate an Attic Hatch

Job Aid for Treat Attic Hatch Badge

Aligns With Standard Work Specifications 3.0103.1



Uninsulated and unsealed attic access points allow conditioned air to escape the home in all seasons and reduce the overall R-value of the attic.



Rigid, durable damming is installed and mechanically fastened in place.



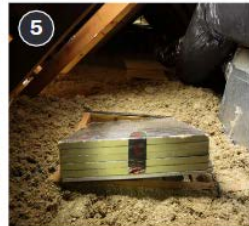
Dam is at least 2 inches taller than the final attic insulation depth.



If replacement is needed, cut a gypsum or plywood board to size and use a durable weatherstrip or closed cell foam tape to create a seal.



Cut and stack rigid foam insulation, gluing with appropriate adhesive, to build up R-value. Ensure the foam meets thermal or ignition barrier requirements of the authority having jurisdiction.



Hatch is insulated to proper R-value (the maximum R-value structurally allowable, up to the final insulation level of surrounding attic).

Dam, Seal, and Insulate an Attic Hatch

5-1



Trim is air sealed with appropriate material.



For vertical accesses, run weatherstripping or closed cell foam tape to air seal at these doorways too. Hold vertical accesses closed with latch if necessary.



Safely and durably sealing and insulating attic access doors prevents air movement and reduces heating and cooling loads.

- Insulate hatch to proper R-value (the maximum R-value structurally allowable, up to the final insulation level of surrounding attic).
- Durably attach insulation to hatch.
- Weatherstrip or otherwise treat access to prevent air movement when hatch is closed.
- Ensure access closes with a tight fit or latch.
- Air seal trim with appropriate material.
- Verify air-tightness of hatch when closed with blower door and smoke (or infrared, if temperatures permit).

Seal and Dam Around Non-Insulation Contact-Rated (Non-IC) Recessed Lights

Job Aid for Seal and Dam High-Temperature Heat Sources in Attic Badge

Aligns with Standard Work Specifications 3.0102.1



Clear any debris and insulation from around non-IC rated can light.



Enclosure has 3 inches of clearance from lamp to insulation on all sides.



Premade boxes can make installation easier when installation site is clear of framing members.



Seal box on all sides and edges to make continuous barrier from attic.



Top of box must be R-1 or less and left free of insulation. Flag enclosure for added visibility.



When boxed with appropriate clearances and fire-rated materials, fire risk is mitigated and air leakage is reduced.

CHECKLIST

Seal and dam high-temp heat sources in attic

DESIRED OUTCOME

Ensure safety from fire and prevent air leakage¹

Non-Insulation Contact (IC) Recessed Lights

- Where non-IC recessed lights will be left in place enclosures completely surround each fixture.
- Enclosures:
 - Are constructed of fire-rated materials (e.g., 5/8" gypsum wallboard).
 - Maintain 3" clearance between fixture (including wiring, box, and ballast) and insulation.
 - Are free of insulation on top.
 - Are flagged to visually identify the location of the enclosure.
- All edges, gaps, and cracks of the enclosure, and between the enclosure and attic floor, are sealed with caulk, mastic, foam, or other approved material.

¹ Relevant Standards: 3.0102.1

Recent Job Aid Enhancements



SPANISH TRANSLATION



ICON LIBRARY

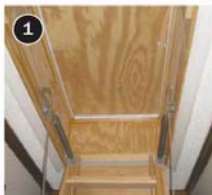
Contención, sellado y aislamiento de escalera de ático abatible

Guía de trabajo para insignia de tratamiento de escotilla de ático

Cumple con las especificaciones normalizadas de trabajo 3.0103.1



Las escaleras desplegables pueden ser un punto débil en las barreras térmicas/de presión, y también pueden permitir que el aislamiento caiga dentro de la casa si no se represan apropiadamente.



Construya una cubierta por encima y alrededor de la escalera desplegable, más alta que la altura final del aislamiento.



Aísle la parte superior y los lados de la cubierta de la represa, de acuerdo con el valor R correspondiente. Utilice materiales que cumplan con los requisitos del código de seguridad contra incendios aplicable (p. ej., barreras térmicas o de ignición).



Selle contra fugas de aire los espacios en el armazón y los bordes de la moldura según sea necesario.



Selle contra fugas de aire con cinta de espuma de celda cerrada o burletes. Instale los pestillos necesarios para garantizar que la puerta de acceso se cierre herméticamente contra el burlete.



Las escaleras desplegables del ático deben estar selladas y aisladas de forma segura y duradera para evitar el movimiento del aire y reducir la transferencia de calor.

Badges Icon Library

Work Lead-Safe	Air Seal Attic Floor	Seal and Dam High-Temperature Heat Sources in Attic	Prep Attic Floor for Insulation	Treat Attic Hatch
Insulate Attic Floor and Pass Inspection First Time	Insulate the Ceiling of a Manufactured Home	Seal and Insulate Knee Walls	Install Dense-Pack Sidelwall Insulation	Insulate the Walls of a Manufactured Home
Install Weather Stripping and Sweep Set on Exterior Door	Air Seal and Insulate Walls of a Conditioned Subspace	Air Seal Floor Above Unconditioned Subspace	Insulate the Floor Above an Unconditioned Subspace	Insulate the Belly of a Manufactured Home
Install or Repair Vapor Retarder in a Subspace	Vent Clothes Dryer to the Exterior	Install Ducting for Bath or Kitchen Range Fan	Air Seal Ducted Distribution System	Insulate Ducted Distribution System
Install Window or Exterior Door	Repair/Replace Cracked or Broken Glass	Insulate a Water Heater Tank and First Six Feet of Pipes	Install Low-Flow Faucet Aerators or Showerhead	Install Exterior Roof Penetration

Visualization Resources

3D House Tool

- Weatherization envelope measure installation techniques.
- Users navigate through a virtual house to locate job aids at locations where common upgrade measures are found.
- [U.S. Department of Energy \(DOE\) Weatherization Installer Job Aids and Single-Family Interactive 3D House.](#)

HOW TO USE THE INTERACTIVE 3D HOUSE



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Questions and Open Discussion

www.nrel.gov

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3D House Demonstration