# Dense-Pack Sidewall Insulation

# Weatherization Installer/Technician Fundamentals

Learning Objectives

By attending this session, participants will be able to:

* Explain the importance of achieving uniform density at the targeted R-value throughout the cavity.
* Name typical tools for the job, including safety equipment.
* Identify basic equipment maintenance protocols.
* Use the proper order of operations for blowing in dense-pack sidewall insulation.

Key Terminology

Lead-safe weatherization (LSW)

Silicosis

Supplemental Materials

Handouts & Resources

“Accessing Stucco Walls for Dense Packing.” *WxTV*. Montana Weatherization Training Center. <www.wxtvonline.org>.

“Additional Siding Removal.” *Weatherization Tech Exchange*. Energy Center of Wisconsin. <www.ecw.org>.

“A Look Inside a Wall: Dense Packing.” *WxTV*. Montana Weatherization Training Center. <www.wxtvonline.org>.

“Behind the Walls.” *Weatherization Tech Exchange*. Energy Center of Wisconsin. <www.ecw.org>.

“Dense Packing Exterior Walls with Cellulose from the Interior.” *WxTV*. Montana Weatherization Training Center. <www.wxtvonline.org>.

Dense-Pack Sidewall Prop Guide.

Fitzgerald, Jim, Gary Nelson, and Lester Shen. “Sidewall Insulation and Air Leakage Control.” *Home Energy* Jan./Feb. 1990: 13-20. <www.homeenergy.org>.

Installed Wall Density Bag Count Worksheet.

“Interior Drilling and Blowing.” *Weatherization Tech Exchange*. Energy Center of Wisconsin. <www.ecw.org>.

Moore, Alex. “Loose-Fill Insulation Coverage Chart.”

“The Insulating Process.” *Weatherization Tech Exchange*. Energy Center of Wisconsin. <www.ecw.org>.

U.S. Department of Energy. Hot Climate Initiative. *Dense-pack Sidewall Insulation*.

U.S. Department of Energy. Weatherization Assistance Program. “Sidewall Insulation Video.” 2009. <www.waptac.org>.

On-line Platform Lessons

Use these on-line interactive training modules as prerequisites before students attend the course or as in-class computer lab sessions. Users must first create an account at [www.nterlearning.org](http://www.nterlearning.org) to access.

i- 5.2 Introduction to Insulation Blowing Equipment <https://www.nterlearning.org/web/guest/course-details?cid=2005>

Relevant Standard Work Specifications

1.104.1 – Insulation Worker Safety

3.1201.4 – Pocket Door

4.1004.1 – Prep for Dense Packing

4.1005.5 – Enclosed Bonus Room Floor – Dense-Pack Insulation

4.1005.6 – Enclosed Attic Storage Platform Floor – Dense-Pack Insulation

4.1088.4 – Parapet Walls – Dense-Pack Insulation

4.1101.1 – Exterior Walls – Dense-Pack Insulation

4.1103.1 – Dense-Pack Exterior Walls

4.1301.4 – Dense-Pack Floor System with Rigid Barrier

4.1301.8 – Pier House Subfloor Installation – Dense-Pack with Rigid Barrier

Classroom Props & Activities

* Surveyor’s flag bent into a “Z” for testing density
* Two cardboard boxes
* Infrared camera
* Halogen lamp or other heat source
* Insulation machines and fill tubes
* Typical tools used for dense-pack insulation

**Density display**: Take two small, thin cardboard boxes of the same size. Fill one with cellulose to the proper density (around 3.5 lbs/ft3); fill the other to a density that is less than recommended. Place the boxes side by side in front of a halogen lamp or other heat source. Let students view the boxes through an infrared camera to see the importance of proper installation density. Pass the boxes around the class to let students feel the difference in weight.

**Sidewall Insulation video**: Discusses benefits of the technique and various issues that installers may face during dense-pack sidewall insulation.

**Hands-On Props**

**Dense-pack sidewall prop** – Allow students to gain hands-on experience by filling at least one bay, then letting them see the effectiveness of their work.

Class Overview

* Use the presentation to teach students about target density and filling technique. Discuss managing the workflow so drillers and fillers function as an efficient team. Show the included “Sidewall Insulation” video during the classroom portion.
* Use the density display to stress the importance of density and uniformity of installation. Give students hands-on practice with the dense-pack sidewall prop, letting each student fill at least one bay and then inspecting the work with the finger test, bent surveyor’s flag, or another method.
* Hand out resource titled “Dense-Pack Sidewall Insulation” and discuss guidelines for operation and maintenance of insulation machine.
* Using the “Installed” insulation density spreadsheet, calculate the amount of insulation required for the area.
* Show and point out important features and functions of typical tools used, including:
	+ Generator
	+ Insulation machine and accessories
	+ Drills, bits, and specialized hand tools
	+ Personal protective equipment