



Lesson: Window Treatments

Building owners select window treatments to improve building efficiency and occupant comfort. Window treatments can insulate windows in winter and block solar heat in summer. This lesson presents the following information about window treatments: how window treatments increase the R-value of windows, how window treatments block solar heat through windows, how to compare the performance of window treatments and how to evaluate the practical challenges of installing window treatments. This is a 1.2 hour session.

BPI (0.60 CEUs)

Category: Evaluation

Lesson: Blower Door Theory

Blower door tests are essential to building-energy evaluations. This lesson covers the science behind blower door tests and how we use test results to evaluate building air tightness, principles of building air tightness testing, why air tightness tests are important and how to interpret the results of your blower door tests. This is a 1.7 hour session.

BPI (0.85 CEUs)

Lesson: Blower Door Test Preparation

Building-energy specialists need to set the building envelope up correctly to conduct accurate blower door tests. This lesson outlines how to configure the building to energy-industry standards. You'll learn how windows, doors, ventilation equipment, and combustion appliances configurations affect measurement accuracy and how to avoid common set-up problems. This is a 1.0 hour session.

BPI (0.50 CEUs)

Lesson: Blower Door Testing

Building-energy specialists can set up blower door equipment in a number of incorrect ways. This lesson explains how to set up the blower door test equipment the right way, how to conduct the blower door test from start to finish, how to avoid common equipment set-up errors and how to interpret blower-door-test results and compare them to industry air tightness standards. This is a 2.9 hour session.

BPI (1.45 CEUs)

Lesson: Blower Door Testing Manometers

Building-energy specialists use manometers to measure building air-pressures and blower-door airflow. Your measurement's accuracy depends how you set up and use the manometer. This lesson covers the most used manometer models and how they measure pressure differences during the blower door test, basic manometer features and functions, how to set up manometers for blower door tests and common problems that cause inaccurate manometer measurements. This is a 2.3 hour session.

BPI (1.15 CEUs)



Lesson: Energy Auditing

An energy audit is your client's roadmap to improve an existing building's energy efficiency. Without an energy audit, your clients can't be confident that improvements will reduce energy use or be cost-effective. This lesson covers the entire auditing process, from initial customer interview to post-evaluation analysis, how to do a customer-interview, utility bill analysis techniques, visual inspection methods, diagnostic test procedures and how to recognize health hazards and building durability issues. This is a 1.7 hour session.

BPI (.85 CEUs)

Lesson: Window Economics

Windows are a high-cost building component, and they have a major impact on energy-efficiency and comfort. Building-energy specialists must be able to select site-appropriate, cost-effective windows. You'll learn the following in this lesson: the basics of energy efficiency economics, how to apply those efficiency economics to windows, the difference between total and incremental costs, the importance of measure life, how to use simple payback and other economic metrics to help make decisions about windows and how to evaluate window economics based on site-specific information. This is a 1.5 hour session.

BPI (0.75 CEUs)

Lesson: Analyzing Consumption

If you work with existing buildings, you must be able to analyze past energy consumption. This lesson discusses how to convert utility bill data into useful information for your projects, how to separate seasonal energy use from baseload use, how degree days affect seasonal consumption and how to use post-improvement utility data to measure the success of retrofit projects.. This is a 1.1 hour session.

BPI (0.55 CEUs)

Lesson: Gas Heating Systems ID

Gas heating equipment comes in all shapes and sizes. It's your job as a building energy specialist to correctly identify these systems. This lesson covers the types of gas-burning appliances, their major features, and how to identify them. You'll learn about the following: the difference between open-combustion and sealed-combustion appliances, how combustion appliances vent their byproducts, and different types of gas-heating equipment and their comparative energy efficiencies. This is a 1.7 hour session.

BPI (0.85 CEUs)

Lesson: Duct Blower Theory

Excessive duct leakage causes major energy and comfort problems in many buildings. This lesson covers why and how building-energy specialists test duct-system leakage, the main types and components of duct systems, typical air-leakage locations, problems caused by poorly sealed ducts, the methods and equipment used to test duct-airtightness test methods and equipment, and energy-code duct-airtightness. This is a 1.6 hour session.

BPI (0.80 CEUs)



Lesson: Duct Blower Testing

Duct airtightness testing can be a challenge, even for experienced building-energy specialists. This lesson covers industry standards for duct-airtightness inspection and testing, how to visually inspect duct systems, how to conduct the total duct leakage test, how to conduct the leakage to outdoors test and how to interpret duct-airtightness test results. This is a 2.1 hour session.

BPI (1.5 CEUs)

Lesson: Pressure Pan Duct Testing

Duct systems located outside the thermal envelope waste a lot of energy. Fortunately, building-energy specialists and HVAC technicians have tools to diagnose duct-leakage problems. This lesson covers evaluating duct-system leakage with a pressure pan. You'll learn how to use a pressure pan to identify the severity and location of duct leaks. You'll also learn the limitations of using a pressure pan to test duct-system leakage. This is a 1.2 hour session.

BPI (0.60 CEUs)

Category: Construction

Lesson: Construction Basics

Building-energy specialists need to understand the overall construction process. This lesson covers the most important design and construction processes that affect building energy efficiency. You'll learn frame construction best-practices, insulation principles, air-barrier issues, and common building design mistakes. This is a 2.0 hour session.

BPI (1.0 CEUs)

Lesson: Roof and Attic Ventilation

Most attics and roofs require ventilation to protect a building from moisture damage and to cool the roof during the summer. Proper attic ventilation or roof ventilation also reduces heat gain in attic spaces. This lesson covers important strategies that keep roofs and attics properly ventilated. You'll learn about climate-specific ventilation problems and the roof design features that eliminate issues caused by poor ventilation. This is a 1.4 hour session.

BPI (0.70 CEUs)

Lesson: Professional Insulation Equipment

This lesson covers the most important tools and practices insulators need to install insulation the right way. Insulation installers need a lot of special equipment to install insulation effectively. You'll learn about the vehicles, blowing machines, small tools, and protective equipment used for insulation retrofits and new construction. This is a 1.2 hour session.

BPI (0.60 CEUs)



Category: Envelope

Lesson: Air Barrier Basics

Air barriers are an essential part of the building envelope, but leaky or incomplete air barriers are ineffective and may even create safety hazards. This lesson covers air-barrier principles and typical air-barrier installation problems. You'll learn how to locate common air-leakage sites and techniques to correct common air-barrier problems. This is a 1.3 hour session.

BPI (0.65 CEUs)

Lesson: Stopping Heat Gain

In climates with cooling needs, the most effective cooling strategy is to stop heat before it enters the building. This lesson describes how heat enters buildings and the best strategies to stop unnecessary heat gain. You'll learn about the different modes of heat gain in buildings: solar heat, air leakage, internal heat gains, and heat transmission. This lesson also discusses design details that limit heat gain and how to improve buildings to limit their heat gain. This is a 1.3 hour session.

BPI (0.65 CEUs)

Lesson: Air Pressure and Flow

Air pressure and airflow affects indoor air quality, building durability, and energy efficiency. This lesson covers air pressure principles and how air pressure applies to building performance. In this lesson you will learn the following: Factors that create pressures and drive airflow between spaces; □ the sources of air-pressure imbalance; and how to measure air-pressure with diagnostic tools. This is a 1.3 hour session.

BPI (0.65 CEUs)

Lesson: Finding Major Air Leaks

In many buildings, air leakage is the single greatest source of heat loss through the building envelope. Air leakage areas can be difficult to find, but they're usually inexpensive to fix. This lesson covers common areas of air leakage found in residential buildings. In this lesson you will learn the following: where to look for major leakage areas; how to correctly seal leakage areas; and techniques to measure the post-improvement effectiveness of air-sealing work. This is a 1.3 hour session.

BPI (0.65 CEUs)

Lesson: Unvented Roof Insulation

Unventilated roof systems aren't as common as conventionally-vented roofs, but they have some design advantages over the conventional roofs. This lesson covers the following topics: how to build unventilated roofs; the potential for energy and durability problems in unventilated roofs. □ Important design details that protect unventilated roofs from heat and moisture damage. This is a 1.3 hour session.

BPI (0.65 CEUs)



Lesson: Insulation Performance Factors

This lesson covers the most important installation issues you'll encounter when inspecting insulation. Insulators should install insulation in ways that optimize its effectiveness, but insulators often install insulation incorrectly. This lesson covers how to evaluate the performance of installed insulation. In this lesson you'll learn the following: why insulation's energy-performance is often less than its rated R-value, how other building factors, including air leakage, affect insulation's effectiveness and how to select insulation that's best suited to your project's purpose, location, and budget. This is a 1.6 hour session.

BPI (0.80 CEUs)

Lesson: Insulation Introduction

Insulation resists heat gain and heat loss in buildings. This lesson covers the types of insulation you'll encounter in buildings. In this lesson you'll learn the following: how insulation works, characteristics of different insulation types and important insulation-performance factors, including safety. This is a 1.4 hour session.

BPI (0.70CEUs)

Lesson: High Performance Roofs

This lesson covers the thermal resistance, reflectivity, and ventilation of roofs. Roofs provide protection from heat, wind, sun and rain. The roof also accommodates the electrical service, plumbing vents, and chimneys, among other building utilities. This lesson covers high-performance roof designs that improve ventilation, shading, and thermal resistance. You'll learn about specific roof features that vent heat and moisture out of the building. This is a 1.4 hour session.

BPI (0.70 CEUs)

Lesson: Window and Door Installation

Good window and door installers pay attention to details that prevent air and water infiltration. This lesson covers high-performance window and door installation techniques. You'll learn the following window-and-door installation essentials. Window frame types for different wall details. Three different window-installation procedures. Window-installation flashing details. Methods to minimize thermal bridging around windows and doors. This is a 2.0 hour session.

BPI (1.00 CEUs)

Lesson: Door Selection

Doors have a small surface area but are an important part of the building envelope. This lesson covers how to select energy-efficient doors that meet your project's needs. In this lesson you'll learn the following: how a door's design affects its thermal resistance and air leakage, what materials and features to look for when selecting an energy-efficient door and energy-efficient door components and installation details. This is a 1.2 hour session.

BPI (0.60 CEUs)



Lesson: Reducing Baseload Cost

Buildings use energy all year. Some of that energy use is seasonal. Heating energy in the winter and cooling energy in the summer. Baseload energy is what we use consistently over the year. This lesson is about reducing baseload consumption, and its cost. This lesson will cover the following: baseload's relative impact on total energy use, how to derive baseload energy use from power bills, how to audit, recognize and prioritize baseload devices, post improvement monitoring and sizing PV systems to match reduced baseload costs. This is a 1.5 hour session.

BPI (0.75 CEUs)

Lesson: Fibrous Insulation

Fibrous insulation is an inexpensive and commonly used form of insulation. Fibrous insulation comes in different forms, so wise selection and correct installation optimizes the benefits. This lesson covers the different types of fibrous insulation and their most important characteristics. You'll learn the following: the relationship between insulation type, thickness, and R-value, how to select fibrous insulation that's appropriate for your project and how inappropriately selected or installed fibrous insulation can affect building energy use and moisture-management. This is a 1.6 hour session.

BPI (0.80 CEUs)

Lesson: Foam Board Insulation

Foam board insulation comes in different forms that have different R-values and other characteristics. This lesson covers how to identify foam board insulation in the field, how to select and install the common foam, board insulation types and how to recognize when fire, moisture or temperature conditions may be inappropriate for foam board installation. This is a 1.3 hour session.

BPI (0.65 CEUs)

Lesson: Spray Foam Insulation

Many builders choose spray-foam insulation for their energy-efficient building projects. Spray foam has advantages over conventional insulation materials, but it also has disadvantages. This lesson covers the main spray-foam types, their installation methods, and compares spray-foam's energy-performance to conventional insulation materials. This is a 1.8 hour session.

BPI (0.9 CEUs)

Lesson: Super-insulated Walls

Super-insulated walls combine advanced framing, airtight sheathing, and insulation to achieve high R-values and superior airtightness. This lesson covers the structural features, thermal features, and weather-resistive features that typify super-insulated walls. This lesson discusses the following topics: the benefits of super-insulated wall systems, features that distinguish super-insulated walls from conventional walls and methods to build super-insulated walls economically. This is a 1.4 hour session.

BPI (0.70 CEUs)



Lesson: Window Performance Factors

Windows must meet certain performance factors to deliver acceptable comfort and energy efficiency. Learn to select the right windows based on the performance factors described in this lesson. This lesson covers the following window performance issues: efficient window selection for retrofit and new construction projects, NFRC window efficiency ratings, how to identify important window characteristics and how to select windows based on performance factors. This is a 1.4 hour session.

BPI (0.70 CEUs)

Lesson: Window Introduction

This lesson covers window's functions in buildings along with window energy efficiency. You'll learn the following window basics: Building-science principles associated with windows, the main window types, introduction to high-performance windows and how to select windows for your projects. This is a 1.4 hour session.

BPI (0.70 CEUs)

Lesson: Wall Insulation Materials

In most buildings, walls make up the largest surface area of the building envelope. Because wall area is so large, insulators help optimize building energy-efficiency by installing wall insulation correctly. This lesson covers the following topics: common wall insulation materials, how to select the right insulation material, how poor installation affects energy performance, how to install wall insulation correctly and how to recognize building flaws that affect R-value. This is a 1.6 hour session.

BPI (0.80 CEUs)

Lesson: Residential Refrigerators

Refrigerators and freezers use a lot of electricity. This lesson discusses when it makes economic sense to replace an old refrigerator. Older refrigerators can use four times more electricity than new energy-efficient models! This lesson will cover the following: how much electricity building owners can save by improving existing refrigerators, how much electricity building owners can save by replacing existing refrigerators, how to calculate annual refrigerator operating costs and how to select new refrigeration with important energy-efficiency features. This is a 1.0 hour session.

BPI (0.50 CEUs)

Lesson: Water Heater Basics

Most buildings in the US still rely on storage-tank water heaters. This lesson covers the features of storage-tank water heaters, along with some new water-heater designs. This lesson will cover the following: how to identify water-heater types, their main components and their efficiency features, how to identify signs of energy and safety problems, how to increase existing storage-tank efficiency and how to select high-efficiency water heaters for retrofit or new construction projects. This is a 1.6 hour session.

BPI (0.80 CEUs)



Category: Building Science

Lesson: Cooling Principles

This Cooling Principles lesson covers the sources of heat gain in buildings and how your climate affects cooling loads. The lesson explains common energy-efficiency strategies that minimize cooling costs by reducing heat gains. Air conditioning is expensive and should be our last resort for cooling a building. This lesson covers the following topics: how people and buildings get rid of excess heat, how to stop heat before it gets into buildings and cost-effective methods for removing excess heat. This is a 1.1 hour session.

BPI (0.55 CEUs)

Lesson: Electric Power and Energy

This Electric Power and Energy lesson you'll learn how electricity works, how it's measured, and how we use it we use it in buildings. Building-energy specialists must understand electric power and energy, however many don't. This lesson covers the fundamentals of electricity generation, transmission, and consumption. This is a 1.2 hour session.

BPI (0.60 CEUs)

Lesson: Energy Calculations

This Energy Calculations lesson covers the most important notations, conversions, and equations you need to know as a building energy inspector or design consultant. This lesson also contains calculation exercises that give you practice at solving simple energy problems. Energy calculations help you and your customers decide on energy-efficiency improvements that make sense for your project. This lesson covers the following topics: energy-unit conversions, heat-transmission rates, air-change rates and energy-improvement payback periods. This is a 2.0 hour session.

BPI (1.00 CEUs)

Lesson: Geometry

This Geometry lesson covers the basic geometric building shapes you'll measure and calculate. You'll learn how to calculate building areas, building volumes, and do other useful geometric calculations. Building-energy specialists and design consultants frequently use geometric calculations for energy auditing and building design. This is a 1.6 hour session.

BPI (0.80 CEUs)

Lesson: Indoor Air Pollutants

This lesson discusses methods to reduce or eliminate indoor air quality health hazards. Indoor air quality affects the health and productivity of building occupants. Often, occupants don't notice indoor air pollutants. This lesson covers common indoor air pollutants and their impact on human health. You'll learn about common pollutant sources and the limits of human tolerance to these pollutants. This is a 1.2 hour session.

BPI (0.60 CEUs)