



### **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 buildingenergy 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)**