

# 18201

## Hangers, Supports, and Restraints

### *Sprinkler Fitting*

---

#### **Overview**

Proper support is essential to the safe installation of a sprinkler piping system. This module identifies strength/spacing requirements, types, and installation of pipe hangers, supports, and restraints. It also covers the installation of firestopping.

### *Learning Objective 1*

---

*Successful completion of this module prepares trainees to:*

Select and install pipe hanger assemblies.

- a. List general hanger installation guidelines.
- b. Identify and install various pipe hangers.
- c. Size and install all-thread rods (ATRs).
- d. Identify and install attachments in wood, steel, and concrete structures.
- e. Identify and install pipe supports and other attachments.

### *Learning Objective 2*

---

*Successful completion of this module prepares trainees to:*

Install seismic bracing.

- a. Identify NFPA 13 requirements for seismic bracing.
- b. Identify the components in sway bracing systems.

## *Learning Objective 3*

---

*Successful completion of this module prepares trainees to:*

Identify firestopping assemblies.

- a. Identify various firestopping products and their ratings.
- b. Install firestopping in floor and wall penetrations.

## *Performance Tasks*

---

1. Install a hanger on a wood joist.
2. Install a post-installed anchor.
3. Cut a hanger rod to a specified length.
4. Make up and install a seismic brace.

Recommended Teaching Time: 17.5 hours

# 18202

## General Purpose Valves

### *Sprinkler Fitting*

---

#### **Overview**

This module explains the valves used to start, stop, direct, and regulate water flow in sprinkler systems. It covers the operation, applications, and basic maintenance of various valves, including indicating control valves, trim valves, check valves, hose valves, pressure control valves, and air venting valves.

## *Learning Objective 1*

---

*Successful completion of this module prepares trainees to:*

Identify the function and operation of the indicating control valves used in sprinkler systems.

- a. Identify gate valves and describe how they operate.
- b. Explain the purpose of post-indicating valves.
- c. Identify butterfly valves and describe how they operate.

## *Learning Objective 2*

---

*Successful completion of this module prepares trainees to:*

Identify the function and operation of the trim valves used in sprinkler systems.

- a. Identify ball lever valves and describe how they operate.
- b. Identify globe valves and describe how they operate.

## *Learning Objective 3*

---

*Successful completion of this module prepares trainees to:*

Identify the function and operation of the supply system valves used in sprinkler systems.

- a. Identify check valves and describe how they operate.
- b. Identify hose valves and describe how they operate.

## *Learning Objective 4*

---

*Successful completion of this module prepares trainees to:*

Identify the function and operation of the pressure control and air venting valves used in sprinkler systems.

- a. Identify pressure-reducing valves and describe how they operate.
- b. Identify pressure-regulating devices and describe how they operate.
- c. Describe the function of air venting valves.

## *Performance Tasks*

---

1. Install a gate valve.
2. Install a supervisory (tamper) switch.
3. Install a butterfly valve.

Recommended Teaching Time: 15 hours

# 18203

## Math for Sprinkler Fitters

### *Sprinkler Fitting*

---

#### **Overview**

This module reviews basic mathematical principles and explains how to apply them to various sprinkler fitting calculations, including floor areas, pitch, offsets, sprinkler spacing, pressure, and volume.

### *Learning Objective 1*

---

*Successful completion of this module prepares trainees to:*

Use basic math operations to solve problems.

- a. Make calculations using addition, subtraction, multiplication, and division.
- b. Use fractions, decimal equivalents, and percentages to express different values.
- c. Identify the exponents used to express area and volume.
- d. Identify the types of angles found in a circle.

### *Learning Objective 2*

---

*Successful completion of this module prepares trainees to:*

Demonstrate practical calculations related to sprinkler systems.

- a. Calculate floor areas.
- b. Perform volume calculations.
- c. Make right-triangle calculations.
- d. Calculate offsets.
- e. Determine sprinkler spacing by area.
- f. Make pressure calculations.

## *Performance Tasks*

---

This is a knowledge-based module. There are no performance tasks.

Recommended Teaching Time: 20 hours

# 18204

## Shop Drawings

### *Sprinkler Fitting*

---

#### **Overview**

This module covers the shop drawings used in sprinkler fitting. It describes the symbols used for various sprinkler system components and explains how to use a shop drawing to identify the types and locations of piping and components. It also provides an overview of Building Information Modeling (BIM).

### *Learning Objective 1*

---

*Successful completion of this module prepares trainees to:*

Identify the types of drawings used in sprinkler system installation.

- a. List the types of drawings contained in a typical drawing package.
- b. Identify the information that can be found in a title block, notes, and drawing legend.
- c. Describe the purpose and content of sprinkler system specifications.
- d. Point out the NFPA requirements for shop drawings that are applicable to fitters.

## *Learning Objective 2*

---

*Successful completion of this module prepares trainees to:*

Identify common symbols used in sprinkler system shop drawings.

- a. Identify typical sprinkler symbols.
- b. Identify common valve and device symbols.
- c. Describe the symbols used to show fittings, hangers, and bracing.
- d. Identify the symbols for rises, drops, plugs, and hydraulic calculation references.
- e. Point out various components and dimensions on a sample shop drawing.

## *Learning Objective 3*

---

*Successful completion of this module prepares trainees to:*

Identify the advantages of Building Information Modeling (BIM).

- a. Define BIM 4D through 7D.
- b. Describe how 3D scanning is used in renovation work.

## *Performance Tasks*

---

1. Use an instructor-supplied shop drawing to identify various types of information, including the sprinkler legend, title block, north arrow, sprinkler type and temperature, and pipe size.

Recommended Teaching Time: 30 hours

# 18205

## Standard Spray Sprinklers

### *Sprinkler Fitting*

---

#### **Overview**

This module describes the characteristics of standard spray sprinklers. It also covers types of construction, NFPA 13 light and ordinary hazard occupancy classifications, and installation considerations.

### *Learning Objective 1*

---

*Successful completion of this module prepares trainees to:*

Identify the characteristics of standard spray sprinklers.

- a. Identify sprinkler temperature ratings and their associated color codes.
- b. Define K-factor.
- c. Describe sprinkler location, spacing, and positioning requirements.

### *Learning Objective 2*

---

*Successful completion of this module prepares trainees to:*

Identify NFPA 13 occupancy classifications.

- a. Define light hazard occupancies.
- b. Define ordinary hazard occupancies.

### *Learning Objective 3*

---

*Successful completion of this module prepares trainees to:*

Identify the types of construction.

- a. Describe the types of unobstructed construction.
- b. Describe the types of obstructed construction.

## *Learning Objective 4*

---

*Successful completion of this module prepares trainees to:*

Describe the installation considerations for standard spray sprinklers.

- a. Explain the spacing requirements for standard spray pendent (SSP) and standard spray upright (SSU) sprinklers.
- b. Explain the spacing requirements for standard spray sidewall (SSW) sprinklers.

## *Performance Tasks*

---

1. Given an instructor-supplied obstruction scenario, space a standard coverage spray sprinkler to avoid the obstruction.
2. Determine the maximum sprinkler spacing based on different types of construction.

Recommended Teaching Time: 20 hours

# 18206

## Wet Pipe Sprinkler Systems

### *Sprinkler Fitting*

---

#### **Overview**

This module describes the operation and installation of wet pipe sprinkler systems. It covers various system controls and switches and explains how they operate. It also describes how to complete a Contractor's Material and Test Certificate for Aboveground Piping and provides an overview of basic system troubleshooting procedures.



## *Learning Objective 1*

---

*Successful completion of this module prepares trainees to:*

Identify the function and operation of wet pipe sprinkler system control valves.

- a. Explain the operation of an alarm check valve and related trim.
- b. Identify the components in a typical wet system riser assembly.
- c. Describe a typical Fire Department Connection (FDC).

## *Learning Objective 2*

---

*Successful completion of this module prepares trainees to:*

Identify the types of switches used in wet pipe sprinkler systems.

- a. Describe how switches operate.
- b. Explain the purpose of paddle-type vane switches and describe how they are installed.
- c. Explain the purpose of pressure switches and describe how they are installed.
- d. Explain the purpose of tamper switches and describe how they are installed.

## *Learning Objective 3*

---

*Successful completion of this module prepares trainees to:*

Describe how to test and troubleshoot wet pipe sprinkler systems.

- a. Explain the basic procedure for performing hydrostatic testing.
- b. Describe how to troubleshoot common wet pipe sprinkler system issues.

## *Performance Tasks*

---

1. Complete a Contractor's Material and Test Certificate for Aboveground Piping for a wet pipe sprinkler system.

Recommended Teaching Time: 25 hours

# 18207

## Dry Pipe Sprinkler Systems

### *Sprinkler Fitting*

---

#### **Overview**

This module describes the operation and installation of dry pipe sprinkler systems. It covers differential and mechanical dry pipe valves and trim, including switches, gauges, air sources, accelerators, and drains. It also provides an overview of basic system troubleshooting and acceptance testing procedures, including the completion of a Contractor's Material and Test Certificate for Aboveground Piping for a dry pipe sprinkler system.

### *Learning Objective 1*

---

*Successful completion of this module prepares trainees to:*

Identify the function and operation of dry pipe sprinkler system valves.

- a. Explain the operation of differential dry pipe valves.
- b. Explain the operation of mechanical dry pipe valves.
- c. Identify the installation considerations for valve trim and accessory devices.

### *Learning Objective 2*

---

*Successful completion of this module prepares trainees to:*

Make calculations for installing piping at the correct pitch to drains.

- a. Calculate pitch.
- b. Identify the installation considerations for various drains.

## *Learning Objective 3*

---

*Successful completion of this module prepares trainees to:*

Describe the air sources and air maintenance devices used in dry pipe sprinkler systems.

- a. Identify the air sources used to supply pressure in dry pipe sprinkler systems.
- b. Identify the air maintenance devices used to regulate airflow in dry pipe sprinkler systems.

## *Learning Objective 4*

---

*Successful completion of this module prepares trainees to:*

Describe how to test and troubleshoot dry pipe sprinkler systems.

- a. Explain the basic procedures for testing dry pipe sprinkler systems.
- b. Describe how to troubleshoot common dry pipe sprinkler system issues.

## *Performance Tasks*

---

1. Complete a Contractor's Material and Test Certificate for Aboveground Piping for a dry pipe sprinkler system.

Recommended Teaching Time: 25 hours