

Fire Sprinkler Apprenticeship Program Curriculum

Fire Sprinkler Level One

18101-07 Orientation to the Trade (5 Hours)

Identifies sprinkler fitter career opportunities and looks at some typical work environments. Examines trade-specific safety hazards and identifies shop plans specific to the sprinkler fitting industry. Introduces workplace safety, material handling, and common tools. Illustrates the correct use of common tools.

18102-07 Introduction to Components and Systems (7.5 Hours)

Introduces testing laboratories and listing agencies. Provides an overview of the major types of sprinkler systems including wet pipe, dry pipe, preaction, and deluge systems. Defines sprinkler-head types, orifice size and k-Factor. Underground and above-ground pipe and tubes are discussed, including hangers, bracing and restraints. Summarizes valves, alarms and fire department connections.

18103-07 Steel Pipe (22.5 Hours)

Identifies steel piping materials along with tools used to cut and thread steel pipe. Describes methods for threading, cutting, and grooving pipe, including how to determine pipe length between fittings (takeouts). Discusses threaded, plain-end and flanged fittings. Covers grooved pipe and fittings including installation techniques.

18104-07 CPVC Pipe and Fittings (10 Hours)

Describes handling and storing of CPVC pipe. Identifies CPVC safety concerns and cautions. Outlines methods and tools for cutting, chamfering, and cleaning CPVC pipe, including calculating takeouts. Joining techniques are described, particularly the solvent-cement (one-step) method. Rules for using plastic pipe hangers are explained.

18105-07 Copper Tube Systems (10 Hours)

Introduces copper tubing and fittings along with cutting and bending tools. The soldering process is described along with techniques for measuring, cutting, reaming and cleaning. Brazing is described as are brazing metals, fluxes and brazing equipment. Support bracing for copper tube is discussed as are grooved couplings for copper pipe.

18106-07 Underground Pipe (17.5 Hours)

Details underground piping installations for various types of pipe. Thrust blocks and restraints are explained. In-building risers, hydrants, yard valves and hydrant houses are discussed as are testing, inspection, flushing, and chlorinating. The underground test certificate is covered.

Fire Sprinkler Level Two

18201-07 Hangers, Supports, Restraints and Guides (15 Hours)

Identifies and describes strength/spacing requirements, types, and installation of pipe hangers, supports, restraints and guides. Covers types and installation of earthquake bracing and explains sleeving and firestopping.

18202-07 General Purpose Valves (15 Hours)

Covers the various types of valves and valve applications used in the sprinkler industry, including service procedures for standard valves. Also covers installation of OS & Y valves, butterfly grooved valves and tamper switches. Outlines procedures for disassembling, servicing and reassembling check valves.

18203-07 General Trade Math (20 Hours)

Explains basic math principles used to solve everyday problems, including converting quantities from the English system to the metric system and vice versa. Specific sprinkler fitting problems are covered such as calculating 45-degree offsets and tank volume, centering sprinkler heads using geometric methods, and problems relating to hanger sizing.

18204-07 Shop Drawings (32.5 Hours)

Instructs how to read drawings to identify materials, calculate square footage and number of sprinklers required, lay out sprinkler hanger locations, and identify sprinkler orifice sizes.

18205-07 Standard Spray Fire Sprinklers (20 Hours)

Discusses standard spray sprinklers relative to occupancies and to maximum coverage calculations. Explains how to identify sprinkler manufacturer and type using the Sprinkler Identification Number (SIN).

18206-07 Wet Pipe Fire Sprinkler Systems (25 Hours)

Explains the purpose, function, and operation of wet pipe system components. Describes riser check valves, alarm check valves, and trim; flow, tamper, and pressure switches; fire department connections and hose stations; antifreeze systems; faulty

pressure gauges; inspector's test connections and auxiliary drains; and hydrostatic testing and test pumps.

18207-07 Dry-Pipe Systems (25 Hours)

Explains the purpose, function, and operation of components used in a dry-pipe system. Instructs how to install pressure gauges on alarm valves and accelerators, how to set and adjust on air maintenance device, and how to reset and troubleshoot dry-pipe systems.

Fire Sprinkler Level Three

18301-07 Deluge / Preaction Systems (40 Hours)

Describes deluge and preaction systems and explains installation techniques and troubleshooting. Covers hydraulic and pneumatic release mechanisms, non-interlocked and interlocked preaction systems and Firecycle[®] Systems.

18302-07 Standpipes (25 Hours)

Describes standpipe classifications and explains flow capabilities of each type. Covers requirements for sizing and installation of standpipes. Explains pressure reducing valves, under flow and no flow conditions. Also covers LINK-SEAL[®] installations.

18303-07 Water Supplies (15 Hours)

Covers basic water chemistry and properties. Discusses methods of determining water supply requirements and considerations for supply systems. Discusses infrastructure, measurement of water supply capability, water supply appurtenances, fire department connections, and typical city water pits.

18304-07 Fire Pumps (40 Hours)

Covers fire pump categories and components. Describes fire pump controller requirements and fire pump performance and alignment. Explains pump and driver characteristics and performance curves as well as controllers, sensing lines, supervision and starting methods. Outlines project requirements, installation, maintenance and troubleshooting.

18305-07 Application-Specific Sprinklers and Nozzles (27.5 Hours)

Describes application-specific sprinkler types and requirements. Discusses area of coverage, positioning and obstruction requirements and explains system selection.

Fire Sprinkler Level Four

18401-08 System Layout (45 Hours)

Identifies and explains basic hydraulic concepts and selection of hydraulic design methods. System configuration, design criteria, discharge characteristics, and types of pressure loss are explained. Performing fire sprinkler system hydraulic calculations is also covered in this module.

18402-08 Inspection, Testing, and Maintenance (17.5 Hours)

Identifies and explains initial and periodic testing and inspection requirements, as well as maintenance and repair of wet pipe systems, dry pipe systems, preaction/deluge systems, and special systems.

18403-08 Special Extinguishing Systems (42.5 Hours)

Identifies and explains the following extinguishing exposure systems: water spray, foam, carbon dioxide, Halon, auxiliary and local alarm. Limited water systems, fire extinguishers, and water mist suppression systems are also covered.

18404-08 Introductory Skills for the Foreman (20 Hours)

Introduces the trainee to foremanship and covers responsibilities, leadership, and safety. Also explains project documentation and reports related to materials tracking and labor tracking.

18405-08 Proper Procedures and Documentation (20 Hours)

Explains the importance of proper documentation to ensure correct installation and avoid future rework and possible unintentional releases. Emphasizes the need to properly document the actual installation using written reports and photographs. Includes causes of and responses to water damage, and provides a detailed case history of an unintentional release.