

**SECOND
EDITION**



PRIVATE FIRE PROTECTION AND DETECTION



INTERNATIONAL FIRE SERVICE TRAINING ASSOCIATION

NONPROFIT EDUCATIONAL ASSOCIATION ORGANIZED TO DEVELOP TRAINING MATERIALS FOR THE FIRE SERVICE

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THE INTERNATIONAL FIRE SERVICE TRAINING ASSOCIATION

The International Fire Service Training Association (IFSTA) was established as a “nonprofit educational association of fire fighting personnel who are dedicated to upgrading fire fighting techniques and safety through training.” This training association was formed in November 1934, when the Western Actuarial Bureau sponsored a conference in Kansas City, Missouri. The meeting was held to determine how all the agencies interested in publishing fire service training material could coordinate their efforts. Four states were represented at this initial conference. Because the representatives from Oklahoma had done some pioneering in fire training manual development, it was decided that other interested states should join forces with them. This merger made it possible to develop training materials broader in scope than those published by individual agencies. This merger further made possible a reduction in publication costs, because it enabled each state or agency to benefit from the economy of relatively large printing orders. These savings would not be possible if each individual state or department developed and published its own training material.

To carry out the mission of IFSTA, Fire Protection Publications was established as an entity of Oklahoma State University. Fire Protection Publications’ primary function is to publish and disseminate training texts as proposed and validated by IFSTA. As a secondary function, Fire Protection Publications researches, acquires, produces, and markets high-quality learning and teaching aids as consistent with IFSTA’s mission. The IFSTA Executive Director is officed at Fire Protection Publications.

IFSTA’s purpose is to validate training materials for publication, develop training materials for publication, check proposed rough drafts for errors, add new techniques and developments, and delete obsolete and outmoded methods. This work is carried out at the annual Validation Conference.

The IFSTA Validation Conference is held the second full week in July, at Oklahoma State University or in the vicinity. Fire Protection Publications, the IFSTA publisher, establishes the revision schedule for manuals and introduces new manuscripts. Manual committee members are selected for technical input by Fire Protection Publications and the IFSTA Executive Secretary. Committees meet and work at the conference addressing the current standards of the National Fire Protection Association and other standard-making groups as applicable.

Most of the committee members are affiliated with other international fire protection organizations. The Validation Conference brings together individuals from several related and allied fields, such as:

- Key fire department executives and training officers
- Educators from colleges and universities
- Representatives from governmental agencies
- Delegates of firefighter associations and industrial organizations
- Engineers from the fire insurance industry

Committee members are not paid nor are they reimbursed for their expenses by IFSTA or Fire Protection Publications. They come because of commitment to the fire service and its future through training. Being on a committee is prestigious in the fire service community, and committee members are acknowledged leaders in their fields. This unique feature provides a close relationship between the International Fire Service Training Association and other fire protection agencies, which helps to correlate the efforts of all concerned.

IFSTA manuals are now the official teaching texts of most of the states and provinces of North America. Additionally, numerous U.S. and Canadian government agencies as well as other English-speaking countries have officially accepted the IFSTA manuals.



Dedication

*This manual is dedicated to the members of that unselfish organization
of men and women who hold devotion to duty
above personal risk, who count on sincerity of service above
personal comfort and convenience, who strive unceasingly to find
better ways of protecting the lives, homes, and property
of their fellow citizens from the ravages of fire and other
disasters . . .* **The Firefighters of All Nations.**

Dear Firefighter:

The International Fire Service Training Association (IFSTA) is an organization that exists for the purpose of serving firefighters' training needs. Fire Protection Publications is the publisher of IFSTA materials. Fire Protection Publications staff members participate in the National Fire Protection Association and the International Association of Fire Chiefs.

If you need additional information concerning our organization or assistance with manual orders, contact:

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Preface

This second edition of **Private Fire Protection and Detection** is intended to familiarize fire department and industrial fire protection personnel with the various types of fire protection systems found in public and private buildings. As with any manual we produce, there are a variety of people who are responsible for the final product.

We gratefully thank the members of the IFSTA Private Fire Protection and Detection validation committee. This manual would not have been possible without their input.

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Ed Prendergast assisted with the technical editing of this manual and also provided numerous pictures that were used throughout the manual. Ed's years of experience as a fire protection engineer for the Chicago Fire Department were of great assistance in completing this project.

The bulk of the pictures in this manual were taken with the cooperation of the United States Air Force Academy Fire Department in Colorado Springs, Colorado. Fire Chief Richard Duncan made his entire department and facilities available to us for this purpose. Special thanks to Assistant Chief Jim Rackl, who organized the project, and to Assistant Chief Joe Scherb and Engineer Ronald Robbins for their extensive help on the project.

Much of the information on fire pumps in Chapter 3 of this manual was taken from Fire Protection Publications' **Fire Protection Hydraulics and Water Supply Analysis** text by Pat D. Brock. Pat, an associate professor in Oklahoma State University's School of Fire Protection and Safety, has an accumulated wealth of knowledge on this topic, and we appreciate the ability to tap into it.

Also providing help from the School of Fire Protection and Safety were Associate Professor Larry Borgelt and student Alvah Mann.

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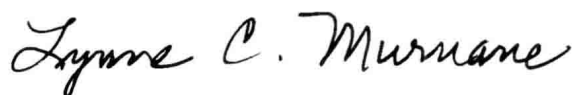
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Glossary

A

ABC Extinguisher

See Multipurpose Fire Extinguisher.

AFFF

Abbreviation for Aqueous Film Forming Foam.

Agent

Generic term for materials that are used to extinguish fires.

Air-Aspirating Foam Nozzle

Nozzle especially designed to provide the aeration required to make the highest quality foam possible, most effective appliance for the generation of low-expansion foam.

Alarm-Initiating Device

Mechanical or electrical device that activates an alarm system. There are three basic types of alarm-initiating devices: manual, products-of-combustion detectors, and extinguishing system activation devices.

Aqueous Film Forming Foam (AFFF)

Synthetic foam concentrate that, when combined with water, is a highly effective extinguishing and blanketing agent on hydrocarbon fuels.

Automatic Alarm

(1) Alarm actuated by heat, smoke, flame-sensing devices, or the waterflow in a sprinkler system and conveyed to local alarm bells and/or the fire station. (2) Alarm boxes that automatically transmit a coded signal to the fire station to give the location of the alarm box.

Automatic Nozzle

Fog stream nozzle that automatically corrects itself to provide a good stream at the proper nozzle pressure.

Automatic Sprinkler Kit

Kit containing the tools and equipment required to close an open sprinkler.

Automatic Sprinkler System

System of water pipes, discharge nozzles, and control valves designed to activate during fires to automatically discharge enough water to control or extinguish a fire. Also called Sprinkler System.

B

Booster Pump

Fire pump used to boost the pressure of the existing water supply within a fixed fire protection system.

Branch Line

Those pipes in an automatic sprinkler system to which the sprinklers are directly attached.

Butterfly Valve

Type of control valve that uses a flat baffle operated by a quarter-turn handle.

C

Call Box

See Telephone Alarm Box.

Certified Shop Test Curves

Before a pump is shipped by the manufacturer, it will be tested in the shop. The results of this test will be plotted on graph paper.

Chemical Foam

Foam formed when an alkaline solution and an acid solution unite to form a gas (carbon dioxide) in the presence of a foaming agent that traps the gas in fire-resistive bubbles; not commonly used today.

Class A Fire

Fires involving ordinary combustibles such as wood, paper, cloth, and so on.

Class A Foam

Class A foams are essentially wetting agents that reduce the surface tension of water and soak into combustible materials easier than plain water. Specially designed for use on Class A combustibles, these foams are becoming increasingly popular for use in wildland and structural fire fighting.

Class B Fire

Fires of flammable and combustible liquids and gases such as gasoline, kerosene, and propane.

Class C Fire

Fires involving energized electrical equipment.

Class D Fire

Fires of combustible metals such as magnesium, sodium, and titanium.

Combustible Liquid

Liquid having a flash point at or above 100°F (37.8°C) and below 200°F (93.3°C).

Cylinder Pressure Gauge

Gauge attached to the cylinder outlet that indicates the pressure in the cylinder.

D

Deluge Sprinkler System

Fire protection sprinkler system in which the sprinklers are always open. The system is controlled by a valve that operates automatically by a thermostatically actuated device. Also called Open-Head or Open-Sprinkler System.

Differential Dry-Pipe Valve

Valve in a dry-pipe sprinkler system in which air pressure is used to hold the valve closed and thus hold the water back.

Dry-Pipe Sprinkler System

Fire protection sprinkler system that has air instead of water under pressure in its piping. Dry systems are often installed in areas subject to freezing.

Dry Powder

Extinguishing agent suitable for use on combustible metal fires.

Dry Standpipe System

Standpipe system that has closed water supply valves or lacks a fixed water supply.

E

Eductor

Portable proportioning device that injects a liquid, such as foam concentrate, into the water flowing through a hoseline.

Elevated Storage

Water storage reservoir located above the level of the water supply system to take advantage of head pressure.

Extinguisher

Portable fire fighting appliance designed for use on specific types of fuels and classes of fire.

Extinguisher Hose

Braided, rubber-covered hose used on extinguishers that is made to withstand pressures up to 1,250 psi (8 619 kPa).

Extinguishing Agent

Any substance used for the purpose of controlling or extinguishing a fire.

F

Factory Mutual System (FM)

Fire research and testing laboratory that provides loss control information for the Factory Mutual System and anyone else who may find it useful.

FDC

Abbreviation for Fire Department Connection.

Feed Main

Pipe connecting the sprinkler system riser to the cross mains. The cross mains directly service a number of branch lines on which the sprinklers are installed.

Female Coupling

Threaded swivel device on a hose or appliance made to receive a male coupling of the same thread and diameter.

FFFP

Abbreviation for Film Forming Fluoroprotein Foam.

Film Forming Fluoroprotein Foam (FFFP)

Foam concentrate that is based on fluoroprotein foam technology with aqueous film forming foam (AFFF) capabilities.

Finished Foam

Completed product after the foam solution reaches the nozzle and air is introduced into the solution (aeration).

Fire

Rapid oxidation of combustible materials accompanied by a release of energy in the form of heat and light.

Fire Alarm

(1) Call announcing a fire. (2) Bell or other device summoning a fire company to respond to a fire or other emergency.

Fire Alarm System

(1) System of alerting devices that takes a signal from fire detection or extinguishing equipment and alerts building occupants or proper authorities of a fire condition. (2) System used to dispatch fire department personnel and apparatus to emergency incidents.

Fire Brigade

Organization of industrial plant personnel trained to use fire fighting equipment within the plant and to carry out fire prevention activities.

Fire Bucket

Bucket with a round bottom; usually painted red and marked with word *fire* to discourage use for purposes other than fire fighting. Frequently kept filled with water, sand, or other fire extinguishing material. Also called Fire Pail.

Fire Damper

Device that automatically interrupts airflow through all or part of an air handling system, thereby restricting the passage of heat and the spread of fire.

Fire Department Connection (FDC)

Point at which the fire department can connect into a sprinkler or standpipe system to boost the water flow in the system. This connection consists of a clappered siamese with two or more 2½-inch (65 mm) intakes or one large-diameter (4-inch [100 mm] or larger) intake. Also called Fire Department Sprinkler Connection or Sprinkler Connection.

Fire Department Sprinkler Connection

See Fire Department Connection.

Fire Detection Devices

Devices and connections installed in a building to detect heat, smoke, or flame.

Fire Detection System

System of detection devices, wiring, and supervisory equipment used for detecting fire or products of combustion and then signaling that these elements are present.

Fire Extinguisher

Portable fire fighting device designed to combat incipient fires.

Fire Hydrant

Upright metal casting that is connected to a water supply system and is equipped with one or more valved outlets to which a hoseline or pumper may be connected to supply water for fire fighting operations. Also called Hydrant.

Fire Load

Maximum amount of heat that can be produced if all the combustible materials in a given area burn.

Fire Pail

See Fire Bucket.

Fire Protection Engineer

Graduate of an accredited institution of higher education who has specialized in engineering problems related to fire protection.

Fire Pump

Water pump used in private fire protection to provide water supply to installed fire protection systems.

Fire Stream

Stream of water or other water-based extinguishing agent after it leaves the fire hose and nozzle until it reaches the desired point.

Fixed-Temperature Device

Fire alarm initiating device that activates at a predetermined temperature.

Flame Detector

There are two basic types of flame detectors: those that detect light in the ultraviolet wave spectrum (UV detectors) and those that detect light in the infrared wave spectrum (IR detectors). Also called Light Detector.

FM

Abbreviation for Factory Mutual. See Factory Mutual System.

Foam

Extinguishing agent formed by mixing a foam concentrate with water and aerating the solution for expansion. Foam may be protein, synthetic, aqueous film forming, high expansion, or alcohol type. For use on Class A and Class B fires.

Foam Blanket

Covering of foam applied over a burning surface to produce a smothering effect; can be used on nonburning surfaces to prevent ignition.

Foam Concentrate

Raw chemical compound solution that is mixed with water and air to produce foam.

Foam Eductors

Type of foam proportioner used for mixing foam concentrate in proper proportions with a stream of water to produce foam solution.

Foam Proportioner

Device that injects the correct amount of foam concentrate into the water stream to make the foam solution.

Foam Solution

Mixture of foam concentrate and water after it leaves the proportioner but before it is discharged from the nozzle and air is added to it.

Fog Stream

Water stream of finely divided particles used for fire control.

Fused Sprinkler

Automatic sprinkler that has operated due to exposure to heat.

Fusible Link

Connecting link device that fuses or melts when exposed to heat. Used in sprinklers, fire doors, dampers, and ventilators.

G

Gate Valve

Control valve with a solid plate operated by a handle and screw mechanism. Rotating the handle moves the plate into or out of the waterway.

Gravity Tank

Elevated water storage tank for fire protection and community water service. A water level of 100 feet (30 m) provides a static pressure head of 43.4 psi (300 kPa) minus friction losses in piping when water is flowing.

H

HAD

Abbreviation for Heat Actuating Devices.

Halogenated Agents

Chemical compounds (halogenated hydrocarbons) that contain carbon plus one or more elements from the halogen series. Halon 1301 and Halon 1211 are most commonly used as extinguishing agents for Class B and Class C fires. Also called Halogenated Hydrocarbons.

Halogenated Hydrocarbons

See Halogenated Agents.

Halon

Halogenated agent. Halon extinguishes fire by inhibiting the chemical reaction between fuel and oxygen.

Handline

Small hoselines (2½-inch [65 mm] or less) that can be handled and maneuvered without mechanical assistance.

Head

Water pressure due to elevation. For every 1-foot increase in elevation, 0.434 psi is gained (for every 1-meter increase in elevation, 9.82 kPa is gained).

Head Pressure

Pressure exerted by a stationary column of water, directly proportional to the height of the column. *Also see* Head.

Heat Actuating Devices

Thermostatically controlled detection devices used to activate fire equipment, alarms, or appliances.

Heavy Content Fire Loading

Storing of combustible materials in high piles that are placed close together.

High-Rise Building

Any building that requires fire fighting on levels above the reach of the department's equipment. Various building and fire codes also have written definitions of what is to be considered a high rise.

High-Rise Pack

Special kit for high-rise operations containing hose, adapters, nozzle, and spanner wrenches.

Horizontal Split-Case Pump

Centrifugal pump with the impeller shaft installed horizontally and often referred to as a split-case pump. This is because the case in which the shaft and impeller rotate is split in the middle and can be separated exposing the shaft, bearings, and impeller.

Hose Cabinet

Recessed wall cabinet that contains a wall hydrant and preconnected fire hose for incipient fire fighting. Also called Hose Rack.

Hose Pack

Compact bundle of hose, usually bound to facilitate moving.

Hose Rack

See Hose Cabinet.

Hydrant

See Fire Hydrant.

I**Impeller**

Vaned, circulating member of the centrifugal pump that transmits motion to the water.

Impeller Eye

Intake orifice at the center of a centrifugal pump impeller.

Incident Commander (IC)

Person in charge of the Incident Management System during an emergency.

Incipient Phase

First phase of the burning process where the substance being oxidized is producing some heat, but the heat has not spread to other substances nearby. During this phase, the oxygen content of the air has not been significantly reduced.

Indicating Valve

Water main valve that visually shows the open or closed status of the valve.

In-Line Eductor

Eductor that is placed along the length of a hose-line.

Intake Pressure

Pressure coming into the fire pump.

L**Lift, Dependable**

Height a column of water may be lifted in sufficient quantity to provide a reliable fire flow. Lift may be

raised through a hard suction hose to a pump, taking into consideration the atmospheric pressure and friction loss within the hard suction hose. Dependable lift is usually considered to be 14.7 feet (4.48 m).

Light Detector

See Flame Detector.

Lift, Maximum

Maximum height to which any amount of water may be raised through a hard suction hose to a pump.

Lift, Theoretical

Theoretical, scientific height that a column of water may be lifted by atmospheric pressure in a true vacuum. At sea level, this height is 33.8 feet (10 m). The height will decrease as elevation increases.

Linen Hose

Fire hose made of linen or flax fabric without a rubber lining; used for standpipe cabinets and forestry operations.

Lobby Control

Person responsible for, and the process of, taking and maintaining control of the lobby and elevators in a high-rise fire fighting situation. This also includes establishing internal communications, coordinating the flow of personnel and equipment to upper levels, and coordinating with building engineering personnel.

Local Alarm System

Combination of alarm components designed to detect a fire and transmit an alarm on the immediate premises.

M**Multipurpose Fire Extinguisher**

Portable fire extinguisher that is rated for Class A, Class B, and Class C fires. Also called ABC Extinguisher.

O**Occupancy**

Classification of use to which owners or tenants put buildings or portions of buildings. Regulated by the various building and fire codes. Also called Occupancy Classification.

Occupancy Classification

See Occupancy.

Open-Head System

See Deluge Sprinkler System.

Orifice

Opening through which water is discharged.

OS&Y Valve

Outside screw and yolk valve; a type of control valve for a sprinkler system in which the position of the center screw indicates whether the valve is open or closed.

Outside Sprinkler

System with open sprinklers, automatically or manually operated, to protect a structure or window openings against a severe exposure hazard.

Outside Standpipe

Standpipe riser on the exterior of a building and equipped with a fire department siamese connection.

P

Pendant Sprinkler

Automatic sprinkler designed for placement and operation with the sprinkler pointing downward from the piping.

Pitot Tube

Instrument containing a Bourdon tube that is inserted into a stream of water to measure the velocity pressure of the stream. The gauge reads in units of pounds per square inch (psi) or kilopascals (kPa).

PIV

Abbreviation for Post Indicator Valve.

PIVA

Abbreviation for Post Indicator Valve Assembly.

Polar Solvents

Flammable liquids that have an attraction for water, much like a positive magnetic pole attracts a negative pole. Examples include alcohols, ketones, and lacquers.

Positive Displacement Pump

Self-priming pump that moves a given amount of water or hydraulic oil through the pump chamber

with each stroke or rotation. This type of pump is used for hydraulic pumps on aerial device hydraulic systems and for priming pumps on centrifugal fire pumps.

Post Indicator Valve (PIV)

Valve that provides a visual means for indicating “open” or “shut” position; found on the supply main of installed fire protection systems.

Post Indicator Valve Assembly (PIVA)

Similar to a PIV except that the valve used is of the butterfly type, while the PIV and the WPIV use a gate valve.

Pre-Action System

Type of automatic sprinkler system in which thermostatic devices charge the system with water before individual sprinklers are fused.

PredischARGE Alarm

Alarm that sounds before a total flooding fire extinguishing system is about to discharge; this gives occupants the opportunity to leave the area.

Pressure-Reducing Valve

Valve installed at standpipe connections that is designed to reduce the amount of water pressure at that discharge to a specific pressure, usually 100 psi (700 kPa).

Pressure Tank

Water storage receptacle that uses compressed air pressure to propel the water into the distribution system. Pressure tanks are generally small and provide only a limited amount of water for fire protection.

Proportioner

Device used to introduce the correct amount of agent, especially foam and wetting agents, into streams of water.

Proportioning Valve

Valve used to balance or divide the air supply between the aeration system and the discharge manifold of a foam system.

Proprietary System

Fire protection system owned and operated by the property owner.

Protein Foam

Protein foams are chemically broken down (hydrolyzed) protein solids. The end product of this chemical digestion is protein liquid concentrate.

Pump Can

Water-filled pump-type extinguisher. Also called Pump Tank.

Pump Capacity Rating

Maximum amount of water a pump will deliver at the indicated pressure.

Pump Charts

Charts carried on a fire apparatus to aid the pump operator in determining the proper pump discharge pressure to use when supplying hoselines.

Pump Discharge Pressure (PDP)

Actual velocity pressure (measured in pounds per square inch) of the water as it leaves the pump and enters the hoseline.

Pump Tank

See Pump Can.

R

Retard Chamber

Chamber that catches excess water that may be sent through the alarm valve during momentary water pressure surges. This reduces the chance of a false alarm activation. The retarding chamber is installed between the alarm check valve and alarm signaling equipment.

S

Sidewall Sprinkler

Sprinkler that extends from the side of a pipe and is used in small rooms where the branch line runs along a wall. It has a special deflector that creates a fan-shaped pattern of water. Also called Wall Sprinkler.

Sprinkler

Waterflow device in a sprinkler system. The sprinkler consists of a threaded nipple that connects to the water pipe, a discharge orifice, a heat-actuated plug that drops out when a certain temperature is reached, and a deflector that creates a stream pattern that is suitable for fire control. Also called Sprinkler Head.

Sprinkler Block

See Sprinkler Wedge.

Sprinkler Connection

See Fire Department Connection.

Sprinkler Head

See Sprinkler.

Sprinkler Kit

Collection of sprinklers, wedges, tongs, and wrenches used to close open sprinklers.

Sprinkler Riser

Vertical pipe used to carry water to the sprinkler system.

Sprinkler System

See Automatic Sprinkler System.

Sprinkler Tongs

Tool used to stop the flow of water from a sprinkler.

Sprinkler Wedge

Piece of wood in the shape of a wedge used to stop the flow of water from individual sprinklers. Also called Sprinkler Block.

Sprinkler Wrench

Special wrench designed for tightening or loosening sprinklers.

Standpipe Hose

Single-jacket hose, lined or unlined, that is preconnected to a standpipe; used primarily by building occupants to mount a quick attack on an incipient fire.

Standpipe System

Wet or dry system of pipes in a large single-story or multistory building with fire hose outlets connected to them. The system is used to provide quick deployment of hoselines during fire fighting operations.

T

Telephone Alarm Box

Public fire alarm station that includes a telephone that gives a direct line on which the caller can talk to the complaint taker/dispatcher. Also called Call Box.

U

UL

Abbreviation for Underwriters Laboratories Inc.

Underwriters Laboratories Inc. (UL)

Independent fire research and testing laboratory.

Unlined Hose

Fire hose without a rubber lining; most frequently used in interior standpipe systems and in wildland fire fighting.

Upright Sprinkler

Sprinkler that sits on top of the piping and sprays water into a solid deflector that breaks it up into a hemispherical pattern that is redirected toward the floor.

V

Venturi Principle

When a fluid is forced under pressure through a restricted orifice, there is a decrease in the pressure exerted against the side of the constriction and a corresponding increase in the velocity of the fluid. Because the surrounding air is under greater pressure, it rushes into the area of lower pressure.

Vertical-Shaft Turbine Pump

Fire pump originally designed to pump water from wells. Presently, it still has application when the water supply is from a nonpressurized source. Vertical-shaft pumps ordinarily have more than one impeller and are therefore multistage pumps.

Volute

Spiral, divergent chamber of a centrifugal pump in which the velocity energy given to water by the impeller blades is converted to pressure.

W

Wall Post Indicator Valve (WPIV)

Similar to a PIV but mounted on the wall of the protected structure.

Wall Sprinkler

See Sidewall Sprinkler.

Waterflow Detector

Waterflow detector recognizes movement of water within the sprinkler or standpipe system. Once movement is noted, the detector gives a local alarm and/or may transmit the alarm.

Water Hammer

Force created by the rapid deceleration or acceleration of water. It generally results from closing a valve or nozzle too quickly.

Wet-Pipe Sprinkler System

Automatic sprinkler system in which the pipes are constantly filled with water under pressure.

Wet Standpipe System

Standpipe system that has water supply valves open and maintains water in the system at all times.

Wetting Agent

Chemical solution added to water to reduce its surface tension and improve its penetrating ability; soap is a mild form of wetting agent.

Wet Water

Wetting agent that is introduced to water to reduce the surface tension and improve its penetration qualities.

WPIV

Abbreviation for Wall Post Indicator Valve.

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Maximum amount of water a pump will deliver at the indicated pressure.

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Actual velocity pressure (measured in pounds per square inch) of the water as it leaves the pump and enters the hoseline.

Pump Tank

See Pump Can.

R

Retard Chamber

Chamber that catches excess water that may be sent through the alarm valve during momentary water pressure surges. This reduces the chance of a false alarm activation. The retarding chamber is installed between the alarm check valve and alarm signaling equipment.

S

Sidewall Sprinkler

Sprinkler that extends from the side of a pipe and is used in small rooms where the branch line runs along a wall. It has a special deflector that creates a fan-shaped pattern of water. Also called Wall Sprinkler.

Sprinkler

Waterflow device in a sprinkler system. The sprinkler consists of a threaded nipple that connects to the water pipe, a discharge orifice, a heat-actuated plug that drops out when a certain temperature is reached, and a deflector that creates a stream pattern that is suitable for fire control. Also called Sprinkler Head.

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Single-jacket hose, lined or unlined, that is preconnected to a standpipe; used primarily by building occupants to mount a quick attack on an incipient fire.

Standpipe System

Wet or dry system of pipes in a large single-story or multistory building with fire hose outlets connected to them. The system is used to provide quick deployment of hoselines during fire fighting operations.

T

Telephone Alarm Box

Public fire alarm station that includes a telephone that gives a direct line on which the caller can talk to the complaint taker/dispatcher. Also called Call Box.

U

UL

Abbreviation for Underwriters Laboratories Inc.

Underwriters Laboratories Inc. (UL)

Independent fire research and testing laboratory.

Unlined Hose

Fire hose without a rubber lining; most frequently used in interior standpipe systems and in wildland fire fighting.

Upright Sprinkler

Sprinkler that sits on top of the piping and sprays water into a solid deflector that breaks it up into a hemispherical pattern that is redirected toward the floor.

V

Venturi Principle

When a fluid is forced under pressure through a restricted orifice, there is a decrease in the pressure exerted against the side of the constriction and a corresponding increase in the velocity of the fluid. Because the surrounding air is under greater pressure, it rushes into the area of lower pressure.

Vertical-Shaft Turbine Pump

Fire pump originally designed to pump water from wells. Presently, it still has application when the water supply is from a nonpressurized source. Vertical-shaft pumps ordinarily have more than one impeller and are therefore multistage pumps.

Volute

Spiral, divergent chamber of a centrifugal pump in which the velocity energy given to water by the impeller blades is converted to pressure.

W

Wall Post Indicator Valve (WPIV)

Similar to a PIV but mounted on the wall of the protected structure.

Wall Sprinkler

See Sidewall Sprinkler.

Waterflow Detector

Waterflow detector recognizes movement of water within the sprinkler or standpipe system. Once movement is noted, the detector gives a local alarm and/or may transmit the alarm.

Water Hammer

Force created by the rapid deceleration or acceleration of water. It generally results from closing a valve or nozzle too quickly.

Wet-Pipe Sprinkler System

Automatic sprinkler system in which the pipes are constantly filled with water under pressure.

Wet Standpipe System

Standpipe system that has water supply valves open and maintains water in the system at all times.

Wetting Agent

Chemical solution added to water to reduce its surface tension and improve its penetrating ability; soap is a mild form of wetting agent.

Wet Water

Wetting agent that is introduced to water to reduce the surface tension and improve its penetration qualities.

WPIV

Abbreviation for Wall Post Indicator Valve.

Table Of Contents

PREFACE	x
GLOSSARY	xii
INTRODUCTION.....	1
1 AUTOMATIC SPRINKLER SYSTEMS.....	9
Standards Related To Automatic Sprinkler Systems	10
NFPA 13, Standard for the Installation of Sprinkler Systems	10
NFPA 13A, Recommended Practice for the Inspection, Testing and Maintenance of Sprinkler Systems	10
NFPA 13D, Standard for the Installation of Sprinkler Systems in One- and Two-Family Dwellings and Mobile Homes.....	10
NFPA 13E, Recommendations for Fire Department Operations in Properties Protected by Sprinkler and Standpipe Systems	10
NFPA 13R, Standard for the Installation of Sprinkler Systems in Residential Occupancies up to Four Stories in Height.....	11
Components Of Sprinkler Systems.....	11
Sprinklers.....	11
Heat-Sensitive Device	12
Deflector Component	14
Discharge Orifice And Water Discharge Rates	15
Sprinkler System Piping	16
Valves	17
Control Valves.....	17
Operating Valves	19
Water Supply	21
Elevated Tanks	21
Aboveground Reservoirs	22
Pressure Tanks	22
Natural Water Sources.....	22
Fire Department Connections.....	22
Types Of Sprinkler Systems	24
Wet-Pipe Sprinkler System	24
Dry-Pipe Sprinkler System	28
Deluge Sprinkler System	32
Preaction Sprinkler System	34
Design Of Automatic Sprinkler Systems	35
Occupancy Classifications	35
Sprinkler Spacing	36
Sprinkler Pipe Sizing.....	37
Sprinkler Systems For Industrial Storage Occupancies	39
Classification Of Commodities	40
Determining The Classification	40
Storage Methods	41
Inspecting And Testing Sprinkler Systems	44
Sprinklers.....	45
Sprinkler Piping And Hangers	46