

## Sprinkler Head Temperature Ratings

Max Ceiling Temperature (F)	Head Temperature Rating (F)	Temperature Classification	Color Code	Glass Bulb Color
100	135-170	Ordinary	Uncolored or Black	Orange or Red
150	175-225	Intermediate	White	Yellow or Green
225	250-300	High	Blue	Blue
300	325-375	Extra High	Red	Purple
375	400-475	Very Extra High	Green	Black
475	500-575	Ultra High	Orange	Black
625	650	Ultra High	Orange	Black

## Sprinkler Coverage

Another development in sprinkler manufacturing is the extended coverage sprinkler. The deflectors on these sprinklers are designed to discharge water over larger areas than standard sprinklers. While this means that each sprinkler must have a higher flow, it results in increased allowable distance between sprinklers, with the possibility that fewer sprinklers may be required in a compartment given size.

## Sprinkler Responses

A major development in sprinkler technology was the quick response sprinkler, a sprinkler with a specially designed response element that allows the rapid transfer of heat to the heat-responsive element and provides a more expeditious delivery of water to the fire. At the time of sprinkler actuation, the fire should be smaller with a quick response sprinkler than with a standard response sprinkler, resulting in fewer sprinklers likely to actuate. Sprinkler elements are either glass bulbs or eutectic (soldered) elements. The response of quick response and standard response sprinklers can be modeled by designers to estimate the time for a sprinkler to actuate, given ceiling height, fire size, and response time index (RTI), using the DETACT computer program, developed by the Building and Fire Research Laboratory at the National Institute of Standards and Technology (NIST). Response time index is a measure of the sensitivity of a sprinkler heat responsive element, with low RTI values being very sensitive to actuation by heat, and high RTI values being less sensitive.

## Sprinkler for Storage Applications

ESFR and large Drop sprinklers are for specialized high challenge fire hazards. An ESFR sprinkler has a quick response element and an extra large orifice that allows for greater amounts of water to be applied early in the fire development, usually on a high challenge fire. Large drop sprinklers have large deflectors with widely spaced teeth to facilitate the creation of large water drops intended to penetrate a high velocity fire plume without evaporating, resulting in some water reaching the burning materials. The fire plume is the column of smoke and gas traveling upward from a fire.

## Sprinkler System Inspection Requirements

NFPA requires that certain activities be performed at prescribed frequencies. However, rarely does an inspection and test agreement assign all of these activities and frequencies to a fire prevention company. To comply fully, an implied partnership is formed between the owner or the owner's representative and the contractor. All of the requirements of NFPA

25 are the responsibility of the owner, and the contractor relies on the owner to perform all inspections and tests not specified in the agreement.

A common agreement for a wet sprinkler system will have the fire protection contractor coming to the building on an annual basis to conduct the annual inspections (See Below), while the owner or owner's representative performs the quarterly, monthly, and weekly required inspections.

Unless specifically referenced in the agreement all other less-frequent activities are not included such as testing gauges every 5 years, testing sprinklers every 5, 10, 20, or 50 years; and internally inspecting alarm valve, check valves, strainers, filters, and orifices. These activities are normally performed by the fire protection contractor but are invoiced as additional periodic services.

## Sprinkler System Inspection Frequencies

<i>Device</i>	<i>Activity</i>	<i>Frequency</i>
<b>Sprinkler System</b>		
Gauges (Dry, Pre-Action, Deluge Systems)	Inspection	Weekly/Monthly
Control Valves	Inspection	Weekly/Monthly
Alarm Devices	Inspection	Quarterly
Gauges (Wet Pipe Systems)	Inspection	Monthly
Hydraulic Nameplate	Inspection	Quarterly
Buildings	Inspection	Annually (prior to freezing)
Hanger/Seismic Bracing	Inspection	Annually
Pipe and Fittings	Inspection	Annually
Sprinklers	Inspection	Annually
Spare Sprinklers	Inspection	Annually
Fire Department Connections	Inspection	Quarterly
Alarm Devices	Test	Quarterly/Semi-Annually
Main Drain	Test	Annually
Anti-freeze Solution	Test	Annually
Gauges	Test	5 years
Sprinklers -- Extra High Temperature	Test	5 years
Sprinklers -- Fast Response	Test	At 20 years and every 10 thereafter
Sprinklers	Test	At 50 years and every 10 thereafter
Valves	Maintenance	Annually or as needed
Obstruction	Maintenance	5 years or as needed
Low Point Drains (Dry Pipe Systems)	Maintenance	Annually prior to freezing and as needed
<b>Private Fire Service Main</b>		
Hose Houses	Inspection	Quarterly
Hydrants (Dry Barrel with Wall)	Inspection	Annually and after each operation
Monitor Nozzle	Inspection	Semi-Annually
Hydrants (Wet Barrel)	Inspection	Annually and after each operation
Mainline Strainers	Inspection	Annually and after each significant flow
Piping (Exposed)	Inspection	Annually
Piping (Underground)	Inspection	See NFPA 25
Monitor Nozzle	Test	Flow Annually (Range and Operation)
Hydrants	Test	Flow Annually
Piping (Exposed and Underground)	Flow Test	5 years
Mainline Strainers	Maintenance	Annually and after each operation
Hose Houses	Maintenance	Annually
Hydrants	Maintenance	Annually
Monitor Nozzle	Maintenance	Annually
<b>Standpipe</b>		
Control Valves	Inspection	Weekly/Monthly
Pressure Regulating Devices	Inspection	Quarterly
Piping	Inspection	Quarterly
Hose Connections	Inspection	Quarterly

Cabinet	Inspection	Annually
Hose	Inspection	Annually
Hose Storage Device	Inspection	Annually
Alarm Device	Test	Quarterly
Hose Nozzle	Test	Annually
Hose Storage Device	Test	Annually
Hose	Test	5 years/3 years
Pressure Control Valve	Test	5 years
Pressure Reducing Valve	Test	5 years
Hydrostatic Test	Test	5 years
Flow Test	Test	5 years
Main Drain Test	Test	Annually
Hose Connections	Maintenance	Annually
Valves	Maintenance	Annually or as needed
<b>Water Storage Tanks</b>		
Conditions of Water in Tank	Inspection	Monthly/Quarterly
Water Temperature	Inspection	Daily/Weekly
Heating System	Inspection	Daily/Weekly
Control Valves	Inspection	Weekly/Monthly
Water Level	Inspection	Monthly/Quarterly
Air Pressure	Inspection	Quarterly
Tank Exterior	Inspection	Quarterly
Support Structure	Inspection	Quarterly
Catwalks and Ladders	Inspection	Quarterly
Surrounding Areas	Inspection	Annually
<b>Valves</b>		
<i>Control Valves</i>		
Sealed	Inspection	Weekly
Locked	Inspection	Monthly
Tamper Switches	Inspection	Monthly
<i>Alarm Valves</i>		
Exterior	Inspection	Monthly
Interior	Inspection	5 years
Strainers, filters, orifices	Inspection	5 years
<i>Check Valves</i>		
Interior	Inspection	5 years
<i>Pre-Action/Deluge Valves</i>		
Enclosure (cold)	Inspection	Daily/Weekly
Exterior	Inspection	Monthly
Interior	Inspection	Annually/5 years
Strainers, Filters, Orifices	Inspection	5 years
<i>Dry Pipe Valves/Quick Opening Devices</i>		
Enclosure	Inspection	Daily/Weekly
Exterior	Inspection	Monthly
Interior	Inspection	Annually

Strainers, Filters, Orifices	Inspection	5 years
<b><i>Pressure Reducing and Relief Valves</i></b>		
Sprinkler System	Inspection	5 years
Hose Connections	Inspection	Quarterly
Hose Racks	Inspection	Quarterly
Fire Pump	Inspection	Weekly
<b><i>Backflow Prevention Assemblies</i></b>		
Reduced Pressure	Inspection	Weekly/Monthly
Reduced Pressure Detectors	Inspection	Weekly/Monthly
<b><i>System Devices</i></b>		
Fire Department Connections	Inspection	Quarterly
Main Drains	Test	Annually/Quarterly
Water-Flow Alarms	Test	Quarterly
<b><i>Control Valves</i></b>		
Position	Test	Annually
Operation	Test	Annually
Supervisory	Test	Semi-Annually
<b><i>Pre-Action/Deluge Valves</i></b>		
Priming Water	Test	Quarterly
Low Air Pressure Alarm	Test	Quarterly
Full Flow	Test	Annually
<b><i>Pre-Action/Deluge Valves</i></b>		
Priming Water	Test	Quarterly
Low Air Pressure Alarm	Test	Quarterly
Full Flow	Test	Annually
<b><i>Dry Pipe Valves/Quick Opening Devices</i></b>		
Priming Water	Test	Quarterly
Low Air Pressure Alarm	Test	Quarterly
Quick Opening Devices	Test	Quarterly
Trip Test	Test	Annually
Full Flow Trip Test	Test	3 years
<b><i>Pressure Reducing and Relief Valves</i></b>		
Sprinkler System	Test	5 years
Circulation Relief	Test	Annually
Pressure Relief Valves	Test	Annually
Hose Connections	Test	5 years
Hose Racks	Test	Annually
<b><i>System Devices</i></b>		
Backflow Prevention Assemblies	Maintenance	Annually
Control Valves	Maintenance	Annually
Pre-Action/Deluge Valves	Maintenance	Annually
Dry Pipe Valves/Quick Opening Devices	Maintenance	Annually

## Fire Pump Testing and Maintenance Frequency

Device	Activity	Frequency
<b>Pump System</b>		
Lubricate pump bearings	Change	Annually
Check pump shaft end play	Check	Annually
Check accuracy of pressure gauges and sensor	Check	Annually
Check pump coupling alignment	Check	Annually
Wet pit suction screens	Check	After each operation
<b>Mechanical Transmission</b>		
Lubricate coupling	Change	Annually
Lubricate right-angle gear drive	Change	Annually
<b>Electrical System</b>		
Exercise isolating switch and circuit breaker	Test	Monthly
Trip circuit breaker (if provided)	Test	Annually
Operate manual starting means (electrical)	Test	Semi-annually
Inspect and operate emergency manual start	Test	Annually
Tighten electrical connections as necessary	Check	Annually
Lubricate mechanical moving parts	Check	Annually
Calibrate pressure switch settings	Check	Annually
Grease motor bearings	Change	Annually
<b>Diesel Engine System</b>		
<b>Fuel</b>		
Tank level	Check	Weekly
Tank float switch	Test	Weekly
Solenoids valve operation	Test	Weekly
Strainer, filter, or dirt leg, or combination thereof	Clean	Quarterly
Water and foreign material in tank	Clean	Annually
Water in system	Check/Clean	Weekly
Flexible hoses and connectors	Visual Inspection	Weekly
Tank vents and overflow piping unobstructed	Check	Annually
Piping	Visual Inspection	Annually
<b>Lubrication System</b>		
Oil level	Check	Weekly
Oil change	Change	Annually
Oil filter	Change	Annually
Lube oil heater	Check	Weekly
Crankcase breather	Change/Clean	Quarterly
<b>Cooling System</b>		
Level	Check	Weekly
Antifreeze protection level	Test	Semi-annually
Antifreeze	Change	Annually
Adequate cooling water to heat exchanger	Check	Weekly

Rod out heat exchanger	Clean	Annually
Water pump(s)	Visual Inspection	Weekly
Condition of flexible hoses and connections	Check	Weekly
Jacket water heater	Check	Weekly
Inspect duct work, clean louvers (combustion air)	Check/Change	Annually
Water strainer	Clean	Quarterly
<b>Exhaust System</b>		
Leakage	Check	Weekly
Drain condensate trap	Check	Weekly
Insulation and fire hazards	Visual Inspection	Quarterly
Excessive back pressure	Test	Annually
Exhaust system hangers and supports	Visual Inspection	Annually
Flexible exhaust section	Visual Inspection	Semi-annually
<b>Battery System</b>		
Electrolyte level	Check	Weekly
Terminals clean and tight	Check	Quarterly
Remove corrosion, case exterior clean and dry	Change	Monthly
Specific gravity or state of charge	Test	Monthly
Charger and charge rate	Visual Inspection	Monthly
Equalize charge	Check	Monthly
<b>Electrical System</b>		
General inspection	Visual Inspection	Weekly
Tighten control and power wiring connections	Check	Annually
Wire chafing where subject to movement	Check	Quarterly
Operation of safeties and alarms	Check/Test	Semi-annually
Boxes, panels, and cabinets	Clean	Semi-annually
Circuit breakers or fuses	Check	Monthly
Circuit breakers or fuses	Change	Biennially