

# Safety Zone: Sprinkler Systems: NFPA 13 and 13R Comparison

Since the invention of fire sprinklers over 100 years ago, the rules, equipment, industries and occupancies have significantly changed. Sprinkler systems are not all the same. It is important to know your system. This document examines the differences between full sprinkler protection (NFPA 13) and residential systems intended for life safety protection (NFPA 13R).

## NFPA 13R - Residential Life Safety

- This level of protection allows residential occupants to escape
- High (but not absolute) level of life safety
- Sprinklers may be omitted in certain spaces - buildings are not 100% protected
- Density of 0.05 gpm/ft<sup>2</sup> or per sprinkler listing
- Maximum 4-sprinkler design
- Attics are often unprotected. Attic or roof fires can extend throughout the entire building and collapse into sprinkler areas, damaging and defeating the protection there
- No protection of balconies
- Minimal design for a single fire. No safety factor for fires with multiple origins
- Alarms, controls, testing capabilities are minimized to reduce costs
- Allows shorter duration of water supplies
- Small, or no, fire department connection
- Smaller piping sizes
- No requirements for underground supply piping. Local plumbing codes only
- May be used as a trade-off for lesser fire-fighting response
- Limitations on building occupancy (residential only), size, and number of stories
- Uncommon in hospitals, nursing homes, college residences, multi-story residential (alternatives or exceptions can apply)

## NFPA 13 - Preferred

Protects life, the facility and all assets. They are not limited to residential.

- Higher degree of property protection
- Considered “fully sprinklered.” Preferred for insurance purposes
- Minimum density of 0.1 gpm/ft<sup>2</sup>, or sprinkler listing
- Minimum 4-sprinkler design. Commonly much larger
- More reliable design and installation
- Sprinklers on balconies
- Greater safety factors
- Designed for a larger area of application, with higher occupant densities
- Larger drains, alarms, controls, better reliability, inspection, test & maintenance capabilities
- In service and use tested over 100 years
- Full-size fire department connection
- Underground supply piping size rules and installation codes for fire protection systems
- Plastic piping may be used, but generally, more robust piping is in use
- More trade-offs may be allowed for materials fire ratings or other construction requirements
- No limit on occupancy or hazard (depends on proper and appropriate design)

## Conclusion

Sprinklers provide a high level of life safety. The NFPA tells us that the risk of dying in a home fire decreases by about 80% if sprinklers are present. Property losses are 85% lower in residences with fire sprinklers than those without sprinklers. The combination of automatic sprinklers and early warning systems, such as smoke alarms, can reduce injuries, loss of life, and property damage by at least 50%.

NFPA 13R is useful for life safety and a degree of incipient property protection, but it does not provide the reliable level of property protection as NFPA 13. Protection designed to NFPA 13 has significant advantages. NFPA 13 is the level of protection recommended by AmTrust Loss Control when the objective is protection against building or contents losses and the preservation of life.

For additional information and resources on this topic and other safety and risk management subjects, be sure to visit the [Loss Control](#) section on our website.

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