

Attic Sprinkler Use Outside of the Traditional Attic Space - Interpretation

Background

The Minnesota State Fire Marshal division's (SFM) Fire Protection Team has been asked to consider the use of the *Tyco Specific Application Attic® Sprinkler* in applications other than attic spaces. Specifically, the application would be the use of Model BB (Back to Back) Attic® sprinklers under a "cathedral" ceiling open to the area below which is classified as a light hazard occupancy. The sprinklers would be installed exposed below the vaulted ceiling.

The specific question involved the proposed installation in a church sanctuary. Although not specifically listed for this type of installation, the manufacturer had in the past, suggested that this might be an appropriate "alternate use". The manufacturer has since reconsidered its "alternate use" position.

Sprinkler Listing and Design Criteria

The Fire Protection Team investigated the listing of the head, the manufacturer's design criteria and its installation guidelines which included the following:

- **Area of Use:** Roof structures, combustible and non-combustible, including wood joist/rafters and wood trussed attics, with a ceiling below.
- **System Type:** Wet pipe systems using CPVC pipe; wet or dry pipe systems using steel pipe.
- **Hazard:** Light hazard.
- **Roof Slope:** Roof slopes from a minimum of 4:12 to maximum of 12:12.
- **Roof Span:** Maximum roof span of 60 feet measured horizontally (not along the slope).
- **Temperature Ratings:** 200° F with K=8.0; 212° F with K=5.6.

Considerations

- The Attic® sprinklers are limited by their listing to attic construction with a ceiling below.
- The Attic® sprinkler has a better distribution pattern for attic (combustible) construction than for an open floor plan. The sprinkler spray pattern is unique in that it directs its spray along the roof line and throws much of the water out toward the edges of the roof.



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- The manufacturer has not tested the Attic® sprinklers as an extended coverage area/density sprinkler for light hazard occupancy.
- It did not appear that the Attic® sprinklers could provide a 0.10 GPM / sq. ft. average distribution over the floor area (i.e. density). They are designed mainly to protect structure.
- NFPA 13 (2016) requires ordinary temperature-rated sprinklers shall be used throughout buildings. NFPA 13 allows sprinklers of intermediate and high-temperature classifications only to be installed in specific locations. The Attic® sprinklers are only available in intermediate-temperature classification.
- The manufacturer has no testing evidence to support the use of Attic® sprinklers beyond their listing.
- The manufacturer does not recommend the use beyond the listing.
- NFPA 13 does provide guidance on the protection of steeply pitched roofs with standard spray sprinklers.
- There are significant liabilities created by allowing the use of these sprinklers beyond their listing.
- The Fire Protection Team received dozens of responses back from leading fire protection engineers, AHJs, and fire protection contractors across the United States.
- The Fire Protection Team spoke with the manufacturer by telephone and confirmed that use outside the listing was not an appropriate application.
- The Fire Protection Team reviewed the original test results and listing criteria.

Conclusion

Based on the review of the manufacturer's installation criteria, the original listing and test criteria performed by Underwriter's Laboratory (UL), telephone conversations with the manufacturer, and responses from national experts, we have reached the following decision:

- The SFM will not accept the installation of the *Tyco Specific Application Attic® Sprinklers* in applications beyond their listing.
- It is not the SFM's position to retroactively cause the removal of this type of installation previously installed by contractors and approved by state or local AHJs acting in good faith.

