

The Station House

A Newsletter for AHJ's, Fire Sprinkler Contractors & Underwriters



In This Issue

- **Tyco / PBS Video available for Industry**
- **Sloped Attic Space and Concealed Space Fire Protection Changes**
- **Underwriters Laboratory Bans the use of O-Ring Sprinklers**
- **New Listing for New Residential LFII Sprinklers in "Beamed" Ceilings**
- **New Concealed Side Wall Sprinklers for Student Housing and Light Hazard**
- **Sprinklers Never Sleep Success Stories**
- **NFPA 2002 Code Update- Dramatic Changes to the Fire Sprinkler Industry**

Tyco Fire Completes PBS Residential Feature for the Fire Protection Community

Working with WJMK, the PBS affiliate in Miami, Tyco Fire Products recently completed a five-minute segment for the "American Architectural Review" series that is hosted by Morley Safer. The segment was filmed in Orlando, Florida, and spotlights Residential Fire Protection.

The presentation features Al Hogan, the Chief Fire Protection Engineer of the Reedy Creek Development at Disney World; Wayne Gey, President of Wayne Automatic (with multiple Florida locations); and Peter Thomas, Vice President of Research and Development for Tyco Fire Products in Cranston, Rhode

Island. Filmed at a multi-family construction site, the segment presents an installation overview, benefits of residential sprinklers, explanations of the system, water demand and sprinkler operation. A finished family room setting is used to demonstrate the aesthetics of the finished system.



Video Stills of PBS/
AAR Video

"Tyco Fire Products was pleased to have had the opportunity to further homeowner understanding of residential fire protection systems," states Tom Prymak, Vice President of Marketing for the company. "The Public Broadcasting System allows us to reach the average homeowner who may never have been aware of the availability and benefits of residential fire protection systems. It also offered us the opportunity to educate the audience, as well as reaching many who may have an influence on the enactment and enforcement of codes that require the life safety benefits of commercial and residential fire sprinkler systems."

The "American Architectural Review" focuses on construction and innovations; the presentations are aired nationally during prime time hours as "fill-in" pieces. The segment on residential fire protection is expected to receive air time for a minimum one-year period on more than three hundred PBS affiliates.

The feature can be viewed at the Tyco Fire Products website at www.tyco-fire.com, and is also available as a CD-ROM that can be viewed on computers. Copies can be obtained by contacting Tyco Fire Products headquarters toll free at 800-523-6512.



NFPA Changes for Sloped Attic Spaces...

Tyco Fire & Building Products has for years had Specific Application "Attic" Sprinklers that were specifically designed for use in sloped attic structures. This year, Tyco submitted to NFPA the test results of fire testing in the same conditions using "Standard-Spray" upright and pendent sprinklers. The results of the fire testing were not positive, since all resulted in a burn-through condition.



Task Group Fire-Test in 4/12 Roof Slope- This was considered acceptable



Damage Result of Task Group Acceptable Fire Test

Based on this testing, questions were raised as to the level of protection provided by quick response standard-spray sprinklers in sloped ceiling construction. NFPA decided to launch a task group to analyze the data, and make recommendations on how effective these sprinklers perform. Consequently, UL ran a series of six full-scale fire tests investigating this effectiveness. The task group discovered that the current way that was acceptable for installation did not adequately control the fire. Alarming results showed that when using standard-spray sprinklers in these areas, it was critical to have sprinklers at or very near the high point peak. Current NFPA guidelines allowed the sprinklers to be physically up to 7'-6" away from the peak. Current rules allow spacing between sprinklers up to 15'-0".

Based on the task groups testing and recommendations, the spacing guidelines have been limited to smaller areas of coverage; maximum spacing between sprinklers has been limited. Also, mandated locations of sprinklers in reference to the peak area has been established and in some cases, higher operating pressure for the sprinklers are required. All of these new requirements are due to the real-world testing and results discovered after this series of fire tests.

NFPA Code Changes Due to Testing:

Protecting combustible concealed spaces with members 3 feet or less on center and a slope greater than 4 inches per foot.

- Line of sprinklers must be installed within **12"** horizontally of the peak (**New Requirement**)
- Line of sprinklers must be installed within **6'-0"** of the eave (**New Requirement**)
- Protection Area Maximum - **120 sq. ft. (Was 130)**
- Spacing Maximum –
 - **8' (at ridge) x 15'**, Pressure Req. **7 psi**
 - **10' (at ridge) x 12'**, Pressure Req. **20 psi**

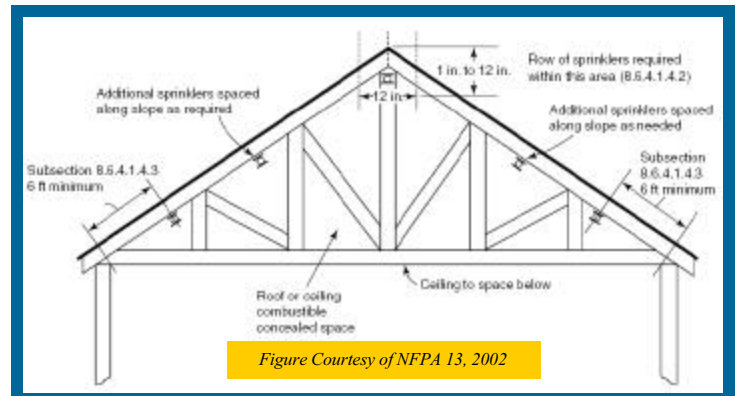


Figure Courtesy of NFPA 13, 2002

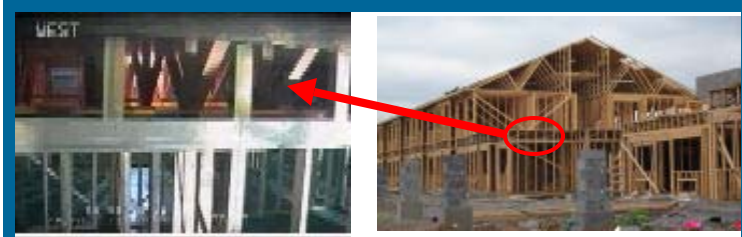
These changes to the 2002 NFPA standard regarding the protection of sloped construction are substantial and should be realized by all disciplines in the fire protection community. The differences in designing these systems are much different than was acceptable, but truly create a better way of sprinklering an occupancy that has difficult challenges.



Office Building Fire in Pennsylvania- Electrical Fire Above Ceiling of 2nd Floor- Full Collapse of Roof Within Minutes - \$4,000,000 Loss (Reprinted from NFPA Journal)

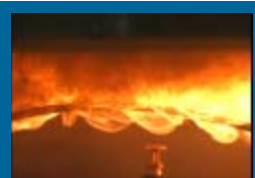
NFPA Changes for “Combustible Concealed” Standard Spray Sprinklers Show Problems

What is a Combustible Concealed Space?



Combustible Concealed (Interstitial) Space

A typical combustible concealed space is the interstitial space between floor levels generally found in wood construction. This is the area where much of the piping, tubing, lighting and mechanical products are installed in a building. Most of the combustible concealed spaces requiring sprinklers are located directly above a ceiling space.



Flames “Above” Sprinklers



Standard Spray Pattern “Cut-off” in a fire

Tyco Fire realized that in order to combat fires in combustible interstitial spaces, a different approach needed to be taken in regards to the type of sprinkler nozzle used for these areas. An earlier test series performed in “attic” spaces showed that standard-spray sprinklers lacked the correct type of discharge pattern that would be needed for the relatively flat and “tight” combustible areas. The earlier testing showed that the pattern of a standard spray sprinkler would be truncated or cut-off, and could not develop as required. This testing enabled the development of the CC-1™ sprinkler nozzle.

Area of Use:

1. Flat concealed areas of wood truss construction or non-combustible bar joist construction
2. Flat concealed areas of solid wood joist construction with a maximum depth of upper joist at 12 inches.

Concealed Space Area:

The concealed space area is not limited. There is a requirement to section the area to 1000 ft (93 m) with draft-curtains if necessary.

Remote Area:

1000 ft (93 m)

Required Density and Minimum Operating Pressure:

0.10 gpm/ft (4.1 mm/min.) and 10 psi (0.7 bar)

Note: Limited Listed Use of CPVC Piping Allowed with the CC-1™ Sprinkler protecting the space.

Code Changes Due to Testing:

The NFPA codes are a minimum set of standards established to provide guidance on how to design and install fire protection concepts. While the majority of the standards provide excellent guidance, in some cases problems or concerns exist with what had been considered proper. The review of real world situations is actually a constant, ongoing process and is the primary reason why the codes change. The codes in fact “fix” problems that are discovered and include the fixes into the next or subsequent standard.



Test Failure with Standard Spray Sprinklers



Combustible Concealed Space Fire Testing with wood-crib fuel

NFPA 13 has reviewed the fire test data for both the CC-1 new technology, as well as the ‘standard-spray sprinklers, and the testing results were unarguable. A code change has been drafted, and accepted into the 2002 edition of NFPA 13 . It reads as follows:

8.14.1.6 Sprinklers used in horizontal combustible concealed spaces (with a slope not exceeding 2 inches per foot) having combustible upper surface where the assembly or supporting members channel heat and where the depth of the space less than 36” from deck to deck or with double wood joist construction with a maximum of 36” between the top of the bottom joist and the bottom of the upper joist shall be listed for such use.



Tyco Fire Products CC-1™ sprinkler

The Current Listed product that Tyco Fire & Building Products provides is the CC-1™ sprinkler nozzle.

U.L. Says No Way to O-Ring Sprinklers— They Are “Gone”

Tyco Fire Products has continually stood behind its product line both in quality and construction. There is no secret that Tyco has encountered challenges in regards to sprinkler O-ring components noted by field issues and laboratory testing. These challenges have resulted in Tyco making difficult decisions. The decisions were economically difficult but were necessary due to our commitment to the industry. Tyco has stood tall, and for a long time stood alone in these choices which affect the fire sprinkler manufacturer community. The decision of replacement of our older O-ring seal affected products was correct. Tyco Fire produces NO O-ring sprinklers. Tyco’s confidence in it’s product line is supported by a 10-year limited warranty, which has been in place for almost 2-years.

“After January 2003, O-Ring... Sprinklers Will No Longer Be Permitted...”

saved countless lives and reduced property damage. The fact that numerous lives and millions of dollars worth of property are lost each day to fires in structures not having sprinkler systems clearly indicates the need for expanded usage of sprinkler protection," said Jim Beyreis, UL's vice president of Global Engineering. "Based on our research, we have found that some O-ring sealed sprinklers can degrade over time due to corrosion or build up of minerals, salts and other elements in water that could affect how the sprinklers activate in a fire.

Even though the vast majority of sprinklers would operate, UL is making these revisions to enhance the level of safety sprinkler systems have provided for decades."

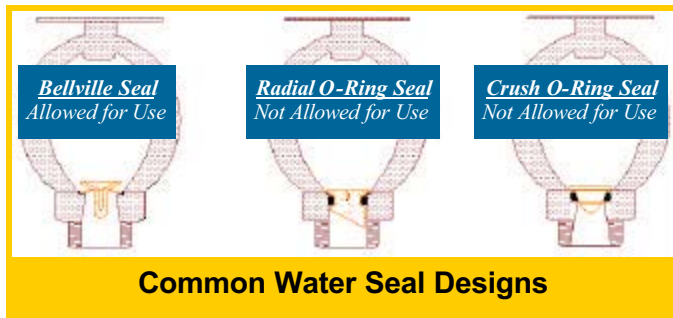
Attached is a statement from UL (Printed in part)

UL restricts use of O-rings in fire sprinklers

NORTHBROOK, Ill., July 27, 2001: Underwriters Laboratories Inc. (UL), the leading product safety testing and certification organization in North America, has revised UL's Standard for Safety for Automatic Sprinklers for Fire Protection Service, **UL 199**, regarding the use of O-ring water seals in fire sprinklers. **After January 2003, O-ring water seal constructions in sprinklers will no longer be permitted by the standard.**

Based upon the results of on-going sprinkler research activities, UL has disseminated several public notices reporting on the operating performance of certain sprinklers and recommending specific precautionary actions. UL issued public notices regarding dry sprinklers on January 22, 1999, and March 3, 2000. On February 2, 2000, and April 24, 2001, notices regarding the Model GB series sprinklers manufactured by Central Sprinkler Company were issued. Central Sprinkler Company recently announced a voluntary replacement program for these and other similarly constructed sprinklers. Additional information regarding this replacement program can be obtained by visiting the web site **www.SprinklerReplacement.com**.

This action follows a UL-funded two-year investigation of the field performance of O-ring sprinklers that included the extensive examination, testing and analysis of samples from more than 200 locations across the country, including hospitals, schools, offices, warehouses and residences. The revised standard was published on July 9, 2001.



Building owners desiring to have installed sprinklers tested should have representative samples of these sprinkler models removed from the installation and sent to UL for testing. Before representative sprinkler samples can be submitted to UL for testing, it is important to consult directly with the sprinkler

manufacturers or through their customer service representatives for information regarding removal and replacement of the test samples, as well as the applicable terms of the manufacturer's warranty.

"Fire sprinklers have an excellent field record, have

Fire Sprinklers Never Sleep— Success Stories

1— Sprinklers Save 50 Apartment Residents

An effective fire alarm system and the hard work of fire and police personnel are credited with getting more than 50 residents out of a burning apartment building.

“The **sprinklers went off just as the one-alarm fire ignited in a second story apartment** at 1:25 a.m.,” fire officials said.

Fire officials said clothes laying over an overheated extension cord helped ignite the fire. The clothes caught fire when the cord sparked, sending flames up the curtains and then into an air conditioner. The cord sparked because it fed too many high-powered electrical appliances, including a TV and VCR.

No damage was reported in other apartments or in the stores on the buildings ground floor. The Building Department gave residents of all but one of the 16 apartments the nod to return home at 10 a.m.

(Reprinted from FPC & Framingham Metro West News)

2— Sprinklers Protect School Before Class

The Abbotsford school district’s oldest elementary school may have been the victim of an arsonist less than a week before the start of the school year. However, students hoping for a prolonged summer break had no such luck.

“It could have been a lot worse,” said school custodian Bobbi Smith. **“The sprinklers saved the building.”**

Firefighters were called to the scene at 2 a.m. and found a burning propane cylinder at the south side of the school. Flames could be seen reaching up the exterior of the building and entering the attic.

“If not for water sprinklers in the attic, and considering the age of the building and the wood construction, the school would have been a complete loss,” fire officials said. “The cause of the fire is under investigation and arson is suspected. Said Smith, “I’m just happy that it is still standing.”

(Reprinted from FPC & Kitts@abbotsfordtimes.com)



3— Sprinkler Extinguishes Flash Fire

A two-year-old child was injured when he placed an open gasoline container next to an operating natural-gas water heater. The heater’s pilot light ignited the gasoline fumes in a flash fire that severely burned the child and **activated a sprinkler** in the garage.

The one-story, single-family, wood-frame house was built on a concrete slab and had an asphalt shingle roof. **A wet-pipe sprinkler system had been installed**, but the system wasn’t monitored. There was no report of smoke alarms.

An occupant called 911, and the father rescued the burned boy from the garage as a single sprinkler extinguished the fire.

Property loss was estimated at \$100.00

(Reprinted from the NFPA Journal)

NFPA Code Update (2002)

- *NFPA now requires the use of “Listed” sprinklers in Combustible Concealed Spaces 36” and less. This now prevents the use of “Standard Spray” sprinklers in these areas. (8.14.1.6)*
- *NFPA now mandates that sprinklers that are installed in sloping attic spaces are required to now be installed within 12” of the peak of the attic. The 36” rule (deflector to peak) will only apply to attics with a slope not exceeding a rise of 4 units and a run of 12 units.*
- *Sprinklers installed in and around ceiling “pockets” and soffit areas now do not have to consider the “pocket” an obstruction provided the pocket contains less than 1000 cubic feet.*
- *Residential Requirements (NFPA 13) **Not 13D or 13R*

The minimum required discharge from each of the four (4) hydraulically most demanding sprinklers shall be the greater of:

- a) *In accordance with the minimum flow rates indicated in individual listings, or*
- b) *Calculated based on delivery of a minimum of 0.1 gpm/sq. ft. (4.1 mm/min) over the design area*



Tyco Fire Products L.P.
451 North Cannon Avenue
Lansdale, PA 19466

Phone: 800-523-6512
215-362-0700
Fax: 215-362-5385



Remember, State Fire Marshal, Your VRP Statistics Are Attached ...

Your state's Voluntary Replacement Program Statistics are attached to this Newsletter. The Statistics for the VRP are state and program specific. You may distribute these statistics or this news letter to your constituents. We encourage you to pass along the information contained in this newsletter and the positive progress that is being made in the VRP.

Tyco Develops New "Concealed" Sidewall for use in Student Housing & Light Hazard Applications

Tyco Fire & Building Products is pleased to announce the future availability of the **"CHEC"** sprinkler.

Concealed-Horizontal-Extended-Coverage



This sprinkler concept was specifically designed for use in all light hazard occupancies, as well as unique residential applications. School student housing is ideal for this new sprinkler use. Other areas that are architecturally sensitive and which sidewall sprinklers would be preferred include hotel rooms, reception areas, office buildings, banquet facilities and hospitals.

Unlike other concealed sprinklers that are currently offered in the market place, special attention was applied to the **CHEC** model. The soft contour of the "concealed" coverplate is physically attractive, and contains no slits or slots on the face of the cover plate for heat collection. This prevents the ability of attaching materials to the plate itself, such as wire hangers.

Features & Benefits for the new **CHEC**:

- **8.0 K-factor**
- **16' x 22' (Quick Response)**
- **4' - 12' Deflector Distance**
- **Lowest Flows in the Industry:**
 - **16 x 14 (26 gpm)**
 - **16 x 16 (26 gpm)**
 - **16 x 20 (36 gpm)**
 - **16 x 22 (36 gpm)**

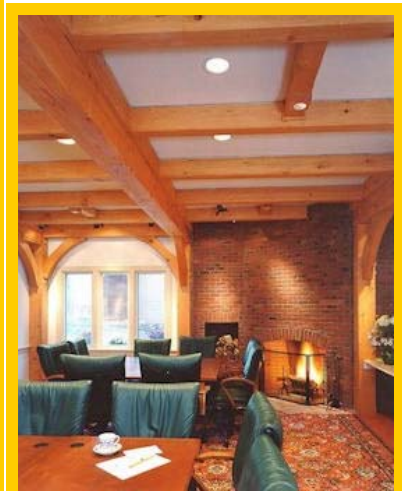
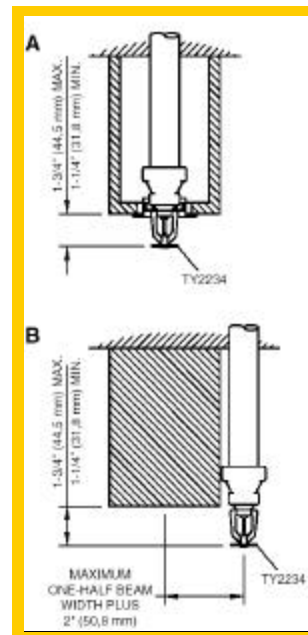
This product will be available in February 2003. Contact us on the Web at: www.tyco-fire.com for more information.

Tyco Fire Produces Another First-Residential Sprinklers Listed For "Beamed Ceilings"

Residential Sprinklers is one of Tyco Fire Products strengths. Tyco now has the **ONLY** option for protecting residential occupancies where "Beamed Ceilings" are present. This concept idea is not new, Tyco customers for years have been requesting this application yet the testing parameters were extremely difficult. For decades, the only Listed application for residential applications has been for Smooth-Flat-Horizontal-Ceilings. That has changed.

Over 90 fire tests later, Tyco Fire & Building Products has residential pendent sprinklers Listed for Beamed ceiling applications.

Please review the current literature for spacing and design information.



Contact us on the Web at: www.tyco-fire.com for more information.