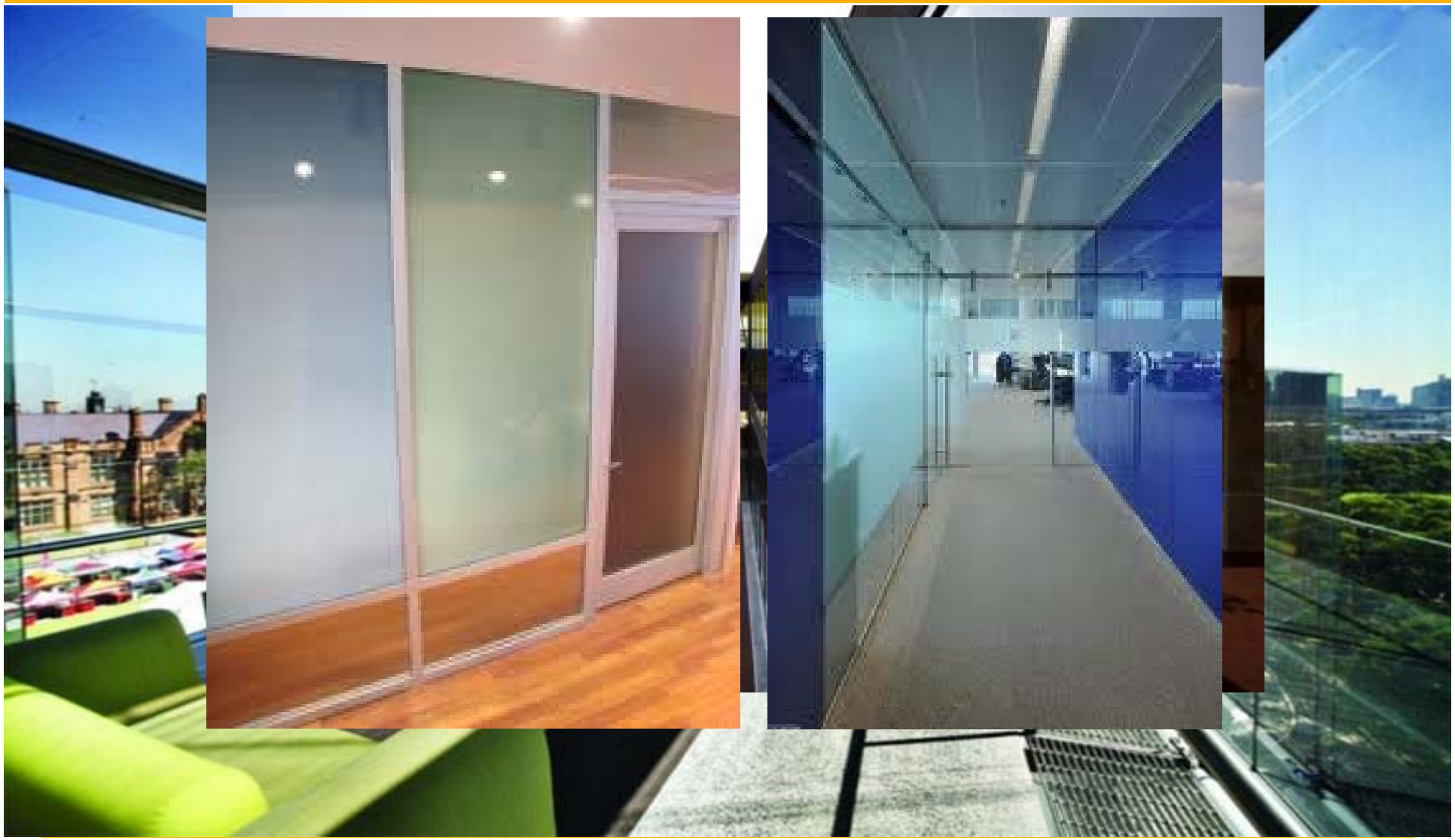
Special Sprinklers

tyco
Fire Protection Products

Products Covered Today

- Window Sprinklers
- Raven™ Institutional Sprinklers
- Combustible Concealed Sprinklers
- Flush Sprinkler Concrete Sprinklers

// Window Sprinklers



tyco Fire Protection Products

Training Objectives

- Understand the definition of Specific Applications Sprinklers.
- Review some of the fire tests conducted during the development of the window sprinklers.
- Identify the applications and design requirements of the window sprinklers.

New Technology

NFPA 13 states:

"…Nothing in this standard is intended to restrict new technologies or alternate arrangements, provided the level of safety prescribed by this standard is not lowered…"

What is “Specific Application”?

- A method of developing specific design and protection criteria for fire hazards not covered by current Standards.

OR

- A method of developing “improved” specific design and protection criteria for hazards currently covered by Standards, but may be found to be insufficient by today’s needs.

How does a “Specific Application” come about?

A need is identified by:

- Manufacturer
- Consortium (e.g. Retail Groups; Building Manufacturers; Tire Manufacturers; etc)
- Insurance Underwriters
- Private Sector

How Does a Specific Application Come About?

- Full Scale fire testing is performed by a Nationally Recognized Laboratory

At which;

- A “Specific Application” Listing is published in an appropriate Listing Guide

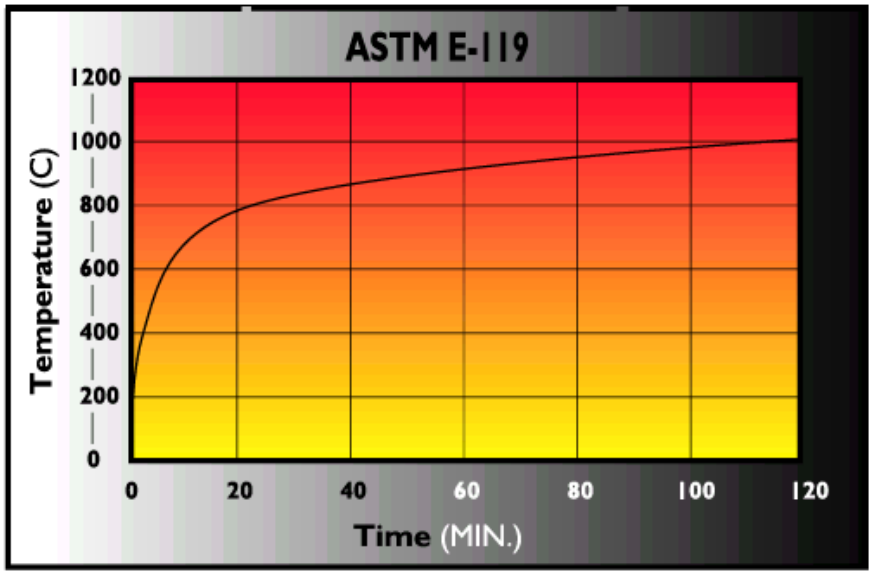
and/or

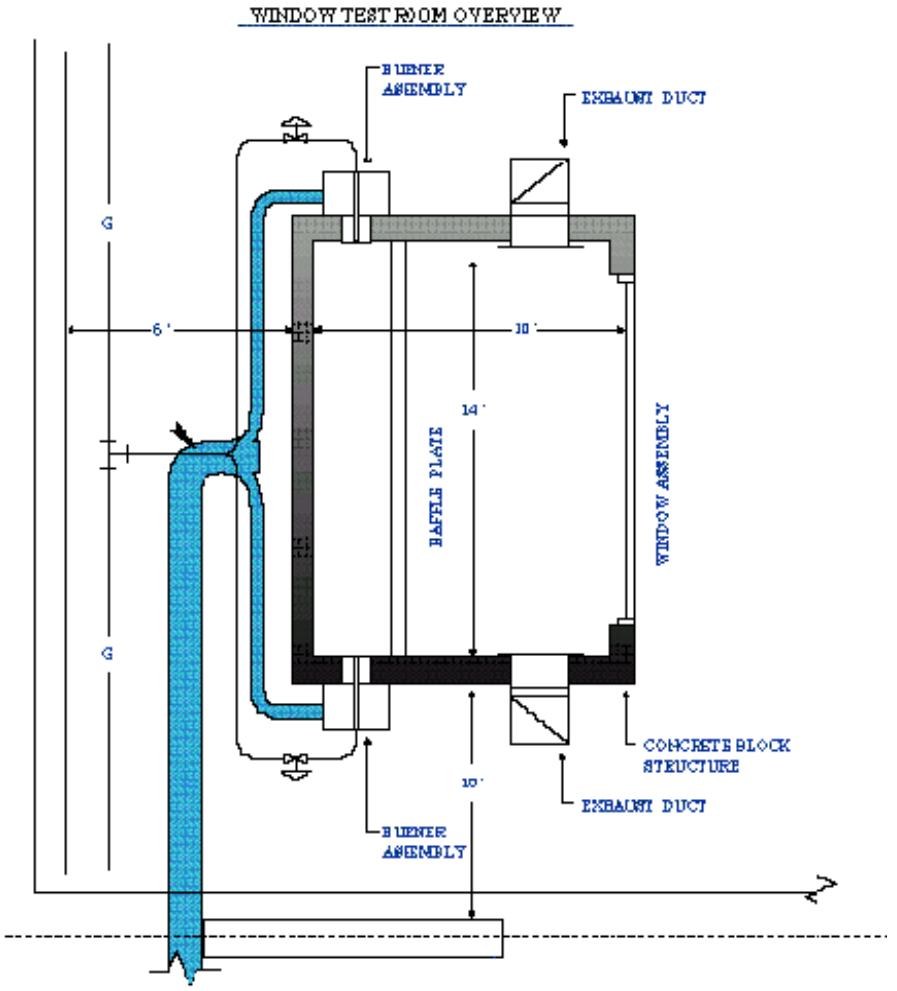
- A Technical Report is written outlining the full scale fire testing and associated data

// Testing

- // Same temperatures as ASTM/UL E-119 and CAN/ULC-S101-M89 (for 2 hours)
- // In accordance with Canadian Construction Materials Centre (CCMC) Technical Guide for Sprinkler Protected Glazing Systems
- // Tested with Butt-Joints and Mullions
  - Five tests with various assembly types and sprinkler locations
- // Passed the Hose Stream Test ANSI/UL 10B
- // No cracking or physical damage to window
  - 40 kW fire

// ASTM E-119 Test Furnace Set Up





// ASTM E 119 Test

// The following is the information provided by UL concerning the ASTM E 119 test procedure: *As a part of the testing, test furnace calibration tests were conducted to establish a natural gas flow rate curve required to generate a time-temperature relationship as specified in ASTM E 119 with a gypsum wall assembly installed in the location where the window was intended to be installed with no sprinklers discharging water. The fire tests conducted to investigate the ability of the sprinkler to protect the window utilized the same natural gas flow conditions that were established during the calibration test. While the gas flow conditions were the same,*

- the temperature within the test chamber was not in accordance with the ASTM E 119 time-temperature curve when sprinklers discharged water onto the window within the test furnace.

- ***operation of the sprinklers onto the window prevented the temperature from reaching the limits of the ASTM E 119 temperature curve within the test chamber.***

// Small Fire Test

// Hose Stream Test

// Hose Stream Testing

// Integral type of test in man fire testing standards:

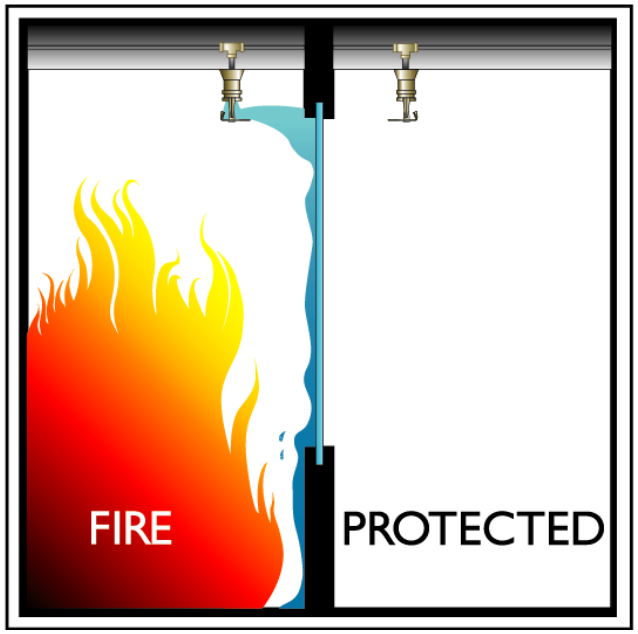
- ASTM E 119
- ASTM E 814 / UL 1479
- ASTM E 1966 / UL 2079

// Indicator of 2 attributes:

- The fire stop's / assembly's integrity during fire exposure
- The material's reliability to perform its intended function

The TFBP Model WS Specific Application Window Sprinkler

- First sprinklers ever to be specifically Listed to provide protection for heat strengthened or tempered glass windows.
  - UL & C-UL Listed
  - ULC – Underwriters Laboratories Of Canada
  - BMEC - Building Material Evaluation Commission
  - ICC Evaluation Service – ICC-ES Legacy Report NER-516
  - New York City Approval
  - Witnessed by Factory Mutual-Report Available

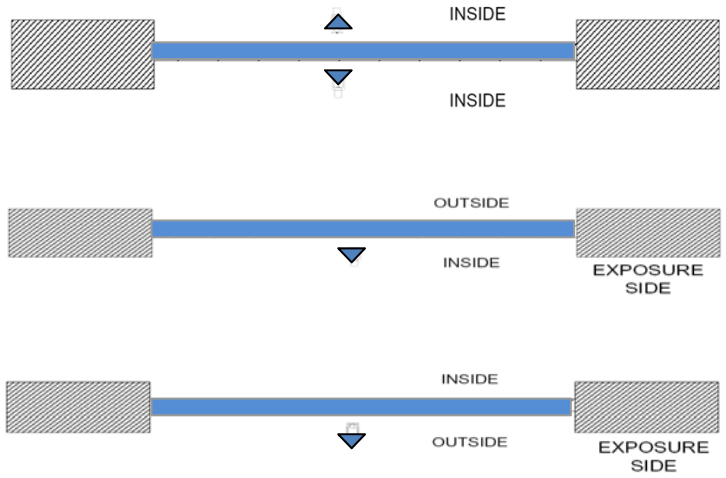


- Recognised by ICC-ES, & ULC as providing a two-hour equivalency for a fire separation assembly.
- The success is based on:
  - Fast response operating element
  - Deflector design that wets entire window

// Area of Use

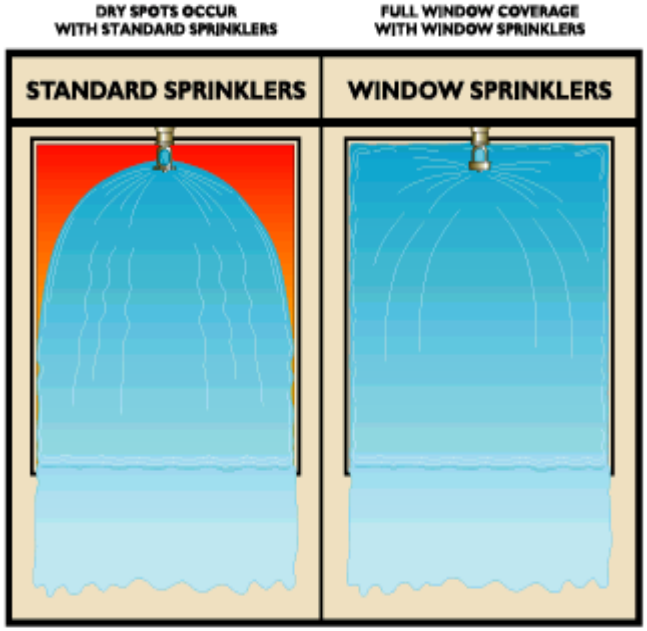
//When acceptable to the Authority Having Jurisdiction:

- In either a sprinklered or un-sprinklered building to protect non-operable window openings that are part of a fire separation.
- As an open sprinkler for “Outside Sprinkler Protection against Exposure Fire”, per NFPA.



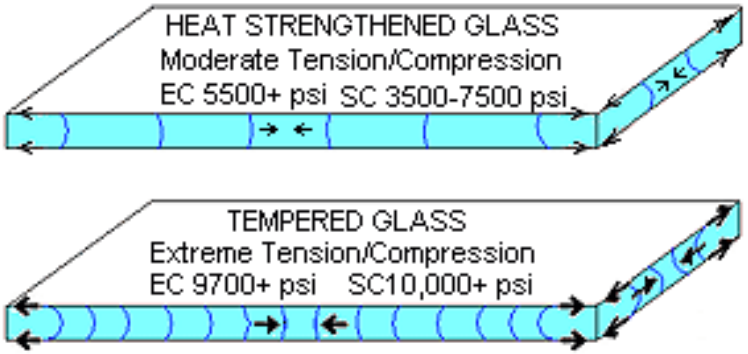
➢ The success is based on:

- Fast response operating element
- Deflector design that wets entire window



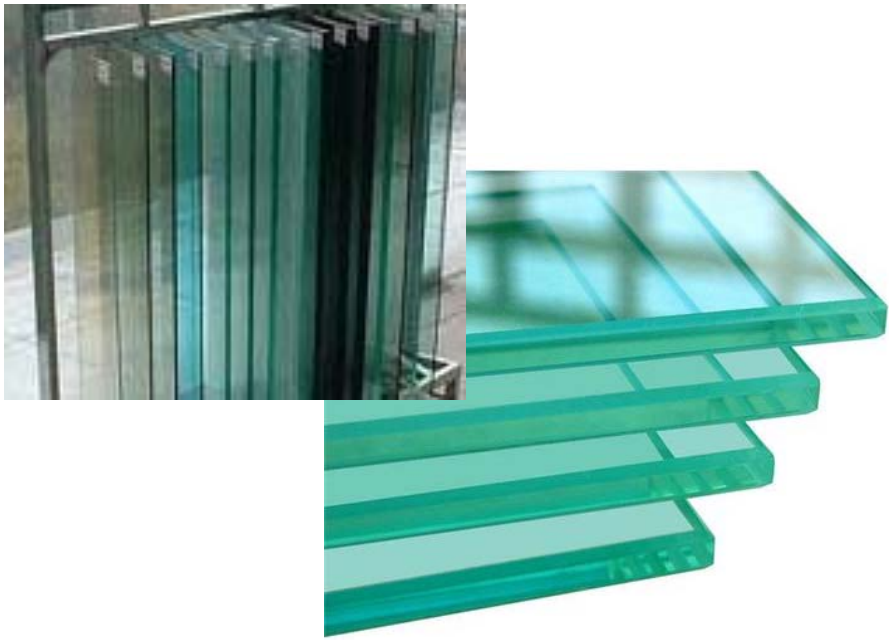
// Glass Type

// Single-glazed (single pane), double-glazed (double pane) or insulated, non-operable heat-strengthened, tempered, or stronger glass window assemblies where each individual pane is a minimum 1/4" (6 mm) thick.



TENSION/COMPRESSION WITHIN GLASS

EC = Edge Compression
SC = Surface Compression



// Installation Requirements

- // Use the literature for guidelines
  - TFP620
- // Very specific rules for installation
- // Reviewed by all Approval Agencies

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Technical Services 800-381-9312 | +1-401-781-8220
www.tyco-fire.com

Model WS Specific Application Window Sprinklers Horizontal and Pendent Vertical Sidewall 5.6 K-Factor

General Description

The TYCO 5.6 K-Factor Model WS Specific Application Window Sprinklers are fast response, glass bulb-type spray sprinklers available in Horizontal Sidewall and Pendent Vertical Sidewall models.

These sprinklers are the first to be specifically Listed to provide protection for heat strengthened or tempered glass windows using closed sprinklers. As part of the testing, the gas flow required to achieve the time/temperature relationship specified in ASTM E119 was established in a test furnace without sprinkler protection. A window assembly protected with the TYCO Model WS Window Sprinklers was then installed in the test furnace, and the same gas flow conditions were maintained for a two-hour test period. No cracking or visible damage to the window was permitted during the test period, even when a hose stream was directed at the window.

The success of the Model WS Window Sprinkler is based on its fast response thermal sensitivity and on its specially designed deflector that ensures that the spray pattern wets the entire surface of the window.

Based on successful testing, the Model WS Window Sprinkler can be used as interior protection of windows or glazing in a sprinklered building or non-sprinklered building. Also, the Model WS Window Sprinkler can be used as an open sprinkler for "Outside Sprinkler Protection against Exposure Fire", using the design requirements of NFPA.

As with any specific application sprinkler, the installation instructions included in this data sheet must be precisely followed. ICC Evaluation Service, Underwriters Laboratories of Canada (ULC), or Building Materials Evaluation Commission (BMEC) guidelines apply; consult the specific approval report.

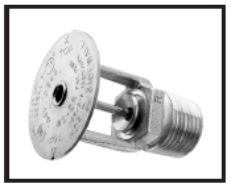
IMPORTANT

Always refer to Technical Data Sheet TFP700 for the "INSTALLER WARNING" that provides cautions with respect to handling and installation of sprinkler systems and components. Improper handling and installation can permanently damage a sprinkler system or its components and cause the sprinkler to fail to operate in a fire situation or cause it to operate prematurely.

NOTICE

The TYCO Model WS Specific Application Window Sprinklers described herein must be installed and maintained in compliance with this document, as well as with the applicable standards recognized by the approval agency, in addition to the standards of any authorities having jurisdiction. Failure to do so may impair the performance of these devices.

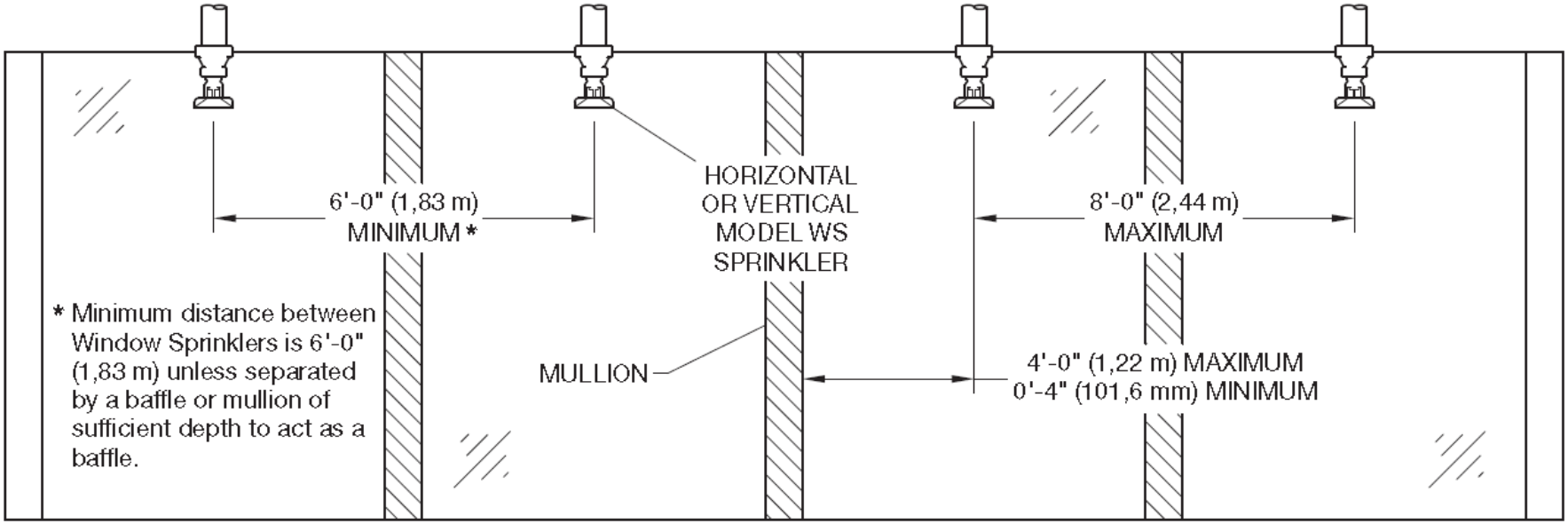
Owners are responsible for maintaining their fire protection system and devices in proper operating condition. The installing contractor or manufacturer should be contacted with any questions.



Model/Sprinkler Identification Number (SIN)

TY3388 - Horizontal Sidewall
TY3288 - Pendent Vertical Sidewall
TY3388 is a redesignation for C3388.
TY3488 is a redesignation for C3488.

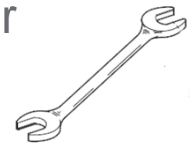
Multiple Windows Separated by Mullions



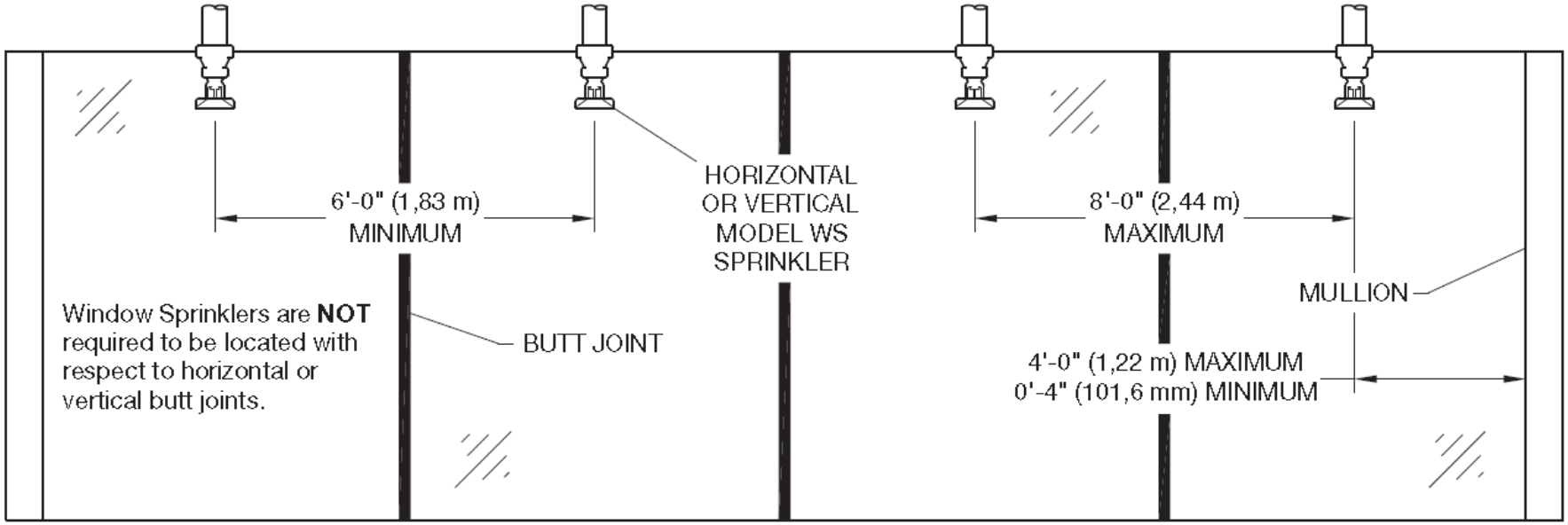
- TFP620: Figure 3B-1
- Minimum distance from Standard Sprinklers = 6-feet (1,83 m) unless separated by a baffle
- Mullion will act as a baffle when:

- (pendant vertical sidewall) mullion extends to back of deflector

- (horizontal sidewall) mullion extends to sprinkler wrench flat

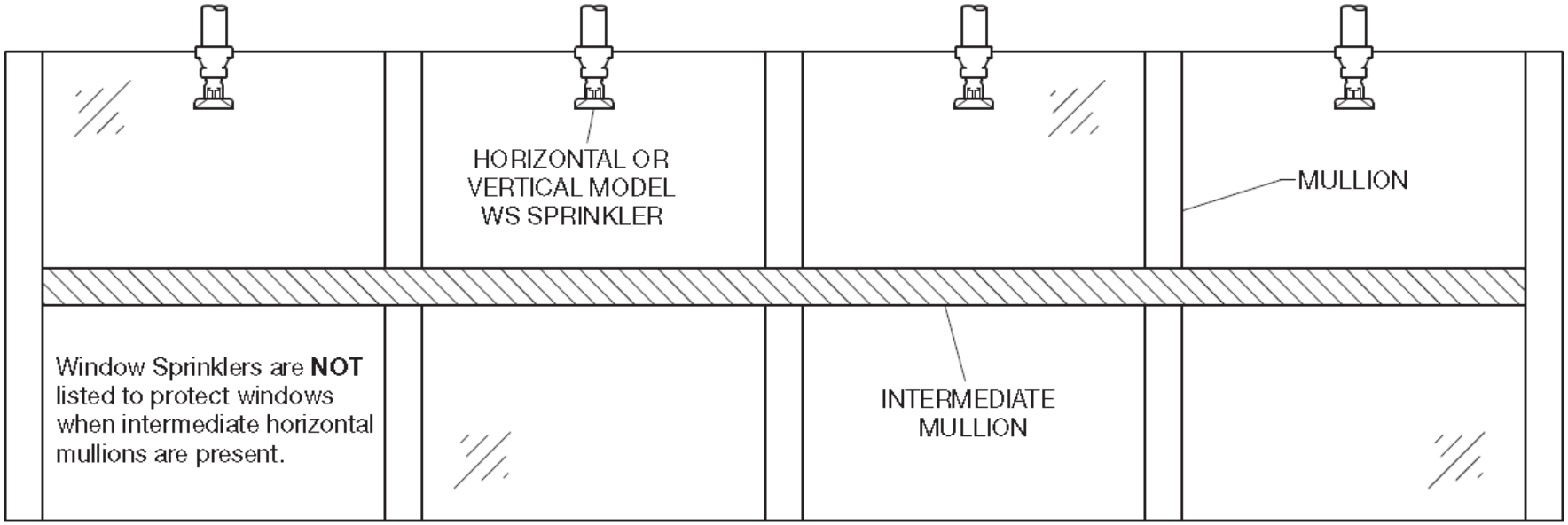


Multiple Windows Connected by Butt-Joints



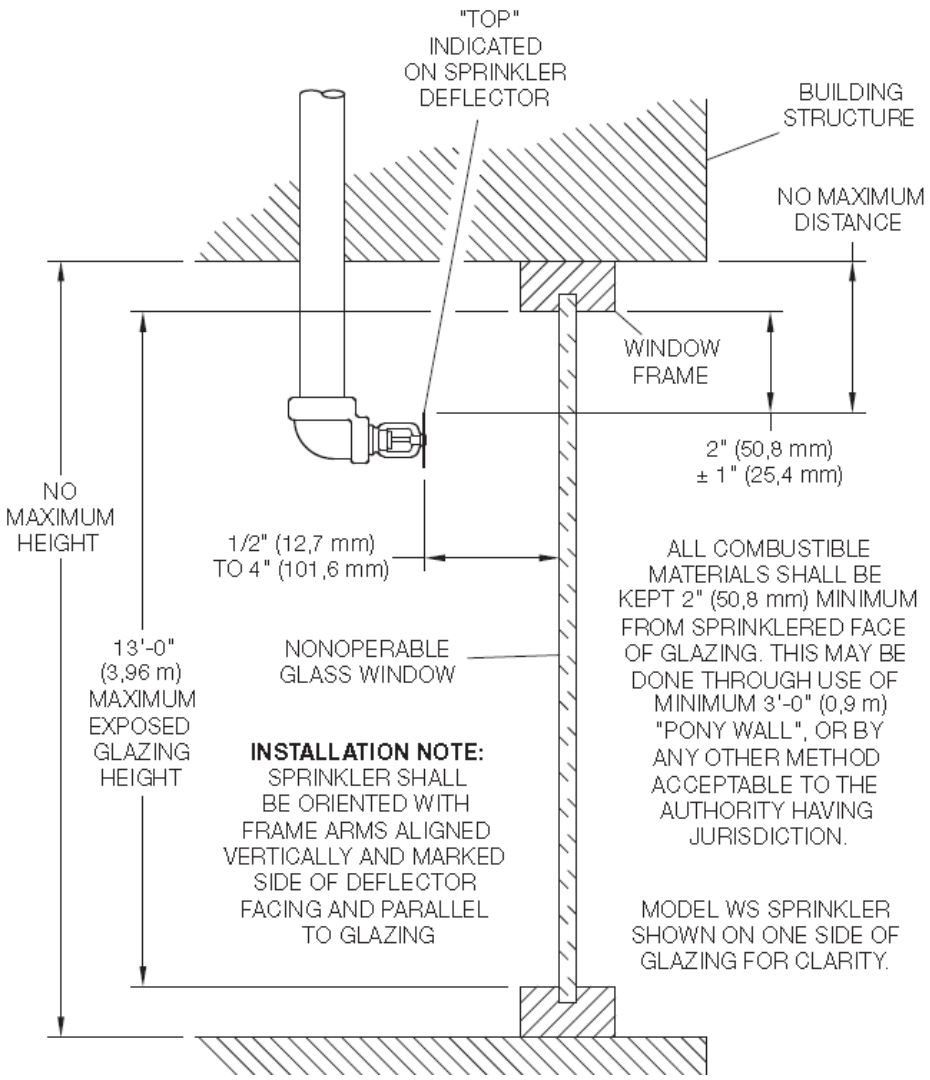
- TFP620: Figure 3B-2
- Sprinklers not required to be spaced with respect to butt-joints
- Tested with 3/8 inch (9.7 mm) silicone butt-joints
- Minimum distance from Standard Sprinklers = 6-feet (1,83 m) unless separated by a baffle

Windows With Horizontal Mullions



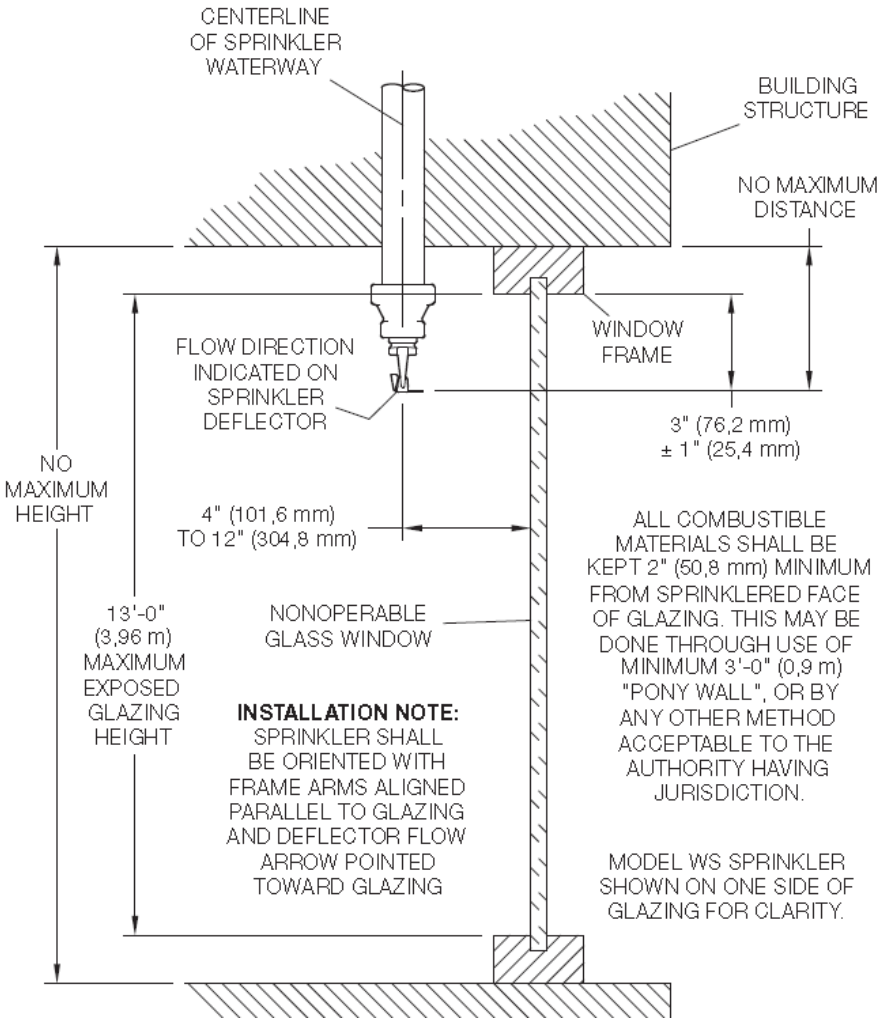
- TFP620: Figure 3B-3
- Not listed to protect windows with horizontal mullions

// Horizontal Sidewall



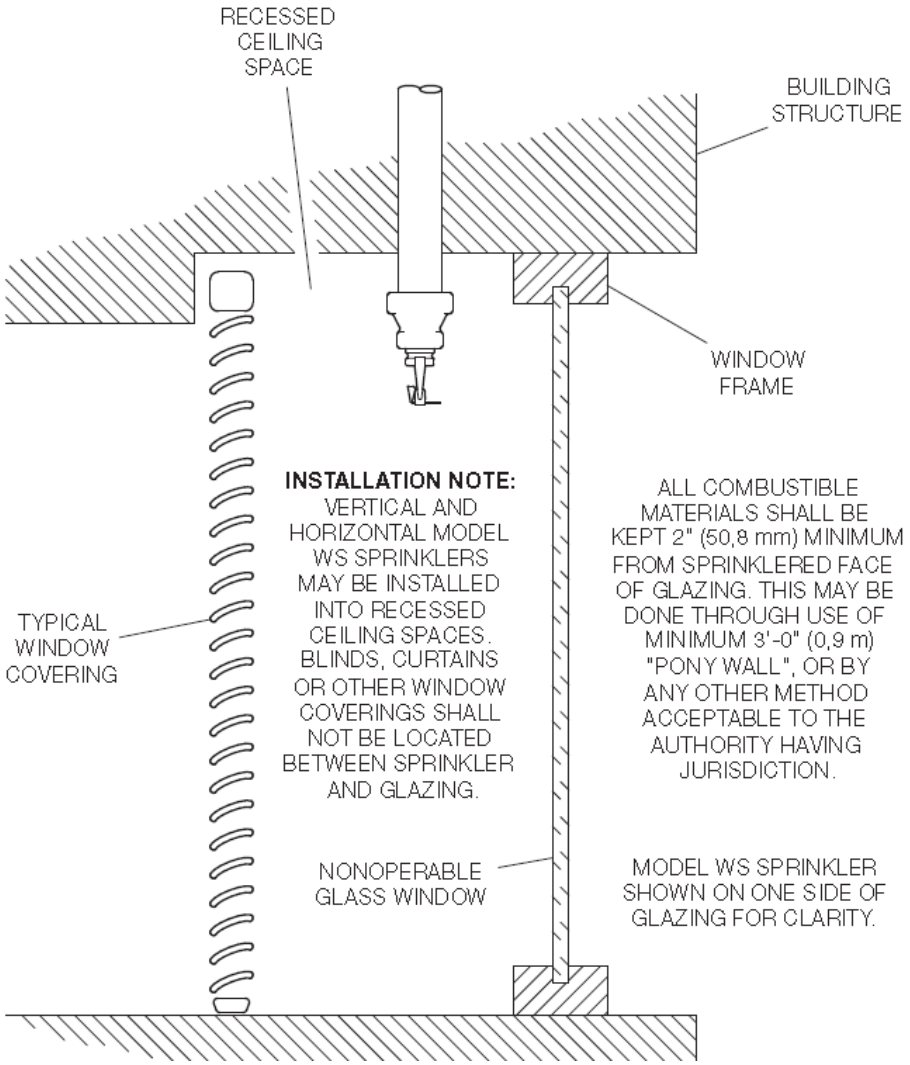
- TFP620: Figure 3C
- Maximum window height = 13 feet (3,96 m)
- Maximum deflector distance from top of window = 2 in (50.8 mm) ± 1 in (25.4 mm)
- Orient the word “Top” stamped on deflector facing the top of the window
- All combustible materials must be minimum 2 inches (50.8 mm) from face of window

Vertical Sidewall



- TFP620: Figure 3D
- Maximum window height = 13 feet (3,96 m)
- Maximum deflector distance from top of window = 3 in (76,2 mm) ± 1 in (25,4 mm)
- Minimum deflector (centerline) distance from face of window = 4 in (101,6 mm)
- Maximum deflector (centerline) distance from face of window = 12 in (304,8 mm)
- All combustible materials must be minimum 2 inches (50,8 mm) from face of window

// Recessed Ceiling Typical Installation



- TFP620: Figure 3E
- Both sprinkler models my be installed into recessed ceiling spaces
- All window treatments / coverings shall not be located between sprinkler and window
- All combustible materials must be minimum 2 inches (50,8 mm) from face of window

// Escutcheon Assemblies

- Any metallic flush or extended escutcheons may be used, provided:
  - Dimensions from deflector to window frame and glass are in accordance with TFP620

- Not listed for recessed applications

Hydraulic Requirements – Interior Protection for Sprinklered Building

- Determine which compartmented has the most hydraulically demanding window sprinklers.
- Calculate up to the most demanding 46.5 linear feet (14,2 linear meters) on one side of the window.
  - Based upon NFPA 1.2 rule when area of operation is 1500 square feet (139.4 square meters)
  - If an area reduction for quick response sprinklers is utilized, the linear length of the calculated window sprinklers shall not be less than 36 linear feet (11 meters)
- If the window sprinklers are in the hydraulically most demanding area of the building, the water demand of the window sprinklers must be added and balanced to the calculated area demand.
- If the window sprinklers are outside the hydraulically most demanding area of the building, the water demand of the window sprinklers is not required to be added to the remote area demand BUT, the ceiling sprinklers adjacent to the window sprinklers must be calculated with the window sprinkler demand.

// Hydraulic Requirements

//Interior Protection for Non-Sprinklered Building

- Calculate all window sprinklers on the most demanding side of the window assembly within the enclosure

//Exterior Exposure Protection

- Calculate all window sprinklers controlled by the deluge valve using the design requirements of NFPA

// Hydraulic Requirements

//Water Duration-

- Must comply with NFPA requirements
- If used to provide fire rating

//Minimum Flow per Sprinkler-

- 20 gpm (75,7 lpm) for sprinkler spacing 6 to 8 feet (1,83 to 2,44 meters)
- 15 gpm (56,8 lpm) for sprinkler spacing

//Maximum Pressure per Sprinkler-

- Horizontal Sidewall = 70 psi (4,83 bar)
  - If baffle or mullion of sufficient depth is provided between sprinklers, maximum pressure = 175 psi (12,07 bar)
- Vertical Sidewall = 175 psi (12,07 bar

// Window Sprinkler Installation Examples

// Window Sprinkler Installation Examples

// Window Sprinkler Installations to avoid

Tyco Model WS Specific Application Window Sprinklers

Tyco Product Offering

- Discharge Coefficient
  - K = 80.6 LPM/Bar$^{1/2}$, 5.6 GPM/psi$^{1/2}$
- Temperature Ratings
  - 68°C (155°F)
  - 93°C (200°F)
- Finish
  - Polyester Coated (White)
  - Chrome Plated
  - Natural Brass
- Approvals
  - UL
  - C-UL
  - ULC Listed
  - NYC under MEA 289-04-E

TY3388
Horizontal Sidewall

TY3488
Pendent Vertical Sidewall

Technical Datasheet: TFP 620

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// Project References in Asia

// New Delhi Indira Gandhi International Airport, India

// Marina Bay Sands, Singapore

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// Project References in Asia

// Wuxi Tahu International Expo, China

// Singapore International Cruise Terminal

// Project References in Asia

// Pacific Place,
Hong Kong

// Centennial Tower , Singapore

// Chengdu MixC City,
China

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Institutional Sprinklers

Raven™ Institutional Sprinkler

What are the problems we are trying to solve?

Installation Contractors initially asked us to design an institutional sprinkler with an adjustable escutcheon. Deeper discussion revealed that this was not really desirable by either the institutional operator nor the installation contractor due to the need to track tools and the ability of inmates to remove even tamper resistant screws

// Institutional Sprinklers

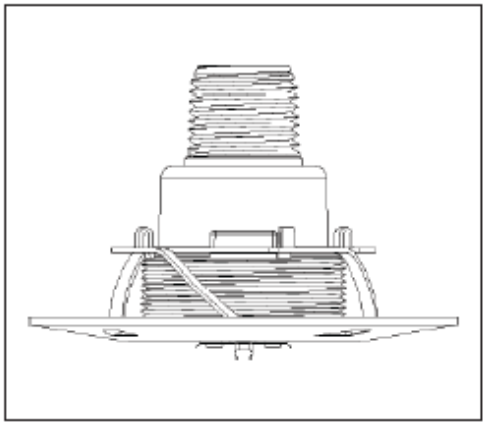
What are the problems we are trying to solve?

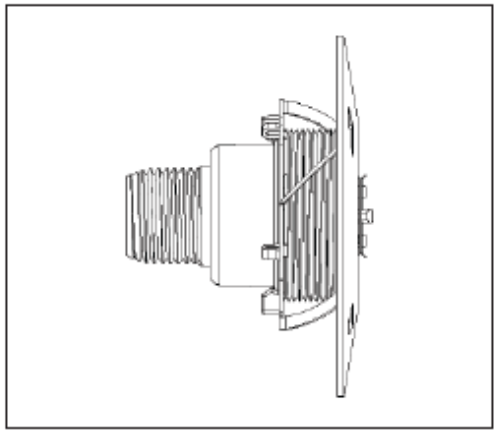
Institutional Operators told us that current institutional sprinklers were not sufficiently "tamper resistant". Inmates and the mentally disabled were damaging the sprinklers or forming weapons from the operating parts causing disruptions to facility operations and causing costly cleanup and repair.

COMPETITIVE COMPARISON

VIKING®

INSTITUTIONAL QUICK RESPONSE/QREC FLUSH PENDENT SPRINKLER VK410 (K5.6)





Pendent EC Only

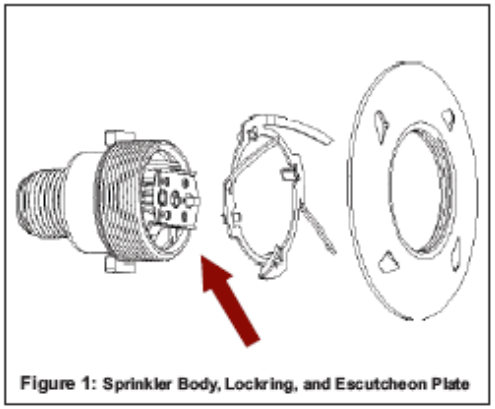


Figure 1: Sprinkler Body, Lockring, and Escutcheon Plate

The operating element can be removed and ultimately **not** operate. It can also be weaponized.

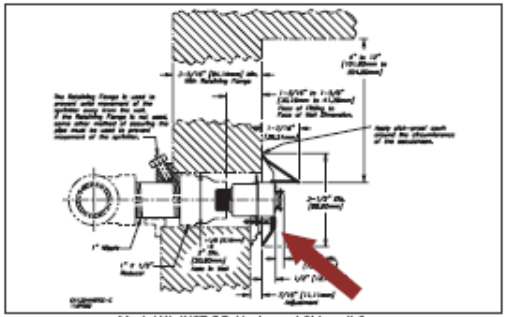
COMPETITIVE COMPARISON

Reliable®	MODEL XL QUICK RESPONSE INSTITUTIONAL SPRINKLERS

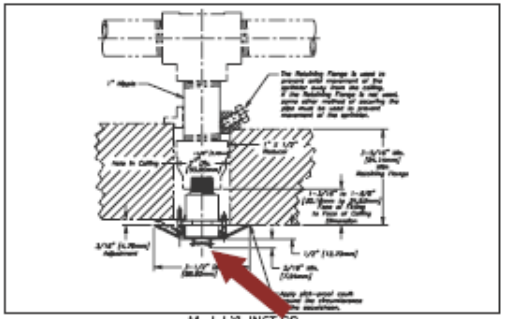
Model XL INST Pendent

Model XL INST Horizontal Sidewall

Sidewall Installation @ 6”-12” From Ceiling = 27 GPM



Model XL INST QR Horizontal Sidewall & Horizontal Sidewall EC Sprinkler



Model XL INST QR Pendant & EC Pendant Sprinkler

The operating element can be removed and ultimately **not** operate. It can also be weaponized.

Raven™ Institutional Sprinkler – Purpose & Function

Tamper Resistant

- prevents forced activation
- prevents accidental activation

Unobtrusive Design

- reduces risk of injury with sprinkler or components

Aesthetically Appealing

- all operating parts concealed

// Raven™ Institutional Sprinkler

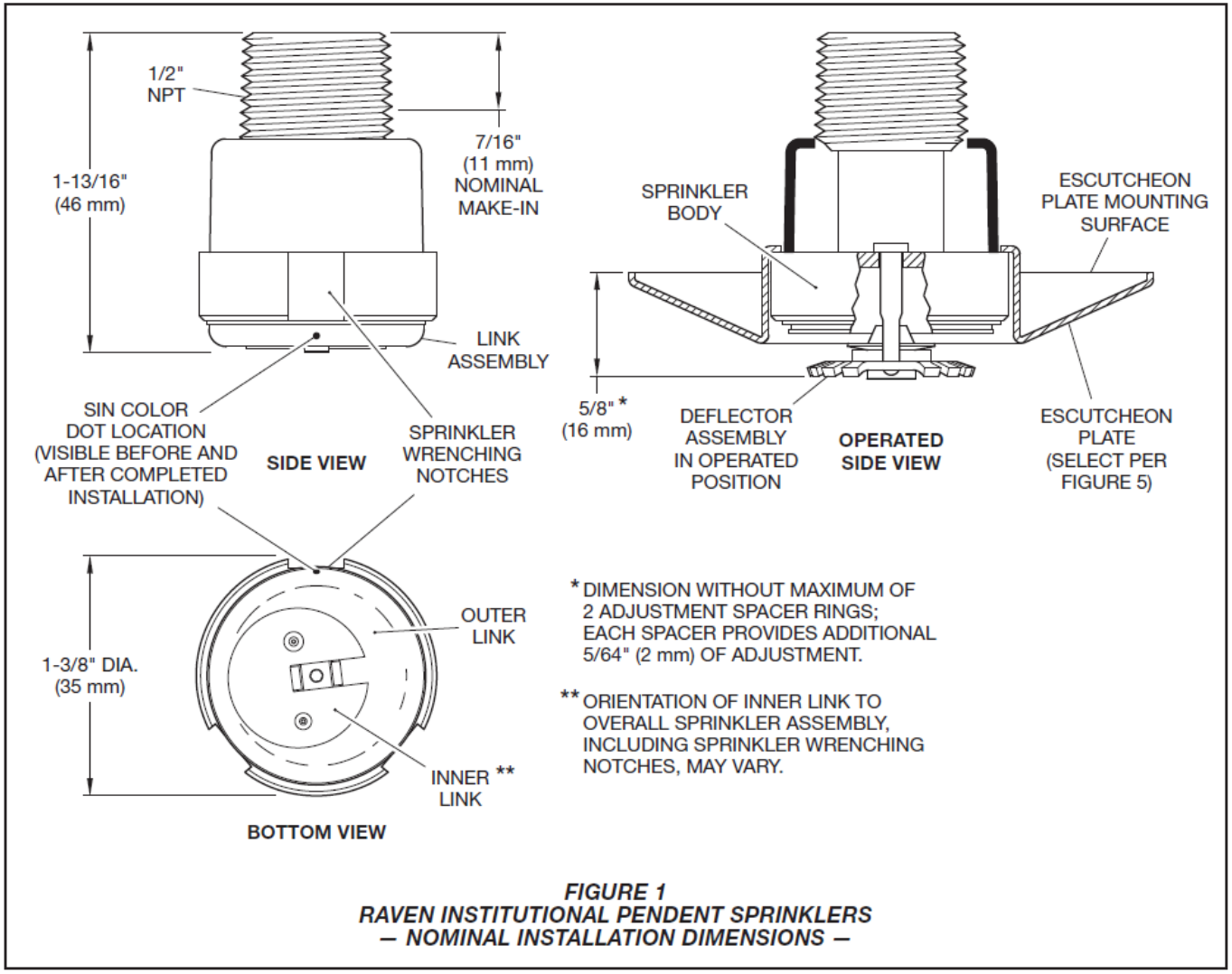
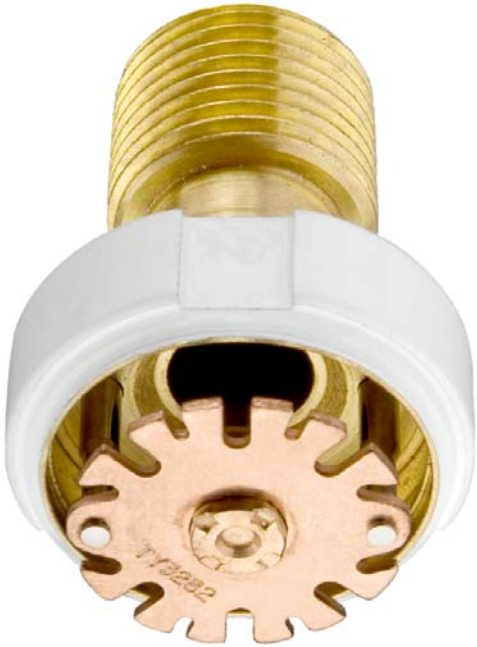


FIGURE 1
RAVEN INSTITUTIONAL PENDENT SPRINKLERS
— NOMINAL INSTALLATION DIMENSIONS —



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// Raven™ Institutional Sprinkler

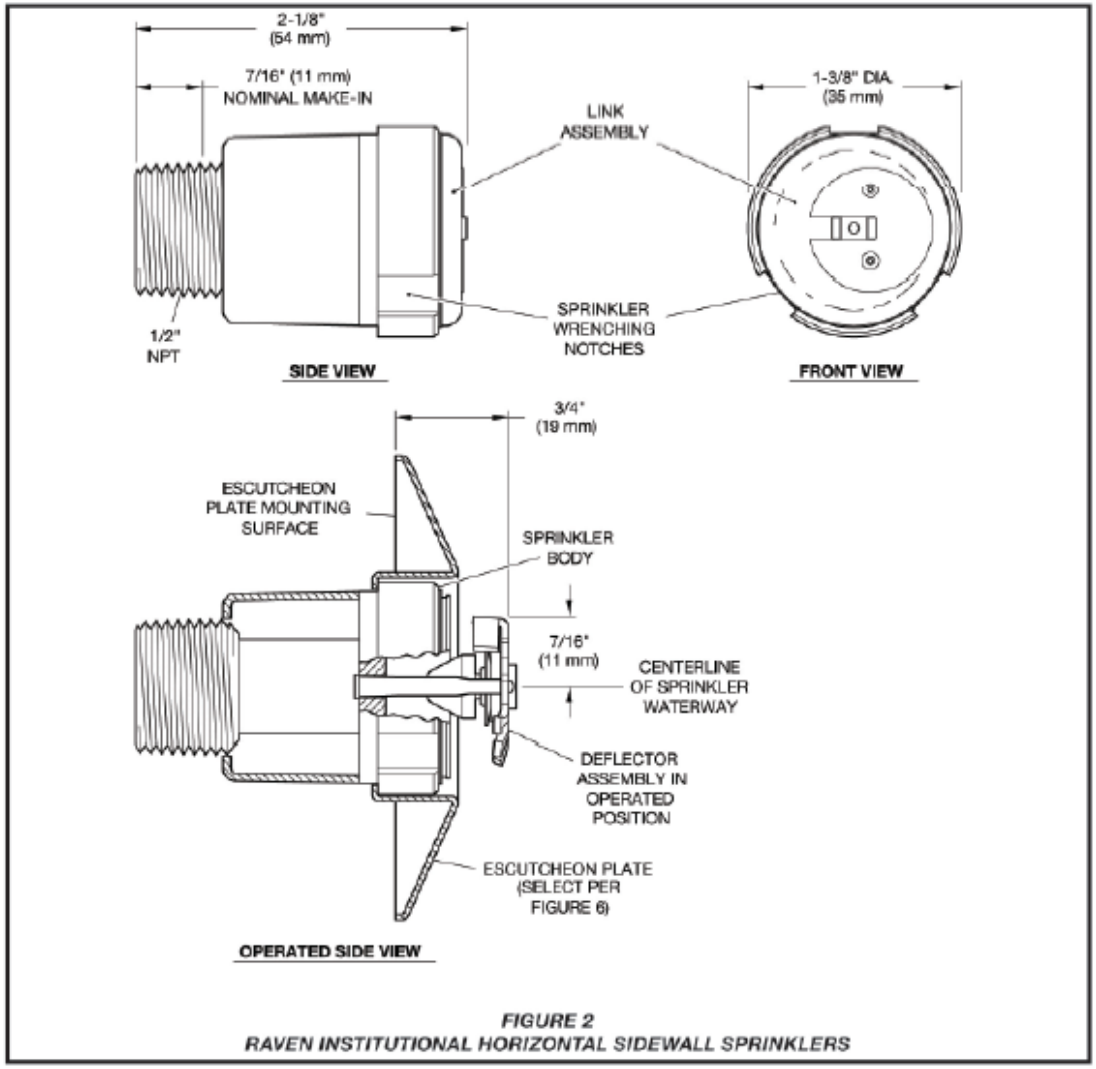

FIGURE 2
RAVEN INSTITUTIONAL HORIZONTAL SIDEWALL SPRINKLERS

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// Raven™ Institutional Sprinkler

5.6K Extended Coverage Pendent (TY3282)

Response Rating	Coverage Area ft. x ft. (m x m)	Minimum Flow(1) GPM (LPM)	Minimum Pressure(2) psi (bar)	Deflector-To-Ceiling Distance in. (mm)	Sprinkler Temperature Rating °F (°C)	Minimum Spacing ft. (m)
Quick	16 x 16 (4,9 x 4,9)	26 (98)	21.6 (1,49)	Flush Mounted	165 (74)	8 (2,4)

5.6K Extended Coverage Horizontal Sidewall (TY3382)

Response Rating	Coverage Area ft. x ft. (m x m)	Minimum Flow(1) GPM (LPM)	Minimum Pressure(2) psi (bar)	Deflector-To-Ceiling Distance(3) in. (mm)	Sprinkler Temperature Rating °F (°C)	Lateral Minimum Spacing(4) ft. (m)
Quick	16 x 16 (4,9 x 4,9)	26 (98)	21.6 (1,49)	4 to 12 (100 to 300)	165 (74)	8 (2,4)

NOTES

1. Requirement is based on minimum flow in GPM (LPM) from each sprinkler.
2. Indicated residual pressures are based on the nominal K-factor.
3. Centerline of the sprinkler waterway is located 7/16 inch (11,1 mm) below the deflector (Figure 7).
4. Minimum spacing is for lateral distance between sprinklers located along a single wall. Otherwise adjacent sprinklers (that is, sidewall sprinklers on an adjacent wall, on an opposite wall, or pendent sprinklers) must be located outside of the maximum listed protection area of the extended coverage sidewall sprinkler being utilized.

TABLE A
RAVEN INSTITUTIONAL SPRINKLERS
— UL AND C-UL LISTING EXTENDED COVERAGE AND FLOW RATE CRITERIA —

// Raven™ Institutional Sprinkler

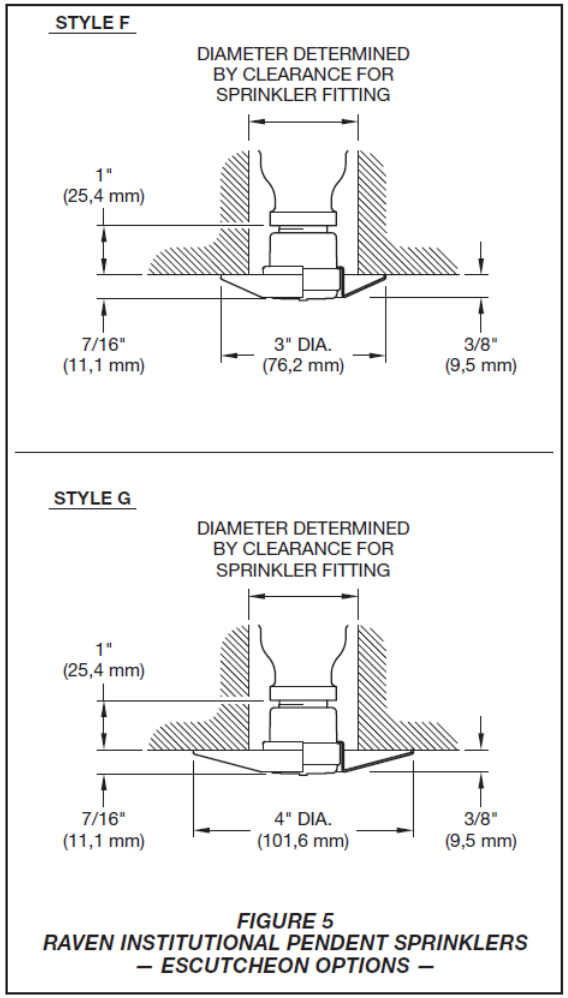


FIGURE 5
RAVEN INSTITUTIONAL PENDENT SPRINKLERS
— ESCUTCHEON OPTIONS —

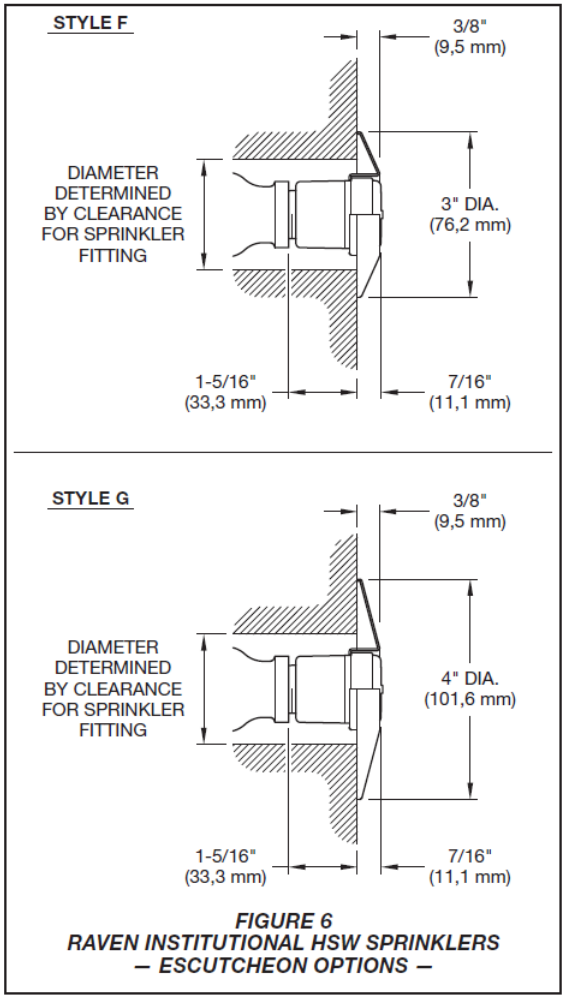


FIGURE 6
RAVEN INSTITUTIONAL HSW SPRINKLERS
— ESCUTCHEON OPTIONS —

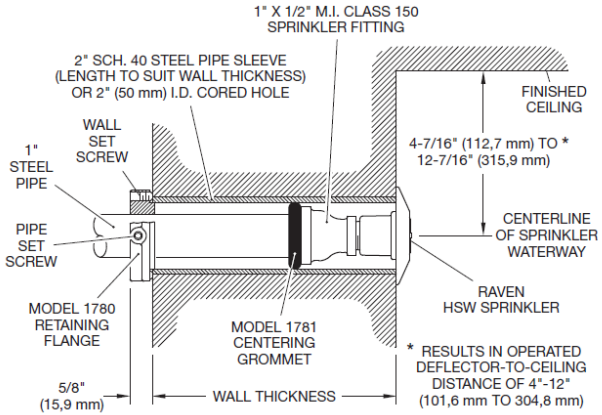


FIGURE 7
OPTIONAL INSTALLATION TECHNIQUE FOR USING MODEL 1780 RETAINING FLANGE AND MODEL 1781 CENTERING GROMMET
(Horizontal Installation Shown — May be Applied to Pendent Installation)

// Raven™ Institutional Sprinkler

Tyco Product Offering

// Discharge Coefficient
- K = 80.6 LPM/Bar$^{1/2}$, 5.6 GPM/psi$^{1/2}$

// Temperature Ratings
- 74°C (165°F)

// Finish (Sprinkler & Escutcheon)
- White
- Chrome Plated

// Approvals
- UL
- C-UL

Pendent
(White Finish)

Horizontal Sidewall
(Chrome Finish)

Technical Datasheet: TFP 651

// Project References in Asia

// Rolleston Prison,
New Zealand

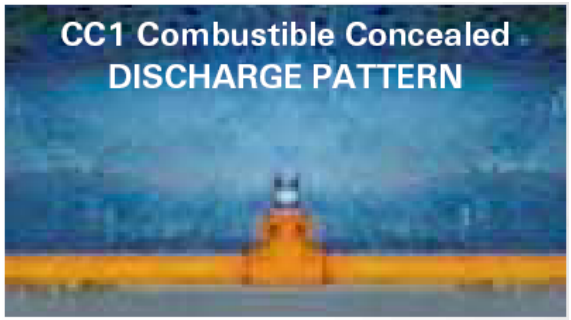
// Asia Square Towers 1 & 2,
Singapore

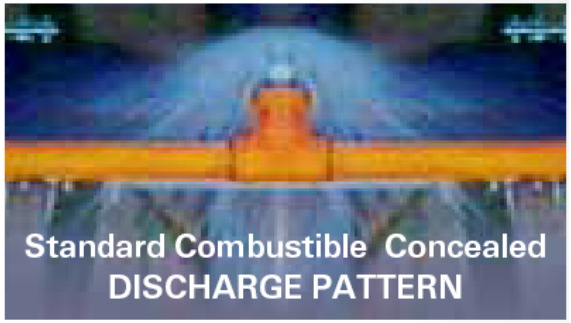
// Thai Stanley Factory, Thailand

Combustible Concealed Sprinklers

// Protecting Combustible Interstitial Spaces

- // Standard spray sprinklers were tested & failed to provide adequate protection.
- // When a fire occurred in interstitial spaces, the flame were concentrated on the upper deck.
- // Since standard spray sprinklers discharged water in an umbrella like pattern, the fire was uncontrolled.
- // The Combustible Concealed Space Sprinkler was developed to provide discharge up on the deck and outward from the sprinkler.
- // These special sprinklers provided protection for the area when standard spray sprinklers could not.





Standard Spray Sprinklers in a Combustible Concealed Space

Standard Spray Sprinklers in a Combustible Concealed Space

// Performance Characteristics of Existing Protection Schemes

How effective is a Standard Spray sprinkler in a Combustible Concealed Space?

- // Standard Protection Areas & Maximum Spacing for Light Hazard
- // (Standard Spray Upright/Standard Spray Pendent)
- // Combustible unobstructed with members 3 ft or more on center: 225 sq. ft.
- // Combustible obstructed or unobstructed with members less than 3 ft. on center: 130 sq. ft.
- // Spacing (maximum): 15 ft.

Performance Characteristics of Existing Protection Schemes

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.

A.8.14.1.6 Surfaces should be considered to channel heat when the surface or supporting members are greater than 2" in depth.

// Project References in Asia

// Australian High Comission, India

Flushed Sprinkler
Concrete Sprinklers

// Flush Sprinkler Concrete Introduction

The TYCO Flush Sprinkler Concrete (FSC) 80 K-factor Flush Mount Pendent Sprinklers are quick response spray sprinklers designed for use in areas such as offices, hospitals, churches, schools, apartments, and hotels.

- The assembly is designed with an installation cup assembly which allows installation in concrete ceilings/floors
- The flush design is aesthetically appealing by concealing all operating parts. The FSC Sprinklers, with heat sensitive solder type release elements, are rated quick response sprinklers.
- Also applicable in suspended ceilings (Grid and gypsum ceilings).

VdS

//FSC Introduction

Flush Sprinkler Concrete
80 K-factor, Flush Mount Pendent
Quick Response, Standard Coverage

Approvals	: VdS Approved
K-factor	: K-80 L/bar
Temperature rating	: 74ºC
Finishing	: Sprinkler - White (RAL9003) / Gray
	: Escutcheon – White (RAL9003) / Gray
	: Sprinkler and Escutcheon available in other

Custom colors

=> set up costs € 250 for sprinkler.

=> set up costs € 250 for escutcheon.

VdS

FSC Sprinkler

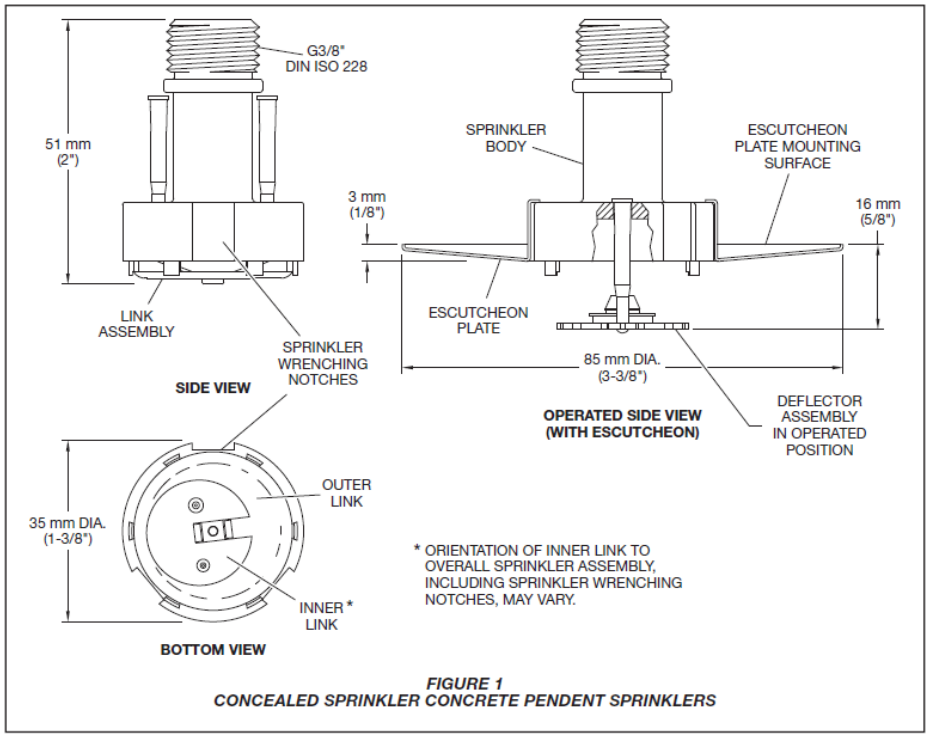
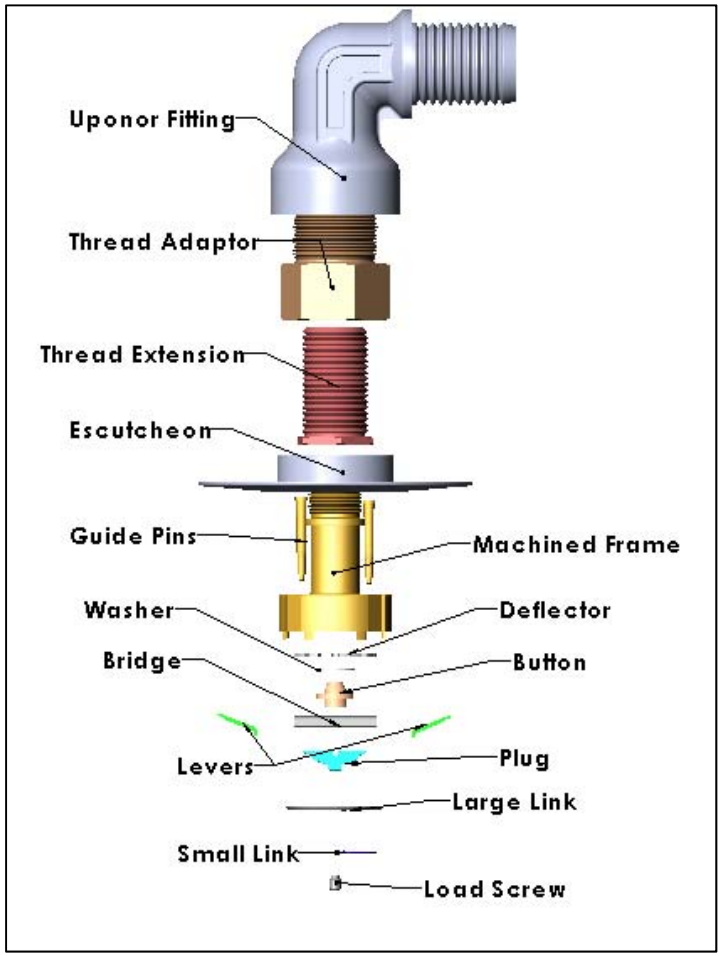


FIGURE 1
CONCEALED SPRINKLER CONCRETE PENDENT SPRINKLERS

The sprinkler will be supplied with the Thread extension (unmounted).

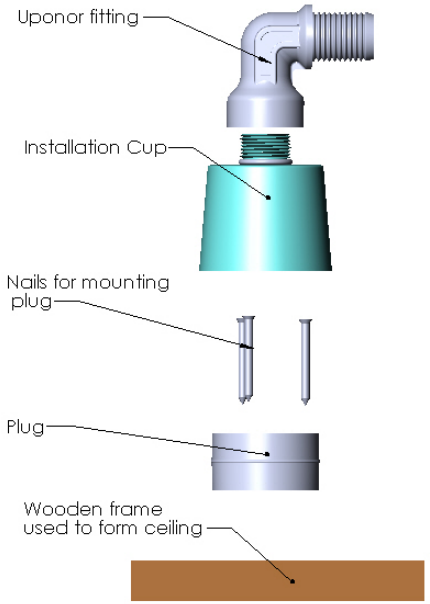
Same construction principle as current Raven Sprinkler.

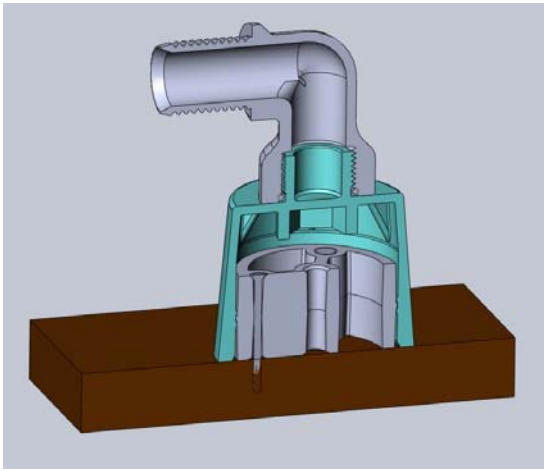


FSC Installation Parts

For installation of the sprinkler in concrete additional parts are available.

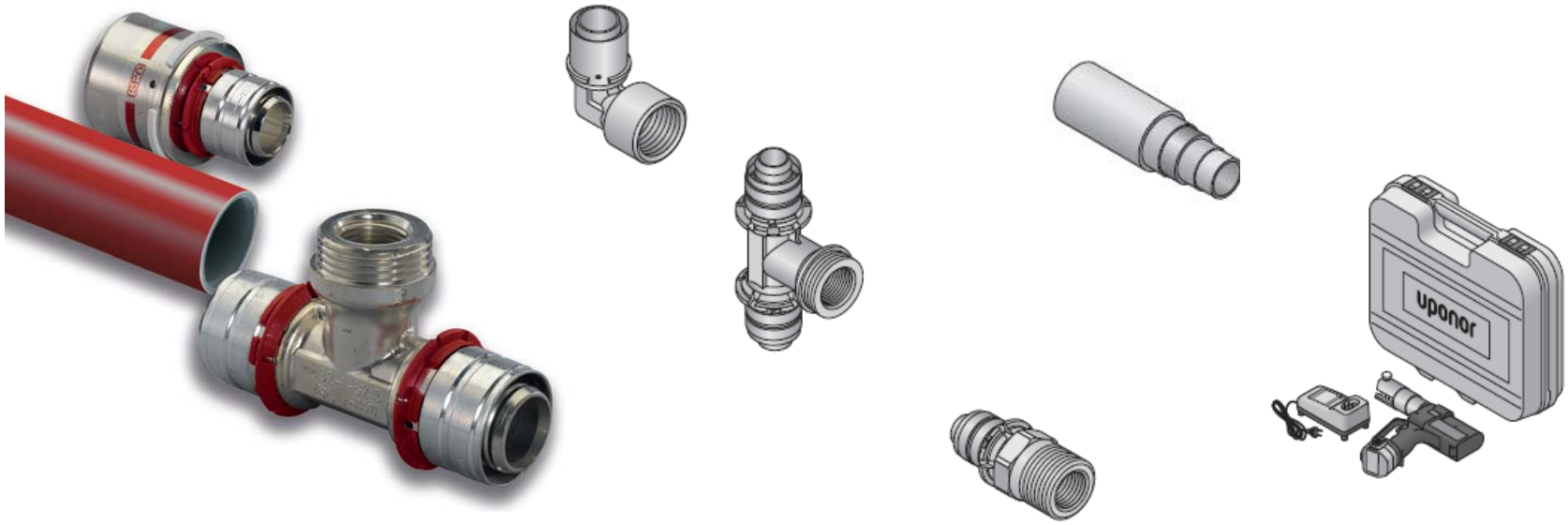
To make the cavity in the concrete a Installation Cup, Cup Insert and a Removal Tool is available.



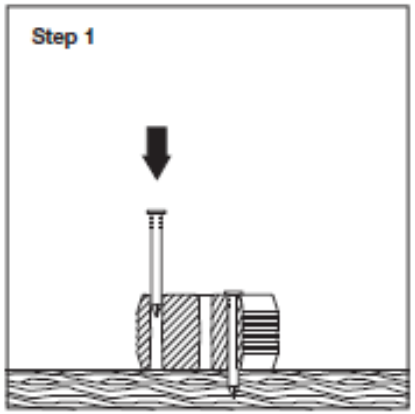


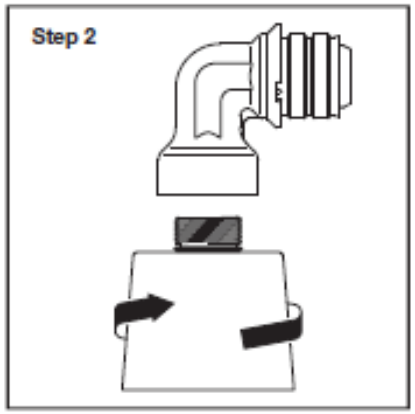
//FSC Installation Parts

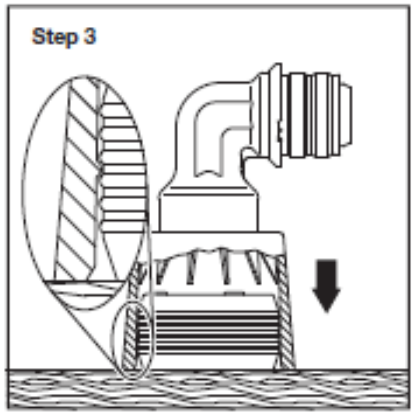
The range of the VdS approved MLC-S (Multi Layer Composite (by Uponor)) piping system which already was available is extended. Pipe diameters of 40mm and 63mm are added and also the corresponding and fittings. The needed tooling for installation is available as well.

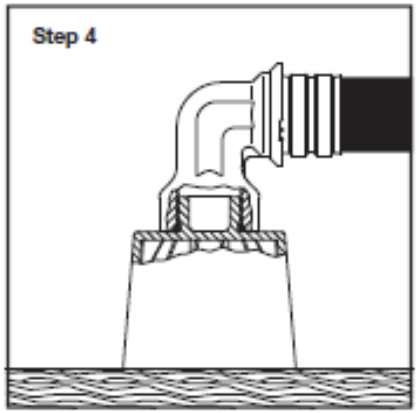


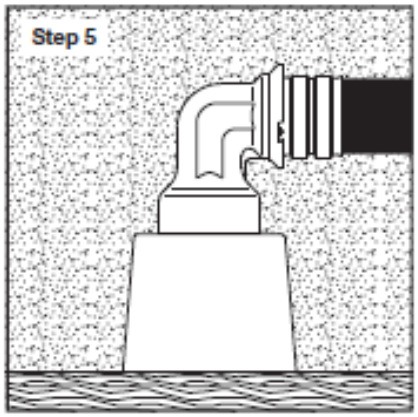
FSC Installation Procedure

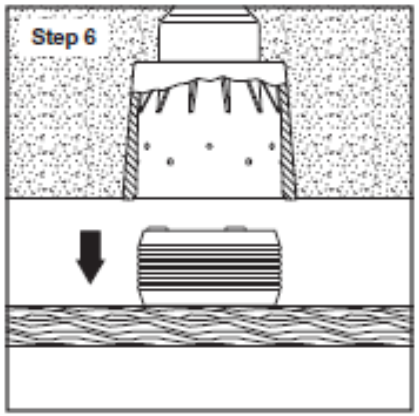


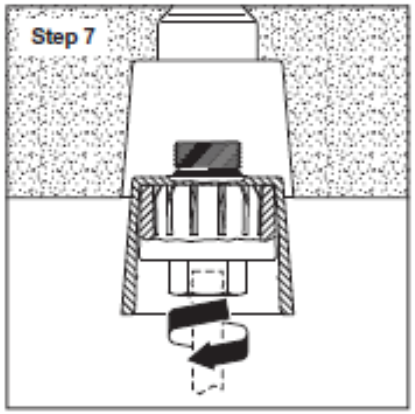


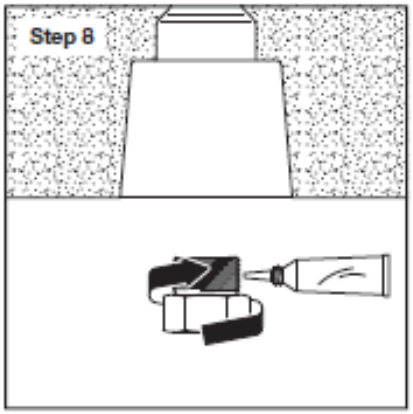




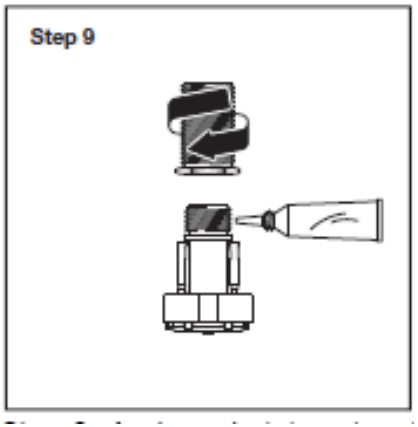


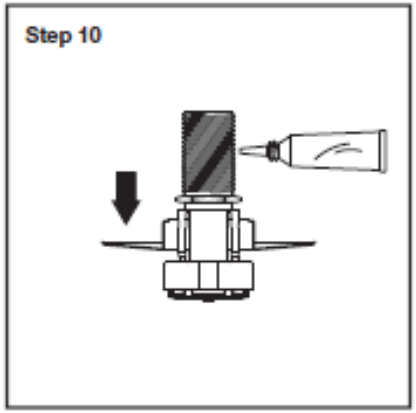


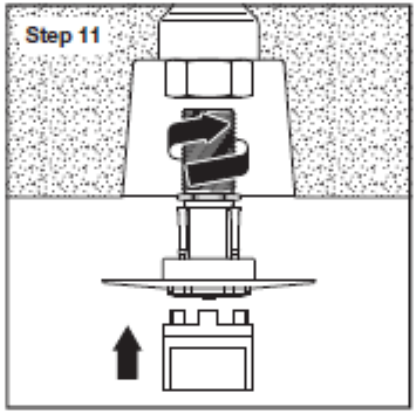


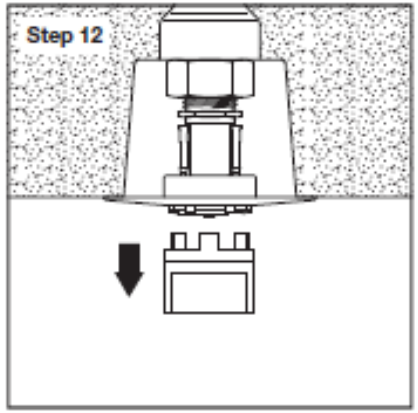


FSC Installation Procedure









FSC Installation Procedure

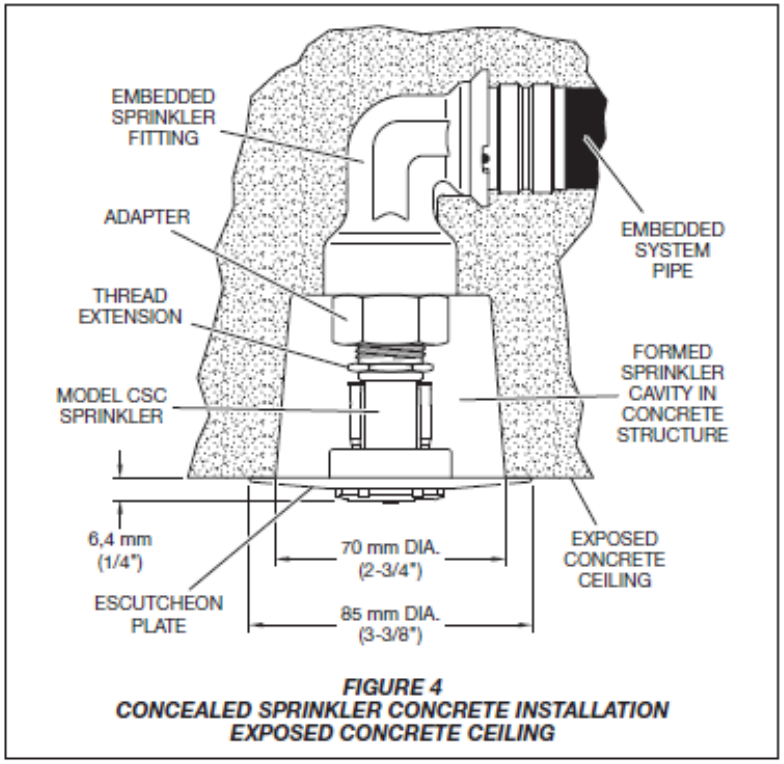


FIGURE 4
CONCEALED SPRINKLER CONCRETE INSTALLATION
EXPOSED CONCRETE CEILING

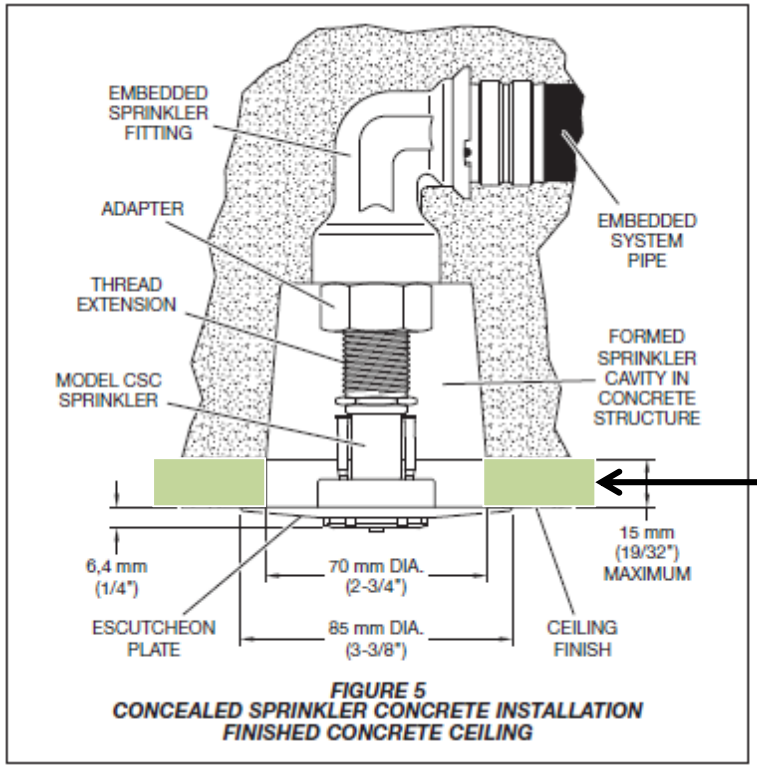
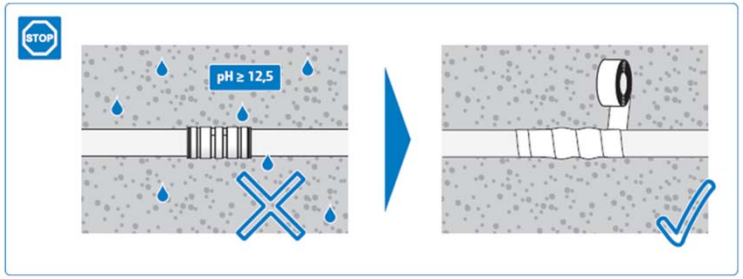


FIGURE 5
CONCEALED SPRINKLER CONCRETE INSTALLATION
FINISHED CONCRETE CEILING

The sprinkler is executed with a thread extension and it therefore adjustable when a plaster is used on the concrete.

FSC Installation Procedure

Example of a construction site using the MLC-S piping



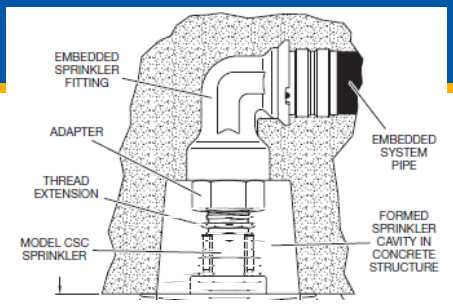
// FSC Installation

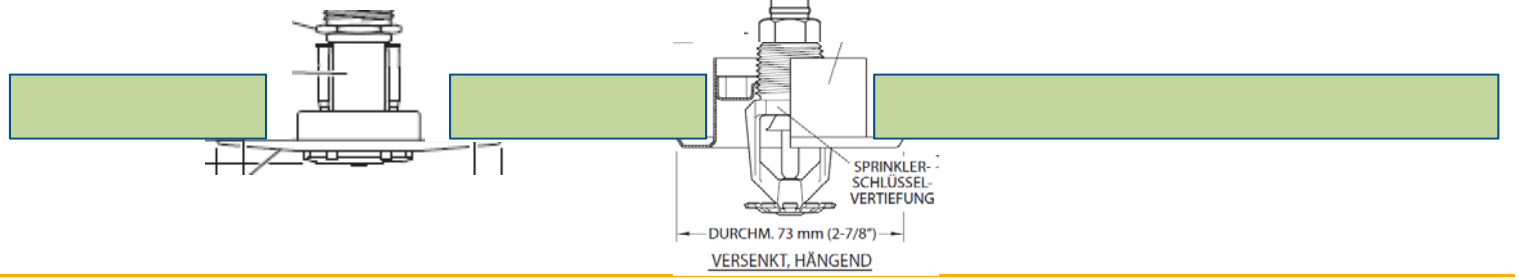
Other connections / applications:

// using Flexible Hoses

// using Drop nippels

// Mounting FSC Sprinkler in suspended ceiling (no restrictions to sprinkler acc. VdS)

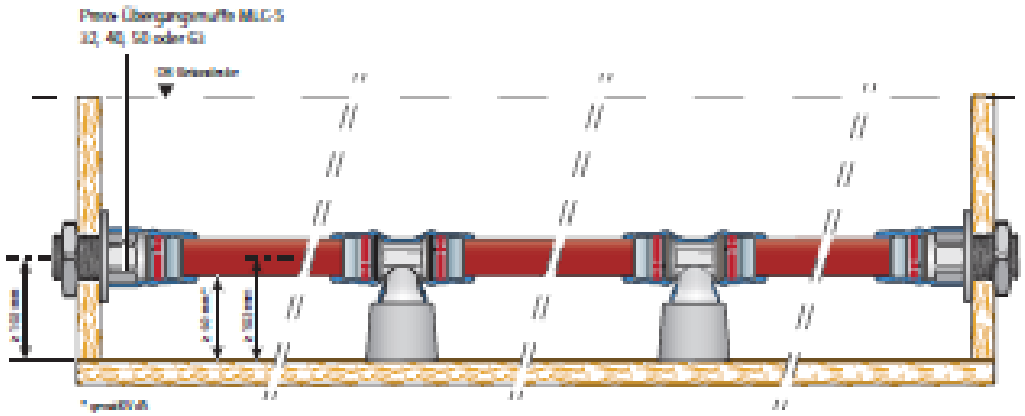




FSC Installation

Connections piping system:

- to Branchlines (E.g. in Main Risershaft)
- of Flush-, Drain and Test connections
- of Internal hydrants
- for the pressurizing process during pouring the concrete.



FSC Documentation

tyco

Worldwide Contacts | www.tyco-fire.com

Model FSC 80 K-factor Flush Sprinkler Concrete Quick Response Standard Coverage

General Description

The TYCO Model FSC 80 K-factor Flush Sprinkler Concrete Sprinklers are quick response spray sprinklers designed for use in areas such as offices, hospitals, churches, schools, apartments, and hotels.

- For applications in poured concrete ceiling/floor assemblies, a unique Installation Cup is used to form the recessed cavity into which the FSC Sprinkler is installed
- The flush design is aesthetically appealing by concealing all operating parts. The FSC Sprinklers, with heat sensitive solder type release elements, are rated quick response sprinklers

NOTICE

The TYCO Model FSC 80 K-factor Flush Sprinkler Concrete sprinklers described herein must be installed and maintained in compliance with this document and with the applicable standards CEA 4001 "Sprinkler Systems: Planning and Installation" or EN12845 "Fixed Firefighting Systems - Automatic Sprinkler Systems - Design, Installation and Maintenance", in addition to the standards of any authorities having jurisdiction. Failure to do so may impair the performance of these devices.

Tyco Fire Protection Products specifically disclaims any liability for damages or injury (including death) arising out of or caused by manipulation, dismantling, or misuse of FSC Sprinklers or the use or attempted use of the FSC Sprinklers or any component thereof as an instrument unrelated to its intended function as a fire protection device.

The owner is responsible for maintaining their fire protection system and devices in proper operating condition. The installing contractor or manufacturer should be contacted with any questions.

IMPORTANT

Always refer to Technical Data Sheet TFP700 for the "INSTALLER WARNING" that provides cautions with respect to handling and installation of sprinkler systems and components. Improper handling and installation can permanently damage a sprinkler system or its components and cause the sprinkler to fail to operate in a fire situation or cause it to operate prematurely.

Sprinkler Identification Number (SIN)

TY3200

Technical Data

Approvals
VdS Approved

Flush Sprinkler Concrete is VdS approved for installation per CEA 4001 "Sprinkler Systems: Planning and Installation" or EN12845 "Fixed Firefighting Systems - Automatic Sprinkler Systems - Design, Installation and Maintenance".

Maximum Working Pressure
12,1 bar (175 psi)

Discharge Coefficient
80,6 LPM/bar$^{1/2}$ (K=5.6 GPM/psi$^{1/2}$)

Temperature Rating
74°C (165°F)

Finishes
Sprinkler: White/Gray
Escutcheon: White/Gray

Physical Characteristics

Frame	Brass
Deflector Assembly	Bronze
Sealing Assembly	Beryllium Nickel with TEFLON
Link Assembly	Copper
Button	Brass
Deflector Guide Pins	Stainless Steel
Bridge	Stainless Steel
Levers	Stainless Steel
Plug	Plastic
Escutcheon	Steel
Installation Cup Assembly	Plastic
Sprinkler Extension Thread	Brass
Thread Adapter	Brass

Design Criteria

General Criteria
The TYCO Model FSC 80 K-factor Flush Sprinkler Concrete Sprinklers are intended to be installed per CEA 4001 "Sprinkler Systems: Planning and Installation" or EN12845 "Fixed Firefighting Systems - Automatic Sprinkler Systems - Design, Installation and Maintenance" where Flush Sprinklers are permitted. Only escutcheons shown in Figure 1 can be utilized with the Model FSC 80 K-factor Flush Sprinkler Concrete Sprinklers.

In all cases, CEA 4001 "Sprinkler Systems: Planning and Installation" or EN12845 "Fixed Firefighting Systems - Automatic Sprinkler Systems - Design, Installation and Maintenance" must be followed to ensure proper installation. The FSC Sprinklers can be used in numerous scenarios including installation in concrete ceilings/floors assemblies.

Datasheet TFP645.

Describes the sprinkler and installation.

Available in DE and EN.

FSC Ordering procedure

Ordering Procedure

Sprinkler Assemblies

Specify: Model FSC 80 K-factor Flush Sprinkler Concrete Pendent Sprinklers with Thread Extension, Quick Response Standard Coverage, 74°C (165°F), with (specify) finish and P/N (specify).

White . . . . . P/N 50-313-4-165
Gray . . . . . P/N 50-313-9-165

Separately Ordered Style H Escutcheons (85 mm Diameter)

White . . . . . P/N 56-313-4-010
Gray . . . . . P/N 56-313-9-010

Separately Ordered Parts for Installation in Concrete

Flush Sprinkler Concrete Pendent Sprinkler:
White . . . . . P/N 51-313-4-165
Gray . . . . . P/N 51-313-9-165
Extension Thread . . . . . P/N 91-313-1-008
Adapter . . . . . P/N 91-313-1-007
Concrete Installation Kit . . . . . P/N 91-313-1-110
(Incl. Installation Cup, Cup Insert, and O-Ring)
Cup O-Ring Sub-Assembly . . . P/N 91-313-1-100
Cup Insert . . . . . P/N 91-313-1-004

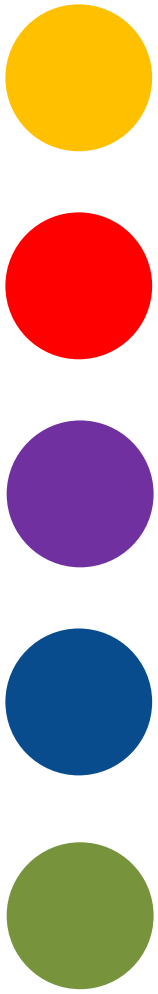
Separately Ordered Sprinkler Wrench

Specify: W-Type 25 Installation Wrench, P/N 56-314-1-001.

Specify: W-Type 28 Installation Cup Removal Tool, P/N 56-000-4-301.

Composed number for Sprinkler + Thread Extension + Thread Adaptor
P/N 503134165 = P/N 513134165 + P/N 913131008 + P/N 913131007
P/N 503139165 = P/N 513139165 + P/N 913131008 + P/N 913131007

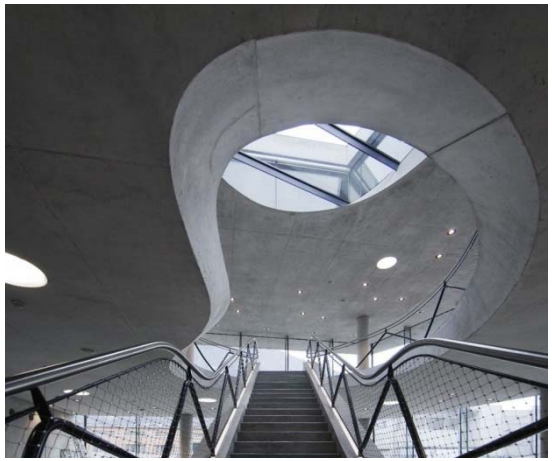
// FSC Colors



Available in every color, set up costs will apply

.

// FSC Typical Applications



// LH, OH1, OH2 and OH3 risks. E.g. Hotels, Offices, Department Stores

// Partly OH4, E.g. Cinema, Theater, Exhibition halls and museums.

Summary

- Superior Design
- Widely applicable. Not only in concrete.
- Deliverable in all requested colors.
- Wide range of MLC-S piping system extended to meet needs for installation.

//Questions

Thank You