

V25, K4.2

SPECIFIC APPLICATION

V2502 UPRIGHT QUICK RESPONSE

Victaulic® Model V2502 Specific Application Sprinklers are quick-response, specific application sprinklers for horizontal, combustible interstitial (concealed) spaces. These upright sprinklers are designed for use in specific light-hazard combustible and non-combustible concealed spaces that require sprinkler protection. The orifice design of the Victaulic Model V2502, with a nominal K-factor of 4.2, allows efficient use of available water supplies for hydraulically designed fire protection systems. The 3mm glass bulb and special deflector combine speed of operation and area of coverage to meet the proper application density and fire protection requirements for shallow, combustible concealed spaces.

In some cases, the Victaulic Model V2502 can be used with CPVC Sprinkler System piping within concealed spaces that require protection and are constructed of the following:

- Engineered wood and steel open truss construction
- Solid or composite wood joist construction where the upper deck is filled with non-combustible insulation

In addition, The Victaulic Model V2502 can be installed with steel pipe in protected areas that are constructed of the following:

- Solid wood joist construction without insulation in the upper deck
- Solid or composite wood joist construction where the upper deck is filled with non-combustible insulation
- Wood or steel trusses

In applications with non-corrosive pipe, the Victaulic Model V2502 can be used in a dry pipe or preaction system using corrosion resistant or internally galvanized steel pipe filled with compressed air or nitrogen as a supervisory medium



SEE VICTAULIC PUBLICATION 10.01 FOR DETAILS



UPRIGHT
(V2502)

SPRINKLER OPERATION:

During a fire, the heat-sensitive liquid in the glass bulb expands and causes the glass to shatter, which releases the pip cap and sealing spring assembly. Water that flows through the sprinkler orifice strikes the deflector and forms a uniform spray pattern to control the fire and protect the structure in concealed spaces.

COVERAGE:

The maximum area of coverage for the Victaulic Model V2502 is 144 ft² (13,4 m²) per sprinkler.

JOB/OWNER

System No. _____

Location _____

CONTRACTOR

Submitted By _____

Date _____

ENGINEER

Spec Sect _____ Para _____

Approved _____

Date _____

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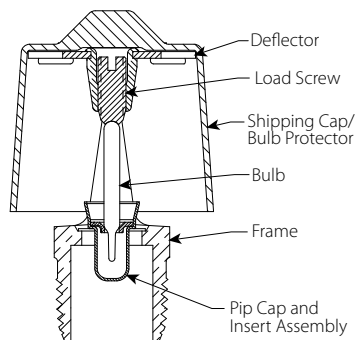
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TECHNICAL SPECIFICATIONS:



Models: V2502

Style: Upright

Nominal Orifice Size: 7/16"/11 mm

K-Factor: 4.2 Imp./6.0 S.I.[^]

Nominal Thread Size: 1/2" NPT/15 mm

Max. Working Pressure: 175 psi/1207 kPa

Factory Hydrostatic Test:

100% @ 500 psi/3448 kPa

Min. Operating Pressure: 8 psi/55 kPa

Nominal Temperature Rating: 175°/79°C

Overall Length: 2 1/4"/58 mm

Material Specifications

Deflector: Brass per UNS C26000 or Copper per C19500

Bulb: Glass with glycerin solution.

Bulb Nominal Diameter:

- Quick Response: 3.0 mm

Load Screw: Brass per UNS C36000

Pip Cap and Insert Assembly: Copper per UNS C11000 and Stainless Steel per UNS S30400

Belleville Spring Sealing Assembly: Nickel Alloy Coated on Both Sides with Teflon* Tape

Frame: Sand Cast brass per UNS C84400

Approved Finish: Brass only

* Teflon is a registered trademark of Dupont Co.

[^] For K-Factor when pressure is measured in Bar, multiply S.I. units by 10.0.

NOTICE

- Sprinklers cannot operate properly with shipping caps/bulb protectors in place.
- Remove shipping caps/bulb protectors carefully by hand after installation.
- Do not use any tools to remove bulb protectors.

APPROVALS/LISTINGS

| Model | Orifice Size | Nominal K-Factor | Response | Deflector Type | Approved Temperature Ratings °F / °C ‡ | | | |
|-------|--------------|----------------------------|----------|----------------|--|-----------|--------|---------|
| | Inches mm | Imperial S.I. [^] | | | UL | ULC | FM | NYC/MEA |
| V2502 | 1/2 13 | 4.2 6.0 | Quick | Upright | 175 79 | 175 79 | — — | — — |

[^] For K-Factor when pressure is measured in Bar, multiply S.I. units by 10.0.

‡ This table shows listings and approvals available at the time of printing. Other approvals may be in process.

RATINGS

Glass bulbs for the Victaulic Model V2502 are rated for ambient temperatures from -67°F/-55°C up to 150°F/65°C.

| Sprinkler Temperature Classification | Victaulic Part Identification | Temperature – °F/°C | | Glass Bulb Color |
|--------------------------------------|-------------------------------|------------------------------|---|------------------|
| | | Nominal Temperature Rating ‡ | Maximum Ambient Ceiling Temperature Allowed † | |
| Intermediate | S-251-5EQ-J10 | 175 79 | 150 65 | Yellow |

‡ The temperature rating is stamped on the deflector.

† Based on NFPA-13. Other limits may apply, depending upon fire loading, sprinkler location, and other requirements of the authority having jurisdiction. Refer to specific installation standards.

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DESIGN CRITERIA

For Combustible Concealed Installations Incorporating Sprinkler System Products and Victaulic Model V2502 Specific Application Sprinklers

General information

System Type: Light hazard, wet pipe system only

Area of Use: Horizontal interstitial (concealed) spaces with a roof pitch of 0/12 to 2/12 (9°) maximum constructed of:

- Engineered wood and steel open trusses
- Solid or composite wood joists where the upper deck is filled with non-combustible insulation

NOTICE

- Concealed spaces are defined as areas that have no access for storage.
- In order to be considered “solid or composite wood joist construction where the upper deck is filled with non-combustible insulation,” the insulation (including insulation provided with a combustible vapor barrier) must completely fill the pockets between the joists and to the bottom of the joists.
- The insulation must be secured in place with metal wire netting. The metal wire netting is intended to hold the insulation in place if the insulation becomes wetted by the operation of a Victaulic Model V2502 sprinkler during a fire.

Minimum Distance Between Victaulic Model V2502 Specific Application

Sprinklers: 7ft/2.4 m

NOTE: This minimum spacing does not apply to additional sprinklers required for protection of sprinkler system products that are offset over an obstruction.

Maximum Distance Between Victaulic Model V2502 Specific Application

Sprinklers: 12 ft/3.7 m

NOTE: This maximum spacing does not apply to additional sprinklers required for protection of sprinkler system products that are offset over an obstruction.

Maximum Sprinkler Coverage Area: 144 ft²/13.4 m² per sprinkler

Remote Area: 1000 ft²/93.0 m²

NOTE: This remote area does not include any additional sprinklers required for protection of sprinkler system products that are offset over an obstruction. For solid or composite wood construction, where the upper deck is filled with non-combustible insulation (Figure 2), the remote area must be calculated per NFPA 13 requirements for light-hazard applications with a smooth, flat ceiling.

Minimum Required Density: 0.10 gpm/ft²/4.1 mm/min

Minimum Operating Pressure: 8 psi/55 kPa

Obstructions: All NFPA obstruction criteria for standard spray sprinklers apply

Specifications for Engineered Wood and Steel Open Truss Construction (Figure 1)

Concealed Space Area: The area of the concealed space is not limited. However, draft curtains (heat collection baffle) or full-height walls must be provided to limit the maximum localized detection area to 1000 ft²/93.0 m². Draft curtains (heat collection baffle) or full-height walls must be at least 1/3 the depth of the concealed space or 8"/203.2 mm, whichever is greater, and must be constructed of a material that will not allow heat to escape through or above the barrier. This material may be 1/4"/6.4 mm thick plywood (refer to Figure 1, Example 1).

Deflector Position: The vertical sprinkler-deflector clearance to the bottom of the roof deck is 2" /50.8 mm minimum to 4"/101.6 mm maximum (refer to Figure 1, Example 2). The sprinkler must be installed only in the upright position. The sprinkler deflector must be installed parallel with the plane of the roof. NOTE: There is no limitation by the UL Listing in relation to frame arm positioning. However, Victaulic prefers the frame arms to be parallel with the trusses; this positioning produces a more efficient spray pattern during sprinkler operation (refer to Figure 1, Example 3).

Concealed Space Height (refer to Figure 1, Example 4):

- **Maximum Height of the Concealed Space:** 36"/914.4 mm
- **Minimum Height of the Concealed Space:** 12"/304.8 mm
- **Maximum Roof Pitch:** 2/12 (9°)

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DESIGN CRITERIA (continued)

For Combustible Concealed Installations Incorporating Sprinkler System Products and Victaulic Model V2502 Specific Application Sprinklers

Specifications for Solid or Composite Wood Joist Construction

Where the Upper Deck is Filled with Non-Combustible Insulation (Figure 2)

Concealed Space Area: The area of the concealed space is not limited. However, draft curtains (heat collection baffle) or full-height walls must be provided to limit the maximum localized detection area to 1000 ft²/93.0 m². Draft curtains (heat collection baffle) or full-height walls must drop below the joist a minimum of 6"/152.4 mm or 1/3 of the total space (whichever is smaller) and must run laterally with the joist spaced at 25 ft/8 m maximum widths. Draft curtains (heat collection baffle) or full-height walls must be constructed of a material that will not allow heat to escape through or above the barrier. This material may be 1/4"/6.4-mm thick plywood (refer to Figure 2, Example 1).

Deflector Position: The clearance from the sprinkler deflector to the bottom of the joist is 1 1/2" minimum to 2"/50.8 mm maximum (refer to Figure 2, Example 2). The sprinkler must be installed only in the upright position. When the Victaulic Model V2502 Specific Application Sprinkler is used in an installation with a pitched roof and a flat ceiling, maintain the specified clearances from the sprinkler deflector to the bottom of the upper deck joist and the maximum height of the pipe run to the ceiling in all locations. The sprinkler deflector must be installed parallel with the plane of the roof.

NOTE: There is no limitation by the UL Listing in relation to frame arm positioning. However, Victaulic prefers the frame arms to be parallel with the joists; this positioning produces a more efficient spray pattern during sprinkler operation (refer to Figure 2, Example 3).

Concealed Space Height (Figure 2, Examples 4 and 4a):

- **Height of the Concealed Space from the Bottom of the Upper Deck Joist to the Top of the Ceiling Surface (Example 4):** 12"/304.8 mm Minimum to 36"/914.4 mm Maximum
- **Height of the Concealed Space from the Bottom of the Upper Deck Joist to the Top of the Ceiling Joist (Example 4a):** 8"/203.2 mm Minimum
- **Maximum Roof Pitch:** 2/12 (9°)

Additional Information

- When Victaulic Model V2502 Specific Application Sprinklers are used with sprinkler system products, the bottom of the horizontal run must be no greater than 6"/152.4 mm or 1/3 of the total space above the ceiling (whichever is smaller). The sprinkler system piping can then be used to supply the Victaulic Model V2502 Specific Application Sprinklers as well as the sprinklers below the ceiling. All instructions in the Spears FG-31010 Installation Instructions must be referenced during system installation. NOTE: If 12"/304.8 mm trusses are used in Figure 1, the bottom of the horizontal run must be no greater than 4"/101.6 mm above the ceiling. In Figure 2, if the concealed space height from the bottom of the upper deck joist to the top of the ceiling joist is the minimum 8"/203.2-mm requirement, the bottom of the horizontal run must be no greater than 4"/101.6 mm above the ceiling (refer to Figures 1 and 2, Example 5).
- When sprinkler system piping must be offset up and over an obstruction, and the bottom of the pipe will be located more than 6"/152.4 mm or 1/3 of the total space above the ceiling, additional Victaulic Model V2502 Specific Application Sprinklers must be installed to protect the CPVC product (refer to Figures 1 and 2, Example 6). The sprinkler must be installed directly over the obstruction (refer to Figures 1 and 2, Example 7).
- When using 1/2"/20 mm piping, all sprigs over 12"/304.8 mm must be laterally braced, per NFPA standards.
- When using 1"/25-mm or larger piping, a hanger must be located at the truss closest to asprig for restraint.
- A minimum lateral distance of 18"/457.2 mm must be maintained between CPVC pipe and heat sources (i.e. fan motors, heat lamps, HVAC heat pump units, etc.).

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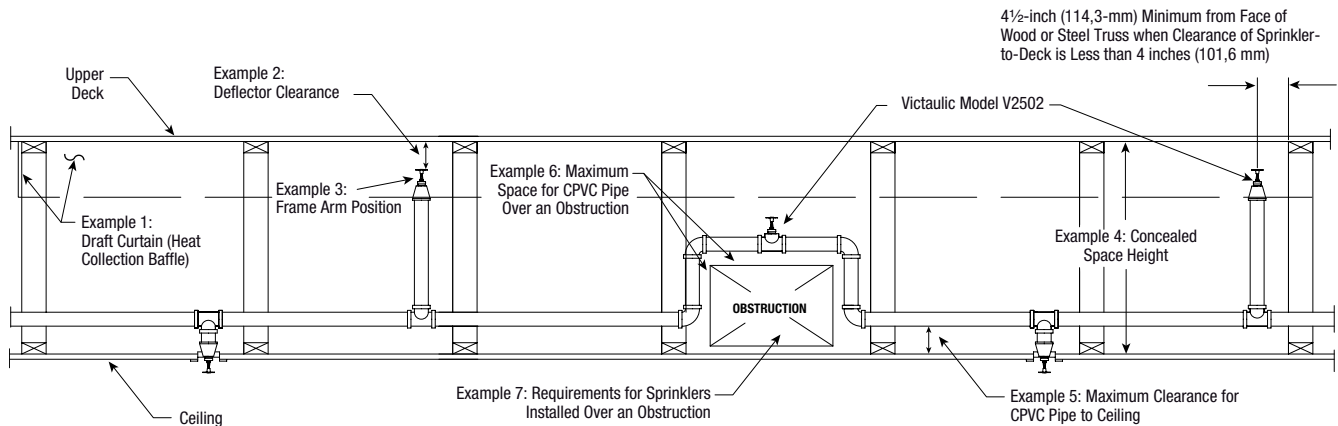
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Figure 1
Engineered Wood and Steel Open Truss Construction Incorporating CPVC Pipe
(Cross Section View)

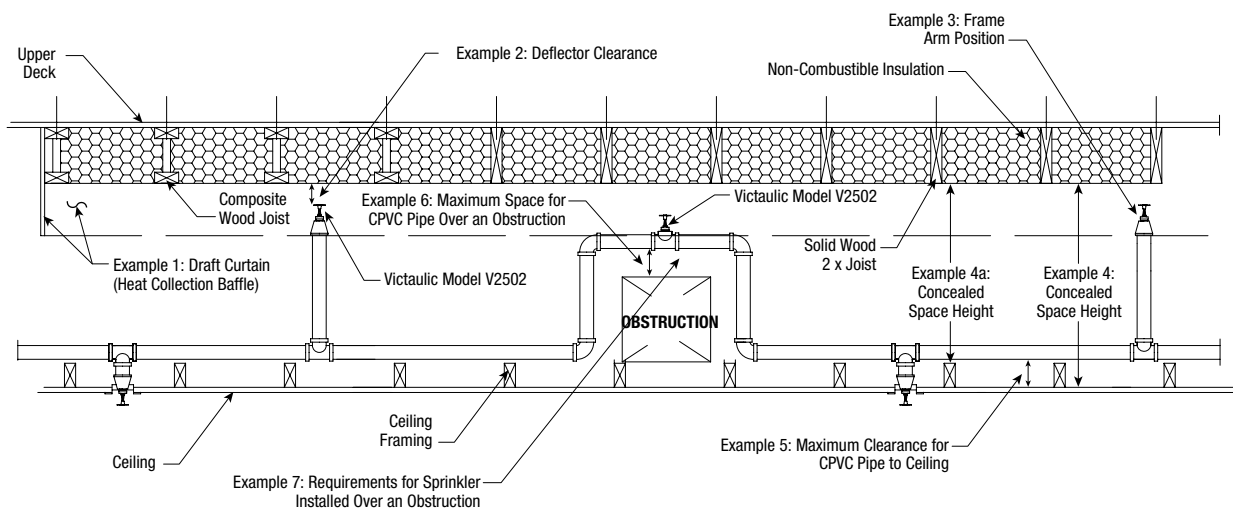


Figure 2
Solid or Composite Wood Construction Incorporating CPVC Pipe where
the Upper Deck is Filled with Non-Combustible Insulation
(Cross Section View)

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DESIGN CRITERIA

For Combustible Concealed Installations Incorporating Steel Pipe and Victaulic Model V2502 Specific Application Sprinklers

General information

System Type: Light hazard – wet pipe, dry pipe, or preaction-type systems supervised with air or inert gas (for steel pipe only). Refer to the “Additional Information” section on the following page.

Area of Use: Horizontal interstitial (concealed) spaces with a roof pitch of 0/12 to 2/12 (9°) maximum constructed of:

- Solid wood joists without insulation in the upper deck
- Solid or composite wood joists where the upper deck is filled with non-combustible insulation
- Wood or steel trusses

NOTICE

- Concealed spaces are defined as areas that have no access for storage.
- In order to be considered "solid or composite wood joist construction where the upper deck is filled with non-combustible insulation," the insulation (including insulation provided with a combustible vapor barrier) must completely fill the pockets between the joists and to the bottom of the joists. When the space is completely filled with non-combustible insulation, wood blocking is not required.
- The insulation must be secured in place with metal wire netting. The metal wire netting is intended to hold the insulation in place if the insulation becomes wetted by the operation of a Victaulic Model V2502 sprinkler during a fire.

Minimum Distance Between Victaulic Model V2502 Specific Application Sprinklers: 7ft/2.1 m

Maximum Distance Between Victaulic Model V2502 Specific Application Sprinklers: 12 ft/3.7 m

NOTE: This maximum spacing does not apply to additional sprinklers required for protection of sprinkler system products that are offset over an obstruction.

Maximum Sprinkler Coverage Area: 144 ft²/13.4 m² per sprinkler

Remote Area: The remote area for wood or steel open truss construction (Figure 5) or solid wood joist construction without insulation in the upper deck (Figure 3) is 1000 ft²/93.0 m² for wet pipe systems or 1300 ft²/121.0 m² for dry pipe systems. The remote area for solid or composite wood joist construction where the upper deck is filled with non-combustible insulation (Figure 4) must be calculated per NFPA 13 requirements for light-hazard applications with a smooth, flat ceiling.

Minimum Required Density: 0.10 gpm/ft²/4.1 mm/min

Minimum Operating Pressure: 8 psi/55 kPa

Obstructions: All NFPA obstruction criteria for standard spray sprinklers apply

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DESIGN CRITERIA

Specifications for Solid Wood Joist Construction Without Insulation in the Upper Deck and Solid or Composite Wood Joist Construction Where the Upper Deck is Filled with Non-Combustible Insulation (Figures 3 and 4)

General information continued

Concealed Space Area: The concealed space area is not limited. However, blocking between the joists and the upper deck must be constructed of a material that will not allow heat to escape through or above the blocking. The blocking must be constructed to the full depth of the upper joist and must contain a non-combustible material or a material that is the same composition of the joist construction. The maximum channel space for blocking is 32 ft/9.8 m intervals.

Draft curtains (heat collection baffle) or full-height walls must drop below the joist a minimum of 6" /152.4 mm or 1/3 of the space, whichever is smaller, and must run laterally with the joist spaced at 25 ft/8.0 m maximum widths to limit the maximum localized detection area to 1000 ft²/93.0 m². Draft curtains (heat collection baffle) or full-height walls must be constructed of a material that will not allow heat to escape through or above the barrier. This material may be 1/8" 6.4 mm thick plywood (refer to Figures 3 and 4, Example 1).

Deflector Position: The vertical sprinkler deflector clearance to the bottom of the upper deck joist is 1 1/2 inches/38.1 mm minimum to 2" /50.8 mm maximum (refer to Figures 3 and 4, Example 2). The sprinkler must be installed only in the upright position. When the Victaulic Model V2502 Specific Application Sprinkler is used in an installation with a pitched roof and a flat ceiling, maintain the specified clearances from the sprinkler deflector to the bottom of the upper deck joist. The sprinkler deflector must be installed parallel with the plane of the roof. **NOTE:** There is no limitation by the UL Listing in relation to frame arm positioning. However, Victaulic prefers the frame arms to be parallel with the joists; this positioning produces a more efficient spray pattern during sprinkler operation (refer to Figures 3 and 4, Example 3).

Concealed Space Height (Figures 3, Example 4 and 4a; Figure 4, Example 4):

- **Height of the Concealed Space from the Bottom of the Upper Deck Joist to the Top of the Ceiling Frame Joist:** 6" /152.4 mm Minimum to 36" /914.4 mm Maximum
- **Height of the Concealed Space from the Bottom of the Upper Deck to the Ceiling Surface (Bottom of Joist):** 54" /1371.6 mm Maximum
- **Maximum Roof Pitch:** 2/12 (9°)

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DESIGN CRITERIA (continued)

For Combustible Concealed Installations Incorporating Steel Pipe and Victaulic Model V2502 Specific Application Sprinklers

Specifications for Wood or Steel Open Truss Construction (Figure 5)

Concealed Space Area: The concealed space area is not limited. However, blocking between the joists and the upper deck must be constructed of a material that will not allow heat to escape through or above the blocking. The blocking must be constructed to the full depth of the upper joist and must contain a non-combustible material or a material that is the same composition of the joist construction. The maximum channel space for blocking is 32 ft/9.8-m intervals.

Draft curtains (heat collection baffle) or full-height walls must drop below the upper deck a minimum of 8"/203.2 mm or $\frac{1}{4}$ of the space, whichever is greater, and must run laterally with the truss spaced at 25 ft/8.0-m maximum widths to limit the maximum localized detection area to 1000 ft²/93.0 m². Draft curtains (heat collection baffle) or full-height walls must be constructed of a material that will not allow heat to escape through or above the barrier. This material may be $\frac{1}{4}$ "6.4 mm thick plywood (refer to Figure 5, Note 1).

Deflector Position: The vertical sprinkler deflector clearance to the bottom of the upper deck surface is 2"/50.8 mm minimum to 4"/101.6 mm maximum (refer to Figure 5, Example 2). The sprinkler must be installed only in the upright position. The sprinkler deflector must be installed parallel with the plane of the roof. **NOTE:** There is no limitation by the UL Listing in relation to frame arm positioning. However, Victaulic prefers the frame arms to be parallel with the trusses; this positioning produces a more efficient spray pattern during sprinkler operation (refer to Figure 5, Example 3).

Concealed Space Height (Figure 5, Example 4):

- **Maximum Height of the Concealed Space:** 36"/914.4 mm from the interior surface of the upper deck to the topside of the ceiling
- **Minimum Height of the Concealed Space:** 12"/304.8 mm from interior surface of the upper deck to the topside of the ceiling
- **Maximum Roof Pitch:** 2/12 (9°)

Additional Information

- Typically, the upper joist is constructed of solid or composite wood with a maximum depth of 12"/304.8 mm on center of 16"/406.4-mm minimum spacing.
- Steel pipe may be hung from the upper joist or truss using proper supports.
- Extra sprinklers are not required for protection of pipe when offsetting over obstructions.
- There are no clearance requirements for supply piping to the ceiling.
- Ceiling sprinklers below the concealed space may be fed from the same piping as the Victaulic Model V2502 Sprinklers.
- When acceptable to the local authority having jurisdiction, Victaulic Model V2502 Specific Application Sprinklers may be used in dry pipe systems when installed with corrosion resistant or internally galvanized pipe.
- Paragraph 8.3.4.3 of NFPA 13 (2010 Edition) allows sprinklers with a nominal K-factor of 4.2 in dry pipe systems with corrosion resistant or internally galvanized pipe. The minimum operating pressure of 8.0 psi/55 kPa referenced in this submittal is based solely upon specific fire tests conducted for the UL Listing.

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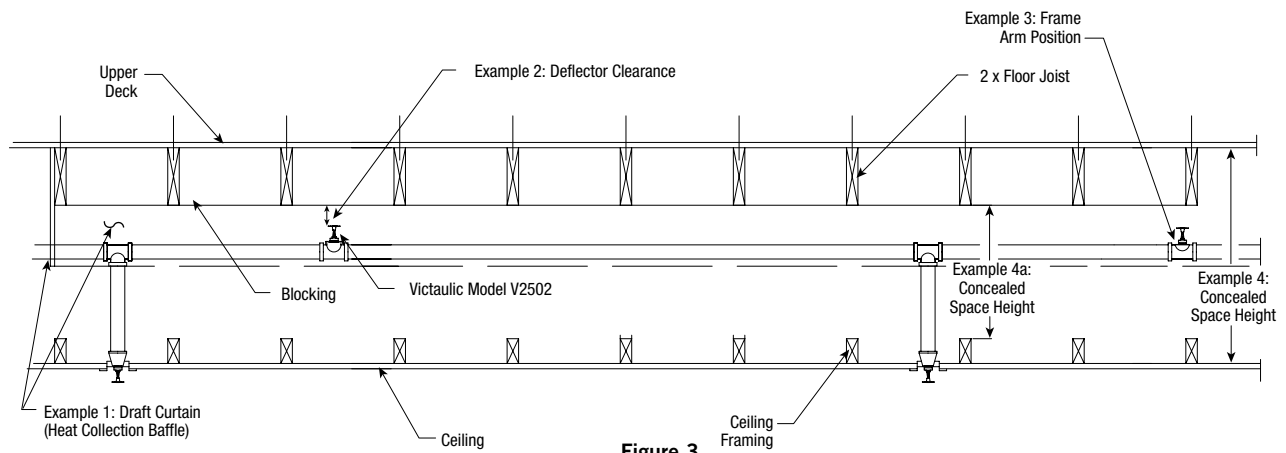
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Figure 3
Solid Wood Joist Construction Incorporating Steel Pipe
(Cross Section View)

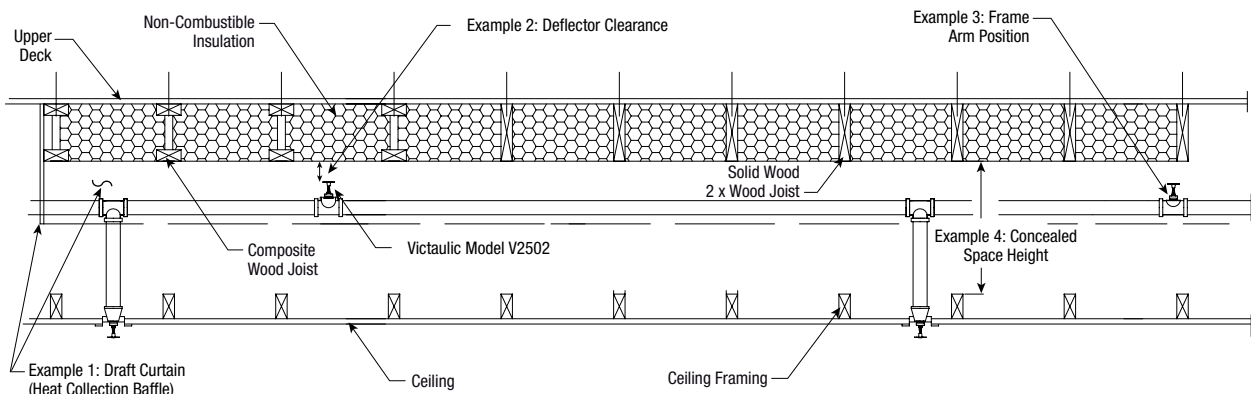


Figure 4
Solid Wood Joist Construction Incorporating Steel Pipe Without Insulation
or Composite Wood Joist Construction Incorporating Steel Pipe Where
the Upper Deck is Filled with Non-Combustible Insulation
(Cross Section View)

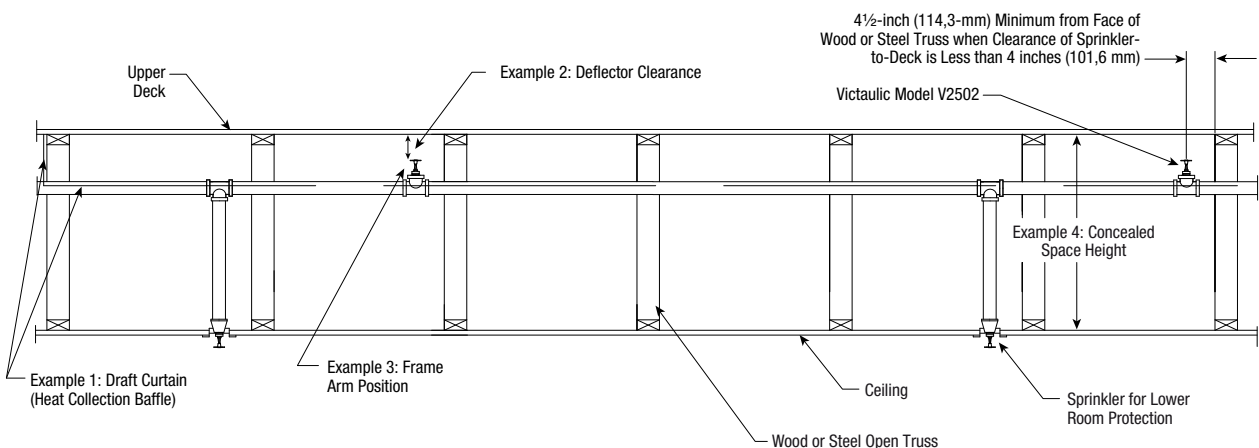


Figure 5
Wood and Steel Open Truss Construction Incorporating Steel Pipe
(Cross Section View)

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WARRANTY

Refer to the Warranty section of the current Price List or contact Victaulic for details.

NOTE

This product shall be manufactured by Victaulic or to Victaulic specifications. All products to be installed in accordance with current Victaulic installation/assembly instructions. Victaulic reserves the right to change product specifications, designs and standard equipment without notice and without incurring obligations.

For complete contact information, visit www.victaulic.com

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