

FireLock® Storage Sprinkler Design Guide

This Firelock Storage Sprinkler Design Guide (the "Guide") illustrates the performance characteristics of the full offering of Victaulic Storage Sprinklers based upon selected design criteria such as ceiling height, class of commodity in storage, type of rack design, etc.

This Guide should be used for general reference only. Consult the individual Submittal Publication for each individual sprinkler and consult Victaulic with any questions. Submittal Publications can be downloaded from the Victaulic website at www.victaulic.com.

REGULATORY APPROVALS AND LISTINGS

FireLock LP-46 Storage Sprinkler V4601 Pendent – FM Approved, cULus Listed
See Submittal Publication 40.95

FireLock LP-46 Storage Sprinkler V4603 Upright – FM Approved
See Submittal Publication 40.98

FireLock V4402 K14.0 ESRF Pendent – cULus Listed, FM Approved
See Submittal Publication 40.82

FireLock V4404 K16.8 ESRF Pendent – cULus Listed, FM Approved
See Submittal Publication 40.86

FireLock V3407 K11.2 ELO Standard Response Pendent – UL, ULC Listed, FM Approved
See Submittal Publication 40.20

FireLock V3408 K11.2 ELO Quick Response Pendent – UL, ULC Listed, FM Approved
See Submittal Publication 40.20

TABLE OF CONTENTS

	<i>Page</i>
Design Considerations – FM and NFPA 13	2
<i>System Type</i>	
Wet – Pendent Sprinklers for Solid Piled, Bin-Box Rack	3
Wet – Pendent Sprinklers for Open Frame Rack Shelving	8
Wet – Upright Sprinklers for Solid Piled, Bin-Box Rack	13
Wet – Upright Sprinklers for Open Frame Rack Shelving	16
Dry/Preaction – Upright Sprinklers for Solid Piled, Bin-Box Rack	19
Dry/Preaction – Upright Sprinklers for Open Frame Rack Shelving	22
<i>Dry System Valve Trip Time Reference</i>	
FireLock NXT® Series 768 Dry Valve or Series 769P Preaction Valve with Accelerator and Four Open Sprinklers (LP-46 V4603 K25.2 Upright)	24
FireLock NXT® Series 768 Dry Valve or Series 769P Preaction Valve with Accelerator and Four Open Sprinklers (K11.2 Sprinklers)	24
FireLock NXT® Series 768 Dry Valve or Series 769P Preaction Valve with Accelerator and One Open Sprinkler (K8.0 Intermediate Sprinklers)	24
FireLock NXT® Series 768 Dry Valve or Series 769P Preaction Valve with Accelerator and One Open Sprinkler (K5.6 Intermediate Sprinklers)	24

Design Considerations – FM and NFPA 13

The sequence to design a storage sprinkler system is as follows:

Factory Mutual (FM) – For Victaulic FM Approved sprinklers

- Determine commodity (FM Data Sheet 8-1)
- Determine type of sprinkler system: wet, dry or preaction. (DS 8-9 section 2.3.2)
- Determine if there are any special applications for the storage area. For example: Freezer storage, or in-rack sprinklers (DS 8-9 section 2.3.6). If storage is refrigerated, see DS 8-29.
- Follow requirements for storage area construction, like draft curtains, heat/smoke venting and panel material for refrigerated systems (DS 2-0 section 2.1.1.7 and 2.1.1.8. DS 1-57 for panel material).
- Determine maximum ceiling height of storage area.
- Determine how commodity is stored. (Solid-piled, palletized or open frame rack)
- Assess any special considerations for container style. Open top combustible containers require special consideration (DS 8-9, Section 2.2.5).
- Follow general guidelines for installation (DS 8-9, section 2.3.1 and FM Bulletin 01-11).
- Follow requirements for ceiling-level sprinklers (DS 8-9, section 2.3.3 and FM Bulletin 01-11).
- Follow requirements for flue spaces (DS 8-9, section 2.2.3.1).
- Apply all data gathered to tables 7-11 of DS 8-9, section 2.3.3.7 and FM Bulletin 01-11.
- Add hose stream value (DS 8-9, section 2.3.5).
- Use the FireLock NXT Trip Time Data provided in this document to assist with water delivery calculations if required.

NFPA 13 – For Victaulic UL Listed sprinklers

- Determine commodity class from NFPA Chapter 5.
- Determine type of sprinkler system (wet/dry/preaction).
- Follow the parameters of wet, dry or preaction systems for the storage area. Also, note any special considerations for the protection area. For example: Freezer storage, or in-rack sprinklers. Follow Chapter 7
- Follow requirements for storage area construction, like draft curtains, heat/smoke venting and panel material for refrigerated systems (Chapter 12.1.1).
- Determine maximum ceiling height of storage area.
- Determine maximum storage height.
- Determine how commodity is stored (solid-piled, palletized or open frame rack).
- Assess any special considerations for container style. Open top combustible containers require special consideration and in-rack sprinklers. No exceptions.
- Use data for CMSA sprinklers protecting class I-IV commodities (Table 16.2.2.1). This table will outline wet/dry capabilities and hose stream allowances.
- Use the FireLock NXT Trip Time Data provided in this document to assist with water delivery calculations if required.
- Follow general guidelines for installation.

FireLock® Storage Sprinkler Design Guide

System Type: Wet – Pendent Sprinklers for Solid Piled, Bin-Box Rack

Storage Type: Single-Row, Double-Row and Multi-Row Racks

Commodity Class: I – III

Maximum Building Height†		Sprinkler	Sprinkler	Sprinkler	Sprinkler
		LP-46 Pendent K25.2 Standard	V3407 Std. Pendent K11.2 V3408 Quick Pendent K11.2	V4402 Pendent K14.0 Quick	V4404 Pendent K16.8 Quick
20	Minimum Flow (gpm)	800	593	1188	1193
	Pressure (psi)	7	7	50	35
	Number of Sprinklers	12	20	12	12
	Hose (gpm)	250	500	250	250
25	Minimum Flow (gpm)	956	593	1188	1193
	Pressure (psi)	10	7	50	35
	Number of Sprinklers	12	20	12	12
	Hose (gpm)	250	500	250	250
30	Minimum Flow (gpm)	956	593	1188	1193
	Pressure (psi)	10	7	50	35
	Number of Sprinklers	12	20	12	12
	Hose (gpm)	250	500	250	250
35	Minimum Flow (gpm)	1171	751	1455	1426
	Pressure (psi)	15	20	75	50
	Number of Sprinklers	12	15	12	12
	Hose (gpm)	250	500	250	250
40	Minimum Flow (gpm)	1656	–	1455	1426
	Pressure (psi)	30	–	75	50
	Number of Sprinklers	12	–	12	12
	Hose (gpm)	250	–	250	250
45	Minimum Flow (gpm)	–	–	1594	1625
	Pressure (psi)	–	–	90	65
	Number of Sprinklers	–	–	12	12
	Hose (gpm)	–	–	250	250

† Design data provided for ceiling heights 15 ft. or less can also be applied to ceiling sprinklers utilizing in-racks sprinkler protection.

Note: Coverage Area is calculated at 100 sq. ft. (10' x 10') per sprinkler.

FireLock® Storage Sprinkler Design Guide

System Type: Wet – Pendent Sprinklers for Solid Piled, Bin-Box Rack

Storage Type: Single-Row, Double-Row and Multi-Row Racks

Commodity Class: IV and Cartoned Unexpanded Plastics

Maximum Building Height†		Sprinkler	Sprinkler	Sprinkler	Sprinkler
		LP-46 Pendent K25.2 Standard	V3407 Std. Pendent K11.2 V3408 Quick Pendent K11.2	V4402 Pendent K14.0 Quick	V4404 Pendent K16.8 Quick
15	Minimum Flow (gpm)	800	593	1188	1193
	Pressure (psi)	7	7	50	35
	Number of Sprinklers	12	20	12	12
	Hose (gpm)	250	500	250	250
20	Minimum Flow (gpm)	800	751	1188	1193
	Pressure (psi)	7	20	50	35
	Number of Sprinklers	12	15	12	12
	Hose (gpm)	250	500	250	250
25	Minimum Flow (gpm)	956	1188	1188	1193
	Pressure (psi)	10	50	50	35
	Number of Sprinklers	12	15	12	12
	Hose (gpm)	250	500	250	250
30	Minimum Flow (gpm)	956	1584	1188	1193
	Pressure (psi)	10	50	50	35
	Number of Sprinklers	12	20	12	12
	Hose (gpm)	250	500	250	250
35	Minimum Flow (gpm)	1656	–	1455	1426
	Pressure (psi)	30	–	75	50
	Number of Sprinklers	12	–	12	12
	Hose (gpm)	250	–	250	250
40	Minimum Flow (gpm)	1656	–	1455	1426
	Pressure (psi)	30	–	75	50
	Number of Sprinklers	12	–	12	12
	Hose (gpm)	250	–	250	250
45	Minimum Flow (gpm)	–	–	1594	1625
	Pressure (psi)	–	–	90	65
	Number of Sprinklers	–	–	12	12
	Hose (gpm)	–	–	250	250

† Design data provided for ceiling heights 15 ft. or less can also be applied to ceiling sprinklers utilizing in-racks sprinkler protection.

Note: Coverage Area is calculated at 100 sq. ft. (10' x 10') per sprinkler.

FireLock® Storage Sprinkler Design Guide

System Type: Wet – Pendent Sprinklers for Solid Piled, Bin-Box Rack

Storage Type: Single-Row, Double-Row and Multi-Row Racks

Commodity Class: Cartoned Expanded Plastic

Maximum Building Height†		Sprinkler	Sprinkler	Sprinkler	Sprinkler
		LP-46 Pendent K25.2 Standard	V3407 Std. Pendent K11.2 V3408 Quick Pendent K11.2	V4402 Pendent K14.0 Quick	V4404 Pendent K16.8 Quick
10	Minimum Flow (gpm)	1000	593	1188	1193
	Pressure (psi)	7	7	50	35
	Number of Sprinklers	15	20	12	12
	Hose (gpm)	500	500	250	250
15	Minimum Flow (gpm)	1000	593	1188	1193
	Pressure (psi)	7	7	50	35
	Number of Sprinklers	15	20	12	12
	Hose (gpm)	500	500	250	250
20	Minimum Flow (gpm)	1000	751	1188	1193
	Pressure (psi)	7	20	50	35
	Number of Sprinklers	15	15	12	12
	Hose (gpm)	500	500	250	250
25	Minimum Flow (gpm)	1195	1188	1188	1193
	Pressure (psi)	10	50	50	35
	Number of Sprinklers	15	15	12	12
	Hose (gpm)	500	500	250	250
30	Minimum Flow (gpm)	1594	1584	1188	1193
	Pressure (psi)	10	50	50	35
	Number of Sprinklers	20	20	12	12
	Hose (gpm)	500	500	250	250

† Design data provided for ceiling heights 15 ft. or less can also be applied to ceiling sprinklers utilizing in-racks sprinkler protection.

Note: Coverage Area is calculated at 100 sq. ft. (10' x 10') per sprinkler.

FireLock® Storage Sprinkler Design Guide

System Type: Wet – Pendent Sprinklers for Solid Piled, Bin-Box Rack

Storage Type: Single-Row, Double-Row and Multi-Row Racks

Commodity Class: Uncartoned Unexpanded Plastic

Maximum Building Height†		Sprinkler	Sprinkler	Sprinkler	Sprinkler
		LP-46 Pendent K25.2 Standard	V3407 Std. Pendent K11.2 V3408 Quick Pendent K11.2	V4402 Pendent K14.0 Quick	V4404 Pendent K16.8 Quick
10	Minimum Flow (gpm)	1000	593	1188	1193
	Pressure (psi)	7	7	50	35
	Number of Sprinklers	15	20	12	12
	Hose (gpm)	500	500	250	250
15	Minimum Flow (gpm)	1000	1188	1188	1193
	Pressure (psi)	7	50	50	35
	Number of Sprinklers	15	15	12	12
	Hose (gpm)	500	500	250	250
20	Minimum Flow (gpm)	1000	1188	1188	1193
	Pressure (psi)	7	50	50	35
	Number of Sprinklers	15	15	12	12
	Hose (gpm)	500	500	250	250
25	Minimum Flow (gpm)	1195	1584	1188	1193
	Pressure (psi)	10	50	50	35
	Number of Sprinklers	15	20	12	12
	Hose (gpm)	500	500	250	250
30	Minimum Flow (gpm)	1594	1584	1188	1193
	Pressure (psi)	10	50	50	35
	Number of Sprinklers	20	20	12	12
	Hose (gpm)	500	500	250	250
35	Minimum Flow (gpm)	–	–	1455	1426
	Pressure (psi)	–	–	75	50
	Number of Sprinklers	–	–	12	12
	Hose (gpm)	–	–	250	250
40	Minimum Flow (gpm)	–	–	1455	1426
	Pressure (psi)	–	–	75	50
	Number of Sprinklers	–	–	12	12
	Hose (gpm)	–	–	250	250

† Design data provided for ceiling heights 15 ft. or less can also be applied to ceiling sprinklers utilizing in-racks sprinkler protection.

Note: Coverage Area is calculated at 100 sq. ft. (10' x 10') per sprinkler.

FireLock® Storage Sprinkler Design Guide

System Type: Wet – Pendent Sprinklers for Solid Piled, Bin-Box Rack

Storage Type: Single-Row, Double-Row and Multi-Row Racks

Commodity Class: Uncartoned Expanded Plastic

Maximum Building Height†		Sprinkler	Sprinkler	Sprinkler	Sprinkler
		LP-46 Pendent K25.2 Standard	V3407 Std. Pendent K11.2 V3408 Quick Pendent K11.2	V4402 Pendent K14.0 Quick	V4404 Pendent K16.8 Quick
10	Minimum Flow (gpm)	1000	593	1188	1193
	Pressure (psi)	7	7	50	35
	Number of Sprinklers	15	20	12	12
	Hose (gpm)	500	500	250	250
15	Minimum Flow (gpm)	1000	840	1188	1193
	Pressure (psi)	7	25	50	35
	Number of Sprinklers	15	15	12	12
	Hose (gpm)	500	500	250	250
20	Minimum Flow (gpm)	1195	1188	1188	1193
	Pressure (psi)	10	50	50	35
	Number of Sprinklers	15	15	12	12
	Hose (gpm)	500	500	250	250
25	Minimum Flow (gpm)	1992	1980	1188	1193
	Pressure (psi)	10	50	50	35
	Number of Sprinklers	25	25	12	12
	Hose (gpm)	500	500	250	250
30	Minimum Flow (gpm)	–	–	1680	1687
	Pressure (psi)	–	–	100	70
	Number of Sprinklers	–	–	12	12
	Hose (gpm)	–	–	250	250

† Design data provided for ceiling heights 15 ft. or less can also be applied to ceiling sprinklers utilizing in-racks sprinkler protection.

Note: Coverage Area is calculated at 100 sq. ft. (10' x 10') per sprinkler.

FireLock® Storage Sprinkler Design Guide

System Type: Wet – Pendent Sprinklers for Open Frame Rack Shelving

Storage Type: Single-Row, Double-Row and Multi-Row Racks (no solid shelves)

Commodity Class: I – III

Maximum Building Height†		Sprinkler	Sprinkler	Sprinkler	Sprinkler
		LP-46 Pendent K25.2 Standard	V3407 Std. Pendent K11.2 V3408 Quick Pendent K11.2	V4402 Pendent K14.0 Quick	V4404 Pendent K16.8 Quick
20	Minimum Flow (gpm)	800	593	1188	1193
	Pressure (psi)	7	7	50	35
	Number of Sprinklers	12	20	12	12
	Hose (gpm)	250	500	250	250
25	Minimum Flow (gpm)	956	920	1188	1193
	Pressure (psi)	10	30	50	35
	Number of Sprinklers	12	15	12	12
	Hose (gpm)	250	500	250	250
30	Minimum Flow (gpm)	956	1584	1188	1193
	Pressure (psi)	10	50	50	35
	Number of Sprinklers	12	20	12	12
	Hose (gpm)	250	500	250	250
35	Minimum Flow (gpm)	1656	–	1455	1426
	Pressure (psi)	30	–	75	50
	Number of Sprinklers	12	–	12	12
	Hose (gpm)	250	–	250	250
40	Minimum Flow (gpm)	1656	–	1455	1426
	Pressure (psi)	30	–	75	50
	Number of Sprinklers	12	–	12	12
	Hose (gpm)	250	–	250	250

† Design data provided for ceiling heights 15 ft. or less can also be applied to ceiling sprinklers utilizing in-racks sprinkler protection.

Note: Coverage Area is calculated at 100 sq. ft. (10' x 10') per sprinkler.

FireLock® Storage Sprinkler Design Guide

System Type: Wet – Pendent Sprinklers for Open Frame Rack Shelving

Storage Type: Single-Row, Double-Row and Multi-Row Racks (no solid shelves)

Commodity Class: IV and Cartoned Unexpanded Plastics

Maximum Building Height†		Sprinkler	Sprinkler	Sprinkler	Sprinkler
		LP-46 Pendent K25.2 Standard	V3407 Std. Pendent K11.2 V3408 Quick Pendent K11.2	V4402 Pendent K14.0 Quick	V4404 Pendent K16.8 Quick
15	Minimum Flow (gpm)	800	593	1188	1193
	Pressure (psi)	7	7	50	35
	Number of Sprinklers	12	20	12	12
	Hose (gpm)	250	500	250	250
20	Minimum Flow (gpm)	800	751	1188	1193
	Pressure (psi)	7	20	50	35
	Number of Sprinklers	12	15	12	12
	Hose (gpm)	250	500	250	250
25	Minimum Flow (gpm)	956	1188	1188	1193
	Pressure (psi)	10	50	50	35
	Number of Sprinklers	12	15	12	12
	Hose (gpm)	250	500	250	250
30	Minimum Flow (gpm)	956	–	1188	1193
	Pressure (psi)	10	–	50	35
	Number of Sprinklers	12	–	12	12
	Hose (gpm)	250	–	250	250
35	Minimum Flow (gpm)	1656	–	1455	1426
	Pressure (psi)	30	–	75	50
	Number of Sprinklers	12	–	12	12
	Hose (gpm)	250	–	250	250
40	Minimum Flow (gpm)	1656	–	1455	1426
	Pressure (psi)	30	–	75	50
	Number of Sprinklers	12	–	12	12
	Hose (gpm)	250	–	250	250

† Design data provided for ceiling heights 15 ft. or less can also be applied to ceiling sprinklers utilizing in-racks sprinkler protection.

Note: Coverage Area is calculated at 100 sq. ft. (10' x 10') per sprinkler.

FireLock® Storage Sprinkler Design Guide

System Type: Wet – Pendent Sprinklers for Open Frame Rack Shelving

Storage Type: Single-Row, Double-Row and Multi-Row Racks (no solid shelves)

Commodity Class: Cartoned Expanded Plastic

Maximum Building Height†		Sprinkler	Sprinkler	Sprinkler	Sprinkler
		LP-46 Pendent K25.2 Standard	V3407 Std. Pendent K11.2 V3408 Quick Pendent K11.2	V4402 Pendent K14.0 Quick	V4404 Pendent K16.8 Quick
15	Minimum Flow (gpm)	1000	593	1188	1193
	Pressure (psi)	7	7	50	35
	Number of Sprinklers	15	20	12	12
	Hose (gpm)	500	500	250	250
20	Minimum Flow (gpm)	1000	751	1188	1193
	Pressure (psi)	7	20	50	35
	Number of Sprinklers	15	15	12	12
	Hose (gpm)	500	500	250	250
25	Minimum Flow (gpm)	1195	1188	1188	1193
	Pressure (psi)	10	50	50	35
	Number of Sprinklers	15	15	12	12
	Hose (gpm)	500	500	250	250
30	Minimum Flow (gpm)	–	–	1188	1193
	Pressure (psi)	–	–	50	35
	Number of Sprinklers	–	–	12	12
	Hose (gpm)	–	–	250	250

† Design data provided for ceiling heights 15 ft. or less can also be applied to ceiling sprinklers utilizing in-racks sprinkler protection.

Note: Coverage Area is calculated at 100 sq. ft. (10' x 10') per sprinkler.

FireLock® Storage Sprinkler Design Guide

System Type: Wet – Pendent Sprinklers for Open Frame Rack Shelving

Storage Type: Single-Row, Double-Row and Multi-Row Racks (no solid shelves)

Commodity Class: Uncartoned Unexpanded Plastic

Maximum Building Height†		Sprinkler	Sprinkler	Sprinkler	Sprinkler
		LP-46 Pendent K25.2 Standard	V3407 Std. Pendent K11.2 V3408 Quick Pendent K11.2	V4402 Pendent K14.0 Quick	V4404 Pendent K16.8 Quick
5	Minimum Flow (gpm)	1333	593	1188	1193
	Pressure (psi)	7	7	50	35
	Number of Sprinklers	20	20	12	12
	Hose (gpm)	500	500	250	250
8	Minimum Flow (gpm)	1333	896	1188	1193
	Pressure (psi)	7	16	50	35
	Number of Sprinklers	20	20	12	12
	Hose (gpm)	500	500	250	250
10	Minimum Flow (gpm)	1992	1980	1188	1193
	Pressure (psi)	10	50	50	35
	Number of Sprinklers	25	25	12	12
	Hose (gpm)	500	500	250	250
12	Minimum Flow (gpm)	1594	1584	1188	1193
	Pressure (psi)	10	50	50	35
	Number of Sprinklers	20	20	12	12
	Hose (gpm)	500	500	250	250
15	Minimum Flow (gpm)	1992	1980	1188	1193
	Pressure (psi)	10	50	50	35
	Number of Sprinklers	25	25	12	12
	Hose (gpm)	500	500	250	250
20	Minimum Flow (gpm)	1512	–	1188	1193
	Pressure (psi)	25	–	50	35
	Number of Sprinklers	12	–	12	12
	Hose (gpm)	250	–	250	250
25	Minimum Flow (gpm)	–	–	1188	1193
	Pressure (psi)	–	–	50	35
	Number of Sprinklers	–	–	12	12
	Hose (gpm)	–	–	250	250
30	Minimum Flow (gpm)	–	–	1455	1426
	Pressure (psi)	–	–	75	50
	Number of Sprinklers	–	–	12	12
	Hose (gpm)	–	–	250	250

Note: Coverage Area is calculated at 100 sq. ft. (10' x 10') per sprinkler.

† Design data provided for ceiling heights 15 ft. or less can also be applied to ceiling sprinklers utilizing in-racks sprinkler protection.

FireLock® Storage Sprinkler Design Guide

System Type: Wet – Pendent Sprinklers for Open Frame Rack Shelving

Storage Type: Single-Row, Double-Row and Multi-Row Racks (no solid shelves)

Commodity Class: Uncartoned Expanded Plastic

Maximum Building Height†		Sprinkler	Sprinkler	Sprinkler	Sprinkler
		LP-46 Pendent K25.2 Standard	V3407 Std. Pendent K11.2 V3408 Quick Pendent K11.2	V4402 Pendent K14.0 Quick	V4404 Pendent K16.8 Quick
5	Minimum Flow (gpm)	1333	593	1455	1426
	Pressure (psi)	7	7	75	50
	Number of Sprinklers	20	20	12	12
	Hose (gpm)	500	500	250	250
8	Minimum Flow (gpm)	1333	896	1455	1426
	Pressure (psi)	7	16	75	50
	Number of Sprinklers	20	20	12	12
	Hose (gpm)	500	500	250	250
10	Minimum Flow (gpm)	1333	1227	1455	1426
	Pressure (psi)	7	30	75	50
	Number of Sprinklers	20	20	12	12
	Hose (gpm)	500	500	250	250
12	Minimum Flow (gpm)	1594	1584	1455	1426
	Pressure (psi)	10	50	75	50
	Number of Sprinklers	20	20	12	12
	Hose (gpm)	500	500	250	250
15	Minimum Flow (gpm)	1992	1980	1455	1426
	Pressure (psi)	10	50	75	50
	Number of Sprinklers	25	25	12	12
	Hose (gpm)	500	500	250	250
20	Minimum Flow (gpm)	–	–	1455	1426
	Pressure (psi)	–	–	75	50
	Number of Sprinklers	–	–	12	12
	Hose (gpm)	–	–	250	250
25	Minimum Flow (gpm)	–	–	1455	1426
	Pressure (psi)	–	–	75	50
	Number of Sprinklers	–	–	12	12
	Hose (gpm)	–	–	250	250
30	Minimum Flow (gpm)	–	–	1680	1687
	Pressure (psi)	–	–	100	70
	Number of Sprinklers	–	–	12	12
	Hose (gpm)	–	–	250	250

Note: Coverage Area is calculated at 100 sq. ft. (10' x 10') per sprinkler.

† Design data provided for ceiling heights 15 ft. or less can also be applied to ceiling sprinklers utilizing in-racks sprinkler protection.

FireLock® Storage Sprinkler Design Guide

System Type: Wet – Pendent Sprinklers for Open Frame Rack Shelving

Storage Type: Single-Row, Double-Row and Multi-Row Racks (no solid shelves)

Commodity Class: Uncartoned Expanded Plastic

Maximum Building Height†		Sprinkler	Sprinkler	Sprinkler	Sprinkler
		LP-46 Pendent K25.2 Standard	V3407 Std. Pendent K11.2 V3408 Quick Pendent K11.2	V4402 Pendent K14.0 Quick	V4404 Pendent K16.8 Quick
35	Minimum Flow (gpm)	–	–	–	–
	Pressure (psi)	–	–	–	–
	Number of Sprinklers	–	–	–	–
	Hose (gpm)	–	–	–	–
40	Minimum Flow (gpm)	–	–	–	–
	Pressure (psi)	–	–	–	–
	Number of Sprinklers	–	–	–	–
	Hose (gpm)	–	–	–	–

† Design data provided for ceiling heights 15 ft. or less can also be applied to ceiling sprinklers utilizing in-racks sprinkler protection.

Note: Coverage Area is calculated at 100 sq. ft. (10' x 10') per sprinkler.

FireLock® Storage Sprinkler Design Guide

System Type: Wet – Upright Sprinklers for Solid Piled,
Bin-Box Rack

Storage Type: Single-Row, Double-Row and Multi-Row Racks

Commodity Class: I – III

Maximum Building Height†		Sprinkler	Sprinkler
		LP-46 V4603 Upright K25.2 Standard	V3403 Std. Upright K11.2 V3404 Quick Upright K11.2
20	Minimum Flow (gpm)	1352	593
	Pressure (psi)	20	7
	Number of Sprinklers	12	20
	Hose (gpm)	250	500
25	Minimum Flow (gpm)	1352	593
	Pressure (psi)	20	7
	Number of Sprinklers	12	20
	Hose (gpm)	250	500
30	Minimum Flow (gpm)	1352	593
	Pressure (psi)	20	7
	Number of Sprinklers	12	20
	Hose (gpm)	250	500
35	Minimum Flow (gpm)	1000	751
	Pressure (psi)	7	20
	Number of Sprinklers	15	15
	Hose (gpm)	500	500
40	Minimum Flow (gpm)	2342	–
	Pressure (psi)	15	–
	Number of Sprinklers	24	–
	Hose (gpm)	500	–

System Type: Wet – Upright Sprinklers for Solid Piled,
Bin-Box Rack

Storage Type: Single-Row, Double-Row and Multi-Row Racks

Commodity Class: IV and Cartoned Unexpanded Plastics

Maximum Building Height†		Sprinkler	Sprinkler
		LP-46 V4603 Upright K25.2 Standard	V3403 Std. Upright K11.2 V3404 Quick Upright K11.2
15	Minimum Flow (gpm)	1352	593
	Pressure (psi)	20	7
	Number of Sprinklers	12	20
	Hose (gpm)	250	500
20	Minimum Flow (gpm)	1352	751
	Pressure (psi)	20	20
	Number of Sprinklers	12	15
	Hose (gpm)	250	500
25	Minimum Flow (gpm)	1352	1188
	Pressure (psi)	20	50
	Number of Sprinklers	12	15
	Hose (gpm)	250	500
30	Minimum Flow (gpm)	1352	1584
	Pressure (psi)	20	50
	Number of Sprinklers	12	20
	Hose (gpm)	250	500

† Design data provided for ceiling heights 15 ft. or less can also be applied to ceiling sprinklers utilizing in-racks sprinkler protection.

Note: Coverage Area is calculated at 100 sq. ft. (10' x 10') per sprinkler.

FireLock® Storage Sprinkler Design Guide

System Type: Wet – Upright Sprinklers for Solid Piled,
Bin-Box Rack

Storage Type: Single-Row, Double-Row and Multi-Row Racks

Commodity Class: Cartoned Expanded Plastic

Maximum Building Height†		Sprinkler	Sprinkler
		LP-46 V4603 Upright K25.2 Standard	V3403 Std. Upright K11.2 V3404 Quick Upright K11.2
10	Minimum Flow (gpm)	1000	593
	Pressure (psi)	7	7
	Number of Sprinklers	15	20
	Hose (gpm)	500	500
15	Minimum Flow (gpm)	1000	593
	Pressure (psi)	7	7
	Number of Sprinklers	15	20
	Hose (gpm)	500	500
20	Minimum Flow (gpm)	1000	751
	Pressure (psi)	7	20
	Number of Sprinklers	15	15
	Hose (gpm)	500	500
25	Minimum Flow (gpm)	1195	1188
	Pressure (psi)	10	50
	Number of Sprinklers	15	15
	Hose (gpm)	500	500
30	Minimum Flow (gpm)	1594	1584
	Pressure (psi)	10	50
	Number of Sprinklers	20	20
	Hose (gpm)	500	500

† Design data provided for ceiling heights 15 ft. or less can also be applied to ceiling sprinklers utilizing in-racks sprinkler protection.

Note: Coverage Area is calculated at 100 sq. ft. (10' x 10') per sprinkler.

FireLock® Storage Sprinkler Design Guide

System Type: Wet – Upright Sprinklers for Solid Piled, Bin-Box Rack

Storage Type: Single-Row, Double-Row and Multi-Row Racks (no solid shelves)

Commodity Class: Uncartoned Unexpanded Plastic

Maximum Building Height†		Sprinkler	Sprinkler
		LP-46 V4603 Upright K25.2 Standard	V3403 Std. Upright K11.2 V3404 Quick Upright K11.2
10	Minimum Flow (gpm)	1000	593
	Pressure (psi)	7	7
	Number of Sprinklers	15	20
	Hose (gpm)	500	500
15	Minimum Flow (gpm)	1000	741
	Pressure (psi)	7	7
	Number of Sprinklers	15	25
	Hose (gpm)	500	500
20	Minimum Flow (gpm)	1000	840
	Pressure (psi)	7	25
	Number of Sprinklers	15	15
	Hose (gpm)	500	500
25	Minimum Flow (gpm)	1195	1188
	Pressure (psi)	10	50
	Number of Sprinklers	15	15
	Hose (gpm)	500	500
30	Minimum Flow (gpm)	1594	1584
	Pressure (psi)	10	50
	Number of Sprinklers	20	20
	Hose (gpm)	500	500

System Type: Wet – Upright Sprinklers for Solid Piled, Bin-Box Rack

Storage Type: Single-Row, Double-Row and Multi-Row Racks (no solid shelves)

Commodity Class: Uncartoned Expanded Plastic

Maximum Building Height†		Sprinkler	Sprinkler
		LP-46 V4603 Upright K25.2 Standard	V3403 Std. Upright K11.2 V3404 Quick Upright K11.2
10	Minimum Flow (gpm)	1000	593
	Pressure (psi)	7	7
	Number of Sprinklers	15	20
	Hose (gpm)	500	500
15	Minimum Flow (gpm)	1000	840
	Pressure (psi)	7	25
	Number of Sprinklers	15	15
	Hose (gpm)	500	500
20	Minimum Flow (gpm)	1195	1188
	Pressure (psi)	10	50
	Number of Sprinklers	15	15
	Hose (gpm)	500	500
25	Minimum Flow (gpm)	1992	1980
	Pressure (psi)	10	50
	Number of Sprinklers	25	25
	Hose (gpm)	500	500

† Design data provided for ceiling heights 15 ft. or less can also be applied to ceiling sprinklers utilizing in-racks sprinkler protection.

Note: Coverage Area is calculated at 100 sq. ft. (10' x 10') per sprinkler.

FireLock® Storage Sprinkler Design Guide

System Type: Wet – Upright Sprinklers for Open Frame Rack Shelving
Storage Type: Single-Row, Double-Row and Multi-Row Racks (no solid shelves)
Commodity Class: I – III

System Type: Wet – Upright Sprinklers for Open Frame Rack Shelving
Storage Type: Single-Row, Double-Row and Multi-Row Racks (no solid shelves)
Commodity Class: Class IV/Cartoned Unexpanded

Maximum Building Height†		Sprinkler	Sprinkler
		LP-46 V4603 Upright K25.2 Standard	V3403 Std. Upright K11.2 V3404 Quick Upright K11.2
20	Minimum Flow (gpm)	1352	593
	Pressure (psi)	20	7
	Number of Sprinklers	12	20
	Hose (gpm)	250	500
25	Minimum Flow (gpm)	1352	920
	Pressure (psi)	20	30
	Number of Sprinklers	12	15
	Hose (gpm)	250	500
30	Minimum Flow (gpm)	1352	1584
	Pressure (psi)	20	50
	Number of Sprinklers	12	20
	Hose (gpm)	250	500
35	Minimum Flow (gpm)	2342	–
	Pressure (psi)	15	–
	Number of Sprinklers	24	–
	Hose (gpm)	500	–
40	Minimum Flow (gpm)	2342	–
	Pressure (psi)	15	–
	Number of Sprinklers	24	–
	Hose (gpm)	500	–

Maximum Building Height†		Sprinkler	Sprinkler
		LP-46 V4603 Upright K25.2 Standard	V3403 Std. Upright K11.2 V3404 Quick Upright K11.2
15	Minimum Flow (gpm)	1352	593
	Pressure (psi)	20	7
	Number of Sprinklers	12	20
	Hose (gpm)	250	500
20	Minimum Flow (gpm)	1352	751
	Pressure (psi)	20	20
	Number of Sprinklers	12	15
	Hose (gpm)	250	500
25	Minimum Flow (gpm)	1352	1188
	Pressure (psi)	20	50
	Number of Sprinklers	12	15
	Hose (gpm)	250	500
30	Minimum Flow (gpm)	1352	–
	Pressure (psi)	20	–
	Number of Sprinklers	12	–
	Hose (gpm)	250	–

† Design data provided for ceiling heights 15 ft. or less can also be applied to ceiling sprinklers utilizing in-racks sprinkler protection.

Note: Coverage Area is calculated at 100 sq. ft. (10' x 10') per sprinkler.

FireLock® Storage Sprinkler Design Guide

System Type: Wet – Upright Sprinklers for
Open Frame Rack Shelving

Storage Type: Single-Row, Double-Row and Multi-Row Racks
(no solid shelves)

Commodity Class: Cartoned Expanded Plastic

Maximum Building Height†		Sprinkler	Sprinkler
		LP-46 V4603 Upright K25.2 Standard	V3403 Std. Upright K11.2 V3404 Quick Upright K11.2
15	Minimum Flow (gpm)	1000	593
	Pressure (psi)	7	7
	Number of Sprinklers	15	20
	Hose (gpm)	500	500
20	Minimum Flow (gpm)	1000	751
	Pressure (psi)	7	20
	Number of Sprinklers	15	15
	Hose (gpm)	500	500
25	Minimum Flow (gpm)	1000	1188
	Pressure (psi)	7	50
	Number of Sprinklers	15	15
	Hose (gpm)	500	500

† Design data provided for ceiling heights 15 ft. or less can also be applied to ceiling sprinklers utilizing in-racks sprinkler protection.

Note: Coverage Area is calculated at 100 sq. ft. (10' x 10') per sprinkler.

FireLock® Storage Sprinkler Design Guide

System Type: Wet – Upright Sprinklers for Open Frame Rack Shelving
Storage Type: Single-Row, Double-Row and Multi-Row Racks (no solid shelves)
Commodity Class: Uncartoned Unexpanded Plastic

System Type: Wet – Upright Sprinklers for Open Frame Rack Shelving
Storage Type: Single-Row, Double-Row and Multi-Row Racks (no solid shelves)
Commodity Class: Uncartoned Expanded Plastic

Maximum Building Height†		Sprinkler	Sprinkler
		LP-46 V4603 Upright K25.2 Standard	V3403 Std. Upright K11.2 V3404 Quick Upright K11.2
5	Minimum Flow (gpm)	1333	593
	Pressure (psi)	7	7
	Number of Sprinklers	20	20
	Hose (gpm)	500	500
8	Minimum Flow (gpm)	1333	896
	Pressure (psi)	7	16
	Number of Sprinklers	20	20
	Hose (gpm)	500	500
10	Minimum Flow (gpm)	1333	1227
	Pressure (psi)	7	30
	Number of Sprinklers	20	20
	Hose (gpm)	500	500
12	Minimum Flow (gpm)	1594	1584
	Pressure (psi)	10	50
	Number of Sprinklers	20	20
	Hose (gpm)	500	500
15	Minimum Flow (gpm)	1992	1980
	Pressure (psi)	10	50
	Number of Sprinklers	25	25
	Hose (gpm)	500	500

Maximum Building Height†		Sprinkler	Sprinkler
		LP-46 V4603 Upright K25.2 Standard	V3403 Std. Upright K11.2 V3404 Quick Upright K11.2
5	Minimum Flow (gpm)	1333	593
	Pressure (psi)	7	7
	Number of Sprinklers	20	20
	Hose (gpm)	500	500
8	Minimum Flow (gpm)	1333	896
	Pressure (psi)	7	16
	Number of Sprinklers	20	20
	Hose (gpm)	500	500
10	Minimum Flow (gpm)	1333	1227
	Pressure (psi)	7	30
	Number of Sprinklers	20	20
	Hose (gpm)	500	500
12	Minimum Flow (gpm)	1594	1584
	Pressure (psi)	10	50
	Number of Sprinklers	20	20
	Hose (gpm)	500	500
15	Minimum Flow (gpm)	2440	1980
	Pressure (psi)	15	50
	Number of Sprinklers	25	25
	Hose (gpm)	500	500

† Design data provided for ceiling heights 15 ft. or less can also be applied to ceiling sprinklers utilizing in-racks sprinkler protection.

Note: Coverage Area is calculated at 100 sq. ft. (10' x 10') per sprinkler.

FireLock® Storage Sprinkler Design Guide

System Type: Dry/Preaction – Upright Sprinklers for Solid Piled, Bin-Box Rack

Storage Type: Single-Row, Double-Row and Multi-Row Racks

Commodity Class: I – III

Maximum Building Height†		Sprinkler	Sprinkler
		LP-46 V4603 Upright K25.2 Standard	V3403 Std. Upright K11.2 V3404 Quick Upright K11.2
20	Minimum Flow (gpm)	1333	741
	Pressure (psi)	7	7
	Number of Sprinklers	20	25
	Hose (gpm)	500	500
25	Minimum Flow (gpm)	1333	741
	Pressure (psi)	7	7
	Number of Sprinklers	20	25
	Hose (gpm)	500	500
30	Minimum Flow (gpm)	1333	741
	Pressure (psi)	7	7
	Number of Sprinklers	20	25
	Hose (gpm)	500	500
35	Minimum Flow (gpm)	1333	1002
	Pressure (psi)	7	20
	Number of Sprinklers	20	20
	Hose (gpm)	500	500
40	Minimum Flow (gpm)	2342*	–
	Pressure (psi)	15*	–
	Number of Sprinklers	24*	–
	Hose (gpm)	500*	–
35-45	Minimum Flow (gpm)	2140**	–
	Pressure (psi)	50**	–
	Number of Sprinklers	12**	–
	Hose (gpm)	500**	–

† Design data provided for ceiling heights 15 ft. or less can also be applied to ceiling sprinklers utilizing in-racks sprinkler protection.

* 25 second water delivery time required. 120 Minute Hose Stream Allowance.

** 20 second water delivery time required. 90 Minute Hose Stream Allowance.

Note: To design dry systems, water delivery times are required. See pages 24 – 28 for Valve Trip Time Reference Data for the Victaulic FireLock NXT Series 768 Dry Valve and Series 769 Preaction Valve.

Note: Coverage Area is calculated at 100 sq. ft. (10' x 10') per sprinkler.

System Type: Dry/Preaction – Upright Sprinklers for Solid Piled, Bin-Box Rack

Storage Type: Single-Row, Double-Row and Multi-Row Racks

Commodity Class: IV and Cartoned Unexpanded Plastics

Maximum Building Height†		Sprinkler	Sprinkler
		LP-46 V4603 Upright K25.2 Standard	V3403 Std. Upright K11.2 V3404 Quick Upright K11.2
15	Minimum Flow (gpm)	1333	741
	Pressure (psi)	7	7
	Number of Sprinklers	20	25
	Hose (gpm)	500	500
20	Minimum Flow (gpm)	1333	1002
	Pressure (psi)	7	20
	Number of Sprinklers	20	20
	Hose (gpm)	500	500
25	Minimum Flow (gpm)	1594	1584
	Pressure (psi)	10	50
	Number of Sprinklers	20	20
	Hose (gpm)	500	500
30	Minimum Flow (gpm)	1594	1980
	Pressure (psi)	10	50
	Number of Sprinklers	25	25
	Hose (gpm)	500	500

FireLock® Storage Sprinkler Design Guide

System Type: Dry/Preaction – Upright Sprinklers for Solid Piled, Bin-Box Rack

Storage Type: Single-Row, Double-Row and Multi-Row Racks

Commodity Class: Cartoned Expanded Plastic

Maximum Building Height†		Sprinkler	Sprinkler
		LP-46 V4603 Upright K25.2 Standard	V3403 Std. Upright K11.2 V3404 Quick Upright K11.2
10	Minimum Flow (gpm)	1333	741
	Pressure (psi)	7	7
	Number of Sprinklers	20	25
	Hose (gpm)	500	500
15	Minimum Flow (gpm)	1333	741
	Pressure (psi)	7	7
	Number of Sprinklers	20	25
	Hose (gpm)	500	500
20	Minimum Flow (gpm)	1333	1002
	Pressure (psi)	7	20
	Number of Sprinklers	20	20
	Hose (gpm)	500	500
25	Minimum Flow (gpm)	1594	1584
	Pressure (psi)	10	50
	Number of Sprinklers	20	20
	Hose (gpm)	500	500
30	Minimum Flow (gpm)	2391	2376
	Pressure (psi)	10	50
	Number of Sprinklers	30	30
	Hose (gpm)	500	500

System Type: Dry/Preaction – Upright Sprinklers for Solid Piled, Bin-Box Rack

Storage Type: Single-Row, Double-Row and Multi-Row Racks

Commodity Class: Uncartoned Unexpanded Plastic

Maximum Building Height†		Sprinkler	Sprinkler
		LP-46 V4603 Upright K25.2 Standard	V3403 Std. Upright K11.2 V3404 Quick Upright K11.2
10	Minimum Flow (gpm)	1000	593
	Pressure (psi)	7	7
	Number of Sprinklers	15	20
	Hose (gpm)	500	500
15	Minimum Flow (gpm)	1000	741
	Pressure (psi)	7	7
	Number of Sprinklers	15	25
	Hose (gpm)	500	500
20	Minimum Flow (gpm)	1000	840
	Pressure (psi)	7	25
	Number of Sprinklers	15	15
	Hose (gpm)	500	500
25	Minimum Flow (gpm)	1195	1188
	Pressure (psi)	10	50
	Number of Sprinklers	15	15
	Hose (gpm)	500	500
30	Minimum Flow (gpm)	1594	1584
	Pressure (psi)	10	50
	Number of Sprinklers	20	20
	Hose (gpm)	500	500

† Design data provided for ceiling heights 15 ft. or less can also be applied to ceiling sprinklers utilizing in-racks sprinkler protection.

Note: To design dry systems, water delivery times are required.

See pages 24 – 28 for Valve Trip Time Reference Data for the Victaulic FireLock NXT Series 768 Dry Valve and Series 769 Preaction Valve.

Note: Coverage Area is calculated at 100 sq. ft. (10' x 10') per sprinkler.

FireLock® Storage Sprinkler Design Guide

System Type: Dry/Preaction – Upright Sprinklers for Solid Piled, Bin-Box Rack

Storage Type: Single-Row, Double-Row and Multi-Row Racks

Commodity Class: Uncartoned Expanded Plastic

Maximum Building Height†		Sprinkler	Sprinkler
		LP-46 V4603 Upright K25.2 Standard	V3403 Std. Upright K11.2 V3404 Quick Upright K11.2
10	Minimum Flow (gpm)	1333	741
	Pressure (psi)	7	7
	Number of Sprinklers	20	25
	Hose (gpm)	500	500
15	Minimum Flow (gpm)	1333	1120
	Pressure (psi)	7	25
	Number of Sprinklers	20	20
	Hose (gpm)	500	500
20	Minimum Flow (gpm)	1594	1584
	Pressure (psi)	10	50
	Number of Sprinklers	20	20
	Hose (gpm)	500	500
25	Minimum Flow (gpm)	2789	2772
	Pressure (psi)	10	50
	Number of Sprinklers	35	35
	Hose (gpm)	500	500

† Design data provided for ceiling heights 15 ft. or less can also be applied to ceiling sprinklers utilizing in-racks sprinkler protection.

Note: To design dry systems, water delivery times are required. See pages 24 – 28 for Valve Trip Time Reference Data for the Victaulic FireLock NXT Series 768 Dry Valve and Series 769 Preaction Valve.

Note: Coverage Area is calculated at 100 sq. ft. (10' x 10') per sprinkler.

FireLock® Storage Sprinkler Design Guide

System Type: Dry/Preaction – Upright Sprinklers for Open Frame Rack Shelving
Storage Type: Single-Row, Double-Row and Multi-Row Racks (no solid shelves)
Commodity Class: I – III

System Type: Dry/Preaction – Upright Sprinklers for Open Frame Rack Shelving
Storage Type: Single-Row, Double-Row and Multi-Row Racks (no solid shelves)
Commodity Class: IV and Cartoned Unexpanded Plastics

Maximum Building Height†		Sprinkler	Sprinkler
		LP-46 V4603 Upright K25.2 Standard	V3403 Std. Upright K11.2 V3404 Quick Upright K11.2
20	Minimum Flow (gpm)	1333	741
	Pressure (psi)	7	7
	Number of Sprinklers	20	25
	Hose (gpm)	500	500
25	Minimum Flow (gpm)	1333	1227
	Pressure (psi)	7	30
	Number of Sprinklers	20	20
	Hose (gpm)	500	500
30	Minimum Flow (gpm)	1992	1980
	Pressure (psi)	10	50
	Number of Sprinklers	25	25
	Hose (gpm)	500	500
35	Minimum Flow (gpm)	2342*	–
	Pressure (psi)	15*	–
	Number of Sprinklers	24*	–
	Hose (gpm)	500*	–
40	Minimum Flow (gpm)	2342*	–
	Pressure (psi)	15*	–
	Number of Sprinklers	24*	–
	Hose (gpm)	500*	–
35 - 45	Minimum Flow (gpm)	2140**	–
	Pressure (psi)	50**	–
	Number of Sprinklers	12**	–
	Hose (gpm)	500**	–

Maximum Building Height†		Sprinkler	Sprinkler
		LP-46 V4603 Upright K25.2 Standard	V3403 Std. Upright K11.2 V3404 Quick Upright K11.2
15	Minimum Flow (gpm)	1333	741
	Pressure (psi)	7	7
	Number of Sprinklers	20	25
	Hose (gpm)	500	500
20	Minimum Flow (gpm)	1333	1002
	Pressure (psi)	7	20
	Number of Sprinklers	20	20
	Hose (gpm)	500	500
25	Minimum Flow (gpm)	1594	1584
	Pressure (psi)	10	50
	Number of Sprinklers	20	20
	Hose (gpm)	500	500
30	Minimum Flow (gpm)	3416	–
	Pressure (psi)	15	–
	Number of Sprinklers	35	–
	Hose (gpm)	500	–

† Design data provided for ceiling heights 15 ft. or less can also be applied to ceiling sprinklers utilizing in-racks sprinkler protection.

* 25 second water delivery time required. 120 Minute Hose Stream Allowance.

** 20 second water delivery time required. 90 Minute Hose Stream Allowance.

Note: To design dry systems, water delivery times are required. See pages 24 – 28 for Valve Trip Time Reference Data for the Victaulic FireLock NXT Series 768 Dry Valve and Series 769 Preaction Valve.

Note: Coverage Area is calculated at 100 sq. ft. (10' x 10') per sprinkler.

FireLock® Storage Sprinkler Design Guide

System Type: Dry/Preaction – Upright Sprinklers for Open Frame Rack Shelving

Storage Type: Single-Row, Double-Row and Multi-Row Racks (no solid shelves)

Commodity Class: Cartoned Expanded Plastic

Maximum Building Height†		Sprinkler	Sprinkler
		LP-46 V4603 Upright K25.2 Standard	V3403 Std. Upright K11.2 V3404 Quick Upright K11.2
15	Minimum Flow (gpm)	1333	741
	Pressure (psi)	7	7
	Number of Sprinklers	20	25
	Hose (gpm)	500	500
20	Minimum Flow (gpm)	1333	1002
	Pressure (psi)	7	20
	Number of Sprinklers	20	20
	Hose (gpm)	500	500
25	Minimum Flow (gpm)	1594	1584
	Pressure (psi)	10	50
	Number of Sprinklers	20	20
	Hose (gpm)	500	500

System Type: Dry/Preaction – Upright Sprinklers for Open Frame Rack Shelving

Storage Type: Single-Row, Double-Row and Multi-Row Racks (no solid shelves)

Commodity Class: Uncartoned Unexpanded Plastic

Maximum Building Height†		Sprinkler	Sprinkler
		LP-46 V4603 Upright K25.2 Standard	V3403 Std. Upright K11.2 V3404 Quick Upright K11.2
5	Minimum Flow (gpm)	1667	741
	Pressure (psi)	7	7
	Number of Sprinklers	25	25
	Hose (gpm)	500	500
8	Minimum Flow (gpm)	1667	1120
	Pressure (psi)	7	16
	Number of Sprinklers	25	25
	Hose (gpm)	500	500
10	Minimum Flow (gpm)	1667	1980
	Pressure (psi)	7	50
	Number of Sprinklers	25	25
	Hose (gpm)	500	500
12	Minimum Flow (gpm)	1992	1980
	Pressure (psi)	10	50
	Number of Sprinklers	25	25
	Hose (gpm)	500	500
15	Minimum Flow (gpm)	2395	2376
	Pressure (psi)	10	50
	Number of Sprinklers	30	30
	Hose (gpm)	500	500

† Design data provided for ceiling heights 15 ft. or less can also be applied to ceiling sprinklers utilizing in-racks sprinkler protection.

Note: To design dry systems, water delivery times are required. See pages 24 – 28 for Valve Trip Time Reference Data for the Victaulic FireLock NXT Series 768 Dry Valve and Series 769 Preaction Valve.

Note: Coverage Area is calculated at 100 sq. ft. (10' x 10') per sprinkler.

FireLock® Storage Sprinkler Design Guide

System Type: Dry/Preaction - Upright Sprinklers for Open Frame Rack Shelving

Storage Type: Single-Row, Double-Row and Multi-Row Racks (no solid shelves)

Commodity Class: Uncartoned Expanded Plastic

Maximum Building Height†		Sprinkler	Sprinkler
		LP-46 V4603 Upright K25.2 Standard	V3403 Std. Upright K11.2 V3404 Quick Upright K11.2
5	Minimum Flow (gpm)	1667	741
	Pressure (psi)	7	7
	Number of Sprinklers	25	25
	Hose (gpm)	500	500
8	Minimum Flow (gpm)	1667	1120
	Pressure (psi)	7	16
	Number of Sprinklers	25	25
	Hose (gpm)	500	500
10	Minimum Flow (gpm)	1667	1534
	Pressure (psi)	7	30
	Number of Sprinklers	25	25
	Hose (gpm)	500	500
12	Minimum Flow (gpm)	992	1980
	Pressure (psi)	10	50
	Number of Sprinklers	25	25
	Hose (gpm)	500	500
15	Minimum Flow (gpm)	2789	2772
	Pressure (psi)	10	50
	Number of Sprinklers	35	35
	Hose (gpm)	500	500

† Design data provided for ceiling heights 15 ft. or less can also be applied to ceiling sprinklers utilizing in-racks sprinkler protection.

Note: To design dry systems, water delivery times are required.

See pages 24 – 28 for Valve Trip Time Reference Data for the Victaulic FireLock NXT Series 768 Dry Valve and Series 769 Preaction Valve.

Note: Coverage Area is calculated at 100 sq. ft. (10' x 10') per sprinkler.

FireLock® Storage Sprinkler Design Guide

CEILING BASED SYSTEMS

Dry System Valve FireLock NXT® Series 768 Dry Valve or Series 769P Preaction Valve with Accelerator and Four Open Sprinklers (LP-46 V4603 K25.2 Upright)

System volume (U.S. Gallons)	Valve trip time (seconds)		
	Initial Set Pressure (Trip Pressure)		
	13psi (10psi)	15psi (12psi)	18psi (15psi)
800	1	0.9	0.9
900	1.1	1.1	1
1000	1.2	1.2	1.1
1100	1.4	1.3	1.2
1200	1.5	1.4	1.3
1300	1.6	1.5	1.4
1400	1.7	1.6	1.5
1500	1.8	1.7	1.6
1600	2	1.8	1.7

Dry System Valve FireLock NXT® Series 768 Dry Valve or Series 769P Preaction Valve with Accelerator and Four Open Sprinklers (K11.2 Sprinklers)

System volume (U.S. Gallons)	Valve trip time (seconds)		
	Initial Set Pressure (Trip Pressure)		
	13psi (10psi)	15psi (12psi)	18psi (15psi)
800	2.3	2.1	1.9
900	2.5	2.3	2.1
1000	2.8	2.6	2.4
1100	3.1	2.8	2.6
1200	3.4	3.1	2.8
1300	3.6	3.3	3
1400	3.9	3.6	3.3
1500	4.2	3.9	3.5
1600	4.5	4.2	3.8

INTERMEDIATE SYSTEMS

Dry System Valve FireLock NXT® Series 768 Dry Valve or Series 769P Preaction Valve with Accelerator and One Open Sprinkler (K8.0 Intermediate Sprinklers)

System volume (U.S. Gallons)	Valve trip time (seconds)		
	Initial Set Pressure (Trip Pressure)		
	13psi (10psi)	15psi (12psi)	18psi (15psi)
800	12.8	12	11.2
900	14.4	13.6	12.4
1000	16	14.8	13.6
1100	17.6	16	14.8
1200	19.2	17.6	16
1300	20.8	19	17.6
1400	22.4	20.6	18.8
1500	24	22.2	20
1600	25.6	23.8	21.6

Dry System Valve FireLock NXT® Series 768 Dry Valve or Series 769P Preaction Valve with Accelerator and One Open Sprinkler (K5.6 Intermediate Sprinklers)

System volume (U.S. Gallons)	Valve trip time (seconds)		
	Initial Set Pressure (Trip Pressure)		
	13psi (10psi)	15psi (12psi)	18psi (15psi)
800	18.4	16.8	15.2
900	20.8	18.8	17.2
1000	22.8	20.8	19.2
1100	25.2	23.2	21.2
1200	27.2	25.6	23.2
1300	29.6	27	24.8
1400	31.6	29.4	26.8
1500	34	31	28.8
1600	36	33.4	30.4

Note: To design dry systems, water delivery times are required. See pages 24 – 28 for Valve Trip Time Reference Data for the Victaulic FireLock NXT Series 768 Dry Valve and Series 769 Preaction Valve.

For complete contact information, visit www.victaulic.com

40.99 6205 REV A 09/2011

VICTAULIC IS A REGISTERED TRADEMARK OF VICTAULIC COMPANY. © 2011 VICTAULIC COMPANY. ALL RIGHTS RESERVED.