SMITH FIRE SYSTEMS

TI - 22062

AUTOMATIC SPRINKLER SYSTEM

EQUIPMENT SUBMITTAL

COSTCO PUYALLUP BREAKROOM MEZZANINE

1201 39TH AVE SW

PUYALLUP, WA 98373

SMITH FIRE SYSTEMS, INC.
1106 54th Avenue East • Tacoma, Washington 98424
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CONTR. REG. NO. SMITHFS1360T

COSTCO PUYALLUP TI22062
BREAKROOM MEZZANINE
1201 39TH AVE SW
PUYALLUP, WA 98379

EQUIPMENT INDEX

NO.	MANUFACTURER	SIZE	MODEL	DESCRIPTION
1	VIKING	½"	VK1001	UPRIGHT SPRINKLER
2	VIKING	½"	VK3021	RECESSED PENDENT SPRINKLER
4	GRUVLOK	1.5"-3"	---	GROOVED FITTINGS
5	ANVIL	1"	---	THREADED FITTINGS
6	IOWA	1.5"	---	DRAIN CAP
6	BMT	1"-3"	---	SCH 40 STEEL PIPE

VK1001 STANDARD RESPONSE UPRIGHT SPRINKLER (K5.6)

TECHNICAL DATA

The Viking Corporation, 210 N Industrial Park Drive, Hastings MI 49058
Telephone: 269-945-9501 Technical Services: 877-384-5464 Fax: 269-818-1680 Email: techsvcs@vikingcorp.com
Visit the Viking website for the latest edition of this technical data page www.vikinggroupinc.com

1. DESCRIPTION

The Viking VK1001 Standard Response Upright Sprinkler is a small thermosensitive glass bulb spray sprinkler available with various finishes and temperature ratings to meet design requirements. The special Polyester and Electroless Nickel PTFE (ENT) coatings can be used in decorative applications where colors are desired. In addition, these coatings have been investigated for installation in corrosive environments and are Listed and Approved as indicated in the Approval Chart.

WARNING: Cancer and Reproductive Harm- www.P65Warnings.ca.gov

2. LISTINGS AND APPROVALS

cULus Listed: Category VNIV

FM Approved: Classes 2016, 2043
Also approved for use in FM Approved vacuum dry sprinkler systems with a maximum supervisory vacuum pressure of -3 psi (-207 mbar).

CE: Standard EN12259-1, DOP_XT1A

LPCB Approved: reference no. 096m

VdS Approved: Certificate no. G 422003

Refer to the Approval Chart and Design Criteria for requirements that must be followed.

3. TECHNICAL DATA

Specifications:
Minimum Operating Pressure: 7 PSI (0.5 bar)
Rated to: **cULus** - 250 PSI (17.2 bar) WWP
FM, CE, LPCB, and VdS - 175 PSI (12 bar) WWP
Factory tested hydrostatically to 500 PSI (34.5 bar)
Thread size: 1/2" NPT (15 mm BSPT)
Nominal K-factor: 5.6 U.S. (80.6 metric*)
Glass-bulb fluid temperature rated to -65 °F (-55 °C)
* Metric K-factor measurement shown is in bar. When pressure is measured in kPa, divide the metric K-factor shown by 10.0.

Material Standards:
Sprinkler Body: Brass CW602N, UNS-C84400 or QM Brass
Deflector: Stainless Steel UNS S30400
Pip Cap Shell - Stainless Steel UNS-S44400
Pip Cap Disc - Stainless Steel UNS-S30100
Belleville Spring - Nickel Alloy
Pip Cap Seal - Polytetrafluoroethylene (PTFE)
Compression Screw: Brass CW612N, CW508L, UNS-C36000 or UNS-C26000
Shipping Cap: Polyethylene
Bulb: Glass, nominal 5 mm diameter
Ordering Information: (Refer to Table 1 and the current Viking List Price Book.)

4. INSTALLATION

Refer to appropriate NFPA, FM Global, and/or any other applicable installation standards. Refer to Figure 3

NOTICE **Risk of permanent damage.**

Over-tightening the sprinkler can cause permanent damage.
> Tighten the sprinkler to a MAXIMUM torque of 14 ft-lbs (19 N-m).

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5. OPERATION

During fire conditions, when the temperature around the sprinkler reaches its operating temperature, the heat-sensitive liquid in the glass bulb expands, causing the bulb to shatter, releasing the pip cap assembly. Water flowing through the sprinkler orifice strikes the sprinkler deflector, forming a uniform spray pattern to extinguish or control the fire.

6. INSPECTIONS, TESTS AND MAINTENANCE

Refer to NFPA 25 for Inspection, Testing and Maintenance requirements.

7. AVAILABILITY

Viking Sprinklers are available through a network of domestic and international distributors. See the website for the closest distributor or contact Viking.

8. GUARANTEE

For details of warranty, refer to Viking's current list price schedule or contact Viking directly.

TABLE 1: ORDERING INFORMATION
Instructions: Using the sprinkler base part number,
(1) add the suffix for the desired Finish
(2) add the suffix for the desired Temperature Rating.

Sprinkler Base Part Number	Size		1: Finishes		2: Temperature Ratings			
	NPT Inch	BSPT mm	Description	Suffix[1]	Nominal Rating	Bulb Color	Max. Ambient Ceiling Temperature[2]	Suffix
23867	1/2	--	Brass	A	135 °F (57 °C)	Orange	100 °F (38 °C)	A
23879	--	15	Chrome	F	155 °F (68 °C)	Red	100 °F (38 °C)	B
			White Polyester [3,5]	M-/W	175 °F (79 °C)	Yellow	150 °F (65 °C)	D
			Black Polyester [3,5]	M-/B	200 °F (93 °C)	Green	150 °F (65 °C)	E
			ENT [3,4,5]	JN	286 °F (141 °C)	Blue	225 °F (107 °C)	G
					OPEN	--	--	Z

Example: 23867MB/W = VK1001 with white polyester finish and 155 °F (68 °C) nominal temperature rating. This sprinkler is to be installed into an area with a maximum ambient temperature of 100 °F (38 °C) meaning if the area will experience temperatures above the maximum ambient rating, you shall use a higher temperature-rated sprinkler.

Accessories

Sprinkler Wrenches (see Figure 1):
Standard (straight) Wrench: Part number 23559MB.
Sprinkler Cabinet:
A. Up to 6 sprinklers: Part number 01724A
B. 6-12 sprinklers: Part number 01725A

Footnotes

1. Where a dash (-) is shown in the Finish suffix designation, insert the desired Temperature Rating suffix. See example above.
2. Based on NFPA 13, NFPA 13R, and NFPA 13D. Other limits may apply, depending on fire loading, sprinkler location, and other requirements of the Authority Having Jurisdiction. Refer to specific installation standards.
3. UL Listed as corrosion resistant.
4. FM Approved as corrosion resistant.
5. The corrosion resistant and corrosion proofing coatings have passed the standard corrosion test required by the approving agencies indicated in the Approval Chart. These tests cannot and do not represent all possible corrosive environments. Prior to installation, verify through the end-user that the coatings are compatible with or suitable for the proposed environment. For automatic sprinklers, the ENT coating is applied to all exposed exterior surfaces, including the waterway.

TECHNICAL DATA

VK1001 STANDARD RESPONSE UPRIGHT SPRINKLER (K5.6)

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APPROVAL CHART

Viking Standard Response Upright Sprinkler
VK1001 K5.6 (80.6 metric)

Finish(es) → Temperature(s) → A 1 X ← Escutcheon(s), If applicable — KEY

Sprinkler Base Part Number[1]	Thread Size		Listings and Approvals[2]			
	NPT	BSPT	cULus		FM	
	Inch	mm	Approval Specification	Maximum WWP	Approval Specification	Maximum WWP
23867	1/2	--	A1	250 PSI (17 bar)	A1	175 PSI (12 bar)
23879	--	15	A1	250 PSI (17 bar)	A1	175 PSI (12 bar)
			Additional Listings and Approvals Maximum WWP 175 PSI (12 bar)			
			CE[6]	**LPCB[7]**	**VdS[8]**	
23867	1/2	--	B1	A1	A1	
23879	--	15	B1	A1	A1	

Approved Temperature Ratings

A = 135 °F (57 °C), 155 °F (68 °C), 175 °F (79 °C), 200 °F (93 °C) and 286 °F (141 °C)
B = 155 °F (68 °C), 175 °F (79 °C), 200 °F (93 °C) and 286 °F (141 °C)

Approved Finishes

1 = Brass, Chrome, White Polyester [3,4], Black Polyester [3,4], and ENT [4,5]

Footnotes

1 Base Part number is shown. For complete part number, refer to Viking's current price schedule.
2 This table shows the listings and approvals available at the time of printing. Check with the manufacturer for any additional approvals.
3 Other colors are available upon request with the same Listings and Approvals as the standard colors.
4 cULus Listed as corrosion resistant.
5 FM Approved as corrosion resistant.
6 CE: Standard EN12259-1, Declaration of Performance DOP_XT1A.
7 LPCB Approved; reference no. 096m
8 VdS Approved; certificate no. G 422003

Figure 1: Sprinkler Wrench

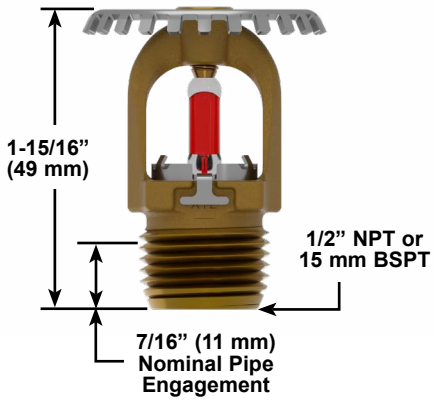

Figure 2: Sprinkler Dimensions

VIKING®	TECHNICAL DATA	VK1001 STANDARD RESPONSE UPRIGHT SPRINKLER (K5.6)

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DESIGN CRITERIA - UL

cULus Listing Requirements:
The Viking VK1001 Standard Response Upright Sprinkler is cULus Listed as indicated in Approval Chart for installation in accordance with the latest edition of NFPA 13 for standard spray sprinklers.

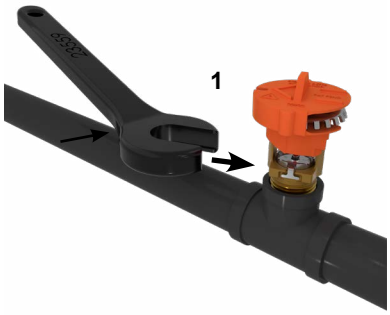
- Designed for use in Light, Ordinary, and Extra Hazard occupancies.
- The sprinkler installation rules contained in NFPA 13 for standard spray upright sprinklers shall be followed.

DESIGN CRITERIA - FM

FM Approval Requirements:
The Viking VK1001 Standard Response Upright Sprinkler is FM Approved as standard response Non-Storage upright sprinkler as indicated in the FM Approval Guide. For specific application and installation requirements, reference the latest applicable FM Loss Prevention Data Sheets (including Data Sheet 2-0). FM Global Loss Prevention Data Sheets contain guidelines relating to, but not limited to: minimum water supply requirements, hydraulic design, ceiling slope and obstructions, minimum and maximum allowable spacing, and deflector distance below the ceiling.
NOTE: The FM Installation guidelines may differ from UL and/or NFPA criteria.

IMPORTANT: Always refer to Form Number F_091699 - Care and Handling of Sprinklers. Also refer to Form Number F_080614 for general care, installation, and maintenance information. Viking sprinklers are to be installed in accordance with the latest edition of Viking Technical Data, the appropriate standards of NFPA, FM Global, LPCB, APSAD, VdS or other similar organizations, and also with the provisions of governmental codes, ordinances, and standards, whenever applicable.

1. Carefully slide the wrench onto the wrench flats.



2. Install the sprinkler into the pipe fitting.
NOTE: The sprinkler frame arms shall be parallel to the pipe.

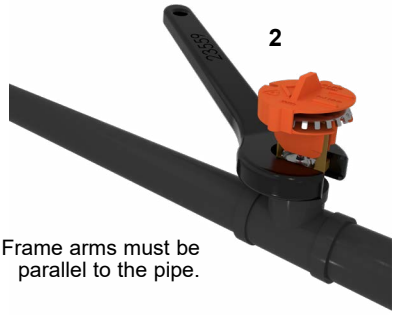


Figure 3: Installation

BULLETIN

CARE AND HANDLING OF SPRINKLERS

The Viking Corporation, 210 N Industrial Park Drive, Hastings MI 49058
Telephone: 269-945-9501 Technical Services: 877-384-5464 Fax: 269-818-1680 Email: techsvcs@vikingcorp.com

SPRINKLERS ARE FRAGILE - HANDLE WITH CARE!

General Handling and Storage:

- Store sprinklers in a cool, dry place.
- Protect sprinklers during storage, transport, handling, and after installation.
- Use the original shipping containers. DO NOT place sprinklers loose in boxes, bins, or buckets.
- Keep sprinklers separated at all times. DO NOT allow metal parts to contact sprinkler operating elements.

For Pre-Assembled Drops:

- Protect sprinklers during handling and after installation.
- For recessed assemblies, use the protective sprinkler cap (Viking Part Number 10364).

Sprinklers with Protective Shields or Caps:

- DO NOT remove shields or caps until after sprinkler installation and there no longer is potential for mechanical damage to the sprinkler operating elements.
- **Sprinkler shields or caps MUST be removed BEFORE placing the system in service!**
- Remove the sprinkler shield by carefully pulling it apart where it is snapped together.
- Remove the cap by turning it slightly and pulling it off the sprinkler.

Sprinkler Installation:

- DO NOT use the sprinkler deflector or operating element to start or thread the sprinkler into a fitting.
- **Use only the designated sprinkler head wrench!** Refer to the current sprinkler technical data page to determine the correct wrench for the model of sprinkler used.
- DO NOT install sprinklers onto piping at the floor level.
- Install sprinklers after the piping is in place to prevent mechanical damage.
- DO NOT allow impacts such as hammer blows directly to sprinklers or to fittings, pipe, or couplings in close proximity to sprinklers. Sprinklers can be damaged from direct or indirect impacts.
- DO NOT attempt to remove drywall, paint, etc., from sprinklers.
- **Take care not to over-tighten the sprinkler and/or damage its operating parts!**

  Maximum Torque:

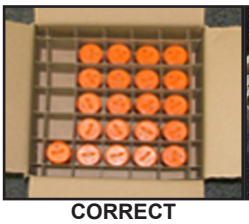
  1/2" NPT: 14 ft-lbs. (19.0 N-m)

  3/4" NPT: 20 ft-lbs. (27.1 N-m)

  1" NPT: 30 ft-lbs. (40.7 N-m)

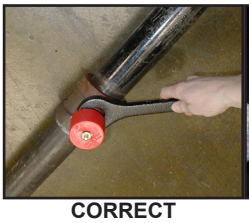
CORRECT
(Original container used)

INCORRECT
(Placed loose in box)



CORRECT
(Protected with caps)

INCORRECT
(Protective caps not used)



CORRECT
(Piping is in place at the ceiling)

INCORRECT
(Sprinkler at floor level)

CORRECT
(Special installation wrenches)

INCORRECT
(Designated wrench not used)

WARNING: Cancer and Reproductive Harm-
www.P65Warnings.ca.gov

⚠ WARNING

Any sprinkler with a loss of liquid from the glass bulb or damage to the fusible element should be destroyed. Never install sprinklers that have been dropped, damaged, or exposed to temperatures exceeding the maximum ambient temperature allowed. Sprinklers that have been painted in the field must be replaced per NFPA 13. Protect sprinklers from paint and paint overspray in accordance with the installation standards. Do not clean sprinklers with soap and water, ammonia, or any other cleaning fluid. Do not use adhesives or solvents on sprinklers or their operating elements.

Refer to the appropriate technical data page and NFPA standards for complete care, handling, installation, and maintenance instructions. For additional product and system information Viking data pages and installation instructions are available on the Viking Web site at www.vikinggroupinc.com.

VIKING | BULLETIN | CARE AND HANDLING OF SPRINKLERS

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PROTECTIVE SPRINKLER SHIELDS AND CAPS

General Handling and Storage:

Many Viking sprinklers are available with a plastic protective cap or shield temporarily covering the operating elements. The snap-on shields and caps are factory installed and are intended to help protect the operating elements from mechanical damage during shipping, storage, and installation. NOTE: It is still necessary to follow the care and handling instructions on the appropriate sprinkler technical data sheets* when installing sprinklers with bulb shields or caps.

WHEN TO REMOVE THE SHIELDS AND CAPS:

NOTE: SHIELDS AND CAPS MUST BE REMOVED FROM SPRINKLERS BEFORE PLACING THE SYSTEM IN SERVICE!

Remove the shield or cap from the sprinkler only after checking all of the following:

- The sprinkler has been installed*.
- The wall or ceiling finish work is completed where the sprinkler is installed and there no longer is a potential for mechanical damage to the sprinkler operating elements.

SHIELDS AND CAPS MUST BE REMOVED FROM SPRINKLERS BEFORE PLACING THE SYSTEM IN SERVICE!

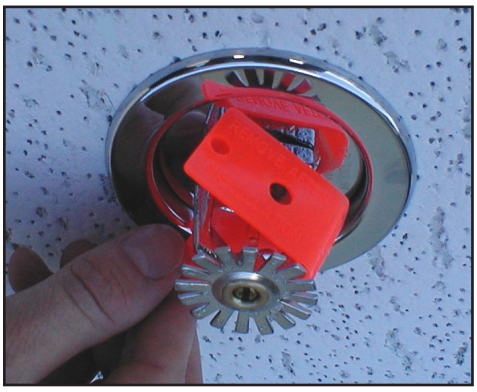


Figure 1: Sprinkler shield being removed from a pendent sprinkler.

Figure 2: Sprinkler cap being removed from a pendent sprinkler.

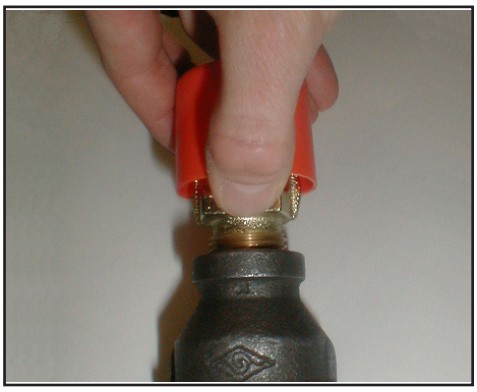


Figure 3: Sprinkler cap being removed from and upright sprinkler.

HOW TO REMOVE SHIELDS AND CAPS:

No tools are necessary to remove the shields or caps from sprinklers. DO NOT use any sharp objects to remove them! **Take care not to cause mechanical damage to sprinklers when removing the shields or caps.** When removing caps from fusible element sprinklers, use care to prevent dislodging ejector springs or damaging fusible elements. NOTE: Squeezing the sprinkler cap excessively could damage sprinkler fusible elements.

- To remove the shield, simply pull the ends of the shield apart where it is snapped together. Refer to Figure 1.
- To remove the cap, turn it slightly and pull it off the sprinkler. Refer to Figures 2 and 3.

NOTICE Refer to the current sprinkler technical data page to determine the correct sprinkler wrench for the model of sprinkler used.

⚠WARNING Never install sprinklers that have been dropped, damaged, or exposed to temperatures in excess of the maximum ambient temperature allowed.

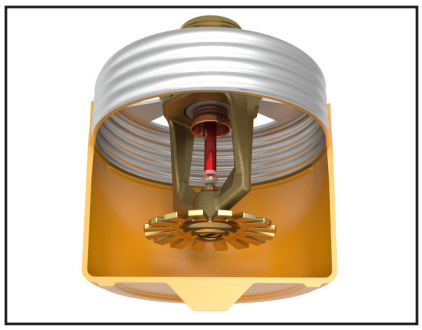
*** Refer to the appropriate current technical data pages for complete care, handling, and installation instructions. Data pages are included with each shipment from Viking or Viking distributors. They can also be found on the Web site at www.vikinggroupinc.com.**

BULLETIN

CARE AND HANDLING OF SPRINKLERS

The Viking Corporation, 210 N Industrial Park Drive, Hastings MI 49058
Telephone: 269-945-9501 Technical Services: 877-384-5464 Fax: 269-818-1680 Email: techsvcs@vikingcorp.com

⚠CAUTION CONCEALED COVER ASSEMBLIES ARE FRAGILE!
TO ASSURE SATISFACTORY PERFORMANCE OF THE PRODUCT, HANDLE WITH CARE.



Concealed Sprinkler and Adapter Assembly with Protective Cap

Concealed Sprinkler and Adapter Assembly (Protective Cap Removed)

Cover Plate Assembly (Pendent Cover 12381 shown)

GENERAL HANDLING AND STORAGE INSTRUCTIONS:

- Do not store in temperatures exceeding 100 °F (38 °C). Avoid direct sunlight and confined areas subject to heat.
- Protect sprinklers and cover assemblies during storage, transport, handling, and after installation.
  -- Use original shipping containers.
  -- Do not place sprinklers or cover assemblies loose in boxes, bins, or buckets.
- Keep the sprinkler bodies covered with the protective sprinkler cap any time the sprinklers are shipped or handled, during testing of the system, and while ceiling finish work is being completed.
- Use only the designated Viking recessed sprinkler wrench (refer to the appropriate sprinkler data page) to install these sprinklers. **NOTE:** The protective cap is temporarily removed during installation and then placed back on the sprinkler for protection until finish work is completed.
- Do not over-tighten the sprinklers into fittings during installation.
- Do not use the sprinkler deflector to start or thread the sprinklers into fittings during installation.
- Do not attempt to remove drywall, paint, etc., from the sprinklers.
- Remove the plastic protective cap from the sprinkler before attaching the cover plate assembly. **PROTECTIVE CAPS MUST BE REMOVED FROM SPRINKLERS BEFORE PLACING THE SYSTEM IN SERVICE!**

Refer to the appropriate current technical data pages for complete care, handling, and installation instructions. Data pages are included with each shipment from Viking or Viking distributors. They can also be found on the Web site at www.vikinggroupinc.com.

VIKING

BULLETIN

CARE AND HANDLING OF SPRINKLERS

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USE THE FOLLOWING PRECAUTIONS WHEN HANDLING WAX-COATED SPRINKLERS

Many of Viking's sprinklers are available with factory-applied wax coating for corrosion resistance. These sprinklers MUST receive appropriate care and handling to avoid damaging the wax coating and to assure satisfactory performance of the product.

General Handling and Storage of Wax-Coated Sprinklers:

- Store the sprinklers in a cool, dry place (in temperatures below the maximum ambient temperature allowed for the sprinkler temperature rating. Refer to Table 1 below.)
- Store containers of wax-coated sprinklers separate from other sprinklers.
- Protect the sprinklers during storage, transport, handling, and after installation.
- Use original shipping containers.
- Do not place sprinklers in loose boxes, bins, or buckets.

Installation of Wax-Coated Sprinklers:

Use only the special sprinkler head wrench designed for installing wax-coated Viking sprinklers (any other wrench may damage the unit).

- Take care not to crack the wax coating on the units.
- For touching up the wax coating after installation, wax is available from Viking in bar form. Refer to Table 1 below. The coating MUST be repaired after sprinkler installation to protect the corrosion-resistant properties of the sprinkler.
- Use care when locating sprinklers near fixtures that can generate heat. Do not install sprinklers where they would be exposed to temperatures exceeding the maximum recommended ambient temperature for the temperature rating used.
- Inspect the coated sprinklers frequently soon after installation to verify the integrity of the corrosion resistant coating. Thereafter, inspect representative samples of the coated sprinklers in accordance with NFPA 25. Close up visual inspections are necessary to determine whether the sprinklers are being affected by corrosive conditions.

TABLE 1

Sprinkler Temperature Rating (Fusing Point)	Wax Part Number	Wax Melting Point	Maximum Ambient Ceiling Temperature[1]	Wax Color
155 °F (68 °C) / 165 °F (74 °C)	02568A	148 °F (64 °C)	100 °F (38 °C)	Light Brown
175 °F (79 °C)	04146A	161 °F (71 °C)	150 °F (65 °C)	Brown
200 °F (93 °C)	04146A	161 °F (71 °C)	150 °F (65 °C)	Brown
220 °F (104 °C)	02569A	170 °F (76 °C)	150 °F (65 °C)	Dark Brown
286 °F (141 °C)	02569A	170 °F (76 °C)	150 °F (65 °C)	Dark Brown

[1] Based on NFPA-13. Other limits may apply, depending on fire loading, sprinkler location, and other requirements of the Authority Having Jurisdiction. Refer to specific installation standards.

⚠WARNING Never install sprinklers that have been dropped, damaged, or exposed to temperatures in excess of the maximum ambient temperature allowed.

Refer to the appropriate current technical data pages for complete care, handling, and installation instructions. Data pages are included with each shipment from Viking or Viking distributors. They can also be found on the Web site at www.vikinggroupinc.com.

TECHNICAL DATA — SPRINKLER OVERVIEW

The Viking Corporation, 210 N Industrial Park Drive, Hastings MI 49058
Telephone: 269-945-9501 Technical Services: 877-384-5464 Fax: 269-818-1680 Email: techsvcs@vikingcorp.com

1. DESCRIPTION

Viking fire sprinklers consist of a threaded frame with a specific waterway or orifice size and a deflector for distributing water in a specified pattern. A closed or sealed sprinkler refers to a complete assembly, including the thermosensitive operating element. An open sprinkler does not use an operating element and is open at all times. The distribution of water is intended to extinguish a fire or to control its spread.

Viking sprinklers are available in several models and styles. Refer to specific sprinkler technical data pages for available styles, finishes, temperature ratings, thread sizes, and nominal K-Factors for the particular model selected.

2. LISTINGS AND APPROVALS

Refer to the Approval Charts on the appropriate sprinkler technical data page(s) and/or approval agency listings.

WARNING: Cancer and Reproductive Harm- www.P65Warnings.ca.gov

3. TECHNICAL DATA

Pressure Ratings:

Maximum allowable water working pressure is 175 psig (12 Bar) unless rated and specified for high water working pressure [250 psig (17.2 bar)].

Sprinkler Identification:

Viking sprinklers are identified and marked with the word “Viking”, the sprinkler identification number (SIN) consisting of “VK” plus a three digit number*, the model letter, and the year of manufacture.

Available Finishes:

Viking sprinklers are available in several decorative finishes. Some models are available with corrosion-resistant coatings or are fabricated from non-corrosive material. Refer to the sprinkler technical data page for additional information.

Available Temperature Ratings:

Viking sprinklers are available in several temperature ratings that relate to a specific temperature classification. Applicable installation rules mandate the use and limitations of each temperature classification. In selecting the appropriate temperature classification, the maximum expected ceiling temperature must be known. When there is doubt as to the maximum temperature at the sprinkler location, a maximum-reading thermometer should be used to determine the temperature under conditions that would show the highest readings to be expected. In addition, recognized installation rules may require a higher temperature classification, depending upon sprinkler location, occupancy classification, commodity classification, storage height, and other hazards. In all cases, the maximum expected ceiling temperature dictates the lowest allowable temperature classification. Sprinklers located immediately adjacent to a heat source may require a higher temperature rating.

K-Factors:

Viking sprinklers are available in several orifice sizes with related K-Factors. The orifice is a tapered waterway and, therefore, the K-Factor given is nominal. Nominal U.S. K-Factors are provided in accordance with the 1999 edition of NFPA 13, Section 3-2.3. Refer to the specific data page for appropriate K-Factor information.

Available Styles:

Viking sprinklers are available for installation in several positions as indicated by a stamping on the deflector. The deflector style dictates the appropriate installation position of the sprinkler; it breaks the solid stream of water issuing from the sprinkler orifice to form a specific spray pattern. The following list indicates the various styles and identification of Viking sprinklers.

UPRIGHT SPRINKLER: A sprinkler intended to be installed with the deflector above the frame so water flows upward through the orifice, striking the deflector and forming an umbrella-shaped spray pattern downward. Marked “SSU” (Standard Sprinkler Upright) or “UPRIGHT” on the deflector.

PENDENT SPRINKLER: A sprinkler intended to be oriented with the deflector below the frame so water flows downward through the orifice, striking the deflector and forming an umbrella-shaped spray pattern downward. Marked “SSP” (Standard Sprinkler Pendent) or “PENDENT” on the deflector.

Viking Technical Data may be found on The Viking Corporation’s Web site at http://www.vikinggroupinc.com. The Web site may include a more recent edition of this Technical Data Page.

CONVENTIONAL SPRINKLER: An “old style” sprinkler intended to be installed with the deflector in either the upright or pendent position. The deflector provides a spherical type pattern with 40 to 60 percent of the water initially directed downward and a proportion directed upward. Must be installed in accordance with installation rules for conventional or old style sprinklers. DO NOT USE AS A REPLACEMENT FOR STANDARD SPRAY SPRINKLERS. Marked “C U/P” (Conventional Upright/Pendent) on the deflector.

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VERTICAL SIDEWALL (VSW) SPRINKLER: A sprinkler intended for installation near the wall and ceiling. The deflector provides a water spray pattern outward in a quarter-spherical pattern and can be installed in the upright or pendent position with the flow arrow in the direction of discharge. Marked “SIDEWALL” on the deflector with an arrow and the word “FLOW”. (Note: Some vertical sidewall sprinklers can only be installed in the upright or pendent position—in this case, the sprinkler will also be marked “UPRIGHT” or “PENDENT”.)

HORIZONTAL SIDEWALL (HSW) SPRINKLER: A sprinkler intended for installation near the wall and ceiling. The special deflector provides a water spray pattern outward in a quarter-spherical pattern. Most of the water is directed away from the nearby wall with a small portion directed at the wall behind the sprinkler. The top of the deflector is oriented parallel with the ceiling or roof. The flow arrows point in the direction of discharge. Marked “SIDEWALL” and “TOP” with an arrow and the word “FLOW”.

EXTENDED COVERAGE (EC) SPRINKLER: A spray sprinkler designed to discharge water over an area having the maximum dimensions indicated in the individual listings. Maximum area of coverage, minimum flow rate, orifice size, and nominal K-Factor are specified in the individual listings. EC sprinklers are intended for Light-Hazard occupancies with smooth, flat, horizontal ceilings unless otherwise specified. In addition to the above markings, the sprinkler is marked “EC”.

QUICK RESPONSE (QR) SPRINKLER: A spray sprinkler with a fast- actuating operating element. The use of quick response sprinklers may be limited due to occupancy and hazard. Refer to the Authority Having Jurisdiction (AHJ) prior to installing.

QUICK RESPONSE EXTENDED COVERAGE (QREC) SPRINKLER: A spray sprinkler designed to discharge water over an area having the maximum dimensions indicated in the individual listing. This is a sprinkler with an operating element that meets the criteria for quick response. QREC sprinklers are only intended for Light Hazard occupancies. The sprinkler is marked “QREC”.

FLUSH SPRINKLER: A decorative spray sprinkler intended for installation with a concealed piping system. The unit is mounted flush with the ceiling or wall, with the fusible link exposed. Upon actuation, the deflector extends beyond the ceiling or wall to distribute water discharge. The sprinkler is marked “SSP”, “PEND”, or “SIDEWALL” and “TOP”.

CONCEALED SPRINKLER: A decorative spray sprinkler intended for installation with a concealed piping system. The sprinkler is hidden from view by a cover plate installed flush with the ceiling or wall. During fire conditions, the cover plate detaches, and upon sprinkler actuation, the deflector extends beyond the ceiling or wall to distribute water discharge. The sprinkler is marked “SSP”, “PEND”, or “SIDEWALL” and “TOP”.

RECESSED SPRINKLER: A spray sprinkler assembly intended for installation with a concealed piping system. The assembly consists of a sprinkler installed in a decorative adjustable recessed escutcheon that minimizes the protrusion of the sprinkler beyond the ceiling or wall without adversely affecting the sprinkler distribution or sensitivity. Refer to the appropriate technical data page for allowable sprinkler models, temperature ratings, and occupancy classifications. DO NOT RECESS ANY SPRINKLER NOT LISTED FOR USE WITH THE ESCUTCHEON.

CORROSION-RESISTANT SPRINKLER: A special service sprinkler with non-corrosive protective coatings, or that is fabricated from non-corrosive material, for use in atmospheres that would normally corrode sprinklers.

DRY SPRINKLER: A special-service sprinkler intended for installation on dry pipe systems or wet pipe systems where the sprinkler is subject to freezing temperatures. The unit consists of a sprinkler permanently secured to an extension nipple with a sealed inlet end to prevent water from entering the nipple until the sprinkler operates. The unit MUST be installed in a tee fitting. Dry upright sprinklers are marked with the “B” dimension [distance from the face of the fitting (tee) to the top of the deflector]. Dry pendent and sidewall sprinklers are marked with the “A” dimension [the distance from the face of fitting (tee) to the finished surface of the ceiling or wall].

LARGE DROP SPRINKLER: A type of special application sprinkler used to provide fire control of specific high-challenge fire hazards. Large drop sprinklers are designed to produce an umbrella-shaped spray pattern downward with a higher percentage of “large” water droplets than standard spray sprinklers. The sprinkler has an extra-large orifice with a nominal K-Factor of 11.2. Marked “HIGH CHALLENGE” and “UPRIGHT”.

EARLY SUPPRESSION FAST-RESPONSE (ESFR) SPRINKLER: A sprinkler intended to provide fire suppression of specific high-challenge fire hazards through the use of a fast response fusible link, 14.0, 16.8, or 25.2 nominal K-Factor, and special deflector. ESFR sprinklers are designed to produce high-momentum water droplets in a hemispherical pattern below the deflector. This permits penetration of the fire plume and direct wetting of the burning fuel surface while cooling the atmosphere early in the development of a high-challenge fire. Marked “ESFR” and “UPRIGHT” or “PEND”.

INTERMEDIATE LEVEL/RACK STORAGE SPRINKLER: A standard spray sprinkler assembly designed to protect its operating element from the spray of sprinklers installed at higher elevations. The assembly consists of a standard or large orifice upright or pendent sprinkler with an integral upright or pendent water shield and guard assembly. Use only those sprinklers that have been tested and listed for use with the assembly. Refer to the technical data page for allowable sprinkler models.

RESIDENTIAL SPRINKLER: A sprinkler intended for use in the following occupancies: one- and two-family dwellings with the fire protection sprinkler system installed in accordance with NFPA 13D; residential occupancies up to four stories in height with the fire protection system installed in accordance with NFPA 13R; and where allowed by the Authority Having Jurisdiction in residential portions of any occupancy with the fire protection system installed in accordance with NFPA 13.

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Residential sprinklers have a unique distribution pattern and utilize a “fast response” heat sensitive operating element. They enhance survivability in the room of fire origin and are designed to provide a life safety environment for a minimum of ten minutes. For this reason, residential sprinklers must not be used to replace standard sprinklers unless tested for and approved by the Authority Having Jurisdiction. In addition to standard markings, the unit is identified as “RESIDENTIAL SPRINKLER” or “RES”.

4. INSTALLATION

Refer to appropriate NFPA Installation Standards.

5. OPERATION

Refer to the appropriate sprinkler technical data page(s).

6. INSPECTIONS, TESTS AND MAINTENANCE

Refer to NFPA 25 for Inspection, Testing and Maintenance requirements.

7. AVAILABILITY

Viking sprinklers are available through a network of domestic and international distributors. See The Viking Corporation web site for the closest distributor or contact The Viking Corporation.

8. GUARANTEE

For details of warranty, refer to Viking’s current list price schedule or contact Viking directly.

IMPORTANT: Always refer to Bulletin Form No. F_091699 - Care and Handling of Sprinklers and the appropriate sprinkler general care, installation, and maintenance guide. Viking sprinklers are to be installed in accordance with the latest edition of Viking technical data, the appropriate standards of NFPA, FM Global, LPCB, APSAD, VdS or other similar organizations, and also with the provisions of governmental codes, ordinances, and standards, whenever applicable. The sprinkler technical data page may contain installation requirements specific for the sprinkler model selected. The use of certain types of sprinklers may be limited due to occupancy and hazard. Refer to the Authority Having Jurisdiction prior to installation.

TECHNICAL DATA

SPRINKLER GENERAL CARE, INSTALLATION, AND MAINTENANCE GUIDE

The Viking Corporation, 210 N Industrial Park Drive, Hastings MI 49058
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1. DESCRIPTION - STANDARD RESPONSE, QUICK RESPONSE, EXTENDED COVERAGE, AND DRY SPRINKLERS

Viking thermosensitive spray sprinklers consist of a small frame and either a glass bulb or a fusible operating element. Available styles include pendent, flush pendent, concealed pendent, upright, horizontal sidewall, vertical sidewall, or conventional, depending on the particular sprinkler model selected.

Viking sprinklers are available with various finishes, temperature ratings, responses, and K-Factors to meet design requirements†. Used in conjunction with one of the corrosion-resistant coatings (for frame style sprinklers), the units provide protection against many corrosive environments. In addition, the special Polyester or PTFE coatings can be used in decorative applications where colors are desired.

† Refer to the sprinkler technical data page for available styles, finishes, temperature ratings, responses, and nominal K-Factors for specific sprinkler models.

2. LISTINGS AND APPROVALS

Refer to the Approval Charts on the appropriate sprinkler technical data page(s) and/or approval agency listings.

3. TECHNICAL DATA

Specifications:

Refer to the appropriate sprinkler technical data sheet.

Material Standards:

Refer to the appropriate sprinkler technical data sheet.

WARNING: Cancer and Reproductive Harm- www.P65Warnings.ca.gov

4. INSTALLATION

NOTE: Take care not to over-tighten the sprinkler and/or damage its operating parts!

Maximum Torque:

1/2" NPT: 14 ft-lbs. (19.0 N-m)

3/4" NPT: 20 ft-lbs. (27.1 N-m)

1" NPT: 30 ft-lbs. (40.7 N-m)

A. Care and Handling (also refer to Bulletin - Care and Handling of Sprinklers, Form No. F_091699.)

Sprinklers must be handled with care. They must be stored in a cool, dry place in their original shipping container. Never install sprinklers that have been dropped, damaged, or exposed to temperatures exceeding the maximum ambient temperature allowed (refer to the temperature chart on the sprinkler technical data page). Never install any glass-bulb sprinkler if the bulb is cracked or if there is a loss of liquid from the bulb. A small air bubble should be present in the glass bulb. Any sprinkler with a loss of liquid from the glass bulb or damage to the fusible element should be destroyed immediately. (Note: Installing glass bulb sprinklers in direct sunlight (ultraviolet light) may affect the color of the dye used to color code the bulb. This color change does not affect the integrity of the bulb.)

Sprinklers must be protected from mechanical damage during storage, transport, handling, and after installation. Sprinklers subject to mechanical damage must be protected with an approved sprinkler guard.

Use only sprinklers listed as corrosion resistant when subject to corrosive environments. When installing corrosion-resistant sprinklers, take care not to damage the corrosion-resistant coating. Use only the special wrench designed for installing coated or recessed Viking sprinklers (any other wrench may damage the unit).

Concealed sprinklers must be installed in neutral or negative pressure plenums only!

Use care when locating sprinklers near fixtures that can generate heat. Do not install sprinklers where they could be exposed to temperatures exceeding the maximum recommended ambient temperature for the temperature rating used.

Wet pipe systems must be provided with adequate heat. Sprinklers supplied from dry systems in areas subject to freezing must be listed dry sprinklers, upright, or horizontal sidewall sprinklers installed so that water is not trapped. For dry systems, pendent sprinklers and sidewall sprinklers installed on return bends are permitted, where the sprinklers, return bend, and branch line piping are in an area maintained at or above 40 °F (4 °C).

B. Installation Instructions - Standard Spray Sprinklers

Viking sprinklers are manufactured and tested to meet the rigid requirements of approving agencies. They are designed to be installed in accordance with recognized installation standards. Deviation from the standards or any alteration to sprinklers or cover plate assemblies after they leave the factory including, but not limited to: painting, plating, coating, or modification, may render them inoperative and will automatically nullify the approvals and any guarantee made by The Viking Corporation.

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Before installation, be sure to have the appropriate sprinkler model and style, with the correct K-Factor, temperature rating, and response characteristics. Sprinklers must be installed after the piping is in place to prevent mechanical damage. Keep sprinklers with protective caps or bulb shields contained within the caps or shields during installation and testing, and any time the sprinkler is shipped or handled.

1a. For frame-style sprinklers, install escutcheon (if used), which is designed to thread onto the external threads of the sprinkler. Refer to the appropriate sprinkler data page to determine approved escutcheons for use with specific sprinkler models.

1b. For flush and concealed style sprinklers: Cut the sprinkler nipple so that the ½" or 3/4" (15 mm or 20 mm)* NPT outlet of the reducing coupling is at the desired location, and centered in the opening* in the ceiling or wall.
*Size depends on the sprinkler model used. Refer to the sprinkler technical data page.

2. Apply a small amount of pipe-joint compound or tape to the external threads of the sprinkler only, taking care not to allow a build-up of compound in the sprinkler inlet. **NOTE:** Sprinklers with protective caps or bulb shields must have the caps or shields kept on them when applying pipe-joint compound or tape. *Exception: For domed concealed sprinklers, remove the protective cap for installation, and then place it back on the sprinkler temporarily..*

3. Refer to the appropriate sprinkler technical data page to determine the correct sprinkler wrench for the model of sprinkler used. DO NOT use the deflector or fusible element to start or thread the sprinkler into a fitting.
   a. Install the sprinkler onto the piping using the special sprinkler wrench only, taking care not to over-tighten or damage the sprinkler.
   b. For flush and concealed style sprinklers: the internal diameter of the special sprinkler installation wrench is designed for use with the sprinkler contained in the protective cap. *Exception: For domed concealed sprinklers, remove the protective cap for installation, and then place it back on the sprinkler temporarily.* Thread the flush or concealed sprinkler into the ½" or 3/4" (15 mm or 20 mm)* NPT outlet of the coupling by turning it clockwise with the special sprinkler wrench. *Thread size depends on the particular sprinkler model used. Refer to the sprinkler technical data page.

C. Installation Instructions - Dry Sprinklers

WARNING: Viking dry sprinklers are to be installed in the 1" outlet (for dry and preaction systems), or run of malleable, ductile iron, or Nibco CPVC* threaded tee fittings (for wet systems) that meet the dimensional requirements of ANSI B16.3 (Class 150), or cast iron threaded tee fittings that meet the dimensional requirements of ANSI B16.4 (Class 125), even at branch line ends. The threaded end of the dry sprinkler is designed to allow the seal to penetrate and extend into the fitting to a predetermined depth. This prevents condensation from accumulating and freezing over the sprinkler seal. ***NOTE: When using CPVC fittings with Viking dry sprinklers, use only new Nibco Model 5012-S-BI. When selecting other CPVC fittings, contact Viking Technical Services.**

1. **DO NOT** install the dry sprinkler into a threaded elbow, coupling, or any other fitting that could interfere with thread penetration. Such installation would damage the brass seal.
2. **DO NOT** install dry sprinklers into couplings or fittings that would allow condensation to accumulate above the seal when the sprinkler is located in an area subject to freezing.
3. **NEVER** try to modify dry sprinklers. They are manufactured for specific "A" or "B" dimensions and cannot be modified.

The dry sprinkler must be installed after the piping is in place to prevent mechanical damage. Before installation, be sure to have the correct sprinkler model and style, with the appropriate "A" or "B" dimension(s), temperature rating, orifice size, and response characteristics. Keep sprinklers with protective caps or bulb shields contained within the caps or shields during installation and testing, and any time the sprinkler is shipped or handled. *Exception:* For concealed and adjustable recessed dry sprinklers, the protective caps and shields are removed for installation.

To install the dry sprinkler, refer to the instructions below and the appropriate sprinkler technical data page for illustrated instructions.

Dry upright sprinklers must be installed above the piping, in the upright position only. When installing dry upright or plain barrel style vertical sidewall sprinklers on piping located close to the ceiling, it may be necessary to lower the sprinkler into the fitting from above the ceiling. When installing dry upright or plain barrel vertical sidewall sprinklers from below the ceiling, verify that the opening in the ceiling is a minimum 1-1/2" (38.1 mm) in diameter.

For dry upright or plain barrel vertical sidewall sprinklers in the upright position: First, install the escutcheon (if used) over the threaded end of the sprinkler barrel. Slide the escutcheon past the external threads. NOTE: When installing the dry upright or plain barrel vertical sidewall sprinkler from above the ceiling, it will be necessary to install the escutcheon after lowering the threaded end of the sprinkler through the ceiling penetration.

A. **For all dry sprinklers:** Apply a small amount of pipe-joint compound or tape to the external threads of the sprinkler barrel only, taking care not to allow a build-up of compound or tape over the brass inlet and seal. **NOTE:** Sprinklers with protective caps or bulb shields must be contained within the caps or shields before applying pipe-joint compound or tape.

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B. Refer to the appropriate sprinkler technical data page to determine the correct sprinkler wrench for the model of sprinkler used.
C. Install the dry sprinkler on the piping using the special dry sprinkler wrench only, while taking care not to damage the sprinkler. **NOTE:** Thread the sprinkler into the fitting hand tight, plus 1/2 turn with the dry sprinkler wrench.
D. *For adjustable standard and adjustable recessed dry pendent and sidewall sprinklers: Escutcheons can be installed after the sprinklers have been installed onto the piping. Refer to the appropriate sprinkler technical data page for escutcheon installation instructions and illustrations.*

D. Installation Instructions - Testing

4. After installation, the entire sprinkler system must be tested. The test must be conducted to comply with the installation standards. Viking *high pressure* sprinklers may be hydrostatically tested at a maximum of 300 psi (20.7 bar) for limited periods of time (two hours), for the purpose of acceptance by the Authority Having Jurisdiction.
   a. Make sure the sprinkler is properly tightened. If a thread leak occurs, normally the sprinkler must be removed, new pipe-joint compound or tape applied, and then reinstalled. This is due to the fact that when the joint seal is damaged, the sealing compound or tape is washed out of the joint. Air testing [do not exceed 40 psi (2.76 bar)] the sprinkler piping prior to testing with water may be considered in areas where leakage during testing must be prevented. Refer to the Installation Standards and the Authority Having Jurisdiction.
   b. **Remove plastic protective sprinkler caps or bulb shields AFTER the wall or ceiling finish work is completed where the sprinkler is installed and there no longer is a potential for mechanical damage to the sprinkler operating elements.** To remove the bulb shields, simply pull the ends of the shields apart where they are snapped together. To remove caps from frame style sprinklers, turn the caps slightly and pull them off the sprinklers. **SPRINKLER CAPS OR BULB SHIELDS MUST BE REMOVED FROM SPRINKLERS BEFORE PLACING THE SYSTEM IN SERVICE!** Retain a protective cap or shield in the spare sprinkler cabinet.
5. For flush style sprinklers: the ceiling ring can now be installed onto the sprinkler body. Align the ceiling ring with the sprinkler body and thread or push it on (depends on sprinkler model) until the outer flange touches the surface of the ceiling. Note the maximum adjustment is 1/4" (6.35 mm). DO NOT MODIFY THE UNIT. If necessary, re-cut the sprinkler drop nipple as required.
6. For concealed sprinklers: the cover assembly can now be attached.
   a. Remove the cover from the protective box, taking care not to damage the cover plate assembly.
   b. Gently place the base of the cover plate assembly over the sprinkler protruding through the opening in the ceiling.
   c. Push the cover plate assembly onto the sprinkler until the unfinished brass flange of the cover plate base (or the cover adapter, if used) touches the surface of the ceiling.
   d. Refer to the applicable technical data sheet to determin the maximum adjustment available for concealed sprinklers. DO NOT MODIFY THE UNIT. If necessary, re-cut the sprinkler drop nipple.

NOTE: If it is necessary to remove the entire sprinkler unit, the system must be taken out of service. See section 6. INSPECTIONS, TESTS AND MAINTENANCE and follow all warnings and instructions.

5. OPERATION

Refer to the appropriate sprinkler technical data page(s). During fire conditions, the operating element fuses or shatters (depending on the type of sprinkler), releasing the pip cap and sealing assembly. Water flowing through the sprinkler orifice strikes the sprinkler deflector, forming a uniform spray pattern to extinguish or control the fire.

IMPORTANT: Always refer to Bulletin Form No. F_091699 - Care and Handling of Sprinklers. Viking sprinklers are to be installed in accordance with the latest edition of Viking technical data, the appropriate standards of NFPA, FM Global, LPCB, APSAD, VdS or other similar organizations, and also with the provisions of governmental codes, ordinances, and standards, whenever applicable. The sprinkler technical data page may contain installation requirements specific for the sprinkler model selected. The use of certain types of sprinklers may be limited due to occupancy and hazard. Refer to the Authority Having Jurisdiction prior to installation.

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6. INSPECTIONS, TESTS AND MAINTENANCE

NOTICE: Refer to NFPA 25 for Inspection, Testing and Maintenance requirements. **NOTICE:** The owner is responsible for having the fire-protection system and devices inspected, tested, and maintained in proper operating condition in accordance with this guide, and applicable NFPA standards. In addition, the Authority Having Jurisdiction may have additional maintenance, testing, and inspection requirements that must be followed.

A. Sprinklers must be inspected on a regular basis for corrosion, mechanical damage, obstructions, paint, etc. Frequency of inspections may vary due to corrosive atmospheres, water supplies, and activity around the sprinkler unit.

B. Sprinklers or cover plate assemblies that have been field painted, caulked, or mechanically damaged must be replaced immediately. Sprinklers showing signs of corrosion shall be tested and/or replaced immediately as required. Installation standards require sprinklers to be tested and, if necessary, replaced after a specified term of service. Refer to NFPA 25 and the Authority Having Jurisdiction for the specified period of time after which testing and/or replacement is required. Never attempt to repair or reassemble a sprinkler. Sprinklers and cover assemblies that have operated cannot be reassembled or re-used, but must be replaced. When replacement is necessary, use only new sprinklers and cover assemblies with identical performance characteristics.

C. The sprinkler discharge pattern is critical for proper fire protection. Therefore, nothing should be hung from, attached to, or otherwise obstruct the discharge pattern. All obstructions must be immediately removed or, if necessary, additional sprinklers installed.

D. When replacing existing sprinklers, the system must be removed from service. Refer to the appropriate system description and/or valve instructions. Prior to removing the system from service, notify all Authorities Having Jurisdiction. Consideration should be given to employment of a fire patrol in the affected area.

1. Remove the system from service, drain all water, and relieve all pressure on the piping.

2a. For frame-style sprinklers, use the special sprinkler wrench to remove the old sprinkler by turning it counterclockwise to unthread it from the piping.

2b. For flush and concealed style sprinklers: Remove the ceiling ring or cover plate assembly before unthreading the sprinkler body from the piping. Ceiling rings and cover plates can be removed either by gently unthreading them or pulling them off the sprinkler body (depends on the sprinkler model used). After the ceiling ring or cover plate assembly has been removed from the sprinkler body, place the plastic protective cap (from the spare sprinkler cabinet) over the sprinkler to be removed and then fit the sprinkler wrench over the cap. Then use the wrench to unthread the sprinkler from the piping. *Exception: Domed concealed sprinklers are removed without the plastic cap.*

3. Install the new sprinkler unit by following the instructions in section 4. INSTALLATION. Care must be taken to ensure that the replacement sprinkler is the proper model and style, with the correct K-Factor, temperature rating, and response characteristics. A fully stocked spare sprinkler cabinet should be provided for this purpose. For flush or concealed sprinklers: stock of spare ceiling rings or cover plates should also be available in the spare sprinkler cabinet.

E. Place the system back in service and secure all valves. Check for and repair all leaks. Sprinkler systems that have been subjected to a fire must be returned to service as soon as possible. The entire system must be inspected for damage, and repaired or replaced as necessary. Sprinklers that have been exposed to corrosive products of combustion or high ambient temperatures, but have not operated, should be replaced. Refer to the Authority Having Jurisdiction for minimum replacement requirements.

7. AVAILABILITY

Viking sprinklers are available through a network of domestic and international distributors. See The Viking Corporation web site for the closest distributor or contact The Viking Corporation.

8. GUARANTEE

For details of warranty, refer to Viking's current list price schedule or contact Viking directly.

VIKING®

BULLETIN

REGULATORY AND HEALTH WARNINGS

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1. DESCRIPTION

Regulatory and Health Warnings applying to materials used in the manufacture and construction of fire protection products are provided herin as they relate to legally mandated jurisdictional regions.

⚠ WARNING

STATE OF CALIFORNIA, USA

Installing or servicing fire protection products such as sprinklers, valves, piping etc. can expose you to chemicals including, but not limited to, lead, nickel, butadiene, titaninum dioxide, chromium, carbon black, and acrylonitrile which are known to the State of California to cause cancer or birth defects or other reproductive harm.

For more information, go to **www.P65Warnings.ca.gov**

2. WARRANTY TERMS AND CONDITIONS

For details of warranty, refer to Viking's current list price schedule at **www.vikinggroupinc.com** or contact Viking directly.

BULLETIN

XT1 Sprinkler and XG Guard Assemblies

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1. INTRODUCTION

The purpose of this bulletin is to inform users of proper XG Guard usage for the Model XT1 Sprinklers. The XG Guard assemblies are specifically listed and approved for use on Model XT1 Sprinklers; no other guard assemblies should be used.

⚠ WARNING

Viking sprinklers are manufactured and tested to meet the rigid requirements of the approving agency. The sprinklers are designed to be installed in accordance with recognized installation standards. Deviation from the standards or any alteration to the sprinkler after it leaves the factory including, but not limited to: unlisted accessories, painting, plating, coating, or modification, may render the sprinkler inoperative and will automatically nullify the approval and any guarantee made by The Viking Corporation. Refer to the Authority Having Jurisdiction prior to installation.

2. GENERAL INFORMATION:

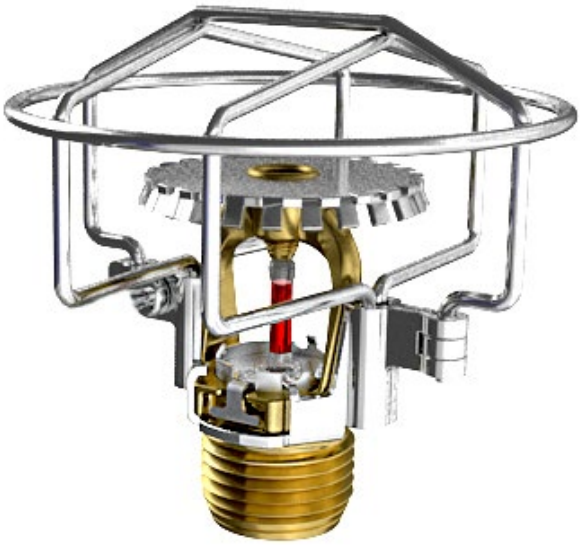
A potential product performance issue may exist when listed products are combined with unlisted product(s) that have not been evaluated together by a recognized approval laboratory. With the development of new products and existing products, it is extremely important to correctly match a sprinkler with a sprinkler guard. Please refer to the appropriate manufacturer's technical literature or call Viking Technical Services at 877-384-5464.

IMPORTANT

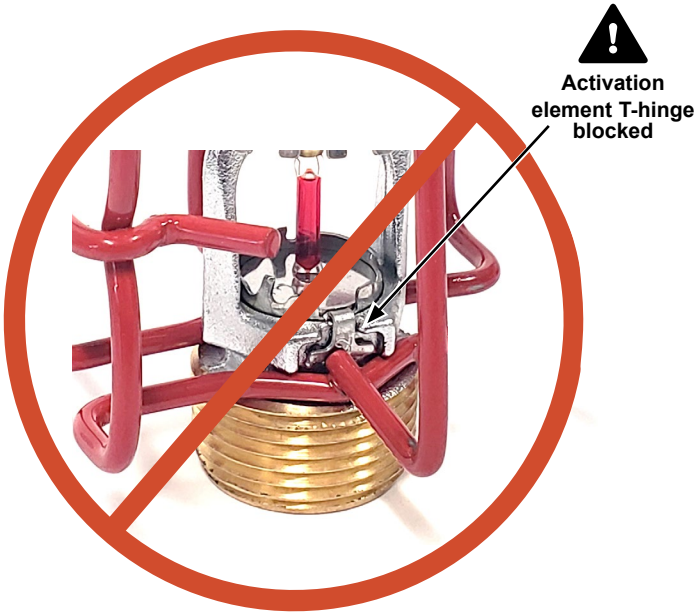
Model XT1 sprinklers are specifically listed and approved with XG Guard. The XG Guard, part number 22931, is listed and approved for use with the following XT1 sprinklers: VK1001, VK1021, VK3001, VK3021, VK2002, VK2022, VK3502, VK3522, VK2001, VK2021, VK3501, VK3521.

NOTE: Image is represetative only. Actual product appearance may vary.

Listed and Approved XG Guard/XT1 Sprinkler Assembly



Unlisted Guard/XT1 Sprinkler Assembly



TECHNICAL DATA

VK3021 QUICK RESPONSE PENDENT SPRINKLER (K5.6)

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Visit the Viking website for the latest edition of this technical data page www.vikinggroupinc.com

1. DESCRIPTION

The Viking VK3021 Quick Response Pendent Sprinkler is a small thermosensitive glass bulb spray sprinkler available with various finishes and temperature ratings to meet design requirements. The special Polyester and Electroless Nickel PTFE (ENT) coatings can be used in decorative applications where colors are desired. In addition, these coatings have been investigated for installation in corrosive environments and are Listed and Approved as indicated in the Approval Chart.

2. LISTINGS AND APPROVALS

UL Listed: Category VNIV

FM Approved: Classes 2017, 2015, 2043
Also approved for use in FM Approved vacuum dry sprinkler systems with a maximum supervisory vacuum pressure of -3 PSI (-207 mbar)

CE: Standard EN12259-1, DOP_XT1A

LPCB Approved: reference no. 096m

VdS Approved: Certificate no. G 422006

WARNING: Cancer and Reproductive Harm- www.P65Warnings.ca.gov

Refer to the Approval Chart and Design Criteria for requirements that must be followed.

3. TECHNICAL DATA

Specifications:
Minimum Operating Pressure: 7 PSI (0.5 bar)
Rated to: UL - 250 PSI (17 bar) WWP
FM, CE, LPCB, and VdS - 175 PSI (12 bar) WWP
Factory tested hydrostatically to 500 PSI (34.5 bar)
Thread size: 1/2" NPT (15 mm BSPT)
Nominal K-factor: 5.6 U.S. (80.6 metric*)
Glass-bulb fluid temperature rated to -65 °F (-55 °C)

* Metric K-factor measurement shown is in bar. When pressure is measured in kPa, divide the metric K-factor shown by 10.0.

Material Standards:
Sprinkler Body: Brass CW602N, UNS-C84400 or QM Brass
Deflector: Stainless Steel UNS S30400
Pip Cap Shell - Stainless Steel UNS-S44400
Pip Cap Disc - Stainless Steel UNS-S30100
Belleville Spring - Nickel Alloy
Pip Cap Seal - Polytetrafluoroethylene (PTFE)
Compression Screw: Brass CW612N, CW508L, UNS-C36000 or UNS-C26000
Shipping Cap: Polyethylene
Bulb: Glass, nominal 3 mm diameter

Ordering Information: (Refer to Table 1 and the current Viking List Price Book.)

4. INSTALLATION

Refer to appropriate NFPA, FM Global, and/or any other applicable installation standards.

NOTICE **Risk of permanent damage.**

Over-tightening the sprinkler can cause permanent damage.
> Tighten the sprinkler to a MAXIMUM torque of 14 ft-lbs (19 N-m).

5. OPERATION

During fire conditions, when the temperature around the sprinkler reaches its operating temperature, the heat-sensitive liquid in the glass bulb expands, causing the bulb to shatter, releasing the pip cap assembly. Water flowing through the sprinkler orifice strikes the sprinkler deflector, forming a uniform spray pattern to extinguish or control the fire.

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6. INSPECTIONS, TESTS AND MAINTENANCE

Refer to NFPA 25 for Inspection, Testing and Maintenance requirements.

7. AVAILABILITY

Viking Sprinklers are available through a network of domestic and international distributors. See the Viking website for the closest distributor or contact Viking.

8. GUARANTEE

For details of warranty, refer to Viking's current list price schedule or contact Viking directly.

TECHNICAL DATA

VK3021 QUICK RESPONSE PENDENT SPRINKLER (K5.6)

The Viking Corporation, 210 N Industrial Park Drive, Hastings MI 49058
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TABLE 1: ORDERING INFORMATION

Instructions: Using the sprinkler base part number,
(1) add the suffix for the desired Finish
(2) add the suffix for the desired Temperature Rating.

Sprinkler Base Part Number	Size		1: Finishes		2: Temperature Ratings			
	NPT Inch	BSPT mm	Description	Suffix[1]	Nominal Rating	Bulb Color	Max. Ambient Ceiling Temperature[3]	Suffix
23870[7]	1/2		Brass	A	135 °F (57 °C)	Orange	100 °F (38 °C)	A
23882[7]		15	Chrome	F	155 °F (68 °C)	Red	100 °F (38 °C)	B
			White Polyester [4,6]	M-/W	175 °F (79 °C)	Yellow	150 °F (65 °C)	D
			Black Polyester [4,6]	M-/B	200 °F (93 °C)	Green	150 °F (65 °C)	E
			ENT [4,5,6]	JN	286 °F (141 °C)	Blue	225 °F (107 °C)	G
					OPEN	--	--	Z

Example: 23870MB/W = VK3021 with white polyester finish and 155 °F (68 °C) nominal temperature rating. This sprinkler is to be installed into an area with a maximum ambient temperature of 100 °F (38 °C) meaning if the area will experience temperatures above the maximum ambient rating, you shall use a higher temperature-rated sprinkler.

Accessories

Sprinkler Wrenches (see Figure 1):

A. Standard Wrench: Part number 23559MB
B. Recessed Socket Wrench: Part number 23560MB[2]

Sprinkler Cabinet:

A. Up to 6 sprinklers: Part number 01724A
B. 6-12 sprinklers: Part number 01725A

Footnotes

1. Where a dash (-) is shown in the Finish suffix designation, insert the desired Temperature Rating suffix. See example above.
2. Requires a 1/2" ratchet which is not available from Viking.
3. Based on NFPA 13, NFPA 13R, and NFPA 13D. Other limits may apply, depending on fire loading, sprinkler location, and other requirements of the Authority Having Jurisdiction. Refer to specific installation standards.
4. UL Listed as corrosion resistant.
5. FM Approved as corrosion resistant.
6. The corrosion resistant coatings have passed the standard corrosion test required by the approving agencies indicated in the Approval Chart. These tests cannot and do not represent all possible corrosive environments. Prior to installation, verify through the end-user that the coatings are compatible with or suitable for the proposed environment. For automatic sprinklers, the ENT coating is applied to all exposed exterior surfaces, including the waterway.
7. UL Listed for 250 PSI (17 bar) WWP.

Figure 1: Sprinkler Wrenches

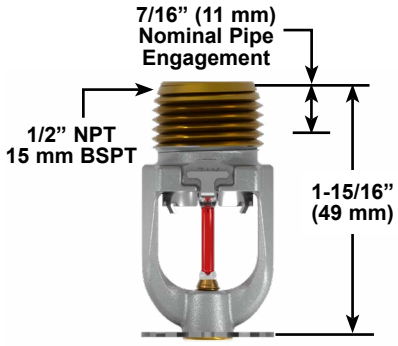

Figure 2: Sprinkler Dimensions

TECHNICAL DATA

VK3021 QUICK RESPONSE PENDENT SPRINKLER (K5.6)

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APPROVAL CHART

Viking Quick Response Pendent Sprinkler
VK3021 K5.6 (80.6 metric)

Finish(es)
Temperature(s) → A 1 X
Escutcheon(s), If applicable
KEY

Sprinkler Base Part Number[1]	Thread Size		Listings and Approvals[2]			
	NPT	BSPT	cULus		FM	
	Inch	mm	Approval Specification	Maximum WWP	Approval Specification	Maximum WWP
23870	1/2	--	A1, A2X, B3Y	250 PSI (17 bar)	A1, B2X, B3Y	175 PSI (12 bar)
23882	--	15	A1, A2X, B3Y	250 PSI (17 bar)	A1, B2X, B3Y	175 PSI (12 bar)

Additional Listings and Approvals
Maximum WWP 175 PSI (12 bar)

			CE[6]	LPCB[7]	VdS[8]
23870	1/2	--	C1, D2X, D3Y	A1, B2X, B3Y	A1
23882	--	15	C1, D2X, D3Y	A1, B2X, B3Y	A1

Approved Temperature Ratings

A = 135 °F (57 °C), 155 °F (68 °C), 175 °F (79 °C), 200 °F (93 °C) and 286 °F (141 °C)
B = 135 °F (57 °C), 155 °F (68 °C), 175 °F (79 °C), and 200 °F (93 °C)
C = 155 °F (68 °C), 175 °F (79 °C), 200 °F (93 °C) and 286 °F (141 °C)
D = 155 °F (68 °C), 175 °F (79 °C), and 200 °F (93 °C)

Approved Finishes

1 = Brass, Chrome, White Polyester [3,4], Black Polyester [3,4], and ENT [4,5]
2 = Brass, Chrome, White Polyester [3,4], and Black Polyester [3,4]
3 = ENT [4,5]

X = Installed with Viking Recessed Escutcheons Models E-1, E-2, E-3, NP-1, NP-2, and NP-3, or Viking Standard Surface Mounted Escutcheons
Y = Installed with Viking Recessed Escutcheons Models E-1 and NP-1, or Viking Standard Surface Mounted Escutcheons

Footnotes

1 Base Part number is shown. For complete part number, refer to Viking's current price schedule.
2 This table shows the listings and approvals available at the time of printing. Check with the manufacturer for any additional approvals.
3 Other colors are available upon request with the same Listings and Approvals as the standard colors.
4 cULus Listed as corrosion resistant.
5 FM Approved as corrosion resistant.
6 CE: Standard EN12259-1, Declaration of Performance DOP_XT1A.
7 LPCB Approved; reference no. 096m
8 VdS Approved; Certificate no. G 422006

VIKING®	TECHNICAL DATA	VK3021 QUICK RESPONSE PENDENT SPRINKLER (K5.6)

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DESIGN CRITERIA - UL

cULus Listing Requirements:
The Viking VK3021 Quick Response Pendent Sprinkler is cULus Listed as indicated in Approval Chart for installation in accordance with the latest edition of NFPA 13 for standard spray sprinklers.

- Designed for use in Light and Ordinary Hazard occupancies.
- The sprinkler installation rules contained in NFPA 13 for standard spray pendent sprinklers shall be followed.

IMPORTANT: Always refer to Form Number F_091699 - Care and Handling of Sprinklers. Also refer to Form Number F_080614 for general care, installation, and maintenance information. Viking sprinklers are to be installed in accordance with the latest edition of Viking Technical Data, the appropriate standards of NFPA, LPCB, APSAD, VdS or other similar organizations, and also with the provisions of governmental codes, ordinances, and standards, whenever applicable.

DESIGN CRITERIA - FM

FM Approval Requirements:
The Viking VK3021 Quick Response Pendent Sprinkler is FM Approved as quick response Non-Storage Pendent sprinkler as indicated in the FM Approval Guide. For specific application and installation requirements, reference the latest applicable FM Loss Prevention Data Sheets (including Data Sheet 2-0). FM Global Loss Prevention Data Sheets contain guidelines relating to, but not limited to: minimum water supply requirements, hydraulic design, ceiling slope and obstructions, minimum and maximum allowable spacing, and deflector distance below the ceiling.
NOTE: The FM Installation guidelines may differ from UL and/or NFPA criteria.

IMPORTANT: Always refer to Form Number F_091699 - Care and Handling of Sprinklers. Also refer to Form Number F_080614 for general care, installation, and maintenance information. Viking sprinklers are to be installed in accordance with the latest edition of Viking Technical Data, the appropriate standards of NFPA, LPCB, APSAD, VdS or other similar organizations, and also with the provisions of governmental codes, ordinances, and standards, whenever applicable.

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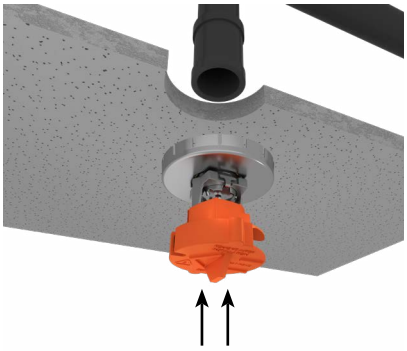
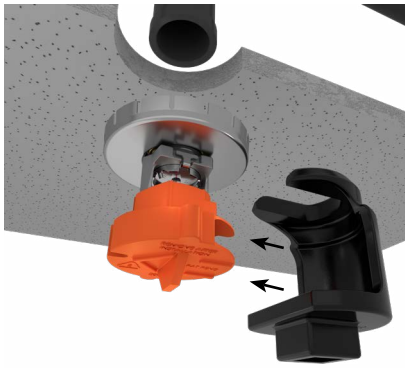
1. Install the escutcheon inner ring onto the sprinkler threads.



2. Carefully slide the wrench** sideways around the protective cap then push upwards to engage with the sprinkler wrench flats.



3. Install the sprinkler and escutcheon assembly into the pipe fitting. Be sure the escutcheon outer ring contacts the surface of the finished ceiling.

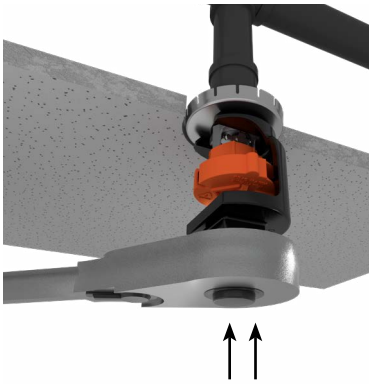
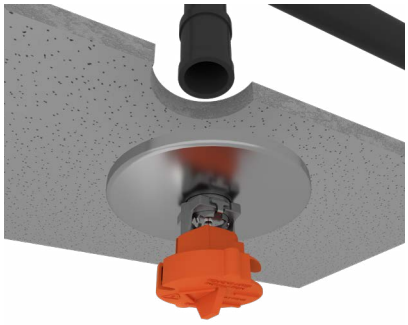


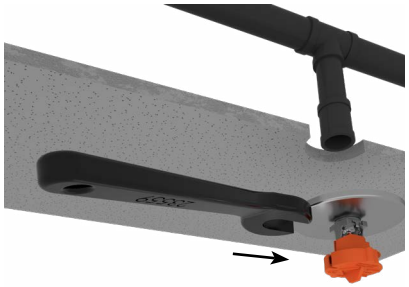
Figure 3: Recessed Installation (with Recessed Socket Wrench)

**A 1/2" ratchet is required (not available from Viking).

1. Install the escutcheon onto the sprinkler threads.



2. Carefully slide the wrench onto the sprinkler wrench flats.



3. Install the sprinkler and escutcheon assembly into the pipe fitting. Be sure the escutcheon contacts the surface of the finished ceiling.

Figure 4: Installation (with Standard Wrench)

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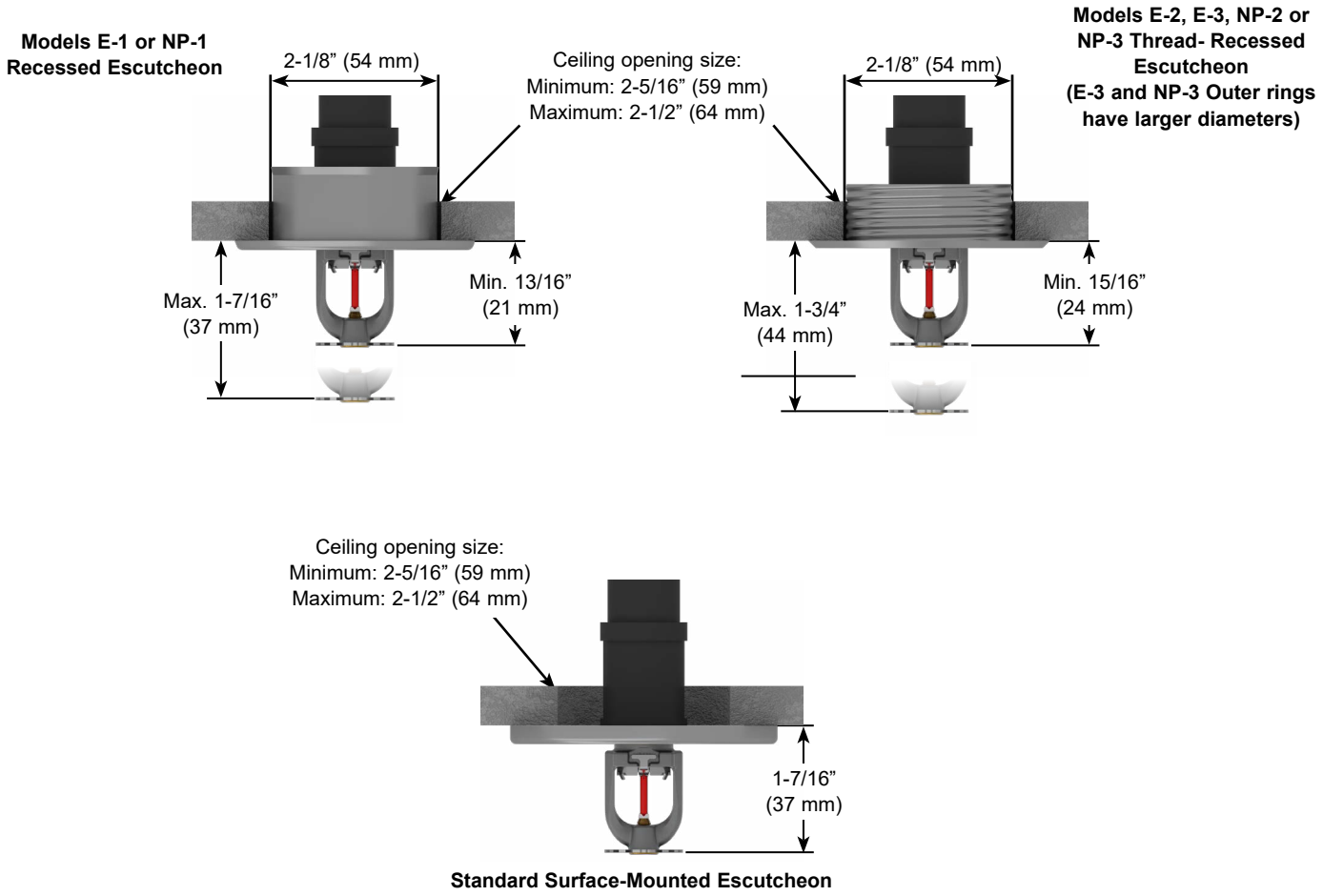

Figure 5: Installation Dimensions with Viking Escutcheons

BULLETIN

CARE AND HANDLING OF SPRINKLERS

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SPRINKLERS ARE FRAGILE - HANDLE WITH CARE!

General Handling and Storage:

- Store sprinklers in a cool, dry place.
- Protect sprinklers during storage, transport, handling, and after installation.
- Use the original shipping containers. DO NOT place sprinklers loose in boxes, bins, or buckets.
- Keep sprinklers separated at all times. DO NOT allow metal parts to contact sprinkler operating elements.

For Pre-Assembled Drops:

- Protect sprinklers during handling and after installation.
- For recessed assemblies, use the protective sprinkler cap (Viking Part Number 10364).

Sprinklers with Protective Shields or Caps:

- DO NOT remove shields or caps until after sprinkler installation and there no longer is potential for mechanical damage to the sprinkler operating elements.
- **Sprinkler shields or caps MUST be removed BEFORE placing the system in service!**
- Remove the sprinkler shield by carefully pulling it apart where it is snapped together.
- Remove the cap by turning it slightly and pulling it off the sprinkler.

Sprinkler Installation:

- DO NOT use the sprinkler deflector or operating element to start or thread the sprinkler into a fitting.
- **Use only the designated sprinkler head wrench!** Refer to the current sprinkler technical data page to determine the correct wrench for the model of sprinkler used.
- DO NOT install sprinklers onto piping at the floor level.
- Install sprinklers after the piping is in place to prevent mechanical damage.
- DO NOT allow impacts such as hammer blows directly to sprinklers or to fittings, pipe, or couplings in close proximity to sprinklers. Sprinklers can be damaged from direct or indirect impacts.
- DO NOT attempt to remove drywall, paint, etc., from sprinklers.
- **Take care not to over-tighten the sprinkler and/or damage its operating parts!**

  Maximum Torque:

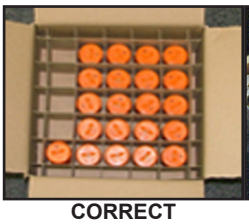
  1/2" NPT: 14 ft-lbs. (19.0 N-m)

  3/4" NPT: 20 ft-lbs. (27.1 N-m)

  1" NPT: 30 ft-lbs. (40.7 N-m)

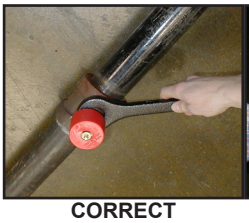
CORRECT
(Original container used)

INCORRECT
(Placed loose in box)



CORRECT
(Protected with caps)

INCORRECT
(Protective caps not used)



CORRECT
(Piping is in place at the ceiling)

INCORRECT
(Sprinkler at floor level)

CORRECT
(Special installation wrenches)

INCORRECT
(Designated wrench not used)

WARNING: Cancer and Reproductive Harm-
www.P65Warnings.ca.gov

⚠ WARNING

Any sprinkler with a loss of liquid from the glass bulb or damage to the fusible element should be destroyed. Never install sprinklers that have been dropped, damaged, or exposed to temperatures exceeding the maximum ambient temperature allowed. Sprinklers that have been painted in the field must be replaced per NFPA 13. Protect sprinklers from paint and paint overspray in accordance with the installation standards. Do not clean sprinklers with soap and water, ammonia, or any other cleaning fluid. Do not use adhesives or solvents on sprinklers or their operating elements.

Refer to the appropriate technical data page and NFPA standards for complete care, handling, installation, and maintenance instructions. For additional product and system information Viking data pages and installation instructions are available on the Viking Web site at www.vikinggroupinc.com.

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PROTECTIVE SPRINKLER SHIELDS AND CAPS

General Handling and Storage:

Many Viking sprinklers are available with a plastic protective cap or shield temporarily covering the operating elements. The snap-on shields and caps are factory installed and are intended to help protect the operating elements from mechanical damage during shipping, storage, and installation. NOTE: It is still necessary to follow the care and handling instructions on the appropriate sprinkler technical data sheets* when installing sprinklers with bulb shields or caps.

WHEN TO REMOVE THE SHIELDS AND CAPS:

NOTE: SHIELDS AND CAPS MUST BE REMOVED FROM SPRINKLERS BEFORE PLACING THE SYSTEM IN SERVICE!

Remove the shield or cap from the sprinkler only after checking all of the following:

- The sprinkler has been installed*.
- The wall or ceiling finish work is completed where the sprinkler is installed and there no longer is a potential for mechanical damage to the sprinkler operating elements.

SHIELDS AND CAPS MUST BE REMOVED FROM SPRINKLERS BEFORE PLACING THE SYSTEM IN SERVICE!

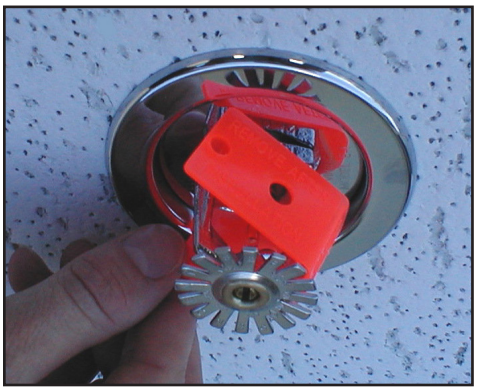

Figure 1: Sprinkler shield being removed from a pendent sprinkler.

Figure 2: Sprinkler cap being removed from a pendent sprinkler.

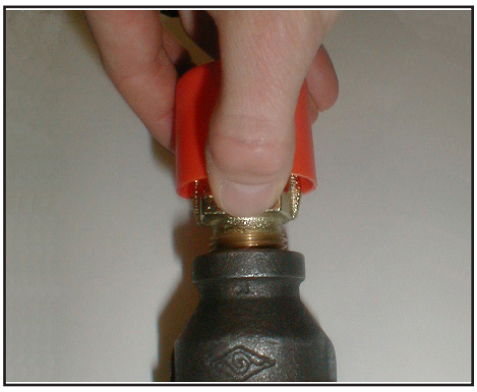

Figure 3: Sprinkler cap being removed from and upright sprinkler.

HOW TO REMOVE SHIELDS AND CAPS:

No tools are necessary to remove the shields or caps from sprinklers. DO NOT use any sharp objects to remove them! **Take care not to cause mechanical damage to sprinklers when removing the shields or caps.** When removing caps from fusible element sprinklers, use care to prevent dislodging ejector springs or damaging fusible elements. NOTE: Squeezing the sprinkler cap excessively could damage sprinkler fusible elements.

- To remove the shield, simply pull the ends of the shield apart where it is snapped together. Refer to Figure 1.
- To remove the cap, turn it slightly and pull it off the sprinkler. Refer to Figures 2 and 3.

NOTICE Refer to the current sprinkler technical data page to determine the correct sprinkler wrench for the model of sprinkler used.

⚠WARNING Never install sprinklers that have been dropped, damaged, or exposed to temperatures in excess of the maximum ambient temperature allowed.

*** Refer to the appropriate current technical data pages for complete care, handling, and installation instructions. Data pages are included with each shipment from Viking or Viking distributors. They can also be found on the Web site at www.vikinggroupinc.com.**

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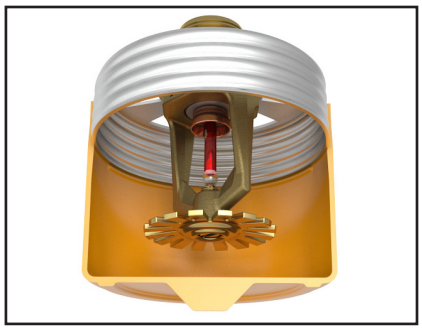
⚠CAUTION CONCEALED COVER ASSEMBLIES ARE FRAGILE!
TO ASSURE SATISFACTORY PERFORMANCE OF THE PRODUCT, HANDLE WITH CARE.



Concealed Sprinkler and Adapter Assembly with Protective Cap

Concealed Sprinkler and Adapter Assembly (Protective Cap Removed)

Cover Plate Assembly (Pendent Cover 12381 shown)

GENERAL HANDLING AND STORAGE INSTRUCTIONS:

- Do not store in temperatures exceeding 100 °F (38 °C). Avoid direct sunlight and confined areas subject to heat.
- Protect sprinklers and cover assemblies during storage, transport, handling, and after installation.
  -- Use original shipping containers.
  -- Do not place sprinklers or cover assemblies loose in boxes, bins, or buckets.
- Keep the sprinkler bodies covered with the protective sprinkler cap any time the sprinklers are shipped or handled, during testing of the system, and while ceiling finish work is being completed.
- Use only the designated Viking recessed sprinkler wrench (refer to the appropriate sprinkler data page) to install these sprinklers. **NOTE:** The protective cap is temporarily removed during installation and then placed back on the sprinkler for protection until finish work is completed.
- Do not over-tighten the sprinklers into fittings during installation.
- Do not use the sprinkler deflector to start or thread the sprinklers into fittings during installation.
- Do not attempt to remove drywall, paint, etc., from the sprinklers.
- Remove the plastic protective cap from the sprinkler before attaching the cover plate assembly. **PROTECTIVE CAPS MUST BE REMOVED FROM SPRINKLERS BEFORE PLACING THE SYSTEM IN SERVICE!**

Refer to the appropriate current technical data pages for complete care, handling, and installation instructions. Data pages are included with each shipment from Viking or Viking distributors. They can also be found on the Web site at www.vikinggroupinc.com.

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USE THE FOLLOWING PRECAUTIONS WHEN HANDLING WAX-COATED SPRINKLERS

Many of Viking's sprinklers are available with factory-applied wax coating for corrosion resistance. These sprinklers MUST receive appropriate care and handling to avoid damaging the wax coating and to assure satisfactory performance of the product.

General Handling and Storage of Wax-Coated Sprinklers:

- Store the sprinklers in a cool, dry place (in temperatures below the maximum ambient temperature allowed for the sprinkler temperature rating. Refer to Table 1 below.)
- Store containers of wax-coated sprinklers separate from other sprinklers.
- Protect the sprinklers during storage, transport, handling, and after installation.
- Use original shipping containers.
- Do not place sprinklers in loose boxes, bins, or buckets.

Installation of Wax-Coated Sprinklers:

Use only the special sprinkler head wrench designed for installing wax-coated Viking sprinklers (any other wrench may damage the unit).

- Take care not to crack the wax coating on the units.
- For touching up the wax coating after installation, wax is available from Viking in bar form. Refer to Table 1 below. The coating MUST be repaired after sprinkler installation to protect the corrosion-resistant properties of the sprinkler.
- Use care when locating sprinklers near fixtures that can generate heat. Do not install sprinklers where they would be exposed to temperatures exceeding the maximum recommended ambient temperature for the temperature rating used.
- Inspect the coated sprinklers frequently soon after installation to verify the integrity of the corrosion resistant coating. Thereafter, inspect representative samples of the coated sprinklers in accordance with NFPA 25. Close up visual inspections are necessary to determine whether the sprinklers are being affected by corrosive conditions.

TABLE 1

Sprinkler Temperature Rating (Fusing Point)	Wax Part Number	Wax Melting Point	Maximum Ambient Ceiling Temperature[1]	Wax Color
155 °F (68 °C) / 165 °F (74 °C)	02568A	148 °F (64 °C)	100 °F (38 °C)	Light Brown
175 °F (79 °C)	04146A	161 °F (71 °C)	150 °F (65 °C)	Brown
200 °F (93 °C)	04146A	161 °F (71 °C)	150 °F (65 °C)	Brown
220 °F (104 °C)	02569A	170 °F (76 °C)	150 °F (65 °C)	Dark Brown
286 °F (141 °C)	02569A	170 °F (76 °C)	150 °F (65 °C)	Dark Brown

[1] Based on NFPA-13. Other limits may apply, depending on fire loading, sprinkler location, and other requirements of the Authority Having Jurisdiction. Refer to specific installation standards.

⚠WARNING Never install sprinklers that have been dropped, damaged, or exposed to temperatures in excess of the maximum ambient temperature allowed.

Refer to the appropriate current technical data pages for complete care, handling, and installation instructions. Data pages are included with each shipment from Viking or Viking distributors. They can also be found on the Web site at www.vikinggroupinc.com.

TECHNICAL DATA — SPRINKLER OVERVIEW

The Viking Corporation, 210 N Industrial Park Drive, Hastings MI 49058
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1. DESCRIPTION

Viking fire sprinklers consist of a threaded frame with a specific waterway or orifice size and a deflector for distributing water in a specified pattern. A closed or sealed sprinkler refers to a complete assembly, including the thermosensitive operating element. An open sprinkler does not use an operating element and is open at all times. The distribution of water is intended to extinguish a fire or to control its spread.

Viking sprinklers are available in several models and styles. Refer to specific sprinkler technical data pages for available styles, finishes, temperature ratings, thread sizes, and nominal K-Factors for the particular model selected.

2. LISTINGS AND APPROVALS

Refer to the Approval Charts on the appropriate sprinkler technical data page(s) and/or approval agency listings.

WARNING: Cancer and Reproductive Harm- www.P65Warnings.ca.gov

3. TECHNICAL DATA

Pressure Ratings:

Maximum allowable water working pressure is 175 psig (12 Bar) unless rated and specified for high water working pressure [250 psig (17.2 bar)].

Sprinkler Identification:

Viking sprinklers are identified and marked with the word “Viking”, the sprinkler identification number (SIN) consisting of “VK” plus a three digit number*, the model letter, and the year of manufacture.

Available Finishes:

Viking sprinklers are available in several decorative finishes. Some models are available with corrosion-resistant coatings or are fabricated from non-corrosive material. Refer to the sprinkler technical data page for additional information.

Available Temperature Ratings:

Viking sprinklers are available in several temperature ratings that relate to a specific temperature classification. Applicable installation rules mandate the use and limitations of each temperature classification. In selecting the appropriate temperature classification, the maximum expected ceiling temperature must be known. When there is doubt as to the maximum temperature at the sprinkler location, a maximum-reading thermometer should be used to determine the temperature under conditions that would show the highest readings to be expected. In addition, recognized installation rules may require a higher temperature classification, depending upon sprinkler location, occupancy classification, commodity classification, storage height, and other hazards. In all cases, the maximum expected ceiling temperature dictates the lowest allowable temperature classification. Sprinklers located immediately adjacent to a heat source may require a higher temperature rating.

K-Factors:

Viking sprinklers are available in several orifice sizes with related K-Factors. The orifice is a tapered waterway and, therefore, the K-Factor given is nominal. Nominal U.S. K-Factors are provided in accordance with the 1999 edition of NFPA 13, Section 3-2.3. Refer to the specific data page for appropriate K-Factor information.

Available Styles:

Viking sprinklers are available for installation in several positions as indicated by a stamping on the deflector. The deflector style dictates the appropriate installation position of the sprinkler; it breaks the solid stream of water issuing from the sprinkler orifice to form a specific spray pattern. The following list indicates the various styles and identification of Viking sprinklers.

UPRIGHT SPRINKLER: A sprinkler intended to be installed with the deflector above the frame so water flows upward through the orifice, striking the deflector and forming an umbrella-shaped spray pattern downward. Marked “SSU” (Standard Sprinkler Upright) or “UPRIGHT” on the deflector.

PENDENT SPRINKLER: A sprinkler intended to be oriented with the deflector below the frame so water flows downward through the orifice, striking the deflector and forming an umbrella-shaped spray pattern downward. Marked “SSP” (Standard Sprinkler Pendent) or “PENDENT” on the deflector.

Viking Technical Data may be found on The Viking Corporation’s Web site at http://www.vikinggroupinc.com. The Web site may include a more recent edition of this Technical Data Page.

CONVENTIONAL SPRINKLER: An “old style” sprinkler intended to be installed with the deflector in either the upright or pendent position. The deflector provides a spherical type pattern with 40 to 60 percent of the water initially directed downward and a proportion directed upward. Must be installed in accordance with installation rules for conventional or old style sprinklers. DO NOT USE AS A REPLACEMENT FOR STANDARD SPRAY SPRINKLERS. Marked “C U/P” (Conventional Upright/Pendent) on the deflector.

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VERTICAL SIDEWALL (VSW) SPRINKLER: A sprinkler intended for installation near the wall and ceiling. The deflector provides a water spray pattern outward in a quarter-spherical pattern and can be installed in the upright or pendent position with the flow arrow in the direction of discharge. Marked “SIDEWALL” on the deflector with an arrow and the word “FLOW”. (Note: Some vertical sidewall sprinklers can only be installed in the upright or pendent position—in this case, the sprinkler will also be marked “UPRIGHT” or “PENDENT”.)

HORIZONTAL SIDEWALL (HSW) SPRINKLER: A sprinkler intended for installation near the wall and ceiling. The special deflector provides a water spray pattern outward in a quarter-spherical pattern. Most of the water is directed away from the nearby wall with a small portion directed at the wall behind the sprinkler. The top of the deflector is oriented parallel with the ceiling or roof. The flow arrows point in the direction of discharge. Marked “SIDEWALL” and “TOP” with an arrow and the word “FLOW”.

EXTENDED COVERAGE (EC) SPRINKLER: A spray sprinkler designed to discharge water over an area having the maximum dimensions indicated in the individual listings. Maximum area of coverage, minimum flow rate, orifice size, and nominal K-Factor are specified in the individual listings. EC sprinklers are intended for Light-Hazard occupancies with smooth, flat, horizontal ceilings unless otherwise specified. In addition to the above markings, the sprinkler is marked “EC”.

QUICK RESPONSE (QR) SPRINKLER: A spray sprinkler with a fast- actuating operating element. The use of quick response sprinklers may be limited due to occupancy and hazard. Refer to the Authority Having Jurisdiction (AHJ) prior to installing.

QUICK RESPONSE EXTENDED COVERAGE (QREC) SPRINKLER: A spray sprinkler designed to discharge water over an area having the maximum dimensions indicated in the individual listing. This is a sprinkler with an operating element that meets the criteria for quick response. QREC sprinklers are only intended for Light Hazard occupancies. The sprinkler is marked “QREC”.

FLUSH SPRINKLER: A decorative spray sprinkler intended for installation with a concealed piping system. The unit is mounted flush with the ceiling or wall, with the fusible link exposed. Upon actuation, the deflector extends beyond the ceiling or wall to distribute water discharge. The sprinkler is marked “SSP”, “PEND”, or “SIDEWALL” and “TOP”.

CONCEALED SPRINKLER: A decorative spray sprinkler intended for installation with a concealed piping system. The sprinkler is hidden from view by a cover plate installed flush with the ceiling or wall. During fire conditions, the cover plate detaches, and upon sprinkler actuation, the deflector extends beyond the ceiling or wall to distribute water discharge. The sprinkler is marked “SSP”, “PEND”, or “SIDEWALL” and “TOP”.

RECESSED SPRINKLER: A spray sprinkler assembly intended for installation with a concealed piping system. The assembly consists of a sprinkler installed in a decorative adjustable recessed escutcheon that minimizes the protrusion of the sprinkler beyond the ceiling or wall without adversely affecting the sprinkler distribution or sensitivity. Refer to the appropriate technical data page for allowable sprinkler models, temperature ratings, and occupancy classifications. DO NOT RECESS ANY SPRINKLER NOT LISTED FOR USE WITH THE ESCUTCHEON.

CORROSION-RESISTANT SPRINKLER: A special service sprinkler with non-corrosive protective coatings, or that is fabricated from non-corrosive material, for use in atmospheres that would normally corrode sprinklers.

DRY SPRINKLER: A special-service sprinkler intended for installation on dry pipe systems or wet pipe systems where the sprinkler is subject to freezing temperatures. The unit consists of a sprinkler permanently secured to an extension nipple with a sealed inlet end to prevent water from entering the nipple until the sprinkler operates. The unit MUST be installed in a tee fitting. Dry upright sprinklers are marked with the “B” dimension [distance from the face of the fitting (tee) to the top of the deflector]. Dry pendent and sidewall sprinklers are marked with the “A” dimension [the distance from the face of fitting (tee) to the finished surface of the ceiling or wall].

LARGE DROP SPRINKLER: A type of special application sprinkler used to provide fire control of specific high-challenge fire hazards. Large drop sprinklers are designed to produce an umbrella-shaped spray pattern downward with a higher percentage of “large” water droplets than standard spray sprinklers. The sprinkler has an extra-large orifice with a nominal K-Factor of 11.2. Marked “HIGH CHALLENGE” and “UPRIGHT”.

EARLY SUPPRESSION FAST-RESPONSE (ESFR) SPRINKLER: A sprinkler intended to provide fire suppression of specific high-challenge fire hazards through the use of a fast response fusible link, 14.0, 16.8, or 25.2 nominal K-Factor, and special deflector. ESFR sprinklers are designed to produce high-momentum water droplets in a hemispherical pattern below the deflector. This permits penetration of the fire plume and direct wetting of the burning fuel surface while cooling the atmosphere early in the development of a high-challenge fire. Marked “ESFR” and “UPRIGHT” or “PEND”.

INTERMEDIATE LEVEL/RACK STORAGE SPRINKLER: A standard spray sprinkler assembly designed to protect its operating element from the spray of sprinklers installed at higher elevations. The assembly consists of a standard or large orifice upright or pendent sprinkler with an integral upright or pendent water shield and guard assembly. Use only those sprinklers that have been tested and listed for use with the assembly. Refer to the technical data page for allowable sprinkler models.

RESIDENTIAL SPRINKLER: A sprinkler intended for use in the following occupancies: one- and two-family dwellings with the fire protection sprinkler system installed in accordance with NFPA 13D; residential occupancies up to four stories in height with the fire protection system installed in accordance with NFPA 13R; and where allowed by the Authority Having Jurisdiction in residential portions of any occupancy with the fire protection system installed in accordance with NFPA 13.

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Residential sprinklers have a unique distribution pattern and utilize a “fast response” heat sensitive operating element. They enhance survivability in the room of fire origin and are designed to provide a life safety environment for a minimum of ten minutes. For this reason, residential sprinklers must not be used to replace standard sprinklers unless tested for and approved by the Authority Having Jurisdiction. In addition to standard markings, the unit is identified as “RESIDENTIAL SPRINKLER” or “RES”.

4. INSTALLATION

Refer to appropriate NFPA Installation Standards.

5. OPERATION

Refer to the appropriate sprinkler technical data page(s).

6. INSPECTIONS, TESTS AND MAINTENANCE

Refer to NFPA 25 for Inspection, Testing and Maintenance requirements.

7. AVAILABILITY

Viking sprinklers are available through a network of domestic and international distributors. See The Viking Corporation web site for the closest distributor or contact The Viking Corporation.

8. GUARANTEE

For details of warranty, refer to Viking’s current list price schedule or contact Viking directly.

IMPORTANT: Always refer to Bulletin Form No. F_091699 - Care and Handling of Sprinklers and the appropriate sprinkler general care, installation, and maintenance guide. Viking sprinklers are to be installed in accordance with the latest edition of Viking technical data, the appropriate standards of NFPA, FM Global, LPCB, APSAD, VdS or other similar organizations, and also with the provisions of governmental codes, ordinances, and standards, whenever applicable. The sprinkler technical data page may contain installation requirements specific for the sprinkler model selected. The use of certain types of sprinklers may be limited due to occupancy and hazard. Refer to the Authority Having Jurisdiction prior to installation.

TECHNICAL DATA

SPRINKLER GENERAL CARE, INSTALLATION, AND MAINTENANCE GUIDE

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Visit the Viking website for the latest edition of this technical data page.

1. DESCRIPTION - STANDARD RESPONSE, QUICK RESPONSE, EXTENDED COVERAGE, AND DRY SPRINKLERS

Viking thermosensitive spray sprinklers consist of a small frame and either a glass bulb or a fusible operating element. Available styles include pendent, flush pendent, concealed pendent, upright, horizontal sidewall, vertical sidewall, or conventional, depending on the particular sprinkler model selected.

Viking sprinklers are available with various finishes, temperature ratings, responses, and K-Factors to meet design requirements†. Used in conjunction with one of the corrosion-resistant coatings (for frame style sprinklers), the units provide protection against many corrosive environments. In addition, the special Polyester or PTFE coatings can be used in decorative applications where colors are desired.

† Refer to the sprinkler technical data page for available styles, finishes, temperature ratings, responses, and nominal K-Factors for specific sprinkler models.

2. LISTINGS AND APPROVALS

Refer to the Approval Charts on the appropriate sprinkler technical data page(s) and/or approval agency listings.

3. TECHNICAL DATA

Specifications:

Refer to the appropriate sprinkler technical data sheet.

Material Standards:

Refer to the appropriate sprinkler technical data sheet.

WARNING: Cancer and Reproductive Harm- www.P65Warnings.ca.gov

4. INSTALLATION

NOTE: Take care not to over-tighten the sprinkler and/or damage its operating parts!

Maximum Torque:

1/2" NPT: 14 ft-lbs. (19.0 N-m)

3/4" NPT: 20 ft-lbs. (27.1 N-m)

1" NPT: 30 ft-lbs. (40.7 N-m)

A. Care and Handling (also refer to Bulletin - Care and Handling of Sprinklers, Form No. F_091699.)

Sprinklers must be handled with care. They must be stored in a cool, dry place in their original shipping container. Never install sprinklers that have been dropped, damaged, or exposed to temperatures exceeding the maximum ambient temperature allowed (refer to the temperature chart on the sprinkler technical data page). Never install any glass-bulb sprinkler if the bulb is cracked or if there is a loss of liquid from the bulb. A small air bubble should be present in the glass bulb. Any sprinkler with a loss of liquid from the glass bulb or damage to the fusible element should be destroyed immediately. (Note: Installing glass bulb sprinklers in direct sunlight (ultraviolet light) may affect the color of the dye used to color code the bulb. This color change does not affect the integrity of the bulb.)

Sprinklers must be protected from mechanical damage during storage, transport, handling, and after installation. Sprinklers subject to mechanical damage must be protected with an approved sprinkler guard.

Use only sprinklers listed as corrosion resistant when subject to corrosive environments. When installing corrosion-resistant sprinklers, take care not to damage the corrosion-resistant coating. Use only the special wrench designed for installing coated or recessed Viking sprinklers (any other wrench may damage the unit).

Concealed sprinklers must be installed in neutral or negative pressure plenums only!

Use care when locating sprinklers near fixtures that can generate heat. Do not install sprinklers where they could be exposed to temperatures exceeding the maximum recommended ambient temperature for the temperature rating used.

Wet pipe systems must be provided with adequate heat. Sprinklers supplied from dry systems in areas subject to freezing must be listed dry sprinklers, upright, or horizontal sidewall sprinklers installed so that water is not trapped. For dry systems, pendent sprinklers and sidewall sprinklers installed on return bends are permitted, where the sprinklers, return bend, and branch line piping are in an area maintained at or above 40 °F (4 °C).

B. Installation Instructions - Standard Spray Sprinklers

Viking sprinklers are manufactured and tested to meet the rigid requirements of approving agencies. They are designed to be installed in accordance with recognized installation standards. Deviation from the standards or any alteration to sprinklers or cover plate assemblies after they leave the factory including, but not limited to: painting, plating, coating, or modification, may render them inoperative and will automatically nullify the approvals and any guarantee made by The Viking Corporation.

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Before installation, be sure to have the appropriate sprinkler model and style, with the correct K-Factor, temperature rating, and response characteristics. Sprinklers must be installed after the piping is in place to prevent mechanical damage. Keep sprinklers with protective caps or bulb shields contained within the caps or shields during installation and testing, and any time the sprinkler is shipped or handled.

1a. For frame-style sprinklers, install escutcheon (if used), which is designed to thread onto the external threads of the sprinkler. Refer to the appropriate sprinkler data page to determine approved escutcheons for use with specific sprinkler models.

1b. For flush and concealed style sprinklers: Cut the sprinkler nipple so that the ½" or 3/4" (15 mm or 20 mm)* NPT outlet of the reducing coupling is at the desired location, and centered in the opening* in the ceiling or wall.
*Size depends on the sprinkler model used. Refer to the sprinkler technical data page.

2. Apply a small amount of pipe-joint compound or tape to the external threads of the sprinkler only, taking care not to allow a build-up of compound in the sprinkler inlet. **NOTE:** Sprinklers with protective caps or bulb shields must have the caps or shields kept on them when applying pipe-joint compound or tape. *Exception: For domed concealed sprinklers, remove the protective cap for installation, and then place it back on the sprinkler temporarily..*

3. Refer to the appropriate sprinkler technical data page to determine the correct sprinkler wrench for the model of sprinkler used. DO NOT use the deflector or fusible element to start or thread the sprinkler into a fitting.
   a. Install the sprinkler onto the piping using the special sprinkler wrench only, taking care not to over-tighten or damage the sprinkler.
   b. For flush and concealed style sprinklers: the internal diameter of the special sprinkler installation wrench is designed for use with the sprinkler contained in the protective cap. *Exception: For domed concealed sprinklers, remove the protective cap for installation, and then place it back on the sprinkler temporarily.* Thread the flush or concealed sprinkler into the ½" or 3/4" (15 mm or 20 mm)* NPT outlet of the coupling by turning it clockwise with the special sprinkler wrench. *Thread size depends on the particular sprinkler model used. Refer to the sprinkler technical data page.

C. Installation Instructions - Dry Sprinklers

WARNING: Viking dry sprinklers are to be installed in the 1" outlet (for dry and preaction systems), or run of malleable, ductile iron, or Nibco CPVC* threaded tee fittings (for wet systems) that meet the dimensional requirements of ANSI B16.3 (Class 150), or cast iron threaded tee fittings that meet the dimensional requirements of ANSI B16.4 (Class 125), even at branch line ends. The threaded end of the dry sprinkler is designed to allow the seal to penetrate and extend into the fitting to a predetermined depth. This prevents condensation from accumulating and freezing over the sprinkler seal. ***NOTE: When using CPVC fittings with Viking dry sprinklers, use only new Nibco Model 5012-S-BI. When selecting other CPVC fittings, contact Viking Technical Services.**

1. **DO NOT** install the dry sprinkler into a threaded elbow, coupling, or any other fitting that could interfere with thread penetration. Such installation would damage the brass seal.
2. **DO NOT** install dry sprinklers into couplings or fittings that would allow condensation to accumulate above the seal when the sprinkler is located in an area subject to freezing.
3. **NEVER** try to modify dry sprinklers. They are manufactured for specific "A" or "B" dimensions and cannot be modified.

The dry sprinkler must be installed after the piping is in place to prevent mechanical damage. Before installation, be sure to have the correct sprinkler model and style, with the appropriate "A" or "B" dimension(s), temperature rating, orifice size, and response characteristics. Keep sprinklers with protective caps or bulb shields contained within the caps or shields during installation and testing, and any time the sprinkler is shipped or handled. *Exception:* For concealed and adjustable recessed dry sprinklers, the protective caps and shields are removed for installation.

To install the dry sprinkler, refer to the instructions below and the appropriate sprinkler technical data page for illustrated instructions.

Dry upright sprinklers must be installed above the piping, in the upright position only. When installing dry upright or plain barrel style vertical sidewall sprinklers on piping located close to the ceiling, it may be necessary to lower the sprinkler into the fitting from above the ceiling. When installing dry upright or plain barrel vertical sidewall sprinklers from below the ceiling, verify that the opening in the ceiling is a minimum 1-1/2" (38.1 mm) in diameter.

For dry upright or plain barrel vertical sidewall sprinklers in the upright position: First, install the escutcheon (if used) over the threaded end of the sprinkler barrel. Slide the escutcheon past the external threads. NOTE: When installing the dry upright or plain barrel vertical sidewall sprinkler from above the ceiling, it will be necessary to install the escutcheon after lowering the threaded end of the sprinkler through the ceiling penetration.

A. **For all dry sprinklers:** Apply a small amount of pipe-joint compound or tape to the external threads of the sprinkler barrel only, taking care not to allow a build-up of compound or tape over the brass inlet and seal. **NOTE:** Sprinklers with protective caps or bulb shields must be contained within the caps or shields before applying pipe-joint compound or tape.

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B. Refer to the appropriate sprinkler technical data page to determine the correct sprinkler wrench for the model of sprinkler used.
C. Install the dry sprinkler on the piping using the special dry sprinkler wrench only, while taking care not to damage the sprinkler. **NOTE:** Thread the sprinkler into the fitting hand tight, plus 1/2 turn with the dry sprinkler wrench.
D. *For adjustable standard and adjustable recessed dry pendent and sidewall sprinklers: Escutcheons can be installed after the sprinklers have been installed onto the piping. Refer to the appropriate sprinkler technical data page for escutcheon installation instructions and illustrations.*

D. Installation Instructions - Testing

4. After installation, the entire sprinkler system must be tested. The test must be conducted to comply with the installation standards. Viking *high pressure* sprinklers may be hydrostatically tested at a maximum of 300 psi (20.7 bar) for limited periods of time (two hours), for the purpose of acceptance by the Authority Having Jurisdiction.
   a. Make sure the sprinkler is properly tightened. If a thread leak occurs, normally the sprinkler must be removed, new pipe-joint compound or tape applied, and then reinstalled. This is due to the fact that when the joint seal is damaged, the sealing compound or tape is washed out of the joint. Air testing [do not exceed 40 psi (2.76 bar)] the sprinkler piping prior to testing with water may be considered in areas where leakage during testing must be prevented. Refer to the Installation Standards and the Authority Having Jurisdiction.
   b. **Remove plastic protective sprinkler caps or bulb shields AFTER the wall or ceiling finish work is completed where the sprinkler is installed and there no longer is a potential for mechanical damage to the sprinkler operating elements.** To remove the bulb shields, simply pull the ends of the shields apart where they are snapped together. To remove caps from frame style sprinklers, turn the caps slightly and pull them off the sprinklers. **SPRINKLER CAPS OR BULB SHIELDS MUST BE REMOVED FROM SPRINKLERS BEFORE PLACING THE SYSTEM IN SERVICE!** Retain a protective cap or shield in the spare sprinkler cabinet.
5. For flush style sprinklers: the ceiling ring can now be installed onto the sprinkler body. Align the ceiling ring with the sprinkler body and thread or push it on (depends on sprinkler model) until the outer flange touches the surface of the ceiling. Note the maximum adjustment is 1/4" (6.35 mm). DO NOT MODIFY THE UNIT. If necessary, re-cut the sprinkler drop nipple as required.
6. For concealed sprinklers: the cover assembly can now be attached.
   a. Remove the cover from the protective box, taking care not to damage the cover plate assembly.
   b. Gently place the base of the cover plate assembly over the sprinkler protruding through the opening in the ceiling.
   c. Push the cover plate assembly onto the sprinkler until the unfinished brass flange of the cover plate base (or the cover adapter, if used) touches the surface of the ceiling.
   d. Refer to the applicable technical data sheet to determin the maximum adjustment available for concealed sprinklers. DO NOT MODIFY THE UNIT. If necessary, re-cut the sprinkler drop nipple.

NOTE: If it is necessary to remove the entire sprinkler unit, the system must be taken out of service. See section 6. INSPECTIONS, TESTS AND MAINTENANCE and follow all warnings and instructions.

5. OPERATION

Refer to the appropriate sprinkler technical data page(s). During fire conditions, the operating element fuses or shatters (depending on the type of sprinkler), releasing the pip cap and sealing assembly. Water flowing through the sprinkler orifice strikes the sprinkler deflector, forming a uniform spray pattern to extinguish or control the fire.

IMPORTANT: Always refer to Bulletin Form No. F_091699 - Care and Handling of Sprinklers. Viking sprinklers are to be installed in accordance with the latest edition of Viking technical data, the appropriate standards of NFPA, FM Global, LPCB, APSAD, VdS or other similar organizations, and also with the provisions of governmental codes, ordinances, and standards, whenever applicable. The sprinkler technical data page may contain installation requirements specific for the sprinkler model selected. The use of certain types of sprinklers may be limited due to occupancy and hazard. Refer to the Authority Having Jurisdiction prior to installation.

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6. INSPECTIONS, TESTS AND MAINTENANCE

NOTICE: Refer to NFPA 25 for Inspection, Testing and Maintenance requirements. **NOTICE:** The owner is responsible for having the fire-protection system and devices inspected, tested, and maintained in proper operating condition in accordance with this guide, and applicable NFPA standards. In addition, the Authority Having Jurisdiction may have additional maintenance, testing, and inspection requirements that must be followed.

A. Sprinklers must be inspected on a regular basis for corrosion, mechanical damage, obstructions, paint, etc. Frequency of inspections may vary due to corrosive atmospheres, water supplies, and activity around the sprinkler unit.

B. Sprinklers or cover plate assemblies that have been field painted, caulked, or mechanically damaged must be replaced immediately. Sprinklers showing signs of corrosion shall be tested and/or replaced immediately as required. Installation standards require sprinklers to be tested and, if necessary, replaced after a specified term of service. Refer to NFPA 25 and the Authority Having Jurisdiction for the specified period of time after which testing and/or replacement is required. Never attempt to repair or reassemble a sprinkler. Sprinklers and cover assemblies that have operated cannot be reassembled or re-used, but must be replaced. When replacement is necessary, use only new sprinklers and cover assemblies with identical performance characteristics.

C. The sprinkler discharge pattern is critical for proper fire protection. Therefore, nothing should be hung from, attached to, or otherwise obstruct the discharge pattern. All obstructions must be immediately removed or, if necessary, additional sprinklers installed.

D. When replacing existing sprinklers, the system must be removed from service. Refer to the appropriate system description and/or valve instructions. Prior to removing the system from service, notify all Authorities Having Jurisdiction. Consideration should be given to employment of a fire patrol in the affected area.

1. Remove the system from service, drain all water, and relieve all pressure on the piping.

2a. For frame-style sprinklers, use the special sprinkler wrench to remove the old sprinkler by turning it counterclockwise to unthread it from the piping.

2b. For flush and concealed style sprinklers: Remove the ceiling ring or cover plate assembly before unthreading the sprinkler body from the piping. Ceiling rings and cover plates can be removed either by gently unthreading them or pulling them off the sprinkler body (depends on the sprinkler model used). After the ceiling ring or cover plate assembly has been removed from the sprinkler body, place the plastic protective cap (from the spare sprinkler cabinet) over the sprinkler to be removed and then fit the sprinkler wrench over the cap. Then use the wrench to unthread the sprinkler from the piping. *Exception: Domed concealed sprinklers are removed without the plastic cap.*

3. Install the new sprinkler unit by following the instructions in section 4. INSTALLATION. Care must be taken to ensure that the replacement sprinkler is the proper model and style, with the correct K-Factor, temperature rating, and response characteristics. A fully stocked spare sprinkler cabinet should be provided for this purpose. For flush or concealed sprinklers: stock of spare ceiling rings or cover plates should also be available in the spare sprinkler cabinet.

E. Place the system back in service and secure all valves. Check for and repair all leaks. Sprinkler systems that have been subjected to a fire must be returned to service as soon as possible. The entire system must be inspected for damage, and repaired or replaced as necessary. Sprinklers that have been exposed to corrosive products of combustion or high ambient temperatures, but have not operated, should be replaced. Refer to the Authority Having Jurisdiction for minimum replacement requirements.

7. AVAILABILITY

Viking sprinklers are available through a network of domestic and international distributors. See The Viking Corporation web site for the closest distributor or contact The Viking Corporation.

8. GUARANTEE

For details of warranty, refer to Viking's current list price schedule or contact Viking directly.

VIKING®

BULLETIN

REGULATORY AND HEALTH WARNINGS

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Visit the Viking website for the latest edition of this technical data page www.vikinggroupinc.com

1. DESCRIPTION

Regulatory and Health Warnings applying to materials used in the manufacture and construction of fire protection products are provided herin as they relate to legally mandated jurisdictional regions.

⚠ WARNING

STATE OF CALIFORNIA, USA

Installing or servicing fire protection products such as sprinklers, valves, piping etc. can expose you to chemicals including, but not limited to, lead, nickel, butadiene, titaninum dioxide, chromium, carbon black, and acrylonitrile which are known to the State of California to cause cancer or birth defects or other reproductive harm.

For more information, go to **www.P65Warnings.ca.gov**

2. WARRANTY TERMS AND CONDITIONS

For details of warranty, refer to Viking's current list price schedule at **www.vikinggroupinc.com** or contact Viking directly.

BULLETIN

XT1 Sprinkler and XG Guard Assemblies

The Viking Corporation, 210 N Industrial Park Drive, Hastings MI 49058
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Visit the Viking website for the latest edition of this technical data page www.vikinggroupinc.com

1. INTRODUCTION

The purpose of this bulletin is to inform users of proper XG Guard usage for the Model XT1 Sprinklers. The XG Guard assemblies are specifically listed and approved for use on Model XT1 Sprinklers; no other guard assemblies should be used.

⚠ WARNING

Viking sprinklers are manufactured and tested to meet the rigid requirements of the approving agency. The sprinklers are designed to be installed in accordance with recognized installation standards. Deviation from the standards or any alteration to the sprinkler after it leaves the factory including, but not limited to: unlisted accessories, painting, plating, coating, or modification, may render the sprinkler inoperative and will automatically nullify the approval and any guarantee made by The Viking Corporation. Refer to the Authority Having Jurisdiction prior to installation.

2. GENERAL INFORMATION:

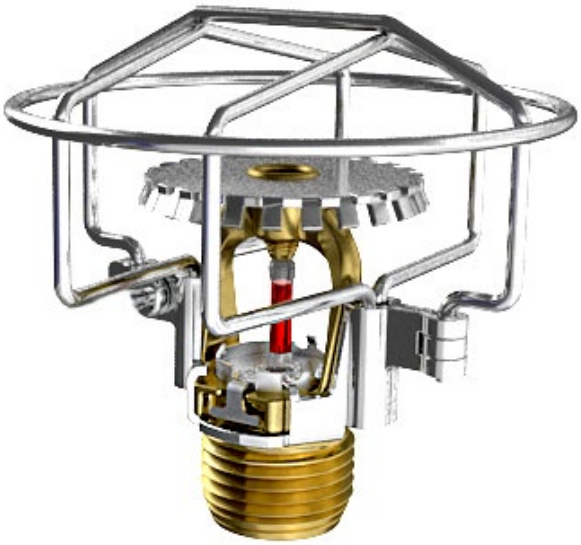
A potential product performance issue may exist when listed products are combined with unlisted product(s) that have not been evaluated together by a recognized approval laboratory. With the development of new products and existing products, it is extremely important to correctly match a sprinkler with a sprinkler guard. Please refer to the appropriate manufacturer's technical literature or call Viking Technical Services at 877-384-5464.

IMPORTANT

Model XT1 sprinklers are specifically listed and approved with XG Guard. The XG Guard, part number 22931, is listed and approved for use with the following XT1 sprinklers: VK1001, VK1021, VK3001, VK3021, VK2002, VK2022, VK3502, VK3522, VK2001, VK2021, VK3501, VK3521.

NOTE: Image is represetative only. Actual product appearance may vary.

Listed and Approved XG Guard/XT1 Sprinkler Assembly



Unlisted Guard/XT1 Sprinkler Assembly

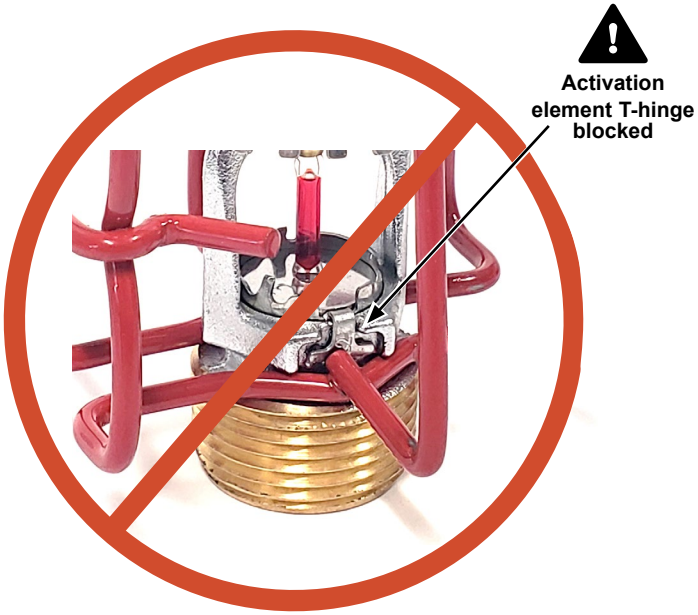


FIG. 7000* Lightweight Flexible Coupling

The Gruvlok® Figure 7000 Lightweight Coupling is designed for applications where system flexibility is desired.

The Figure 7000 Lightweight Coupling is approximately 30% lighter in weight than the Figure 7001 Coupling. Working pressure ratings shown are for reference only and are based on Schedule 40 pipe. For the latest UL/ULC listed and FM approved pressure ratings versus pipe schedule, see www.anvilstar.com or contact your local AnvilStar Representative.

The Figure 7000 Lightweight Coupling with a Pre-Lubricated Grade "E" EPDM, Type "A" gasket (coupling is easily identified by purple nuts) is intended for use in fire protection systems installed in accordance with NFPA Standard 13 "Sprinkler Systems".

c UL us FM APPROVED

For Listing/Approval Details and Limitations, visit our website at *www.anvilstar.com* or contact an Anvil®/AnvilStar™ Sales Representative.

– Available galvanized.

* When ordering, refer to product as FP7400.

MATERIAL SPECIFICATIONS

HOUSING:
Ductile Iron conforming to ASTM A-536, Grade 65-45-12

ANSI BOLTS & HEAVY HEX NUTS:
Heat treated, oval-neck track head bolts conforming to ASTM A-183 Grade 2 with a minimum tensile strength of 110,000 psi and heavy hex nuts of carbon steel conforming to ASTM A-563 Grade A or Grade B, or J995 Grade 2. Bolts and nuts are provided zinc electroplated as standard.

COATINGS:
Rust inhibiting paint Color: ORANGE (standard)
Hot Dipped Zinc Galvanized (optional)
Other available options: Example: RAL3000 or RAL9000 Series
For other coating requirements contact an AnvilStar Representative.

LUBRICATION:
Standard Gruvlok
Gruvlok Xtreme™ required for dry pipe systems and freezer applications.

GASKETS: Materials
Properties as designated in accordance with ASTM D-2000.

Pre-Lubricated Grade "E" EPDM, Type A Gasket (Violet color code)
-40°F to 150°F (Service Temperature Range)(-40°C to 66°C)
Recommended for wet and dry (oil free air) pipe fire protection sprinkler systems. For dry pipe systems and freezer applications, Gruvlok Xtreme™ Lubricant is required.

Grade "E" EPDM (Green color code)
-40°F to 230°F (Service Temperature Range)(-40°C to 110°C)
Recommended for water service, diluted acids, alkalies solutions, oil-free air and many chemical services.

NOT FOR USE IN PETROLEUM APPLICATIONS.

GASKET TYPE:
Standard C Style
Flush Gap ($1^{1}/_{4}$"-8")

PROJECT INFORMATION	APPROVAL STAMP
Project:	❑ **Approved**
Address:	❑ **Approved as noted**
Contractor:	❑ **Not approved**
Engineer:	**Remarks:**
Submittal Date:	
Notes 1:	
Notes 2:	

FIG. 7000* Lightweight Flexible Coupling

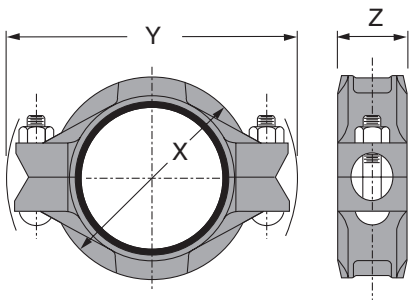


FIGURE 7000 LIGHTWEIGHT COUPLING

Nominal Size	Pipe O.D.	Max. Working Pressure	Max. End Load	Range of Pipe End Separation	Deflection From ℄		Coupling Dimensions			Coupling Bolts		Specified Torque §		Approx. Wt. Ea.
					Per Coupling	Pipe	X	Y	Z	Qty.	Size	Min.	Max.	
In./DN(mm)	*In./mm*	*PSI/bar*	*Lbs./kN*	*In./mm*	*Degrees*	*In./Ft.*	*In./mm*	*In./mm*	*In./mm*		*In./mm*	*Ft.-Lbs./N-m*		*Lbs./Kg*
1¼	1.660	600	1,299	0-⅛	4° 19'	0.90	2¾	4⅜	1¾	2	⅜ x 2¼	30	45	1.4
32	*42.2*	*41.4*	*5.78*	*0-3.2*		*75.3*	*70*	*111*	*44*		*M10 x 57*	*40*	*60*	*0.6*
1½	1.900	600	1,701	0-⅛	3° 46'	0.79	3	4⅝	1¾	2	⅜ x 2¼	30	45	1.5
40	*48.3*	*41.4*	*7.57*	*0-3.2*		*65.7*	*76*	*117*	*44*		*M10 x 57*	*40*	*60*	*0.7*
2	2.375	600	2,658	0-⅛	3° 1'	0.63	3½	5½	1¾	2	⅜ x 2¼	30	45	1.7
50	*60.3*	*41.4*	*11.82*	*0-3.2*		*52.6*	*89*	*140*	*44*		*M10 x 57*	*40*	*60*	*0.8*
2½	2.875	600	3,895	0-⅛	2° 29'	0.52	4	5¾	1¾	2	⅜ x 2¼	30	45	1.9
65	*73.0*	*41.4*	*17.33*	*0-3.2*		*43.3*	*102*	*146*	*44*		*M10 x 57*	*40*	*60*	*0.9*
3 O.D.	*2.996*	*600*	*4,230*	*0-⅛*	*2° 23'*	*0.50*	*4*	*6⅛*	*1¾*	*2*	*⅜ x 2¼*	*80*	*100*	*2.3*
76.1	76.1	41.4	18.82	0-3.2		41.6	102	156	44		M10 x 57	110	150	1.0
3	3.500	600	5,773	0-⅛	2° 3'	0.43	4⅝	6¾	1¾	2	½ x 2¾	80	100	2.9
80	*88.9*	*41.4*	*25.68*	*0-3.2*		*35.8*	*117*	*171*	*44*		*M12 x 70*	*110*	*150*	*1.3*
4¼ O.D.	*4.250*	*600*	*8,512*	*0-¼*	*3° 22'*	*0.70*	*5½*	*7¾*	*2*	*2*	*½ x 3*	*80*	*100*	*4.0*
108.0	108.0	41.4	37.86	0-6.4		58.7	140	197	51		M12 x 76	110	150	1.8
4	4.500	600	9,543	0-¼	3° 11'	0.67	5⅞	8⅛	2	2	½ x 3	80	100	4.6
100	*114.3*	*41.4*	*42.45*	*0-6.4*		*55.5*	*149*	*206*	*51*		*M12 x 76*	*110*	*150*	*2.1*
5¼ O.D.	*5.236*	*500*	*10,766*	*0-¼*	*2° 44'*	*0.57*	*6½*	*9⅛*	*2*	*2*	*⅝ x 3½*	*100*	*130*	*5.7*
133.0	133.0	34.5	47.89	0-6.4		47.7	165	232	51		M16 x 85	135	175	2.6
5½ O.D.	*5.500*	*500*	*11,879*	*0-¼*	*2° 36'*	*0.54*	*6¾*	*9⅜*	*2*	*2*	*⅝ x 3½*	*100*	*130*	*6*
139.7	139.7	34.5	52.84	0-6.4		45.4	171	238	51		M16 x 85	135	175	2.7
5	5.563	500	12,153	0-¼	2° 35'	0.54	7	9⅝	2	2	⅝ x 3½	100	130	6.1
125	*141.3*	*34.5*	*54.06*	*0-6.4*		*45.1*	*178*	*244*	*51*		*M16 x 85*	*135*	*175*	*2.8*
6¼ O.D.	*6.259*	*500*	*15,384*	*0-¼*	*2° 17'*	*0.48*	*7½*	*10⅜*	*2*	*2*	*⅝ x 3½*	*100*	*130*	*6.7*
159.0	159.0	34.5	68.43	0-6.4		39.8	191	264	51		M16 x 85	135	175	3.0
6½ O.D.	*6.500*	*500*	*16,592*	*0-¼*	*2° 12'*	*0.46*	*7¾*	*10¾*	*2*	*2*	*⅝ x 3½*	*100*	*130*	*7.0*
165.1	165.1	34.5	73.80	0-6.4		34.8	197	273	51		M16 x 85	135	175	3.2
6	6.625	500	17,236	0-¼	2° 10'	0.45	8	11	2	2	⅝ x 3½	100	130	8.1
150	*168.3*	*34.5*	*76.67*	*0-6.4*		*37.8*	*203*	*279*	*51*		*M16 x 85*	*135*	*175*	*3.7*
8	8.625	500	29,213	0-¼	1° 40'	0.35	10	13¼	2⅜	2	¾ x 4½	130	180	14.2
200	*219.1*	*34.5*	*129.95*	*0-6.4*		*29.1*	*264*	*337*	*60*		*M20 x 110*	*175*	*245*	*6.4*

Not for use in copper system.

§ – For additional Bolt Torque information see Technical Data Section.

Other sizes available, see Gruvlok Catalog or contact an AnvilStar Representative.

⚠ WARNING

For dry pipe systems and freezer applications lubrication of the gasket is required, Gruvlok® Xtreme™ Lubricant is required.

FIG. 7400* Rigidlite® Coupling

The Gruvlok® Figure 7400 Rigidlite Coupling is specially designed to provide a rigid, locked-in pipe connection to meet the specific demands of rigid design steel pipe. Fast and easy swing-over installation of the rugged lightweight housing produces a secure, rigid pipe joint. The Figure 7400 Rigidlite Coupling is UL/ULC Listed and FM Approved for fire protection service in both wet and dry systems, with roll grooved or cut grooved steel pipe prepared in accordance with Gruvlok grooving specifications. Working pressure ratings shown are for reference only and are based on Schedule 40 pipe. For the latest UL/ULC listed and FM approved pressure ratings versus pipe schedule, see www.anvilstar.com or contact your local AnvilStar Representative.

The Figure 7400 Rigidlite Coupling with a Pre-Lubricated Grade "E" EPDM, Type "A" gasket (coupling is easily identified by purple nuts) is intended for use in fire protection systems installed in accordance with NFPA Standard 13 "Sprinkler Systems".

c UL us FM APPROVED

For Listing/Approval Details and Limitations, visit our website at *www.anvilstar.com* or contact an Anvil®/AnvilStar™ Sales Representative.

VdS

DN 50 and DN200 sizes are VdS approved.

– Available galvanized.

* When ordering, refer to product as FP7400.

MATERIAL SPECIFICATIONS

HOUSING:
Ductile Iron conforming to ASTM A-536, Grade 65-45-12

ANSI BOLTS & HEAVY HEX NUTS:
Heat treated, oval-neck track head bolts conforming to ASTM A-183 Grade 2 with a minimum tensile strength of 110,000 psi and heavy hex nuts of carbon steel conforming to ASTM A-563 Grade A or Grade B, or J995 Grade 2. Bolts and nuts are provided zinc electroplated as standard.

COATINGS:
Rust inhibiting paint Color: ORANGE (standard)
Hot Dipped Zinc Galvanized (optional)
Other available options: Example: RAL3000 or RAL9000 Series
For other coating requirements contact an AnvilStar Representative.

LUBRICATION:
Standard Gruvlok
Gruvlok Xtreme™ required for dry pipe systems and freezer applications.

GASKETS: Materials
Properties as designated in accordance with ASTM D-2000.

Pre-Lubricated Grade "E" EPDM, Type A Gasket (Violet color code)
-40°F to 150°F (Service Temperature Range)(-40°C to 66°C)
Recommended for wet and dry (oil free air) pipe fire protection sprinkler systems. For dry pipe systems and freezer applications, Gruvlok Xtreme™ Lubricant is required.

Grade "E" EPDM (Green color code)
-40°F to 230°F (Service Temperature Range)(-40°C to 110°C)
Recommended for water service, diluted acids, alkalies solutions, oil-free air and many chemical services.

NOT FOR USE IN PETROLEUM APPLICATIONS.

GASKET TYPE:
Standard C Style
Flush Gap ($1^1/_4$" - 8")

PROJECT INFORMATION	APPROVAL STAMP
Project:	❑ **Approved**
Address:	❑ **Approved as noted**
Contractor:	❑ **Not approved**
Engineer:	**Remarks:**
Submittal Date:	
Notes 1:	
Notes 2:	

FIG. 7400* Rigidlite® Coupling

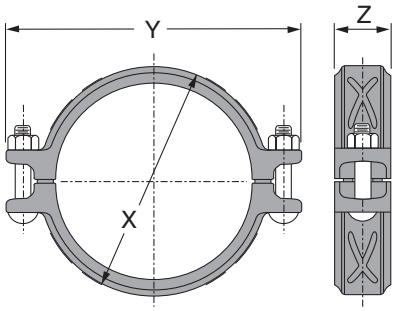


FIGURE 7400 RIGIDLITE® COUPLING

Nominal Size	Pipe O.D.	Max. Working Pressure	Max. End Load	Range of Pipe End Separation	Coupling Dimensions			Coupling Bolts		Specified Torque §		Approx. Wt. Ea.
					X	Y	Z	Qty.	Size	Min.	Max.	
In./DN(mm)	*In./mm*	*PSI/bar*	*Lbs./kN*	*In./mm*	*In./mm*	*In./mm*	*In./mm*		*In./mm*	*Ft.-Lbs./N-m*		*Lbs./Kg*
1¼	1.660	300	649	0-⅛	2⅝	4¾	1¾	2	⅜ x 2¼	30	45	1.3
32	*42.2*	*20.7*	*2.89*	*0-3.2*	*67*	*121*	*44*		*M10 x 57*	*40*	*60*	*0.6*
1½	1.900	300	851	0-⅛	2⅞	4⅞	1¾	2	⅜ x 2¼	30	45	1.4
40	*48.3*	*20.7*	*3.78*	*0-3.2*	*73*	*124*	*44*		*M10 x 57*	*40*	*60*	*0.6*
2	2.375	300	1,329	0-⅛	3¼	5½	1¾	2	⅜ x 2¼	30	45	1.6
*50**	*60.3*	*20.7*	*5.91*	*0-3.2*	*83*	*140*	*44*		*M10 x 57*	*40*	*60*	*0.7*
2½	2.875	300	1,948	0-⅛	3⅞	6	1¾	2	⅜ x 2¼	30	45	1.9
65	*73.0*	*20.7*	*8.66*	*0-3.2*	*98*	*152*	*44*		*M10 x 57*	*40*	*60*	*0.9*
3 O.D.	*2.996*	*300*	*2,115*	*0-⅛*	*4*	*5⅞*	*13⁄4*	*2*	*3⁄8 x 21⁄4*	*30*	*45*	*1.9*
76.1	76.1	20.7	9.41	0-3.2	102	149	44		M10 ax 57	40	60	0.9
3	3.500	300	2,886	0-⅛	4½	6¾	1¾	2	⅜ x 2¾	30	45	2.1
80	*88.9*	*20.7*	*12.84*	*0-3.2*	*114*	*171*	*44*		*M10 x 70*	*40*	*60*	*1.0*
4	4.500	300	4,771	0-¼	5⅝	7¾	1⅞	2	⅜ x 2¾	30	45	3.1
100	*114.3*	*20.7*	*21.22*	*0-6.4*	*143*	*197*	*48*		*M10 x 70*	*40*	*60*	*1.4*
5½ O.D.	*5.500*	*300*	*7,127*	*0-¼*	*6¾*	*9¼*	*2*	*2*	*1⁄2 x 3*	*80*	*100*	*4.5*
139.7	139.7	20.7	31.70	0-6.4	171	235	51		M12 x 76	110	150	2.0
5	5.563	300	7,292	0-¼	6⅞	9¼	2	2	½ x 3	80	100	4.6
125	*141.3*	*20.7*	*32.44*	*0-6.4*	*175*	*235*	*51*		*M12 x 76*	*110*	*150*	*2.1*
6½ O.D.	*6.500*	*300*	*9,955*	*0-¼*	*7¾*	*10⅜*	*2*	*2*	*½ x 3*	*80*	*100*	*5.5*
165.1	165.1	20.7	44.28	0-6.4	200	264	51		M12 x 76	110	150	2.5
6	6.625	300	10,341	0-¼	7⅞	10⅜	2	2	½ x 3	80	100	5.5
150	*168.3*	*20.7*	*46.00*	*0-6.4*	*200*	*264*	*51*		*M12 x 76*	*110*	*150*	*2.5*
8	8.625	300	17,528	0-⅛	10¼	12¾	2⅜	2	½ x 3	80	100	8.4
*200**	*219.1*	*20.7*	*77.97*	*0-3.2*	*260*	*324*	*60*		*M12 x 76*	*110*	*150*	*3.8*

Note: 7400 Grade "E" EPDM gasket is required for use in copper system.

* DN 50 and DN 200 sizes are VdS approved.

§ – For additional Bolt Torque information see Technical Data Section.

Other sizes available, see Gruvlok Catalog or contact an AnvilStar Representative.

⚠ WARNING

For dry pipe systems and freezer applications lubrication of the gasket is required, Gruvlok® Xtreme™ Lubricant is required.

❑ FIG. 7050

90° Elbow*

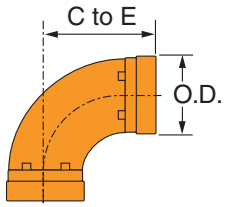


FIGURE 7050 90° ELBOW*			
Nominal Size	O.D.	Center to End	Approx. Wt. Ea.
In./DN(mm)	*In./mm*	*In./mm*	*Lbs./Kg*
1 *25*	1.315 *33.4*	2¼ C *57*	0.6 *0.3*
1¼ *32*	1.660 *42.2*	2¾ C *70*	1.0 *0.5*
1½ *40*	1.900 *48.3*	2¾ C *70*	1.2 *0.5*
2 *50*	2.375 *60.3*	3¼ C *83*	1.7 *0.8*
2½ *65*	2.875 *73.0*	3¾ C *95*	2.6 *1.2*
3 O.D. 76.1	*2.996* 76.1	*4 C* 102	*3.6* 1.6
3 *80*	3.500 *88.9*	4¼ C *108*	4.0 *1.8*
3½ *90*	4.000 *101.6*	4½ C *114*	5.5 *2.5*
4¼ O.D. 108.0	*4.250* 108.0	*4¾ C* 121	*7.7* 3.5
4 *100*	4.500 *114.3*	5 C *127*	7.7 *3.5*
5¼ O.D. 133.0	*5.236* 133.0	*5¼ C* 133	*10.4* 4.7
5½ O.D. 139.7	*5.500* 139.7	*5¼ C* 133	*10.9* 4.9
5 *125*	5.563 *141.3*	5½ C *140*	11.1 *5.0*
6¼ O.D. 159.0	*6.259* 159.0	*6 C* 152	*15.2* 6.9
6½ O.D. 165.1	*6.500* 165.1	*6½ C* 165	*17.4* 7.9
6 *150*	6.625 *168.3*	6½ C *165*	16.5 *7.5*
8 *200*	8.625 *219.1*	7¾ C *197*	30.6 *13.9*
10 *250*	10.750 *273.1*	9 C *229*	53.5 *24.3*
12 *300*	12.750 *323.9*	10 C *254*	82 *37.2*
14 *350*	14.000 *355.6*	21 *533*	169.0 *76.7*
16 *400*	16.000 *406.4*	24 *610*	222.0 *100.7*
18 *450*	18.000 *457.2*	27 *686*	280.0 *127.0*
20 *500*	20.000 *508.0*	30 *762*	344.0 *156.0*
24 *600*	24.000 *609.6*	36 *914*	490.0 *222.3*

❑ FIG. 7051

45° Elbow*

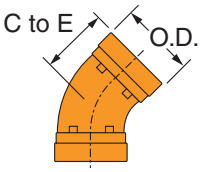


FIGURE 7051 45° ELBOW*			
Nominal Size	O.D.	Center to End	Approx. Wt. Ea.
In./DN(mm)	*In./mm*	*In./mm*	*Lbs./Kg*
1 *25*	1.315 *33.4*	1¾ C *44*	0.5 *0.2*
1¼ *32*	1.660 *42.2*	1¾ C *44*	0.7 *0.3*
1½ *40*	1.900 *48.3*	1¾ C *44*	0.9 *0.4*
2 *50*	2.375 *60.3*	2 C *51*	1.5 *0.7*
2½ *65*	2.875 *73.0*	2¼ C *57*	1.9 *0.9*
3 O.D. 76.1	*2.996* 76.1	*2½ C* 64	*2.2* 1.0
3 *80*	3.500 *88.9*	2½ C *64*	3.3 *1.5*
3½ *90*	4.000 *101.6*	2¾ C *70*	4.3 *2.0*
4¼ O.D. 108.0	*4.250* 108.0	*2⅞ C* 83	*4.4* 2.0
4 *100*	4.500 *114.3*	3 C *76*	5.4 *2.4*
5¼ O.D. 133.0	*5.236* 133.0	*3¼ C* 83	*7.3* 3.3
5½ O.D. 139.7	*5.500* 139.7	*3¼ C* 83	*7.8* 3.5
5 *125*	5.563 *141.3*	3¼ C *83*	9.0 *4.1*
6¼ O.D. 159.0	*6.259* 159.0	*3½ C* 89	*10.1* 4.6
6½ O.D. 165.1	*6.500* 165.1	*3½ C* 89	*11.1* 5.0
6 *150*	6.625 *168.3*	3½ C *89*	11.2 *5.1*
8 *200*	8.625 *219.1*	4¼ C *108*	19.8 *9.0*
10 *250*	10.750 *273.1*	4¾ C *121*	34.3 *15.6*
12 *300*	12.750 *323.9*	5¼ C *133*	50.0 *22.7*
14 *350*	14.000 *355.6*	8¾ *222*	92.0 *41.7*
16 *400*	16.000 *406.4*	10 *254*	117.0 *53.1*
18 *450*	18.000 *457.2*	11¼ *286*	146.0 *66.2*
20 *500*	20.000 *508.0*	12½ *317*	179.0 *81.2*
24 *600*	24.000 *609.6*	15 *381*	255.0 *115.7*

❑ FIG. 7052

22 ½° Elbow

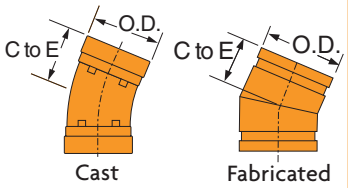


FIGURE 7052 22½° ELBOW*			
Nominal Size	O.D.	Center to End	Approx. Wt. Ea.
In./DN(mm)	*In./mm*	*In./mm*	*Lbs./Kg*
1 *25*	1.315 *33.4*	3¼ *83*	0.5 *0.2*
1¼ *32*	1.660 *42.2*	1¾ *44*	0.7 *0.3*
1½ *40*	1.900 *48.3*	1¾ *44*	0.8 *0.4*
2 *50*	2.375 *60.3*	1⅞ C *48*	1.5 *0.7*
2½ *65*	2.875 *73.0*	2 *51*	1.9 *0.9*
3 *80*	3.500 *88.9*	2¼ C *57*	3.2 *1.5*
3½ *90*	4.000 *101.6*	2½ *64*	4.0 *1.8*
4 *100*	4.500 *114.3*	2⅝ C *67*	5.3 *2.4*
5 *125*	5.563 *141.3*	2⅞ *73*	7.2 *3.3*
6 *150*	6.625 *168.3*	3⅛ C *79*	8.2 *3.7*
8 *200*	8.625 *219.1*	3⅞ C *98*	17.8 *8.1*
10 *250*	10.750 *273.1*	4⅜ *111*	30.0 *13.6*
12 *300*	12.750 *323.9*	4⅞ *124*	40.4 *18.3*
14 *350*	14.000 *355.6*	5 *127*	46.0 *20.9*
16 *400*	16.000 *406.4*	5 *127*	52.2 *23.7*
18 *450*	18.000 *457.2*	5½ *140*	65.0 *29.5*
20 *500*	20.000 *508.0*	6 *152*	80.0 *36.3*
24 *600*	24.000 *609.6*	7 *178*	112.0 *50.8*

❑ FIG. 7053

11 ¼° Elbow

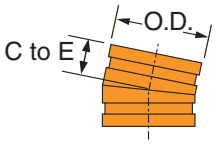


FIGURE 7053 11¼° ELBOW*			
Nominal Size	O.D.	Center to End	Approx. Wt. Ea.
In./DN(mm)	*In./mm*	*In./mm*	*Lbs./Kg*
1 *25*	1.315 *33.4*	1⅜ *35*	0.3 *0.1*
1¼ *32*	1.660 *42.2*	1⅜ *35*	0.5 *0.2*
1½ *40*	1.900 *48.3*	1⅜ *35*	0.7 *0.3*
2 *50*	2.375 *60.3*	1⅜ *35*	0.9 *0.4*
2½ *65*	2.875 *73.0*	1½ *38*	1.5 *0.7*
3 *80*	3.500 *88.9*	1½ *38*	2.0 *0.9*
3½ *90*	4.000 *101.6*	1¾ *44*	2.8 *1.3*
4 *100*	4.500 *114.3*	1¾ *44*	3.3 *1.5*
5 *125*	5.563 *141.3*	2 *51*	5.0 *2.3*
6 *150*	6.625 *168.3*	2 *51*	6.5 *2.9*
8 *200*	8.625 *219.1*	2 *51*	10.0 *4.5*
10 *250*	10.750 *273.1*	2⅛ *54*	14.5 *6.6*
12 *300*	12.750 *323.9*	2¼ *57*	18.7 *8.5*
14 *350*	14.000 *355.6*	3½ *89*	32.1 *14.6*
16 *400*	16.000 *406.4*	4 *102*	42.0 *19.1*
18 *450*	18.000 *457.2*	4½ *114*	53.2 *24.1*
20 *500*	20.000 *508.0*	5 *127*	65.7 *29.8*
24 *600*	24.000 *609.6*	6 *152*	96.0 *43.5*

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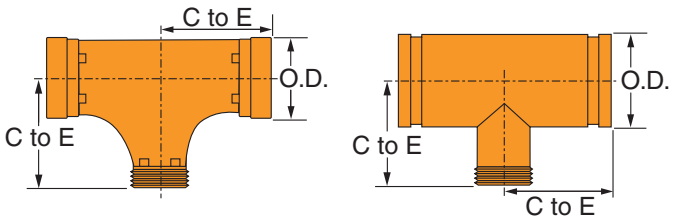
C - Cast malleable or ductile iron, all others are fabricated steel.

* 14"-24" Standard Radius 90° & 45° Elbows are 1 ½.

Center to end dimensions and weights may differ from those shown in chart, contact a Gruvlok Representative for more information.

❑ FIG. 7064

Reducing Tee w/ Threaded Branch



Cast Fabricated

FIGURE 7064 REDUCING TEE WITH THREADED BRANCH

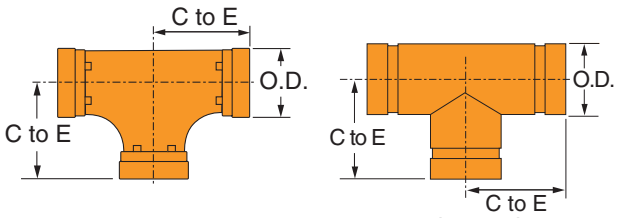
Nominal Size	Center to End	Approx. Wt. Ea.	Nominal Size	Center to End	Approx. Wt. Ea.
In./DN(mm)	*In./mm*	*Lbs/Kg*	*In./DN(mm)*	*In./mm*	*Lbs/Kg*
2 x 2 x ¾ *50 x 50 x 20*	3¼ *83*	1.6 *0.7*	8 x 8 x 4 *200 x 200 x 100*	7¾ *197*	50.0 *22.7*
2 x 2 x 1 *50 x 50 x 25*	3¼ C *83*	2.6 *1.2*	8 x 8 x 5 *200 x 200 x 125*	7¾ *197*	41.0 *18.6*
2 x 2 x 1¼ *50 x 50 x 32*	3¼ *83*	1.7 *0.8*	8 x 8 x 6 *200 x 200 x 150*	7¾ *197*	54.0 *24.5*
2 x 2 x 1½ *50 x 50 x 40*	3¼ C *83*	2.7 *1.2*	10 x 10 x 2 *250 x 250 x 50*	9 *229*	61.8 *28.0*
2½ x 2½ x 1 *65 x 65 x 25*	3¾ *95*	4.1 *1.9*	10 x 10 x 3 *250 x 250 x 80*	9 *229*	63.0 *28.6*
2½ x 2½ x 1½ *65 x 65 x 40*	3¾ *95*	4.3 *2*	10 x 10 x 4 *250 x 250 x 100*	9 *229*	64.0 *29.0*
2½ x 2½ x 2 *65 x 65 x 50*	3¾ *95*	4.4 *2*	10 x 10 x 5 *250 x 250 x 125*	9 *229*	65.1 *29.5*
3 x 3 x ¾ *80 x 80 x 20*	4¼ *108*	5.7 *2.6*	10 x 10 x 6 *250 x 250 x 150*	9 *229*	55.0 *24.9*
3 x 3 x 1 *80 x 80 x 25*	4¼ C *108*	7.0 *3.2*	10 x 10 x 8 *250 x 250 x 200*	9 *229*	64.7 *29.3*
3 x 3 x 1½ *80 x 80 x 40*	4¼ *108*	5.3 *2.4*	12 x 12 x 3 *300 x 300 x 80*	10 *254*	84.9 *38.5*
3 x 3 x 2 *80 x 80 x 50*	4¼ *108*	5.5 *2.5*	12 x 12 x 4 *300 x 300 x 100*	10 *254*	85.8 *38.9*
3 x 3 x 2½ *80 x 80 x 65*	4¼ *108*	5.8 *2.6*	12 x 12 x 5 *300 x 300 x 125*	10 *254*	87.0 *39.5*
4 x 4 x ¾ *100 x 100 x 20*	3¾ *95*	7.2 *3.3*	12 x 12 x 6 *300 x 300 x 150*	10 *254*	88.3 *40.1*
4 x 4 x 1 *100 x 100 x 25*	3¾ *95*	7.0 *3.2*	12 x 12 x 8 *300 x 300 x 200*	10 *254*	91.2 *41.4*
4 x 4 x 1½ *100 x 100 x 40*	5 *127*	9.2 *4.2*	12 x 12 x 10 *300 x 300 x 250*	10 *254*	94.8 *43.0*
4 x 4 x 2 *100 x 100 x 50*	5 *127*	10.2 *4.6*	14 x 14 x 8 *350 x 350 x 200*	11 *279*	110.0 *49.7*
4 x 4 x 2½ *100 x 100 x 65*	5 *127*	11.2 *5.1*	14 x 14 x 10 *350 x 350 x 250*	11 *279*	114.0 *51.5*
4 x 4 x 3 *100 x 100 x 80*	5 *127*	11.4 *5.2*	14 x 14 x 12 *350 x 350 x 300*	11 *279*	117.0 *52.8*
5 x 5 x 2 *125 x 125 x 50*	5½ *140*	14.5 *6.6*	16 x 16 x 8 *400 x 400 x 200*	12 *305*	135.0 *61.2*
5 x 5 x 3 *125 x 125 x 80*	5½ *140*	16.1 *7.3*	16 x 16 x 10 *400 x 400 x 250*	12 *305*	139.0 *63.0*
5 x 5 x 4 *125 x 125 x 100*	5½ *140*	17.9 *8.1*	16 x 16 x 12 *400 x 400 x 300*	12 *305*	142.0 *64.4*
6 x 6 x 2 *150 x 150 x 50*	6½ *165*	26.4 *12*	18 x 18 x 10 *450 x 450 x 250*	15½ *394*	204.0 *92.5*
6 x 6 x 2½ *150 x 150 x 65*	6½ *165*	26.5 *12*	18 x 18 x 12 *450 x 450 x 300*	15½ *394*	209.0 *94.8*
6 x 6 x 3 *150 x 150 x 80*	6½ *165*	26.5 *12*	18 x 18 x 14 *450 x 450 x 350*	15½ *0*	211.0 *95.7*
6 x 6 x 4 *150 x 150 x 100*	6½ *165*	26.5 *12*	18 x 18 x 16 *450 x 450 x 400*	15½ *0*	216.0 *98.0*
6 x 6 x 5 *150 x 150 x 125*	6½ *165*	28.0 *12.7*	24 x 24 x 8 *600 x 600 x 200*	20 *508*	334.0 *152*
8 x 8 x 2 *200 x 200 x 50*	7¾ *197*	37.5 *17*	24 x 24 x 10 *600 x 600 x 250*	20 *508*	342.0 *155*
8 x 8 x 3 *200 x 200 x 80*	7¾ *197*	38.7 *17.6*	24 x 24 x 12 *600 x 600 x 300*	20 *508*	349.0 *158*

C - Cast malleable or ductile iron, all others are fabricated steel.

See Fitting Size chart on page 47 for O.D.

❑ FIG. 7060

Tee



Cast Fabricated

FIGURE 7060 – TEE

Nominal Size	O.D.	Center to End	Approx. Wt. Ea.
In./DN(mm)	*In./mm*	*In./mm*	*Lbs./Kg*
1 *25*	1.315 *33.4*	2¼ C *57*	0.9 *0.4*
1¼ *32*	1.660 *42.2*	2¾ C *70*	1.5 *0.7*
1½ *40*	1.900 *48.3*	2¾ C *70*	1.8 *0.8*
2 *50*	2.375 *60.3*	3¼ C *83*	2.4 *1.1*
2½ *65*	2.875 *73.0*	3¾ C *95*	4.0 *1.8*
3 O.D. 76.1	*2.996* 76.1	*4 C* 101	*4.6* 2.1
3 *80*	3.500 *88.9*	4¼ C *108*	5.8 *2.6*
3½ *90*	4.000 *101.6*	4½ C *114*	9.8 *4.4*
4¼ O.D. 108.0	*4.250* 108.0	*4¾ C* 121	*9.3* 4.2
4 *100*	4.500 *114.3*	5 C *127*	10.3 *4.7*
5¼ O.D. 133.0	*5.236* 133.0	*5¼ C* 133	*14.1* 6.4
5½ O.D. 139.7	*5.500* 139.7	*5½ C* 140	*16.1* 7.3
5 *125*	5.563 *141.3*	5½ C *140*	16.2 *7.3*
6¼ O.D. 159.0	*6.259* 159.0	*6 C* 152	*20.8* 9.4
6½ O.D. 165.1	*6.500* 165.1	*6½ C* 165	*24.4* 11.1
6 *150*	6.625 *168.3*	6½ C *165*	25.7 *11.7*
8 *200*	8.625 *219.1*	7¾ C *197*	41.1 *18.6*
10 *250*	10.750 *273.1*	9 C *229*	74.5 *33.8*
12 *300*	12.750 *323.9*	10 C *254*	94.7 *43.0*
14 *350*	14.000 *355.6*	11 *279*	118.0 *53.5*
16 *400*	16.000 *406.4*	12 *305*	146.0 *66.2*
18 *450*	18.000 *457.2*	15½ *394*	218.0 *98.9*
20 *500*	20.000 *508.0*	17¼ *438*	275.0 *125*
24 *600*	24.000 *609.6*	20 *508*	379.0 *172*

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❑ FIG. 7074

Cap

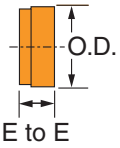

FIGURE 7074 CAP			
Nominal Size	O.D.	End to End	Approx. Wt. Ea.
In./DN(mm)	*In./mm*	*In./mm*	*Lbs./Kg*
1C *25*	1.315 *33.4*	1¼ *32*	0.3 *0.1*
1¼ C *32*	1.660 *42.2*	1¼ *32*	0.4 *0.2*
1½ C *40*	1.900 *48.3*	1¼ *32*	0.5 *0.2*
2 C *50*	2.375 *60.3*	1 *25*	0.5 *0.2*
2½ C *65*	2.875 *73.0*	1 *25*	0.7 *0.3*
3 O.D. C 76.1	*2.996* 76.1	*1* 25	*0.8* 0.4
3 C *80*	3.500 *88.9*	1 *25*	1.1 *0.5*
3½ C *90*	4.000 *101.6*	1 *25*	1.4 *0.6*
4¼ O.D. C 108.0	*4.250* 108.0	*1⅛* 29	*2.0* 0.9
4 C *100*	4.500 *114.3*	1⅛ *29*	2.8 *1.3*
5¼ O.D. C 133.0	*5.236* 133.0	*1⅛* 29	*3.2* 1.5
5½ O.D. C 139.7	*5.500* 139.7	*1⅛* 29	*4.0* 1.8
5 C *125*	5.563 *141.3*	1⅛ *29*	4.0 *1.8*
6¼ O.D. C 159.0	*6.259* 159.0	*1⅛* 29	*5.1* 2.3
6½ O.D. C 165.1	*6.500* 165.1	*1⅛* 29	*6.0* 2.7
6 C *150*	6.625 *168.3*	1 5/16 *33*	6.0 *2.7*
8 C *200*	8.625 *219.1*	1½ *38*	12.5 *5.7*
10 C *250*	10.750 *273.1*	1½ *38*	21.9 *9.9*
12 C *300*	12.750 *323.9*	1½ *38*	33.8 *15.3*
14* *350*	14.000 *355.6*	8½ *216*	40 *18.1*
16* *400*	16.000 *406.4*	9 *229*	45 *20.4*
18* *450*	18.000 *457.2*	10 *254*	58 *26.3*
20* *500*	20.000 *508.0*	11 *279*	79 *35.8*
24* *600*	24.000 *609.6*	12½ *318*	100 *45.4*

* Machined Cap
C - Cast Malleable or Ductile Iron

❑ FIG. 7075

Bull Plug

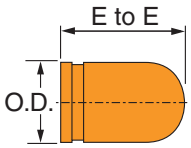

FIGURE 7075 BULL PLUG			
Nominal Size	O.D.	End to End	Approx. Wt. Ea.
In./DN(mm)	*In./mm*	*In./mm*	*Lbs./Kg*
2 *50*	2.375 *60.3*	4 *102*	2.5 *1.1*
2½ *65*	2.875 *73.0*	5 *127*	3.1 *1.4*
3 *80*	3.500 *88.9*	6 *152*	4.4 *2.0*
4 *100*	4.500 *114.3*	7 *178*	7.4 *3.4*
5 *125*	5.563 *141.3*	* *	* *
6 *150*	6.625 *168.3*	10 *254*	18.5 *8.4*

* Contact a Gruvlok Representative for dimensions & weights.
This product is not UL/ULC Listed or FM Approved.

❑ FIG. 7068

Cross

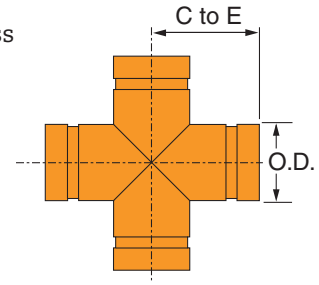

FIGURE 7068 CROSS			
Nominal Size	O.D.	Center to End	Approx. Wt. Ea.
In./DN(mm)	*In./mm*	*In./mm*	*Lbs./Kg*
1 *25*	1.315 *33.4*	2¼ *57*	1.3 *0.6*
1¼ *32*	1.660 *42.2*	2¾ *70*	2.1 *1.0*
1½ *40*	1.900 *48.3*	2¾ *70*	2.5 *1.1*
2 *50*	2.375 *60.3*	3¼ *83*	2.9 *1.3*
2½ *65*	2.875 *73.0*	3¾ *95*	5.2 *2.4*
3 *80*	3.500 *88.9*	4¼ *108*	7.5 *3.4*
3½ *90*	4.000 *101.6*	4½ *114*	9.8 *4.4*
4 *100*	4.500 *114.3*	5 *127*	12.2 *5.5*
5 *125*	5.563 *141.3*	5½ *140*	17.6 *8.0*
6 *150*	6.625 *168.3*	6½ *165*	28.3 *12.8*
8 *200*	8.625 *219.1*	7¾ *197*	48.0 *21.8*
10 *250*	10.750 *273.1*	9 *229*	70.0 *31.8*
12 *300*	12.750 *323.9*	10 *254*	110 *49.9*
14 *350*	14.000 *355.6*	11 *279*	140 *63.5*
16 *400*	16.000 *406.4*	12 *305*	170 *77.1*
18 *450*	18.000 *457.2*	15½ *394*	260 *118*
20 *500*	20.000 *508.0*	17¼ *438*	320 *145*
24 *600*	24.000 *609.6*	20 *508*	585 *265*

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Anvil® Cast Iron & Malleable Iron Threaded Fittings

Manufactured in Columbia, PA USA, Anvil offers the most complete line of Cast Iron and Malleable Iron Threaded Fittings in the industry. Our versatile range of fittings is designed to provide connection options for different applications and environments.

Cast Iron (Gray Iron) Threaded Fittings are manufactured in accordance with ASME/ANSI B14.4 and are UL/ULC listed and FM approved.

Malleable Iron Fittings are manufactured in accordance with ASME/ANSI B16.3 and Unions ASME/ANSI B16.39 and are available in Class 150, Class 250, and Class 300 UL/ULC listed and FM approved. In both classes, all Elbows and Tees ⅜" and larger are 100% air tested at a minimum of 100 psi (6.9 bar).

Cast Iron Flanged Fittings are manufactured in accordance with ASME B16.1 and are available in both Class 125 and Class 250.

Anvil® Steel Pipe Nipples & Steel Pipe Couplings

Anvil offers a variety of Steel Pipe Nipples and Steel Pipe Couplings for the fire protection industry.

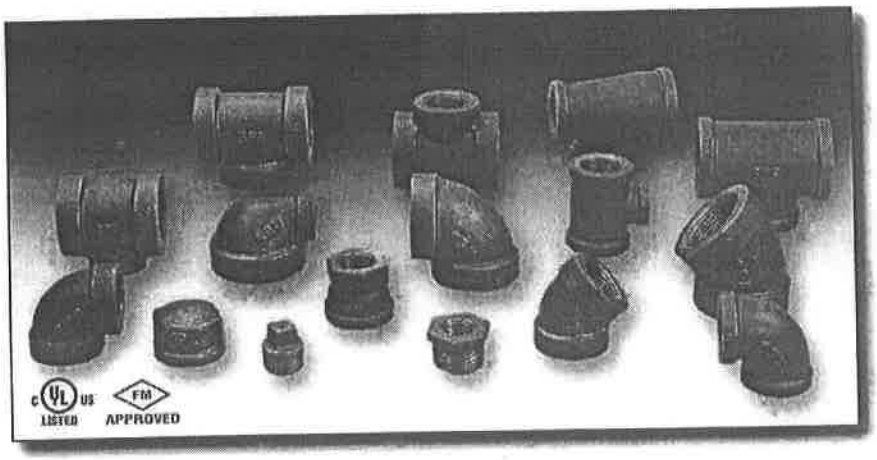
Anvil's Steel Pipe Nipples are manufactured in accordance with ASTM/ANSI A 733 welded and seamless carbon steel pipe nipples. Materials include black and hot-dipped galvanized finishes. Anvil manufactures a wide range of stock pipe nipples in ⅛" diameter through 8" diameter close through 72" inch length in half-inch increments. We also offer standard nipple packs ranging from one each (close to 6") and standard six packs which offer multiple counts of each. Cartons are packed with handles for easy carrying.

Steel Pipe Couplings are manufactured in accordance with ASTM specification A 865. Straight-tapped couplings range in size from ⅛" NPS through 2" NPS, while 2½" NPS and larger are taper tapped.

SPF™ Ductile Iron & Cast Iron Threaded Fittings

SPF Ductile Iron Threaded Fittings are UL/ULC Listed and FM Approved for 500 psi service. These fittings provide a dependable threaded connection and are available in a range of styles and specifications. All SPF Ductile Iron Threaded Fittings dimensions conform to ANSI B16.3 Class 150 requirements, and threads are NPT per ANSI/ASME B1.20.1.

SPF Cast Iron Threaded Fittings are UL/ULC Listed and FM Approved for 300 psi service. These fittings are available in a range of styles and specifications. All SPF Cast Iron Threaded Fittings dimensions conform to ANSI B16.4 requirements, and threads are NPT per ANSI/ASME B1.20.1.



REDUCING COUPLLING

SPF/ANVIL

AnvilStar™
Fire Products Division of Anvil® International

Ductile Iron

MATERIAL SPECIFICATIONS

Ductile iron threaded fittings are UL & ULC Listed & Factory Mutual Approved for 500 psi service.

Ductile iron per ASTM A536 Class 65-45-12.

Dimensions conform to ASME B16.3 Class 150.

Threads are NPT per ANSI/ASME B1.20.1.

NOTICE: Ductile iron fittings have higher tensile strength than that of steel pipe. Therefore, over tightening can cause damage to pipe threads which may cause leakage. Ductile iron fittings should be tightened three turns beyond hand tight, but no more than four turns.

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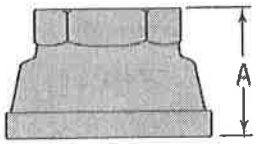
REDUCING COUPLING

Nominal Size	Anvil Item Number	Universal Number	Max. Working Pressure *	Dimensions A	Approx. Wt. Each
In. (mm)			*PSI (kPa)*	*In. (mm)*	*Lbs. (kg)*
1 x 1/2 *25 x 15*	840010755	DRC031	500 *3450*	1.69 *42.92*	0.39 *0.18*
1 x 3/4 *25 x 20*	840010763	DRC032	500 *3450*	1.69 *42.92*	0.53 *0.24*

* UL, ULC & FM Pressure Ratings

For additional listings and approvals, see the technical data section.



COUPLING

SPF/ANVIL

AnvilStar™
Fire Products Division of Anvil® International

Ductile Iron

MATERIAL SPECIFICATIONS

Ductile iron threaded fittings are UL & ULC Listed & Factory Mutual Approved for 500 psi service.

Ductile iron per ASTM A536 Class 65-45-12.

Dimensions conform to ASME B16.3 Class 150.

Threads are NPT per ANSI/ASME B1.20.1.

NOTICE: Ductile iron fittings have higher tensile strength than that of steel pipe. Therefore, over tightening can cause damage to pipe threads which may cause leakage. Ductile iron fittings should be tightened three turns beyond hand tight, but no more than four turns.

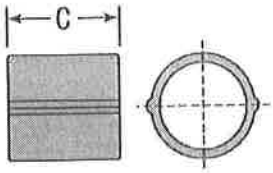
UL FM ULC
APPROVED

For Listing/Approval Details and Limitations visit our Web Site *www.anvilintl.com* or contact an Anvil®/AnvilStar™ Sales Representative.

COUPLING

Nominal Size	Anvil Item Number	Universal Number	Dimensions A	Approx. Wt. Each
In. (mm)			*In. (mm)*	*Lbs. (kg)*
1 *25*	840008692	DCL033	1.67 *42.42*	0.40 *0.18*
1¼ *32*	840008700	DCL044	1.93 *49.02*	0.57 *0.26*
1½ *40*	840008718	DCL055	2.15 *54.61*	0.75 *0.34*
2 *50*	840008726	DCL066	2.53 *64.26*	1.15 *0.52*

For additional listings and approvals, see the technical data section.



90° ELBOW

SPF/ANVIL

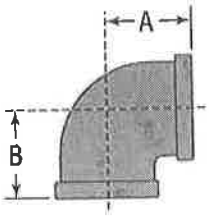
Ductile Iron

AnvilStar™
Fire Products Division of Anvil® International

Submittal Sheet

90° ELBOW

Nominal Size	Anvil Item Number	Universal Number	Max. Working Pressure	Dimensions- In.(mm)		Approx. Wt. Each
				A	B	
In. (mm)			PSI (kPa)	In. (mm)	In. (mm)	Lbs. (kg)
1 20	840000004	DB90033	500 3450	1.50 38.10	1.50 38.10	0.62 0.28
1¼ 32	840000012	DB90044	500 3450	1.75 44.45	1.75 44.45	0.90 0.41
1½ 40	840000020	DB90055	500 3450	1.94 49.276	1.94 49.276	1.20 0.54
2 50	840000038	DB90066	500 3450	2.25 57.15	2.25 57.15	1.85 0.84



MATERIAL SPECIFICATIONS

Ductile iron threaded fittings are UL & ULC Listed & Factory Mutual Approved for 500 psi service.
Ductile iron per ASTM A536 Class 65-45-12.
Dimensions conform to ASME B16.3 Class 150.
Threads are NPT per ANSI/ASME B1.20.1.

UL FM ULC
APPROVED
For Listing / Approval details contact your AnvilStar™ Representative.

NOTICE: Ductile iron fittings have higher tensile strength than that of steel pipe. Therefore, over tightening can cause damage to pipe threads which may cause leakage. Ductile iron fittings should be tightened three turns beyond hand tight, but no more than four turns.

PROJECT INFORMATION:		APPROVAL STAMP:
Project:		
Date:	Phone:	
Architect / Engineer:		
Contractor:		
Address:		
Notes 1:		
Notes 2:		

For the latest UL/ULC Listed and FM Approved pressure ratings, versus pipe schedule, go to **www.anvilstar.com** or contact your local AnvilStar representative

ANVIL INTERNATIONAL, INC.

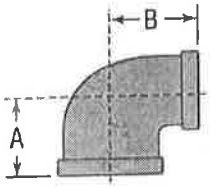
REDUCING 90° ELBOW

SPF/ANVIL

Ductile Iron

AnvilStar™
Fire Products Division of Anvil® International

Submittal Sheet



REDUCING 90° ELBOW

Nominal Size	Anvil Item Number	Universal Number	Max. Working Pressure	Dimensions		Approx. Wt. Each
				A	B	
In. (mm)			PSI (kPa)	In. (mm)	In. (mm)	Lbs. (kg)
1 x ½ 25 x 15	840001036	DB90031	500 3450	1.26 32.00	1.36 34.54	0.44 0.20
1 x ¾ 25 x 20	840001044	DB90032	500 3450	1.37 34.79	1.45 36.83	0.52 0.24
1¼ x ½ 32 x 15	840001051	DB90041	500 34550	1.34 34.03	1.53 38.86	0.64 0.29
1¼ x ¾ 32 x 20	840001069	DB90042	500 3450	1.45 36.83	1.62 41.14	0.72 0.33
1¼ x 1 32 x 25	840001077	DB90043	500 3450	1.58 40.13	1.67 42.41	0.75 0.34
1½ x 1 40 x 25	840001085	DB90053	500 3450	1.65 41.91	1.80 45.72	0.92 0.42
1½ x 1¼ 40 x 32	840001093	DB90054	500 3450	1.82 46.22	1.88 47.75	1.08 0.49
2 x ½ 50 x 15	840001101	DB90061	500 3450	1.49 37.84	1.88 47.75	1.08 0.49
2 x ¾ 50 x 20	840001119	DB90062	500 3450	1.60 40.64	1.97 50.03	1.24 0.56
2 x 1 50 x 25	840001127	DB90063	500 3450	1.73 43.94	2.02 51.30	1.40 0.64
2 x 1¼ 50 x 32	840001135	DB90064	500 3450	1.90 48.26	2.10 53.34	1.52 0.70
2 x 1½ 50 x 40	840001143	DB90065	500 3450	2.02 51.30	2.16 54.86	1.65 0.75

MATERIAL SPECIFICATIONS

Ductile iron threaded fittings are UL & ULC Listed & Factory Mutual Approved for 500 psi service.
Ductile iron per ASTM A536 Class 65-45-12.
Dimensions conform to ASME B16.3 Class 150.
Threads are NPT per ANSI/ASME B1.20.1.

APPROVED
For Listing / Approval details contact your AnvilStar™ Representative.

NOTICE: Ductile iron fittings have higher tensile strength than that of steel pipe. Therefore, over tightening can cause damage to pipe threads which may cause leakage. Ductile iron fittings should be tightened three turns beyond hand tight, but no more than four turns.

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Project:		
Date:	**Phone:**	
Architect / Engineer:		
Contractor:		
Address:		
Notes 1:		
Notes 2:		

For the latest UL/ULC Listed and FM Approved pressure ratings, versus pipe schedule, go to **www.anvilstar.com** or contact your local AnvilStar representative

ANVIL

45° ELBOW

SPF/ANVIL

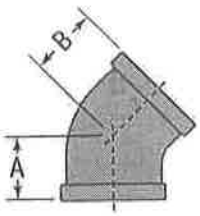
Ductile Iron

AnvilStar™
Fire Products Division of Anvil® International

Submittal Sheet

45° ELBOW

Nominal Size	Anvil Item Number	Universal Number	Max. Working Pressure	Dimensions-		Approx. Wt. Each
				A	B	
In. (mm)			*PSI (kPa)*	*In. (mm)*	*In. (mm)*	*Lbs. (kg)*
1 *25*	840002133	DB45033	500 *3450*	1.12 *28.44*	1.12 *28.44*	0.46 *0.21*
1¼ *32*	840002141	DB45044	500 *3450*	1.29 *32.76*	1.29 *32.76*	0.73 *0.33*
1½ *40*	840002158	DB45055	500 *3450*	1.43 *36.32*	1.43 *36.32*	0.92 *0.42*
2 *50*	840002166	DB45066	500 *3450*	1.68 *42.67*	1.68 *42.67*	1.50 *0.68*



MATERIAL SPECIFICATIONS

Ductile iron threaded fittings are UL & ULC Listed & Factory Mutual Approved for 500 psi service.
Ductile iron per ASTM A536 Class 65-45-12.
Dimensions conform to ASME B16.3 Class 150.
Threads are NPT per ANSI/ASME B1.20.1.

UL FM ULC
APPROVED
For Listing / Approval details contact your AnvilStar™ Representative.

NOTICE: Ductile iron fittings have higher tensile strength than that of steel pipe. Therefore, over tightening can cause damage to pipe threads which may cause leakage. Ductile iron fittings should be tightened three turns beyond hand tight, but no more than four turns.

PROJECT INFORMATION:		APPROVAL STAMP:
Project:		
Date:	**Phone:**	
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ANVIL INTERNATIONAL, INC.

CAP

SPF/ANVIL

Ductile Iron

AnvilStar™
Fire Products Division of Anvil® International

Submittal Sheet

CAPS

Nominal Size	Anvil Item Number	Universal Number	Max. Working Pressure	Dimensions A	Approx. Wt. Each
In. (mm)			*PSI (kPa)*	*In. (mm)*	*Lbs. (kg)*
1 *25*	840005615	DCP003	500 *3450*	1.16 *29.46*	0.32 *0.15*
1¼ *32*	840005623	DCP004	500 *3450*	1.28 *32.51*	0.43 *0.20*
1½ *40*	840005631	DCP005	500 *3450*	1.33 *33.78*	0.60 *0.27*
2 *50*	840005649	DCP006	500 *3450*	1.45 *36.83*	0.91 *0.41*

MATERIAL SPECIFICATIONS

Ductile iron threaded fittings are UL & ULC Listed & Factory Mutual Approved for 500 psi service.
Ductile iron per ASTM A536 Class 65-45-12.
Dimensions conform to ASME B16.3 Class 150.
Threads are NPT per ANSI/ASME B1.20.1.

UL FM ULC
APPROVED
For Listing / Approval details contact your AnvilStar™ Representative.

NOTICE: Ductile iron fittings have higher tensile strength than that of steel pipe. Therefore, over tightening can cause damage to pipe threads which may cause leakage. Ductile iron fittings should be tightened three turns beyond hand tight, but no more than four turns.

PROJECT INFORMATION:		APPROVAL STAMP:
Project:		
Date:	**Phone:**	
Architect / Engineer:		
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Notes 1:		
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ANVIL INTERNATIONAL, INC.

STRAIGHT TEE

SPF/ANVIL

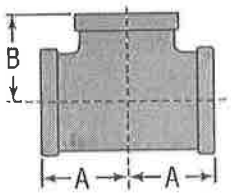
Ductile Iron

AnvilStar™
Fire Products Division of Anvil® International

Submittal Sheet

STRAIGHT TEE

Nominal Size	Anvil Item Number	Universal Number	Max. Working Pressure	Dimensions		Approx. Wt. Each
				A	B	
In. (mm)			PSI (kPa)	In. (mm)	In. (mm)	Lbs. (kg)
1 25	840003164	DT333	500 3450	1.50 38.10	1.50 38.10	0.85 0.39
1¼ 32	840003172	DT444	500 3450	1.75 44.45	1.75 44.45	1.22 0.55
1½ 40	840003180	DT555	500 3450	1.94 49.27	1.94 49.27	1.55 0.70
2 50	840003198	DT666	500 3450	2.25 57.15	2.25 57.15	2.45 1.11



MATERIAL SPECIFICATIONS

Ductile iron threaded fittings are UL & ULC Listed & Factory Mutual Approved for 500 psi service. Ductile iron per ASTM A536 Class 65-45-12.

Dimensions conform to ASME B16.3 Class 150. Threads are NPT per ANSI/ASME B1.20.1.

UL FM ULC
APPROVED
For Listing / Approval details contact your AnvilStar™ Representative.

NOTICE: Ductile iron fittings have higher tensile strength than that of steel pipe. Therefore, over tightening can cause damage to pipe threads which may cause leakage. Ductile iron fittings should be tightened three turns beyond hand tight, but no more than four turns.

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Project:		
Date:	**Phone:**	
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ANVIL INTERNATIONAL, INC.

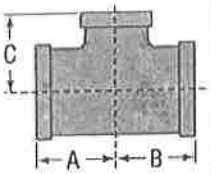
REDUCING TEE

AnvilStar™
Fire Products Division of Anvil® International

SPF/ANVIL

Ductile Iron

Submittal Sheet



REDUCING TEE

Nominal Size	Anvil Item Number	Universal Number	Max. Working Pressure	Dimensions A	Dimensions B	Dimensions C	Approx. Wt. Each
In. (mm)			PSI (kPa)	In. (mm)	In. (mm)	In. (mm)	Lbs.(kg)
1 x ½ x 1 25 x 15 x 25	840004196	DT313	500 3450	1.50 38.10	1.36 34.54	1.50 38.10	0.64 0.29
1 x ¾ x 1 25 x 20 x 25	840004204	DT323	500 3450	1.50 38.10	1.45 36.83	1.50 38.10	0.73 0.33
1 x 1 x ½ 25 x 25 x 15	840004212	DT331	500 3450	1.26 32.00	1.26 32.00	1.36 34.54	0.71 0.32
1 x 1 x ¾ 25 x 25 x 20	840004220	DT332	500 3450	1.37 34.80	1.37 34.80	1.45 36.83	0.76 0.34
1 x 1 x 1¼ 25 x 25 x 32	840004238	DT334	500 3450	1.67 42.41	1.67 42.41	1.58 40.13	0.98 0.44
1 x 1 x 1½ 25 x 25 x 40	840004246	DT335	500 3450	1.80 45.72	1.80 45.72	1.65 41.91	1.16 0.53
1¼ x 1 x ½ 32 x 25 x 15	840004253	DT431	500 3450	1.34 34.04	1.26 32.00	1.53 38.86	0.82 0.37
1¼ x 1 x ¾ 32 x 25 x 20	840004261	DT432	500 3450	1.45 36.83	1.37 34.80	1.62 41.15	0.90 0.41
1¼ x 1 x 1 32 x 25 x 25	840004279	DT433	500 3450	1.58 40.13	1.50 38.10	1.67 42.42	1.00 0.45
1¼ x 1 x 1¼ 32 x 25 x 32	840004287	DT434	500 3450	1.75 44.45	1.67 42.42	1.75 44.45	1.08 0.49
1¼ x 1 x 1½ 32 x 25 x 40	840004295	DT435	500 3450	1.88 47.75	1.80 45.72	1.82 46.22	1.42 0.64
1¼ x 1¼ x ½ 32 x 32 x 15	840004303	DT441	500 3450	1.34 34.04	1.34 34.04	1.53 38.86	0.86 0.39
1¼ x 1¼ x ¾ 32 x 32 x 20	840004311	DT442	500 3450	1.45 36.83	1.45 36.83	1.62 41.15	0.92 0.42
1¼ x 1¼ x 1 32 x 32 x 25	840004329	DT443	500 3450	1.58 40.13	1.58 40.13	1.67 42.42	0.95 0.43
1¼ x 1¼ x 1½ 32 x 32 x 40	840004337	DT445	500 3450	1.88 47.75	1.88 47.75	1.82 46.22	1.45 0.66
1¼ x 1¼ x 2 32 x 32 x 50	840004345	DT446	500 3450	2.10 53.34	2.10 53.34	1.90 48.26	1.75 0.79
1½ x 1 x ½ 40 x 25 x 15	840004352	DT531	500 3450	1.41 35.81	1.34 34.04	1.66 42.16	0.95 0.43
1½ x 1 x ¾ 40 x 25 x 20	840004360	DT532	500 3450	1.52 38.61	1.37 34.80	1.75 44.45	1.14 0.52
1½ x 1 x 1 40 x 25 x 25	840004378	DT533	500 3450	1.65 41.91	1.50 38.10	1.80 45.72	1.17 0.53
1½ x 1 x 1¼ 40 x 25 x 32	840004386	DT534	500 3450	1.82 46.23	1.67 42.42	1.88 47.75	1.34 0.61
1½ x 1 x 1½ 40 x 25 x 40	840004394	DT535	500 3450	1.94 49.28	1.80 45.72	1.94 49.28	1.45 0.66
1½ x 1¼ x ½ 40 x 32 x 15	840004402	DT541	500 3450	1.41 35.81	1.34 34.04	1.66 42.16	1.05 0.48
1½ x 1¼ x ¾ 40 x 32 x 20	840004410	DT542	500 3450	1.52 38.61	1.45 36.83	1.75 44.45	1.15 0.52

REDUCING TEE

Nominal Size	Anvil Item Number	Universal Number	Max. Working Pressure	Dimensions A	Dimensions B	Dimensions C	Approx. Wt. Each
In. (mm)			PSI (kPa)	In. (mm)	In. (mm)	In. (mm)	Lbs.(kg)
1½ x 1¼ x 1 40 x 32 x 25	840004428	DT543	500 3450	1.65 41.91	1.58 40.13	1.80 45.72	1.25 0.57
1½ x 1¼ x 2 40 x 32 x 50	840004436	DT546	500 3450	2.16 54.86	2.10 53.34	2.02 51.30	1.90 0.86
1½ x 1½ x ½ 40 x 40 x 15	840004444	DT551	500 3450	1.41 35.81	1.41 35.81	1.16 29.46	1.15 0.52
1½ x 1½ x ¾ 40 x 40 x 20	840004451	DT552	500 3450	1.52 38.61	1.52 38.61	1.75 44.45	1.24 0.56
1½ x 1½ x 1 40 x 40 x 25	840004469	DT553	500 3450	1.65 41.91	1.65 41.91	1.80 45.72	1.30 0.59
1½ x 1½ x 1¼ 40 x 40 x 32	840004477	DT554	500 3450	1.82 46.23	1.82 46.23	1.88 47.75	1.48 0.67
1½ x 1½ x 2 40 x 40 x 50	840004485	DT556	500 3450	2.16 54.86	2.16 54.86	2.02 51.30	1.98 0.90
2 x 1 x 2 50 x 25 x 50	840004493	DT636	500 3450	2.25 57.15	2.02 51.31	2.25 57.15	2.15 0.98
2 x 1¼ x 2 50 x 32 x 50	840004501	DT646	500 3450	2.25 57.15	2.10 53.34	2.25 57.15	2.30 1.04
2 x 1½ x ½ 50 x 40 x 15	840004519	DT651	500 3450	1.49 37.85	1.41 35.81	1.88 47.75	1.50 0.68
2 x 1½ x ¾ 50 x 40 x 20	840004527	DT652	500 3450	1.60 40.64	1.52 38.61	1.97 50.04	1.62 0.73
2 x 1½ x 1 50 x 40 x 25	840004535	DT653	500 3450	1.73 43.94	1.65 41.91	2.02 51.31	1.64 0.74
2 x 1½ x 1¼ 50 x 40 x 32	840004543	DT654	500 3450	1.90 48.26	1.82 46.23	2.10 53.34	1.80 0.82
2 x 1½ x 1½ 50 x 40 x 40	840004550	DT655	500 3450	2.02 51.31	1.94 49.28	2.16 54.86	2.00 0.91
2 x 1½ x 2 50 x 40 x 50	840004568	DT656	500 3450	2.25 57.15	2.16 54.86	2.25 57.15	2.35 1.07
2 x 2 x ½ 50 x 50 x 15	840004576	DT661	500 3450	1.49 37.85	1.49 37.85	1.88 47.75	1.60 0.73
2 x 2 x ¾ 50 x 50 x 20	840004584	DT662	500 3450	1.60 40.64	1.60 40.64	1.97 50.04	1.68 0.76
2 x 2 x 1 50 x 50 x 25	840004592	DT663	500 3450	1.73 43.94	1.73 43.94	2.02 51.31	1.85 0.84
2 x 2 x 1¼ 50 x 50 x 32	840004600	DT664	500 3450	1.90 48.26	1.90 48.26	2.10 53.34	2.04 0.93
2 x 2 x 1½ 50 x 50 x 40	840004618	DT665	500 3450	2.02 51.31	2.02 51.31	2.16 54.86	2.18 0.99
2 x 2 x 2½ 50 x 50 x 65	-	DT667	500 3450	2.60 66.04	2.60 66.04	2.39 60.71	3.61 1.64
2½ x 2 x ¾ 65 x 50 x 20	-	DT762	500 3450	1.74 44.20	1.60 40.64	2.32 58.93	2.28 1.03

MATERIAL SPECIFICATIONS

Ductile iron threaded fittings are UL & ULC Listed & Factory Mutual Approved for 500 psi service.
Ductile iron per ASTM A536 Class 65-45-12.
Dimensions conform to ASME B16.3 Class 150.
Threads are NPT per ANSI/ASME B1.20.1.

UL FM ULC
APPROVED
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Project:		
Date:	Phone:	
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ANVIL INTERNATIONAL

BUSHINGS

SPF/ANVIL

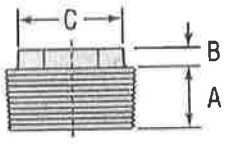
Ductile Iron

AnvilStar™
Fire Products Division of Anvil® International

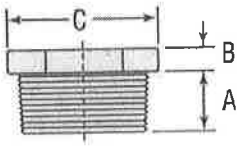
Submittal Sheet

BUSHINGS

Nominal Size	Anvil Item Number	Universal Number	Dimensions			Style	Approx. Wt. Each
			A	B	C		
In. (mm)			In. (mm)	In. (mm)	In. (mm)		Lbs. (kg)
1 x ½ 25 x 15	840600001	DBUSH31	0.75 19.05	0.25 6.35	1.42 36.06	Outside	0.22 0.10
1 x ¾ 25 x 20	840600019	DBUSH32	0.75 19.05	0.25 6.35	1.42 36.06	Outside	0.17 0.08
1¼ x 1 32 x 25	840600027	DBUSH43	0.80 20.32	0.28 7.11	1.76 44.70	Outside	0.28 0.13
1½ x 1 40 x 25	840600035	DBUSH53	0.83 21.08	0.31 7.874	2.00 50.80	Outside	0.45 0.20
1½ x 1¼ 40 x 32	840600043	DBUSH54	0.83 21.08	0.31 7.874	2.00 50.80	Outside	0.30 0.14
2 x 1 50 x 25	840600050	DBUSH63	0.88 22.35	0.41 10.414	1.95 49.53	Inside	0.67 0.30
2 x 1¼ 50 x 32	840600068	DBUSH64	0.88 22.35	0.34 8.636	2.48 62.99	Outside	0.73 0.33
2 x 1½ 50 x 40	840600076	DBUSH65	0.88 22.35	0.34 8.636	2.48 62.99	Outside	0.61 0.28



Inside Head



Outside Head

MATERIAL SPECIFICATIONS

Ductile iron threaded fittings are UL & ULC Listed & Factory Mutual Approved for 500 psi service.
Ductile iron per ASTM A536 Class 65-45-12.
Dimensions conform to ASME B16.3 Class 150.
Threads are NPT per ANSI/ASME B1.20.1.

UL FM ULC
APPROVED
For Listing / Approval details contact your AnvilStar™ Representative.

NOTICE: Ductile iron fittings have higher tensile strength than that of steel pipe. Therefore, over tightening can cause damage to pipe threads which may cause leakage. Ductile iron fittings should be tightened three turns beyond hand tight, but no more than four turns.

Project Information:		Approval Stamp:
Project:		
Date:	Phone:	
Architect / Engineer:		
Contractor:		
Address:		
Notes 1:		
Notes 2:		

For the latest UL/ULC Listed and FM Approved pressure ratings, versus pipe schedule, go to **www.anvilstar.com** or contact your local AnvilStar representative

ANVIL INTERNATIONAL, INC.

CROSS

SPF/ANVIL

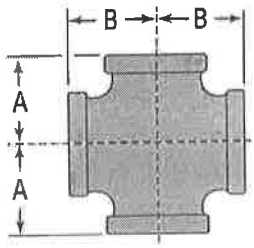
Ductile Iron

AnvilStar™
Fire Products Division of Anvil® International

Submittal Sheet

CROSS

Nominal Size	Anvil Item Number	Universal Number	Max. Working Pressure	Dimensions		Approx. Wt. Each
				A	B	
In. (mm)	In. (mm)	PSI (kPa)	PSI (kPa)	In. (mm)	In. (mm)	Lbs. (kg)
1 25	840006647	DX033	500 3450	1.50 38.10	1.50 38.10	0.98 0.44
1¼ 32	840006654	DX044	500 3450	1.75 44.45	1.75 44.45	1.50 0.68
1½ 40	840006662	DX055	500 3450	1.94 49.27	1.94 49.27	1.90 0.86
2 50	840006670	DX066	500 3450	2.25 57.15	2.25 57.15	2.95 1.34
1¼ x 1 32 x 25	840007678	DX043	500 3450	1.58 40.13	1.67 42.41	1.27 0.58
1½ x 1 40 x 25	840007686	DX053	500 3450	1.65 41.91	1.80 45.72	1.48 0.67
2 x 1 50 x 25	840007694	DX063	500 3450	1.73 43.94	2.02 51.30	2.10 0.95



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NOTICE: Ductile iron fittings have higher tensile strength than that of steel pipe. Therefore, over tightening can cause damage to pipe threads which may cause leakage. Ductile iron fittings should be tightened three turns beyond hand tight, but no more than four turns.

Project Information:		Approval Stamp:
Project:		
Date:	Phone:	
Architect / Engineer:		
Contractor:		
Address:		
Notes 1:		
Notes 2:		

For the latest UL/ULC Listed and FM Approved pressure ratings, versus pipe schedule, go to **www.anvilstar.com** or contact your local AnvilStar representative

ANVIL INTERNATIONAL, INC.

Iowa Fittings
www.iowafittings.com
phone: 866.357.3756
6x: 866.357.8486

Eccentric and Concentric Drain Cap

Figure 80E

Figure 80C

Eccentric and Concentric Drain Cap				
Nominal Size	E-E	Weight		Available Outlet Sizes
		S/10	S/40	
1	2	-	-	¼", ½", ¾"
1¼	2	-	.6	¼", ½", ¾", 1"
1½	2	-	.7	¼", ½", ¾", 1", 1¼"
2	2	1.2	.7	¼", ½", ¾", 1", 1¼", 1½"
2½	2	1.2	.9	¼", ½", ¾", 1", 1¼", 1½", 2"
3	2	1.6	1.3	¼", ½", ¾", 1", 1¼", 1½", 2", 2½"
3½	2	-	1.5	¼", ½", ¾", 1", 1¼", 1½", 2", 2½", 3"
4	2	2.2	2.1	¼", ½", ¾", 1", 1¼", 1½", 2", 2½", 3"
5	2	-	2.4	¼", ½", ¾", 1", 1¼", 1½", 2", 2½", 3", 4"
6	2	4.2	3.2	¼", ½", ¾", 1", 1¼", 1½", 2", 2½", 3", 4"
8	2	7.4	10.6	¼", ½", ¾", 1", 1¼", 1½", 2", 2½", 3", 4"
10	2¼	-	17.4	¼", ½", ¾", 1", 1¼", 1½", 2", 2½", 3", 4"
12	2¼	-	27.5	¼", ½", ¾", 1", 1¼", 1½", 2", 2½", 3", 4"

Other sizes available upon request.
Dimensions listed in inches and approximate weight of 1" outlet in pounds.

Submittal Form	www.iowafittings.com
Job Information:	Date:
Architect/Engineer:	Approved as Sumbitted:
Phone:	
Contractor:	
Address:	
Comments:	

BULL MOOSE TUBE

SCHEDULE 10 & 40 SPRINKLER PIPE SUBMITTAL DATA SHEET

APPROVALS AND SPECIFICATIONS

- ASTM A135, Grade A
- ASTM A795, Type E, Grade A
- Pressure rated to 300 psi
- Underwriters Laboratories—United States of America
- Underwriters Laboratories—Canada
- Factory Mutual
- NFPA-13
- NFPA-13R
- NFPA-14
- CIVIL DEFENSE APPROVAL—United Arab Emirates
- Made in the United States of America
- UL, ULC & FM listed for roll-groove, plain-end and welded joints for wet, dry, preaction and deluge sprinkler systems.
- LEED v4 Certified

FINISHES AND COATINGS

- Schedule 10 & 40 Sprinkler Pipe receives an OD mill coating of water-based paint which has corrosion protection expected with a painted carbon steel product, i.e. it would be expected to resist corrosion for an extended and indefinite period in a clean and dry environment and, as environmental conditions deteriorate, the corrosion protection would also diminish.
- Schedule 10 & 40 Sprinkler Pipe (black) receives an ID mill coating of Eddy Guard II MIC preventative coating. EG2 has been tested at independent laboratories to resist bacterial growth and maintain minimal bacterial count after multiple flushes (25) of the pipe.
- Schedule 10 & 40 Sprinkler Pipe when Hot Dip Galvanized by ASTM A123 and supplied by Bull Moose Tube is UL listed and FM approved.

PRODUCT IDENTIFICATION

- Every length of Bull Moose fire sprinkler pipe features large, easy-to-read, continuous stenciling, clearly identifying the manufacturer, type of pipe, size, and length.

	Nominal Pipe Size (inches)	1	1-1/4"	1-1/2"	2"	2-1/2"	3"	4"	6"**	8"**
Schedule 10	O.D. (in)	1.315	1.660	1.900	2.375	2.875	3.500	4.500	6.625	8.625
	I.D. (in)	1.097	1.442	1.682	2.157	2.635	3.260	4.260	6.357	8.249
	Empty Weight (lb/ft)	1.410	1.810	2.090	2.640	3.530	4.340	5.620	9.290	16.940
	Water Filled Weight (lb/ft)	1.800	2.518	3.053	4.223	5.893	7.957	11.796	23.038	40.086
	C.R.R.*	15.27	9.91	7.76	6.27	4.92	3.54	2.50	1.158	1.805
	Pieces per Lift	91	61	61	37	30	19	19	10	7
Schedule 40	O.D. (in)	1.315	1.660	1.900	2.375	2.875	3.500	4.500		
	I.D. (in)	1.049	1.380	1.610	2.067	2.469	3.068	4.026		
	Empty Weight (lb/ft)	1.680	2.270	2.720	3.660	5.800	7.580	10.800		
	Water Filled Weight (lb/ft)	2.055	2.918	3.602	5.114	7.875	10.783	16.316		
	C.R.R.*	1.00	1.00	1.00	1.00	1.00	1.00	1.00		
	Pieces per Lift	70	51	44	30	30	19	19		

*Calculated using Standard UL CRR formula, UL Fire Protection Directory, Category VIZY **Not Eddy Guard II treated/Not produced by BMT

SUBMITTAL INFORMATION

Project

Contractor

Engineer

Specification Reference

Date

System Type

Locations

Comments

◯ Schedule 10 - Black ◯ Schedule 10 - Hot Dip Galvanized ◯ Schedule 40 - Black ◯ Schedule 40 - Hot Dip Galvanized

BULLMOOSETUBE.COM
1819 Clarkson Road, Chesterfield, MO 63017
US: 800.325.4467 | Canada: 800.882.4666 | sales@BullMooseIndustries.com