Victaulic® Pressure Valves
Series 867-42T-20, 867-43T, 867-43T-PS

30.93

867-42T-20

867-43T

867-43T-PS

1.0 PRODUCT DESCRIPTION

Available Sizes

- 1 ½ – 16"/DN40 – DN400

Function

- **867-42T-20:** Pilot Operated, Pressure Reducing Check Valve
- **867-43T:** Pilot Operated, Safety Pressure Relief Valve
- **867-43T-PS:** Pump Suction, Pressure Control Valve

Maximum Operating Temperature by Material

- **Standard:** NR - Fabric Reinforced Polyisoprene 122°F/50°C
- **Optional:** Fabric Reinforced Nitrile (Buna-N) 176°F/80°C

End Connections

- Grooved (OGS)
- Flanged[1,2]
- Threaded[2]

Application

- For hydraulic control applications in fire protection systems designed to NFPA 13 and NFPA 14
- Series 867-43T Safety Pressure Relief Valves are not designed to be used as circulation relief valves. For circulation relief valves, use the Series 867-3HC submittal 30.98

[1] Valves 10"/DN250 – 16"/DN400 are only available with flanged end connections.
[2] By special order only.

ALWAYS REFER TO ANY NOTIFICATIONS AT THE END OF THIS DOCUMENT REGARDING PRODUCT INSTALLATION, MAINTENANCE OR SUPPORT.

2.0 CERTIFICATION/LISTINGS

Available Sizes, Pressure Ratings and Agency Approvals[3]

Product Configuration	Nominal Size Range inches DN	FM Approval						UL Listed					
		Grooved		Class 300		Class 150		Grooved		Class 300 Flange		Class 150 Flange	
		Rating psi bar	Pilot Range psi bar	Rating psi bar	Pilot Range psi bar	Rating psi bar	Pilot Range psi bar	Rating psi bar	Pilot Range psi bar	Rating psi bar	Pilot Range psi bar	Rating psi bar	Pilot Range psi bar
867-42T-20	1½ – 2 DN40 – DN50	365 25	30 – 235 2 – 16	365 25	30 – 235 2 – 16	235 16	30 – 235 2– 16	400 27.6	60 – 200 4 – 14	400 27.6	60 – 200 4 – 14	250 17	60 – 175 4 – 12
	2½	365 25	30 – 235 2 – 16	–	–	–	–	400 27.6	60 – 200 4 – 14	–	–	–	–
	3 – 8 DN80 – DN200	365 25	30 – 235 2 – 16	365 25	30 – 235 2 – 16	235 16	30 – 235 2– 16	365 25	60 – 175 4 – 12	365 25	60 – 175 4 – 12	250 17	60 – 175 4 – 12
	10[4] DN250	–	–	365 25	30 – 235 2 – 16	250 17	30 – 235 2– 16	–	–	365 25	60 – 175 4 – 12	250 17	60 – 175 4 – 12
	12 – 16[4] DN300 – DN400	–	–	300 21	30 – 235 2 – 16	300 21	–	–	–	300 21	60 – 175 4 – 12	250 17	60 – 175 4 – 12
867-43T	1½ – 2 DN40 – DN50	365 25	125 – 365 9 – 25	365 25	125 – 365 9 – 25	235 16	60 – 235 4 – 16	365 25	125 – 365 9 – 25	365 25	125 – 365 9 – 25	–	–
	2½	365 25	125 – 365 9 – 25	–	–	–	–	365 25	125 – 365 9 – 25	–	–	–	–
	3 – 8 DN80 – DN200	365 25	125 – 365 9 – 25	365 25	125 – 365 9 – 25	235 16	60 – 235 4 – 16	365 25	125 – 365 9 – 25	365 25	125 – 365 9 – 25	365 25	365 25
	10[4] DN250	–	–	300 21	125 – 300 9 – 21	235 16	60 – 235 4 – 16	–	–	365 25	125 – 365 9 – 25	365 25	365 25
867-43T-PS	1½ – 2 DN40 – DN50	365 25	30 – 175 2 – 12	365 25	5 – 30 0.3 – 2	235 16	5 – 30 0.3 – 2	–	–	–	–	–	–
	2½	365 25	30 – 175 2 – 12	–	–	–	–	–	–	–	–	–	–
	3 – 8 DN80 – DN200	365 25	30 – 175 2 – 12	365 25	5 – 30 0.3 – 2	235 16	5 – 30 0.3 – 2	–	–	–	–	–	–
	10[4] DN250	–	–	300 21	5 – 30 0.3 – 2	235 16	5 – 30 0.3 – 2	–	–	–	–	–	–

[3] Selecting optional valve body materials may change listing or approval. Contact Victaulic for details.

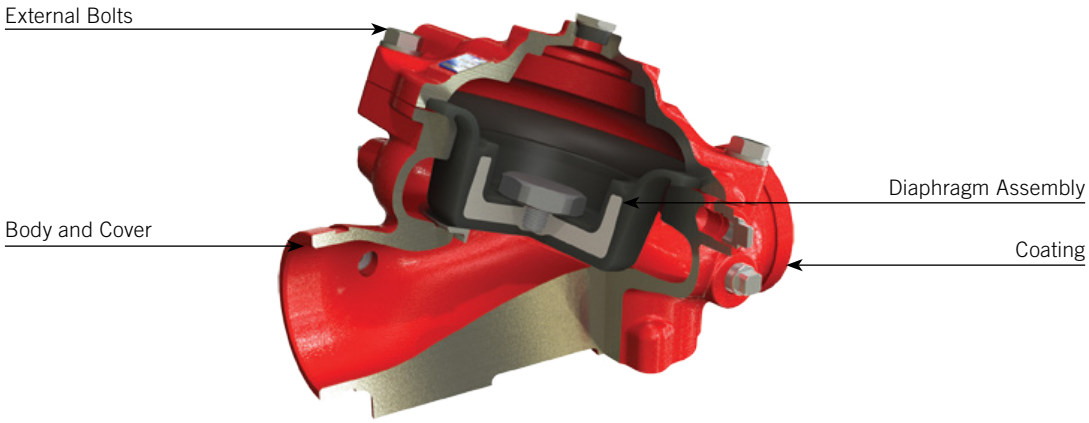
[4] Valves 10"/DN250 are only available with flanged end connections.

NOTES

- Max recommended pressure differential: 175 psi/12 Bar when normal inlet operation pressure is below 330 psi/23 Bar
- Max recommended pressure differential: 200 psi/14 Bar when normal inlet operation pressure is above 330 psi/23 Bar

3.0 SPECIFICATIONS - MATERIAL

Series 867-42T-20, 867-43T, 867-43T-PS Body Style



Body and Cover: (specify choice)[5,6]

- ☐ Standard: Ductile Iron ASTM A536 Grade 65-45-12
- ☐ Optional: Cast Steel ASTM A216 Grade WCB
- ☐ Optional: Stainless Steel 316 ASTM A351 Grade CF8M
- ☐ Optional: Nickel Aluminum Bronze ASTM B148, Grade C95800
- ☐ Optional: Super Duplex ASTM A890 Grade 5A
- ☐ Optional: Hastelloy[7] ASTM B336 Grade C276
- ☐ Optional: Titanium ASTM B367 Grade C2/C3

Diaphragm Assembly: (specify choice)

- ☐ Standard: NR - Fabric Reinforced Polyisoprene
- ☐ Optional: Fabric Reinforced Nitrile (Buna-N)

Coating: (specify choice)

- ☐ Standard: Electrostatic Powder Coating Polyester
- ☐ Optional: High Build Epoxy Fusion-Bonded with UV Protection, Anti-Corrosion

External Bolts: (specify choice)

- ☐ Standard: Stainless steel 316 ASTM A276

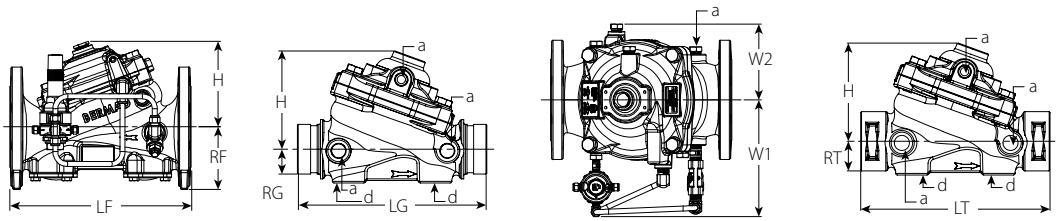
5 Selecting optional valve body materials may change listing or approval. Contact Victaulic for details.

6 Flanged end connection available in all materials, grooved and threaded available in ductile iron only.

7 Hastelloy is a registered trademark of Haynes International.

4.0 DIMENSIONS

Series 867-42T-20, 867-43T, 867-43T-PS



Size		Flanged Class 150						Flange Class 300					
Nominal inches DN	**Actual Outside Diameter** inches mm	**LF** inches mm	**RF** inches mm	**H** inches mm	**W1** inches mm	**W2** inches mm	**Weight** inches mm	**LF** inches mm	**RF** inches mm	**H** inches mm	**W1** inches mm	**W2** inches mm	**Weight** lb kg
1 ½ DN40	1.900 48.3	9.06 230	2.56 65	4.93 125	6.10 155	3.05 77	25.3 11.5	9.06 230	2.56 65	4.93 125	6.10 155	3.05 77	30.5 13.8
2 DN50	2.375 60.3	9.06 230	3.03 77	4.93 125	6.10 155	3.05 77	28.2 12.8	9.25 235	3.03 77	4.93 125	6.10 155	3.05 77	32.9 14.9
2 ½	2.875 73.0	–	–	–	–	–	–	–	–	–	–	–	–
3 DN80	3.500 88.9	12.21 310	4.18 106	6.03 153	9.88 251	3.94 100	60.5 27.4	12.84 326	4.18 106	6.03 153	9.88 251	3.94 100	71.0 32.2
4 DN100	4.500 114.3	13.79 350	4.77 121	6.42 163	10.47 266	4.53 115	82.5 37.4	14.50 368	4.77 121	6.42 163	10.47 266	4.53 115	104.0 47.2
6 DN150	6.625 168.3	18.91 480	5.79 147	9.14 232	14.65 372	5.51 140	178.2 80.8	19.94 506	5.79 147	9.14 232	14.65 372	5.51 140	222.8 101.1
8 DN200	8.625 219.1	23.64 600	7.09 180	11.82 300	19.29 490	6.77 172	321.2 145.7	24.66 626	7.09 180	11.82 300	19.29 490	6.77 172	382.0 173.3
10 DN250	10.750 273.0	28.76 731	8.04 204	11.82 300	19.29 490	8.03 204	379.0 171.9	28.76 731	8.04 204	11.82 300	19.29 490	8.03 204	459.0 208.2
12 DN300	12.750 323.9	33.46 850	9.72 247	17.36 441	25.83 656	9.53 242	712.0 323.0	28.76 731	9.72 247	17.36 441	25.83 656	9.53 242	712.0 323.0
14 DN350	14.000 355.6	38.58 980	10.71 272	17.36 441	25.83 656	9.53 242	784.0 355.6	38.58 980	10.71 272	17.36 441	25.83 656	9.53 242	784.0 355.6
16 DN400	16.000 406.4	43.31 1100	12.44 316	17.76 451	25.83 656	9.53 242	886.0 401.9	43.31 1100	12.44 316	17.76 451	25.83 656	9.53 242	886.0 401.9

Size		Grooved						Threaded						All	
Nominal inches DN	**Actual Outside Diameter** inches mm	**LG** inches mm	**RG** inches mm	**H** inches mm	**W1** inches mm	**W2** inches mm	**Weight** lb kg	**LT** inches mm	**RT** inches mm	**H** inches mm	**W1** inches mm	**W2** inches mm	**Weight** lb kg	**a** inches DN	**d** inches DN
1 ½ DN40	1.900 48.3	9.06 230	0.95 24	4.93 125	6.10 155	3.05 77	20.2 9.2	9.06 230	0.95 24	4.93 125	6.10 155	3.05 77	20.2 9.2	½ DN15	¾ DN20
2 DN50	2.375 60.3	9.06 230	1.19 30	4.93 125	6.10 155	3.05 77	18.7 8.5	9.06 230	1.19 30	4.93 125	6.10 155	3.05 77	20.3 9.2	½ DN15	¾ DN20
2 ½	2.875 73.0	9.25 235	1.44 37	4.93 125	6.10 155	3.05 77	28.2 12.8	–	–	–	–	–	–	½ DN15	¾ DN20
3 DN80	3.500 88.9	12.21 310	1.75 44	6.03 153	9.88 251	3.94 100	36.8 16.7	–	–	–	–	–	–	½ DN15	1 ½ DN40
4 DN100	4.500 114.3	13.79 350	2.25 57	6.42 163	10.47 266	4.53 115	50.3 22.8	–	–	–	–	–	–	½ DN15	2 DN50
6 DN150	6.625 168.3	18.91 480	3.31 84	9.14 232	14.65 372	5.51 140	99.0 44.9	–	–	–	–	–	–	½ DN15	2 DN50
8 DN200	8.625 219.1	23.64 600	4.33 110	11.82 300	19.29 490	6.77 172	262.0 118.8	–	–	–	–	–	–	½ DN15	2 DN50
10 DN250	10.750 273.0	–	–	–	–	–	–	–	–	–	–	–	–	½ DN15	2 DN50
12 DN300	12.750 323.9	–	–	–	–	–	–	–	–	–	–	–	–	½ DN15	2 DN50
14 DN350	14.000 355.6	–	–	–	–	–	–	–	–	–	–	–	–	½ DN15	2 DN50
16 DN400	16.000 406.4	–	–	–	–	–	–	–	–	–	–	–	–	½ DN15	2 DN50

5.0 PERFORMANCE

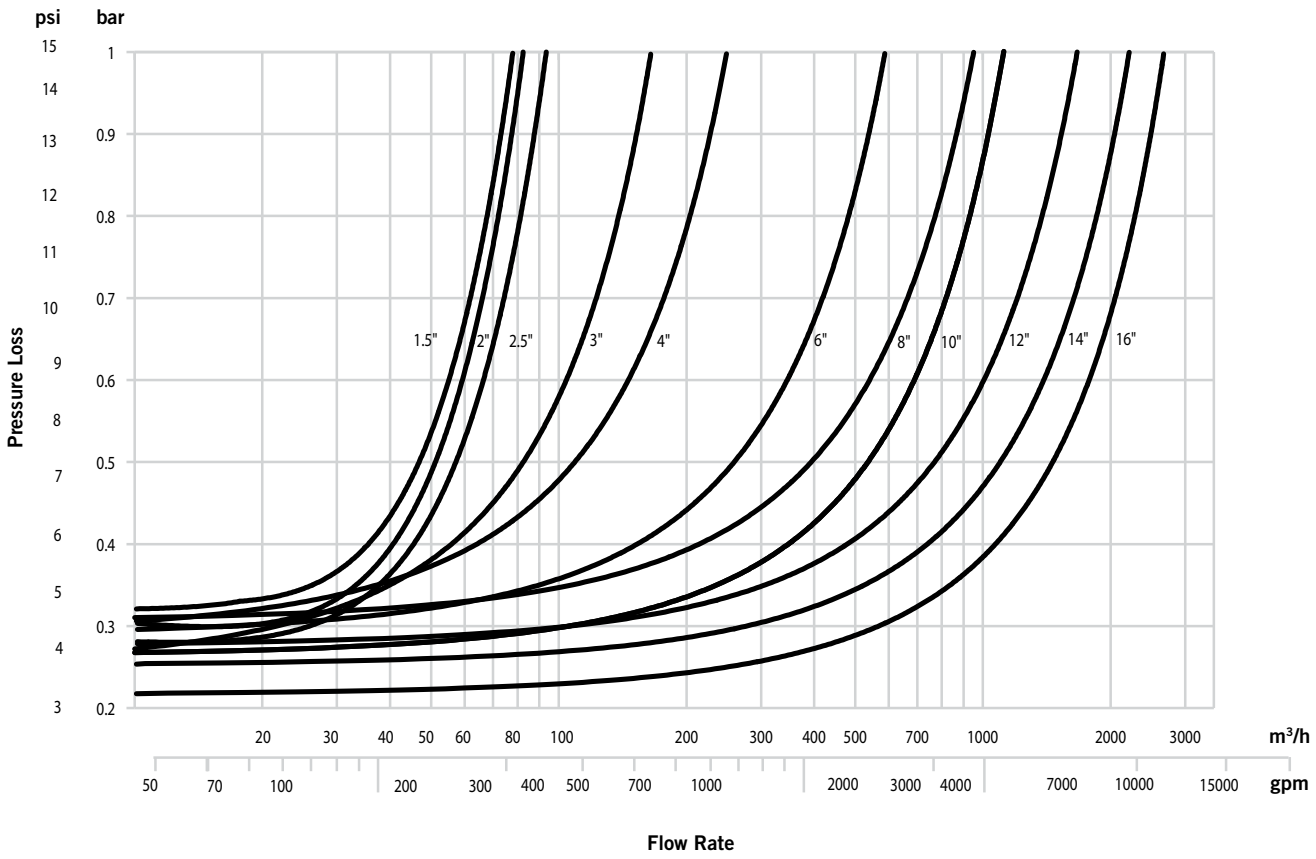
Relief Valve Sizing for a Series 867-42T-20 and 867-43T

Systems must be designed with adequate downstream pressure relief valves to protect components from over-pressurization during normal system operation.

To maintain FM Approvals and/or meet NFPA 13 and 14 design requirements, a listed pressure relief valve shall be installed on the downstream side of all pressure reducing valves. The size of the pressure relief valve shall be adequately sized as to not exceed the rated working pressures of the downstream system components. Please contact Victaulic, for additional questions on relief valve sizing.

5.1 PERFORMANCE

Series 867-42T-20 Pressure Reducing Valve Pressure Drop

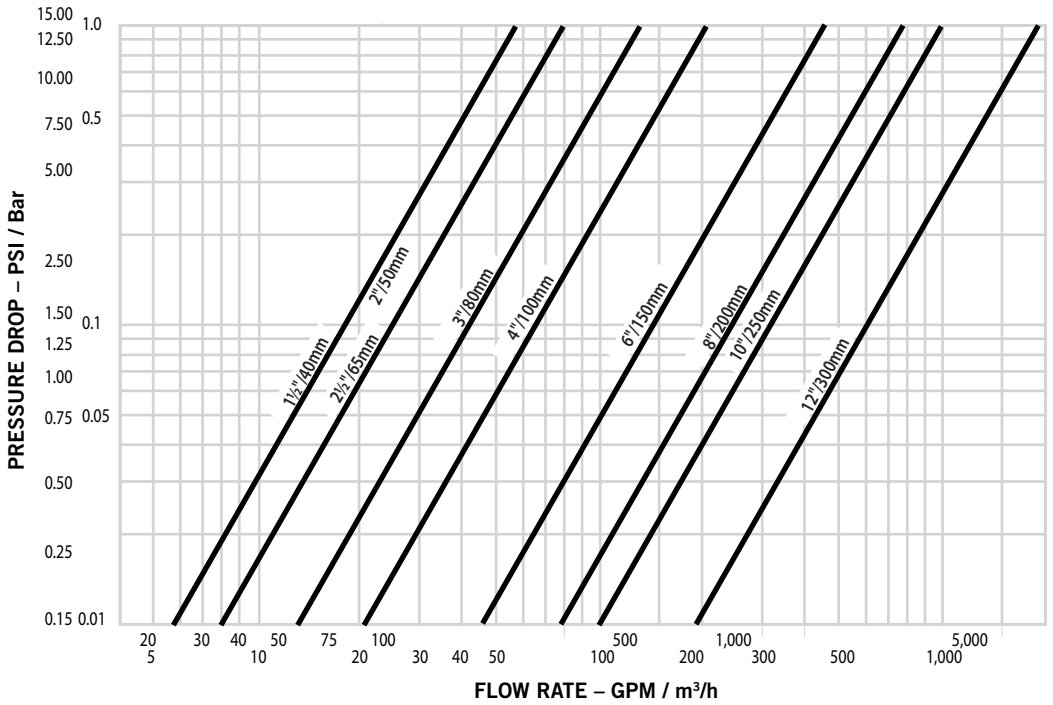


NOTE

- Use this graph to determine the pressure loss when the water supply pressure is equal to or less than the downstream valve set pressure.

5.1 PERFORMANCE (CONTINUED)

Flow Chart: Series 867-42T-20 and 867-43T-PS

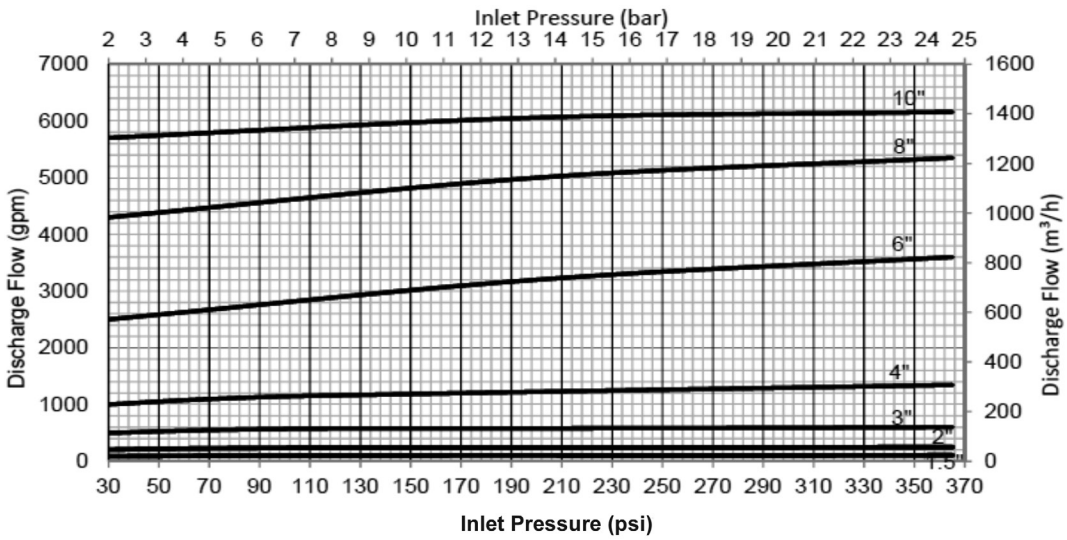


NOTE

- Use this chart to determine pressure loss when the water supply pressure is equal to or less than the downstream valve set pressure.
- Use this chart to determine the friction loss through the second valve of a redundant reducing setup.

5.2 PERFORMANCE

Discharge Flow Chart for Series 867-43T Pressure Relief Valves



NOTE

- Use this chart to determine the valve size based on the design flow (GPM).
- For sizes greater than 10" please use information in Section 5.4.
- 867-43T pressure relief valves need to be installed as safety relief valves only. In systems using 867-43T where the pressure delta is greater than 175psi/12bar, please consult Victaulic engineering for guidance.

5.3 PERFORMANCE

Flow Coefficients and Frictional Resistance for Series 867-42T-20 Pressure Reducing Valves

Cv Values:

Cv values for flow of water at +60°F/+16°C through a fully open valve are shown in the table below.

Formulas for Cv and Kv values

$$\Delta P = \frac{Q^2}{C_v^2} \qquad Q = C_v \times \sqrt{\Delta P}$$

or

$$\Delta P = \frac{Q^2}{K_v^2} \qquad Q = K_v \times \sqrt{\Delta P}$$

Where:

Flow Coefficient	C_v	K_v
Q (Flow)	GPM	m³/hr
ΔP (Pressure Drop)	psi	Bar

Frictional Resistance

The chart below expresses the flow coefficients and the frictional resistance in equivalent length of pipe for Series 867-42T-20 Pressure Reducing Valves.

Valve Size		Full Open	Equivalent Length of Pipe
Nominal inches DN	**Actual Outside Diameter** inches mm	**Flow Coefficient** C_v K_v	feet meters
1 ½ DN40	1.900 48.3	79 68	7 2
2 DN50	2.375 60.3	92 80	16 5
2 ½	2.875 73.0	116 100	28 9
3 DN80	3.500 88.9	219 189	23 7
4 DN100	4.500 114.3	398 344	30 9
6 DN150	6.625 168.3	912 789	49 15
8 DN200	8.625 219.1	1340 1159	89 27
10 DN250	10.750 273.0	1565 1354	203 62
12 DN300	12.750 323.9	2737 2368	171 52
14 DN350	14.000 355.6	3292 2848	194 59
16 DN400	16.000 406.4	3758 3251	289 88

6.0 NOTIFICATIONS

⚠ WARNING

- **Read and understand all instructions before attempting to install any Victaulic products.**
- **Always verify that the piping system has been completely depressurized and drained immediately prior to installation, removal, adjustment, or maintenance of any Victaulic products.**
- **Wear safety glasses, hardhat, and foot protection.**

Failure to follow these instructions could result in death or serious personal injury and property damage.

- **These products shall be used only in fire protection systems that are designed and installed in accordance with current, applicable National Fire Protection Association (NFPA 13, 13D, 13R, etc.) standards, or equivalent standards, and in accordance with applicable building and fire codes. These standards and codes contain important information regarding protection of systems from freezing temperatures, corrosion, mechanical damage, etc.**
- **The installer shall understand the use of this product and why it was specified for the particular application.**
- **The installer shall understand common industry safety standards and potential consequences of improper product installation.**
- **It is the system designer's responsibility to verify suitability of materials for use with the intended fluid media within the piping system and external environment.**
- **The material specifier shall evaluate the effect of chemical composition, pH level, operating temperature, chloride level, oxygen level, and flow rate on materials to confirm system life will be acceptable for the intended service.**

Failure to follow installation requirements and local and national codes and standards could compromise system integrity or cause system failure, resulting in death or serious personal injury and property damage.

7.0 REFERENCE MATERIALS

06.33 Victaulic QuickVic™ Rigid Coupling Style 107V

10.02 FireLock® Rigid Coupling Style 005H with Vic-Plus™ Gasket System

10.64: Victaulic® FireLock™ Installation-Ready™ Rigid Couplings Style 009N and Style 109

29.01: Victaulic Terms and Conditions

30.98: Victaulic® Direct Acting Pressure Relief Valve/Fire Pump Casing Relief Valve Series 867-3HC

I-100: Field Installation Handbook

I-009N: Field Installation and Maintenance Style 009N

I-867-42T IOM: Installation, Operation and Maintenance Manual Series 867-42T-20 IOM

I-867-43T: Installation, Operation and Maintenance Manual Series 867-43T

