

TECHNICAL BULLETIN

FIMPG38319

INSTALLATION INSTRUCTIONS:

Drain the system completely. Add **FIRE & ICE MASTER -PG38-** to the system through a filling cup. Use the end sprinklers to vent air from the piping. Back out all of the sprinklers slightly, until **F&IMPG38** appears assuring that the piping is completely filled and all the air has been purged from the system.

If the filling cup is NOT above the highest sprinkler, use the following installation procedures:

1. Put a filling cup at the highest sprinkler branch line and fill the system with **F&IMPG38**. The drop pipe should be completely filled through the filling cup as shown in the diagram. Tighten the sprinkler heads and open the valve marked "A" until the drop pipe and the section of the pipe above valve "A" are empty. Close valve "A". Close the filling connection valve and then slowly open the supply valve wide.
2. Or, a small pump can be used to add **F&IMPG38** to the system at the valve marked "B" in the diagram below.

Systems should be tested to determine the level of freeze protection at the beginning of each freezing season. For systems larger than 40 gallons NFPA 13 requires a drain/test connection be installed at the most remote portion of the system. Use of antifreeze solutions should be in conformity to any state or local health codes. Please contact your local health authorities if you have any questions concerning code.

Because the specific gravity of propylene glycol is so close to that of water, you cannot use a hydrometer to test the concentration. The best way to test freeze protection is with a refractometer. Refractometers are extremely accurate, easy to use and effective, regardless of solution colors, dyes and temperature. **UTILITY** offers refractometers for sale as an accommodation. Included with the refractometer are comprehensive instructions. If test indicates that the solution has weakened, replace the solution with fresh **F&IMPG38**.

FIRE & ICE MASTER -PG38- is a propylene glycol-based antifreeze, which satisfies the recommendations of NFPA 13. Systems freeze-protected with **F&IMPG38** are assured flow protection to -33°F , and burst protection to -71°F . **F&IMPG38** contains pure high grade propylene glycol. This is because propylene glycol is non-toxic and non-irritating and eliminates the possibility of contaminating domestic, potable water with toxic materials. Beware of products that may contain other ingredients such as methanol, ethanol or ethylene glycol, which cheapen these products and raise the toxicity of the anti-freeze. This defeats the very reason for using non-toxic anti-freeze. Also beware of products that are not inhibited or require you to add inhibitor bought separately. Don't endanger your system by using corrosive, uninhibited material. Proper amounts of the correct inhibitors are expensive and necessary. Uninhibited material is not a bargain. Do not use automobile anti-freeze. It contains ethylene glycol which is very toxic.

To meet NFPA guidelines, **F&IMPG38** should not be diluted. This product is considered GRAS (Generally Recognized As Safe) by the Food and Drug Administration. **F&IMPG38** lubricates pumps, valves and moving parts and will not harm plastic or rubber seals, diaphragms or washers, will not support bacterial growth. Do not use in systems containing galvanized pipe or aluminum. As with any chemical product, compatibility should be checked prior to introducing **F&IMPG38**. **F&IMPG38** is not recommended for long-term contact with CPVC. **F&IMPG38** has a greater tendency to leak past faulty joints than water, so all leaks must be corrected properly. **F&IMPG38** is stable and suitable for use at continuous operating temperatures to 250°F , and will not degrade significantly from short exposure to temperatures up to 350°F . **F&IMPG38** will not foam. If foaming occurs, it is due to other factors, such as air or contamination in the system. Be sure the system is free from dirt, grease, oil and other contaminants before installing **F&IMPG38**.

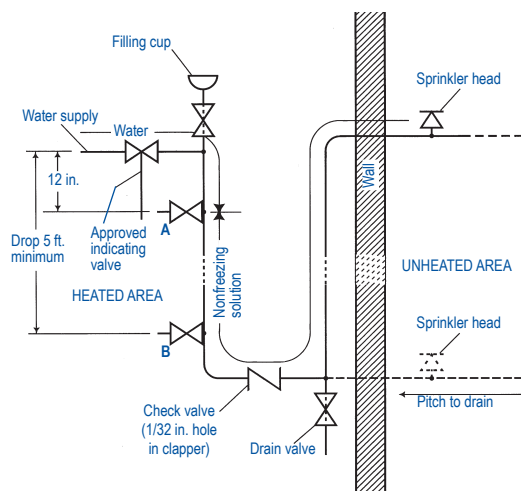


Propylene Glycol-based Non-Toxic Freeze Protection Fluid

- flow protection to below -33°F
- burst protection lower than -71°F

PRE-MIXED TO NFPA GUIDELINES DO NOT DILUTE

Full-strength inhibited
antifreeze solution for wet fire
protection sprinkler systems





HOW TO SIZE YOUR SYSTEM

USE THE FOLLOWING CHART TO HELP SIZE THE PIPING IN YOUR SYSTEM.

Nominal size		Gallons Per 100 ft. of Length	Length in Feet Per Gallon
3/8"	Standard Steel Pipe	1.0	100.0
1/2"	Standard Steel Pipe	1.6	63.3
3/4"	Standard Steel Pipe	2.8	36.0
1"	Standard Steel Pipe	4.5	22.2
1 1/4"	Standard Steel Pipe	7.8	12.8
1 1/2"	Standard Steel Pipe	10.5	9.5
2"	Standard Steel Pipe	17.5	5.7
2 1/2"	Standard Steel Pipe	25.0	4.0
3"	Standard Steel Pipe	39.0	2.6
3 1/2"	Standard Steel Pipe	53.0	1.9
4"	Standard Steel Pipe	66.7	1.5
3/8"	Type "L" Copper Tubing	0.753	132.6
1/2"	Type "L" Copper Tubing	1.21	82.6
5/8"	Type "L" Copper Tubing	1.81	55.2
3/4"	Type "L" Copper Tubing	2.51	39.8
1"	Type "L" Copper Tubing	4.29	23.4
1 1/4"	Type "L" Copper Tubing	6.55	15.3
1 1/2"	Type "L" Copper Tubing	9.25	10.8
2"	Type "L" Copper Tubing	16.05	6.2
2 1/2"	Type "L" Copper Tubing	24.78	4.0
3"	Type "L" Copper Tubing	35.38	2.8
3 1/2"	Type "L" Copper Tubing	47.84	2.1
4"	Type "L" Copper Tubing	62.0	1.6
5"	Type "L" Copper Tubing	97.1	1.0
6"	Type "L" Copper Tubing	139.2	0.7

EXPANSION DAMAGE PROTECTION POINT **-71°F.**

FLOW POINT **-33°F.**

REFRACTIVE INDEX n_D **1.3758**

THERMAL CONDUCTIVITY
(Btu/(hr·ft²)(°F/ft))

10°F.	0.210
30°F.	0.216
50°F.	0.222
70°F.	0.228
90°F.	0.234
110°F.	0.238
130°F.	0.242
150°F.	0.245
170°F.	0.247
190°F.	0.249
210°F.	0.250

SPECIFIC GRAVITY

20°F.	1.0426
40°F.	1.0380
60°F.	1.0330
80°F.	1.0264
100°F.	1.0198
120°F.	1.0120
140°F.	1.0044
160°F.	0.9964
180°F.	0.9894

SPECIFIC HEAT
BTU / LB. / DEGREE FAHRENHEIT

60°F.	0.9070
80°F.	0.9135
100°F.	0.9192
120°F.	0.9248
140°F.	0.9305
160°F.	0.9353
180°F.	0.9408
200°F.	0.9483
220°F.	0.9531
240°F.	0.9579

VISCOSITY
CENTIPOISE/mPa s

25°F.	14.5
50°F.	6.5
75°F.	3.6
100°F.	2.3
125°F.	1.6
150°F.	1.1
175°F.	0.9
200°F.	0.7

THE SPECIFICATIONS LISTED ARE FOR TYPICAL IDEAL SITUATIONS. CONTAMINANTS IN THE SYSTEM MAY ALTER THE CHARACTERISTICS OF THIS PRODUCT.

Stock Number	Size & Description	Pack	Lbs./ case
18-426	5 GAL. FIRE & ICE MASTER PG38	1	50
18-429	55 GAL. FIRE & ICE MASTER PG38	1	573
18-465	REFRACTOMETER	1	1

THE INFORMATION IN THIS BULLETIN IS BELIEVED TO BE ACCURATE. ALL RECOMMENDATIONS ARE MADE WITHOUT WARRANTY SINCE THE CONDITIONS OF USE ARE BEYOND OUR CONTROL. THE LISTED PROPERTIES ARE ILLUSTRATIVE AND ARE NOT PRODUCT SPECIFICATIONS. WE DISCLAIM ANY LIABILITY IN CONNECTION WITH THE USE OF THIS INFORMATION.



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