



## Foodmax Freeze

### Food safe heat transfer medium

#### Description

Foodmax Freeze is an inhibited propylene glycol specialist fluid for use in HVAC (heating, ventilation, air conditioning) systems, industrial heat transfer systems, food industry chilling and freezing systems.

#### Applications

- Freeze protection. Protect your systems down to  $-50^{\circ}\text{C}$ . Eliminate the cost and nuisance associated with freeze damage
- Corrosion protection. Prolong the life of your capital plant by protecting against the corrosive attack of water and uninhibited glycols
- Safety. Eliminate the risk of leakage for food and non-food applications. Protect your employees – safe to handle
- Secondary heat transfer. Reduce your system maintenance and extend the life expectancy of your heat transfer fluid

#### Benefits

- Safety must always come first for HVAC, industrial heat transfer, and chilling and refrigeration plants. Propylene Glycol on which Foodmax Freeze is based is recognised for its low toxicity and may be handled safely by individuals maintaining heat transfer systems.
- Inhibited Propylene Glycol provides superior corrosion protection. Its inhibitor package minimises effects of corrosion by buffering the organic acids that form during normal system operation. Plain water and uninhibited glycols are notorious

for their corrosive attack on many metals

- Adding Foodmax Freeze significantly lowers your system maintenance requirements and increases its heat transfer fluid life expectancy thus securing your equipment investment
- Provides improved heating and cooling efficiency for hospitals and industrial units;
- Extends the temperature range of water for both low and high temperature industrial testing baths;
- Is an excellent chilling medium for ice skating rinks and heating medium for ice snow melting and removal systems.

Propylene glycol may be used in the food at levels not to exceed good manufacturing practise (see table below) Moreover all additives used in Foodmax Freeze are food grade materials.

#### FDA regulations on Use of Propylene

Level %	Food	Regulations*
5	Alcoholic Beverages	170.3 (n) (2)
24	Confectionery & Frostings	170.3 (n) (9)
2.5	Frozen Dairy Product	170.3 (n) (20)
97	Seasonings & Flavourings	170.3 (n) (26)
5	Nut and Nut Products	170.3 (n) (32)
2.0	All other food categories	

\* Code of Federal Regulations Food and Drug Administration. Department of Health and Human Services. Part 184.1666.

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## Use

It is strongly recommended that in areas of hard water Foodmax Freeze is diluted with demineralised or deionised water, as dissolved minerals in hard water can react with the inhibitors and precipitate out of solution. Foodmax Freeze is available in bulk, 215 kg drums and IBC's. It can also be supplied pre-diluted with deionised water for topping up or full system changes.

To ensure optimum protection against freezing and corrosion the level concentration of Foodmax Freeze with the heat transfer medium should be maintained at the level specified by the system manufacturer or installer. The level of Foodmax Freeze within the heat transfer medium can be easily determined by checking the specific gravity and reading off the concentration from the table below:

Specific Gravity 20°/ 20°	% v/v Foodmax Freeze	Freezing Point °C
1.020	20	-7
1.025	25	-9
1.030	30	-12
1.035	35	-16
1.039	40	-20
1.043	45	-25
1.047	50	-31
1.050	55	-37
1.053	60	-45

Assistance with analysis of concentration and inhibitor condition on samples drawn from systems filled with Foodmax Freeze solutions can be provided by Matrix Specialty Lubricants through our local representatives.

## Frost Protection

Foodmax Freeze solutions can protect systems down to a temperature of -50°C preventing cracked pipes, broken valves and coils and other freeze damage associated with the use of plain water.

Adding Foodmax Freeze gives your system superior freeze protection.

## Typical Uses

- Prevents freeze burst problems in schools, offices, vacant property, caravans etc.
- Safeguards HVAC systems lines down to temperatures of -50°C.
- Protects water systems in marine and recreational vehicles from freezing and bursting.
- Protects industrial pre-heating coils during severe conditions.

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## Frost Protection

Temperature °C	% v/v Foodmax Freeze Required for Freeze Protection	% v/v Foodmax Freeze Required for Burst Protection
-6	17	11
-12	26	18
-18	34	23
-24	41	28
-29	45	30
-35	49	33
-40	51	35
-46	53	35
-51	55	35

## Corrosion Effects Heat Transfer Fluids (Corr. Weight Loss in mg/coupon ASTM D1384)

Metal	Plain Water	Uninhibited Propylene Glycol	Uninhibited Ethylene Glycol	Aimol-M Foodmax Freeze
Copper	2	4	4	4
Solder	100	1100	1800	1
Brass	5	5	10	4
Steel	215	215	975	1
Cast Iron	450	350	1200	3
Aluminium	110	15	165	2

The table above shows the relative corrosion rates of Foodmax Freeze heat transfer fluid compared to uninhibited ethylene and propylene glycol and plain water. It ably demonstrates that Foodmax Freeze provides a high level of corrosion protection for nearly all metals of construction used in HVAC or industrial cooling systems.

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**Typical properties of aqueous solutions % wt PG**

	Temp, °C	Foodmax Freeze, %			
		30	40	50	60
Thermal Conductivity (W/m.K)	4	0.425	0.384	0.344	0.311
	82	0.484	0.433	0.386	0.343
	177	0.476	0.431	0.386	0.341
Specific Heat (kJ/kg.K)	4	3.90	3.75	3.51	3.28
	82	4.02	3.91	3.76	3.64
	177	4.11	4.06	4.02	3.99
Viscosity (cP)	4	5.5	9.2	14.0	24.0
	82	0.68	0.85	1.1	1.3
	177	0.30	0.35	0.40	0.44
Density (g/ml)	4	1.04	1.05	1.06	1.06
	82	0.93	0.93	0.94	0.94

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