

ZI-CHEM 3193

Closed Cooling Freeze Protection

HIGHLIGHTS

ZI-CHEM 3193 is an essential component of the ZI-TECHASIA plant preventative maintenance management program for closed circuit cooling water systems. ZI-CHEM 3193 concentrated product comprised of uninhibited propylene glycol.

ZI-CHEM 3193 provides protection at very low operating temperatures by preventing bursting of pipes due to freezing of water. It can also function at temperatures up to 120°C. Because propylene glycol has low acute oral toxicity, this product is suitable for applications where direct contact with food or beverage products may occur.

TYPICAL PROPERTIES

- Appearance: Clear colorless liquid
- Specific gravity: 1.02 – 1.10
- pH (neat) 9.0 – 11.0
- Reserve alkalinity: 35 – 40 mg/L
- Heavy metals: < 5.0 mg/L

PRIMARY APPLICATIONS

ZI-CHEM 3193 should be added on system filling, and whenever there is new makeup after water losses. Addition rates should be in proportion to the target concentration in the water.

FEEDING & CONTROL

ZI-CHEM 3193 can be added to the makeup tank, bypass feeder, or chemical injection pump. Recommended chemical pump materials include PVC, polypropylene, Viton, Teflon and stainless steel.

Your ZI-TECHASIA technical field specialist will recommend the most appropriate dosage for your particular application on an ongoing basis.

TEMPERATUR DATA

Temp	ZI-CHEM 3193 %		Temp	ZI_CHEM 3193 %	
°C	Freeze Protection	Burst Protection	°C	Freeze Protection	Burst Protection
-7	18	12	-34	50	33
-12	29	20	-40	54	35
-18	36	24	-46	57	35
-23	42	28	-51	60	36
-29	26	30			

THE BENEFITS

- Provide protection in extremely low temperature
- Improved heat transfer capacity
- Extended equipment life
- Reduced maintenance cost
- Avoid unscheduled downtime

COMMON APPLICATIONS

- Automotive industries
- Packaging facilities
- Power generating facility
- Tire & Rubber manufacturing
- Commercial & Institutional Building

PACKAGING

- 25kg pails
- 200kg drums
- 1,000kg IBC's or in bulk

HANDLING & SAFETY

ZI-TECHASIA maintains a database of safety data sheets (SDS) on all our products. These contain health & safety information to assist in the safe and appropriate chemical handling, ensuring the protection of personnel.



TARGET WATER QUALITY

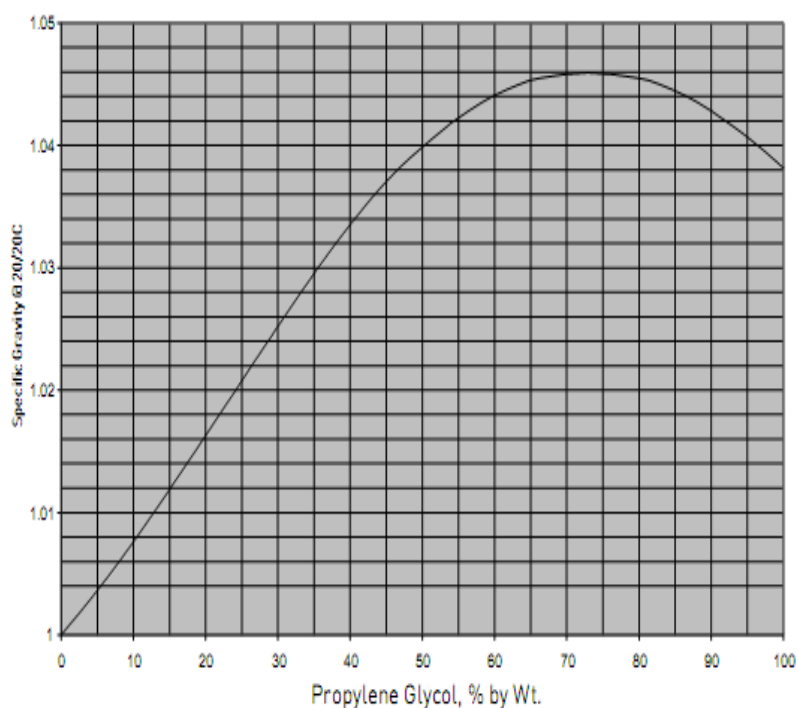
The recommended parameters for target water quality for closed cooling circuits using propylene glycol in concentrations as follows. Note that fully or partially softened or deionized water may be required to achieve these parameters.

- Calcium hardness <50ppm
- Chloride <25ppm
- Magnesium hardness <50ppm
- Sulfate as SO₄ <25ppm

OPERATIONAL PROPERTIES

Following is a chart of SG of propylene glycol solutions compared to different concentrations at 20°C

Specific Gravity of Aqueous Propylene Glycol Solutions



Product Technical Data

ZI-CHEM

Typical freezing and boiling points of ZI-CHEM 3193 at various concentrations:

Weight %	Freezing Point °C	Boiling Point °C
0.0	0.0	100.0
5.2	-1.6	100.0
10.5	-3.3	100.0
15.7	-5.1	100.0
20.9	-7.1	100.6
26.1	-9.6	101.1
31.4	-12.7	102.2
36.6	-16.4	102.8
41.8	-21.1	103.9
47.0	-26.7	104.4
52.3	-33.5	105.6
57.5	-41.6	106.1
62.7	-51.1	107.2
68.0	-	108.3
73.2	-	110.0
78.4	-	113.9
83.6	-	118.3
88.9	-	125.0
94.1	-	132.2
99.3	-	154.4