



# TECHNICAL DATA SHEET

## ALKEMIST™ THERMOLUBE-PG

High-Performance Propylene Glycol Heat Transfer Fluid & Antifreeze Coolant

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### Industrial Closed-Loop Antifreeze Fluid with Advanced Multimetal Inhibitor Package

#### INDUSTRIAL & HVAC HEAT TRANSFER FLUID

**Product Overview:** ALKEMIST™ THERMOLUBE-PG is a premium-grade monopropylene glycol-based heat transfer fluid and secondary refrigerant formulated with high-purity USP/industrial grade 1,2-propanediol and a heavy-duty, low-depletion carboxylate/azole corrosion inhibitor package.

**Key Engineering Advantages:** Exceptional thermal stability, low toxicity profile compared to ethylene glycol, multi-metal corrosion protection (copper, brass, steel, cast iron, aluminum), anti-foam protection, and buffered alkaline pH reserve to prevent acidic degradation over extended operational lifecycles.

**Recommended Applications:** HVAC chilled water systems, rooftop chillers, food processing refrigeration, solar thermal loops, ice rinks, data center liquid cooling, and stationary engine cooling jackets.

#### Document Control

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ALK-TLPG-TDS-002

VERSION

1.0

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PRODUCT CODE

ALK-THERMO-PG

FLUID BASE

1,2-Propanediol (Propylene Glycol)

#### Manufacturer

##### ALKEMIST | WATER AND CHEMICALS SOLUTIONS (SMC-PRIVATE) LIMITED

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## 1. Typical Physical & Chemical Specifications



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**Verified Laboratory QC Parameters:** Manufactured under strict quality control to ensure consistent thermal conductivity and corrosion protection.

| TECHNICAL PROPERTY               | TYPICAL VALUE / SPECIFICATION                                      | TEST METHOD / STANDARD          |
|----------------------------------|--------------------------------------------------------------------|---------------------------------|
| APPEARANCE / COLOUR              | Clear, colourless to pale yellow liquid (fluorescent dye optional) | Visual Inspection @ 25°C        |
| ODOUR                            | Mild characteristic odour                                          | Organoleptic Evaluation         |
| SPECIFIC GRAVITY (SG @ 20/20°C)  | <b>1.03 - 1.06 g/cm³</b> (Concentrate)                             | ASTM D1122 Standard Test Method |
| PH (50% AQUEOUS DILUTION @ 25°C) | <b>8.5 - 10.0 (Buffered Alkaline)</b>                              | ASTM D1287 Standard Test Method |
| RESERVE ALKALINITY (RA)          | > 10.0 mL 0.1N HCl                                                 | ASTM D1121 Standard Test Method |
| BOILING POINT (CONCENTRATE)      | > 187°C (> 369°F)                                                  | ASTM D1120 Standard Test Method |
| FLASH POINT (CLOSED CUP)         | > 99°C (> 210°F)                                                   | ASTM D93 Standard Test Method   |
| REFRACTIVE INDEX (@ 20°C)        | 1.431 - 1.439 (Concentrate)                                        | Abbe Refractometer Measurement  |

## 2. Freeze Protection & Concentration Reference Table

ALKEMIST™ THERMOLUBE-PG dilution curve provides precise freeze-point suppression and burst protection across varying volumetric mixing ratios:

| VOLUME % PG CONCENTRATE | FREEZING POINT (°C / °F) | BURST PROTECTION POINT | SYSTEM OPERATING RANGE |
|-------------------------|--------------------------|------------------------|------------------------|
| 30% V/V                 | -14°C ( 7°F)             | -23°C (-10°F)          | -10°C to 110°C         |
| 40% V/V                 | -23°C (-10°F)            | -38°C (-36°F)          | -18°C to 115°C         |
| 50% V/V (RECOMMENDED)   | <b>-37°C (-34°F)</b>     | <b>-51°C (-60°F)</b>   | <b>-30°C to 120°C</b>  |
| 60% V/V                 | -52°C (-62°F)            | -65°C (-85°F)          | -45°C to 125°C         |

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**Technical Note on Dilution:** It is strongly recommended to maintain a minimum of 30% v/v glycol concentration to ensure adequate corrosion inhibitor reserve. Do not dilute with raw hard water; always use deionized or distilled water (< 50 µS/cm conductivity) for makeup and dilution.

### 3. Comprehensive Client FAQs (Frequently Asked Questions)

#### Q1: Why choose Propylene Glycol (PG) over Ethylene Glycol (EG)?

Propylene glycol has significantly lower acute oral toxicity compared to ethylene glycol. It is legally mandated for use in HVAC and closed-loop systems where there is any potential indirect contact with potable water, food processing plants, pharmaceutical production, or HVAC units in occupied public buildings.

#### Q2: How often should the fluid pH and Reserve Alkalinity (RA) be tested?

We recommend testing the fluid pH and reserve alkalinity at least semi-annually (every 6 months). A sudden drop in pH below 7.5 or depletion of reserve alkalinity indicates inhibitor exhaustion and requires servicing or makeup inhibitor dosing.

#### Q3: Can ALKEMIST™ THERMOLUBE-PG be mixed with existing glycol in my system?

Mixing with other inhibited propylene glycol coolants of similar carboxylate formulation is generally acceptable. However, mixing PG with Ethylene Glycol or uninhibited automotive antifreeze can cause chemical incompatibility, precipitation of additives, and rapid corrosion. Always perform a small beaker compatibility test or request an Alkemist laboratory fluid audit before mixing.

#### Q4: What is the expected service life of the fluid?

Under normal operating conditions (system temperatures under 100°C, proper maintenance, absence of severe air entrainment or bacterial contamination), THERMOLUBE-PG provides a long service life of **3 to 5 years**. High operating temperatures (> 120°C) accelerate thermal degradation.

#### Q5: How do I measure freeze point accurately on site?

While hydrometers provide a rough estimate, a temperature-compensated optical refractometer calibrated for propylene glycol is the fastest and most accurate field instrument for determining both refractive index and corresponding freeze point protection.

#### Q6: What metals are protected by the inhibitor package?

The advanced multi-metal corrosion inhibitor package provides active passivation for copper, brass, soldered joints, carbon steel, cast iron, stainless steel, and aluminum alloys commonly found in industrial chillers and heat exchangers.

### 4. Packaging, Storage & Handling

**Packaging Availability:** Supplied in 20 Litre pails, 210 Litre HDPE industrial drums, and 1,000 Litre IBC Intermediate Bulk Containers (totes).

**Shelf Life:** 3 years from date of manufacture when stored in original unopened containers.

**Storage Guidelines:** Store indoors between 5°C and 45°C away from direct sunlight and strong oxidizing chemicals.



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