

ASHRAE TC 9.9 Technical Snapshot

Ensuring Propylene Glycol Fluid Quality: From Production to Commissioning

Maintaining propylene glycol fluid integrity is not managed by a single control point but by a series of good practices including:

- Manufacturing quality
- Packaging and transport cleanliness
- Controlled storage
- Clean handling
- Filtration during commissioning
- Verification of fluid quality at commissioning
- Establishing baseline fluid properties

When executed correctly, these practices significantly

- Reduce early-life fluid risks
- Support long-term system reliability by ensuring the cooling system starts service in a clean and controlled state

This Technical Alert builds on [Fluid Quality Considerations](#) in the TC 9.9 Datacom Encyclopedia, which provides an in-depth reference on various fluids and fluid quality.

Production Level Fluid Quality

- Ensure product composition is consistent across manufacturing batches and product consistently meets product specifications.
- Filter the fluid during manufacturing to eliminate introduction of particulates from raw materials and manufacturing equipment.
- Use new, clean packaging (e.g., drums, totes, pails) to prevent debris, moisture, or residues from compromising fluid chemistry before site delivery.
- Store propylene glycol in compatible, UV-protected containers. Protect fluids from environmental exposure during transit and on-site storage.

Responsibility: Fluid manufacturer

Transport and On-Site Storage

- Clean storage vessels and transport vehicles to eliminate contamination. Ensure rigorous removal of previous cargo residues.
- Verify all transfer equipment is clean, dry, and odor-free. Protect transfer fittings and hoses from debris and environmental exposure.
- Protect propylene glycol from unnecessary environmental exposure during transport and storage, including avoiding direct sunlight. Maintain storage temperatures as specified by the supplier.
- Inspect and track stored fluid; perform verification testing for extended storage periods per manufacturer guidelines. Align storage duration with project commissioning timelines.
- Filter propylene glycol through filters recommended by the fluid manufacturer when transferring into storage containers.

Responsibility: Fluid manufacturer, distributor, contractors and end user

Handling Prior to and During Fill

- Prevent contamination by using dedicated, clean transfer equipment and keeping all vessels and ports closed when not in use.
- Avoid open-air handling and seal openings around any fluid transfer pipes/tubes/hoses, especially in construction environments, to minimize airborne debris and dust.
- Seal containers promptly and limit ambient air exposure to maintain fluid purity before system fill.
- Visually inspect fluid for precipitation and consult the supplier if detected.
- [*TCS Commissioning: Bringing a New Liquid Cooling System Online*](#) provides additional guidance for bringing new TCS deployments online with a focus on preventing contamination, verifying installation quality, ensuring fluid integrity, and validating system performance.

Responsibility: Commissioning agents / contractors and end-user

Filtration at System Introduction

- Filter PG25 during system introduction to capture particles introduced during handling and transport.
- Utilize initial startup filtration to establish the baseline system cleanliness as a last line of defense to reduce particulates entering the system.
- [*Liquid Filtration*](#) in the TC 9.9 Datacom Encyclopedia provides filtration recommendations.

Responsibility: Commissioning agents / contractors and end-user

Post-Installation Verification

- Verify propylene glycol concentration after installation. If the system was flushed with water prior to the introduction of the PG25, any residual water can dilute or contaminate the PG25 fluid.
- Measure concentration only after sufficient circulation to guarantee thorough mixing and representative sampling.
- Compare readings against target propylene glycol design tolerances and consult the supplier if levels are outside the specified range.
- Perform any fluid adjustments deliberately and follow with re-verification to confirm compliance.

Responsibility: Commissioning agents / contractors and end user

Establish Baseline Lab Measurements

- Collect a representative fluid sample after full circulation and stabilization for analysis by a qualified laboratory.
- Confirm glycol concentration and document baseline physical and chemical properties at the start of operation.
- Establish a traceable benchmark to enable long-term trend analysis and distinguish installation issues from in-service changes.
- Develop a site-specific sampling plan to determine if testing of all systems is required or a representative set is sufficient.
- If in-line monitoring is deployed, reference the in-line sensor data to the laboratory measured samples. Note there may be a difference between the in-line, laboratory analysis and portable field tests.

Responsibility: Commissioning agents / contractors, end user, fluid vendor and qualified laboratories