

Syensqo Galden® High-Performance PFPE Fluids

Discover why Galden® Fluorinated Fluids from Syensqo are ideal for today's semiconductor and EV applications.

High Performance Fluids for a Wide Range of Applications

Syensqo Golden® PFPE is a line of high-performance, inert, fluorinated fluids used for heat transfer and for various high-tech applications in the Electrical & Electronics and Semiconductors markets. These fluids offer good dielectric properties, exceptional chemical stability, and the capacity to operate at very low and very high temperatures in aggressive conditions.

These characteristics make Golden PFPE fluids an excellent choice for a wide range of applications, including applications that currently use 3M fluorinated fluids (which are in the process of being phased out of the market).

Ideal Applications Include:

- ▲ **Heat Transfer Fluids**
 - ▼ Thermal exchange systems
 - ▼ Testing equipment
 - ▼ Server cooling
- ▲ **Vapor Phase Soldering**
- ▲ **Thermal Shock Testing**
- ▲ **Hermetic Seal Testing**
- ▲ **Solvents**
- ▲ **Fuel Cells**
- ▲ **Cooling for EV Batteries and Rapid charging stations**

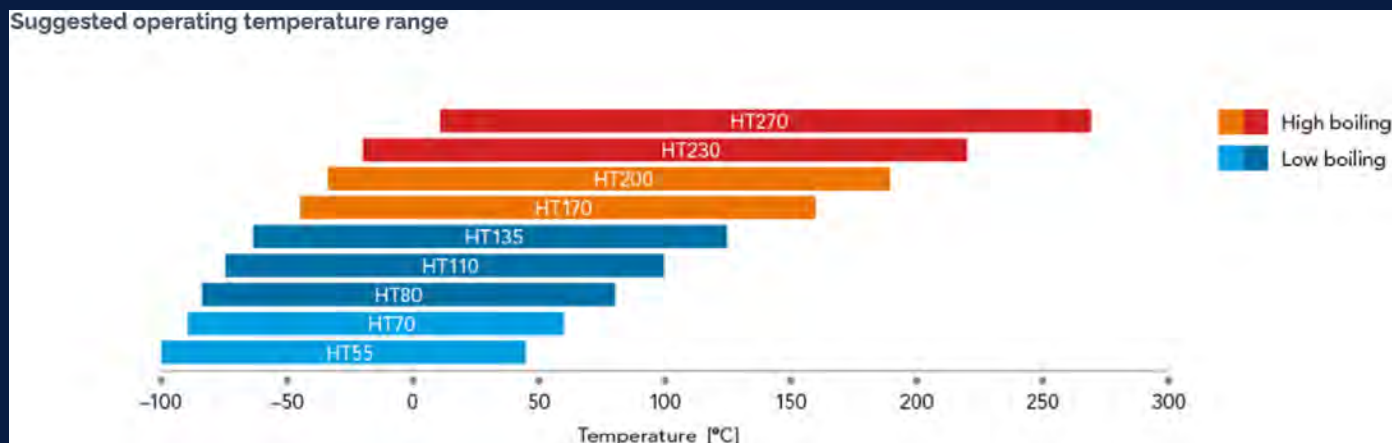


Properties

Here are some of the properties that make Galden PFPE fluids suitable for various applications in semiconductor manufacturing.

Thermal Properties

Galden HT heat transfer fluids have a broader range of boiling points than other commercial fluorinated heat transfer fluids, ranging from 55°C to 270°C (131°F to 518°F). High Boiler (HB) grades (170°C to 270°C, or 338°F to 518°F) can be used at end-use temperatures up to 290°C.



Viscosity and Pour Point

Viscosity and pour point are two of the most important properties for assessing a fluid's ability to perform across a range of operating temperatures. Galden HT fluids offer a range of options, including fluids that remain viscous at very high operating temperatures, as well as a wide variety of very low-temperature pour points, ranging from -66°C to -115°C (-76°F to -175°F).

Flame Properties

Galden PFPE fluids are not flammable and have no flash, fire or auto-ignition point. They are approved by Factory Mutual Underwriters and compliant with FM Standard 6930 for fluid safety.

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Electrical Properties

Galden PFPE fluids exhibit excellent dielectric properties, a primary reason they are used across many applications.

Dielectric Strength: 40kV at 2.54 mm gap

Volume Resistivity: 1.5×10^{15} ohm-cm

Material Compatibility

Galden PFPE fluids are compatible with most common materials of construction.

General Guidelines for the Compatibility of Galden PFPE Fluids Based on Immersion Testing:

METALS

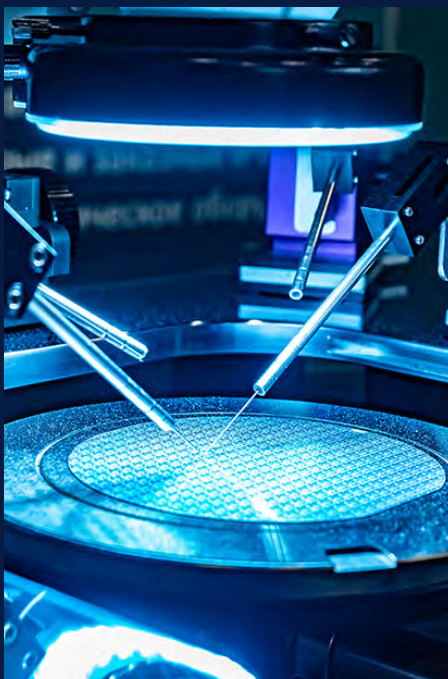
AISI 316, Copper, Brass, Iron, Nickel,
Aluminum, Stainless Steel, Bronze

PLASTICS

LDPE, PP, PC, ABS Copolymers, PET,
POM, PTFE, PVC, PMMA, Polyphenyloxide

ELASTOMERS

Butyl Rubber, Natural Rubber, Silicone
Rubber, NBR, EPDM, Fluorosilicone



Low Maintenance, Stable, and Safe

Galden PFPE systems are practically maintenance-free and present no corrosion hazard. Dielectric properties do not change with use, eliminating the risk of short-circuiting. Environmentally safe, Galden PFPE is non-toxic, non-explosive, and has no flash, fire or auto-ignition points.



Applications

Heat Transfer Fluids

The Galden HT line includes a wide range of heat transfer fluids to fit the needs of various applications. Their wide range of boiling points (55°C to 270°C) makes them ideal for use in the semiconductor and electronics industries. Additionally, their non-conductivity, low viscosity and ability to withstand extreme temperatures make them ideal for thermal exchange systems, testing equipment and server cooling.

High Boiling (HB) grades operate from 150°C to 290°C, and can be used to replace liquids with higher evaporations rates, thereby reducing cost. Additionally, because PFPE fluids are inert, they are ideal for electronic cleaning applications.

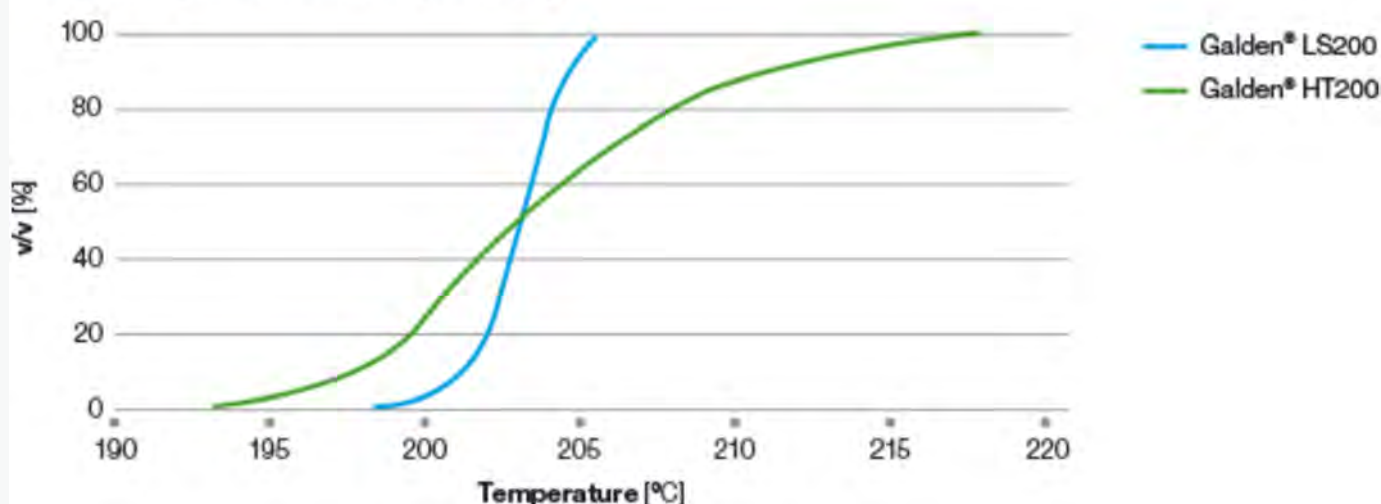
Galden HT fluids are also compatible with most construction materials used in heat exchangers and pose no corrosion or short-circuit risk.

Lead-Free Vapor Phase Soldering

Galden LS and HS grades (LS/HS) provide a lead-free solution for vapor phase soldering (VPS) processing up to 260°C. The precise vapor temperature of Galden® PFPE eliminates overheating, and the narrow molecular weight distribution eliminates the evaporation of low boiling components and undesired boiling point drift during processing.

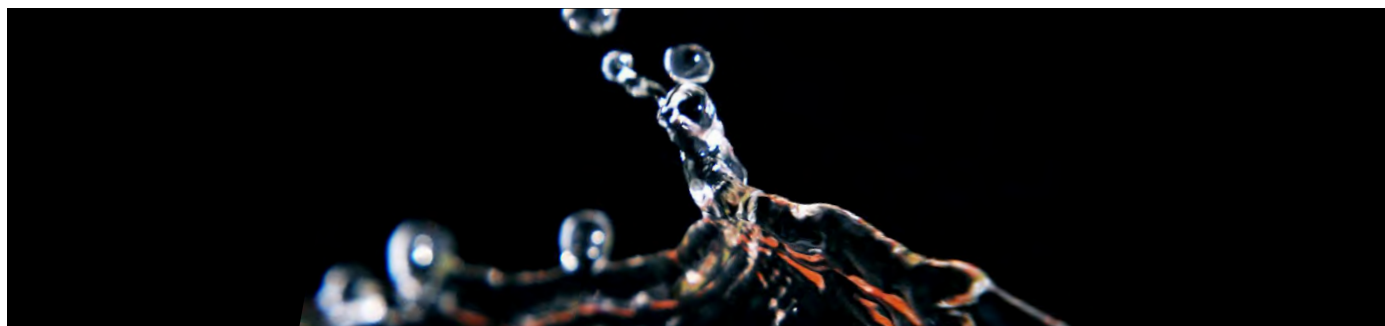
Galden® LS/HS grades are RoHS compliant and provide the broadest temperature range of lead-free solutions that are able to withstand higher processing temperatures.

Galden® LS/HS grades offer a broad temperature range



Thermal Shock Testing

Galden D fluids are ideal for testing the resistance of electronic devices to extreme temperature fluctuations. These fluids can be used in both dual and single fluid testing systems due to their wide range of operating temperatures. Using a single fluid system can significantly lower operating costs by reducing fluid consumption and equipment downtime, eliminating cross contamination and simplifying inventory.



Hermetic Seal Testing

Galden PFPE fluids are inert and do not leave a residue, making them a popular choice for detector and indicator fluids in leak test procedures. Galden D detector fluids are capable of detecting both large and small leaks due to their good balance between low and high boiler components. High boilers penetrate through large gaps and remain liquid until the test is performed, while low boilers easily penetrate and expose small leaks.

Solvents

Galden SV grade fluids are low molecular weight, CFC-free solvents that are inert, non-toxic, odorless and colorless. These products have no flash, fire or auto-ignition points, making them extremely safe. Being chemically inert makes it ideal for cleaning operations where solvents are applied to hot components, heated prior to application or pressure sprayed onto components. Galden® SV is also used as a carrier for fluorinated lubricants, such as Syensqo Fomblin® PFPE lubricants.

Fuel Cells

Galden® HT heat transfer fluids are considered one of the safest dielectric fluids for fuel cell manufacturing due to their high thermal stability, chemical inertness and absence of flash and fire points (FM approved 6930).

EV Batteries & Cooling Systems

The high powered EV batteries and charging stations of tomorrow will require advanced, high-performance cooling fluids to operate safely and reliably. Galden EV110 and EV135 fluids provide the utmost in safety, reliability, performance and economics, and will help enable the super-fast charging times that mainstream consumers will demand from EVs.

Galden EV fluids are ideally suited to EV cooling applications due to:

- ▼ Wide operating temperatures
- ▼ Excellent dielectric properties, including high dielectric strength
- ▼ High resistivity
- ▼ Low viscosity
- ▼ Low cost of ownership
- ▼ No galvanic corrosion or rusting potential
- ▼ No change in resistivity over long periods of use
- ▼ Zero fluid degradation (lifetime fluid service in a sealed system)
- ▼ Completely inert
- ▼ Zero conductivity (non aqueous, will not absorb water or become conductive)

Replacement for 3M Fluorinated Fluids

When 3M announced its exit from the fluorinated fluids market, many manufacturers were left scrambling to find suitable replacements. Galden PFPE fluids offer an ideal solution for replacing 3M fluids, with a wide range of products that perform as well or better across specifications.

The chart on the right shows which Galden fluids are best for replacing any 3M fluids currently used or used in the past by application.

APPLICATION/ TEST CONDITION	TYPICAL 3M FLUID RECOMMENDATION	GALDEN CROSS REFERENCE
Gross Leak, Bubble Test, Indicator Fluid	FC-40, FC-43	D02, D03
Gross Leak, Detector Fluid	FC-84, FC-72	DET
Thermal Shock, Cold Bath, -65C	FC-77	DET, D02TS
Thermal Shock, Hot Bath, +125C	FC-40, FC-43	D02, D03, D02TS
Thermal Shock, Hot Bath, +150C	FC-40, FC-43	D02, D03, D02TS
Thermal Shock, Hot Bath, +200C	FC-70	D05, LS215
Thermal Shock, Single Fluid 0 - +100C	FC-40, FC-43	D02, D03, D02TS
Thermal Shock, Single Fluid, -65 - +150C	N/A	D02TS
Vapor Phase, Primary, 200C	N/A	LS200
Vapor Phase, Primary, 210C	N/A	LS210
Vapor Phase, Primary, 215C	FC-70, FC-5312	LS210
Vapor Phase, Primary, 230C	N/A	LS230
Vapor Phase, Primary, 240C	N/A	LS240
Vapor Phase, Primary, 260C	N/A	HS260
Liquid Burn-In	FC-40, FC-43	D02, D03, D02TS

About Sales & Service Inc

Since 1989, Sales & Service Inc has connected semiconductor manufacturers with the solutions they need to improve process efficiency, innovate and move their most important projects forward. We carry a full line card of semiconductor manufacturing equipment and materials from the world's leading providers, and our team has the industry expertise to help you find the perfect solution for your needs.

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Contact Sales & Service Inc For More Information

Contact the experts at Sales & Service Inc (SSI) for more information about Syensqo Galden PFPE fluids or for help selecting the right product for your application.

Contact Us