

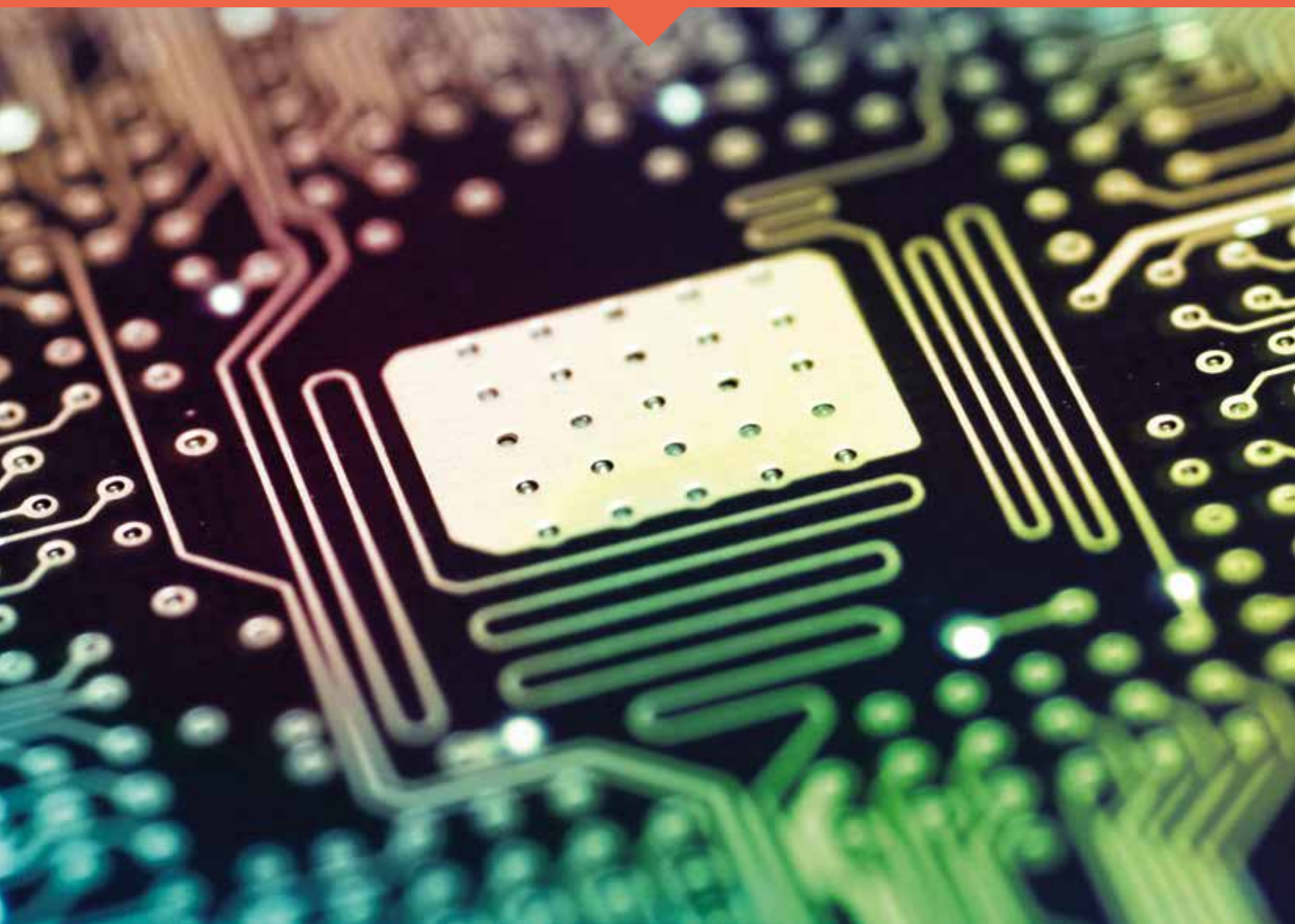


SYENSQO

Specialty Polymers

Galden[®] LS/HS

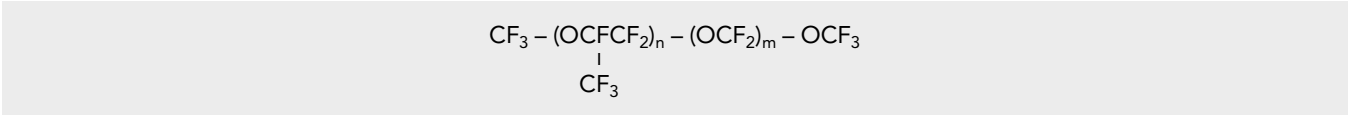
Vapor Phase Soldering Fluids



Galden® LS and HS Vapor Phase Soldering Fluids

Galden® LS/HS is a line of fully fluorinated fluids specifically designed for the Vapor Phase Soldering process. The narrow molecular weight distribution as well

as the very strong carbon-fluorine bond and the flexible ether link provide the properties which make Galden® LS/HS ideal for use in VPS.



Features	Benefits
Wide choice of grades with different boiling point	Widest operating temperature range to optimize VPS process
Narrow molecular weight distribution	Maximum process stability and repeatability No boiling point drift
Low heat of vaporization	Rapid and residue free drying
Vapor density greater than air	Pre-heating and heating processes take place in an inert atmosphere
Excellent thermal and chemical stability	No corrosion or reaction with materials of construction
Good compatibility with materials	No formation of decomposition residues
No flash or fire points	Enhanced safety
No auto ignition point	Safe to use at high temperature
No explosion hazards	

Vapor Phase Soldering and Lead-Free Solder

RoHS (Restriction of Hazardous Substances) emphasizes lead reduction importance and compels manufacturers to produce and deliver lead-free equipment.

Lead-free printed circuit boards (PCBs) have been a crucial protagonist of this innovation; solder was traditionally composed of ~ 60% tin (Sn) and ~ 40% lead (Pb), whereas modern lead-free solders include silver (Ag), Copper (Cu) and Bismuth (Bi) as tin-alloying elements. While traditional tin/lead solder melts at ~180°C, lead-free solder melts at ~ 227°C, creating challenges for PCB manufacturers.

Aside from the high soldering temperatures, several heating criticalities come with the more complex and crowded PCBs, the integrated circuit (IC) substrate designs due to the miniaturization of electronic devices like smartphones and wearables, and the heterogeneous packaging of the electronic components like chiplets and system in package designs. All these challenges can be readily addressed through vapor phase soldering thanks to Galden® LS and HS grades.

Enabling vapor phase soldering technology, thanks to their narrow molecular weight distribution, Galden® LS and HS bring the following benefits compared to alternative technologies:

- Precise temperature control based on the fluid’s boiling point
- Absence of shadow effects typical of convective and radiative heating
- Accurate and uniform heat delivery, avoiding overheating and reducing the risk of the tombstoning effect
- Short soldering time, leading to lower the induced mechanical and thermal stress for the components

Galden® LS and HS grades for vapor phase soldering offer the best lead-free process solution since:

- Galden® LS and HS fluids are RoHS compliant
- Galden® LS and HS fluids have zero Ozone Depletion Potential (ODP)
- Galden® LS and HS fluids offer the broadest temperature range for lead-free solder up to 260°C

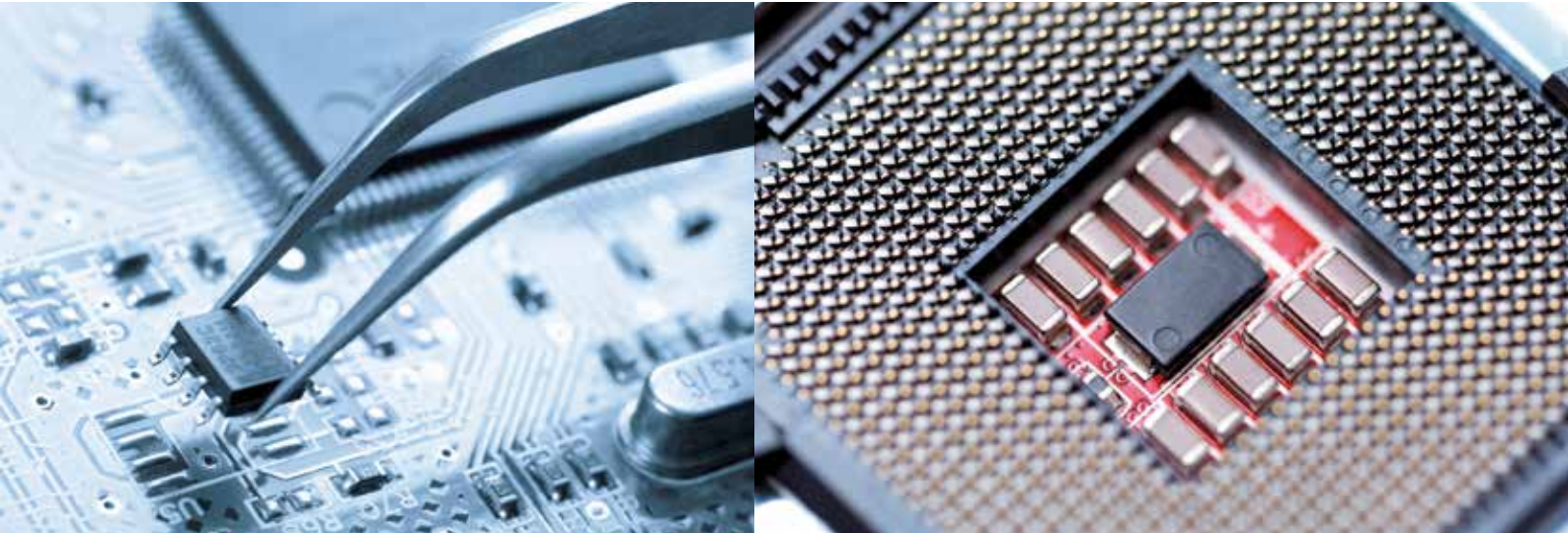
Safety

Galden® LS and HS grades for vapor phase soldering offer favorable environmental and worker safety properties: non-toxicity, non-flammability, and Zero Ozone Depletion Potential (ODP). Furthermore, Galden® LS and HS fluids exhibit high chemical and thermal stability and are safe to use up to 290°C.

The chemical inertness and non-corrosive nature of Galden® LS and HS fluids make them outstandingly safe for workers to handle and improve overall workplace safety.

Vapor Phase Soldering (Typical Properties at 25°C)

Properties	Units	LS200	LS215	LS230	HS240	HS260
Boiling point	°C	200	215	230	240	260
Density	g/cm³	1.79	1.80	1.82	1.82	1.83
Kinematic viscosity	cSt	2.50	3.80	4.40	5.30	7.00
Vapor pressure	Pa	21	12	3.4	1	1
Specific heat	J/Kg.°C	973	973	973	973	973
Heat of vap. at boiling point	J/g	63	63	63	63	63
Thermal conductivity	W/m.°C	0.07	0.07	0.07	0.07	0.07
Coefficient of expansion	cm³/cm³.°C	0.0011	0.0011	0.0011	0.0011	0.0011
Surface tension	dyne/cm	19	20	20	20	20
Dielectric strength	kV (2.54 mm gap)	40	40	40	40	40
Dielectric constant		2.1	2.1	2.1	2.1	2.1
Volume resistivity	Ohm·cm	1015	1015	1015	1015	1015
Average molecular weight	amu	870	950	1,020	1,085	1,210





Contact Details

www.syensqo.com/en/form/product-inquiry

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