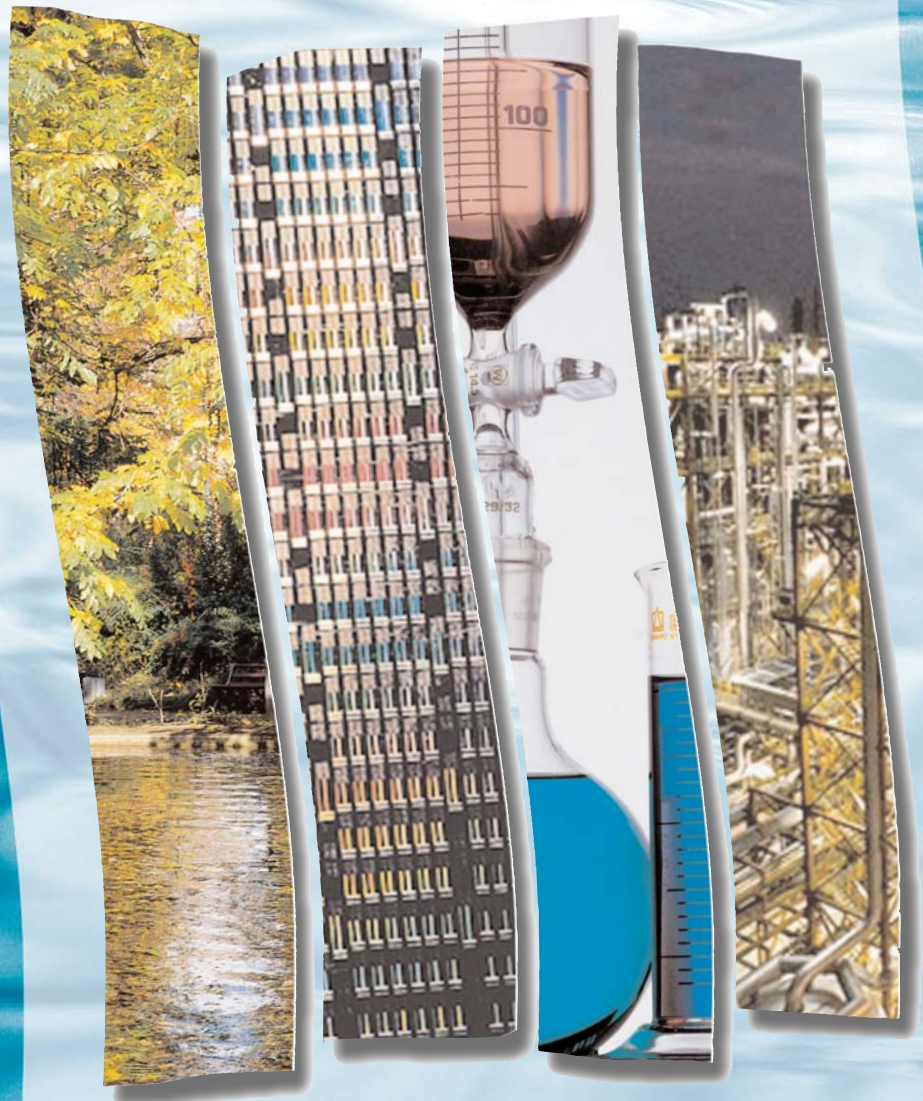


H-GALDEN[®] ZT



Heat Transfer Fluids

Solvay
Solexis



What is H-GALDEN®



H-GALDEN® ZT fluids complement **GALDEN® HT** fluids with comparable thermal stability, dielectric properties and safety. They show improved heat transfer performance and lower environmental load due to the short atmospheric life.

FEATURES

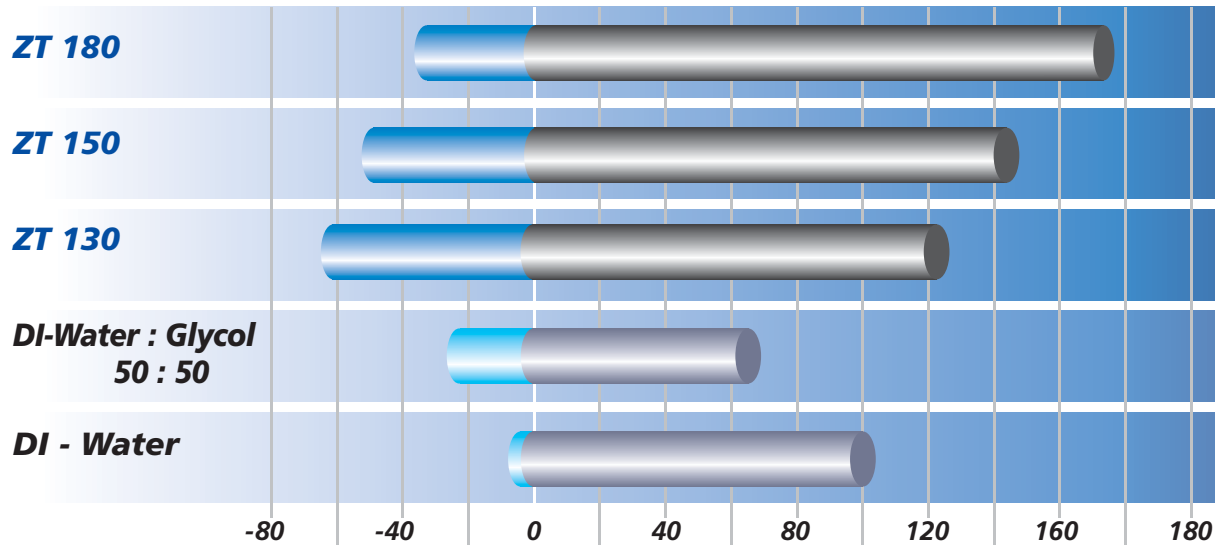
BENEFITS

<ul style="list-style-type: none"> • Superior heat transfer performance • High boiling point with low pour point and low viscosity • Low evaporation losses 	<ul style="list-style-type: none"> • Better temperature control • Single fluid for wide working temperature range • Low environmental load
<ul style="list-style-type: none"> • High electrical resistivity (1000 times higher than DI-water) • No significant change in resistivity with use • No Rf power leakage (High transparency to Rf Power) 	<ul style="list-style-type: none"> • Low maintenance • High MTBF (Mean Time Between Failure) • Low cost of operation • No resistivity monitoring need • No risk of short circuiting even if leaked on to electronic components • Better process control
<ul style="list-style-type: none"> • Excellent thermal and chemical stability • Excellent compatibility with materials 	<ul style="list-style-type: none"> • No corrosion or reaction with construction materials • No formation of decomposition residues • No circulating pump seizure due to fluid degradation or corrosion
<ul style="list-style-type: none"> • Ozone depletion potential: 0 • GWP (ITH 100 years): 1800 • Life in atmosphere: 7 year 	<ul style="list-style-type: none"> • Low environmental load

H-GALDEN® ZT Application Chart

Industry	Applications	Key Features
Semiconductors Front - End	Heat Transfer media for: Steppers, Dry - Etchers, CVD, PVD and Ion Implanters	Excellent Dielectric Properties, Thermal Stability, Safety
Semiconductors Back - End	Heat Transfer media for: Probers	Excellent Dielectric Properties, Excellent Heat Transfer Efficiency, Safety
Electronic	Heat Transfer media for: Testing Equipments	Excellent Dielectric Properties, Safety, Environmental Safety

Wide Working Temperature - Single Fluid Approach



Working temperature range: the lower temperature limit is set when the fluid viscosity reaches the value of 20 cP (11 – 12 cSt), whereas the upper limit is set at 10°C below the boiling point of the fluid itself.

H-GALDEN® is cheaper than DI-Water!

The operating cost of DI-Water and DI-Water/Glycol systems is estimated to be more than twice that of H-GALDEN systems.

- *DI-Water and DI-Water/Glycol* are characterized by narrow operating temperature ranges:
DI-Water: 0°C – 100°C
DI-Water/Glycol: -20°C – 65°C.

- *DI-Water and DI-Water/Glycol* systems require maintenance control for water resistivity and efficiency of de-ionization resins.

- *DI-Water and DI-Water/Glycol* could lead to galvanic corrosion in presence of dissimilar metals, the replacement of corroded parts increases the operation costs.

- *DI-Water and DI-Water/Glycol* tend to dissolve ions and become ionized leading to damage due to short circuiting.

- *H-GALDEN* fluids are characterized by a wide operating temperature range.

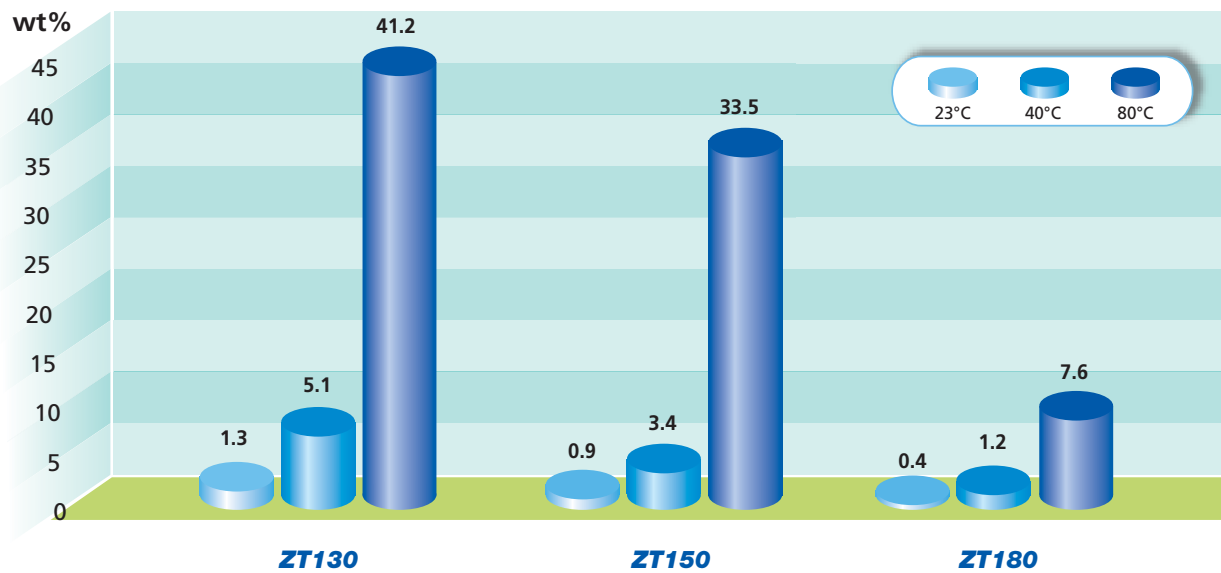
- *H-GALDEN* fluids offer different grades to optimize performance.

- *H-GALDEN* systems do not require resistivity monitoring and de-ionization resins.

- *H-GALDEN* systems are practically maintenance free and no corrosion problems are encountered.

- *H-GALDEN* dielectric properties do not change with use, no short circuiting risk.

Evaporation Loss - test method JIS C2101



JIS C2101 standard method for Electrical Insulating Oils:

1. Fill with 20gr of fluid a beaker of 50cc.
2. Cover the test beaker with a beaker of 250cc.
3. Place the two beakers in a thermostatic oven with ventilation at test temperature for 8hrs.
4. After 8 hrs let the beaker to cool down in a dryer with silica.
5. Evaluate the Δ weight

Material Compatibility

H-GALDEN® ZT fluids show good compatibility with most of the materials commonly present in heat exchangers, but due to their low surface tension and polarity they may penetrate certain sealing and gasket materials causing swelling or extraction of fillers and plasticizers.

Swelling could have positive effect on sealing, but the sealing could fail if the joint is opened for maintenance. It is recommended to replace seals and gasket after every maintenance cycle.

The extraction of plasticizers would reduce the elasticity of seals, gaskets, hoses and tubes. The material could become rigid and brittle.

Among plastics, PMMA results of questionable compatibility, whilst EPDM and silicone rubbers are not affected by **H-GALDEN® ZT** exposure.

Fluorinated elastomers such as Tecnoflon® and Viton® are not compatible with **H-GALDEN® ZT** fluids as they can absorb into the elastomer.

Solvay Solexis always suggest performing compatibility tests with formulated seals and gaskets in the temperature range of interest.

Solvay Solexis carried out static compatibility tests and work closely with tools manufacturers, TCUs and systems components such as seals, gaskets, pipes and fittings. The results are listed in a report available upon request.

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