

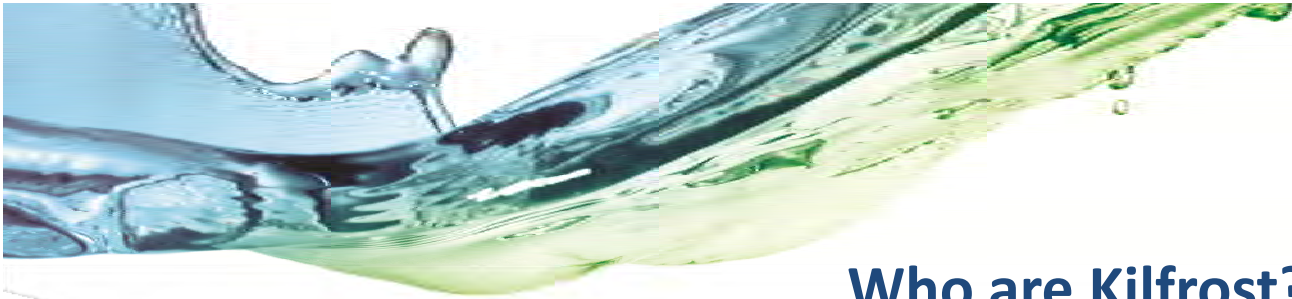
Thermal Transfer Fluids Combatting The Risks Of Toxicity And Improving Performance



GSHP
association
MEMBER

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Kilfrost



Who are Kilfrost?

Kilfrost is a 3rd generation family owned business, manufacturing in the UK and operating globally. Kilfrost produces safety critical solutions for 'Anti-freeze', 'De-Icing' and 'Thermal Transfer Fluid' associated industries.

Situated between Carlisle and Newcastle, at Haltwhistle, the geographical 'Centre of Britain'.

Innovative

Kilfrost has a history of innovation and continues to invest heavily in R&D

Trusted

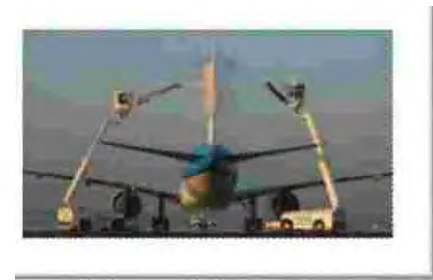
Kilfrost is a global leader and has been trusted by industry for over 75 years

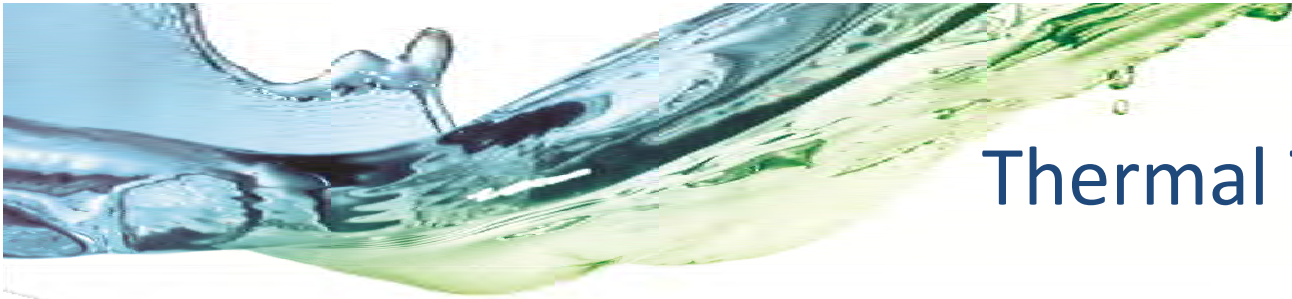
Dynamic

Kilfrost is a dynamic company, full of passionate and experience industry-leading experts in their field

Visionary

Kilfrost looks to the future and is proud to lead the way with next-generation products





Thermal Transfer Fluids!

(TTF's)

Base Fluid

Examples

Monoethylene Glycol (MEG)

Monopropylene Glycol (MPG)

Methanol & Ethanol

Glycerol....



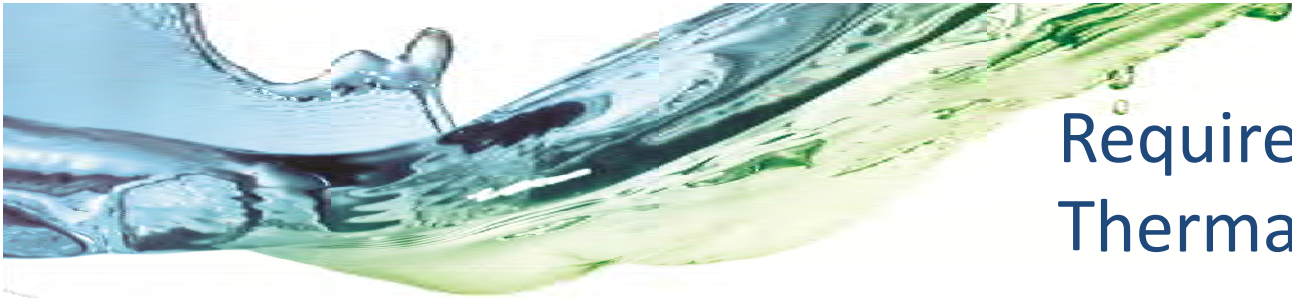
Performance Additives

Examples

Corrosion inhibitors

Preservatives/Biocide

pH Buffers...



Requirements for Thermal Transfer Fluids?



Heat Transfer Efficiency

- Pressure Drops
- Heat Transfer Coefficients
- Pumping costs, piping diameters, COP



System Protection

- System Efficiency
- System Reliability
- Industry Reputation

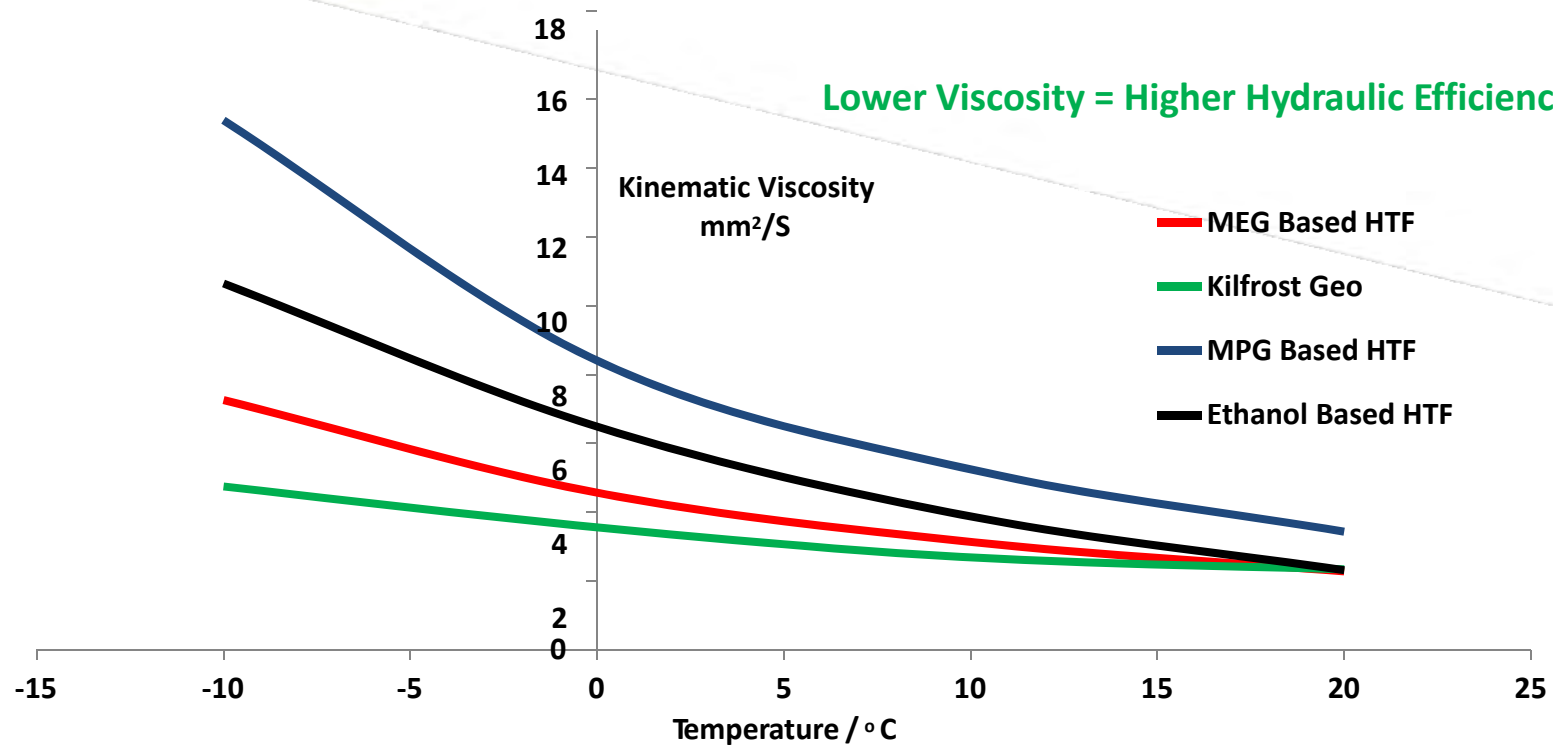


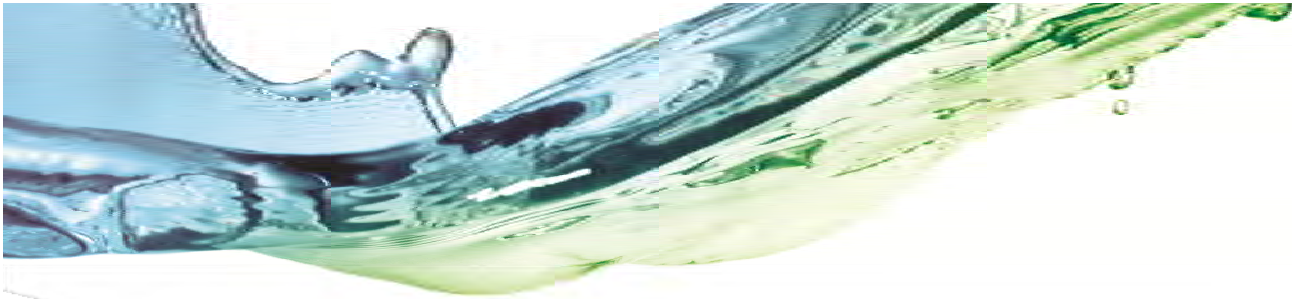
Human & Environmental Impact

- Carbon footprint
- Safety
- Regulatory changes

Heat Transfer Efficiency

Viscosity Comparison of Thermal Fluids (-15° C Freeze Protection)

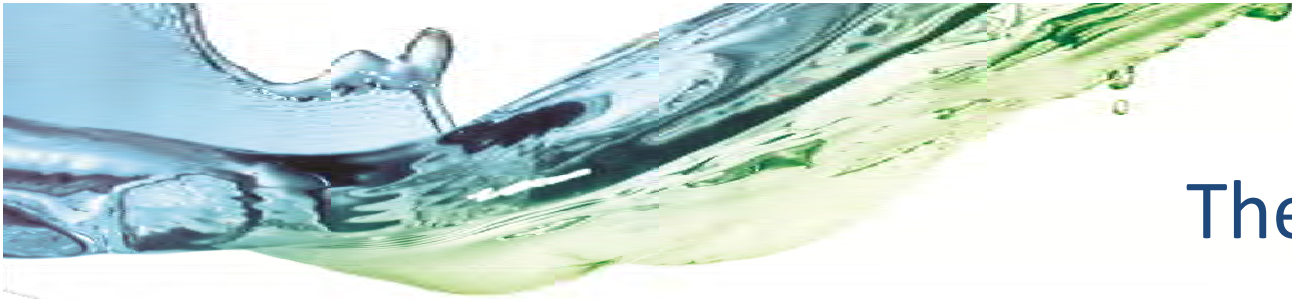




Thermal Transfer Fluids are as important as the emitter and heat pump itself and can contribute to the life expectancy if considered at the design stage.

For Surface Water Sourced Heat Pumps all of the following should be considered;

1. **Performance / Efficiency** (circulation pumps, heat exchanger, pipe diameter, system volume)
2. **Toxicity** – (Aquatic, human pets / wildlife / fauna / GRAS)
3. **Ecological & Environmental Profile** (non-fossil fuel bases/gases/flammability etc)
4. **Longevity and network protection** (bio-film / Corrosion / Solids / pressure / expansion / workload)
5. **Risk Assessment & Method Statements** (handling / site safety / transport / spillage / fire)



The Compromise

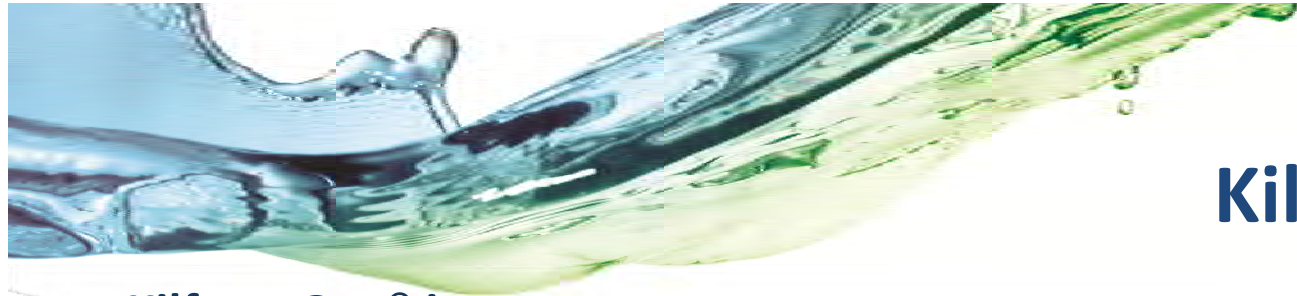
Choosing efficiency over safety is commonplace

MEG and Ethanol Based Fluids widely used

As the industry develops more installations will make use of these products

Potential Risks are increasing with time





Kilfrost Geo[®]

Kilfrost Geo[®] is;

- ✓ **Classified as Non-Toxic** - According to REACH
- ✓ Free from MEG
- ✓ Specifically engineered for Ground and SWSHP closed loop installations
- ✓ Formulated using a sustainable and non-fossil fuel derived heat transfer fluid base fluid with viscosity modifiers
- ✓ Lower viscosity than both MPG and MEG based heat transfer fluids
- ✓ Leads to lower pressure drops and improved hydraulic performance
- ✓ Leads to improved heat transfer efficiency
- ✓ Includes ASTM-D1384 proven organic corrosion inhibitors (Free from nitrates, nitrites, phosphates and silicates)
- ✓ Patented technology



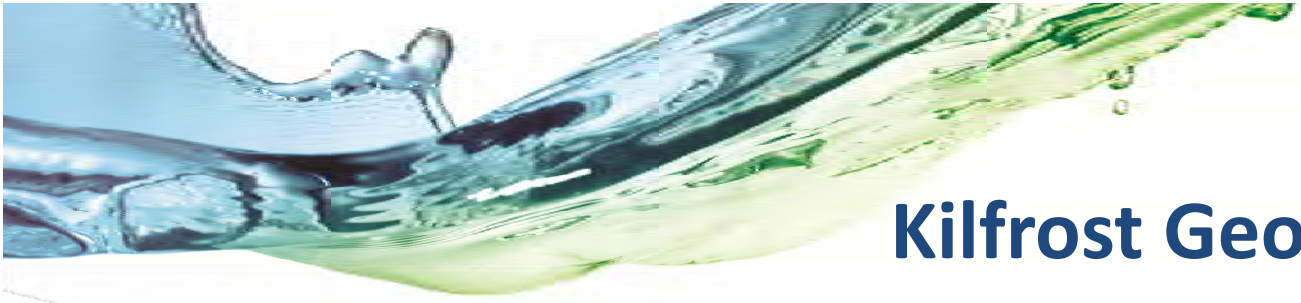
Kilfrost Geo[®] Benefits

Replacing an MPG based product with non-toxic Kilfrost Geo[®] will;

- Improve hydraulic efficiency - reduce pressure drops
 - Reduce pumping costs **and/or reduce reduce collector size?**
 - Improve Efficiency overall Increase COP / **Designed ErP**

Replacing an MEG based product with non-toxic Kilfrost Geo[®] will;

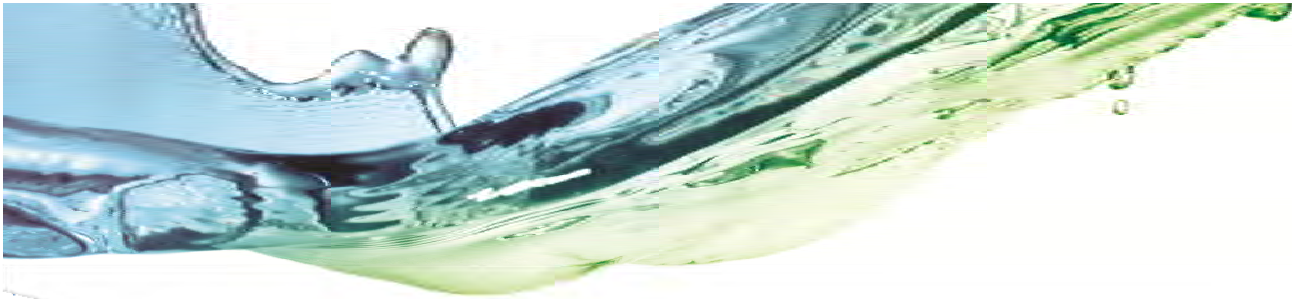
- Minimise environmental and human health risks
 - Improve heat transfer efficiency
 - No more compromising on performance vs risks



Kilfrost Geo[®] Summary

	Toxicity	Efficiency	Longevity
Kilfrost Geo	✓	✓	✓
MEG Based	✗	✓	✓
MPG Based	✓	✗	✓





Thank you!

Kilfrost

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