




It's time to be green ™

Sustainability with NMR Technology



NMR Technology

- ➔ Nucleo Molecular Regenerative
- ➔ Nanotechnology using Nanomagnetics
 - thin-film magnets
- ➔ 4 US Patents
- ➔ Thermal conductivity, superior metal stabilization, reduction of laminar friction, metal degradation prevention

History of NMR technology

- Synthetic Engine Oils- revolutionized the engine oil business
- PROA technology- Polarized refrigerant oil additives to enhance oil performance
- Nanomagnetism- NMR - surface chemistry for electron transfer

Nanomagnetics

Van der Waals forces

Inter molecular forces

Boundary layer phenomenon

Reduction of laminar friction
Increased refrigerant flow

Friction Reduction

Surface chemistry

Bubble Effect

Energy transfer in liquids

Oakridge National Lab and Dept of Energy

Performance tests



ASTM D2783 (test to failure): Extreme Pressure Properties of Lubricating Fluid (Four-Ball Method)

Temperature:	75 [±] /.2°C
Speed:	1760 [±] /.40 rpm
Duration:	10 [±] /.1 sec
Load:	5 [±] /.0.2 Kgf
Load Wear Index	60.0
Weld point, kg	295

Standard Refrigerant Oil

Weld Point, kg	Minimum Value	Maximum Value
Four Ball Test ASTM D2783	3	8.5

Average Load Wear Index	Minimum Value	Maximum Value
Four Ball Test ASTM D2783	120	145

ASTM D 2717: Thermal Conductivity of Petroleum Products

Thermal Conductivity @ 90 °F, Btu.in/hr.ft ² °F (Refrigeration Oil Only)	0.94
Thermal Conductivity @ 90 °F, Btu.in/hr.ft ² °F (10% PIX Additive + 90% Refrigeration Oil)	1.18

→ Benefits of PermaFrost®

PermaFrost® benefits can be summarized into two categories.

1. Direct benefits

Enhancement of cooling capacity or output.

2. Indirect benefits

Reduction of energy and maintenance costs.

Indirect benefits are benefits derived from the direct benefit that depend on improvement to the direct benefit.

New Applications of NMR

- Power Generation
- Aviation/Aerospace
- Composite material
- Circuit Boards
- Transportation



It's time to be green ™



1305 West Causeway, Suite 220
Mandeville, LA 70471

866.433.4715

www.powertronglobal.com