Shell Thermia Oil D

Heat transfer fluid

Shell Thermia Oil D is a higher viscosity heat transfer fluid for use in indirectly heated closed heat transfer systems. It is based on carefully selected highly refined mineral oils chosen for their ability to provide superior performance in heat transfer systems.

Applications

- ***Industrial heat transfer systems***
  For use in closed heat transfer systems used in chemical and process plant, textile manufacture etc. where the oil is circulated in a pumped system operating under atmospheric pressure with or without an inert gas blanket.

Shell Thermia D can be used in high temperature continuous heat transfer equipment with the following application limits:

Max. film temperature	340°C
Max. bulk temperature	320°C

Performance Features and Benefits

- **High oxidation and thermal stability**

Thermia D is based on carefully selected highly refined mineral oils and resists oil cracking, oxidation and thickening. This provides extended oil life, provided efficient fluid heating and good pump circulation is ensured, such that film temperatures on the heater surface do not exceed the limits above.

- **Excellent fluidity and high heat transfer coefficient**

Specially selected mineral oils ensure excellent fluidity and heat transfer over a wide temperature range.

- **Good solvency**

Resists deposit formation, holding oxidation products in solution and keeping internal surfaces of heat exchangers clean.

- **Low vapour pressure**

Resists cracking and minimises formation of volatile decomposition products requiring recovery via expansion chamber and condensate collector.

- **Non-corrosive**

Prevents corrosion of the internal surfaces of copper and steel heat exchanger and system components.

- **Non-toxic**

Mineral oil-based heat transfer fluids are safer to handle than some types of synthetic fluid. After reaching their useful life they can easily be collected for recycling or disposal.

Specifications and Approvals

Classified under ISO 6743-12 Family Q
Meets DIN 51522 requirements

Advice

The service life of Thermia D depends on the design and operation of the system. If the system is well designed and not subjected to abnormal workloads, the life can be many years.

It is important to monitor oil condition regularly as rates of change in physical characteristics are more significant than actual values. The properties that should be monitored are viscosity, acidity, flash point (open and closed) and insolubles content.

Advice on applications not covered in this leaflet may be obtained from your Shell representative.

Health & Safety

Guidance on Health and Safety are available on the appropriate Material Safety Data Sheet, which can be obtained from your Shell representative.

Protect the environment

Take used oil to an authorised collection point. Do not discharge into drains, soil or water

Typical Physical Characteristics

Thermia			**D**
Density at 15°C	kg/m^3	ISO 12185	885
Flash Point PMCC	°C	ISO 2719	252
Flash Point COC	°C	ISO 2592	270
Fire Point COC	°C	ISO 2592	290
Pour Point	°C	ISO 3016	-9
Kinematic Viscosity		ISO 3104	
at 20°C	mm^2/s		321
at 40°C	mm^2/s		97
at 100°C	mm^2/s		10.9
at 200°C	mm^2/s		2.09
at 300°C	mm^2/s		0.91
Initial Boiling Point	°C	ISO 3771	400
Neutralisation Value	mg KOH/g	ASTM D974	< 0.05
Water Content	%m/m	ISO 3733	< 0.1
Ash (Oxidation)	%m/m	ISO 6245	< 0.01
Carbon Residue (Conradson)	%m/m	ISO 10370	0.06
Copper Corrosion (3h/100°C)		ISO 2160	class 1
Coefficient of Thermal Expansion	per °C		0.0008

These characteristics are typical of current production. Whilst future production will conform to Shell's specification, variations in these characteristics may occur.

Typical Design Data - Thermia D:

Temperature	℃		0	20	40	100	150	200	250	300	340
Density	kg/m3		894	882	870	834	803	773	743	712	688
Specific Heat Capacity	kJ/kg*K		1.925	1.925	2.007	2.254	2.459	2.665	2.871	3.076	3.241
Thermal Conductivity	W/m*K		0.169	0.165	0.162	0.151	0.142	0.134	0.125	0.116	0.109
Prandtl No.			17582	3300	1048	135	56	32	22	17	15