



# Shell Thermia

## Heat Transfer Fluids

Shell Thermia Oils B and D are based on carefully selected highly refined mineral oils chosen for their ability to provide superior performance in indirect closed fluid heat transfer systems.

### Applications

- **Enclosed circulated heat transfer systems**  
for industrial applications such as process industry, chemical plants, textile producers etc. and in household equipment such as oil filled heaters

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

Thermia	B	D
Max. film temperature	340°C	340°C
Max. bulk temperature	250°C	280°C

### Performance Features and Benefits

- **High oxidation and thermal stability**  
Thermia B and D are based on carefully selected highly refined mineral oils. The rates of oil cracking and oxidation are very small, giving long oil life. This assumes an efficient fluid heater with good pump circulation that the film temperatures on the heater surface do not exceed the limits above.
- **Low viscosity and high heat transfer coefficient**  
Low viscosities enable excellent fluidity and heat transfer also at lower temperatures.
- **Good solvency**
- **Non-corrosive**
- **Low vapour pressure**
- **Non-toxic oils and easy disposal**  
Mineral oil heat transfer fluids are safer to handle than synthetic fluids. After service they can easily be collected as used oil for recycling or disposal.

### Specification and Approvals

Classified as ISO 6743-12 Family Q  
Meets typically DIN 51522 requirements

### Advice

The life of Thermia oils depends on the design and usage of the system. If the system is well designed and not subjected to abnormal workloads, the life can be for 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. For contact details see page ii in the front of this binder.

### Health and 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			<b>B</b>	<b>D</b>
Density at 15 °C	kg/l	ISO 12185	0.868	0.881
Flash Point PMCC	°C	ISO 2719	220	268
Flash Point COC	°C	ISO 2592	230	
Fire Point COC	°C	ISO 2592	255	
Pour Point	°C	ISO 3016	-12	-6
Kinematic Viscosity		ISO 3104		
at 0 °C	mm <sup>2</sup> /s		230	
at 40 °C	mm <sup>2</sup> /s		25	108
at 100 °C	mm <sup>2</sup> /s		4.7	11.8
at 200 °C	mm <sup>2</sup> /s		1.2	
Initial Boiling Point	°C	ISO 3771	> 355	
Autoignition Temperature	°C	DIN 51794	360	
Neutralisation Value	mgKOH/g	ASTM D974	< 0.05	
Water Content	%m/m	ISO 3733	< 0.1	
Ash (Oxid)	%m/m	ISO 6245	< 0.01	
Carbon Residue (Conradson)	%m/m	ISO 10370	0.02	
Copper Corrosion (3h/100°C)		ISO 2160	class 1	
Coefficient of Thermal Expansion	1/°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 B:

Temperature	°C	0	20	40	100	150	200	250	300	340
Density	kg/l	0.876	0.863	0.850	0.811	0.778	0.746	0.713	0.681	0.655
Specific Heat Capacity	kJ/kg*K	1.809	1.882	1.954	2.173	2.355	2.538	2.72	2.902	3.048
Thermal Conductivity	W/m*K	0.136	0.134	0.133	0.128	0.125	0.121	0.118	0.114	0.111
Prandtl No.		3375	919	375	69	32	20	14	11	9
Vapour Pressure	mbar	-	-	-	-	-	5	26	100	260

### Thermia D:

Temperature	°C	0	20	40	100	150	200	250	280
Density	kg/l	0.911	0.900	0.888	0.849	0.819	0.788	0.748	0.737
Specific Heat Capacity	kJ/kg*K	1.87	1.93	2.00	2.20	2.36	2.54	2.70	2.80
Thermal Conductivity	W/m*K	0.130	0.128	0.1264	0.1217	0.1172	0.113	0.109	0.108
Prandtl No.		-	6000	1000	165	59	33	22	9