

# MAK THERMIC FLUID A

## High performance heat transfer fluid

MAK Thermic Fluid A is a new generation, superior quality heat transfer oil formulated exclusively from highly refined base stock and specially chosen additive. The antioxidant additive provides excellent resistance to oxidation and thermal break down of the oil and ensures longer operating life. This oil has a very high flash point, low vapour pressure and low volatility. MAK Thermic Fluid A is compatible with seal materials normally used in heat transfer systems with mineral oil.

### Applications:

MAK Thermic Fluid A is developed for indirect heating in a closed system with forced circulation. It is recommended for heat transfer systems for industrial applications like chemical plants, process heating, textile plants etc. It is also suitable for applications where repeated heating and cooling cycles are involved. MAK Thermic Fluid A can be used in continuous heat transfer system with the following temperature limit:

Max. Bulk Temperature: 300°C

### Performance/ Benefits:

**Excellent Oxidation Resistance** – Outstanding resistance to sludge and deposit formation even when the oil undergoes repeated heating and cooling cycles. Dual-stage-antioxidant system keeps heat exchanger surface clean. Longer operating life and lower operating cost.

**Excellent Thermal Stability** – provides resistance to break down and deposit formation inside the piping for optimum life and performance.

**Low Viscosity** – low viscosity assures excellent fluidity and heat transfer over a wide temperature range.

**Low Volatility and Low Vapour Pressure** – low volatility coupled with low vapour pressure and high flash point indicates low evaporative loss. Reduces top up quantity. Low vapour pressure resists cracking and minimises the formation of volatile decomposition products.

**Excellent Thermal Conductivity** – high heat transfer coefficient ensures rapid heating. Potential for saving of fuel consumption.

**Consistent Performance** – offers extended oil life, good pump circulation and efficient fluid heating. Enhances life of rotary seal and pump.

**Non-Corrosive and Non-Toxic** – no corrosion of the piping and other system elements. Provides safe working environment to the operators.

### Specification:

- IS 14745:1999 (Reaffirmed 2014) for Thermic Fluid - Medium

### Typical Physico-Chemical Data: MAK Thermic Fluid A

Characteristics	Method	Value
Appearance	Visual	Clear & Bright
Colour	Visual	Light Yellow
Density, g/cc @15°C	ASTM D1298	0.859
Copper Corrosion, 100°C, 3 hrs.	ASTM D130	1a
Pour Point, °C,	ASTM D97	-18
Flash Point, COC, °C	ASTM D92	238
Fire Point, COC, °C	ASTM D92	268
Kinematic Viscosity @40°C, cSt	ASTM D445	31.5
Kinematic Viscosity @100°C, cSt	ASTM D94	5.54
Viscosity Index	ASTM D2270	115
Initial Boiling Point, °C	ASTM D1160	380
Final Boiling Point, °C	ASTM D1160	480
Neutralisation Value, mg KOH/ g	ASTM D664	<0.2
Co-efficient of Thermal Expansion, per °C	--	0.00080
Thermal Conductivity @29.5°C, Cal/cm. S °C	--	0.000321

### Storage & Handling:

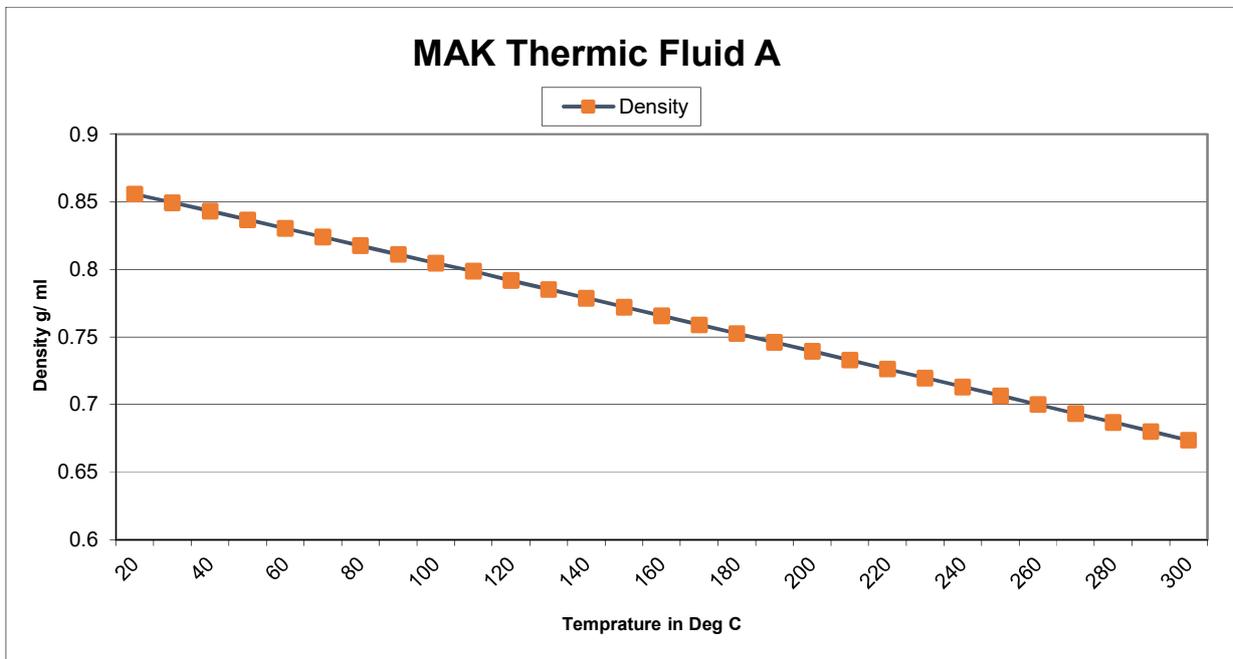
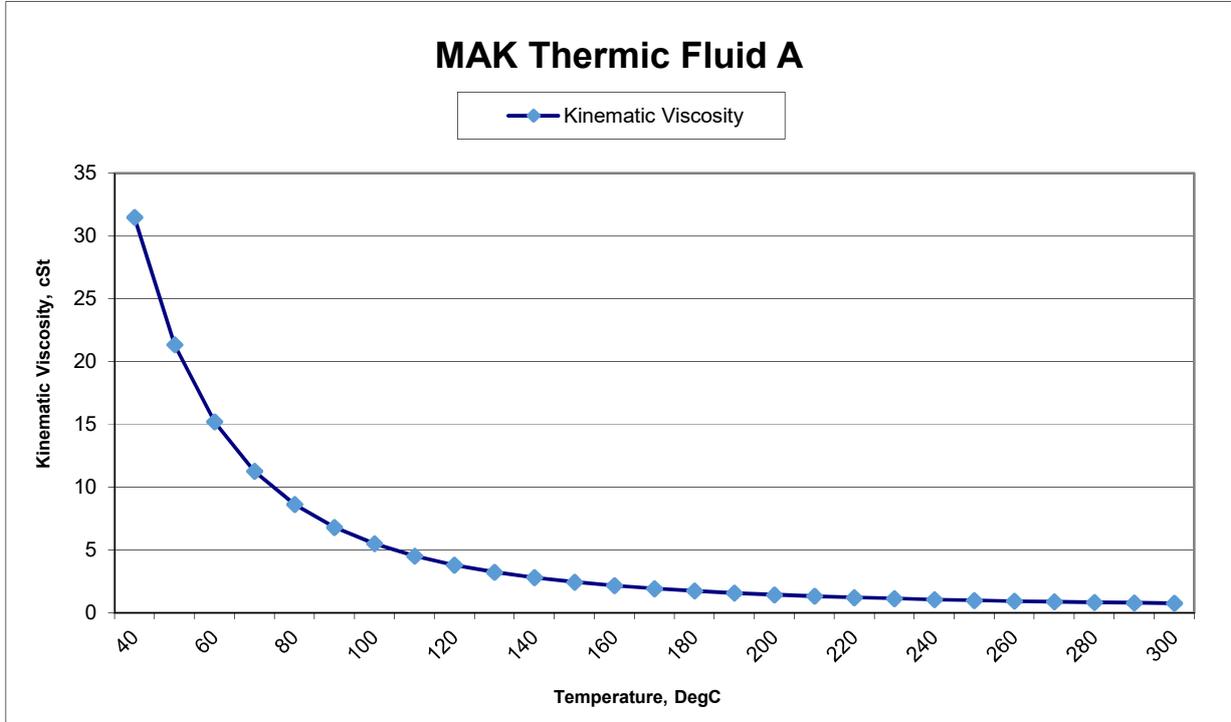
The product should be stored inside. Keep it properly sealed to avoid contamination. Avoid freezing. Shelf life is 5 yrs. under protected storage conditions.

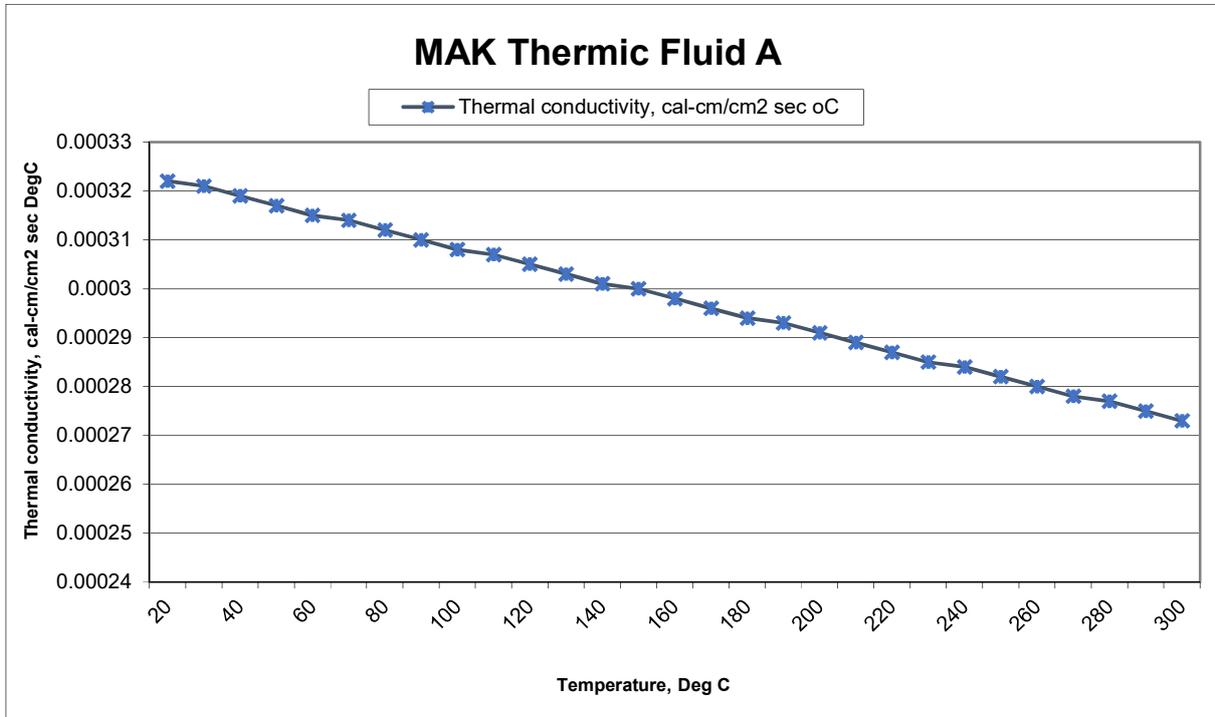
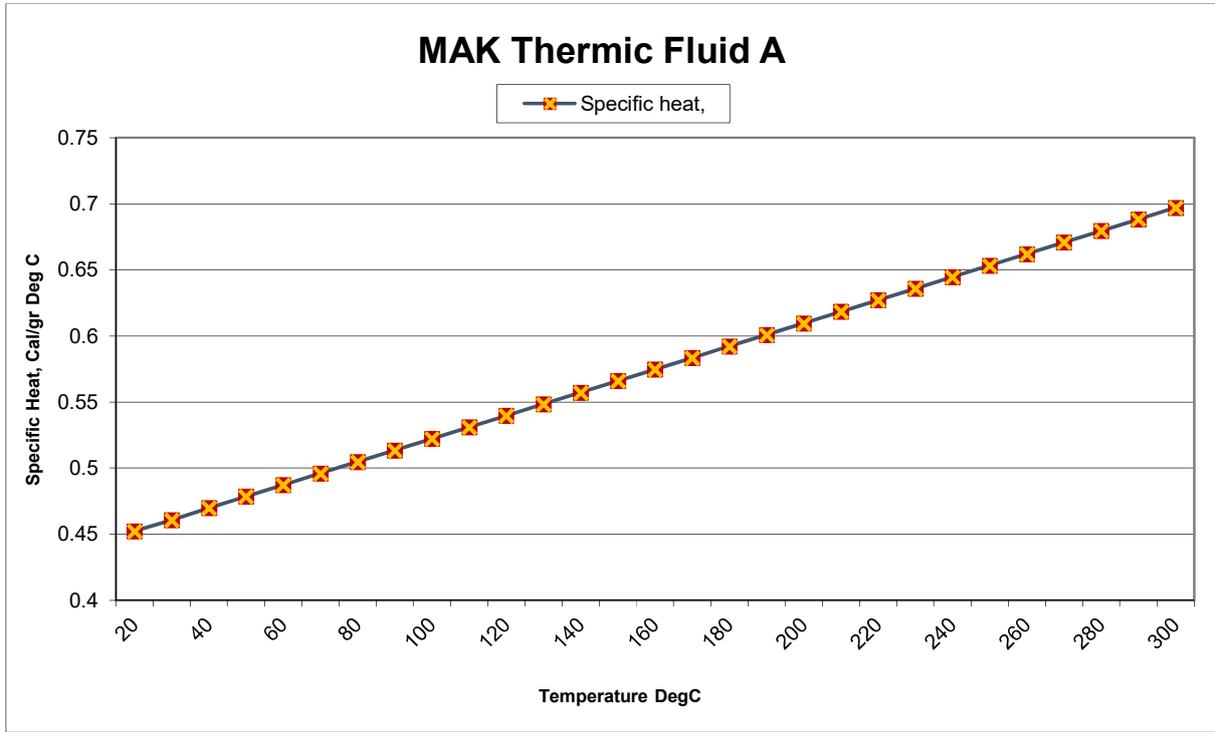
### Health & Safety:

They are unlikely to be hazardous when properly used in recommended applications. Contamination of the oil from other oils, greases, chemicals, dirty water etc. can occur during the use. It should be avoided. Regular monitoring of the in-use product is recommended.



### Additional Data:





**MAK Thermic Fluid A**

Temperature, °C	15	20	30	40	50	60	70	80
Kinematic Viscosity, cSt				31.5	21.36	15.21	11.27	8.64
Density, g/ml	0.859	0.8558	0.8495	0.8432	0.8368	0.8305	0.824	0.8176
Specific heat, cal/g °C	0.447928	0.452298	0.4606	0.469777	0.478517	0.487256	0.495996	0.504735
Thermal conductivity, cal/cm sec °C	0.000323	0.000322	0.00032	0.000319	0.000317	0.000315	0.000314	0.000312

Temperature, °C	90	100	110	120	130	140	150	160
Kinematic Viscosity, cSt	6.81	5.51	4.54	3.81	3.25	2.81	2.46	2.17
Density, g/ml	0.8112	0.8047	0.7987	0.7918	0.7853	0.7788	0.7722	0.7657
Specific heat, cal/g °C	0.513475	0.522214	0.530954	0.539693	0.548433	0.557172	0.565912	0.574652
Thermal conductivity, cal/cm sec °C	0.00031	0.000308	0.000307	0.000305	0.000303	0.000301	0.0003	0.000298

Temperature, °C	170	180	190	200	210	220	230	240
Kinematic Viscosity, cSt	1.94	1.75	1.58	1.44	1.33	1.22	1.14	1.06
Density, g/ml	0.7591	0.7526	0.746	0.7395	0.7329	0.7263	0.7197	0.7131
Specific heat, cal/g °C	0.583391	0.592131	0.60087	0.60961	0.618349	0.627089	0.635828	0.644568
Thermal conductivity, cal/cm sec °C	0.000296	0.000294	0.000293	0.000291	0.000289	0.000287	0.000285	0.000284

Temperature, °C	250	260	270	280	290	300		
Kinematic Viscosity, cSt	0.997	0.938	0.886	0.839	0.798	0.76		
Density, g/ml	0.7066	0.7000	0.6934	0.6868	0.6802	0.6736		
Specific heat, cal/g °C	0.653307	0.662047	0.670786	0.679526	0.688266	0.697005		
Thermal conductivity, cal/cm sec °C	0.000282	0.00028	0.000278	0.000277	0.000275	0.000273		