MAK THERMIC FLUID SYNTH

High performance synthetic heat transfer fluid

MAK THERMIC FLUID SYNTH is a fully synthetic superior quality heat transfer oil formulated from selected base stocks and additive system, to provide reliable and consistent heat transfer performance over long period of service life. This oil has a relatively high flash point, low vapour pressure and low volatility. It is compatible with most of the mineral oils normally used in heat transfer systems.

Applications:

MAK THERMIC FLUID SYNTH 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 SYNTH can be used in continuous heat transfer system with the following temperature limit:
Extended maximum use temperature: 315^{O}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:

- Proprietary grade

Typical Physico-Chemical Data: MAK THERMIC FLUID SYNTH

Characteristics	Method	Value
Appearance	Visual	Clear & Bright
Colour	Visual	Light Yellow
Density, g/cc @15^{O}C	ASTM D1298	0.862
Copper Corrosion, 100^{O}C, 3 hrs.	ASTM D130	1a
Flash Point, COC, ^{O}C	ASTM D92	210
Fire Point, COC, ^{O}C	ASTM D92	268
Kinematic Viscosity @40^{O}C, cSt	ASTM D445	21.0
Kinematic Viscosity @100^{O}C, cSt	ASTM D94	4.1
Viscosity Index	ASTM D2270	90
Initial Boiling Point, ^{O}C	ASTM D1160	370
Final Boiling Point, ^{O}C	ASTM D1160	420
Neutralisation Value, mg KOH/ g	ASTM D664	<0.1
Co-efficient of Thermal Expansion, per ^{O}C	--	0.000798
Thermal Conductivity @29.5^{O}C, Cal/cm. S ^{O}C	--	0.000322

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.

Product and Application Development Deptt.
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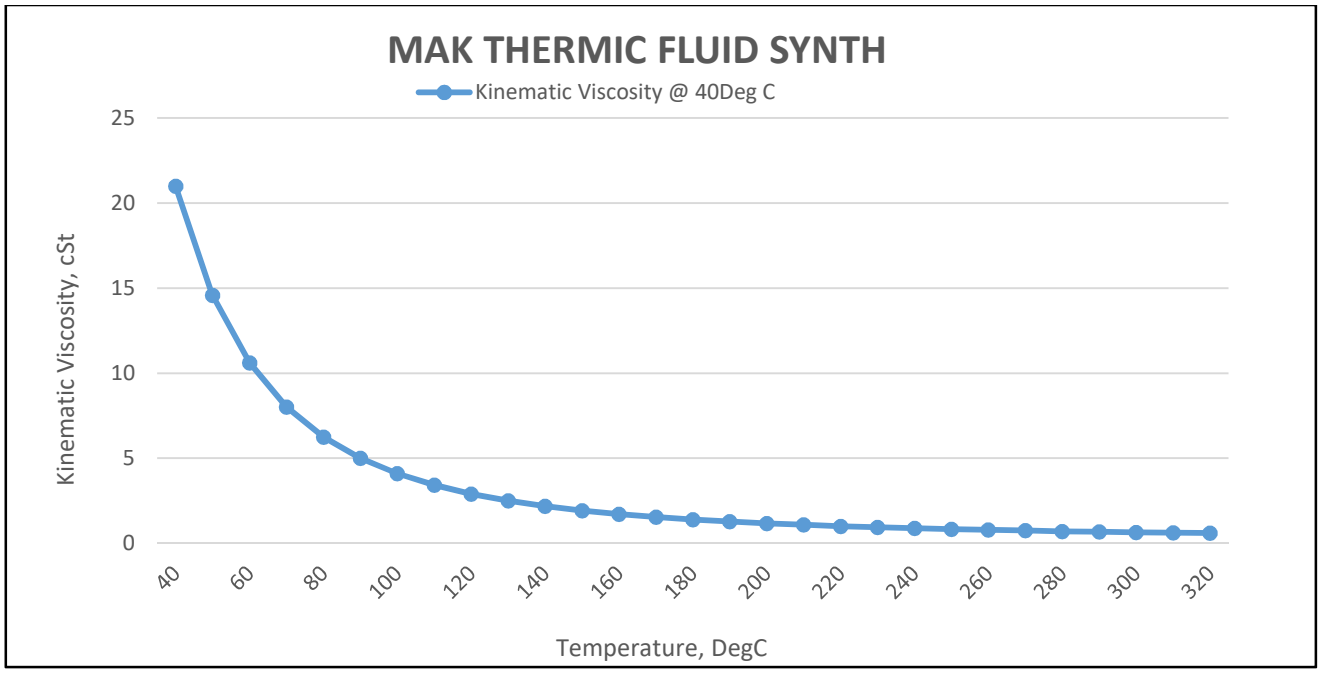
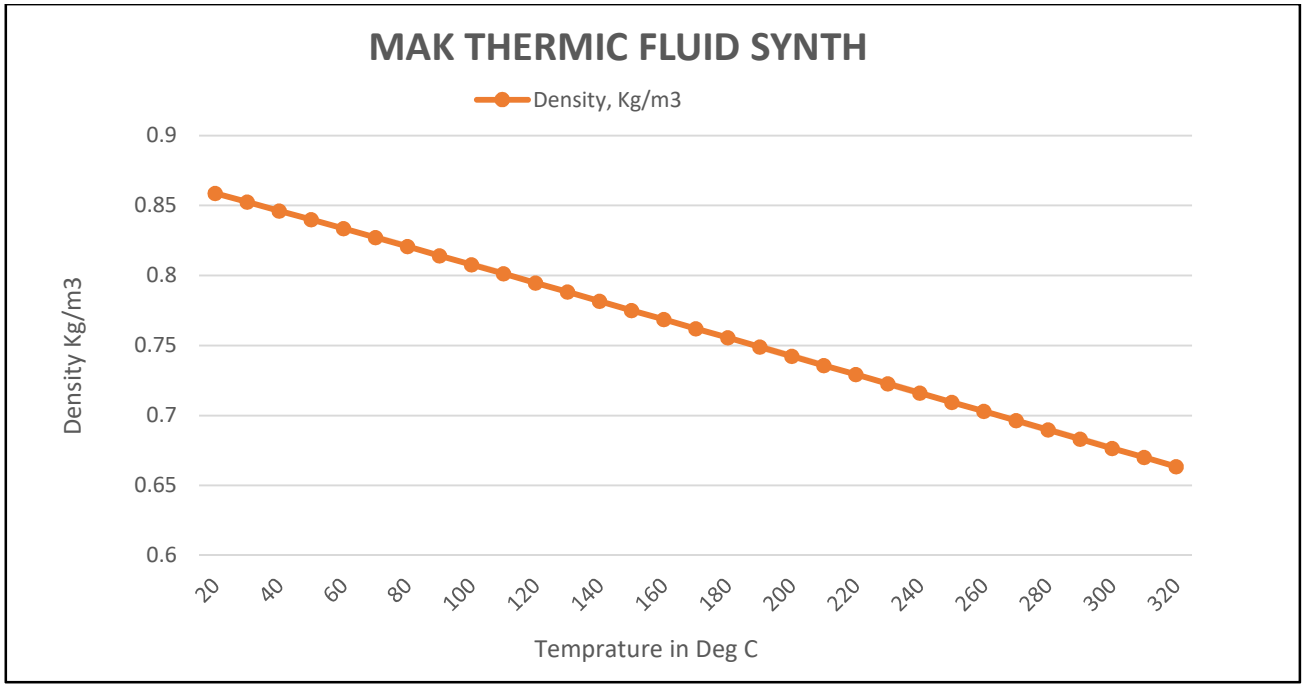
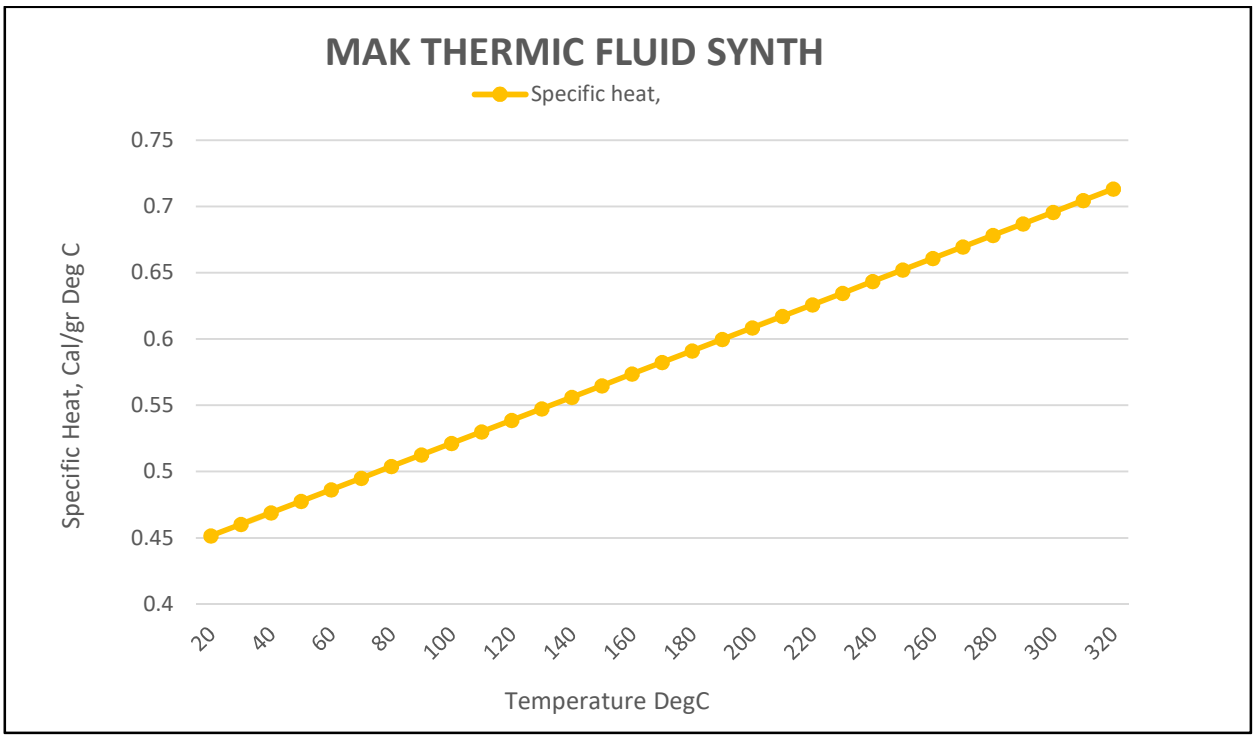
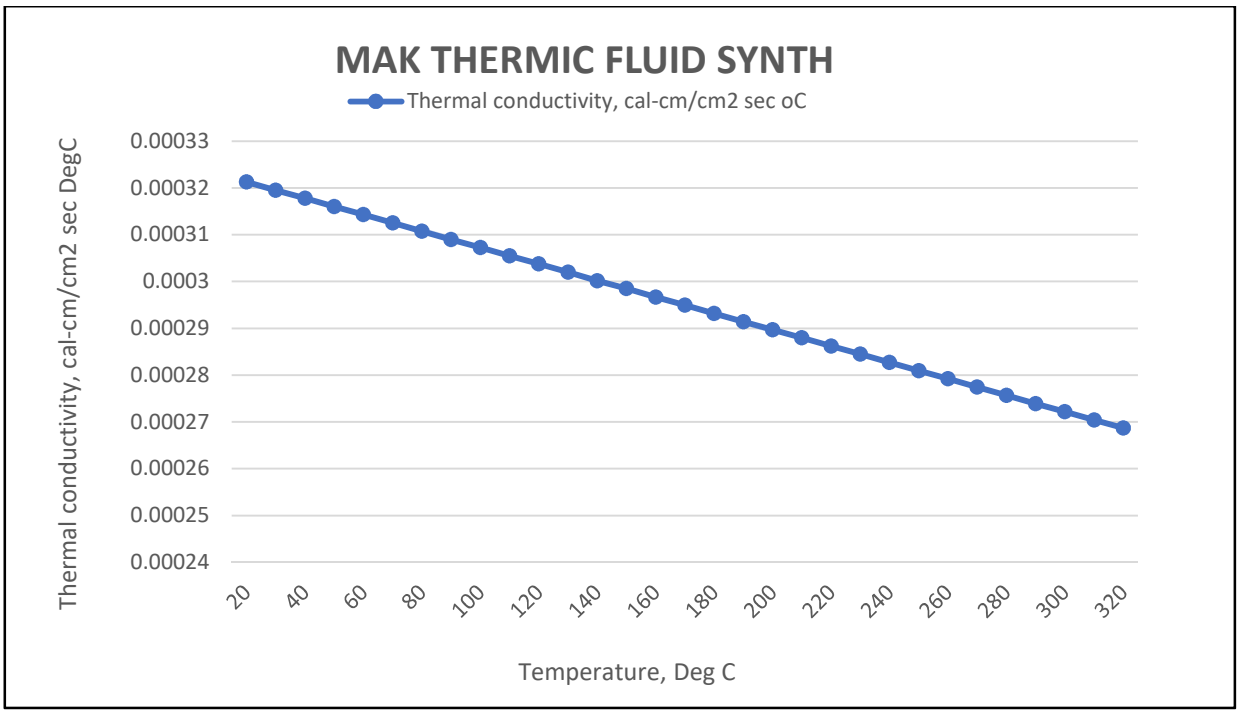
Additional Data:






MAK THERMIC FLUID SYNTH
Specific heat,
Specific Heat, Cal/gr Deg C
0.75
0.7
0.65
0.6
0.55
0.5
0.45
0.4
20 40 60 80 100 120 140 160 180 200 220 240 260 280 300 320
Temperature DegC


MAK THERMIC FLUID SYNTH
Thermal conductivity, cal-cm/cm2 sec oC
Thermal conductivity, cal-cm/cm2 sec DegC
0.00033
0.00032
0.00031
0.0003
0.00029
0.00028
0.00027
0.00026
0.00025
0.00024
20 40 60 80 100 120 140 160 180 200 220 240 260 280 300 320
Temperature, Deg C

MAK THERMIC FLUID SYNTH

Temperature, ^{O}C	15	20	30	40	50	60	70	80
Kinematic Viscosity, cSt				21.0	14.59	10.61	8.01	6.25
Density, g/ml	0.862	0.8588	0.8525	0.8462	0.8399	0.8335	0.8271	0.8207
Specific heat, cal/g ^{O}C	0.447148	0.45151	0.46023	0.468958	0.477683	0.486407	0.495132	0.503856
Thermal conductivity, cal/cm sec ^{O}C	0.000322	0.000321	0.00032	0.000318	0.000316	0.000314	0.000313	0.000311

Temperature, ^{O}C	90	100	110	120	130	140	150	160
Kinematic Viscosity, cSt	5.0	4.1	3.42	2.91	2.51	2.19	1.93	1.72
Density, g/ml	0.8142	0.8078	0.8013	0.7948	0.7883	0.7818	0.7752	0.7687
Specific heat, cal/g ^{O}C	0.51258	0.521305	0.530029	0.538753	0.547478	0.556202	0.564926	0.573651
Thermal conductivity, cal/cm sec ^{O}C	0.000309	0.000307	0.000306	0.000304	0.000302	0.0003	0.000299	0.000297

Temperature, ^{O}C	170	180	190	200	210	220	230	240
Kinematic Viscosity, cSt	1.55	1.4	1.28	1.18	1.09	1.01	0.94	0.89
Density, g/ml	0.7621	0.7556	0.749	0.7425	0.7359	0.7293	0.7227	0.7161
Specific heat, cal/g ^{O}C	0.582375	0.591099	0.599823	0.608547	0.617272	0.625996	0.63472	0.643445
Thermal conductivity, cal/cm sec ^{O}C	0.000295	0.000293	0.000291	0.00029	0.000288	0.000286	0.000284	0.000283

Temperature, ^{O}C	250	260	270	280	290	300	310	320
Kinematic Viscosity, cSt	0.83	0.79	0.75	0.71	0.68	0.65	0.63	0.6
Density, g/ml	0.7096	0.7030	0.6964	0.6898	0.6832	0.6767	0.6701	0.6636
Specific heat, cal/g ^{O}C	0.65217	0.660893	0.669619	0.678342	0.687067	0.695791	0.704515	0.713239
Thermal conductivity, cal/cm sec ^{O}C	0.000281	0.000279	0.000277	0.000276	0.000274	0.000272	0.00027	0.000269