



# TECHNICAL DATA

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## #281 HEAT TRANSFER OIL

Heat Transfer Oil is a non-corrosive, non-fouling, paraffinic heat transfer fluid that is formulated to provide fast and efficient heat transfer when used in open loop or closed system applications with expansion tank temperatures up to 600°F (315°C). Heat Transfer Oil's operability temperature is from 20°F (-7°C) to a maximum film temperature of 600°F (315°C)

Heat Transfer Oil is blended from the finest select high viscosity index severely solvent refined, severely hydrotreated 100% pure paraffin base oils available. These 100% pure paraffin base oils allow Heat Transfer Oil to exhibit the following performance characteristics:

1. **High Viscosity Index** – This results in a minimum change in viscosity over a broad temperature range.
2. **High Thermal and Oxidative Stability** – This results in the product having resistance to cracking, carbon, sludge, varnish and lacquer formation during high temperature operation.
3. **Low Volatility Characteristics** – The low volatility of paraffin base oils results in lower makeup requirements, eliminates vapor lock in circulating pumps and reduces the possibility of cavitation.
4. **Flash and Fire Points Significantly Above 400°F (204°C) and Auto-Ignition Temperature Above 608°F (320°C).**

Besides these performance benefits Heat Transfer Oil also offers the following benefits:

1. High thermal efficiency for rapid and efficient transfer of heat.
2. Low vapor pressure at elevated temperatures and high boiling point to prevent pressure build-up.
3. Non-corrosive to system parts.
4. Excellent hydrolytic stability and resistance to emulsification with water.
5. Excellent compatibility with other petroleum base heat transfer oils.
6. Excellent compatibility with all types of seals, materials of construction and finishes commonly used in heat transfer systems.
7. Non-fouling on degradation.
8. Virtually odorless and essentially non-toxic.
9. Long service life for proven trouble-free operation.

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**TYPICAL PROPERTIES**

Specific Gravity 60°F	.874
Viscosity cSt, @ 40°C	41.5-47.5
Viscosity cSt, @ 100°C	6.5-7.2
Viscosity Index (ASTM D-2270)	100
Flash Point °F/°C (ASTM D-92)	445°/229.44°
Fire Point °F/°C (ASTM D-92)	480°/248.89°
Auto-ignition Temperature °F/°C	695°/368.33°
Pour Point °F/°C (ASTM D-97)	5°/-15°
Conradson Carbon % (ASTM D-189)	0.02
Ramsbottom Carbon Mass % (ASTM D-524)	0.05
Aniline Point °F/°C (ASTM D-611)	227°/108.33°
Total Acid No. (ASTM D-664)	0.1
Copper Strip Corrosion Test (ASTM D-130)	1a
Vapor Pressure (ASTM D-2879) mm Hg @ 68°F/20°C	<0.1
Noack Volatility (ASTM D-5800) % Evaporation Loss @ 150°C	9.5
Coefficient of Thermal Expansion	5.0 X10 <sup>-4</sup> /°F
Coefficient of Thermal Expansion	9.0 X10 <sup>-4</sup> /°C
Thermal Conductivity Btu-inches/hr-sq ft-°F	
20°F/-7°C	0.930540824
32°F/-0°C	0.93020595
100°F/-38°C	0.911227789
122°F/50°C	0.90508747
212°F/100°C	0.879974829
250°F/121°C	0.869368612
300°F/149°C	0.855415552
302°F/150°C	0.85485743
392°F/200°C	0.829741923
400°F/204°C	0.827509434
450°F/232°C	0.813556375
482°F/250°C	0.804626417
500°F/269°C	0.799603315
600°F/315°C	0.771697197

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Thermal Conductivity Watt/Meter-k (W/M-°K)	
20°F/-7°C	0.134209939
32°F/-0°C	0.13416164
100°F/-38°C	0.13142446
122°F/50°C	0.130538855
212°F/100°C	0.1269196912
250°F/121°C	0.1253872
300°F/149°C	0.123374779
302°F/150°C	0.123294282
392°F/200°C	0.119671926
400°F/204°C	0.119349939
450°F/232°C	0.117337518
482°F/250°C	0.116049569
500°F/269°C	0.115325098
600°F/315°C	0.111300258
Specific Heat Btu/lb/°F	
20°F/-7°C	0.424653581
32°F/-0°C	0.430404525
100°F/-38°C	0.463121104
122°F/50°C	0.473709785
212°F/100°C	0.517027117
250°F/121°C	0.535316657
300°F/149°C	0.550381841
302°F/150°C	0.56034449
392°F/200°C	0.603661781
400°F/204°C	0.60751221
450°F/232°C	0.631577394
482°F/250°C	0.646979112
500°F/269°C	0.655642579
600°F/315°C	0.703772948

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Specific Heat Kilojoule/kilogram-K (kj/kg-°K)	
20°F/-7°C	1.776750583
32°F/-0°C	1.800812533
100°F/-38°C	1.937698699
122°F/50°C	1.98200174
212°F/100°C	2.163241458
250°F/121°C	2.239764893
300°F/149°C	2.340453623
302°F/150°C	2.344481175
392°F/200°C	2.525720892
400°F/204°C	2.541831087
450°F/232°C	2.642519816
482°F/250°C	2.706960605
500°F/269°C	2.743208551
600°F/315°C	2.944586014
Thermal Diffusivity in <sup>2</sup> /hr	
20°F/-7°C	0.463
32°F/-0°C	0.463
100°F/-38°C	0.452
122°F/50°C	0.452
212°F/100°C	0.451
250°F/121°C	0.435
300°F/149°C	0.424
302°F/150°C	0.424
392°F/200°C	0.419
400°F/204°C	0.413
450°F/232°C	0.407
482°F/250°C	0.407
500°F/269°C	0.402
600°F/315°C	0.391

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Thermal Diffusivity mm <sup>2</sup> /s	
20°F/-7°C	0.083
32°F/0°C	0.083
100°F/-38°C	0.081
122°F/50°C	0.081
212°F/100°C	0.079
250°F/121°C	0.078
300°F/149°C	0.076
302°F/150°C	0.076
392°F/200°C	0.075
400°F/204°C	0.074
450°F/232°C	0.073
482°F/250°C	0.072
500°F/269°C	0.072
600°F/315°C	0.070