

# NuTherm HC-20

## Technical Data Sheet

## NuTherm HC-20

High performance, Potassium Formate/Water-based closed system heat transfer fluid ideal for low temperature applications

### Description:

**NuTherm HC-20** is a high performance heat transfer fluid designed as an alternative to less effective glycol, PAG, and Calcium Chloride closed system fluids. **NuTherm HC-20** is non-toxic, non-flammable, and has a robust corrosion inhibition package making it ideal for use in closed systems down to  $-20^{\circ}\text{C}$  ( $-4^{\circ}\text{F}$ ) and up to  $218^{\circ}\text{C}$  ( $425^{\circ}\text{F}$ ).

**NuTherm HC-20** has superior thermophysical properties in comparison to traditional closed system heat transfer fluids, including higher thermal conductivity and specific heat, as well as lower viscosity, making it an extraordinarily more efficient closed system coolant within its operational temperature range.

**NuTherm HC-20** is non-hazardous, biodegradable, CFC-free, antimicrobial, and has exceptional thermal stability at high temperatures in comparison to glycols, PAG's, Calcium Chloride, Trichloroethylene and Methylene Chloride (Dichloromethane) making it an intelligent alternative. **NuTherm HC-20** is formulated with an incredibly robust and efficient corrosion inhibition package, allowing the product to be used on most metals including Stainless Steel, Carbon Steel, Cast Steel, Copper and its alloys (Brass & Bronze), Monel, Nickel, Hastelloy, Inconel, Tantalum, Titanium, Titanium alloys (Ti6Al4V), Aluminium and Cast Iron. Do not use on Zinc, Zinc-plated or galvanized metals, Magnesium. **NuTherm HC-20** corrosion tests at  $80^{\circ}\text{C}$  show incredible results of x mmpy (x mpy) on C260 Brass alloys, x mmpy (x mpy) on 304L Stainless Steel, and x mmpy (x mpy) on AL1100 Aluminium. **NuTherm HC-20 does not produce pitting corrosion on Aluminium alloys like other Potassium Formate open bath heat transfer fluids.**

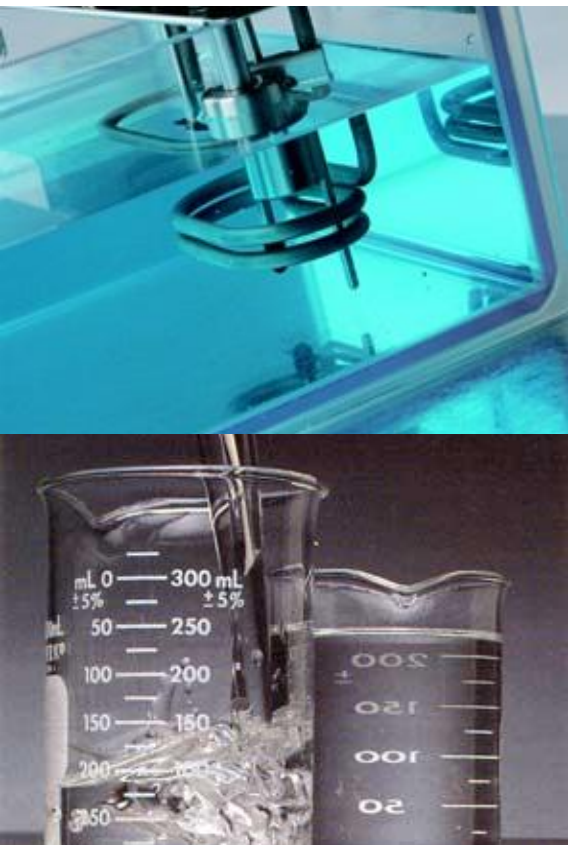
\*mmpy = millimeters per year; mpy = mils per year (1 mil = 0.001 inch); In general, uniform corrosion rates less than 2 mpy are acceptable for most applications. Corrosion rates between 2 and 10 mpy are considered marginal and may impact useful life of equipment. Corrosion rates greater than 10 mpy are unacceptable.



## Product Benefits

- High thermal conductivity
- High specific heat
- Low viscosity
- Non-toxic, non-flammable
- High metal compatibility
- Biodegradable
- Environmentally friendly (CFC-free)
- Robust corrosion inhibition
- Economical
- Pre-mixed solutions

# NuTherm HC-20 Physical Properties



## NuTherm HC-20

BULK DENSITY	10.32 #/gal
SPECIFIC GRAVITY @ 20 °C	1.237 g/cm <sup>3</sup>
TEMPERATURE RANGE (CLOSED SYSTEM)	-20 to 218°C (-4 to 425°F)
THERMAL STABILITY	HIGH
ODOR	ODORLESS
FLASH POINT (°C)	NONE
FIRE POINT (°C)	NONE
MELTING POINT / FREEZING POINT	-30°C (-22°F)
BOILING POINT	110°C (230°F)
pH	8.0 to 8.5
APPEARANCE and COLOR	CLEAR, COLORLESS to AMBER

**Availability:** 5-gallon pails, 55-gallon drums, 275-gallon tote-bins, and bulk tankers.

**Shipment:** Non-Hazardous for transport via DOT, IMDG, and IATA.

**Storage:** Keep out of direct sunlight. Keep from freezing. Store between 4 to 38°F (40-100°F).

**Disposal:** Dispose of in accordance with local, state, and federal regulations.

**1155 Park Avenue  
Emeryville, CA 94608**

(888) 99-NuGen  
(888) 996-8436  
Fax (707) 891-3012

[www.NuGenTec.com](http://www.NuGenTec.com)  
[Oilfield@NuGenTec.com](mailto:Oilfield@NuGenTec.com)

### EMERGENCY OVERVIEW:

This product may cause serious irritation to the eyes.

### SAFETY:

Please make sure you have read and understand the product label and SDS before using this product. Use proper chemical hygiene when handling product. Wash thoroughly after handling. Observe label precautions. This product is classified and labeled according to the Globally Harmonized System (GHS).

# NuTherm HC-20 Properties



Temperature (°F)	Viscosity (cPs)	Thermal Conductivity (BTU/hr•ft•°F)	Specific Heat (BTU/lb•°F)	Density (lb/ft <sup>3</sup> )
-4	4.50	0.284	0.745	78.4
0	4.30	0.285	0.746	78.3
20	3.40	0.292	0.752	77.9
40	2.80	0.298	0.759	77.6
60	2.30	0.305	0.765	77.2
80	1.90	0.311	0.771	76.9
100	1.60	0.318	0.777	76.5
120	1.40	0.324	0.784	76.1
140	1.20	0.331	0.790	75.8
160	1.00	0.337	0.796	75.4
180	0.93	0.344	0.803	75.1
200	0.82	0.351	0.809	74.7
220	0.73	0.357	0.815	74.3
240	0.66	0.364	0.821	74.0
260	0.60	0.370	0.828	73.6
280	0.54	0.377	0.834	73.3
300	0.50	0.383	0.840	72.9
320	0.46	0.390	0.846	72.6
340	0.42	0.396	0.853	72.2
360	0.39	0.403	0.859	71.8
380	0.36	0.409	0.865	71.5
400	0.34	0.416	0.871	71.1
420	0.32	0.422	0.878	70.8
425	0.31	0.424	0.879	70.7

Temperature (°C)	Viscosity (mPa•s)	Thermal Conductivity (W/m•K)	Specific Heat (kJ/kg•K)	Density (kg/m <sup>3</sup> )
-20	4.50	0.483	3.117	1258
-10	3.60	0.493	3.141	1253
0	3.00	0.503	3.164	1248
10	2.50	0.513	3.188	1242
20	2.10	0.523	3.212	1237
30	1.80	0.533	3.235	1232
40	1.60	0.543	3.259	1227
50	1.40	0.553	3.282	1222
60	1.20	0.563	3.306	1216
70	1.10	0.573	3.330	1211
80	0.95	0.583	3.353	1206
90	0.85	0.593	3.377	1201
100	0.77	0.603	3.400	1196
120	0.70	0.613	3.424	1191
130	0.63	0.623	3.448	1185
140	0.58	0.633	3.471	1180
150	0.54	0.643	3.495	1175
160	0.49	0.653	3.518	1170
170	0.46	0.663	3.542	1165
180	0.43	0.673	3.566	1159
190	0.40	0.683	3.589	1154
200	0.37	0.693	3.613	1149
210	0.35	0.703	3.636	1144
220	0.33	0.713	3.660	1139

# NuTherm HC-20 Properties



## Vapor Pressure

Temperature (°C)	Temperature (°F)	Vapor Pressure (psia)
20	68	0.30
30	86	0.40
40	104	0.66
50	122	1.16
60	140	1.99
70	158	3.26
80	176	5.11
90	194	7.68
100	212	11.2
110	230	15.8
120	248	21.8
130	266	29.6
140	284	39.4
150	302	51.8
160	320	67.1
170	338	86.1
180	356	109.2
190	374	137.3
200	392	171.2
210	410	211.7
218	424	249.5

## Gasket & Polymer Compatibility

Material	Compatibility
Nitrile / NBR	Excellent to 150°F, Good above 150°F
Hydrogenated Nitrile / HNBR	Excellent
Ethylene Propylene / EP, EPDM	Excellent
Chloropropene	Good
Isobutylene / IIR Latex	Good
Synthetic Isoprene / NR (Natural Rubber)	Good / Excellent
Natural Isoprene / NR (Natural Rubber)	Good / Excellent
Chemraz Kalrez / FFKM	Excellent
PTEF / FEP (Teflon)	Excellent
Gylon Style 3500,3504, 3510	Excellent
Nylon / Polyamide	Good / Excellent
Polyvinyl Chloride / PVC	Good / Excellent
Polyethylene	Excellent
Polypropylene	Excellent
Epoxy	Good / Excellent
Graphite	Excellent

## Metals Compatibility (Closed System)

Material	Compatibility
Aluminium*	Compatible
Cast Steel	Compatible
Monel	Compatible
Brass	Compatible
Copper	Compatible
Nickel	Compatible
Bronze	Compatible
Hastelloy	Compatible
Stainless Steel	Compatible
Carbon Steel	Compatible
Inconel	Compatible
Tantalum	Compatible
Cast Iron*	Compatible
Incoloy 825	Compatible
Titanium	Compatible
Ti6Al4V	Compatible
Zinc**	Incompatible
Zinc Plating**	Incompatible
Galvanized Surfaces**	Incompatible
Magnesium**	Incompatible

\*Recommended for use only in closed, airtight systems that have been purged with an inert gas, such as Nitrogen, in the headspace.

\*\*May be used for support framing, electrical conduit, and structural components. If product spills or splashes on any metals, rinse immediately with water to prevent surface discoloration.