

PIROBLOC

HEATING BETTER



HTF-FDA HT1 NSF

Synthetic Heat Transfer Fluid
Food Grade

Pirobloc HTF-FDA HT1 NSF is formulated to help lower operating costs by reducing the frequency of fluid change-outs in operations that require a food grade product.

La exclusiva composición de HTF-FDA HT1 NSF unique chemistry starts with a blend of 99.9% crystal-clear base fluids. These crystal-clear fluids are free of impurities that can hinder performance. We fortify these thermally stable fluids with specially selected additives to provide outstanding protection from oxidative breakdown.

The result is HTF-FDA HT1 NSF, a food grade fluid that provides high thermal efficiency in systems operating up to 326°C (620°F). HTF-FDA HT1 NSF breakthrough chemistry can assist in extending fluid life longer than leading competitive fluids, and help lower operating costs by reducing the frequency of fluid change-outs.

PRODUCT APPLICATIONS

HTF-FDA HT1 NSF is recommended for use in non pressurized, liquid phase, closed heat transfer systems used in food processing or pharmaceutical operations with continuous bulk operating temperatures up to 326°C (620°F). Typical applications include central cooking facilities, drying, edible oil deodorizing and the heating of deep frying oils. HTF-FDA HT1 NSF may also be used in heating baths where a virtually odourless, non-toxic* fluid is required for worker health and safety.

HTF-FDA HT1 NSF's outstanding resistance to oxidative breakdown is also beneficial in food related manufacturing operations where exposure to air can not be avoided, and oxidation is the most likely form of fluid degradation. Common applications include the manufacture of plastic bottles, films and containers for the packaging of food products.

OPERATIONAL CONSIDERATIONS

HTF-FDA HT1 NSF's high thermal stability provides long service life under normal operating conditions up to its maximum recommended temperature. However, actual fluid life is dependent upon system design and operating practice.

PRODUCT PERFORMANCE

Comparison with the liquids of the main competitors.

- Higher thermal and oxidative stability which can help extend fluid life and lower operating costs
- More resistant to oxidative breakdown.
- Higher resistance to oxidative thickening.
- Less prone to solids and resins formation.
- Low vapour pressure can help on top-up costs while improving workplace safety.
- Natural lubricity extends operational savings.
- Fully registered for use in and around food processing areas.

Special precautions should be taken to avoid operating conditions that can shorten fluid life.

These include:

- thermal shocking resulting from accelerated system temperature increases
- thermal shocking from hot spots on a system's heating coils.
- continuously running above the maximum recommended operating temperature.

Although HTF-FDA HT1 NSF is highly resistant to oxidative breakdown, excessive air and water contamination can reduce thermal efficiency and shorten fluid life. Where practical, Pirobloc recommends inert gas blanketing of a system's expansion tank to guard against exposure to air and water and the need to change-out the fluid prematurely. While HTF-FDA HT1 NSF has been formulated for high resistance to contamination from air and water, contamination with process chemicals or deteriorated residual fluids can shorten fluid life. To maximize

system efficiency and fluid life, Pirobloc highly recommends system flushing prior to recharging with HTF-FDA HT1 NSF.

THERMAL DATA

PROPERTY	TEMPERATURE			
	15 °C	38 °C	260 °C	316 °C
Density, kg/L	0,868	0,854	0,716	0,681
Thermal Conductivity, W/m K	0,138	0,136	0,124	0,121
Heat Capacity, kJ/kg K	1,87	1,94	2,69	2,88
Vapour Pressure, kPa (psia)	0,00	0,00	3,01	14,28

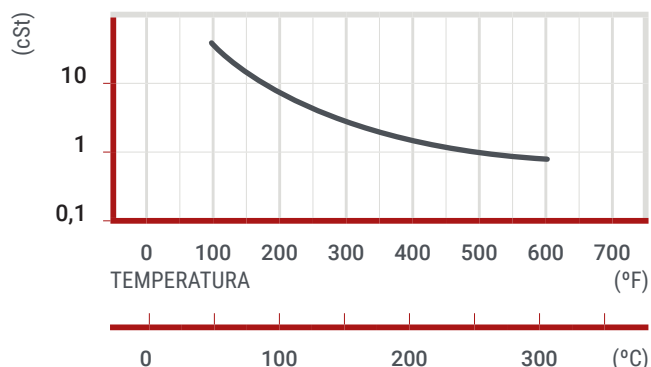
TYPICAL PERFORMANCE DATA

PROPERTY	UNITS	ASTM TEST METHOD	HTF-FDA HT1 NSF
Application temperature range	°C		-10 a 325
Colour		D1500	<0.5
Pour Point	°C	D5950	-18
Flash Point	°C	D92	237
Fire Point	°C	D92	249
Film temperature	°C		345
Autoignition temp	°C	E659	354
Viscosity,, cSt at 40 °C (104 °F) cSt at 100 °C (212 °F)	cSt	D445	37.1 5.9
Coefficient of Thermal Expansion	%/°C	-	0.0915
Distillation Range			
10 %	°C	D2887	383
50 %	°C		431
90 %	°C		478

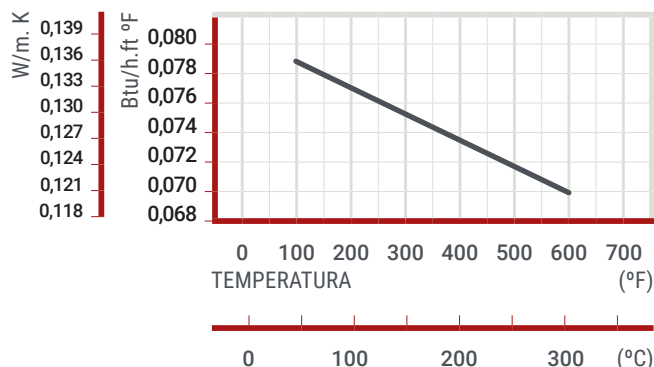
The values quoted above are typical of normal production. They do not constitute a specification.

*non-toxic defined as non-controlled under WHMIS, non-hazardous under OSHA and non-dangerous under DPD.

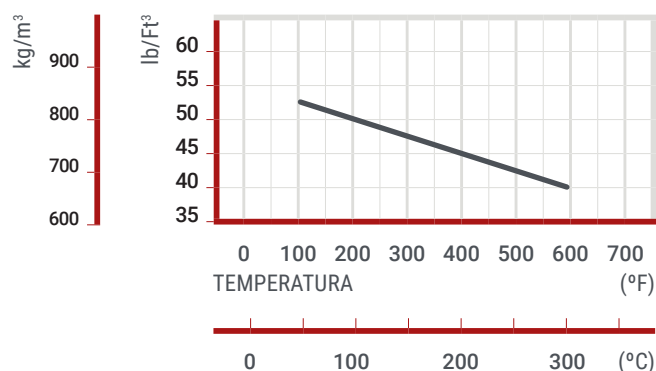
VISCOSITY



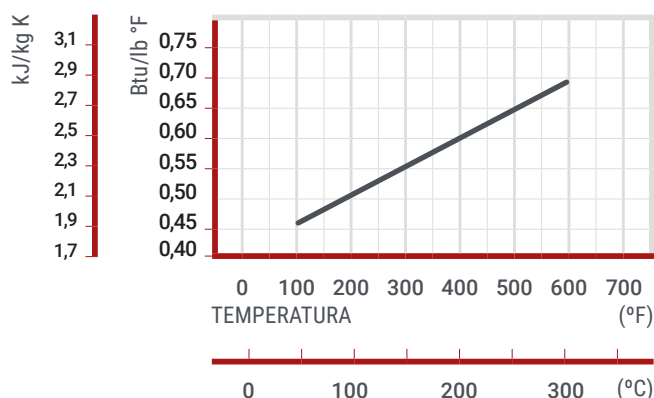
THERMAL CONDUCTIVITY



DENSITY



HEAT CAPACITY



FEATURES AND BENEFITS

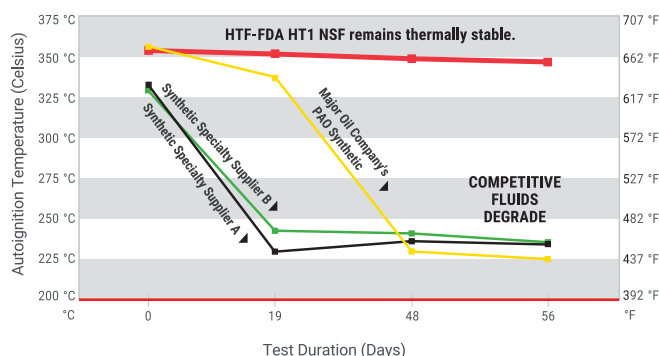
Higher thermal and oxidative stability than leading competitors which can help extend fluid life and lower operating costs

- More thermally stable than leading competitive fluids, even full synthetics.
Thermal stressing of a heat transfer fluid can cause the formation of light molecular compounds. These compounds can:
 - raise a fluid's vapour pressure, which can cause fluid leakage from control valves and pipe flanges, circulating pump cavitation and vapour locking
 - dramatically reduce a fluid's autoignition temperature, the lowest temperature that a fluid will combust, without flame or spark, in the presence of oxygen
 - lower the operating temperature at which the heat transfer system can safely operate

- necessitate a costly, premature fluid change-out
- In Ampoule studies, conducted at 316°C (600°F), HTF-FDA HT1 NSF remained thermally stable and maintained its autoignition temperature throughout the 56 day test; three times longer than two leading specialty fluids and more than 20% longer than a major oil company's synthetic fluid:

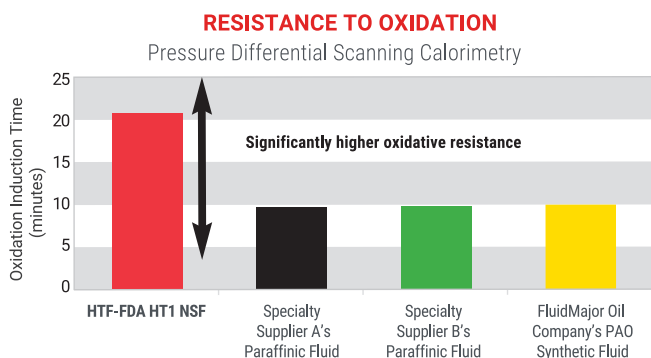
THERMAL STABILITY

316 °C (600 °F) Ampoule Study Based on the DIN 51528 method



More resistant to oxidative breakdown than leading competitive fluids

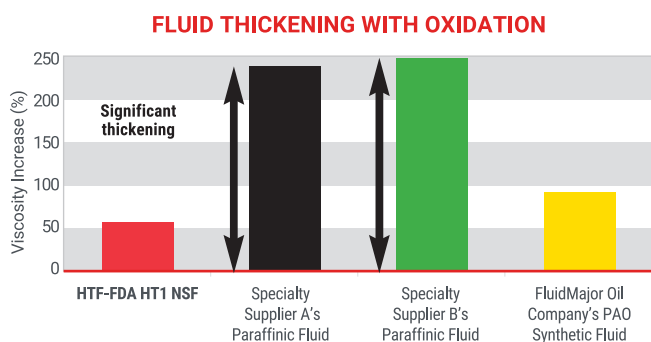
- A fluid's resistance to oxidative breakdown is critical in heat transfer systems where exposure to air cannot be avoided. Strong oxidative resistance can significantly extend fluid life, providing operational savings by reducing fluid change-out frequency and down time.
- In severe oxidation testing, HTF-FDA HT1 NSF demonstrates significantly stronger resistance to oxidation versus two leading specialty suppliers' food grade fluids and a fully synthetic food grade fluid from a major oil company:



Higher resistance to oxidative thickening versus leading competitive fluids

As a fluid oxidizes, it becomes more viscous. This increase in viscosity can:

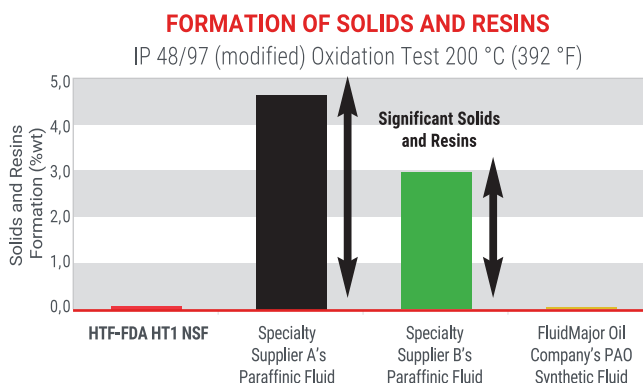
- significantly reduce a fluid's thermal efficiency
- make the fluid more difficult to circulate through the heat transfer system
- result in overheating of the fluid



- necessitate a costly, premature fluid change-out
- In a severe oxidation stability test, HTF-FDA HT1 NSF demonstrates significantly better resistance to viscosity increase versus two specialty food grade fluids, and better resistance than the synthetic food grade fluid of a major oil company supplier:

Less prone to solids and resins formation versus leading competitive fluids

- HTF-FDA HT1 NSF resistance to oxidative fluid breakdown also minimizes the formation of deposits. These deposits can dramatically reduce a system's heat transfer efficiency, resulting in increased operating costs.
- In a severe oxidation test, HTF-FDA HT1 NSF demonstrates significantly better resistance to formation of solids and resins versus two leading specialty food grade fluids, and equivalent resistance to a synthetic food grade fluid of a major oil company:



Low vapour pressure can help on top-up costs while improving workplace safety

- HTF-FDA HT1 NSF's low vapour pressure can reduce or eliminate fluid leakage from control valves and pipe flanges
- Reduction or elimination of leaks provides a cleaner and safer operating environment, and results in operational savings by reducing the need for cleaning, maintenance and fluid top-up

Natural lubricity extends operational savings

- HTF-FDA HT1 NSF's natural lubricating properties can also help to reduce maintenance costs by extending the service life of circulating pumps and other rotating parts

Fully registered for use in and around food processing areas

- HTF-FDA HT1 NSF also meets the highest industry purity standards and fits perfectly in HACCP (Hazard Analysis Critical Control Point) and GMP (Good Manufacturing Practice) plans:
- HT1 registered by NSF
- All fluid components comply with FDA 21 CFR 178.3570 "Lubricants with incidental food contact"
- Acceptable for use in food processing facilities.
- Certified Kosher and Pareve by Star K
- Certified Halal by IFANCA

