

Ternary Molten Salt Heat Transfer Fluid

Process Applications

- Very high-temperature applications
- Solar thermal storage
- Hot bath systems
- High-temperature reaction applications
- Preheating natural gas lines
- Metal alloy heat treatments
- Environmental chambers

■ Dynalene MS-450 Overview

Dynalene MS-450 is a safe-to-use molten salt heat transfer fluid which can be used in hot bath or solar thermal applications at very high temperatures. MS-450 can safely withstand temperatures up to 450°C, higher than most commercially available heat transfer fluids on the market today. Dynalene MS-450 has a lower melting point than MS-1 and MS-2, providing extra freeze protection and a wider operating range.

Dynalene's molten salt fluids have excellent thermo-physical properties in the liquid state, such as low viscosity, high heat capacity, and high thermal conductivity. The high energy density of Dynalene's molten salts provides long-term heat storage for any high-temperature application. Our heat transfer salts provide excellent corrosion resistance to stainless and alloy steels and exhibit minimal vapor pressures even near peak operating temperatures. This eliminates the need for expensive materials and high pressure components, in addition to increasing the safety of your system.

■ Thermal Stability

The maximum operating temperature of MS-450 is 450°C. Above this temperature the fluid will slowly evolve into gases of nitrogen with very low vapor pressures. Prolonged exposure to temperatures higher than the recommended maximum operating temperature may lead to solidification in the melt.

■ Material Compatibility

Dynalene MS-450 can be used safely with carbon steel up to 450°C. Above this operating temperature, stainless steel or more resistant alloys are recommended for Dynalene's molten salts. Copper and bronze can be used up to 300°C.

Recommended Temperature Range:

150°C (302°F) to 450°C (842°F)

■ Properties of Dynalene MS-450

A comprehensive list of all thermo-physical properties of Dynalene MS-450 can be found on page 2. For health and safety information or to request a Material Safety Data Sheet, contact our Dynalene sales representatives.

Composition:	Molten salt mixture
Appearance:	Off-white, translucent solids
Odor:	None
Freezing Point:	120°C (248°F)
Max Operating Temp:	450°C (842°F)
Latent Heat:	95 J/g
Thermal Conductivity*:	0.473 W/mK
Specific Heat*:	1.26 J/gK
Density*:	1.92 g/cm ³
Viscosity*:	11.7 cP
Freezing Contraction:	5%

*Taken at 300°C

■ Benefits of Choosing Dynalene MS-450

- Safe-to-use
- High thermal stability
- High energy density
- Low vapor pressure
- Cost-effective
- Available throughout North America
- Total fluid care
- Proven performance

Properties of Dynalene MS-450

SI Units

Temp °C	Viscosity mPa·s	Thermal Cond. W/m·K	Specific Heat kJ/kg·K	Density kg/m ³
130	1089	0.435	1.252	2035
135	666	0.436	1.252	2031
140	436	0.437	1.252	2028
145	302	0.438	1.253	2025
150	220	0.439	1.253	2022
155	167	0.440	1.253	2018
160	131	0.441	1.253	2015
165	106	0.443	1.254	2012
170	88.1	0.444	1.254	2008
175	74.6	0.445	1.254	2005
180	64.3	0.446	1.254	2002
185	56.1	0.447	1.255	1999
190	49.7	0.448	1.255	1995
195	44.4	0.449	1.255	1992
200	40.0	0.450	1.255	1989
220	28.2	0.455	1.256	1976
240	23.2	0.459	1.257	1963
260	17.8	0.464	1.258	1949
280	14.2	0.468	1.259	1936
300	11.7	0.473	1.260	1923
320	9.8	0.477	1.261	1910
340	8.5	0.481	1.262	1897
360	7.5	0.486	1.263	1884
380	6.7	0.490	1.264	1871
400	6.0	0.495	1.265	1858
420	5.5	0.499	1.266	1844
440	5.1	0.504	1.267	1831
460	4.7	0.508	1.268	1818

US Units

Temp °F	Viscosity cP	Thermal Cond. BTU/hr·ft·°F	Specific Heat BTU/lb·°F	Density lb/ft ³
266	1089	0.251	0.299	127.2
275	666	0.252	0.299	127.0
284	436	0.253	0.299	126.8
293	302	0.253	0.299	126.6
302	220	0.254	0.299	126.4
311	167	0.255	0.299	126.1
320	131	0.255	0.299	125.9
329	106	0.256	0.299	125.7
338	88.1	0.256	0.300	125.5
347	74.6	0.257	0.300	125.3
356	64.3	0.258	0.300	125.1
365	56.1	0.258	0.300	124.9
374	49.7	0.259	0.300	124.7
383	44.4	0.260	0.300	124.5
392	40.0	0.260	0.300	124.3
428	28.2	0.263	0.300	123.5
464	23.2	0.265	0.300	122.7
500	17.8	0.268	0.301	121.8
536	14.2	0.271	0.301	121.0
572	11.7	0.273	0.301	120.2
608	9.8	0.276	0.301	119.4
644	8.5	0.278	0.301	118.6
680	7.5	0.281	0.302	117.7
716	6.7	0.283	0.302	116.9
752	6.0	0.286	0.302	116.1
788	5.5	0.289	0.302	115.3
824	5.1	0.291	0.303	114.5
860	4.7	0.294	0.303	113.6

US to SI Conversions:

Viscosity:	1 cP = 0.001 Pa·s
Thermal Cond.:	1 Btu/hr·ft·°F = 1.73 W/mK
Specific Heat:	1 Btu/lb _m ·°F = 4,186 J/kg°C
Density:	1 lb _m /ft ³ = 16 kg/m ³