DURATHERM
Heat Transfer Fluids

DURATHERM 450FG

Rated for use up to 232°C (450°F) and ideal for applications such as blow molding, injection molding or any application where lower working temperatures are required or for applications requiring both heating and cooling cycles between between -25°C and 232°C (-12°F and 450°F).

Duratherm 450FG meets USDA requirements for incidental food contact, is NSF registered HT1, and meets the requirements of 21CFR1783570.

APPLICATION

Duratherm 450FG is specifically engineered for applications requiring a food grade thermal fluid for process heating and cooling precisely and efficiently between between -25°C and 232°C (-12°F and 450°F).

Offering precise temperature control and long life at an economical cost **Duratherm 450FG** is ideal for low temperature applications such as blow molding, injection molding, pharmaceutical manufacturing or any application requiring batch heating and cooling.

THE DIFFERENCE

Our exclusive additive package, including a proprietary dual stage anti-oxidant, ensures long trouble free operation. **Duratherm 450FG** also incorporates metal deactivators, a seal and gasket extender, de-foaming and particle suspension agents.

LASTS LONGER

In the heat transfer fluid industry cost is always a concern, however, fluid longevity and resistance to harmful fouling are of equal importance.

Air contact is normally detrimental to a fluid. Oxidation can cripple your system and if left unchecked will ultimately cause catastrophic failure. Unscheduled downtime due to oil failure has a high cost and negative effect on production.

The Duratherm product line was developed with this in mind. Most other fluids fall short in their protection from oxidation and can quickly foul a system. Duratherm is engineered to give unsurpassed levels of protection and service life.

ENVIRONMENTAL

Duratherm 450FG is environmentally friendly, non-toxic, non-hazardous and non-reportable. Worker health and safety is of great concern, **Duratherm 450FG** poses no ill effect to worker safety. After its long service life it can easily be disposed of with other waste oils.

1 800 446 4910

www.durathermfluids.com

DURATHERM 450FG

- Maximum temperature: 232°C / 450°F
- Flash point 150°C / 302°F
- Food grade
- Great oxidation resistance
- Efficient for lower-temperature applications
- Non-toxic/non-hazardous
- Includes free fluid analysis and tech support

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TEMPERATURE RATINGS

Maximum Bulk/Use Temp.	232°C	450°F
Maximum Film Temp.	254°C	490°F
Pour Point ASTM D97	-45°C	-49°F

SAFETY DATA

Flash Point ASTM D92	150°C	302°F
Fire Point ASTM D92	163°C	327°F
Autoignition ASTM E-659-78	329°C	625°F

THERMAL PROPERTIES

Thermal Expansion Coefficient	0.1016 %/°C	0.0564 %/°F
Thermal Conductivity	W/m K	BTU/hr F ft
-40°C / -40°F	0.148	0.085
-18°C / 0°F	0.146	0.085
38°C / 100°F	0.142	0.082
121°C / 250°F	0.136	0.079
232°C / 450°F	0.129	0.074
Heat Capacity	kJ/kg K	BTU/lb F
-40°C / -40°F	1.905	0.455
-18°C / 0°F	1.972	0.472
38°C / 100°F	2.142	0.512
121°C / 250°F	2.394	0.572
232°C / 450°F	2.731	0.653

PHYSICAL PROPERTIES

Appearance: colorless, clear and bright liquid		
Viscosity ASTM D445		
cSt at -40°C / -40°F	140.36	
cSt at -18°C / 0°F	45.77	
cSt at 40°C / 104°F	4.61	
cSt at 121°C / 250°F	1.42	
cSt at 232°C / 450°F	0.67	
Density ASTM D1298	kg/m3	lb/ft3
-40°C / -40°F	905.54	56.53
-18°C / 0°F	890.50	55.58
38°C / 100°F	852.23	53.21
121°C / 250°F	795.51	49.66
232°C / 450°F	722.38	44.92
Vapor Pressure ASTM D2879	kPa	psi
-40°C / -40°F	0.00	0.00
-18°C / 0°F	0.00	0.00
38°C / 100°F	0.58	0.08
121°C / 250°F	2.13	0.31
232°C / 450°F	20.62	3.00
Distillation Range ASTM D2887	10%	263°C (505°F)
	90%	508°C (947°F)
Average Molecular Weight	372	

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

DURATHERM 450

PROPERTY VS. TEMPERATURE CHART
METRIC

TEMPERATURE (Celsius)	DENSITY (kg/m^3)	KINEMATIC VISCOSITY (Centistoke)	DYNAMIC VISCOSITY (Centipoise)	THERMAL CONDUCTIVITY (W/m-K)	HEAT CAPACITY (kJ/kg-K)	VAPOR PRESSURE (kPa)
-50	912.38	5982.19	5458.00	0.149	1.874	0.00
-45	908.96	264.68	240.58	0.148	1.890	0.00
-40	905.54	140.36	127.10	0.148	1.905	0.00
-30	898.70	80.12	72.00	0.147	1.936	0.00
-20	891.87	50.38	44.93	0.146	1.966	0.00
-10	885.03	33.05	29.25	0.146	1.997	0.00
0	878.20	13.94	12.24	0.145	2.026	0.00
10	871.36	9.98	8.70	0.144	2.057	0.26
20	864.53	7.46	6.45	0.143	2.088	0.37
30	857.70	5.78	4.96	0.143	2.118	0.49
40	850.86	4.61	3.92	0.142	2.148	0.60
50	844.03	3.77	3.18	0.141	2.179	0.70
60	837.19	3.14	2.63	0.141	2.209	0.82
70	830.36	2.67	2.22	0.140	2.239	0.95
80	823.53	2.30	1.90	0.139	2.269	1.12
90	816.69	2.01	1.64	0.138	2.300	1.30
100	809.86	1.78	1.44	0.138	2.330	1.52
110	803.02	1.59	1.28	0.137	2.360	1.78
120	796.19	1.43	1.14	0.136	2.391	2.09
130	789.35	1.30	1.03	0.136	2.421	2.54
140	782.52	1.19	0.93	0.135	2.451	3.12
150	775.69	1.10	0.85	0.134	2.482	3.83
160	768.85	1.02	0.78	0.133	2.512	4.71
170	762.02	0.95	0.72	0.133	2.543	5.78
180	755.18	0.89	0.67	0.132	2.573	7.10
190	748.35	0.84	0.63	0.131	2.603	8.72
200	741.51	0.79	0.59	0.131	2.634	10.70
210	734.68	0.75	0.55	0.130	2.664	13.12
220	727.85	0.71	0.52	0.129	2.695	16.13
230	721.01	0.68	0.49	0.129	2.725	19.82
232	719.55	0.67	0.48	0.128	2.733	20.68

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PROPERTY VS. TEMPERATURE CHART
STANDARD

TEMPERATURE (Fahrenheit)	DENSITY (lb/ft^3)	KINEMATIC VISCOSITY (Centistoke)	DYNAMIC VISCOSITY (Centipoise)	THERMAL CONDUCTIVITY (BTU/hr-F-ft)	HEAT CAPACITY (BTU/lb-F)	VAPOR PRESSURE (Psia)
-60	57.01	7252.75	6622.53	0.086	0.447	0.00
-50	56.77	899.96	818.32	0.086	0.451	0.00
-40	56.53	140.36	127.10	0.085	0.455	0.00
-30	56.29	97.88	88.26	0.085	0.459	0.00
-20	56.06	76.31	68.52	0.085	0.463	0.00
-10	55.82	58.79	52.57	0.085	0.467	0.00
0	55.58	45.77	40.75	0.085	0.472	0.00
10	55.35	36.15	32.04	0.084	0.476	0.00
20	55.11	29.39	25.94	0.084	0.480	0.00
30	54.87	14.51	12.76	0.084	0.484	0.00
40	54.63	11.95	10.46	0.084	0.488	0.00
50	54.40	9.98	8.70	0.083	0.492	0.04
60	54.16	8.45	7.34	0.083	0.496	0.05
70	53.92	7.24	6.26	0.083	0.500	0.06
80	53.69	6.27	5.40	0.083	0.504	0.07
90	53.45	5.48	4.70	0.082	0.508	0.07
100	53.21	4.84	4.13	0.082	0.512	0.08
110	52.98	4.30	3.65	0.082	0.516	0.09
120	52.74	3.85	3.25	0.082	0.520	0.10
130	52.50	3.47	2.92	0.082	0.524	0.11
140	52.26	3.14	2.63	0.081	0.528	0.12
150	52.03	2.87	2.39	0.081	0.532	0.13
160	51.79	2.63	2.18	0.081	0.536	0.14
170	51.55	2.42	2.00	0.081	0.540	0.16
180	51.32	2.23	1.84	0.080	0.544	0.17
190	51.08	2.07	1.70	0.080	0.548	0.19
200	50.84	1.93	1.57	0.080	0.552	0.20
210	50.61	1.80	1.46	0.080	0.556	0.21
220	50.37	1.69	1.37	0.079	0.560	0.23
230	50.13	1.59	1.28	0.079	0.564	0.26
240	49.89	1.50	1.20	0.079	0.568	0.28
250	49.66	1.42	1.13	0.079	0.572	0.31
260	49.42	1.34	1.06	0.079	0.576	0.34
270	49.18	1.28	1.01	0.078	0.580	0.38
280	48.95	1.22	0.95	0.078	0.584	0.43
290	48.71	1.16	0.91	0.078	0.588	0.48
300	48.47	1.11	0.86	0.078	0.592	0.54
310	48.23	1.06	0.82	0.077	0.596	0.60
320	48.00	1.02	0.78	0.077	0.600	0.68
330	47.76	0.98	0.75	0.077	0.605	0.76
340	47.52	0.94	0.72	0.077	0.609	0.86
350	47.29	0.91	0.69	0.076	0.613	0.96
360	47.05	0.88	0.66	0.076	0.617	1.08
370	46.81	0.85	0.64	0.076	0.621	1.21
380	46.58	0.82	0.61	0.076	0.625	1.35
390	46.34	0.79	0.59	0.076	0.629	1.52
400	46.10	0.77	0.57	0.075	0.633	1.70
410	45.86	0.75	0.55	0.075	0.637	1.91
420	45.63	0.73	0.53	0.075	0.641	2.13
430	45.39	0.71	0.52	0.075	0.645	2.39
440	45.15	0.69	0.50	0.074	0.649	2.68
450	44.92	0.67	0.48	0.074	0.653	3.00

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