



# DOWTHERM J

## Synthetic Organic Heat Transfer Fluid—Liquid and Vapor Phase Data

DOWTHERM\* J heat transfer fluid is a mixture of isomers of an alkylated aromatic specially engineered for demanding low-temperature applications in liquid phase pressurized systems. DOWTHERM J fluid offers outstanding low-temperature pumpability and excellent thermal stability for protection against accidental overheating.

**Recommended use temperature range:** -80°C (-110°F) to 315°C (600°F). DOWTHERM J fluid can also be used in vapor phase systems operating from 180°C (358°F) to 315°C (600°F).

**Suitable applications:** Single fluid heating and cooling

For health and safety information for this product, contact your Dow sales representative or call the number for your area on the second page of this sheet for a Material Safety Data Sheet (MSDS).

### Typical Properties of DOWTHERM J Fluid†

Composition: Mixture of Isomers of an Alkylated Aromatic

Color: Clear, Colorless Solution

Property	SI Units	English Units
Freeze Point	<-81°C	<-100°F
Boiling Point	181°C	358°F
Flash Point <sup>1</sup>	57°C	136°F
Fire Point <sup>2</sup>	60°C	140°F
Autoignition Temperature <sup>3</sup>	420°C	788°F
Density @ 25°C (75°F)	860 kg/m <sup>3</sup>	54.13 lb/ft <sup>3</sup>
Surface Tension in Air @25°C (77°F)		0.28 Dynes/cm
Estimated Critical Temperature	383°C	721°F
Estimated Critical Pressure	28.4 bar	28 atm
Estimated Critical Volume	3.65 l/kg	0.0585 ft <sup>3</sup> /lb
Average Molecular Weight	134	
Heat of Combustion	41,400kJ/kg	17,800 Btu/lb

† Not to be construed as specifications

<sup>1</sup> Closed Cup

<sup>2</sup> C.O.C.

<sup>3</sup> The old ASTM procedure, D-2155-66, has been withdrawn by the testing society and replaced by ASTM E659-78

### Specific Heat, Density, Thermal Conductivity and Viscosity of DOWTHERM J Fluid Below 0°F

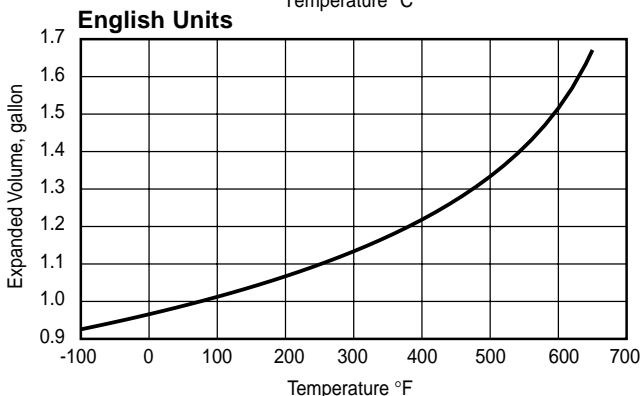
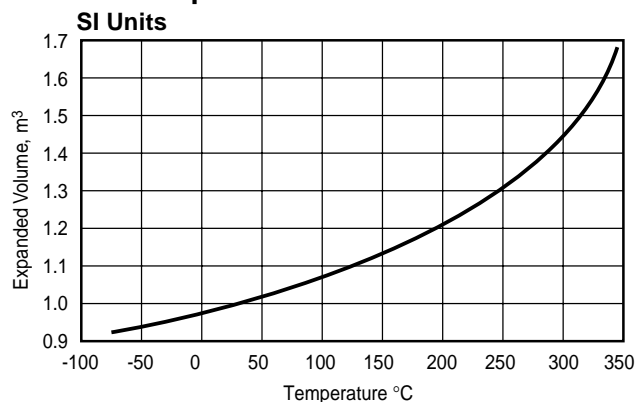
#### SI Units

Temp. °C	Specific Heat kJ/kgK	Density kg/m <sup>3</sup>	Thermal Conductivity W/mk	Viscosity mPa-s
0	1.769	878.5	0.1326	1.23
-20	1.714	892.9	0.1368	1.80
-40	1.663	907.0	0.1411	2.88
-60	1.616	921.0	0.1453	5.12
-80	1.584	931.3	0.1485	8.43

#### English Units

Temp. °F	Specific Heat Btu/(lb)(°F)	Density lb/ft <sup>3</sup>	Thermal Conductivity Btu/hr ft <sup>2</sup> (°F/ft)	Viscosity cP
0	0.411	55.64	0.0788	1.72
-20	0.404	56.14	0.0802	2.19
-40	0.397	56.63	0.0816	2.88
-60	0.391	57.11	0.0829	3.91
-80	0.385	57.59	0.0843	5.50
-100	0.379	58.07	0.0856	7.96

### Thermal Expansion of DOWTHERM J Fluid



# DOWTHERM J Synthetic Organic Heat Transfer Fluid

## Saturated Liquid Properties of DOWTHERM J Fluid (SI Units)

Temp. °C	Specific Heat kJ/kg K	Density kg/m <sup>3</sup>	Thermal Conduc. W/mK	Viscosity mPa sec	Vapor Pressure bar
-80	1.584	931.3	0.1485	8.43	
0	1.769	878.5	0.1326	1.23	
80	2.023	817.4	0.1156	0.47	0.03
160	2.315	749.2	0.0987	0.28	0.58
240	2.636	668.8	0.0817	0.20	3.59
320	3.040	560.4	0.0647	0.16	12.79

## Saturated Liquid Properties of DOWTHERM J Fluid (English Units)

Temp. °F	Specific Heat mPa sec	Density W/mK	Thermal Conduc. kJ/kg K	Viscosity c <sub>p</sub> /c <sub>v</sub>	Vapor Pressure psia
-100	0.379	58.07	0.0856	7.96	
60	0.434	54.13	0.0747	0.96	0.01
220	0.504	49.79	0.0638	0.39	1.33
380	0.584	44.80	0.0529	0.24	19.63
540	0.676	38.53	0.0420	0.18	106.87

## Saturated Vapor Properties of DOWTHERM J Fluid (SI Units)

Temp. °C	Vapor Pressure bar	Liquid Enthalpy kJ/kg	Latent Heat kJ/kg	Vapor Enthalpy kJ/kg	Vapor Density kg/m <sup>3</sup>	Z <sub>vapor</sub>	Vapor Viscosity mPa·s	Vapor Therm. Cond. W/mK	Spec. Heat (c <sub>p</sub> ) kJ/kg K	Ratio of Spec. Heats c <sub>p</sub> /c <sub>v</sub>
-80										
-40										
0										
40	0.004	26.5	375.1	401.6	0.02	0.999	0.006	0.011	1.385	1.047
80	0.033	102.5	357.5	460.0	0.15	0.996	0.007	0.014	1.553	1.042
120	0.163	185.9	338.5	524.3	0.69	0.987	0.007	0.017	1.713	1.040
160	0.576	275.8	317.5	593.3	2.23	0.966	0.008	0.020	1.868	1.041
200	1.578	371.7	294.2	665.9	5.76	0.931	0.009	0.024	2.023	1.046
240	3.587	473.3	267.4	740.8	12.78	0.878	0.010	0.028	2.186	1.056
280	7.116	580.8	235.6	816.4	25.76	0.803	0.011	0.032	2.374	1.079
320	12.794	695.1	195.0	890.1	49.87	0.698	0.013	0.036	2.647	1.136

## Saturated Vapor Properties of DOWTHERM J Fluid (English Units)

Temp. °F	Vapor Pressure psia	Liquid Enthalpy Btu/lb	Latent Heat Btu/lb	Vapor Enthalpy Btu/lb	Vapor Density lb/ft <sup>3</sup>	Z <sub>vapor</sub>	Vapor Viscosity cP	Vapor Therm. Cond. Btu/hr ft <sup>2</sup> (°F/ft)	Spec. Heat (c <sub>p</sub> ) Btu/lb °F	Ratio of Spec. Heats c <sub>p</sub> /c <sub>v</sub>
-100										
-20										
60										
140	0.18	27.3	157.6	185.0	0.0037	0.9982	0.006	0.0072	0.351	1.044
220	1.33	65.7	148.9	214.5	0.0249	0.9913	0.007	0.0091	0.395	1.041
300	6.06	107.6	139.2	246.8	0.1031	0.9732	0.008	0.0112	0.436	1.041
380	19.63	152.9	128.3	281.2	0.3109	0.9380	0.009	0.0134	0.477	1.045
460	49.90	201.1	115.7	316.9	0.7656	0.8811	0.010	0.0158	0.520	1.055
540	106.87	252.5	100.5	353.0	1.669	0.7977	0.011	0.0184	0.570	1.081
600	174.52	293.4	86.1	379.5	2.892	0.7114	0.012	0.0205		

**For further information, call...**

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