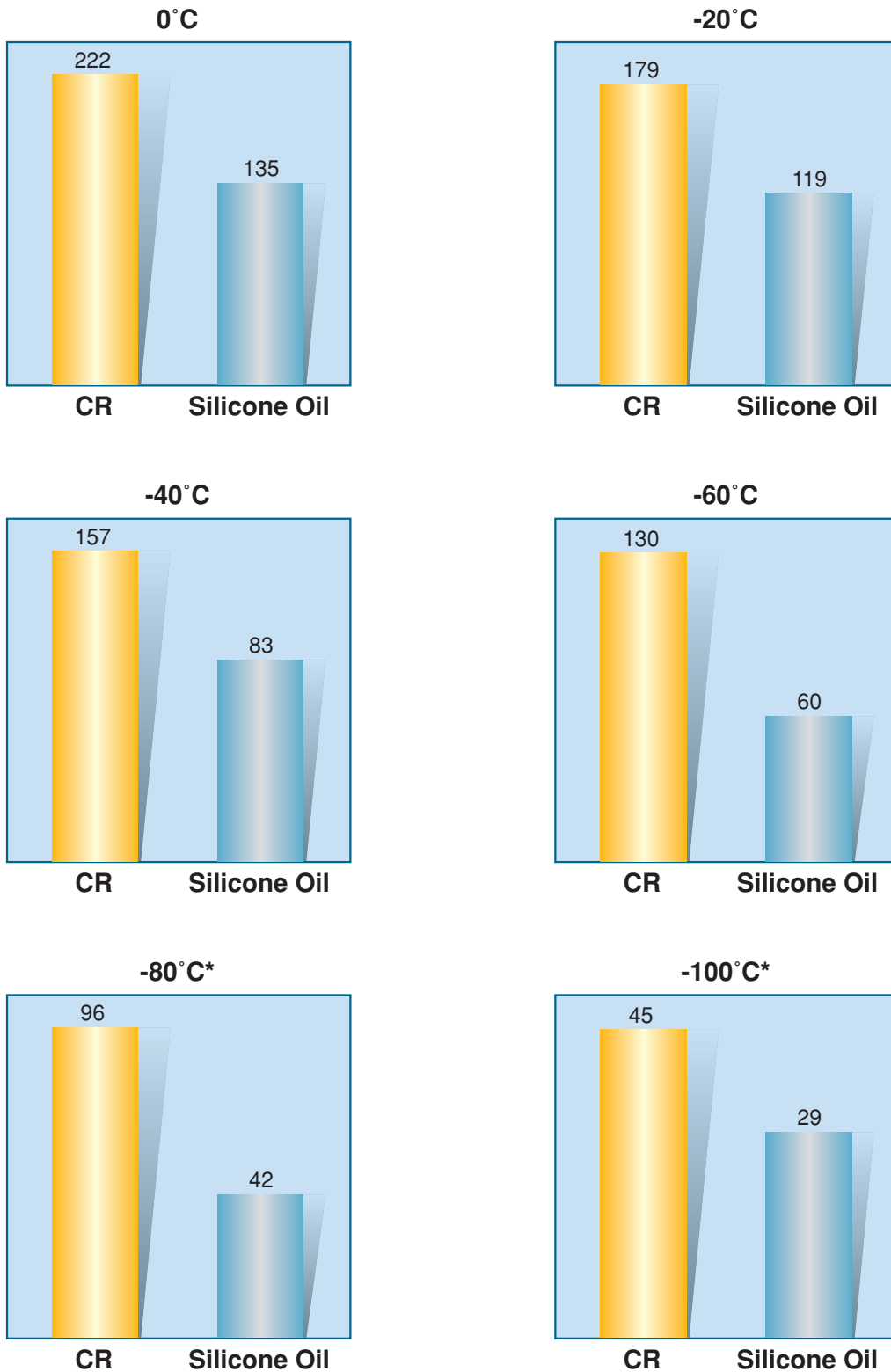


Comparison of Inside Film Coefficients

Paratherm CR™ Cryogenic Fluid vs. Silicone Oil



*Silicone Oil's lowest operating temperatures are limited to -82°C to -87°C.

(Article by Jim Lines of Graham Corporation: "How Low Can You Go?," Chemical Processing, pages 35-39, January 2003).

Fluid Efficiency Comparison

Paratherm CR™ Cryogenic Fluid vs. Silicone Oil

Inside Film Coefficient (hi), BTU/(hr-ft²-°F/ft)

(Calculated in 3/4" Sch. 40 pipe @ 4'/sec.)

Density, lb/gal

Thermal Conductivity, BTU(hr-ft²-°F/ft)

Viscosity, cP

Specific Heat, Btu/(lb-°F)

Paratherm CR™					
Temp.°C	Density	Thermal Conductivity	Viscosity	Specific Heat	hi
0	7.09	0.0818	1.00	0.441	222
-20	7.25	0.0826	1.62	0.423	179
-40	7.42	0.0835	2.22	0.405	157
-60	7.58	0.0844	3.40	0.388	130
-80	7.75	0.0854	6.64	0.37	96
-100	7.91	0.0863	34.75	0.352	45

Silicone Oil*					
Temp.°C	Density	Thermal Conductivity	Viscosity	Specific Heat	hi
0	7.30	0.0650	2.10	0.413	135
-20	7.48	0.0689	3.10	0.403	119
-40	7.68	0.0705	7.00	0.394	83
-60	7.80	0.0728	15.00	0.387	60
-80	7.95	0.0763	35.00	0.376	42
-100	8.17	0.0775	78.60	0.363	29

Efficiency Comparison			
Temp.°C	hi: CR™	hi: Silicone Oil	% > Silicone Oil
0	222	135	64
-20	179	119	51
-40	157	83	88
-60	130	60	116
-80	96	42	129
-100	45	29	52



*All data pertaining to Silicone Oil was obtained from or interpolated using manufacturer's website literature.

Note: The information and recommendations in this literature are made in good faith and are believed to be correct as of the below date. You, the user or specifier, should independently determine the suitability and fitness of Paratherm heat transfer fluids for use in your specific application. We warrant that the fluids conform to the specifications in Paratherm literature. Because our assistance is furnished without charge, and because we have no control over the fluid's end use or the conditions under which it will be used, we make no other warranties-expressed or implied, including

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