



ALCOOL
refrigeration brine coolants

Brine information manual

Alcool Product Comparison Chart

Product concentration (% by volume)	Alcool		Alcool LF/LFFG		Alcool NF	
	Freezing point (°C)	Class 3 Flammable Liquid	Freezing point (°C)	Class 3 Flammable Liquid	Freezing point (°C)	Non-Flammable Liquid
0	0.0	No	0.0	No	0.0	No
5	-1.4	No	-1.0	No	-1.0	No
10	-2.9	No	-2.0	No	-2.0	No
15	-4.6	No	-4.0	No	-4.0	No
20	-6.8	No	-6.0	No	-6.0	No
25	-9.0	No	-9.0	No	-9.0	No
27	-10.1	Yes	-10.2	No	-10.2	No
30	-11.7	Yes	-12.0	No	-12.0	No
35	-14.7	Yes	-16.0	No	-16.0	No
37	-16.1	Yes	-17.6	Yes	-17.6	No
40	-18.2	Yes	-20.0	Yes	-20.0	No
45	-22.4	Yes	-24.0	Yes	-24.0	No
50	-26.2	Yes	-28.0	Yes	-28.0	No

Thermal Conductivity – Alcool LF/Water Solutions

% by weight Alcool LF	Thermal Conductivity at T°C (Btu/Ft. Hr °R)					
	-5°C	-10°C	-15°C	-20°C	-25°C	-30°C
10	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen
20	0.260	Frozen	Frozen	Frozen	Frozen	Frozen
30	0.241	0.238	Frozen	Frozen	Frozen	Frozen
40	0.222	0.220	0.218	0.216	Frozen	Frozen
50	0.203	0.202	0.200	0.198	0.196	0.194

% by weight Alcool LF	Thermal Conductivity at T°C (W/m °K)					
	-5°C	-10°C	-15°C	-20°C	-25°C	-30°C
10	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen
20	0.450	Frozen	Frozen	Frozen	Frozen	Frozen
30	0.417	0.412	Frozen	Frozen	Frozen	Frozen
40	0.384	0.381	0.377	0.374	Frozen	Frozen
50	0.351	0.350	0.346	0.343	0.339	0.336

Specific Heat

– Alcool LF/Water Solutions

% by weight Alcool LF	Specific Heat at T°C (Btu/Lb/°R)					
	-5°C	-10°C	-15°C	-20°C	-25°C	-30°C
10	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen
20	0.914	Frozen	Frozen	Frozen	Frozen	Frozen
30	0.871	0.867	Frozen	Frozen	Frozen	Frozen
40	0.828	0.823	0.819	0.815	Frozen	Frozen
50	0.784	0.778	0.773	0.769	0.765	0.761

% by weight Alcool LF	Specific Heat at T°C (kJ/kg/°K)					
	-5°C	-10°C	-15°C	-20°C	-25°C	-30°C
10	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen
20	3.83	Frozen	Frozen	Frozen	Frozen	Frozen
30	3.65	3.63	Frozen	Frozen	Frozen	Frozen
40	3.47	3.45	3.43	3.41	Frozen	Frozen
50	3.28	3.26	3.24	3.22	3.2	3.19

Physical Properties – Alcool LF/Water Solutions

CONCENTRATION (% by volume)	DENSITY (15°C)	FREEZING POINT * (°C)	FLOW POINT (°C)	FLASH POINT ** (°C)	FIREPOINT (°C)
10	0.9956	-2.0	-5.0	59.0	None
20	0.9911	-6.0	-8.0	47.0	86.0
30	0.9879	-12.0	14.0	39.0	74.0
40	0.9824	-20.0	26.0	34.0	60.0
50	0.9746	-28.0	----	32.0	40.0
60	0.9635	----	----	29.0	32.0

*The freezing point is the temperature at which the first formation of ice crystals were observed.

The temperature remained constant during the phase change from liquid to solid so the practical limit of flow should be taken as the freezing point.

**Closed Cup



Alcool products are classified non-flammable in storage after dilution.

Available in bulk tankers, 1000L IBCs and 200L drums.

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Viscosity Comparison (Alcool LF/Water Solutions vs Ethanol/Water Solutions)

Viscosity Alcool LF/Water Solutions

CONCENTRATION (% by volume)	VISCOSITY (centipoise)				
	0	-5°C	-10°C	-15°C	-20°C
10	2.59				
20	3.67	4.46			
30	4.74	6.12	7.71		
40	7.27	9.82	13.66	19.65	29.67
50	8.58	11.70	16.08	24.37	37.03
60	9.64	13.49	17.82	26.98	42.39

(The figures in this table are based on actual test results)

Viscosity Ethanol/Water Solutions

CONCENTRATION (% by volume)	VISCOSITY (centipoise)				
	0	-5°C	-10°C	-15°C	-20°C
18.55	4.1	5.7			
27.85	5.7	7.4	9.5		
35.09	6.9	9.0	11.8	15.5	
41.9	7.2	9.5	12.4	16.4	22.0
48.67	7.0	8.9	11.6	15.0	19.7
56.65	6.7	8.4	10.8	13.8	17.7

*(The figures in this table are based on dilution of 100% Ethanol - Alcool is only 90% by volume ethanol
No correction has been made to the figures to allow for this)*

Viscosity, Densities and Refractive Index – Alcool LF

Concentration of Alcool LF (% by Volume)	Specific Gravity (@ 20°C/20°C)	Density (kg/L @15°C)	Density (kg/L @ 20°C)	Refractive Index @ 20°C
10	0.994	0.993	0.992	1.340
15	0.992	0.991	0.990	1.343
20	0.990	0.990	0.988	1.346
25	0.988	0.988	0.986	1.349
30	0.986	0.986	0.984	1.353
35	0.984	0.984	0.982	1.358
40	0.980	0.981	0.978	1.361
45	0.977	0.978	0.975	1.364
50	0.972	0.974	0.970	1.368

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Technical support and brine testing provided by our on-site laboratory

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