EASTMAN

Technical Data Sheet
FREEZIUM™ -60C

Applications
- Refrigeration

Product Description

Freezium™ is a secondary coolant developed specifically for use in indirect cooling systems and heat pumps. Freezium, based on a solution of potassium formate (HCOOK) - an organic salt - has been modelled to possess all the properties of the ideal secondary refrigerant: low viscosity, good thermal conductivity, and high specific heat capacity. Unlike conventionally used coolants, Freezium is neither toxic nor flammable. And it biodegrades quickly if ever released into the environment.

All heat exchange and other facilities where Freezium will be used must be designed, built, cleaned and taken into use by professional personnel specialized in the application. Please consult local expert companies.

Typical Properties

Property	Typical Value, Units
General	
Appearance	Liquid
Color	Blue
Assay	>50% min. active material
Density @ 20°C	1.34 g/cm^3
Dynamic viscosity @ 20°C	2.8 mPa·s
Flash Point Abel closed cup	Non-flammable
Freezing Point	<-60 °C
Boiling Point	114 °C
Solubility in Water	Complete
pH	8-10

Handling Precautions

The properties of Freezium depend on the concentration. Freezium is commercially available as a grade having the freezing point of -60°C. Other grades can be produced by diluting (see table below). Note however that other physical properties change with concentration as well and after diluting you need to remember to adjust the Kemcorn inhibitor amount as well.

Temperature T °C	Density ρ kg/m3	Specific heat cp kJ/ (kg K)	Thermal conductivity λ W/ (mK)	Kinematic viscosity v mm2/s	Dynamic viscosity μ mPas	Prandtl number Pr -
-10	1356	2,60	0,45	4,80	6,51	37,6
-15	1358	2,59	0,45	5,76	7,82	45,0
-20	1360	2,57	0,44	7,03	9,56	55,9
-25	1362	2,56	0,44	8,75	11,9	69,2

-30	1364	2,54	0,43	11,1	15,1	89,4
-35	1366	2,52	0,43	14,4	19,7	115
-40	1368	2,51	0,42	19	26	155
-45	1370	2,49	0,42	27	37	219
-50	1372	2,48	0,41	41	56	340
-55	1374	2,46	0,41	61	84	503

Freezium is perfectly compatible with most common engineering materials in a wide temperature range including copper, stainless and carbon steel, and user-friendly plastics.

The materials to avoid are aluminium, zinc and galvanized steel. Use of cast iron should be restricted to cool parts of the system.

Material	**Temperature compatibility range °C**	
	Lower limit	**Upper limit**
EPDM	-40	70
PTFE	-40	160
PS	-40	70
PP	-40	70
HDPE	-40	70
LDPE	-40	40
ABS	-40	70
Stainless steel	-60	160
Bronze	-60	60
Brass	-60	60
Copper	-60	60
Carbon steel	-60	40
Cast iron	-60	30

Note! Compositions of plastics and elastomers may vary according to the supplier. Ask the final approval from the supplier of the material.

This document is intended mainly for evaluation of the suitability of Freezium for the application in question. All heat exchange and other facilities where Freezium will be used must be designed, built, cleaned and taken into use by professional personnel specialized in the application. Please consult local expert companies.

Please see the Material Safety Data Sheet before handling the material.

Packaging

Freezium is available as bulk and in IBC (1000 l).

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