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# Freezium

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## 1 Description

**Freezium** is used as a multipurpose heat transfer fluid based on potassium formate.

## 2 Application

Many applications in the industry require a fluid to transport heat or cold. Those applications range from solar panels or heat pump systems, over cooling or heating of industrial processes and refrigerants in indirect cooling systems to artificial ski-tracks or ice rinks. This transport medium is usually called secondary refrigerant or secondary coolant. The ideal secondary refrigerant must ensure a good thermal conductivity; have a high specific heat and low viscosity. **Freezium** remains completely fluid even if the pipe work

is frozen. It is also important that the secondary refrigerant is non-flammable and compatible with common engineering materials.

**Freezium** has been developed specifically for indirect cooling systems and heat pumps. **Freezium** provides protection against freezing and corrosion. The dilution is determined by system requirements, mainly freezing requirements.

## 3 Compatibility and mixability

Exclusive use of **Freezium** is recommended for optimal corrosion protection. Mixing with other heat transfer fluids may lead to some precipitation of solid material, causing problems in systems by clogging or damaging pumps, and by increasing the risk of corrosion. In-house testing has confirmed that topping-up **Zitrec S** installations with **Freezium** up to 10% gives no incompatibility issues. Contact your local area sales manager for more information or specific questions.

**Freezium -60°C** is provided as ready-to-use product. **Freezium -60°C** can be diluted with

water up to a freezing point of -30°C. In applications where no corrosion protection is required (f.e. plastic pipes), **Freezium -60°C** might be diluted further.

For optimal performance and controlled quality, we advise the use of deionised or distilled water to prepare the ready-to-use dilutions. We refer to our product information leaflet on water quality recommendations.

We advise against the use of **Freezium** in installations containing aluminum, zinc or galvanized steel.

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## 4 Storage requirements

The product should be stored preferably at ambient temperatures. Periods of exposure to temperatures above 35°C should be minimized.

Further, it is strongly advised not to expose the coolant in translucent packages to direct sunlight because this can degrade the colour dyes present in the coolant, and result in fading of the colour or discoloration over time. This reaction can be accelerated if coupled with high ambient temperatures. It is

therefore advisable to store coolant filled in translucent packages indoors to avoid this issue.

**Freezium** can be stored for minimum 1 year in unopened containers without any effect on the product quality or performance.

It is strongly recommended to use new containers and not recycled ones. The use of galvanized steel is not recommended for pipes or any other part of the storage/mixing installation.

## 5 Toxicity & safety

**Freezium** is not toxic and biodegrades quickly. For Toxicity and Safety Data we refer to the Material Safety Data Sheet. The information and advice given should be observed and due attention should be given to the precautions necessary for handling

chemicals. This product should not be used to protect the inside of drinking water systems against freezing. The transport is not regulated.

*All information contained in this Product Information Leaflet is accurate to the best of our knowledge and belief as at the date of issue specified. However, the Company makes no warranty or representation, express or implied, as to the accuracy or completeness of such information. Freezium™ is a registered trademark of Kemira Oy, Finland*

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## Addendum - Technical information

Chemical and physical properties

	Freezium -60°C	method
colour	light blue	visual
pH*	9.5 typ.	ASTM D1287
freezing point	-60°C typ.	ASTM D1177
boiling point	114°C typ.	ASTM D1120
density, 20°C, kg/l	1.340 typ.	ASTM D1298

\* pH of a 5% potassium formate solution, which is a solution of **Freezium** in water prepared using the following formula:

$$100 = A + B$$

$$A = ((100 \cdot 5) / C) = \text{amount of Freezium in g}$$

$$B = \text{amount of water in g}$$

$$C = \text{concentration of potassium formate in the Freezium}$$

Corrosion protection

**Freezium -60°C** contains an inhibitor package to ensure corrosion protection at both high and low temperature. Anti-corrosion performance is demonstrated through standard and specific corrosion testing.

### ASTM D1384 glassware corrosion tests

	weight loss in mg/coupon <sup>1</sup>					
	brass	copper	solder	steel	cast iron	aluminium
reference product - 40°C	8.4	7.2	82.3	2.0	347.9	23.3
<b>Freezium -60°C</b>	2.0	2.5	112.0	-0.5	306.0	1.0

1 : weight loss AFTER chemical cleaning. Weight gain is indicated by a - sign.

2 : reference product is also potassium formate based