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# Zitrec™ S

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## 1 Description

**Zitrec S** - is a multipurpose glycol-free heat transfer fluid based on a matrix of potassium formate and sodium propionate. **Zitrec S** has excellent physical properties and combined

with good corrosion protection, therefore extremely suitable for use at very low temperatures.

## 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 rigs. This transport medium is usually called secondary refrigerant, brine or secondary coolant. The ideal secondary refrigerant must ensure a good thermal conductivity, have a high specific heat, high density and low viscosity. It is also important that the secondary refrigerant is non-

flammable and compatible with common engineering materials.

**Zitrec S** has been developed specifically for closed indirect cooling systems where low temperatures are predominant. **Zitrec S** provides protection against boiling, freezing and corrosion. The required dilution is determined by system requirements, mainly freezing requirements. Therefore **Zitrec S** is available in five ready-to-use dilutions: -10°C, -25°C, -40°C, -45°C and -55°C.

## 3 Compatibility and mixability

Although **Zitrec S** is – to some extent – compatible with most alternative heat transfer fluids, exclusive use of **Zitrec S** is recommended for optimal corrosion protection and physical parameters. 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. Specifically special care should be taken with calcium chloride and solely potassium formate based brines, as this can increase significantly the risk of corrosion.

**Zitrec S** should not be diluted further with water. Not only would adding water to **Zitrec**

**S** change the freezing point of the new dilution, the corrosion protection level would also be reduced. By mixing 2 ready-to-use **Zitrec S** dilutions in a specific ratio, intermediate freezing points can be obtained. However, this mixing still needs to be done with special care: should the **Zitrec S** solution get more diluted than you planned, then the freezing point would end up higher, causing possibly **Zitrec S** to freeze and block your system.

**Zitrec S** should not be used in installations containing Zinc or galvanized steel.

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## 4 Storage requirements

The product should be stored at ambient temperatures and periods of exposure to temperatures above 35°C should be minimized. The use of galvanized steel is not recommended for pipes or any other part of

the storage/mixing installation. **Zitrec S** can be stored for minimum 2 years in unopened containers without any effect on the product performance. It is strongly recommended to use new containers and not recycled ones.

## 5 Toxicity & safety

For detailed toxicity and safety data we refer to the material safety data sheet. **Zitrec S** and its major constituents are considered

readably biodegradable. 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.*

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## Chemical and physical properties

### Addendum - Technical information

properties	method	Zitrec S - 10°C	Zitrec S - 25°C	Zitrec S - 40°C	Zitrec S - 45°C	Zitrec S - 55°C
colour	visual	yellow fluorescent	yellow fluorescent	yellow fluorescent	yellow fluorescent	yellow fluorescent
pH	ASTM D1287	9.15	9.45	9.85	10.00	10.15
freeze point °C (typical)	ASTM D 1177	-10	-25	-40	-45	-55
boiling point °C	ASTM D 1120	104	107	111	112	115
density , 20°C, kg/dm <sup>3</sup>	ASTM D5931	1.089	1.183	1.251	1.271	1.312

**Zitrec S** contains an optimized inhibitor package to ensure maximum and long lasting corrosion protection. The inhibitors are based on carboxylate technology, which guarantees a longer lifetime than with traditional products.

Anti-corrosion performance is demonstrated through standard and specific corrosion testing. The ASTM 1384 glassware corrosion test is a generally accepted test

within engine coolant testing. In this test a bundle of cast aluminum, cast iron, carbon steel, brass, solder and copper coupons is submerged for 2 weeks in the test liquid which is kept at 88°C. Variables in this test are the addition of corrosive salts (chloride, sulphate and carbonate), or oxygen which is blown as air through the test liquid. Both lead to increased corrosion rates.

## Corrosion protection

### ASTM D1384 glassware corrosion tests

	weight loss in mg/coupon <sup>1</sup>					
	Brass	Copper	Solder 30/70	Steel	Cast iron	Aluminum
industry limit <sup>4</sup> (max)	10	10	30	10	10	30
reference product -10°C <sup>3</sup>	3	2	86	2	1	11
<b>zitrec S -10°C</b>	3	4	70	0	0	4

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

2 : reference product is also a brine based heat transfer fluid

3 : ASTM D1384 with addition of corrosive salts and air bubbling

4 : ASTM D1384 limit for automotive engine coolants

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Corrosion protection

## ASTM D1384<sup>3</sup> glassware corrosion tests

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	weight loss in mg/coupon <sup>1</sup>					
	Brass	Copper	Solder 30/70	Steel	Cast iron	Aluminum
reference product A-55°C <sup>3</sup>	1	1	127	4	1	5
reference product B- 55°C <sup>2</sup>	3	5	283	5	45	3
<b>Zitrec S – 55°C</b>	1	1	106	2	2	0

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

2: reference products A and B are also brine based heat transfer fluids

3: ASTM D1384 with addition of corrosive salts but without air bubbling