

Zitrec™ MC

1. Description

Zitrec MC - mixed with the appropriate amount of water - is used as a multipurpose

heat transfer fluid based on mono ethylene glycol.

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 or secondary coolant. The ideal secondary refrigerant must ensure a good thermal conductivity; have a high specific heat and low viscosity. It is also important that the secondary refrigerant is non-flammable and compatible with common engineering materials.

determined by system requirements, mainly freezing requirements. However, to ensure good corrosion protection it is recommended to use at least 33 vol. % of **Zitrec MC** in the coolant solution, which provides freeze protection to -20°C. For lower freezing protection it is recommended to use **Zitrec M-15°C**. This ready-to-use solution contains an adjusted corrosion inhibitor package to ensure optimal corrosion protection.

Zitrec MC provides protection against boiling, freezing and corrosion. The dilution is

Mixtures with more than 70 vol. % of **Zitrec MC** in water are not recommended, because the freeze point is increasing again and physical properties are worse.

| dilution Zitrec M vol % | freeze point °C | dilution Zitrec M vol % | freeze point °C |
|----------------------------|--------------------|----------------------------|--------------------|
| 28.0 | - 15 | 52.4 | - 40 |
| 39.1 | - 25 | 56.2 | - 45 |
| 43.8 | - 30 | 63.5 | - 55 |

3. Compatibility and mixability

Zitrec MC is compatible with most other heat transfer fluids based on ethylene glycol. Exclusive use of **Zitrec MC** is recommended for optimal corrosion protection.

This heat transfer fluid is compatible with European hard tap waters, up to a water hardness of 30 °dH (German hardness degrees, equivalent to 535 mg/l CaCO₃).

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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. As with any antifreeze coolant, the use of galvanized steel is not recommended for pipes or any other part of the storage/mixing installation.

Zitrec MC can be stored for minimum 8 years in unopened containers without any effect on the product quality or 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.

The transport is not regulated. Labeling as for any MEG based heat transfer fluid is

required: X_n; R 22 (Harmful if swallowed) and S 2 (Keep out of reach of children).

This product should not be used to protect the inside of drinking water systems against freezing.

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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Addendum - Technical information

Chemical and physical properties

| properties | Zitrec MC | method | properties | Zitrec MC | method |
|---------------------------|----------------|------------|---------------------------|------------|------------|
| ethylene glycol | 92% w/w glycol | internal | | | |
| inhibitor content | 5 % w/w | internal | density, 20°C | 1.113 typ. | ASTM D5931 |
| water content | 5% w/w max | ASTM D1123 | equilibrium boiling point | 180°C typ. | ASTM D1120 |
| nitrite, amine, phosphate | nil | IC | pH | 8.6 typ. | ASTM D1287 |
| colour | yellow | visual | refractive Index, 20°C | 1.431 typ. | ASTM D1218 |

| properties | M-40°C | M-25°C | M-15°C | method |
|------------------------|------------|------------|------------|-------------|
| colour | yellow | yellow | yellow | visual |
| pH | 8.6 typ. | 8.5 typ. | 8.2 typ. | ASTM D1287 |
| freeze point | - 40°C | - 25°C | -15°C | ASTM D 1177 |
| specific gravity, 20°C | 1.071 typ. | 1.056 typ. | 1.041 typ. | ASTM D5931 |

Zitrec MC contains an optimized inhibitor package to ensure maximum and long lasting corrosion protection at both high and low temperature. 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.

Corrosion protection

ASTM D1384 glassware corrosion tests

| | weight loss in mg/coupon ¹ | | | | | |
|----------------------|---------------------------------------|--------|--------|-------|-----------|----------|
| | Brass | Copper | Solder | Steel | cast iron | Aluminum |
| industry limit (max) | 10 | 10 | 30 | 10 | 10 | 30 |
| Zitrec MC | 0.9 | 1 | 0.6 | 0.2 | -0.1 | 0.1 |

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

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Dynamic heat transfer corrosion tests (2000W)

Corrosion protection

| | weight loss in mg/coupon ¹ | |
|--------------------------------|---------------------------------------|-----------|
| | cast iron | aluminium |
| test duration, hrs | 48 | 48 |
| Zitrec M-9 ² | | |
| hot coupon | 1.5 | 23.3 |
| top coupon | 2.4 | 3.6 |
| Zitrec M-40 | | |
| hot coupon | - | 2.1 |
| top coupon | - | 33.3 |

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

2 typical test conditions are 20 vol-% dilution