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<th>Chemical base</th>
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<tr>
<td>REWOCOROS® AC 101</td>
<td>Ferrous metals</td>
<td>Modified fatty acid</td>
<td>Co-emulsifier, lubricity enhancer</td>
</tr>
<tr>
<td></td>
<td>Aluminum</td>
<td>monoethanolamide</td>
<td>Co-emulsifier, lubricity enhancer</td>
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<tr>
<td>REWOCOROS® AC 100</td>
<td>Emulsifiable fluids</td>
<td>Modified fatty acid monoethanolamide</td>
<td>Co-emulsifier, lubricity enhancer</td>
</tr>
<tr>
<td></td>
<td>Water-soluble fluids</td>
<td>Modified fatty acid diethanolamide</td>
<td>Co-emulsifier, lubricity enhancer</td>
</tr>
<tr>
<td>REWOCOROS® AL 200</td>
<td>Ethoxylated fatty alcohol phosphoric acid ester</td>
<td>Ethoxylated fatty alcohol phosphoric acid ester</td>
<td>EP-/AW-properties, lubricity enhancer</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Co-emulsifier, lubricity enhancer</td>
</tr>
<tr>
<td>REWOCOROS® AC 144</td>
<td>Modified carboxylic acid amine salt</td>
<td>Low foaming tendency, excellent</td>
<td>hard water stability</td>
</tr>
<tr>
<td>REWOCOROS® RA 405</td>
<td>Blend of modified boric acid and diglycolamine</td>
<td>Low foaming tendency, improves buffer capacity</td>
<td>Low foaming tendency, improves buffer capacity</td>
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</table>

1) not available in USA
2) only available in The Americas

Corrosion Inhibitors for Metalworking Fluids

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Multifunctional corrosion inhibitors for aqueous metalworking fluids

Corrosion inhibitors are an integral part of metalworking fluid formulations and are widely used in water miscible metalworking fluids. Their main purpose is to prevent rust formation and corrosion on work pieces, machine parts and tools made of metals. Additionally, depending on the composition and chemical structure of individual components, corrosion inhibitors may also provide co-emulsification, low foaming tendency, and enhanced lubricity which make them multifunctional. Applications include soluble oils, semi-synthetic and full synthetic fluids as well as cleaners.

Corrosion inhibitors marketed by Evonik under the trade name REWOCOROS® exhibit excellent corrosion inhibition properties for steel, iron, aluminum, and other metals. Typically, REWOCOROS® products are offered as compounds based on fatty acid amides, alkanolamides, boric acid or imidazolines.

REWOCOROS® Metal protection through corrosion inhibition

**Bimetallic corrosion coupon test**

The bimetallic corrosion coupon test (ASTM E-463-96) is designed to evaluate corrosion inhibitors of additives in aqueous metalworking formulations. Metal plates are immersed in an electrolyte for 14 days and mass loss and visual inspection are taken as indicators of performance.

**Filter chip test**

Standard test methods as the chip/filter paper method acc. to DIN 51360 (part 2) are used to determine corrosion prevention characteristics of aqueous metal working fluids. Cast iron chips caused no staining (Filter paper on the right) after being treated for 2 hours with REWOCOROS® containing water based cooling lubricants. In comparison, the iron chips caused staining (Filter paper on the left) without REWOCOROS® products.

**Impedance spectroscopy**

Electrochemical methods can be used for the characterization of corrosion inhibitors. Current-potential measurements and impedance spectroscopy provide a deeper insight into the mechanism of corrosion inhibition and the interaction of the corrosion inhibitor with the metal surface. Furthermore, useful information can be obtained on the mode and rate of corrosion of the metal surface and both electrically free corrosion inhibitors can be evaluated. The diagram shows an impedance spectrum. The electrical resistance across the metal/water interface is dependent on the adsorption of corrosion inhibitor molecules. This resistance, inversely known as polarization resistance, is a direct measure of corrosion inhibition and should be as high as possible.

REWOCOROS® Products such as REWOCOROS® AC 181 and REWOCOROS® AC 183 US are designed to provide excellent corrosion inhibition in metal working formulations. Ideally corrosion inhibitors should be suitable for metal protection of steels, non-ferrous metals and other metals.

REWOCOROS® AL 200 and AL 200 US offers out standing corrosion inhibition of aluminum alloys and other non-ferrous metals. Additionally REWOCOROS® AL 200 provides excellent EP/AW properties and reserve alkalinity to water based systems.

REWOCOROS® Multifunctional corrosion inhibitors for non-ferrous metals

REWOCOROS® AL 200 and AL 200 US offers outstanding corrosion inhibition of aluminum alloys and other non-ferrous metals. Additionally REWOCOROS® AL 200 provides excellent EP/AW properties and reserve alkalinity to water based systems. The performance of REWOCOROS® AL 200 is assessed on various metal surfaces. Furthermore, useful information can be obtained on the mode and rate of corrosion of the metal surface and both electrically free corrosion inhibitors can be evaluated. The diagram shows an impedance spectrum. The electrical resistance across the metal/water interface is dependent on the adsorption of corrosion inhibitor molecules. This resistance, inversely known as polarization resistance, is a direct measure of corrosion inhibition and should be as high as possible.

REWOCOROS® Multifunctional corrosion inhibitors for ferrous metals

REWOCOROS® AC 101 and REWOCOROS® AC 100 US are designed to provide excellent corrosion inhibition in metal working formulations. Ideally corrosion inhibitors should be suitable for metal protection of steels, non-ferrous metals and other metals.
Multifunctional corrosion inhibitors for aqueous metalworking fluids

Corrosion inhibitors are an integral part of metalworking fluid formulations and are widely used in water miscible metalworking fluids. Their main purpose is to prevent rust formation and corrosion on work pieces, machine parts and tools made of metals.

Additionally, depending on the composition and chemical structure of individual components, our corrosion inhibitors may also provide co-emulsification, low fraying tendency, and enhanced lubri- city which make them multifunctional. Applications include soluble oils, semi-synthetic and full synthetic fluids as well as cleaners.

Corrosion inhibitors marketed by Evonik under the trade name REWOCOROS® exhibit excellent corrosion inhibition properties for steel, iron, aluminum, and other metals. Typically, REWOCOROS® products are offered as compounds based on fatty acid amides, alkanolamides, boric acid or imidazolines.

REWOCOROS® Metal protection through corrosion inhibition

The bimetallic corrosion coupon test (ASTM E-462-96) is designed to evaluate corrosion inhibitors of additives in aqueous metalworking fluids. Metal plates are immersed in an electrolyte for 14 days and mass loss and visual inspection are taken as indicators of performance.

Multifunctional corrosion inhibitors for ferrous metals

Products such as REWOCOROS® AC 101 and REWOCOROS® AC 103 US are designed to provide excellent corrosion inhibition in metal working formulations. Ideally corrosion inhibitors show a low foam tendency and enhanced lubricity, properties which are present in these products. When used as a co-emulsifier (with fatty alcohol ethoxylates) they can transform milky emulsions into transparent micro emulsions with good stability.

REWOCOROS® AL 200 and offers outstanding corrosion inhibition of aluminum alloys and other non-ferrous metals. Additionally, REWOCOROS® AL 200 provides excellent EP/AW* properties and reserve alkalinity to water based systems.

The performance of REWOCOROS® AL 200 can be evaluated on the scale and type of corrosion of the metal surface and most importantly how corrosion inhibitors can inhibit it. The diagram shows an impedance spectrum. The electrical resistance across the metal/water interface is dependent on the absorption of corrosion inhibitors. This resistance, indirectly known as polarization resistance, is a direct measure of the inhibitor performance, and should be as high as possible.

REWOCOROS® Impedance spectroscopy

Impedance spectrum


dotted line: without inhibitor

Actual measurement: with inhibitor
Multifunctional corrosion inhibitors for aqueous metalworking fluids

Corrosion inhibitors are an integral part of metalworking fluid formulations and are widely used in water miscible metalworking fluids. Their main purpose is to prevent rust formation and corrosion on work pieces, machine parts and tools made of metals.

Additionally, depending on the composition and chemical structure of individual components, our corrosion inhibitors may also provide co-emulsification, low foaming tendency, and enhanced lubricity, which make them multifunctional. Applications include soluble oils, semi-synthetic and full synthetic fluids as well as cleaners.

Corrosion inhibitors marketed by Evonik under the trade name REWOCOROS® exhibits excellent corrosion inhibition properties for steel, iron, aluminum, and other metals. Typically, REWOCOROS® products are offered as compounds based on fatty acid amides, alkanolamides, boric acid or imidazolines.

REWOCOROS® Metal protection through corrosion inhibition

Bimetallic corrosion coupon test

The bimetallic corrosion coupon test (ASTM F 483-98) is designed to evaluate corrosion inhibitors of aluminum alloys and other non-ferrous metals. The coupons are immersed in the test fluid for 14 days and mass loss and visual inspection are taken as indicators of performance.

Filter chip test

Standard test methods as the chip/filer paper method acc. to DIN 51360 (part 2) are used to determine corrosion prevention characteristics of aqueous metal working fluids. Cast iron chips caused no staining (filter paper on the right) after being treated for 2 hours with REWOCOROS® containing water based cooling lubricant. In comparison, the iron chips caused staining (filter paper on the left) without REWOCOROS® products.

Multifunctional corrosion inhibitors for non-ferrous metals

REWOCOROS® AL 200 and offers outstanding corrosion inhibition of aluminum alloys and other non-ferrous metals. Additionally, REWOCOROS® AL 200 provides excellent EP/AW*-properties and reserve alkalinity to water based systems. The performance of REWOCOROS® AL 200 can be evaluated by the electrode free corrosion of the metal surface and should be as long as possible.

REWOCOROS® Impedance spectroscopy

Electrochemical methods can be used for the characterization of corrosion inhibitors. Current-potential measurements and impedance spectroscopy provide a deeper insight into the mechanism of corrosion inhibition and the interaction between inhibitor and metal surfaces. Furthermore, useful information can be obtained on the mode and rate of corrosion of the metal surface and also implicitly free corrosion inhibitors can be identified. The diagram shows an impedance spectrum. The electrical resistance across the metal/water interface is dependent on the absorption of corrosion inhibitors. This resistance, commonly known as polarization resistance, is a direct indication of how well the inhibitor performs, and should be as long as possible.

REWOCOROS® Multifunctional corrosion inhibitors for ferrous metals

Products such as REWOCOROS® AC 161 and REWOCOROS® AC 185 US are designed to provide excellent corrosion inhibition in metal working formulations. Ideally corrosion inhibitors should offer co-emulsification, low foaming tendency, enhanced lubricity, properties which are present in these products. When used in a co-emulsifier (with fatty alcohol ethoxylates) they can transform milky emulsions into transparent micro emulsions with good stability.

REWOCOROS® Multifunctional corrosion inhibitors for non-ferrous metals

REWOCOROS® AL 200 and offers outstanding corrosion inhibition of aluminum alloys and other non-ferrous metals. Additionally, REWOCOROS® AL 200 provides excellent EP/AW*-properties and reserve alkalinity to water based systems. The performance of REWOCOROS® AL 200 can be evaluated by the electrode free corrosion of the metal surface and should be as long as possible.

REWOCOROS® Impedance spectroscopy

Electrochemical methods can be used for the characterization of corrosion inhibitors. Current-potential measurements and impedance spectroscopy provide a deeper insight into the mechanism of corrosion inhibition and the interaction between inhibitor and metal surfaces. Furthermore, useful information can be obtained on the mode and rate of corrosion of the metal surface and also implicitly free corrosion inhibitors can be identified. The diagram shows an impedance spectrum. The electrical resistance across the metal/water interface is dependent on the absorption of corrosion inhibitors. This resistance, commonly known as polarization resistance, is a direct indication of how well the inhibitor performs, and should be as long as possible.

REWOCOROS® Multifunctional corrosion inhibitors for ferrous metals

Products such as REWOCOROS® AC 161 and REWOCOROS® AC 185 US are designed to provide excellent corrosion inhibition in metal working formulations. Ideally corrosion inhibitors should offer co-emulsification, low foaming tendency, enhanced lubricity, properties which are present in these products. When used in a co-emulsifier (with fatty alcohol ethoxylates) they can transform milky emulsions into transparent micro emulsions with good stability.

REWOCOROS® Multifunctional corrosion inhibitors for non-ferrous metals

REWOCOROS® AL 200 and offers outstanding corrosion inhibition of aluminum alloys and other non-ferrous metals. Additionally, REWOCOROS® AL 200 provides excellent EP/AW*-properties and reserve alkalinity to water based systems. The performance of REWOCOROS® AL 200 can be evaluated by the electrode free corrosion of the metal surface and should be as long as possible.
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<td>Modified fatty acid monoethanolamide</td>
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<td>Aluminum</td>
<td>Modified fatty acid monoethanolamide</td>
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<td>Emulsifiable fluids</td>
<td>Modified fatty acid diethanolamide</td>
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<tr>
<td>REWOCOROS® AL 200</td>
<td>Water soluble fluids</td>
<td>Ethoxylated fatty alcohol phosphoric acid ester</td>
<td>EP-/AW-properties, lubricity enhancer</td>
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<tr>
<td>REWOCOROS® AC 144</td>
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<td>Modified carboxylic acid amine salt</td>
<td>Low foaming tendency, excellent hard water stability</td>
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<tr>
<td>REWOCOROS® RA 60 S</td>
<td></td>
<td>Blend of modified boric acid and diglycolamine</td>
<td>Low foaming tendency, improves buffer capacity</td>
</tr>
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1) Not available in USA  
2) Only available in The Americas

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Evonik. Power to create.
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<td>REWOCOROS® AC 144</td>
<td>Modified carboxylic acid amine salt</td>
<td>Low foaming tendency, excellent hardness stability</td>
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<td>REWOCOROS® RA 603</td>
<td>Blend of modified boric acid and diglycolamine</td>
<td>Low foaming tendency, improved buffer stability</td>
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