Habicor®
High performance corrosion inhibitors
Habicor® – protecting your values

Habich GmbH manufactures Habicor® inorganic anticorrosive pigments designed to protect metal surfaces. Based on electrochemical and chemical reactions they dramatically slow down the corrosion process and can be used in various organic and inorganic coating systems. Their activity varies depending on the selected coating system, the film thickness, the pigment loading and the substrate. Optimal performance depends on selecting the ideal combination of pigments and their concentration.

Corrosion

Metals tend to their most thermodynamically stable state (e.g. iron oxide). Corrosion is an electrochemically driven process where the metal degrades due to reaction with its environment. This reaction transforms the metal into its lowest energy state. The electrochemical process is the same as the reaction mechanism of a galvanic cell. The presence of water, oxygen and salts usually accelerate the degradation process, also called corrosion.

Corrosion inhibitors protect your values

Anodic inhibitors
Anodic inhibitors act by a reducing anodic reaction. The inhibitors react with the initially formed corrosion product, creating a cohesive and insoluble film on the metal surface and thereby protecting it from further corrosion. The anodic reaction is affected by the corrosion inhibitors, reducing the corrosion potential of the metal.

Cathodic inhibitors
Cathodic inhibitors oxidize preferentially and prevent the underlying metal from oxidizing. These inhibitors contain metal ions able to initiate a cathodic reaction due to their alkalinity. They produce insoluble compounds which form a compact and adherent film. The cathodic inhibitors form a barrier.

Habicor® pigments
The corrosion preventing mechanisms are related to pigment surface area. Protection starts earlier the larger the surface area is. Therefore if required, Habicor® pigments are micronized. This also leads to improved dispersibility.

Habicor® pastes
Habicor® pastes are easy to use, pre-milled, binder-free pigment slurries. They can often be added to the formulation without additional grinding. Habicor® pastes reduce manufacturing costs and improve the flexibility of customers' production. These products do not form dust and therefore contribute to cleaner work places.

Habicor® FRI
Habicor® FRI are flash rust inhibitors which are added to water based coatings to stop corrosion formation during the drying process.

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Habicor® FRI – Flash Rust Inhibitors

Flash rust occurs quickly at the early stages of paint application and drying in water-based coatings. Most of the time, the corrosion products are soluble and capable of migrating within the coating and result in stains or spots. Therefore flash rust inhibitors are added to water-based coatings to suppress corrosion during the drying process.

In addition to our Habicor® anticorrosive pigments we offer liquid Habicor® FRI products to prevent your finish from flash rust and in-can rust.

Key benefits

- high efficiency at low dosage
- easy to use
- can be incorporated at any stage of production of paint
- low odor
- suitable for high gloss applications
- does not support foam formation
- no negative impact on the efficiency of the long term corrosion inhibitor
- very good compatibility
- high storage stability
- neutral colour
- VOC free

Product range

Habicor® FRI additives are recommended for aqueous paint systems used in general industrial, protective, automotive and decorative applications. These additives are effective in any aqueous product which has direct contact to unprotected steel surfaces.

Habicor® FRI 1000
A highly effective conventional, VOC free liquid flash rust inhibitor.

Habicor® FRI 1001
A VOC-free liquid, highly efficient, nitrite-free additive, ideal to formulate environmental friendly water-based primers and DTM paints.

Key benefits

- 0.2 % flash rust inhibitor by total formula weight
- DFT: 60 µm
- water based 1 K acrylic primer system
- Test: 20°C, 50 % humidity,
- Substrate: Cold rolled steel panels

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- DFT: 60 µm
- water based 1 K acrylic primer system
- Test: 20°C, 50 % humidity
- Substrate: Cold rolled steel panels

Key benefits

- no negative impact on the efficiency of the long term corrosion inhibitor
- very good compatibility
- high storage stability
- neutral colour
- VOC free

Density [g/cm³]

<table>
<thead>
<tr>
<th>Habicor® FRI 1000</th>
<th>Habicor® FRI 1001</th>
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</thead>
<tbody>
<tr>
<td>1.1</td>
<td>1.1</td>
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</table>

pH-Value

<table>
<thead>
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<th>Habicor® FRI 1000</th>
<th>Habicor® FRI 1001</th>
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<td>~ 9</td>
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Inhibitor load:

<table>
<thead>
<tr>
<th>Habicor® FRI 1000</th>
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<tr>
<td>0.2 – 2.0</td>
<td>0.2 – 2.0</td>
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</table>
Silicate and phosphosilicate based anticorrosive pigments

Habicor® SI is a calcium doped silicate pigment which was developed as a non-toxic alternative to chromates for coil coating. The effect consists in the ion exchange of calcium ions bound to amorphous silicate carrier material against hydrogen ions. Habicor® SI shows excellent performance with polyester and polyurethanes based binders.

Habicor® CS is a non-toxic, zinc free anticorrosive pigment. It is based on a modified calcium phosphosilicate, co-precipitated with further calcium compounds. Habicor® CS provides its best corrosion protection in water-borne resins but it can also be used in solvent-borne paints. In combination with adhesion promoting pigments such as Habicor® CP 4295 synergisms can be achieved (page 10).

Habicor® ZS is a non-toxic, modified zinc strontium phosphosilicate corrosion inhibitor used in the wide range of protective coatings. Habicor® ZS is recommended for usage in the huge range of resin systems, solvent-borne and water-borne ones. Habicor® ZS is also effective in thin film applications like coil coatings.

<table>
<thead>
<tr>
<th>Habicor®</th>
<th>Density [g/ml]</th>
<th>Bulk density [kg/l]</th>
<th>Residue on sieve 325 mesh [%]</th>
<th>Average particle size [µm]</th>
<th>Oil absorption [g/100g]</th>
<th>Loss on ignition [%]</th>
<th>Conductivity [µS/cm]</th>
<th>pH-value</th>
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<td>SI</td>
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<td>0.3</td>
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<td>CS</td>
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<td>ZS</td>
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<td>-0.1</td>
<td>6.8</td>
<td>20</td>
<td>7.9</td>
<td>200</td>
<td>8.2</td>
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</table>

Habicor® SI
- solvent borne 2 pack high solid acrylic primer
- 8 % of anticorrosive pigment
- Substrate: Cold rolled steel (Q-Panel)
- DFT: 100 µm
- 523 h in SST (ASTM B-117)

Habicor® CS
- waterborne 2 pack polyester resin
- 8 % anticorrosive pigment
- Substrate: Cold rolled steel (Q-Panel)
- DFT: 100 µm
- 200 h in SST (ASTM B-117)

Habicor® ZS
- solvent borne short oil alkyd resin
- 8 % anticorrosive pigment
- Substrate: Cold rolled steel (Q-Panel)
- DFT: 100 µm
- 480 h in SST (ASTM B-117)

Blanc Habicor® SI Zinc phosphate

Blanc Habicor® ZS Zinc phosphate

Blanc Habicor® CS Zinc phosphate

Blanc Habicor® CS Zinc phosphate

Blanc Habicor® ZS Zinc phosphate
Zinc phosphate-based anticorrosive pigments

Habicor® ZP 3850/3860 are very compatible anticorrosive pigments, suitable for many water and solvent borne systems.

Habicor® ZA has improved protective properties compared to zinc phosphate due to its higher phosphate content and better interaction with the carboxylate groups of the resin and the metal substrate.

Habicor® ZN is an organically modified basic zinc phosphate. With increased hydroxyl ion content, the pH of the coating can be stabilized and the electron donation at the anode can be suppressed. Due to the organic modification of a higher activity of the pigment and improved adhesion of the coating can be achieved.

<table>
<thead>
<tr>
<th>Habicor®</th>
<th>Density [g/ml]</th>
<th>Bulk density [kg/l]</th>
<th>Residue on sieve &gt;250 mesh [%]</th>
<th>Average particle size [µm]</th>
<th>Oil absorption [g/100g]</th>
<th>Loss on ignition [%]</th>
<th>Conductivity [µS/cm]</th>
<th>pH-value</th>
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</thead>
<tbody>
<tr>
<td>ZP 3850 Zinc phosphate tetrahydrate</td>
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<td>0.8</td>
<td>&lt;0.2</td>
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<td>15.2</td>
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<td>ZP 3860 Zinc phosphate dihydrate</td>
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<td>ZA Modified zinc aluminium polyphosphate</td>
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<td>25</td>
<td>10.2</td>
<td>200</td>
<td>6.9</td>
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<tr>
<td>ZN Organic modified basic zinc phosphate</td>
<td>3.9</td>
<td>0.6</td>
<td>&lt;0.2</td>
<td>4.3</td>
<td>25</td>
<td>6.8</td>
<td>250</td>
<td>6.8</td>
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<tr>
<td>ZO Organic coated basic zinc phosphate</td>
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<td>&lt;0.2</td>
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<td>30</td>
<td>7.6</td>
<td>250</td>
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<tr>
<td>ZM Multiphase pigment based on basic zinc phosphate</td>
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<td>10.0</td>
<td>250</td>
<td>8.0</td>
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</table>

Habicor® ZO is an organically coated basic zinc phosphate, which shows a better protection behavior than zinc phosphate in PU and alkyd resins. In combination with Habicor® CP 4295 the product provides excellent protection on aluminum substrates.

Habicor® ZM has improved corrosion protection performance due to the presence of molybdate anions, which, as anodic passivators, are not dissimilar to chromate ions.

Habicor® ZA

- solvent borne 1 pack polyurethane resin
- 8 % of anticorrosive pigment
- Substrate: Zinc aluminium galvanized steel
- DFT: 100 µm
- 1000 h in SST (ASTM B-117)

Habicor® ZN

- water borne 1 pack polyurethane modified alkyd resin
- 8 % of anticorrosive pigment
- Substrate: Cold rolled steel (Q-Panel)
- DFT: primer 60 µm
- 265 h in SST (ASTM B-117)

Habicor® ZO

- water borne 1 pack polyurethane resin
- 8 % of anticorrosive pigment
- Substrate: Cold rolled steel (Q-Panel)
- DFT: 110 µm
- 300 h in SST (ASTM B-117)

Habicor® ZM

- solvent borne low molecular weight polyester resin
- 8 % of anticorrosive pigment
- Substrate: Bare steel (Q-Panel)
- DFT: primer 15 µm
- 165 h in SST (ASTM B-117)
Orthophosphates and Polyphosphates

Habicor® AZ is an anticorrosive pigment based on zinc modified aluminum tripolyphosphate for water and solvent based applications. It has a very good adhesion and impact resistance. This product can not only be used in steel products, it also can be used for aluminum and zinc substrates.

Habicor® SP is an anticorrosive pigment for water and solvent based applications. This product is effective not only on steel products, it also can be used on ferrous and non-ferrous substrates like aluminum.

<table>
<thead>
<tr>
<th>Pigment</th>
<th>Density [g/ml]</th>
<th>Bulk density [g/l]</th>
<th>Residue on sieve 325 mesh (%)</th>
<th>Average particle size [µm]</th>
<th>Oil absorption [g/100g]</th>
<th>Loss on ignition (%)</th>
<th>Conductivity [µS/cm]</th>
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<td>&lt;0.1</td>
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Habicor® AZ is an anticorrosive pigment based on zinc modified aluminum tripolyphosphate for water and solvent based applications. It has a very good adhesion and impact resistance. This product can not only be used in steel products, it also can be used for aluminum and zinc substrates.

Habicor® CP 4295 is an anticorrosive pigment providing adhesion promotion based on Chromium(III) phosphate. Often used in combination with other Habicor® pigments.

Habicor® SP

- Solventborne 2 pack polyurethane
- 8 % of anticorrosive pigment
- Substrate: zinc aluminium galvanized steel panels
- DFT: 100 µm
- 1000 h in SST (ASTM B-117)

Habicor® CP 4295

- Solventborne heat curing polyester-melamin system (coil coating)
- 5 % of anticorrosive pigment
- Substrate: zinc aluminium galvanized steel panels with phosphate pretreatment
- DFT: Primer 6 µm, top coat 20 µm
- 1000 h in SST (ASTM B-117)

Habicor® CP 4295 + Habicor® SI

- solvent borne short oil alkyd resin
- 8 % of anticorrosive pigment
- Substrate: Cold rolled steel (Q-Panel)
- DFT: 55 µm
- 300 h in SST (ASTM B-117)
### Application Guide

<table>
<thead>
<tr>
<th>Habicor®</th>
<th>Silicate</th>
<th>Phosphosilicate</th>
<th>Zinc phosphates</th>
<th>Modified zinc phosphates</th>
<th>Polyphosphates</th>
<th>Orthophosphate</th>
<th>Molybdate</th>
<th>Chromates</th>
<th>Flash rust inhibitor</th>
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- **Excellent**: +++
- **Good**: ++
- **Possible**: +

### Solvent-based coatings

- **Medium and long oil alkyds**: ++ +++ ++ ++ ++ ++ +++
- **2-Pack epoxies**: + ++ ++ ++ +++ + +
- **Epoxy esters**: ++ ++ ++ ++ + ++
- **High solid epoxies**: ++ ++ ++ + +++ +
- **High solid polyurethanes**: ++ ++ ++ ++ +++ ++
- **Polyurethanes**: + +++ ++ + ++ +++ +++

### Water-based coatings

- **Alkyd emulsions**: ++ ++ ++ ++ + ++ +++
- **Acrylics and modified acrylics**: + ++ ++ ++ ++ + +
- **2-Pack epoxies**: ++ +++ ++ ++ +
- **2-Pack polyurethanes**: ++ ++ + ++ ++
- **Polyesters**: +++ + ++ ++ +++
- **Epoxyesters**: +++ + ++ ++ +++

### Specialities

- **Powder coatings**: + + +
- **Etch and wash primers**: + + +
- **Coil coatings**: +++ + +++ + +++

### High performance corrosion inhibitors
Chromate-based anticorrosive pigments

Habicor® chromate-based anticorrosive pigments fulfill the desire of our customers for high quality corrosion protection pigments. These pigments will only be used where other technologies cannot reach the requested technical and safety protection level.

Whether in aerospace coating, coil coating, automotive coating or in shipbuilding, wherever this pigment class is used, no compromises concerning corrosion protection can be accepted because of safety reasons or long term warranty periods.

Part of the extraordinary technical properties of these products is that they offer a high protective level independent of substrate and binder.

Habicor® pastes

Habicor® pastes are among the best anticorrosive pastes worldwide. They are high solids, binder-free pigment slurries based on our Habicor® pigments range and are supplied in a range of media suitable for solvent-borne, water-thinnable and aqueous systems.

Benefits

- no hazardous dust
- pre-dispersed and milled slurries
- easy dosing and incorporation
- up to 75 % w/w solid

Solvents

- Xylene
- Solvent Naphtha
- Water
- Other solvents on request

Resins

- On request

Following the trend to make the handling of sensitive products more save, Habich GmbH offers the opportunity to manufacture semi finished primers or primers for you. Contact us for more details.

<table>
<thead>
<tr>
<th>Paste</th>
<th>Pigment</th>
<th>Content of pigment [%]</th>
<th>Solvent</th>
<th>Density [g/ml]</th>
<th>Resin based [%]</th>
<th>Fineness [µm]</th>
<th>Hegman</th>
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<td>Xylene</td>
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<td>Paste 21</td>
<td>Strontium chromate</td>
<td>70</td>
<td>Naphtha light</td>
<td>1.9</td>
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</table>

Further pigment slurries can be developed on request.
Habich GmbH is a globally recognized manufacturer of special inorganic pigments. Our product portfolio includes, in addition to inorganic coloured pigments and coloured pigment preparations, a broad range of inorganic corrosion protection pigments, pigment slurries and pigment pastes.

As a 6th generation Austrian family business, we stand for reliability and sustainability in our business relationships. For more than 170 years, customer satisfaction and customer success are our main objectives. Flexibility and innovative strength characterize our abilities. Thanks to our highly motivated, chemically and technically trained employees we also can provide tailor made solutions to meet any situation.