



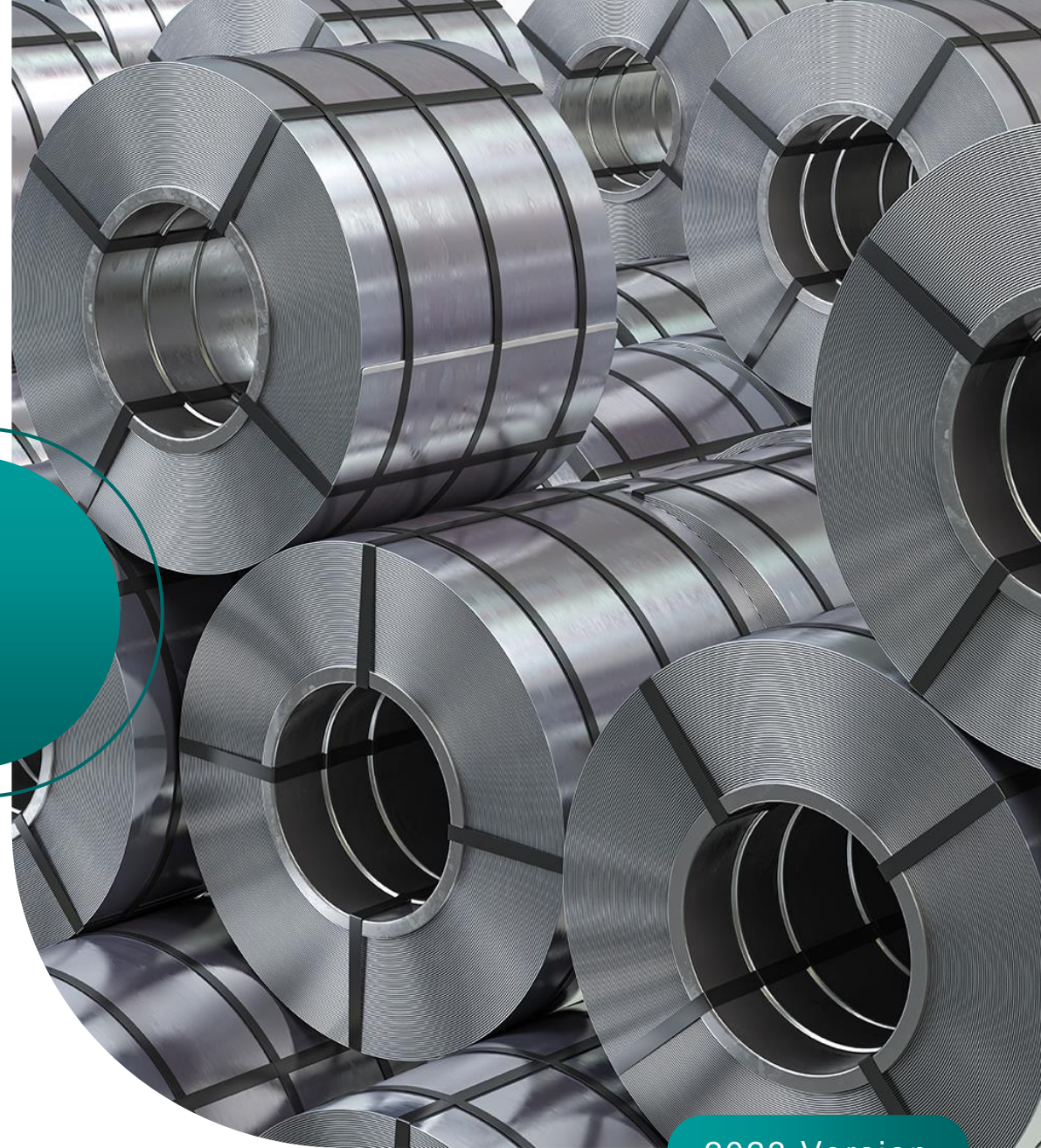
HHC
Benefit | Cooperation | Integrity

MS 700 Series

Silica Anti-corrosion Pigments

www.hhc-silica.com

2023 Version





Description :

- **Main raw material:** Synthetic amorphous silica
- **Other function materials:** Calcium Oxide etc.
- **Characteristic:** Ion-exchange, calcium oxide-modified silica, non-toxic and free heavy metal.
- **Appearance:** white, non-crystalline powder
- **R&D background:** to replace traditional anti-corrosion pigments, such as zinc phosphate, strontium chromate, etc., to cope with increasing environmental problems and regulatory restrictions
- **Application:** general industrial paints, coils, automotive coatings, home appliance panels, etc.

Advantage

- Outstanding anti-corrosion performance.
- Suitable for water-borne and solvent systems
- Eco-friendly, free-zinc, non-toxic.
- Low oil absorption, easy to disperse.



Synthetic powder silica

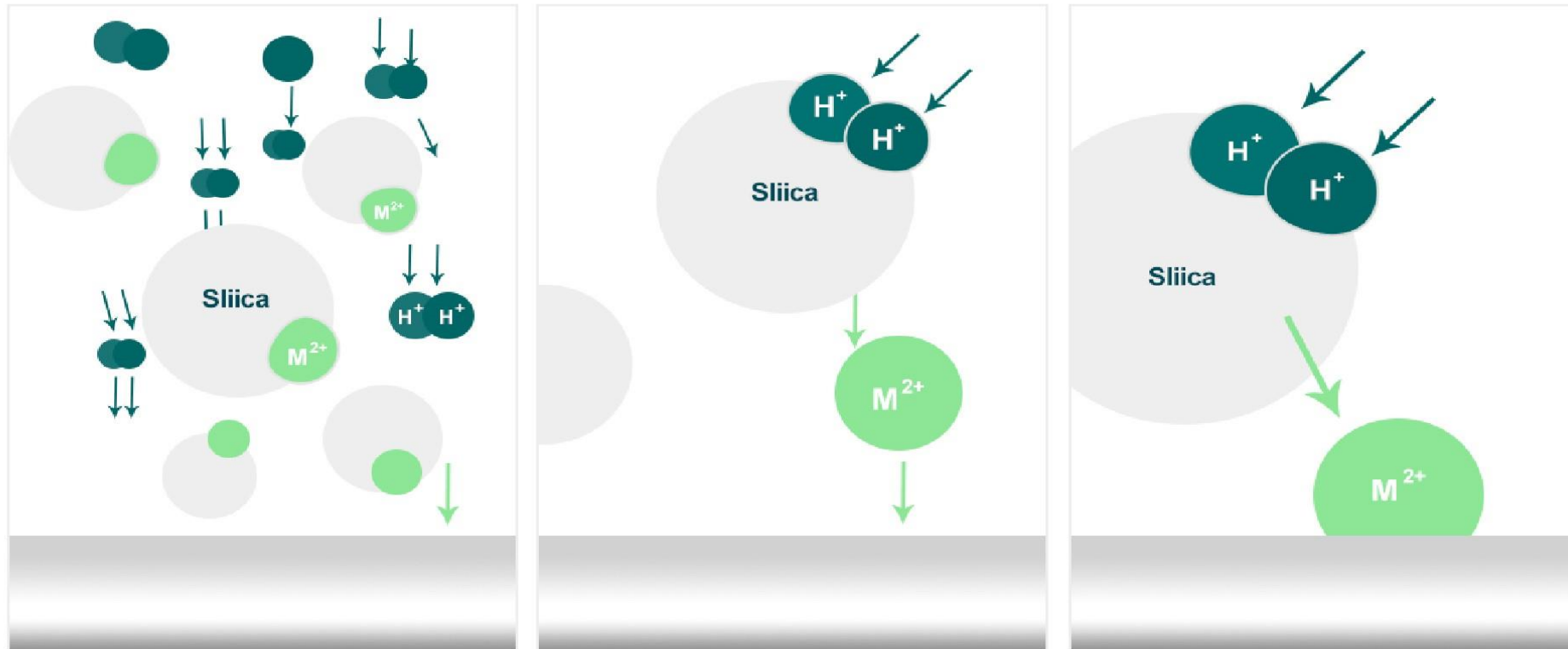


Reject and retard corrosion



Chemical Protection Principle: ion exchange

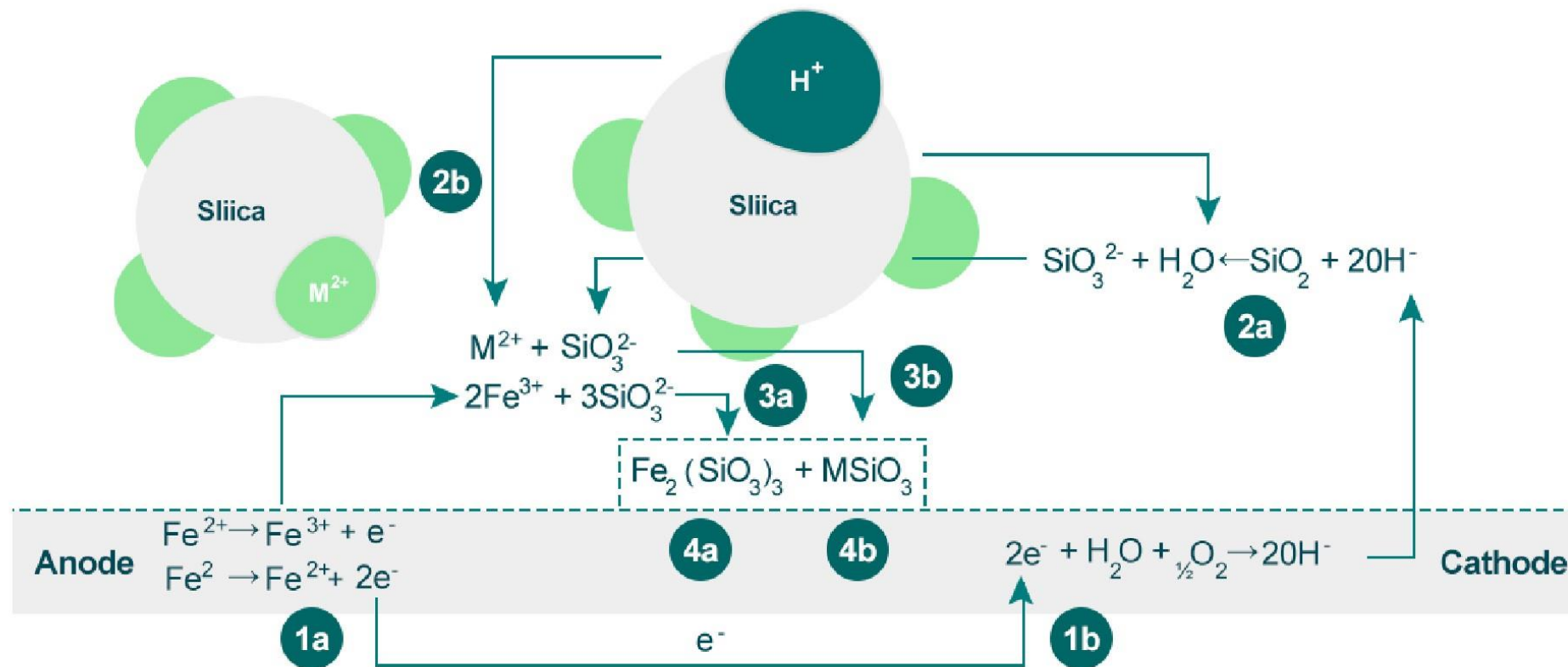
Resists acid corrosion, Anti-corrosion pigments modified with calcium ions, will react with water molecules and hydrogen ions which seep into the coating film. It will generate hydroxide ions and release calcium ions to keep the pH value as neutral or alkaline. It avoids the metals for acidic hydrogen evolution corrosion and reduces the coating films' bulge phenomenon.





Physical Protection Principle: inert layer

When metals have corrosion, the anode generates iron or ferrous ions, and the cathode generates hydroxide ions. The hydroxide ion will react with silica and release a silicate ion. The hydroxide will react with the iron or calcium ion to generate silicate and cover the surface of the metal to give an inert protective layer. Therefore, any further electrochemical reaction of the metal is prevented, and any further corrosion is prevented from occurring effectively.





Experimental conditions: 650 hours

- Experimental standard: GB/T 2423.17, IEC 60068-2-11, neutral salt spray test;
- Coating System: Epoxy resin, 2-pack system, water-based paint;
- Coating parameters: film thickness 50~60 μm , single-layer primer, cold-rolled thick steel plate, 8% anti-corrosion pigment addition;



MS 780



MS 730



AC 5



MS 775



ZPA



	HHC Silica Anti-corrosion pigment	Zinc phosphate products
Corrosion resistance	<ul style="list-style-type: none">• Higher efficiency and lower addition;• And more durable corrosion protection, through the salt spray test, reaching more than 1000 hours of protection time (up to 1900 hours or more)	<ul style="list-style-type: none">• High addition;• The salt spray test is generally within 600 hours, even for the modified zinc phosphate series, it isn't easy to reach a higher level
Suitability	<ul style="list-style-type: none">• Suitable for 2-park systems, solvent-borne systems• Particularly suitable for waterborne systems	<ul style="list-style-type: none">• Suitable for 2-park systems, solvent-borne systems• Poor performance in waterborne systems
Cost	<ul style="list-style-type: none">• Low price, about the same level as zinc phosphate	<ul style="list-style-type: none">• The market has widely accepted it, and the market has a high tolerance for the price
Environmental and regulations	<ul style="list-style-type: none">• Non-toxic and harmless to the human body• Does not contain toxic substances, heavy metals, and phosphoric acid substances• Easy to pass mandatory certification	<ul style="list-style-type: none">• It is a phosphoric acid product. Although there are no restrictions in some countries, as the regulations become more and more stringent, the restrictions will increase and there will be risks.



	HHC Silica Anti-corrosion pigment	Other Silica Anti-corrosion pigments
Corrosion resistance	<ul style="list-style-type: none"> Same corrosion resistance and same salt spray test results 	<ul style="list-style-type: none"> Excellent anti-corrosion ability, as a new generation of anti-corrosion pigments, it is unique in some application fields;
Suitability	<ul style="list-style-type: none"> The applicability is consistent with GRACE, and a 1:1 equivalent replacement is available. Due to the excellent modification process, some models have the characteristics of pH neutrality or weak acidity and can get rid of the shackles of acid catalysts in some situations. 	<ul style="list-style-type: none"> Wide range of applicability, good performance for solvent-based systems, waterborne systems, primers, and 2-pack systems
Cost	<ul style="list-style-type: none"> Only half of the price of GRACE or lower, it can completely replace traditional anti-rust pigments, and the customer's use cost will be more flexible 	<ul style="list-style-type: none"> Expensive, many customers have to actively reduce the amount added or use modified traditional products
Environmental and regulations	<ul style="list-style-type: none"> The same environmental protection features as GRACE products; 	<ul style="list-style-type: none"> Excellent environmental protection properties, non-toxic and non-polluting Meet stringent regulatory requirements



MS 700 Series

Silica Anti-corrosion Pigments

Parameter

HHC	Average particle size (um)	Oil Absorption DBP	pH	Appearance	Bulk Density (g/cm ³)
MS 730	2.8~3.2	70~90	6~8	White, Odorless powder	0.55~0.65
MS 770	2.8~3.2	40~60	8~10		0.75~0.9
MS 775	6.0~7.0	40~60	8~10		0.75~0.9
MS 780	2.8~3.2	50~70	8~10		0.6~0.7
MS795	6.0~7.0	30~50	8~10		0.85~1.1
RP 300	2.5~3.0	70~90	6~8		0.55~0.65
RP 500	2.5~3.0	50~70	6.5~8.5		0.65~0.75



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Applications

HHC	Recommended Application	Best Suitability	Addition Value
MS 730	Home appliance coil, construction coil, thin coating process	Waterborne primers, 2-pack systems Film thickness $\leq 10 \mu\text{m}$	5~8%
MS 770	Construction machinery, container	Waterborne primers, 2-pack systems	5~12%
MS 775	Construction machinery, container	Waterborne primers, 2-pack systems	5~12%
MS 780	Home appliance coil, construction coil, thin coating process	Waterborne primers, 2-pack systems Film thickness $\leq 10 \mu\text{m}$	5~8%
MS795	Steel structure	Solvent borne primers	5~12%
RP 300	High-end home appliance coils, construction coils	Waterborne primers, 2-pack systems	5~8%
RP 500	High-end construction machinery, rail transit, aerospace machinery	Waterborne primers, 2-pack systems	5~8%



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Equivalent model

HHC	GRACE	OTHERS
MS 730	CS 311, C 303	XCA02
MS 770, MS 775		Zinc Phosphate, HEUCOPHOS [®] ZPA
MS 780	AC 3, AC 5	XCA02, Nubirox 106 Strontium chromate, HEUCOPHOS [®] ZPA
MS 795		Zinc Phosphate
RP 300	C 303, CS 311	XCA02
RP 500	AC 3, AC 5	HEUCOPHOS [®] ZPA

Technology serves the business, Service doesn't end with delivery!

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