

# Sika® FerroGard®-903

## Corrosion inhibiting impregnation

### Product Description

Sika® FerroGard®-903 is a surface applied mixed corrosion inhibitor, designed for use as an impregnation of steel reinforced concrete.

Sika® FerroGard®-903 is based on organic and inorganic compounds. Sika® FerroGard®-903 penetrates the concrete and forms a protective monomolecular layer on the surface of the reinforcing steel.

Protection with Sika® FerroGard®-903 both delays the start of corrosion and reduces the corrosion rate. Corrosion protection with Sika® FerroGard®-903 - increases the service and maintenance life cycles by up to 15 years when used as part of a complete Sika Concrete Repair and Protection System.

### Uses

- For the corrosion protection of steel reinforced concrete structures above and below ground
- As a corrosion control treatment for undamaged reinforced concrete where reinforced steel is corroding, or is at risk from corrosion due to the effects of carbonated or chloride contaminated concrete
- Sika® FerroGard®-903 is especially suitable for extending the service life of aesthetically valuable fair-faced concrete surfaces such as historic structures

### Characteristics / Advantages

- Complies with principles 9.2 and 11.3 of EN 1504-9
- Does not change the appearance of the concrete structure
- Does not alter the water vapour diffusion properties of concrete
- Long term protection and durability
- Can be applied to the surface of existing repairs and surrounding areas to prevent the development of incipient anodes
- Mixed inhibitor, protects both anodic and cathodic zones of the steel
- Can be applied where other repair/prevention options are not viable
- Economic extension of the service life of reinforced concrete structures
- Easy, economical application, renewable
- Can be used as part of a simple yet effective concrete repair and protection system
- Penetration depth can be tested on site using the Sika "Qualitative Colour Test"

### Tests

#### Approval / Standards

BRE, The use of surface applied FerroGard 903 Corrosion Inhibitor to delay the onset of chloride induced corrosion in hardened concrete – Report No. 224-346A - 2005

Mott MacDonald, Evaluation of Sika® FerroGard®, Ref. 26'063/001 Rev A April 1996.

Wolfseher & Partner, Materials Technological Investigation, Report No. 96.144.11 and Report No. 98.115.11.

University of Surrey, Corrosion Inhibitors for High Performance Reinforced Concrete Structures – November 2000

C-Probe Technologies Ltd, Performance of Corrosion Inhibitors in Practice – 2000



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## Product Data

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### Form

**Appearance / Colour**      Transparent liquid.

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**Packaging**                      25 kg pail  
   180 kg drum

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### Storage

**Storage Conditions / Shelf life**      24 months from date of production if stored properly in undamaged and unopened, original sealed packaging. Store in a cool environment. In case of - frost (< -5 °C), - reversible crystallisation may occur. If this happens, let the product warm up at room temperature (+15 - +25 °C), then stir well to redissolve the crystals.

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### Technical Data

**Chemical Base**                      Amino alcohol and inorganic combination.

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**Density**                                ~ 1.13 (at +20°C)

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**pH Value**                              ~ 11

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**Viscosity**                              ~ 25 mPas.s

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**Penetration Rate**                      Site surveys and experimental tests have shown that Sika® FerroGard®-903 can penetrate through concrete at a rate of a few millimetres per day and to a depth of approximately 25 mm in 1 month. This penetration rate can be faster or slower dependent on the porosity of the concrete. Sika® FerroGard®-903 penetrates through both liquid and vapour phase diffusion mechanisms.

As concrete quality and permeability differs, it is recommended some preliminary depth profile testing to assess the specific penetration rate using the Sika "Qualitative Colour Test".

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## System Information

**System Structure**                      Sika® FerroGard®-903 is part of the Sika® Concrete Repair & Protection Systems:

Repair system:	Sika® MonoTop, SikaTop® or Sika® Icoment
Reinforcement corrosion control:	Sika® FerroGard®-903
Concrete protection:	Sikagard® Coatings or Impregnations

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## Application Details

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<b>Consumption / Dosage</b>	Total consumption: $\approx 0.500 \text{ kg/m}^2$ ( $\approx 440 \text{ ml/m}^2$ )  For very dense concrete with low permeability, the rate of application of Sika® FerroGard®-903 can be reduced but must not be lower than $0.300 \text{ kg/m}^2$ . To assess project concrete requirements, consumption and depth of penetration should be checked on site using the Sika "Qualitative Colour Test".
<b>Substrate Quality</b>	The concrete shall be free from dust, loose material, surface contamination, existing renders, laitance coatings, oil and other materials which reduce or prevent penetration.  If the substrate is to be overcoated, the surface profile should be sufficient to provide the required adhesion values.
<b>Substrate Preparation</b>	Delaminated, weak, damaged and deteriorated concrete should be repaired using Sika MonoTop, SikaTop or Icoment mortars.  For fair-faced concrete, water blast the concrete surface with pressure (up to 18 MPa – 180 bars)  For concrete surface to be further overcoated, roughen the surface using water blasting with high pressure (up to 60 MPa – 600 bars)  Do not use hot water.  For optimum penetration the substrate should be allowed to dry out prior to the application of Sika® FerroGard®-903.

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## Application Conditions / Limitations

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<b>Substrate Temperature</b>	+5°C min. / +40°C max.
<b>Air Temperature</b>	+5°C min. / +40°C max.

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## Application Instructions

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<b>Mixing</b>	Sika® FerroGard®-903 is supplied ready for use and must not be diluted. Do not shake the material prior to use. Following transportation, some foam may appear in the container - this does not affect the performance of the product.
<b>Application Method / Tools</b>	Sika® FerroGard®-903 should be applied to saturation by brush, roller, low pressure or airless spray equipment.  Where fair-faced concrete is to remain as an aesthetic feature, the treated surfaces should be cleaned by pressure washing ( $\sim 10 \text{ MPa} - 100 \text{ bars}$ ) within 2 days of the application.
<b>Cleaning of Tools</b>	Use water to clean application equipment etc.

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## Waiting Time / Overcoatability

### Number of coats:

This is dependent on the porosity and moisture content of the substrate and the weather conditions.

### Vertical surfaces:

Normally, 2 to 3 coats are necessary to achieve the required consumption – However, job site conditions will ultimately dictate how many coats are required.

### Horizontal Surfaces:

Saturate surface using 1-2 coats taking care to avoid ponding.

### Waiting time between coats:

This is dependent on the porosity of the concrete and the weather conditions, normally 1-6 hours. Allow the surface to dry between coats to a matt damp appearance.

## OVERCOATING:

### Vertical & Non Trafficked Horizontal Surfaces:

If the area treated with Sika® FerroGard®-903 is to be overcoated, the following procedure has to be observed:

- Allow to dry for 1 day
- Wash down thoroughly by pressure washer ≈10 MPa – 100 bars
- Allow to dry

### Horizontal Trafficked Surfaces:

- Allow to dry for 1 day
- Wash down thoroughly by low pressure water blasting 18 MPa – 180 bars and push water in one direction away from surface to be overcoated to remove any residue. Two washes may be necessary especially on dense concrete to achieve the required adhesion values.

Sikagard® hydrophobic impregnations, Sikagard® breathable coatings or Sikafloor products can then be applied. (Refer to appropriate Product Data Sheet)

If non Sika coatings are to be applied, please contact the manufacturers technical department for confirmation of compatibility with Sika® FerroGard®-903 or undertake compatibility and adhesion site trials.

### Concrete repairs/overlays:

When Sika® FerroGard®-903 is used within a patch repair or before a cementitious overlay, wash area thoroughly after application as per overcoating requirements. A bonding primer of SikaTop® Armatec-110 EpoCem® or SikaTop 121 shall be used (Refer to appropriate Product Data Sheet) with Sika MonoTop, SikaTop, Sikacem or Icoment repair systems.

### Smoothing coat/pore filling:

When using a smoothing coat/pore filler over surface treated with Sika® FerroGard®-903, only SikaTop®-121, SikaGard®-720 EpoCem® or Sika® MonoTop-107 is to be used. Cementitious levelling mortars should only be used if there is a well prepared open textured surface that is completely cleaned of residue – this may require additional washing or surface preparation to achieve the desired adhesion values. Site trials are recommended to confirm preparation and washing regime.

<b>Notes on Application / Limitations</b>	<p>Do not apply when there is expected rain or frost.</p> <p>The following construction materials have to be protected from splashes of Sika® FerroGard®-903 during application:</p> <ul style="list-style-type: none"> <li>- Aluminium, copper, galvanised steel, marble and other similar natural stone</li> </ul> <p>In cases of splashes on alkaline sensitive surface, wash immediately with water.</p> <p>Visible concrete defects (spalling, cracks etc) must be repaired using conventional repair methods (removal of delaminating/loose concrete, treatment of reinforcement, reprofiling etc.).</p> <p>Sika® FerroGard®-903 may not be used at the normal consumption rate if the chloride concentration at the reinforcement depth is higher than 1.0% chloride ions (free ions), corresponding to 1.7% sodium chloride (by weight of cement). Increased consumption can be considered for higher chloride concentrations. Trials and corrosion rate monitoring to confirm consumption and effectiveness should be considered</p> <p>Do not apply in tidal zones or to substrates saturated with water.</p> <p>Avoid application in direct sun and/or strong wind and/or rain.</p> <p>Do not apply to concrete in direct contact with drinking water.</p> <p>Depending on substrate conditions, the application of Sika® FerroGard®-903 may lead to a slight darkening of the surface. Proceed with preliminary testing.</p> <p>The applied Sika® FerroGard®-903 can reduce the bond of subsequent concrete repair and coating systems, especially on dense, low permeability concrete. Thorough washing of any residue from surface is essential.</p> <p>All surface treatments are to be carried out using cold potable water.</p>
<b>Curing Details</b>	
<b>Curing Treatment</b>	Sika® FerroGard®-903 does not require any special curing but must be protected from rain for at least 6 hours at +20 °C.
<b>Value Base</b>	All technical data stated in this Product Data Sheet are based on laboratory tests. Actual measured data may vary due to circumstances beyond our control.
<b>Local Restrictions</b>	Please note that as a result of specific local regulations the performance of this product may vary from country to country. Please consult the local Product Data Sheet for the exact description of the application fields.
<b>Health and Safety Information</b>	For information and advice on the safe handling, storage and disposal of chemical products, users should refer to the most recent Material Safety Data Sheet containing physical, ecological, toxicological and other safety-related data.

## Legal Notes

The information, and, in particular, the recommendations relating to the application and end-use of Sika products, are given in good faith based on Sika's current knowledge and experience of the products when properly stored, handled and applied under normal conditions in accordance with Sika's recommendations. In practice, the differences in materials, substrates and actual site conditions are such that no warranty in respect of merchantability or of fitness for a particular purpose, nor any liability arising out of any legal relationship whatsoever, can be inferred either from this information, or from any written recommendations, or from any other advice offered. The user of the product must test the product's suitability for the intended application and purpose. Sika reserves the right to change the properties of its products. The proprietary rights of third parties must be observed. All orders are accepted subject to our current terms of sale and delivery. Users must always refer to the most recent issue of the local Product Data Sheet for the product concerned, copies of which will be supplied on request.



Sika Limited  
Watchmead  
Welwyn Garden City  
Hertfordshire  
AL7 1BQ  
United Kingdom

Phone +44 1707 394444  
Telefax +44 1707 329129  
[www.sika.co.uk](http://www.sika.co.uk), email: [sales@uk.sika.com](mailto:sales@uk.sika.com)

