

RHEOCRETE[®] CNI

Corrosion-inhibiting admixture

DESCRIPTION

RHEOCRETE CNI is a calcium nitrite based corrosion-inhibiting admixture for steel reinforced concrete. **RHEOCRETE CNI** contains minimum 30% active ingredients by mass and meets ASTM C494 interim requirements for Type C, accelerating admixtures.

Mechanism of action

In the alkaline environment of concrete, a natural passive ferric oxide layer naturally forms on the surface of embedded reinforcing steel and protects the steel from corrosion. This passive oxide layer may break down in the presence of chlorides, oxygen and moisture resulting in corrosion of the steel.

RHEOCRETE CNI delays corrosion by re-passivating defects on the oxide/steel surface. These defects are ferrous oxide ions that are susceptible to chloride attack. When chloride ions attack the ferrous ions, they combine to create a ferrous chloride complex (rust) and initiate pitting corrosion on the reinforcing steel. If untreated, chloride ions continue to attack newly exposed ferrous ions and form additional expansive corrosion products leading to staining, cracking and spalling of the concrete.

Nitrite ions contained in **RHEOCRETE CNI** are effective in preventing ferrous chloride complex formation by reacting with defective ferrous oxide ions prior to chloride attack and reforming the passive layer. Nitrite ions surround the defective ferrous oxide ion and convert it to a more stable ferric ion species less susceptible to corrosion. This oxidation reaction serves to re-passivate the reinforcing steel and re-establish the barrier between the steel and chlorides that initiate corrosion.

Chemical Composition

RHEOCRETE CNI contains a minimum of 30% calcium nitrite by mass as an active ingredient. **RHEOCRETE CNI** is identical in composition and mechanism to other commercially available 30% calcium nitrite corrosion-inhibiting admixture, and at equal dosage rates, provides similar performance and corrosion protection. The water content of **RHEOCRETE CNI** is approximately 0.875 kg/L. This water contributes to the consistency of the concrete mixture and the hydration of the cementitious materials. The water contributed by **RHEOCRETE CNI** should be used in the calculation of the water-cementitious material ratio of the concrete.

Non-Chloride

RHEOCRETE CNI will not initiate or promote corrosion of reinforcing steel embedded in concrete, prestressed concrete or concrete placed in galvanised steel floor and roof systems. Neither calcium chloride nor any

chloride-based ingredients are used in the manufacture of **RHEOCRETE CNI**.

Compatibility

RHEOCRETE CNI may be used with Portland cements and mineral admixtures approved under recognised international standards. It is compatible with other chemical admixtures, including water reducers, superplasticisers, retarders and air entrainers. Chemical admixtures should be added separately to the concrete to ensure desired results.

FIELDS OF APPLICATION

RHEOCRETE CNI is recommended for steel reinforced concrete where longer service lives are desired and it is expected that the concrete will be exposed to environmental chlorides from de-icing salts or massive exposure.

RHEOCRETE CNI may also be used to offset the potentially corrosive effects of the chloride-bearing concrete-making ingredients and in applications where the initial chloride ion content of the concrete may exceed code requirements or other specified chloride limits.

FEATURES AND BENEFITS

RHEOCRETE CNI is a corrosion inhibitor that provides basic corrosion protection for steel reinforced concrete structures.

Effective corrosion protection against chlorides in concrete Extends the service life of reinforced concrete structures.

TYPICAL PERFORMANCE DATA

RHEOCRETE CNI provides plastic and hardened concrete properties consistent with an ASTM C494 Class C admixture.

The extension in service life due to the product is a function of the product dosage, the chloride exposure level, structure design factors and the transport properties of the concrete. The following tables illustrate the effect of **RHEOCRETE CNI** dosage and chloride exposure level:

RHEOCRETE CNI Dosage L/m ³	Chloride Protection Limit, kg/m ³	
	With chloride-bearing materials	All other applications
5.0	1.2	-
10.0	2.4	3.6
15.0	3.6	5.9
20.0	4.8	7.7
25.0	6.0	8.9
30.0	7.2	9.5

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The Chemical Company

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Contact local BASF Construction Chemicals representatives for additional guidance regarding specific applications, service life, and the use of corrosion protection.

APPLICATION

RHEOCRETE CNI will effectively inhibit corrosion in all types of steel reinforced concrete including precast /prestressed and post-tensioned applications.

Concrete setting times may be accelerated with the use of **RHEOCRETE CNI**. If desired, a retarding or hydration control admixture may be added to the concrete mixture to offset the acceleration effects of **RHEOCRETE CNI**. Please contact your local BASF Construction Chemicals representative for additional information on set-balancing admixtures for concrete.

DOSAGE

RHEOCRETE CNI is recommended for use at a dosage rate of 5 L/m³ of concrete for all applications and corrosion environments.

RHEOCRETE CNI dosed at 5 L/m³ is formulated to provide optimum corrosion protection of reinforced concrete structures in severe corrosive environments and therefore provides excellent corrosion protection in less severe corrosion environments as well.

RHEOCRETE CNI is recommended for use at a single dosage in order to eliminate the confusion and

uncertainties related to determining the severity of the corrosive environment and predicting the chloride exposure of the structure.

PACKAGING

RHEOCRETE CNI is available in 205L drums and bulk delivery.

SHELF LIFE

RHEOCRETE CNI can be stored for 12 months if stored at temperatures between 12 to 38°C, in tightly sealed original drums. If found to be frozen, thaw it and reconstitute by stirring. Do not use pressurised air for agitation.

PRECAUTIONS

Health : **RHEOCRETE CNI** does not contain any hazardous substances requiring labelling.

It is safe for use with standard precautions followed in the construction industry, such as use of hand gloves, safety goggles, etc.

For detailed Health, Safety and Environmental recommendations, please consult and follow all instructions on the product Material Safety Data Sheet.

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STATEMENT OF RESPONSIBILITY

The technical information and application advice given in this **BASF Construction Chemicals** publication are based on the present state of our best scientific and practical knowledge. As the information herein is of a general nature, no assumption can be made as to a product's suitability for a particular use or application and no warranty as to its accuracy, reliability or completeness either expressed or implied is given other than those required by law. The user is responsible for checking the suitability of products for their intended use.

NOTE

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