

MasterLife[®] CI 30

Corrosion-inhibiting admixture

DESCRIPTION

MasterLife CI 30 is a calcium nitrite based corrosion-inhibiting admixture for steel reinforced concrete. **MasterLife CI 30** 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.

MasterLife CI 30 delays corrosion by repassivating 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 **MasterLife CI 30** 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 repassivate the reinforcing steel and re-establish the barrier between the steel and chlorides that initiate corrosion.

Chemical Composition

MasterLife CI 30 contains a minimum of 30% calcium nitrite by mass as an active ingredient. **MasterLife CI 30** 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 **MasterLife CI 30** 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

MasterLife CI 30 should be used in the calculation of the water-cementitious material ratio of the concrete.

Non-Chloride

MasterLife CI 30 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 **MasterLife CI 30**.

Compatibility

MasterLife CI 30 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

MasterLife CI 30 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.

MasterLife CI 30 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

MasterLife CI 30 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

MasterLife CI 30 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.

MasterLife[®] CI 30

The following tables illustrate the effect of **MasterLife CI 30** dosage and chloride exposure level:

MasterLife CI 30 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

Contact local Master Builders Solutions representatives for additional guidance regarding specific applications, service life, and the use of corrosion protection.

APPLICATION

MasterLife CI 30 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 **MasterLife CI 30**. If desired, a retarding or hydration control admixture may be added to the concrete mixture to offset the acceleration effects of **MasterLife CI 30**. Please contact your local Master Builders Solutions representative for additional information on set-balancing admixtures for concrete.

DOSAGE

MasterLife CI 30 is recommended for use at a dosage rate of 5 L/m³ of concrete for all applications and corrosion environments.

MasterLife CI 30 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.

MasterLife CI 30 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

MasterLife CI 30 is available in 205L drums and bulk delivery.

SHELF LIFE

MasterLife CI 30 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: MasterLife CI 30 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.

® = registered trademark of MBCC Group member in many countries of the world

STATEMENT OF RESPONSIBILITY

The technical information and application advice given in this MBCC Group 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

Field service where provided does not constitute supervisory responsibility. Suggestions made by MBCC Group either orally or in writing may be followed, modified or rejected by the owner, engineer or contractor since they, and not MBCC Group, are responsible for carrying out procedures appropriate to a specific application.