

MasterLife CI 30

Corrosion-inhibiting admixture for steel reinforced concrete

Material Description

MasterLife CI 30 is a calcium nitrite based corrosion-inhibiting admixture for steel reinforced concrete. **MasterLife CI 30** admixture contains a minimum of 30% active ingredients by mass and meets ASTM C 494 interim requirements for Type C, Accelerating Admixtures.

Characteristics and Benefits

MasterLife CI 30 admixture is a corrosion inhibitor that provides basic corrosion protection for steel reinforced concrete structures. It provides effective corrosion protection against chlorides in concrete. It also extends the service life of reinforced concrete structures.

Properties

In the alkaline environment of concrete, a natural passive ferric oxide layer 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 and moisture, resulting in corrosion of the steel.

MasterLife CI 30 admixture delays corrosion by repassivating defects on the 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** admixture 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.

Application

MasterLife CI 30 admixture will effectively inhibit corrosion in all types of steel reinforced concrete including precast/pre-stressed and post-tensioned applications. **MasterLife CI 30** admixture is recommended for use in parking garages, bridge decks, marine structures, slabs, floors and other reinforced concrete applications requiring corrosion protection against chlorides from deicing salts or marine exposure. **MasterLife CI 30** admixture will also inhibit the potentially corrosive effects of chloride-bearing concrete-making ingredients.

Compatibility

MasterLife CI 30 admixture may be used with Portland cements and mineral admixtures. 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.

Concrete Setting Time

Concrete setting times may be accelerated with the use of **MasterLife CI 30** admixture. If desired, a retarding admixture such as MasterPozzolith RT 300 or MasterSet RT 122, may be added to the concrete to offset the acceleration effects of **MasterLife CI 30** admixture. Please contact your Master Builders Solutions for additional information on set-balancing admixtures for concrete.

Dosage

MasterLife CI 30 is recommended for use at a rate of 10.0 to 30.0 L/m³ of concrete, depending upon the severity of the corrosion environment and the anticipated chloride loading of the structure. The dosage of **MasterLife CI 30** admixture for a given application may be selected from the table or computed by using the following expression:

$$\text{Dosage (L/m}^3\text{)} = 3.69 \times \frac{\text{Anticipated Chloride Loading (kg/m}^3\text{)}}{\text{Chloride-to-Nitrite Ratio}}$$



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Chloride protection limits for **MasterLife CI 30** are as given in the dosage table. The chloride protection limits given are based on critical chloride-to-nitrite ratios that range from 1.20 to 1.50. Please contact your local Master Builders Solutions Technical Sales Representative for additional information regarding dosage rates of **MasterLife CI 30** for your application.

MasterLife CI 30 Dosage L/m ³	Chloride Protection Limit, kg/m ³
10.0	3.6
15.0	5.9
20.0	7.7
25.0	8.9
30.0	9.5

MasterLife CI 30 may be used to offset the potentially corrosive effects of chloride-bearing concrete-making ingredients, and in applications where the initial chloride ion content of the concrete may exceed specified chloride limits. Contact your local Master Builders Solutions Technical Sales Representative for more details for this type of approach.

Chemical Composition

MasterLife CI 30 admixture contains a minimum of 30% calcium nitrite by mass as an active ingredient. The water content of **MasterLife CI 30** admixture is approximately 70%. 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-to-cementitious material ratio of the concrete.

Non Chloride

MasterLife CI 30 admixture will not initiate or promote corrosion of reinforcing steel embedded in concrete, pre-stressed concrete or concrete placed on galvanised steel floor and roof systems. Neither calcium chloride nor any chloride-based ingredients are used in the manufacture of **MasterLife CI 30**.

Packaging

MasterLife CI 30 admixture is available in bulk, 1000 litre pallecons, 195 litre drums or 20 litre pails.

Storage & Shelf Life

Keep only in the original container in a cool, well-ventilated place. Protect from direct sunlight. Protect from temperatures below: 0 °C. The packed product must be protected from temperatures below the indicated one.

MasterLife CI 30 has a shelf life of 12 months.

Precautions

For the full health and safety hazard information and how to safely handle and use this product, make sure that you obtain a copy of the Safety Data Sheet (SDS) from our office or website.

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Disclaimer

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