

## CORROSION-INHIBITING ADMIXTURE FOR STEEL REINFORCED CONCRETE

### Description

NIROSAFE ACI is a calcium nitrite-based corrosion inhibiting admixture for steel reinforced concrete. It is supplied in the form of liquid that instantly disperses in water.

### Uses

- ✓ All RCC Structures including precast/prestressed and post tensioned applications
- ✓ Parking garages, bridge decks, marine structures, slabs, floors, foundations, etc..
- ✓ RCC structures requiring corrosion protection against chlorides for ground water and marine exposure

### Advantages

- ✓ Provides effective corrosion protection against chlorides in concrete.
- ✓ Extends the service life of reinforced concrete structures.
- ✓ Set acceleration, which may be desirable in cold weather applications
- ✓ Can be used in conjunction with other admixtures
- ✓ Will not affect workability or strength of concrete.

### Reaction Mechanisms

Calcium nitrite-based corrosion inhibitors convert the passive layer on the steel surface into a more stable and less reactive state. When the chloride ions reach the layer, no reaction occurs – the steel is in a passive state. It is the anodic corrosion sites on the steel that are protected against the chloride attack and for this reason nitrites are called anodic inhibitors. It is important that sufficient nitrite is present to counter the chloride ions. The dosage of the admixture is therefore based on the predicted level of chloride at the steel over the design life of the structure.

### Characteristics

Form	: Liquid
Relative Density	: 1.25 ± 0.02 at 25°C
pH	: Min. 6
Chloride ion content	: Nil (As per BS 5075 Part I)

### Standard Compliance

Meets ASTM C 494 Type C.

### Compatibility

NIROSAFE ACI is compatible with other NCL admixtures in the same concrete mix. All admixtures should be added to the concrete separately and must not be mixed together prior to addition. The performance of concrete containing more than one admixture should be assessed by trial mixes to ensure the desired combination of effects is obtained.

NIROSAFE ACI is suitable for use with ordinary Portland cement.

Contact NCL for advice on use with sulphate resisting cements and cement replacement materials.

### Concrete setting time

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

### Dosage

NIROSAFE ACI is recommended for use at a rate of 5.0 to 30.0 L/m<sup>3</sup> of concrete, depending upon the severity of the corrosion environment and the anticipated chloride loading of the structure.

NIROSAFE ACI 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 code requirements or other specified chloride limits.

The limits for applications involving the use of chloride-bearing materials are based on a critical chloride-to-nitrite ratio of 0.90 in accordance with the recommendations of the Federal Highway Administration (FHWA). Chloride protection limits for NIROSAFE ACI are as given in the dosage table. These limits may also be used in very severe corrosion environments for enhanced protection, if desired. The chloride protection limits given for all other applications, such as parking structures and bridges, are based on critical chloride-to-nitrite ratios that range from 1.20 to 1.50. Please contact your local NCL representative for additional information regarding dosage rates of NIROSAFE ACI for your application.

NIROSAFE ACI Dosage L/m <sup>3</sup>	Chloride Protection Limit, kg/m <sup>3</sup>	
	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	7.2	9.5

### Non-chloride

Neither calcium chloride nor any chloride-based ingredients are used in the manufacture of NIROSAFE ACI.

### Technical support

NIRMAN CHEMICALS provides technical advisory services for on-site assistance and guidance on mix design, optimum dosage evaluation of trials.

### Packaging

NIROSAFE ACI is supplied in 20 kg, 225 kg drums or in bulk on request.

### Storage and Shelf life

NIROSAFE ACI must be stored where temperatures do not drop below +5°C. If product has frozen, thaw at +5°C or above and completely reconstitute using mild mechanical agitation. Do not use pressurized air for agitation. Store under cover, out of direct sunlight and protect from extremes of temperature.

Shelf life is 12 months when stored as above.

Failure to comply with the recommended storage conditions may result in premature deterioration of the product or packaging.

For specific storage advice consult our local NIRMAN CHEMICALS representative.

### Safety precautions

NIROSAFE ACI does not fall into the hazard classifications. However, it should not be swallowed or allowed to come into contact with the skin and eyes. Suitable protective gloves and goggles should be worn. Splashes on the skin should be removed with water. In case of contact with the eyes it shall be rinsed immediately with plenty of water and medical advice sought immediately. If swallowed, medical attention shall be sought immediately - Vomiting should not be induced.

### Fire

NIROSAFE ACI is water based and non-flammable.

### Cleaning of Tools

Clean all tools and application equipment with water immediately

### Note

All Technical Data Sheets are updated on regular basis; it is the user's responsibility, to obtain the most recent issue.

Field services where provided, does not constitute supervisory responsibility, for additional information contact our local NIRMAN CHEMICALS representative.

### Disclaimer

Whilst any information contained herein is true, accurate and represents our best knowledge and experience, no warranty is given or implied with any recommendations made by us, our representatives or distributors, as the conditions of use and the competence of any labor involved in the application are beyond our control.



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