

## BIPOLAR CORROSION-INHIBITING ADMIXTURE FOR STEEL REINFORCED CONCRETE

### Description

NIROSAFE BCI is a unique bipolar concrete penetrating type corrosion inhibiting admixture for steel in the reinforced concrete. It is a blend of special chemicals which preferentially provide protection to steel in both liquid and vapour phases. The vapours penetrate even through the hardened concrete towards steel due to strong affinity. NIROSAFE BCI also enables to reduce concrete porosity through water reduction and thereby improves durability of concrete.

### Uses

NIROSAFE BCI is designed for reinforced concrete particularly at risk of corrosion. It specifically provides protection from chloride induced corrosion.

Typical uses are in:

- Concrete roads
- Bridges
- Tunnels
- Retaining walls
- Industrial plants
- Multi storey car parks

### Advantages

NIROSAFE BCI is a low dosage admixture having

- Nitrates free
- Improves durability of the structure
- Used as an admixture: Dosage is independent of anticipated chloride levels
- Ensures steel protection even in the hardened concrete
- Does not get consumed by cement hydration
- No adverse effect on slump retention and compressive strength
- Independent reports tested to international standards

### Reaction Mechanisms

NIROSAFE BCI is a Bipolar Corrosion Inhibitor, containing molecules in which electron density distribution causes the inhibitor to be attracted to both anodic and cathodic processes. Due to the good quality of its vapour pressure and distribution with the moisture within the concrete, these molecules migrate to the steel and form a monomolecular layer along the reinforcement in concrete.

Thus, corrosion vis-à-vis micro cell formation is inhibited.

### Characteristics

Form	: Liquid
Relative Density	: $1.03 \pm 0.02$ at $25^{\circ}\text{C}$
pH	: Min. 6
Chloride ion content	: Nil (As per BS 5075 Part I)

### Standard Compliance

NIROSAFE BCI complies to ASTM C1582, which has been tested in accordance ASTM G109 and also with various standards such as, ASTM G1, ASTM G3, JIS 1535 (modified) IS9103 for compressive strength, AASHTO – T259 and ASTM C 1202.

### Compatibility

NIROSAFE BCI is compatible with PCE and SNF based admixtures, in addition to all types of cement, OPC, PPC, PSC, OPC with GGBFS and OPC with Fly ash and micro silica.

NIROSAFE BCI is also compatible with air entraining, waterproofing, shrinkage reducing concrete admixtures. Contact NCL for advice on use with sulphate resisting cements and cement replacement materials.

### Durability

Reduce the risk of corrosion thus enhancing durability of concrete

### Dosage

NIROSAFE BCI is recommended to use at a dosage of 1 to 4 kg/m<sup>3</sup>, depending upon the severity of the corrosion environment and the anticipated chloride loading of the structure.

It can be added separately to the concrete mixer along with other admixtures.

### Effects of under and overdosing

Under dosages may not be fulfilled the requirement and over dosage may reduce the workability.

### Non-chloride

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

## Mixing

NIROSAFE BCI admixture may be added with concrete batch water. It should not be mixed with any other admixtures prior to being introduced into the concrete mixer.

Depending on local materials, mixing efficiency and other conditions, the use of this admixture may require changes in normal batching procedures to facilitate air entrainment.

## Packaging

NIROSAFE BCI is supplied in 20 kg, 200 kg drums or in bulk on request.

## Storage and Shelf life

NIROSAFE BCI 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.

## Safety precautions

NIROSAFE BCI 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 BCI 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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