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**CSIR-CENTRAL ELECTROCHEMICAL RESEARCH INSTITUTE**

(वैज्ञानिक तथा औद्योगिक अनुसंधान परिषद् Council of Scientific & Industrial Research)

कारैकुडी-630 003, तमिलनाडु, भारत Karaikudi-630 003, Tamil Nadu, India

### Summary of Report

**Project Title:** Evaluation of **Bipolar Concrete Penetrating Corrosion Inhibiting Admixture (BCPCIA)** to protect the embedded steel in concrete from corrosion

**Sponsored Project Number:** SSP 23/22

**Objective:** The objectives of the project is to evaluate the bipolar inhibiting nature of CORROSTOP-15 of M/s. Laal Chemicals, Chennai.

#### **Test Results:**

- The Bipolar Concrete Penetrating Corrosion Inhibiting Admixture (BCPCIA) is tested in both short term and long term tests as per the RDSO specification No. M&C/PCN/126/2020 (Rev.1.0) and ASTM G109.
- The short term test for CORROSTOP-15 passed all the requirements as per RDSO specification M&C/PCN/126/2020 (Rev.1.0)
- The colour of CORROSTOP-15 looks very clear, smell is not pungent, no skin irritation and pH is 12.74 and viscosity is 11.38 sec. All the parameters are well within the limit of RDSO specification M&C/PCN/126/2020 (Rev.1.0)
- The corrosion rate of rebar with 1% CORROSTOP-15 is less than 2 mpy which perfectly passed the RDSO requirements through the long term immersion test of 720 hours.

*Rakesh C Barik*

(Dr. Rakesh C Barik) 17/07/2023

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- The concrete strength with 1% CORROSTOP-15 is greater than or equal to control concrete. This is must essential requirements for any inhibitor use in concrete. The mechanical properties of concrete is not affected when adding CORROSTOP-15 in concrete
- The electrochemical test by Tafel polarization in 3.5% NaCl solution for 20 days proved beyond doubt that CORROSTOP-15 follows the bipolar mechanism and act as a bipolar concrete penetrating corrosion inhibitor.
- Modified accelerated corrosion test (based on Japanese Standard JIS Z 1535) for 21 hours in raw water with BCPCIA showed only 1-2 corrosion spots.
- Macro cell corrosion studies of rebars in chloride environment passed upto 04 cycles (1 cycle consists of 14 days drying and 14 days wetting).
- CORROSTOP-15 supplied by Laal Chemicals showed better performance for protection of steel in reinforced concrete due to the bipolar mechanism.

**The test results are satisfactory and meets the requirements as per standard tests held at CSIR-CECRI.**

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