

# Electrochemical Realkalization of Steel-Reinforced Concrete— A State-of-the-Art Report

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## ABSTRACT

*Presents state-of-the-art information on electrochemical realkalization (ER) of conventionally reinforced concrete structures. Included are discussions of common industry practices used by design engineers to control corrosion of reinforcing steel in portland cement concrete structures through the application of ER. Intended for use by engineers attempting to protect corroding reinforced concrete structures by use of electrochemical treatment techniques. The information presented in this report is limited to ER for atmospherically exposed reinforced concrete and is not applicable to prestressed or post-tensioned elements or concrete containing epoxy-coated reinforcing steel, galvanized, or other coated or nonferrous reinforcement. Part II of a two-part series. Part I focuses on electrochemical chloride extraction of chloride-contaminated concrete.*

## KEYWORDS

*Reinforced concrete, electrochemical realkalization, portland cement, carbonated concrete, TG 556*

# Foreword

The purpose of this technical committee report is to present state-of-the-art information on electrochemical realkalization (ER) for conventionally reinforced concrete structures. Included are discussions of common industry practices used by design engineers to control corrosion of reinforcing steel in portland cement concrete structures through the application of ER. This report is intended for use by engineers attempting to protect corroding reinforced concrete structures by use of electrochemical treatment techniques. The information presented in this report is limited to ER for atmospherically exposed reinforced concrete and is not applicable to prestressed or post-tensioned elements or concrete containing epoxy-coated reinforcing steel, galvanized, or other coated or nonferrous reinforcement.

This report, focusing on realkalization of carbonated concrete structures, is Part II of a two-part series. Part I focuses on electrochemical chloride extraction of chloride-contaminated concrete.<sup>1</sup> Research on rebar bond strength and other issues reviewed there may be relevant to ER treatment. The reader is therefore advised to review both documents.

This technical committee report was originally prepared in 2004 by Task Group (TG) 054 on Electrochemical Chloride Extraction and Realkalization of Reinforced Concrete in collaboration with the Corrosion Prevention Association.<sup>(1)</sup> It was revised in 2020 by TG 556,\* “Electrochemical Realkalization of Steel-Reinforced Concrete—A State of the Art Report.” Task Group 556 is administered by Specific Technology Group (STG) 01 on Reinforced Concrete. This report is issued by NACE International under the auspices of STG 01.

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