Table of Contents

Preface

Chapter 1: Corrosion Behaviour of Materials and Structures

The Behavior Study of Reinforced Concrete in an Aggressive Environment N. Khial and Y. Bellal	3
Corrosion Behaviors of Reinforcing Steel in Concrete with Various Moisture Contents Z.L. Cao	12
Deterioration of Transportation Infrastructures: Corrosion of Reinforcements in Concrete Structures K. Gharehbaghi and F. Rahmani	18
Review on Design Consideration and Code Provisions on Corrosion Resistant Reinforcing Bars A. Reza and M.A. Saqif	25
Research on the Durability of Reinforced Concrete under the Seawater Environment J. Wang, Z.J. Zhang and J.L. Wang	31
Investigation of Biostability of Concrete Constructions for Special Purpose M. Drapaluk and V. Pylypenko	36
Experimental Study and Mechanism on the Corrosion of Stressed Reinforcement Bars D. Zeng, H.Y. Lu, B.H. Hao, H.Z. Yu and Y. Mi	44
Selection and Durability of Stainless Steels for Civil Engineering Applications J. Mietz and A. Burkert	51
Corrosive Environment Factors and their Influence on the Development of Weathering Steel Corrosion Products M. Kubzová, V. Křivý, V. Urban and K. Kreislova	58
The Effect of Chloride on Carbon Steel Reinforcement Corrosion A.M. Taher, A. Alsayd and E. Abdallah	68
Resistance of Chlorides-Induced Corrosion of Steel Bar Embedded in CNTs-OH Modified Concrete	73
Z.K. Wang, J. Fan and G.Y. Li Effect of Chloride-Induced Steel Corrosion on Working Life of Concrete Structures I. Holly and J. Bilčík	73 79
Examining the Effect of Asphalt Plant Surplus Filler on Water and Chloride Ion Permeability of Cement Mortar H. Vafaeinejad and M. Kioumarsi	85
Determination of Time Dependent Diffusion Coefficient Aging Factor of HPC Mixtures Q. Tran, P. Ghosh, P. Lehner and P. Konečný	93
Influences of Repair Materials Properties on Reinforcement Corrosion-Induced Cover Cracking Time W. Yodsudjai and P. Setpittayakul	103
Service Life Extension and CO ₂ Emission due to Silane Treatment on Chloride-Exposed Concrete Structures	103
A. Petcherdchoo and C. Ongsopapong Determining Criteria for Assessment of RC Structures Affected by Carbonation-Induced	110
Corrosion J. Mlčoch and M. Sýkora	116
Determination of Concrete Resistance to Corrosive Effects of Water with Aggressive CO ₂ Using Model Mortars D. Kocáb, I. Terzijski, J. Strnad and M. Ševčík	123
Identifying Concrete Resistance to Corrosion by Deionised Water with Aggressive Carbon Dioxide	120
D. Kocáb, I. Terzijski, J. Strnad, P. Štěpánek and M. Ševčík	130
Influence of Biocorrosion on Concrete Properties I. Chromková and R. Čechmánek	136

Experiment Study on Degradation Laws of Sulfuric Acid Corrosion Reinforcements M.Q. Lin, F.J. Dai and J.T. Li	144
Chemical Attacks in Geopolymeric Materials by Sulfuric Acid and Hydrochloric Acid A.M. da Silva, C.E. Pereira, F. Oliveira Costa and B.V. de Sousa	149
Effect of Silica Fume and Fly Ash on Compressive Strength and Weight Loss of High Strength Concrete Material in Sulfuric and Acetic Acid Attack W. Liu, H.L. Tan, C.L. Ni, Z.B. Chen, T.Z. Luo and L. Yu	155
Comparison of Degradation of Concretes with High Portions of Mineral Additions and Ordinary Portland Cement Based Concretes due to Simulated Acidic Rain A. Eštoková, V.O. Harbuľáková and M. Smolakova	165
Durability of Two Types of HPC at Sulphate Solution Environment J. Pokorný, M. Pavlíková and Z. Pavlík	171
Simple Comparison of Different Concrete Resistance to Sulphate-Induced Corrosion I. Terzijski, D. Kocáb, J. Strnad, M. Zlámal and P. Louda	177
Comparison of Resistance of Concrete for Sewage Pipes to Sulphate Corrosion Using Model Mortars	
D. Kocáb, I. Terzijski, J. Strnad and P. Louda	182
Fire Resistance of Reinforced Concrete Corrosion-Damaged Columns of the "Standard" Fire	100
A.G. Tamrazyan, M.S. Mineev and A. Urasheva	189
Estimation of Factors of Aggressive Influence and Corrosion Wear of Underground Structures E.Y. Kulikova	196
Corrosivity Evaluation of Steel Members near the Air-Liquid Interface Using a Ground	170
Corrosion Sensor S. Kainuma and M.Y. Yang	202
Experimental Study on Corrosion Behaviour of Concrete Containing Bottom Ash as Partial Replacement of Fine Aggregate	200
K.M. Priyaa, P. Srinivasan and P. Gajalakshmi	208
Preliminary Study of Corrosion Behavior on Carbon Steel Rebar in Mortar Mixed with Tin Slag as Partial Substitute Cementious Material under 3.5% NaCl Environment Using Electrochemical	
A.S. Ashari, A. Cahyadi and R. Riastuti	215
Study of Corrosion Damage of Glass Fibers in Textile Fiberglass Reinforcement under Expositions Simulating Concrete Environment T. Bittner, P. Pokorný, P. Bouška and Š. Nenadálová	220
Influence of Type of Alkaline Activator on Durability of Alkali Activated Concrete Using Aggregates Capable to Alkali-Silica Reaction	
P.V. Krivenko and O.Y. Kovalchuk	228
Carbonation Resistance of Sustainable Concrete Using Recycled Aggregate and Supplementary Cementitious Materials A. Khartabil and S. Al Martini	237
Modification of Concrete with Polymer Additives Based on Secondary Resources	231
N. Evstafyeva, I. Stefanenko and T. Akchurin	244
Composite Reinforcement as a Way to Increase the Durability of Building Structures V.E. Rumyantseva and V.S. Konovalova	250
Mechanical and Shrinkage Behaviors of Ductile Fiber-Reinforced Polymer Repair Mortar G.Y. Han and J.L. Luo	256
Increasing the Strength and Reliability of the Jetty Pile Structure with the Application of	
Glass Fiber Reinforced Polymer J. Wisnugroho, D.F.A. Afsari and Y. Indrajaya	262
Modification of Masonry Mortar and Structure of Ceramic Bricks to Reduce Efflorescence G.I. Yakovlev, I. Ginchitskaia, V. Grakhov, G.N. Pervushin, I.S. Polyanskikh, R. Drochytka, A.F. Buryanov, D. Khaseev and Z.S. Saidova	268
Effect of Addition of Chromate to Concrete on the Bond Strength of Hot-Dip Galvanized Ribbed Rebar at Ambient Temperature	
P. Pokorný and D. Čítek	274

Micro-Mechanical Properties of Individual Phases in Cement Pastes under Brine Solution Using Nanoindentation and Scanning Electron Microscopy	
Y. Li, W. Peng, Z.Z. Guan and Q.J. Ding	279
Corrosion of Steel Reinforcements in Concretes of Non-Coastal Areas - Case Study: Kigali, Rwanda	
G. Abaho, M.R. Pranesh and G.S. Kumaran	293
Corrosion Rate Estimation in Steel Sheet Pile Walls - Comparison between Empirical Models and Eurocode 3, Part 5 B. Balegh and H. Trouzine	300
Effect of Different Corroding Media on the Corrosion Rate of Locally Produced Thermo	300
Mechanically Treated (TMT) High Strength Structural Steel Bar M.R. Jomaddar and M.M.A. Bepari	310
Improving the Cement Systems Corrosion Resistance Based on Clogging Theory S.M. Rakhimbaev, N.M. Tolypina, E.N. Khakhaleva and D.A. Tolypin	318
Effect of Water Conditions on Macro-Cell Corrosion Potential Difference and Current Density of Reinforcing Steel in Concrete Z.L. Cao	323
Structural Transformations of Cement Stone in Conditions of Development of the	323
Biocenosis of a Poultry Enterprise V.V. Strokova, I.V. Zhernovskaya, V.V. Nelubova and M.D. Rykunova	331
Prestressing Steel Ropes - Corrosion Impact on its Properties	
J. Kolísko, V. Vacek, P. Pokorný and M. Kostelecká	338
The Ability to Determine the Degree of Damage to Welds Depending on Damage to the Welding Elements	2.47
I. Tvardovskyi, T. Kalinina and O. Chuchmai	347
Research Progress on the Effect of Stray Current on Properties of Cement-Based Materials in China G.N. Li and B.M. Wang	355
Assessment of Corrosion Effects on Railway Bridges in the Middle Area of Vietnam Using	
Multibody Dynamics Approach M. Pham, C.T. Dang and C.V. Nguyen	363
A Model for Bond Strength in Presence of Corrosion in Concrete A. Cesetti, P. Savino and F. Tondolo	372
Application of Experiment Planning Methods in Researching of Reinforced Concrete Constructions Corrosion Process	
A.A. Kuznetsov, A.S. Bryukhova and N.V. Volkova	381
Corrosion Wastage Models for Steel Structures: Literature Review and a New Interpretative Formulation for Wrought Iron Alloys G. di Lorenzo, F. Rizzo, A. Formisano, R. Landolfo and A. Guastaferro	387
G. di Lorenzo, F. Rizzo, A. Formisano, R. Landono and A. Guastarento	367
Chapter 2: Corrosion Protection of Materials and Structures	
The Impact of Electrochemical Chloride Extraction on Reinforced Bond	
K. Zhang, W. Shan and W.B. Sun	395
The Effect of the Variation of Input Parameters on the Onset of Corrosion of the Bridge Deck Exposed to Chlorides Considering Selected Reinforcement Protection	404
P. Konečný and P. Lehner	401
Technology and Properties of Composite Materials with Modifier of Chloride Aluminum A. Yusupova, G.A. Medvedeva and A.A. Bobryshev	412
Resistance of Surface Layers of Concrete against Aggressive Environment R. Pernicová and D. Dobiáš	418
Expansion of Concrete Functionality due to Use of New Hydrophobic Additives V.D. Tukhareli, A.V. Tukhareli and T.F. Cherednichenko	426
Effect of Geopolymer Coating on Mild Steel F.F. Zainal, M.F. Fazill, K. Hussin, A. Rahmat, M.M.A.B. Abdullah and W. Wazien	432
Coating Thickness of Reinforced Concrete Affecting to Cathodic Polarization and Cyclic	
Voltammogram of Reinforced Steel K.M. Moon, S.Y. Lee, J.H. Jeong and M.H. Lee	438

Evaluation on the Addition of Inhibitor and Surface Treatment to Corrosion Behavior of the Reinforced Steel Bar Embedded in Mortar Specimen	
K.M. Moon, S.Y. Lee, J.H. Jeong and M.H. Lee	445
An Experiment on Bond-Slip Behavior of Epoxy Coated Rebar Made by IGBT Method J.S. Kim, S.H. Lee and J.W. Choi	452
Corrosion Resistance of Polyester Powder Coatings Using Fillers of Various Chemical Nature	
V. Gots, O. Lastivka, O. Berdnyk, O. Tomin and P. Shilyuk	457
Improving the Bio-Resistance of Cement Concretes by Means of Fungicidal Poly-Functional Modifiers	
M.M. Kosukhin, A.M. Kosukhin and I.V. Starostina	464
Deterioration Characteristics of Overlapping Layers between Al-5Mg Thermal Spray Coating and Heavy-Duty Paint Coating M.Y. Yang, K. Muto, S. Kainuma, J.X. Du and H. Miyata	471
•	4/1
Efficiency of Impressed Current Cathodic Protection in Repaired Reinforced Concrete R.A. Malek, A. Hattori, K. Hirotaka and N. Kamaruddin	477
Corrosion of Aluminum Alloy Used as Sacrificial Anode for Steel Embedded Concrete Transmission Tower in Brackish Mud Z. Yahya, M.M. Rahman and M. Daud	483
Synthesis and Characterization of Eu-Doped SrTiO ₃ Photocatalytic Materials Using in the Cathodic Protection of 304 Stainless Steel Z.F. Zhang, F.J. Wang, W. Sun and J.Y. Jiang	487
Development of Sacrificial Anode Usable in High Specific Resistivity Solution by Parameter	107
of Addition of NaCl K.M. Moon, M.H. Lee and T.S. Baek	492
Possibility Justification of Application of the Mecanochemical Method during Preparation of the Metal Structures' Surfaces under Repair and Reconstruction V.E. Absimetov, E.V. Saltanova and D.B. Solovev	498
The Reinforced Concrete Reinforcement Corrosion Degradation Inhibition with Nitrates of Alkali and Alki-Earth Metals	502
V.E. Rumyantseva and V.S. Konovalova	503