# Standardization of methods for repair reinforced concrete structures in Russia

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# Issues related to concrete and reinforced concrete repair

- Definitions and repair rules
- Correct diagnostics to state causes of defects and be able to select appropriate repair techniques
- Requirements to material properties and testing methods
- Production control
- Conformity assessment



### **National standards**

## «Products and systems for protection and repair of concrete structures»

#### GOST 32016-2012

Products and systems for protection and repair of concrete structures. General requirements



#### GOST 32943- 2014

Products and systems for protection and repair of concrete structures. Requirements to bonded connections of structural strengthening elements



#### GOST 34277-2017

Products and systems for protection and repair of concrete structures. Requirements for anchoring products and bondable load-bearing structural strengthening elements

























МАТЕРИАЛЫ И СИСТЕМЫ ДЛЯ ЗАЩИТЫ И РЕМОНТА БЕТОННЫХ КОНСТРУКЦИЙ



#### GOST 32017-2012

Products and systems for protection and repair of concrete structures. Requirements for systems for concrete protection in the course of repair works



#### GOST 33762-2016

Products and systems for protection and repair of concrete structures. Requirements to injectable sealing products and filling of cracks, voids and interstices



#### GOST R 56378-2015

Products and systems for protection and repair of concrete structures. Requirements for repair products and bonded connections in contact zones in the process of structural rehabilitation



# The main requirement

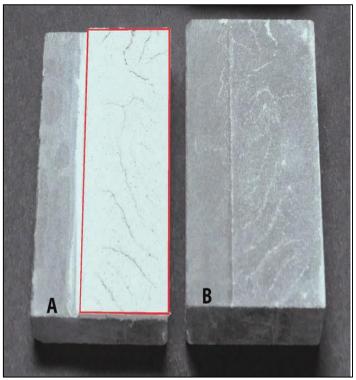
of these standards is products compatibility to the authentic structural material.

Compatibility of any repair product is defined by substrate properties as well as by structural requirements.

# Laboratory testing



To control repeatability and reliability of test procedures described in the standards as well as to be able to estimate them, we at ZAO «Triada-Holding» carried out laboratory testing



1)Tested specimen

3)Columns filled with grouts



2)Example of a commercially available injectability apparatus with an empty column



# CΠ 349.1325800.2017 Concrete and reinforced concrete structures. Rules for structural strengthening and repair

МИНИСТЕРСТВО СТРОИТЕЛЬСТВА И ЖИЛИЩНО - КОММУНАЛЬНОГО ХОЗЯЙСТВА РОССИЙСКОЙ ФЕЛЕРАЦИИ

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КОНСТРУКЦИИ БЕТОННЫЕ И ЖЕЛЕЗОБЕТОННЫЕ. ПРАВИЛА РЕМОНТА И УСИЛЕНИЯ

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#### **Structural management strategy**

Requirements for selection of products and systems as well as substrate surface preparation

Basic principles for design and structural strengthening as well as techniques of their realization

Requirements to products for strengthening, repair, and connection

Structural strengthening solutions

Requirements to analysis of strengthened structures

Safety requirements to repair and strengthening works

Issues related to repair and protection of concrete and reinforced concrete structures shall be further investigated in more detail. All the parties concerned are to be involved to build a team for developing and discussing normative documents devoted to repair and protection of concrete and reinforced concrete structures

