

Summary of the doctoral dissertation
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**SHAPING COMPOSITION OF DURABLE CONCRETE WITH MULTI-
CONSTITUENT CEMENTS (CEM II, CEM III) FOR APPLICATION IN ROAD
AND BRIDGE CONSTRUCTIONS**

Summary

This doctoral dissertation considers the issue of extending the use of multi-component cements CEM II and CEM III in the composition of concrete incorporated in the elements of the construction of communication engineering objects (bridges, concrete surface). The use of cements with mineral additives as constituents of concrete is a common practice used to support the idea of sustainable development, however, in the case of bridge or road concretes, the presence of cements with mineral additives CEM II ÷ CEMV is not frequently observed. There are many reasons for this state of affairs, but the main should be mentioned here is the long-term functioning of rigid formal and legal conditions that did not envisage the current and developing state of cement technology.

The literature study described in the dissertation describes the state of knowledge in the field of cement and concrete technology, in particular in the use of mineral additives in the cement and concrete composition and their impact on the corrosion resistance of cementitious composites (strength properties, thermal resistance, resistance to chemical aggression). Particular attention was paid to the benefits of using cements with the addition of granulated blast-furnace slag as a natural material and structural protection of concrete exposed to the impact of the environment characteristic of road and bridge structures.

The dissertation analyzed laboratory tests results on the characteristics of concrete components, properties of concrete mix and hardened concrete including: characteristics of used cements including hydration properties rheological properties of concrete mix, compressive strength and concrete resistance to chemical aggression most commonly encountered in bridge construction and road surfaces, e.g. carbonation, sulfate, chloride and alkaline aggression. The arguments regarding the usefulness of CEM II / A, B-S and CEM III metallurgical cements were supported by selected realizations of real bridge structures and road surfaces.

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