

## IMPROVING THE WATER RESISTANCE OF MACRO-DEFECT-FREE CEMENTS

Jiří Másilko, František Šoukal, Lukáš Buzek, Jan Koplík  
Brno University of Technology, Faculty of Chemistry, Purkyňova 118, 612 00 Brno,  
Czech Republic, e-mail: xcmasilko@fch.vutbr.cz

**Keywords:** Macro-defect-free, polyvinyl alcohol, moisture resistance, cross-linking.

### **Abstract.**

Macro-defect-free (MDF) cements are perspective materials providing unique properties relative to traditional cement pastes with great potential to incoming constructional utilization. But it is known, that MDF cements exhibit sensitivity to water, with swelling and reduction of strength. This work is aimed at monitoring of an organic polymer effect on the moisture resistance of MDF materials and phase changes. The effects of three different organotitanate cross-linking agents on the properties and moisture sensitivity were investigated. The organotitanate-modified MDF cement samples exhibited improved moisture resistance as compared to the standard samples when exposed to 100 % relative humidity at 22°C. One way, how to eliminate the moisture sensitivity, is chemical modification the microstructure of the MDF cements, especially polymer matrix and the interphase. We have been trying to fabricate new type of polymer, where the side groups of the standard polymer (PVA) were substituted with respect to cross-linking by curing MDF cements.