

## 2. Abstract

The method of testing flat prisms is used for many years in Germany as accelerated test method to evaluate high sulfate resistance (HS) of hydraulic binders and cement/fly ash-mixtures.

Since it's publication, about 40 years ago, the method was subject to considerable amendments, concerning principally water/binder-ratio, standard sand and duration of sulfate attack. In its current version the method of testing flat prisms is used to evaluate HS-properties of new binder systems for approvals issued by the Deutsches Institut für Bautechnik (DIBt). The expert group „concrete technology“ of the DIBt (SVA-A) recommended to examine the efficiency of this test method.

The aim of this research project is to determine, if the method of testing flat prisms in its original version or in its current version is more suitable to assess the HS-properties of binder systems.

The sulfate resistance of 5 Portland cements was tested with regard to their content of  $C_3A$  (0 wt.-%, 4 wt.-%, 8 wt.-%, 11 wt.-%, 12 wt.-%). For this purpose flat prisms were produced from mortar using standard sand DIN 1164:1958-12 and  $w/c=0,60$  (original mortar) and from mortar using CEN standard sand DIN EN 196-1:1990-3 and  $w/c=0,50$  (current mortar). These prisms were tested concerning sulfate attack by measuring their expansion during 182 days.

In addition the 4 Portland cements containing  $C_3A$  were used to test the influence of fly ashes from 2 manufacturers on sulfate resistance. 20 wt.-% and 40 wt.-% respectively of the cement were substituted by fly ash and original mortar prisms as well as current mortar prisms were produced. These prisms were also tested concerning sulfate attack by measuring their expansion during 182 days.