

T 298  
2755

Institut für Erhaltung und Modernisierung von Bauwerken e.V. (IEMB)

## Summary

### **Principles on testing of autoclaved aerated concrete in buildings for the determination of the strength and for the calculation of safety**

(according to contract for work with Deutsches Institut für Bautechnik - Az: IV 1-5-770/94)

During 1958 to 1990 about 160000 housing units have been built as prefabricated structures with wall elements consisting of autoclaved aerated concrete. This concrete was fabricated in work Parchim (Federal state Mecklenburg/Vorpommern) and built in building typ of four to five stories.

The judgement of the building shows the following weak points

- lack of thermal insulation and moisture protection at external walls
- cracks.

A bonded heat insulation system guarantees the functional performance. In this case, the evaluation of ultimate limit state is required, i.e. the control of compressive strength, modulus of deformation, moisture and dry density must be carried out.

Results of this research projekt are instructions for application in practice (see IEMB-Bericht Nr. 1-18/1996: Principles of Examination of autoclaved aerated concrete).

Especially

a) Global safety factor for parapet and pillar panel elements

$$\gamma \geq 1,80$$

b) Global safety factor for load bearing walls (gable walls)

$$\gamma \geq 1,90$$

c) Guidelines for the experimental examination of autoclaved aerated concrete specimens, derived from existing buildings (influence of moisture content and anisotropic behaviour of the compressive strength).

d) Statistical evaluation

Application of log-normal distribution (Estimation of the 5 %-fractile of compressive strength for a confidence level  $P = 1 - \alpha$ )

e) Compressive strength

Determination of the design value of the compressive strength and the modulus of elasticity.