



Institut für
Bauforschung
und Lehrstuhl für
Baustoffkunde

RWTHAACHEN
UNIVERSITY

ABSTRACT

„Evaluation of the leaching behaviour of
foamed glass gravel“

F 7123

Foamed glass gravel (FGG) is a mineral insulating material with load-bearing properties produced from waste glass. Since waste glass is classified as a waste product, the material must be tested on leachable substances and an assessment of the impact on soil and groundwater in accordance with the "Principles for assessing the impact of construction products on soil and groundwater - 2011 version" (DIBt Principles) must be carried out. Within the scope of the investigations, the total contents after aqua regia digestion according to DIN EN 13657 and the bottle shaking test eluate values according to DIN EN 12457-4 are determined on the glass powder used. This corresponds to an evaluation according to stage 1 of the DIBt concept. In stage 2, the FGG is examined in a column test according to DIN 19528.

Results from ~ 300 random samples of factory production control and external monitoring repeatedly show exceedances of the currently permissible upper limits of Table A-7 of MVV TB 2020/2, which correspond to the Z1 values (solid) or the Z1.2 values (eluate) of the TR Boden, 2004. Frequent exceedances of ≥ 20 % of the samples can be observed in the total contents for lead and copper and in the eluates for arsenic, copper and mercury.

Since the FGG can only be infiltrated by seepage water in its edge area and the surface area is increased by testing the glass powder, the question arises, whether the testing and evaluation is appropriate or too strict. Instead of the glass powder, waste glass fragments could also be tested in the leaching test or, in view of the low hazard potential in the intended application, the testing and evaluation procedure for FGG could be revised.

Therefore the influence of the particle size on the eluate concentrations in the bottle shaking test was determined in this project, and a proposal for the evaluation system was developed on the basis of the systematics of the "Ersatzbaustoffverordnung" (EBV, Substitute Construction Materials Ordinance).

Six bottle shaking tests were carried out on two different waste glasses, which were crushed to different grain sizes. The results show that the evaluation of the waste glass instead of the glass powder will probably exclude fewer materials from use. In particular, arsenic and mercury showed much lower eluate concentrations than in the shake test of the powdered samples. However, testing waste glass fragments instead of the glass powder does not guarantee that the limit values will not be exceeded.

An evaluation analogous to the procedure of the EBV takes not only the background values in the soil, but also the building geometry and the only partial percolation of the FGG layer as mitigating factors in the evaluation of the eluate values into account.

Consideration of these factors would allow for a covered and, most likely also a partially percolated application of SGS.