# Shear capacity and compression strut failure of biaxial hollow slabs

M. Schnellenbach-Held, M. Aldejohann, Institute of Concrete Structures and Materials, University of Duisburg-Essen, Universitaetsstrasse 15, 45141 Essen, Germany

***Abstract***

Introduction and motivation
Two-way hollow core slabs are particularly advantageous due to their load bearing behavior with equal efficiency in longitudinal as well as in transverse direction by the use of embedded spherical hollow bodies. The deadweight-load reduction up to 35 % leads to a higher flexibility and more slender constructions. The prefabricated reinforcement cages are easy to handle and allow a very rational installation on the building site as well as in precast element plants.

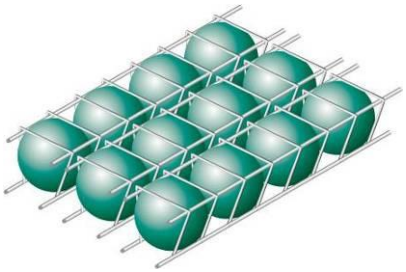

Figure 1 Three-dimensional view of prefabricated module

Motivation
The current European design standards require the smallest “web”-thickness $b_w$ of a specimen to calculate the shear force for structures without stirrup reinforcement. Hence, the smallest distance between two hollow bodies must be used which would lead to a shear capacity of two-way hollow core slabs that is merely 10% of the shear capacity of a massive slab. This design rule does not describe the real shear capacity of these slabs. The thickness $b_w$ exists just in one singular point - between two hollow balls - and increases along its height and depth. Subsequently, the shear capacity and the load bearing system for high shear forces have been investigated. The results of the tests and finite element-calculations will be presented at the Users Meeting. Further finite element calculations and tests to investigate the failure strength of the compression struts of biaxial hollow core slabs with shear reinforcement have been carried out recently. Results of these investigations shall be presented at the Users Meeting, too.