Foam-born concrete shells – the peculiar first free-form shells of Heinz Isler

Matthias BECKH*, Giulia BOLLER

*ETH Zurich, Institute of Technology in Architecture (ITA), Chair of Structural Design
Stefano-Franscini-Platz 1, 8093 Zurich (CH)
beckh@arch.ethz.ch

Keywords: Concrete Shells, Free-Form, Flow-Form, Expansion Form Models, Heinz Isler

Abstract

The paper focuses on the first free-form projects of the eminent Swiss engineer Heinz Isler, which were based on the so-called expansion or flow-form method [1]. Isler used this method early in his career before he moved on to use the more labor-intensive and intricate yet structurally better suited hanging models to gain the form of his free-form structures. This form-finding procedure was based on a fluid foam made of polyurethane, which was slowly expanding through a rectangular matrix while it hardened. The resulting surface geometry of the hardened PU foam was measured and used as a basis to work out the final geometry of the shell. Interestingly, this method was not mentioned during his seminal presentation at the founding congress of the IASS 1959 in Madrid [2], where he famously introduced three different approaches to seek the geometry of free-form shells structures: the hanging cloth, the freely shaped hill, and inflated rubber membrane.

The paper will trace the first free-form projects conceived by Isler in the early 1960s like the Wyss garden center in Solothurn, the Migros supermarket in Bellinzona (1964) and the Kilcher factory building in Recherswil (1965) and compare the different approaches that he used to conceive their geometry. Furthermore, the reasons for the application and the final renunciation of this method will be explored. The paper will be based on materials of the gta Heinz Isler archive of the ETH Zürich.

References

[1] J. Chilton, *Heinz Isler. The Engineer's Contribution to Contemporary Architecture*, Thomas Telford Ltd., 2000, pp. 66-67.

[2] H. Isler, "New Shapes for Shells", in *Bulletin of the International Association for Shell Structures [1959]*, IASS, 1960, paper C-3.

[3] H. Isler, "New Shapes for Shells – Twenty Years After", in *Bulletin of the International Association for Shell and Spatial Structures*, IASS, 1979, vol. 71/72.