

# Transparent Shells: Form, Topology, Structure

By Hans Schober



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This book describes the design, detailing and structural engineering of filigree, double-curved and long-span glazed shells of minimal weight and ingenious details.

Innovative, clear and understandable geometric principles for the design of double-curved shell structures are explained in a practical manner. The principles are simple to apply with the use of functions now available in most CAD programs. The author demonstrates how floating and homogeneous structures can be created on these "free" forms, particularly grid shells of planar rectangles. These are especially suitable for glazing with flat panes and offer structural, economical and architectural advantages. Examples are provided to illustrate in simple ways the latest methods of form finding calculation and holistic optimisation through the complex interaction of structure, form and topology.

Numerous examples built all over the world from 1989 to 2014 offer orientation and assistance in the design of such double-curved shells. Essential design parameters, many details and node connections of constructed projects are presented and evaluated. These structures have been built all over the world in close partnership with renowned architects.



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#### Transparent Shells: Form, Topology, Structure By Hans Schober Bibliography

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#### **Editorial Review**

#### About the Author

This book draws on the author's contemplations and experiences, and includes his descriptions of recent developments in the field of transparent shell structures. He gathered these during his time with the engineering firm schlaich bergermann und partner.

Dr.-Ing. Hans Schober graduated in Structural Engineering at the University of Stuttgart, before joining schlaich bergermann und partner in 1982. In 1992 he became a partner at the Stuttgart headquarters, then taking over the position of managing director of the New York branch in 2005. In 2009 he then returned to Stuttgart as partner at sbp until 2013. Since then he has worked as a consultant. As a student of Jörg Schlaich he devoted his time to pedestrian and railway bridges; focusing particularly on the design of filigree transparent shells and stressed cable net facades. On various projects he worked in collaboration with a number of internationally renowned architects including, amongst others, F. O. Gehry, Meinhard von Gerkan und Volkwin Marg (gmp), Rafael Vinoly, Hani Rashid (asymptote), David Childs (SOM), James Carpenter, I. M. Pei, Cesar Pelli, Massimiliano Fuksas, and Shigeru Ban.

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