

New design code for glass structures

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Summary

In December 2010 part 1 (general bases) and 2 (linearly supported glazing) of the new code for design of glass structures DIN 18008 has been published as final version. The parts 3 (point fixed elements), 4 (balustrades) and 5 (accessible glazing) have been published as draft version in October 2011. These rules are – in contrast to actual used regulations – following the modern concept of partial safety factors. Regarding the field of application the published parts cover most of the daily work; two last parts (6 accessible for maintenance work and 7 for structural elements) are under preparation at the moment. So worldwide for the first time regulations covering most aspects for structural design of glass structures will be available.

Keywords: glass structures, code, design and construction rules, safety concept.

1. Introduction

1.1 General

Starting from applications of the craftsmen with predominately use of glass as window the fascinating material glass was increasingly used as structural element. Parallel to this of course also design methods had to change from simple, mainly on experience based rules of thumb to more complex methods. The latest, actual step is the application of up to date concept of partial safety factors also for glass used as structural element.

At present design of glass is done in Germany using rules based on global safety concept and experience [1], [2], [3], [4]. They only cover a small field of application, for interesting structures special knowledge is needed and a special permit has to be applied for in Germany. In Europe at present the transfer from global safety concept to concept of partial safety factors is done since several years, so concept of design for all building materials except glass do follow the modern concept [5], [6]. Because of this a DIN standard working committee was established to develop rules according the new concept. By this the field of applications covered in codes was widened to almost every form of application (not only linear bearing vertical and overhead but also e.g. point fixed glazing, accessible glazing...).

As design criteria for structural elements of glass (e.g. plate for window-panes as well as beams for stairs or girders) usually the tensile stress is used. In addition criteria of maximum deflection are sometimes introduced; the latter can be understood as service limit state or sometimes as a hidden requirement for ultimate limit state.

It is obvious that with development of design rules and regulations for wider field of applications the simplicity also had to decrease: from simple to use tables to several complex formulas. But of course still simple to use design tools not only for “traditional applications” can be made easily.