WG 1 Glass Structures - guidelines for application of structural glass

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Summary

Working Group 1 "Glass Structures" was founded in 2007. The relevance of the topic is proved by publication of SED, European research and standardization activities. In future WG1 is planning to publish a guideline for the application of structural used glass elements, bringing together different design recommendations worldwide. A short overview about applications and by this possible structure of such a guideline is given in this paper and more extensive in the presentation. As an example DIN 18008 as a code covering most aspects for structural design of glass structures is named and a short outlook to Eurocode 10 for glass structures is given.

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

1. Introduction

IABSE Working Group 1 "Glass Structures" was founded in 2007. Short after beginning of activities SED 10 on "structural use on glass" was published and COST action TU0905 "titled "Structural Glass - Novel design methods and next generation products" was started. Recently work on a Eurocode for structural glass began. Looking at the members of IABSE WG1, COST TU0905 and CEN/TC250-WG3 a certain intersection can be identified. As COST action came to an end by April 2014 more activities under the roof of IABSE WG1 are planned.

The use of glass in architecture is common since long times, its change from opening closing elements (windows) towards load carrying structural elements started only few decades ago – first with singular applications getting more and more common. Brittle behavior of the building material glass and by this fracture without prior announcement (e.g. by slowly growing cracks) make in most cases necessary to use so called safety glass breaking to smaller pieces or better a combination with organic materials like "plastic" interlayers forming e.g. laminated safety glass necessary. But in addition of choosing the appropriate materials also adequate detailing of e.g. bearing situation has to be carried out. The application of elements made of glass is a challenging task for structural engineers.

For a proper design one has to care for the intact situation, proving ultimate limit state as well as serviceability limit state; this can be done by structural analysis or full scale testing or combination, e.g. testing of point fixings to get a basis for numerical modeling. In addition one has to take into consideration that the glass may break, one single ply of a laminated glass or sometimes more or even all layers; this again can be done by full scale testing in laboratory or on site or sometimes by choosing proper construction like e.g. edge protection.

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