



Structural Glass – Recent Advances and Next Generation Designs

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Abstract

Owing to the fascinating physical, optical and chemical properties of glass and its potential for delivering energy-efficient building envelopes, glass has become one of the most preferred construction materials in modern buildings. However, compared to more traditional structural building materials such as steel, reinforced concrete and timber, research on glass and its structural applications are still immature. Consequently, many basic design problems are still to be solved. This special seminar session on 'Structural Glass – Recent Advances and Next Generation Designs' will provide a forum for the presentation and discussion of the latest developments in structural glass research and their applications. The seminar session includes five presentations aimed not only at researchers but also at manufacturers, designers and contractors. The speakers will then stimulate a lively discussion among all those delegates attending the session for about 30 minutes.

Keywords: Architecture; Buildings; Facades; Glass; Structural Design

1 Introduction

In order to achieve energy-saving and CO₂ reduction demands, architects increasingly seek to bring natural environmental factors into the interior of buildings. This is mostly achieved through the use of larger glazed areas in facades and roofs, where the glass is a structural component of the buildings. Today's architects are using larger glass surfaces in their designs, with added functionality and complexity. In 2010, 60 million tons of float glass was produced globally, 80% of which was used in the building industry. The global market for float glass is projected to reach 84 million tons by 2020. However, a holistic approach to research, construction and engineering is required in order to maintain growth of glass as a construction material in the built environment.

Over the last two decades rapid scientific and technological progress was made in structural

glass research and their practical applications. Extensive network of experts and a growing numbers of scientific and industry developments have been established. For example, several 'structural glass' conferences with an increasing representation from research and industry, have been held in the last few years. The new journal, 'Glass Structures and Engineering', provides an international forum for the presentation and discussion of the latest developments in structural glass research and their applications. A draft Eurocode on 'structural glass' have recently been published and is currently under review. Once the Eurocode has published it will certainly further promote the use of Structural Glass in the built environment. Professional institutions, for example, Institution of Structural Engineers, has recently published preliminary guidelines of 'structural use of glass'.

However, compared to more traditional structural building materials such as steel, reinforced