

Quality in designing & producing hollow glass blocks

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Abstract:

Hollow glass blocks are modular construction blocks used for curtain walls, it consists of two pressed glass bodies fused and welded, under increasing needs for energy in architecture, it is a good solution to save energy by exploiting daylight, also this blocks are good for thermal insulation. Hollow glass blocks do not need high technology in manufacturing, so it is easy to be made in Egypt. To succeed in production quality requirements must be known as it is in standards. This thesis clarifies standards specifications and test methods for hollow glass blocks in relation to manufacture and using conditions discussing percentages of oxides and raw materials used in glass batch and their effects in glass properties, quality in design including block shapes, glass thickness, how to make patterns considering glass thickens in relation to dusty environment such as Egypt, test methods for dimensional irregularities and exclusion conditions are discussed as well: misalignment, twisting, bulge, depression and high seals are defects may happen during taking glass out of moulds fusing edges or welding glass blocks halves like some visual irregularities may happen, the test method was declared, explaining defects happen, the test method was declared, explaining defects happen during melting or pressing the glass. Different measuring methods and tools are explained. To test mechanical resistance two opposing edges of the block should be capped with cement mortar conformed to EN 998-2, it must be in certain thickness, samples must be prepared as shown in standard, and it would be tested as in using. Thermal transmittance shall be determined in accordance with ISO 15099:2003 and ISO 12567-1:2000, the lower thermal transmittance the greater thermal isolation. Overall quality requirements were declared, including chemical composition, design principles, testing methods and acceptance limits, thesis also obtained the causes of defects even in glass melting or in manufacturing processes. It is recommended to disseminate quality knowledge in designing and manufacturing of glass according to standards.

Keywords

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