

Theoretical Study of Flexible Edge Seals for Vacuum Glazing

Authors : Farid Arya, Trevor Hyde

Abstract : The development of vacuum glazing represents a significant advancement in the area of low heat loss glazing systems with the potential to substantially reduce building heating and cooling loads. Vacuum glazing consists of two or more glass panes hermetically sealed together around the edge with a vacuum gap between the panes. To avoid the glass panes from collapsing and touching each other under the influence of atmospheric pressure an array of support pillars is provided between the glass panes. A high level of thermal insulation is achieved by evacuating the spaces between the glass panes to a very low pressure which greatly reduces conduction and convection within the space; therefore heat transfer through this kind of glazing is significantly lower when compared with conventional insulating glazing. However, vacuum glazing is subject to inherent stresses due to atmospheric pressure and temperature differentials which can lead to fracture of the glass panes and failure of the edge seal. A flexible edge seal has been proposed to minimise the impact of these issues. In this paper, vacuum glazing system with rigid and flexible edge seals is theoretically studied and their advantages and disadvantages are discussed.

Keywords : flexible edge seal, stress, support pillar, vacuum glazing

Conference Title : ICSBDC 2017 : International Conference on Sustainable Buildings Design and Construction

Conference Location : Venice, Italy

Conference Dates : August 14-15, 2017