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An Investigation into Sealing Materials for Vacuum Glazing

Authors : Paul Onyegbule, Harjit Singh

Abstract : Vacuum glazing is an innovative transparent thermal insulator that has application in high performance window, especially in renewable energy. Different materials as well as sealing methods have been adopted to seal windows with different temperatures. The impact of temperatures on sealing layers has been found to have significant effects on the microstructure of the seal. This paper seeks to investigate the effects of sealing materials specifically glass powder and flux compound (borax) for vacuum glazing. The findings of the experiment conducted show that the sealing material was rigid with some leakage around the edge, and we found that this could be stopped by enhancing the uniformity of the seal within the periphery. Also, we found that due to the intense tensile stress from the oven surface temperature of the seal at 200 ⁰C, a crack was observed at the side of the glass. Based on the above findings, this study concludes that a glass powder with a lower melting temperature of below 250 ⁰C with the addition of an adhesive (borax flux) should be used for future vacuum seals.

Keywords : double glazed windows, U-value, heat loss, borax powder, edge seal
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