

EXPERIMENTAL STUDY ON THE AGING PERFORMANCE OF SECONDARY SILICONE SEALANT OF INSULATING GLASS UNITS

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ABSTRACT

Insulating glass units (IGUs) have been widely used as an energy saving building product. The air/water tightness performance of the edge seal system is the key to achieve the durability of IGUs. Nowadays, most edge seal consists of a dual sealant system, in which the secondary sealant is to retain the integrity of IGU. High temperature/relative humidity conditions and UV-exposure are the two most common factors that cause the detrimental aging effects upon the secondary sealant. In this paper, the cross-bonded test method is employed to examine the aging effects on the mechanical performance of silicone specimens. The tensile strength, shear strength, elongate rate at break and Shore hardness are measured for different aging periods. Aging rates are also calculated to investigate the aging sensitivity. It is found that most aging actions occur at the early age. The aging mechanisms are also discussed: excessive cross linking formation and the Si-O bond oxidation on the interface are deemed as two major reasons that attribute to the different aging behaviours of silicone sealants.