



DETECTION AND EFFECT OF AMINE BLUSH IN PASTE ADHESIVE BONDLINES

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ABSTRACT

Paste adhesives are used in secondary bonding of composite structure in several aircraft applications. Due to their use conditions, paste adhesives are susceptible to amine blush – a greasy, tacky surface layer formed via the reaction of migrating amines with environmental water or carbon dioxide - which can reduce the strength of the bond. Our research explores the environmental conditions that promote amine blush (temperature, humidity, exposure time) in commercial paste adhesive systems, and the development of detection and quantification methodologies. Fourier Transform Infrared spectroscopy (FTIR) was used to monitor the formation of amine blush layers on the surface of spread paste adhesives. Various microscopy techniques were used to monitor the thickness of the formed blush layer. Bond strength was measured using the T-peel test (ASTM D 1876). Initial results suggest that in some paste adhesives at ambient conditions, amine blush forms within the first 15 minutes after spreading of the adhesive, while bond strength reduces by 90% within the first 45 minutes after spreading. Analysis investigates correlations between the environmental conditions during paste adhesive application before closing the bonds, the formation and thickness of the blush layer, and the loss in bond strength of T-peel specimens.