

## AN EXPERIMENTAL STUDY OF THE MECHANICAL BEHAVIOUR OF ADHESIVELY BONDED JOINTS AS A FUNCTION OF TEMPERATURE

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### ABSTRACT

*Adhesively bonded joints are an increasing alternative to mechanical joints in engineering applications and found applications in various areas from high technology industries such as aeronautics, aerospace, electronics, and automotive to traditional industries such as construction, sports and packaging.*

*The influence of temperature on the strength of adhesive joints is an important factor to consider in the design of adhesive joints. The most significant factors that determine the strength of an adhesive joint when used over a wide temperature range are the coefficients of thermal expansion (CTE), (especially when compared to the CTE of the substrates), and different adhesive mechanical properties with temperature. However, due to the polymeric nature of adhesives, the most important factor to consider is the variation of the mechanical properties of the adhesives with temperature.*

*In this paper the influence of temperature on the mechanical behaviour of single lap joints bonded with different adhesive types – an epoxy, a polyurethane and a silicone – have been studied. Results showed that the lap shear strength of the single lap joints decreased with increasing the temperature for all adhesives studied. For epoxy joints the lap shear strength slightly decrease with decreasing the temperature, while for polyurethane joints, the lap shear strength increased by approximately two times than at room temperature.*

**KEYWORDS:** Epoxy, Polyurethane, RTV adhesive, Temperature tests.

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