

## **Tapered Double Cantilever Beam: Evaluation of the Test Set-up for Self-Healing Polymers**

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**Abstract :** Tapered Double Cantilever Beam (TDCB) is the most commonly used test set-up to evaluate the self-healing feature of thermoset polymers autonomously activated in the presence of crack. TDCB is a modification of the established fracture mechanics set-up of Double Cantilever Beam and is designed to provide constant strain energy release rate with crack length under stable load evolution (mode-I). In this study, the damage of virgin and autonomously healed TDCB polymer samples is evaluated considering the load-crack opening diagram, the strain maps provided by Digital Image Correlation technique and the fractography maps given by optical microscopy. It is shown that the pre-crack introduced prior to testing (razor blade tapping), the loading rate and the length of the side groove are the features that dominate the crack propagation and lead to inconstant fracture energy release rate.

**Keywords :** polymers, autonomous healing, fracture, tapered double cantilever beam

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