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# Effect of ultraviolet curing kinetics on the mechanical properties of out of die pultruded vinyl ester composites

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**Abstract**

This paper analyses the effect of curing kinetics on the mechanical properties of composites manufactured by out of die ultraviolet (UV) cured pultrusion. Curing kinetics have been modified using two combinations of depth curing (BAPO) and surface curing (α aminoketone) photoinitiators. The rate constant of the autocatalytic model *k*, shows that the curing kinetics of the formulation with the higher content of BAPO and lower content of α aminoketone is faster in the studied intensity range. Spectrometry results justify the differences in curing kinetics, since the light transmission through thickness is higher during the whole UV curing process due to photobleaching effect of BAPO. Faster UV curing kinetics generates lower expansion at the exit of the pultrusion die, reducing the void content approximately 90%. Consequently, flexural and interlaminar shear strength, as well as specific energy absorption index of the fast curing resin, are higher.

**Keywords**: A. Resins; B. Cure behaviour; B. Mechanical properties; E. Pultrusion.