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Modeling of Short-Fiber Composite Strength

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Short-fiber composites have some advantages over continuous fiber composites. They can be made with conventional manufacturing techniques, such as injection molding, extrusion. The properties of short-fiber composites are greatly dependent on the short fiber orientation during the manufacturing stage. The stiffness and thermal expansion coefficients have been under study for a number of years with micro-mechanics models. The strength property modeling, however, has been a research topic but not so mature enough to be widely used. This paper presents and evaluates a strength model that can predict short-fiber composite strength based on statistical and micro-mechanical theories taking the important fiber orientation distribution factor into account.