

III. The Thin Film Anomaly

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Abstract

An ideal goal for any structural engineer is to cut the weight of a material in half without decreasing its strength. Sea-Space Systems has approached this in polymeric film developments. Ultra-thin-gauge polyethylene films, less than 1/10 mil in gauge, have demonstrated several unique properties, one of the more interesting being the strength anomaly. For example, 1/15-mil film has an ultimate tensile strength of approximately 5500 psi, compared to a value of approximately 2500 psi for regular-gauge film extruded from a similar resin. Pertinent technical details of this anomaly and a theory for explaining the phenomena are discussed.