Correlation of Adhesive Performance with Particle Composition and Structure for Core-Shell Water-Borne Pressure-Sensitive Adhesives

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Water-borne pressure-sensitive adhesives are becoming increasingly important as industry seeks to move away from environmentally-unfriendly solvent-based adhesives. One of the main challenges is to develop latexes which, when cast as films, show high levels of adhesion to non-polar surfaces such as polyethylene.

A balance has to be achieved between improving peel adhesion and maintaining cohesive strength in the films when designing pressure-sensitive adhesives for improved performance. One approach to maintaining cohesive strength of these soft polymer films is to introduce controlled levels of crosslinking. Core-shell latexes with shells that contain functional groups which can be activated towards crosslinking during film formation have been used. Adhesive performance has been determined using peel (180°) and shear resistance tests that conform to FINAT standards. Correlations of the peel and shear resistance performance of films from latexes containing variations in core:shell ratio, amounts of chain transfer agent used in the core and shell, shell polymer composition, and degree of crosslinker activation will be discussed.