C10.2.5.

Strippable shields with improved thermal stability and faster cable extrusion rates

K.P. Pang, The Dow Chemical Company, Somerset, New Jersey USA
T.J. Person, The Dow Chemical Company, Somerset, New Jersey USA

The installation of splices and terminations for medium-voltage power cables is facilitated with cable designs which employ insulation shields that are easily removed from the underlying insulation. These strippable insulation shields are typically based upon highly polar copolymers, which reduce thermodynamic miscibility with the non-polar insulation, and result in reduced adhesion even after the layers are crosslinked together. Ethylene-vinyl acetate (EVA) is a common base resin for strippable insulation shield formulations, however, the temperatures of continuous vulcanization are limited by the decomposition temperature of EVA and the subsequent formation of equipment-damaging acetic acid. Such temperature limitations may pose extrusion line rate limitations for some cable manufacturers. EVA and other commonly used ethylene alkyl acrylate copolymers (such as ethylene methyl acrylate, ethylene ethyl acrylate, ethylene butyl acrylate) of sufficient polarity to impart easy strip-ability over a non-polar crosslinked insulation, tend to be tacky materials. Increased polarity of insulation shield base resins through higher comonomer content yields lower adhesion, however the base resin becomes more expensive and more difficult to handle and store without risk of material agglomeration.

New technology has been developed to reduce adhesion between the insulation shield and insulation in medium voltage power cables. This technology provides an opportunity for insulation shields to be based upon reduced comonomer content base resins, or alternate base resins that would otherwise result in bonded systems. The result is the potential for lower cost materials, lower adhesion values, reduced acid generation, higher temperature limitations, and improved cable line speeds.