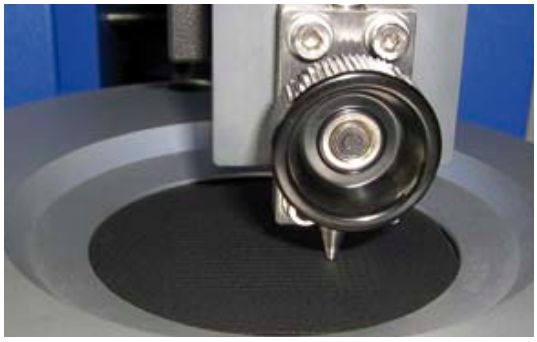

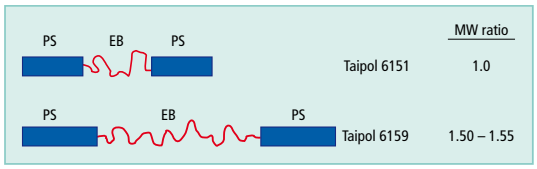

Ultra violet (UV) crosslinking technology was applied to crosslink SBS thermoplastic elastomers. Statistical trend analyses were used to optimize the physical properties of UV-crosslinked styrene butadiene styrene (SBS) block copolymers. D-optimal design was selected to analyse the interaction between the independent (factors affecting the properties) and dependent variables (responses to the properties). Irradiation time and height were treated as continuous factors whereas photoinitiator (PI) concentration and vinyl content of SBS block copolymers were treated as categorical factors. Analyses of variance (ANOVA) and response surface methodology (RSM) were employed to model and analyse the mechanical properties observed. Primary results showed that low PI concentration (1 wt.-%) and high vinyl content gave significant improvement in the mechanical properties. Variations of individual properties were also analyzed and graphically visualized by RSM. Numerical and graphical optimization showed that, 1 wt.-% of PI concentration on 35 s treatment time and 15 cm packing height give best overall balance of properties. In other words, closer distance to the UV lamp and lesser irradiation were best to give the overall balance of physical properties. Surface morphology and tensile fractography were performed to understand the nature and mode of surface damage and failure respectively.