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Cost effective, enhanced peeling strength solution for surface protective films

Co-extruded surface protective films (SPF) are widely used to protect surfaces of electronic screens, appliances, construction materials and other valuable products.

A typical co-extruded SPF has multi-layer structure consisting of skin layer, core layer and adhesive layer. The adhesive layer enables SPF to adhere to the protected surface and is typically formulated using styrene-ethylene-butylene-styrene copolymer (SEBS), hydrocarbon resin (HCR) and additives.

Oppera™ modifiers can be used as HCR in the adhesive layer, bringing potential of peeling strength improvement and lower material cost.

Key benefits



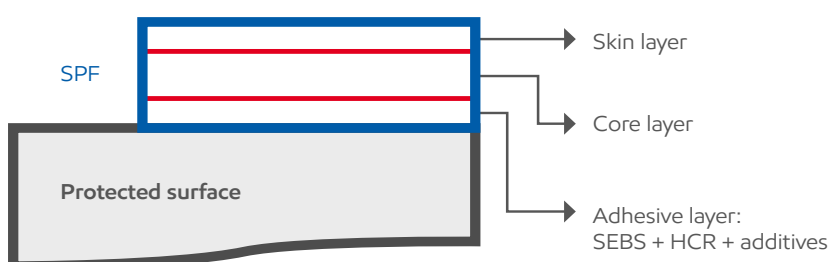
Cost savings



Better peeling strength



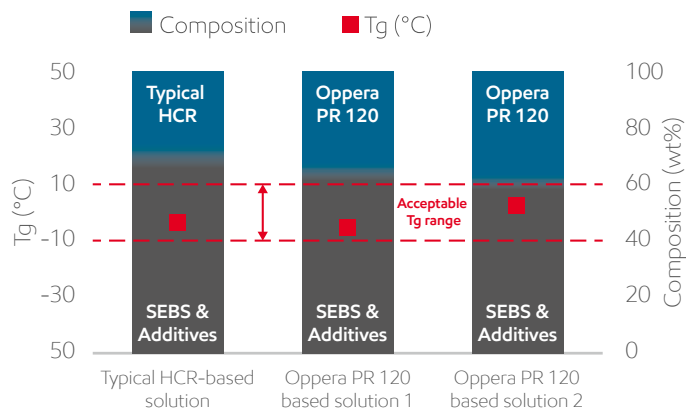
Typical structure of SPF



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Potential of cost-effective SPF solutions with Oppera™ modifiers

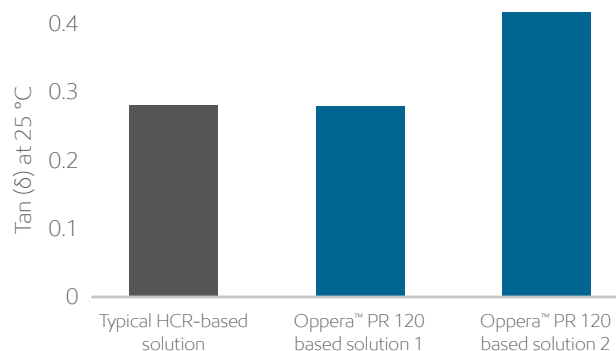
Keeping glass transition temperature (T_g) within certain range is important for the formulation of adhesive layer in SPF⁽¹⁾. Comparing with typical HCR-based adhesive layer solution, Oppera PR 120 based solutions with higher loading of HCR have potential to lower material cost while maintaining acceptable T_g .



Composition and T_g of typical HCR-based and Oppera PR 120 based solutions for adhesive layer of SPF.

Opportunities to enhance peeling strength using Oppera modifiers

For a formulation of SPF adhesive layer, the rheology behavior ($\tan(\delta)$ at 25°C) is commonly used to assess the peeling strength⁽¹⁾. By varying the dosage of Oppera PR 120, adjustable $\tan(\delta)$ can be achieved for different peeling strength level. Compared with typical HCR based solution, Oppera PR 120 based solution 1 maintains same level of $\tan(\delta)$ at 25°C; Oppera PR 120 based solution 2 has higher $\tan(\delta)$ at 25°C, indicating improved peeling strength.



$\tan(\delta)$ at 25°C of typical HCR-based and Oppera PR 120 based solutions for the adhesive layer of SPF

Reference

⁽¹⁾Cao Tong Yuan. Hot melt pressure sensitive adhesive technology and application [M]. Beijing, China: Chemical Industry Press, 2017: page 83-100



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