

Monocomponent Spunbond/Film Laminates

Produced with ASPUN™ Fiber Grade Resins and ELITE™ Enhanced Polyethylene Resins

Leading the Way to Softer, Stronger Laminates

Today's consumers are demanding unprecedented levels of comfort and protection from the hygiene absorbent products they purchase. As a direct result, brand owners and converters are seeking out materials that offer not only soft, cloth-like haptics but also good strength and abrasion resistance as required by:

- Baby diapers and training pants
- Feminine care products
- Adult absorbents for incontinence
- Medical drapes and gowns

The Dow Chemical Company (Dow) is answering this challenge by working with our customers to develop laminates that combine ultra-soft nonwovens with tough yet drapeable films. These laminates – featuring ASPUN™ Fiber Grade Resins in a nonwoven and ELITE™ Enhanced Polyethylene (EPE) Resins in a film – offer improved haptics compared to traditional laminates made with homopolymer polypropylene (hPP) nonwovens.

Figure 1: Handle-o-Meter Evaluation of Laminates Tested (28 GSM)^(1,2)

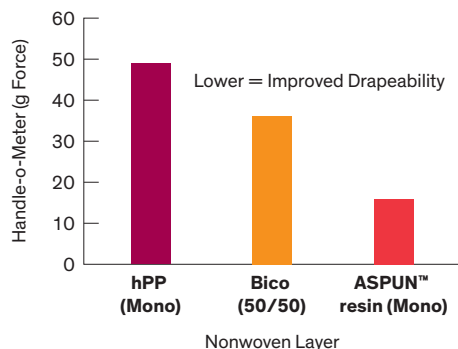


Table 1: Tensile, Abrasion, and Adhesion Properties of Laminates Tested (28 GSM)^(1,2)

Nonwoven Layer	Ultimate Tensile Strength – MD (MPa)	Ultimate Tensile Elongation – MD (%)	Abrasion Resistance/ Fuzz Level (mg/cm ³)	Peel Strength (N)
hPP (Mono)	4.5	40	0.45	0.46
Bico (50/50)	7.5	90	0.1	No delamination possible
ASPUN™ resin (Mono)	3.5	110	0.25	No delamination possible

To allow a head-to-head comparison, Dow tested laminates that coated 8 GSM⁽¹⁾ film made with ELITE™ EPE Resin onto 20 GSM nonwovens made with:

- 100% ASPUN™ Fiber Grade Resin
- 50% ASPUN™ resin/50% hPP bicomponent
- 100% hPP

As shown in Figure 1, the laminate featuring monocomponent (mono) ASPUN™ fibers exhibits significantly improved levels of softness and drapeability compared to those of both the bicomponent (bico) and mono hPP.

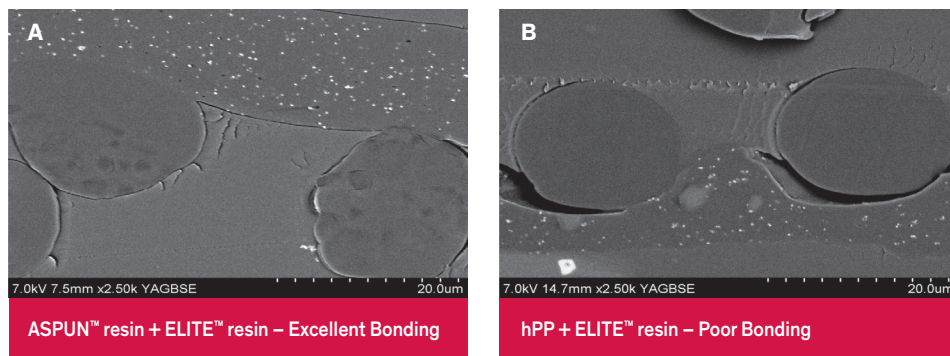
Testing of other key attributes, including tensile properties, abrasion resistance, and adhesion also reveals favorable performance for the combination of ASPUN™ resin/

ELITE™ EPE versus the hPP/ELITE™ resin-based laminate (see Table 1). The bico laminate combines the toughness of polypropylene with increased extensibility and excellent adhesion between the bico nonwoven and the PE film layer.

The SEM (Scanning Electron Microscope) images in Figure 2 illustrate the excellent bonding of the ASPUN™ resin/ELITE™ resin-based laminate in even greater detail, with image A showing complete fusion with no delamination and image B showing poor bonding between the hPP nonwoven and PE film.

In the final analysis, both laminates featuring ASPUN™ resin offer improved performance that is well suited for health and hygiene applications such as back sheet, drapes, and gowns.

Figure 2: Microscopy Comparison of Bonding Performance⁽³⁾



⁽¹⁾ GSM = g/m² ⁽²⁾ Data per tests conducted by Dow. Additional information available upon request. Properties shown are typical, not to be construed as specifications.

⁽³⁾ Images taken with a Scanning Electron Microscope in a Dow laboratory.

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Published April, 2016.

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