EASTMAN

Eastman Advantis™ 510W adhesion promoter

Tech tip

Eastman Advantis™ 510W adhesion promoter as a blend-in for soft-feel automotive applications

Eastman Advantis 510W is an excellent waterborne product for thermoplastic polyolefin (TPO, PP) adhesion. It provides outstanding automotive adhesion and has proven to be a successful blend-in resin for automotive bumper applications.

Advantis 510W has now been confirmed as a superb blend-in for soft-feel interior automotive applications as well.

Advantis 510W is a chlorine-free waterborne adhesion promoter that has several key advantages:

- **Environmentally friendly**—VOC compliant meets strict environmental guidelines.
- **Extremely compatible**—Has an extensive range of formulation opportunities to allow maximum formulation latitude as a stir-in additive.
- **Excellent adhesion**—Shows superior adhesion capabilities in not only substrate adhesion but intercoat applications as well.
- **Superior resistance**—Provides exceptional exposure resistance to harsh elements such as gasoline, humidity, and UV.

Technical analysis

Formulations of a control sample and a sample with Eastman Advantis 510W were prepared using the process listed in Appendix 1. Tape adhesion testing (Appendix 2) was then performed on the control as well as the material containing Advantis 510W. The control did not have any Advantis 510W added into the formulation. The control sample failed with 0% adhesion. The Advantis 510W add-in sample passed with 100% adhesion; the tape delaminated and left tape residue on the sample surface. The results revealed that Advantis 510W provided excellent adhesion when used as a stir-in for soft-feel coatings.

Figure 1: Side by side comparison of the coated substrates

The soft-feel with Eastman Advantis 510W panel shows 100% adhesion (tape delamination), and the soft-feel control panel shows complete failure.

Table 1. Eastman Advantis 510W soft-feel interior demonstration formulation (30% solid/solid)

Component I	Description	% solids	Weight
Bayhydrol® UH 340/1	Aliphatic PUD (anionic)	40.0	21.31
Bayhydrol® U 355	Aliphatic PUD	55.0	15.50
TiPure® R-746 slurry	TiO_2 aqueous dispersion	76.8	11.31
Byk®-346	Dispersant	52.0	0.64
Advantis 510W	EMN WB NCPO with DMEA	24.0	40.21
Tego® Foamex 805	Defoamer	24.0	0.35
Acematt™ OK-412	Fumed silica	100.0	3.35
Eastman DB	Solvent	0.0	3.78
Component II			
Bayhyur® 302 (75% in *n*-BA/mineral spirits 7:3)	HDI polymer	75	3.55
Total			**100**

Table 2. Typical properties of Eastman Advantis 510W

Property	Typical value, units
Appearance	Off-white, milky liquid
Solids	24 wt%
pH @ 25˚C	8
Neutralization	Amine
Stability Shelf life 1 year (RT) @ 40˚C, 4 weeks	 No significant change No significant change
Viscosity @ 25˚C	<75 cP
Water	76 wt%
Density	970 g/L (8.1 lb/gal)
Particle size	0.03 microns
T_g	<0˚C

Appendix 1: Order of addition

Add the following ingredients and disperse with cowls (approx. 800 rpm). Be sure that all of the pigment has been dispersed. (Could check this with a Hegman.)

- Bayhydrol UH 344/1
- Bayhydrol U 355
- TiO_2 pigment
- Tego Foamex 805

Reduce speed to approximately 500 rpm. Then slowly add the following while stirring. Once all have been added, slowly increase the mixer up to 800 rpm and mix for approximately 10 minutes. Then check again with Hegman. Mix until no particles appear on Hegman.

- OK-412

Reduce speed to approximately 500 rpm. Then slowly add the following while stirring. Once all have been added, slowly increase the mixer up to 800 rpm and mix for approximately 10 minutes.

- BYK 346
- Eastman Advantis 510W
- Lastly add the Eastman DB.
- Add water if needed to adjust viscosity. Use a Ford cup #4 to determine viscosity. Ideal spray viscosity is 15–18 seconds. Thirty seconds is the absolute highest viscosity to spray by hand.
- Add the Bayhydur® 302 just before ready to spray.

Appendix 2: Tape adhesion testing (ASTM D3359) summary

A lattice pattern with cuts in each direction is made in the film to the substrate. Pressure sensitive tape (Intertape™ part #51596) is applied over the lattice and then removed. Adhesion is evaluated by comparison with descriptions and illustrations.

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Eastman Chemical Company
Corporate Headquarters
P.O. Box 431
Kingsport, TN 37662-5280 U.S.A.

U.S.A. and Canada, 800-EASTMAN (800-327-8626)
Other Locations, +(1) 423-229-2000

www.eastman.com/locations