

SOLUTION DATA SHEET

Outdoor Applications Last Longer in the Sun with ESTANE TPU



Markets	Inflatables, balloons, kites, boat sails, camp tents, outdoor textile coating
Polymer	ESTANE thermoplastic polyurethane (TPU)
Key Benefits	<ul style="list-style-type: none"> • Excellent hydrolysis, puncture, and surface abrasion resistance • Does not yellow nor shows color fade over time • Very good fungi and microorganisms resistance • Plasticizer-free

Lubrizol Engineered Polymers has been investigating new ways of granting outdoor materials more key performance attributes and longer durability. Our melt coating portfolio is a broad package of consolidated and easy processable solutions which provide a consistent high quality when applied by processors.

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Our material science expertise and application development insights spurred the creation of a new product with additional technical benefits (in comparison to our standard TPU and the market polymer reference) for melt coating end applications that need to maintain initial clear or bright colors and stay outdoors, like tents or inflatables. The new development is a polyether-based aliphatic material which has excellent UV stability, and a very good microbial resistance. ESTANE ALR MC-93A-VE is a fully commercial grade which is the first of its kind designed for a melt coating process.

Durable ESTANE ALR MC-93A-VE TPU does not contain any dangerous ingredients according to REACH compliance*, and has high hydrolytic stability and resistance to puncture and surface abrasion.

Aliphatic masterbatch processing is recommended for this easy-to-color aliphatic polymer. This material is long lasting and more color stable than others using aromatic TPUs or PVC. As the life of the material is extended, its potential for longer time use reduces the need for a new one, making it a more sustainable solution. And its production and disposal, unlike with PVC alternatives, does not release toxic chemicals. ESTANE TPU is recyclable. **

Several tests have been carried out to test the performance of the new grade. The graphs below show a comparison with aromatic ESTANE melt coating grades. The first one shows the hydrolysis resistance of the new grade ESTANE ALR MC-93A-VE TPU:

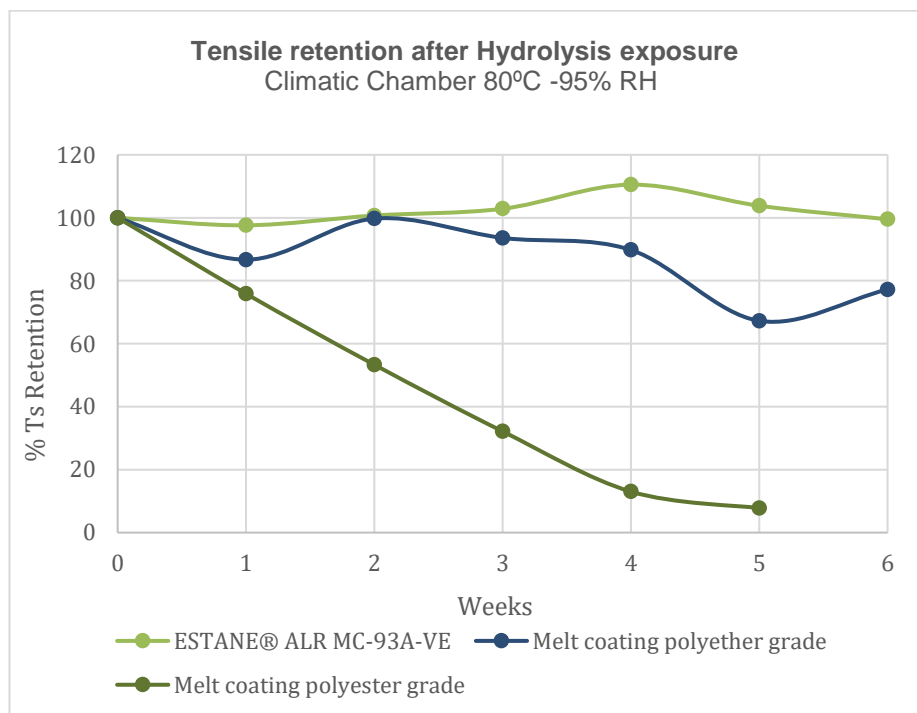
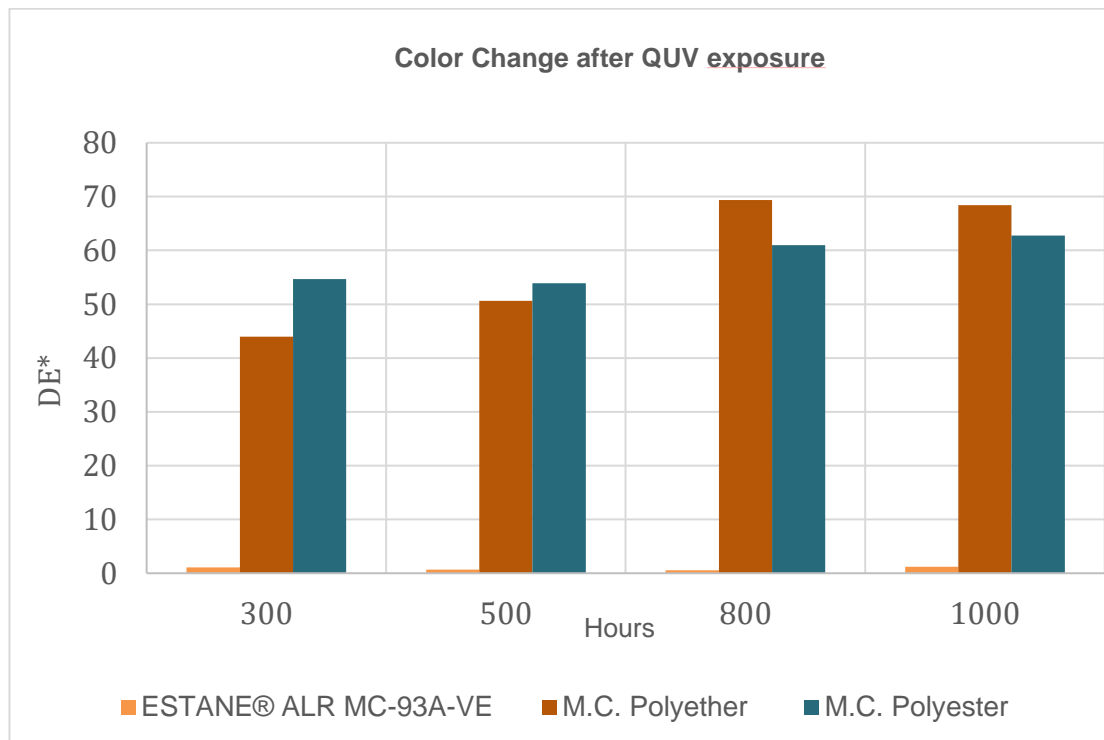


Figure 1: Relation between hydrolysis resistance and tensile strength of new ESTANE grade

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The result of the test comparing the UV resistance of the new grade to two aromatic TPUs for melt coating (referenced below as M.C. Polyether and M.C. Polyester) clearly shows its superior color stability as can be seen in the following graph:



Evaluation of color change according to ASTM E313

QUV according to ASTM G154-06/ISO 105-A02

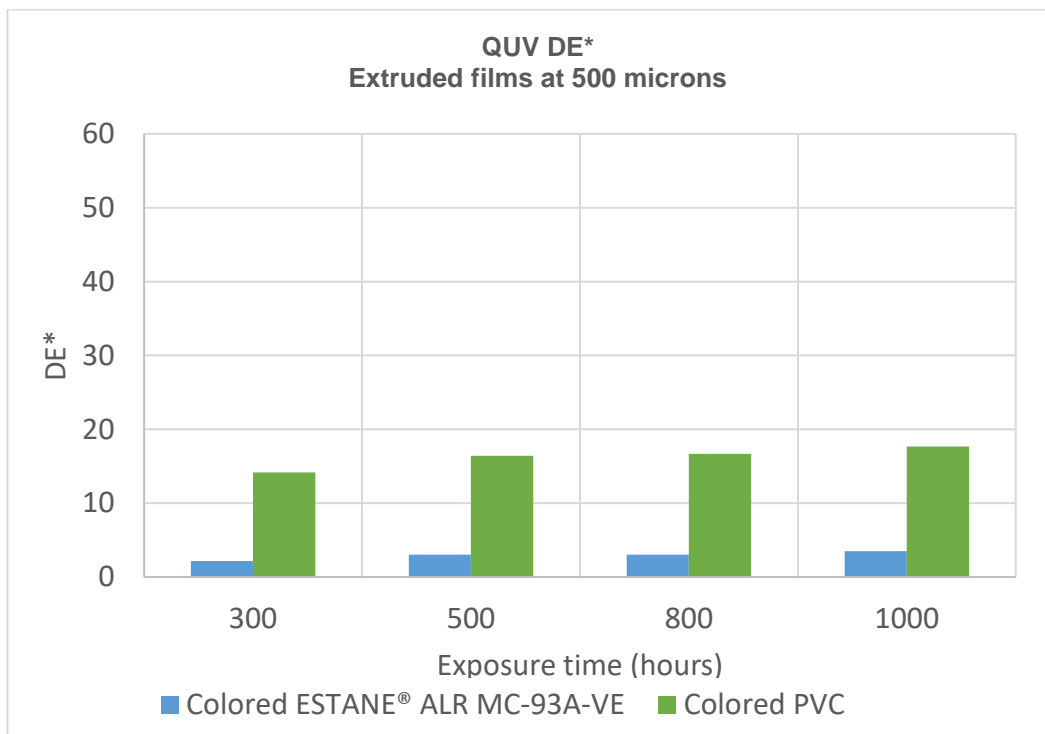
Test conditions: 1000 hours, 6 cycles of 8h UV at 60°C, 0,89 W/m²*nm and 4h condensation at 50°C

Figure 2: UV resistance of ESTANE ALR MC-93A-VE TPU

After UV testing, the new material’s mechanical properties were examined, and high-quality values were maintained.

To further check the UV resistance of ESTANE ALR MC-93A-VE TPU, it was colored and tested along with colored PVC by using the same blue color. PVC had a larger color change during the test in comparison, as can be seen in the graph on the following page.

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Figure 3: UV resistance of colored ESTANE ALR MC-93A-VE TPU vs colored PVC

Other benefits obtained by using aliphatic TPU:

- Cold weather flexibility with no brittleness in a broad temperature range, and free of plasticizers.
- Good processability by extrusion, melt coating or calendaring. TPU-coated textiles can be glued or welded (the welding process is faster and more reliable than glue).
- Resistance to deformation and scratches, and no odor.

New market demands and application concepts require innovative materials. For many decades, Lubrizol has been providing innovative TPU specialties to meet customer requirements, and today new ESTANE ALR MC-93A-VE TPU is well positioned to bring a new solution to customers creating products for a demanding external environment.

For more information, please visit our web site: www.lubrizol.com/Engineered-Polymers.

**For more information on regulatory compliance, please contact Lubrizol Customer Assistance.*

***Recyclability is based on access to a readily available standard recycling program that supports such materials. Products may not be available in all areas.*

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