We are providing in-depth consulting services that assist you in developing and applying the best weathering test methods and strategies for your products. The Atlas Consulting Group specializes in testing, consulting, and engineering dedicated to ensuring that your products are weather resistant.

The Issue of the Atlas Weathering Consulting Insights Newsletter is the fourth and final installment of a four-part series that has briefly addressed four of the most frequently asked questions that the Atlas Consulting Group receives in regards to weathering testing.

The Question on Everyone's Mind

"How does the temperature influence my laboratory weathering test?" is a frequently asked question. Two main effects should be considered regarding the temperature in weathering testing:

1) Increasing the temperature increases the degradation rate (Arrhenius principle)

This also applies for photochemical degradation reactions. The extent of degradation depends on the material and the aging mechanism. A rule of thumb says that a temperature increase by 10 K (10°C) doubles the reaction rate. This rule can be used if there is limited information about the degradation process. Note: the real temperature influence might deviate but is material specific.

2) Increasing the temperature can change the degradation process

The most important phase transition for technical polymers is defined by the glass transition temperature $T_g$. If the sample temperature is above $T_g$, the whole degradation process can be completely different. Typical technical amorphous or semi-crystalline material turns from a hard and brittle glassy state into a viscous flowable state. Two main effects should be considered regarding the temperature in weathering testing:

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