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Accelerated Weathering Testing

Accelerated weathering methods simulate the damaging effects of long term outdoor exposure of coatings by exposing samples to varying conditions of the most aggressive components of weathering - ultraviolet radiation, moisture and heat.

No direct correlation can be made between accelerated weathering methods and actual outdoor exposure. However, relative comparisons under controlled conditions are an excellent means of estimating performance of coatings in exterior applications.

Test samples are mounted in frames and subjected to a cycle of ultraviolet radiation exposure followed by moisture exposure via controlled condensation. Various cycles are defined depending upon the intended end use application - for example, a typical cycle for automotive exterior applications would be 8 hours UV exposure at 70°C followed by 4 hours of condensation at 50°C. These cycles are continued for extended periods of time, potentially up to thousands of hours.

The method outlined above conforms to the following standard practices: ASTM D4329, D4587, ISO 4892 and SAE J2020. It is generally accepted, but not always true depending upon the substrate, that 1000 hours of the above exposure is equivalent to one year of Arizona or Florida south-facing exposure.

Weathering data is generated by comparative testing of exposed samples versus unexposed control samples. Often several exposure times (such as 500, 1000, and 2000 hours) will also be compared to each other. Depending upon the requirements of the client, such comparative testing may involve measurements of haze, luminous light transmission, yellowness index, colour change, and/or physical properties such as surface hardness, abrasion resistance, impact strength and adhesion.

Optical Coating Technologies does not carry out these weathering tests – our coating manufacturers do and provide us with the data as requested. Specific testing can be carried out to order.