

Title: Moving from Weathering Screening Testing to Service Life Prediction

Author: James E. Pickett

Abstract:

Accelerated weathering test procedures of relatively short duration can at best only weed out very poorly performing materials intended for long duration applications such as solar energy. Materials that “pass” such screening tests could still undergo failure well before the expected service life of the system, thereby presenting significant performance and business risks. In contrast to the material agnostic, one-size-fits-all approach to screening tests, further risk reduction requires detailed understanding of the degradation and failure modes for the particular material system under consideration and careful experimental design. A general approach and two examples are described. The lifetime of coatings and laminates can be predicted using the rate of UV absorber loss while the lifetime of co-extruded multilayer materials is determined by the rate of erosion and the thickness of the protective layer.

Biography:

James Pickett received a Ph.D. in organic chemistry from Yale University in 1980 and spent his career at the GE Research Center in Schenectady, New York. Most of his work focused on polymer degradation and stabilization, particularly in the design and testing of highly weatherable materials and systems. He has been awarded over 60 U.S. patents, published over 70 papers and chapters, and co-edited 2 books. He has also served as an editor for the journal *Polymer Degradation and Stability*. Since his retirement from GE, he has worked as a consultant.