Background

Polyolefins are valued for their enduring performance over extended periods of time, making them ideal for applications that require long-term outdoor durability. To guarantee such longevity, it is essential to test the long-term functionality of the polyolefin when developing a new product or making any changes to the raw materials, formula, or processing conditions. Currently, the testing is conducted using a Q-Sun Xenon Arc weathering chamber, which replicates a range of outdoor conditions, including UV exposure and moisture, through various cycling patterns.

This testing must comply with ASTM D6878 (Thermoplastic Polyolefin-Based Sheet Roofing) and ASTM G155 (Practice for Operating Xenon Arc Lamp Apparatus for Exposure of Materials). We look at cracking every 500 hours to determine crack initiation at 20X magnification. While this testing method effectively accelerates weathering, it still leads to prolonged project timelines. Depending on the product, this test could take anywhere from 15 to 24 months.

What we're looking for

We are looking for technological innovations that can further accelerate the weathering testing process or enhance predictive accuracy for the long-term performance of polyolefin composite materials, thereby reducing the time-to-market for new developments and material sourcing. The overall goal would be to accelerate this testing by 50%.

Solutions of interest include:

- Advanced predictive models that correlate shorter testing periods with long-term weathering outcomes
- Alternative accelerated weathering techniques with faster and reliable outcomes

Our must-have requirements are:

- Aligns with industry standards
- Demonstrates strong correlation between accelerated tests and real-world performance
- Reduces testing time without compromising predictive accuracy of product performance

Our nice-to-have's are:

- Cost-effective implementation
- Easy integration into current testing procedures

What's out of scope:

- Complex integrations impractical for existing testing frameworks
- Solutions targeting non-polyolefin materials

Acceptable technology readiness levels (TRL): Levels 2-9

1. Basic principles observed
2. Concept development
3. Experimental proof of concept
4. Validated in lab conditions
5. Validated in relevant environment
6. Demonstrated in relevant environment
7. Regulatory approval
8. Product in production
9. Product in market

What we can offer you

Eligible partnership models:

- Sponsored research
- Co-development
- Supply/purchase
- Licensing

Benefits:

- **Sponsored Research**
  Up to $100,000 for a 6-12-month engagement.

- **Expertise**
  Internal expertise in the R&D labs and with the R&D chemists and engineers.

- **Data**
  We can provide existing data, and any support needed with collecting data and subsequent analysis.

- **Facilities and Services**
  Access to our weathering equipment and lab capabilities.

Please contact the University of South Florida Technology Transfer office representative for submission - Karla Schramm at kschramm@usf.edu