

# Surface modifications and additives to prevent particulate adhesion on polyolefins

## Background

White appearance has become dominant in roofing products for commercial buildings and constructions because it can efficiently reflect solar energy to reduce heat island effects. When a membrane is installed on a roof, accidental stains, soil and dust on membrane edges need to be cleaned off prior to seaming and welding. Over time, atmospheric particles are picked up and accumulate on the membrane surface. Most particles either scatter or absorb sunlight, which causes changes in solar reflectance and thermal emittance of white membrane in the field with aging time. Current maintenance practices involve periodic cleaning to maintain aesthetics and energy efficiency of a building.

## What we're looking for

We are looking for technologies that can keep naturally-exposed membrane surfaces white and clean throughout their lifetime in the field. Solutions may include chemical additives, or surface modifications or other approaches that prevent dirt and dust from sticking to surfaces.

### Solutions of interest include:

- Chemical additives or surface modifications to prevent soil and dust adhesion
- Other solutions that can be integrated into the material or its structure during manufacturing

### Our must-have requirements are:

- Compatible with polyolefins
- Minimal to no adverse effects on weatherability and physical properties of polyolefin membranes
- Long-term durability in outdoor environments
- Significantly reduces the percentage of dirt accumulation on membranes left uncleaned for one year (ASTM D3274)

### Our nice-to-have's are:

- Minimal to no impact on solar reflectance of uncleaned membranes after 3 years of aging (ASTM C1549)
- Long-lasting functionality under normal operating conditions

**What's out of scope:**

- Any technology that has no potential to be deployed at large scale in a manufacturing plant within 3-4 years
- Post-production surface applications, such as coatings or protective films adhered to membrane surfaces

**Acceptable technology readiness levels (TRL): Levels 4-9**

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 one year. If the preliminary work shows promising results, the sponsorship could be extended to another year.

**Expertise**

Internal expertise in the production plant and with R&D scientists in the industry.

**Tools and Technologies**

We can provide the relevant data and any support needed with collecting data and subsequent analyses.

**Facilities and Services**

We will provide access to one of our plants for the product trials.

Please contact the University of South Florida Technology Transfer office representative for submission - Roisin McNally at [rmcnally@usf.edu](mailto:rmcnally@usf.edu).