

*Solar Radiation Map*

## BACKGROUND

This document provides information on how Transshield Shrinkable Fabric® covers are engineered to withstand UV degradation to provide long term storage and shipping solutions for industrial applications.

Transshield engineers and manufactures shipping and storage covers to protect high value industrial equipment, modular construction units, wind energy equipment as well as boats of all sizes and shapes. Once installed these covers are heat shrunk to provide a tight fit around the articles and spend the majority of their utility enduring the forces of nature. Transshield covers are highly engineered to protect against UV degradation, wind, rain, hail, dust and any contaminants that may come in contact with these high value products.



## ASTM G155 and UV DEGRADATION

ASTM G155 is a standard practice for operating xenon arc light apparatus for exposure of non-metallic materials.

UV rays make up just 5% of sunlight, yet they cause most of the exposure damage to materials. Damage from the UV rays deteriorate both visual (color loss) and mechanical

properties (tensile strength) of plastics and weaken them over time.

In order to engineer products that can withstand UV exposure, the automotive, surface coatings, pharmaceutical, textiles, and building materials industries adopted ASTM G155 as their standard measure of UV stability.

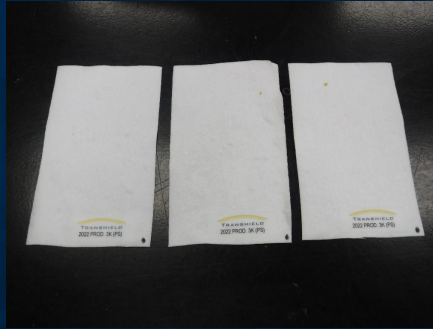


# TESTING

Transshield Shrinkable Fabric® is engineered and tested to withstand environmental degradation. This document provides data on how resistance to UV rays is engineered into the Shrinkable Fabric, and how it retains its utility after 3000 hours of accelerated exposure to ASTM G155 Cycle 1 standards which means 102 minutes of light and 18 minutes of light + water spray providing 0.35 W/m<sup>2</sup>/nm at 340nm. During the test period, samples were taken at 1000, 2000, and 3000 hours of exposure. Fabric samples were tested to ASTM D882 standards and mechanical properties were compared to unexposed control samples.



Fabric sample placement for UV Testing

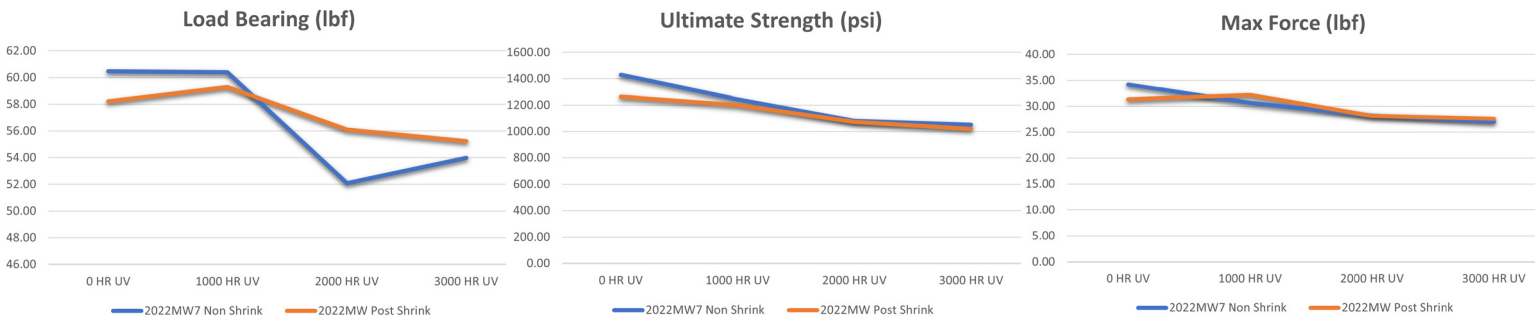


Samples were marked to match their exposure time



All samples were tested to ASTM D882

# RESULTS



After 3000 hours of accelerated exposure, post-shrink samples of Transshield Shrinkable Fabric retained 95% of its load bearing strength, 80% of its ultimate strength, and 88% of its breaking force. Over the course of the 3000 hours, the fabric samples were subjected to a total UV of 315 mega joules (MJ). In comparison, the annual total UV for Florida is approximately 280 MJ; for Arizona, it is 333 MJ. Therefore, we can estimate that Transshield Shrinkable Fabric can be in operation in Florida for approximately 14 months and in Arizona, approximately 11 months and still retain 80% of its ultimate strength and about 95% of its load bearing strength.

Transshield's Engineering Team achieves these results by use of pigments that are optimized for outdoor environments along with proper use of antioxidants and UV additives in its fabric construction. In conclusion, it is safe to say that Transshield covers are fit for operation for up to two years.

For further information please follow the link on the QR Code below.

2932 THORNE DRIVE  
ELKHART, IN 46514  
TEL: 574.266.4118

