UV Test Report

SCIGRIP 400LSE

LOW SURFACE ENERGY ADHESIVE

TWO PART MMA

Application Description

Low surface energy (LSE) substrates are notoriously difficult to bond. These substrates have a low affinity for other substances which result in poor wetting properties. As a result, traditional adhesives often fail to adhere to these substrates securely. To overcome this, several strategies can be employed including surface treatment, primer or adhesion promoter and mechanical bonding. Unfortunately, these strategies add time, cost and weight or design restrictions to the project.

Speciality adhesives are a way to overcome these challenges, increase process efficiency, lightweight and improve aesthetics. The ability to bond a wide variety of materials is integral realising innovative design possibilities.

SG400LSE is a new product designed to overcome the bonding challenges of low surface energy plastics.

In these tests, we collected data on the adhesive performance when subjected to UV exposure through stimulating the effects of natural sunlight and artificial irradiance. Understanding the impact on lap shear strength.

QUV testing provides valuable insights into the adhesive's durability and long term performance in outdoor and other environments where exposure to UV radiation and temperature fluctuations can degrade adhesive bonds over time. QUV testing is critical to determine suitability for outdoor applications.

Scope of Testing

Lap shear samples were prepared with SG400 based on ASTM D3163. The following substrates were used to make lap shears.

1. PMMA – PMMA
2. PMMA – Aluminium

Test Methods

ASTM D3163	Standard Test Method for Determining Strength of Adhesively Bonded Rigid Plastic Lap-Shear Joints in Shear by Tension Loading

The samples were placed in the Q-LAB QUV tester for 100 hours and tested alongside specimens prepared and conditioned at room temperature.

Results

Table 1. Lap Shear Results (PMMA – PMMA)

Conditions	Mean Shear Strength (MPa)	Failure Mode
Room Temperature	3.91	PMMA Broke
100 Hours Under QUV	2.97	PMMA Broke

Table 2. Lap Shear Results (PMMA – Aluminium)

Conditions	Mean Shear Strength (MPa)	Failure Mode
Room Temperature	5.84	PMMA Broke
100 Hours Under QUV	4.55	PMMA Broke

Image 1.PMMA-PMMA (Room Temperature)

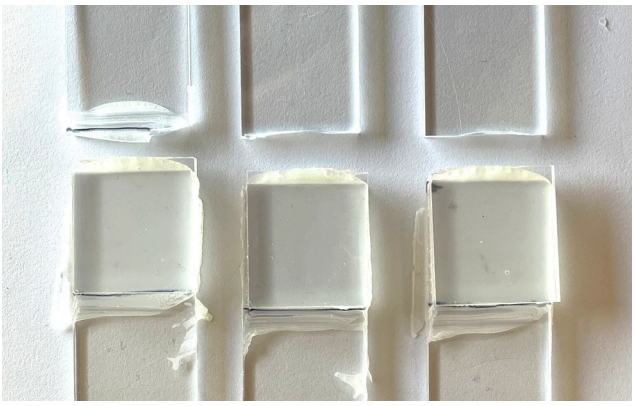
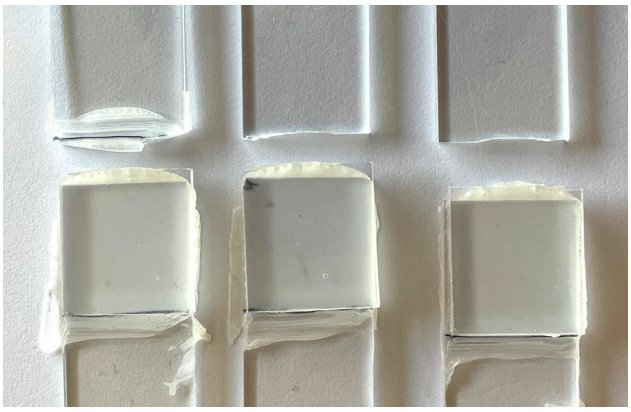


Image 2.PMMA-PMMA (QUV)



More Results and Conclusions on Back →

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Image 3.PMMA-Aluminum (Room Temperature)

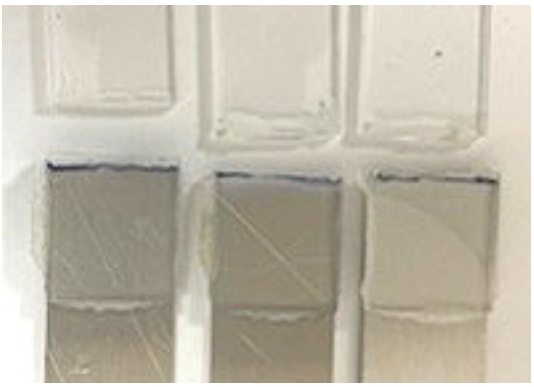
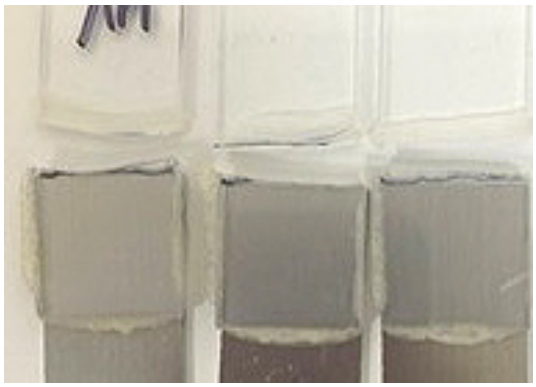


Image 4.PMMA-Aluminum (QUV)



Conclusions & Recommendations

All of the specimens failed by stock break after 100 hours of UV exposure. The strength was slightly lower, indicating that the polymer substrates were impacted by the UV exposure more than the adhesive was. PMMA substrate was chosen due to its clarity, making it an ideal choice for demonstrating the impact of UV exposure on the adhesive. There was no adhesive or cohesive failure observed in any of the specimens.