

Case study: adhesive alternative to welding for bonding polycarbonate

The Problem

A world leader in electrical explosion protection and sensor technology, was looking for **an alternative to laser welding** for an application that requires sealing two polycarbonate parts in their photoelectric sensors. The customer was **bonding polycarbonate clear covers to a polycarbonate PCB enclosure** by laser welding. However, they were unsatisfied with the results, as laser welding between polycarbonate and polycarbonate can give inconsistent bond results. It also requires large laser weld equipment that take up a lot of floor space.

Our colleagues in the Dymax Application Engineering department recommended using light-curing adhesives to replace the current laser weld process.

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A UV flood lamp with an appropriate UV curing adhesive used for bonding polycarbonate parts

The Solution

To support the customer in finding the most suitable light-curing adhesives and curing equipment for the process, the Dymax team tested several materials with customer parts in Dymax's laboratories

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and found that [Dymax 3094-GEL-REV-A](#) provided the best bonding strength when being cured with the [Dymax ECE-5000 UV flood curing system](#). This curing system offers high-intensity curing energy over a 12.7 cm x 12.7 cm area. Cure times of 5-30 seconds are typical when using Dymax light-curable materials.

Dymax application engineers optimised the process and provided the solutions to the customer, who was pleased with the test results and decided to put Dymax 3094-GEL-REV-A into their production qualification process.

The Results

The parts built with Dymax 3094-GEL-REV-A passed the customer's reliability requirement for IP67 ingress protection, thermal cycling at -40°C to 70°C, and damp heat soaking at 70°C/90%RH. The customer was satisfied with the results and proceeded to qualify the low-stress active bonder **Dymax 3094-GEL-REV-A** to replace the laser welding process. The Dymax solutions system provided them with more units per hour and reduced the production floor space.

[Talk to us](#) about fast, efficient and effective processes for **bonding polycarbonate**.

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