

Case study: putting electronics into an archery arrow with novel CAs

Application

In today's technologically-advanced world, consumers want products that are better, smarter and more intuitive to their needs. For brand owners and manufacturers, this means continuing to push the boundaries on innovative, increasingly-smaller devices that can give consumers new product options unlike anything they've seen before. The miniaturisation of devices can pose assembly and bonding challenges, especially when placing electronic sensors and batteries in an already-small component, such as inside the shaft of an **archery arrow**. Fortunately for a leading electronic device manufacturer, **Born2Bond™** [Flex](#) and [Light Lock HV](#) adhesives helped them address these challenges and make arrows smarter and more innovative.

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Challenge

A leading electronic device manufacturer was looking to bond an impact sensor and LED array onto an arrow shaft and affix the battery inside. In addition to being very small and comprising many components, the sensor and its battery had to withstand the elements, as well as the high velocity, high impact force an arrow would experience. The company tried many leading adhesive technologies currently available on the market, but none offered the performance requirements needed for both the sensor and battery. The following failures occurred:

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- The sensor and/or battery failed from the impact force of the arrow hitting its target or even more probable, not hitting the target and connecting with a rock or nearby tree.
- The bonded assembly allowed water ingress, causing failures with the sensor and/or battery.

Solution

For this application, weight distribution is especially important. In addition to meeting stringent mechanical property requirements, the chosen adhesive needed to securely position and bond the components into the arrow shaft keeping the critical correct balance throughout the arrow shaft. Two **Born2Bond** products were evaluated and proved successful.

Born2Bond Flex proved ideal for the battery component of this application, because it was able to maintain full performance even as the arrow hit its target.

- Over 200% elongation for unmatched strength and flexibility
- High impact resistance for enhanced performance
- Gel consistency for precise application and protection from water ingress



Born2Bond Light Lock HV was the product of choice for the sensor component of this application,

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because it resisted debonding under impact force and was odourless for a safer, more comfortable manufacturing process.

- 5-10 second fixture time to keep assembly lines moving
- Low blooming for improved final product aesthetics
- Strong bond to sensor housing plastic to withstand the high impact forces
- Environmental protection for the sensor in the housing



Possessing unmatched performance capabilities, these compatible products offer a unique, innovative combination that enabled the manufacturer to address both the sensor and the battery bonding needs and propel their smarter product ideas forward. **Flex** and **Light Lock HV** are based on

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a fast-curing, novel instant adhesive technology designed specifically for challenging, “**by-the-dot**” assembly needs.

Customer benefits

Since implementing **Born2Bond Flex** and **Born2Bond Light Lock HV** into the arrow manufacturing process, the manufacturer has been able to:

- Increase precise application capabilities using robotic dispensing equipment
- Meet product performance requirements of -40°C
- Improve the well-being of their employees with **Born2Bond**’s low-odour formulation

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