

Lighting the way to a quicker cure

LED-curable acrylate adhesives from **Panacol-Elosol** and **Tangent Industries** are easy to handle, biocompatible and resistant to all common sterilisation processes. Here's how this exciting new technology will open up new possibilities for mass-producing medical devices.

LED-cured adhesives are a reliable and cost-effective means of joining components for medical disposables. Most are acrylates that can be used with illumination systems that emit either UV (365, 385 or 395nm) or only visible light (405 or 460nm). New LED-compatible acrylates are derived from technology that has been used in medical device assembly for over 30 years.

UV or light-curing acrylates are still the best choice for bonding transparent or translucent substrates, such as plastics or glass. They are easy to handle, can be quickly dispensed and cure within seconds.

This technology can be easily integrated into automated production lines. In high-volume, high-speed production processes, acrylates can be cured with LED light in a fraction of a second. Cured acrylates from Panacol and Tangent are also compatible with common sterilisation processes, such as gamma, electron beam, ethylene oxide and autoclaving.

LED-curable acrylates for medical device assembly are formulated to meet industry biocompatibility requirements, and are typically certified to USP Class VI or ISO 10993 standards. Acrylates are also ideal for bonding glass or plastic substrates to metals, as they are transparent, making an invisible bond line. Typical examples of bonded medical devices are catheters, lancets, IV tube sets, glucose monitoring devices, blood bags, reservoirs, and syringes.

High adhesion after sterilisation

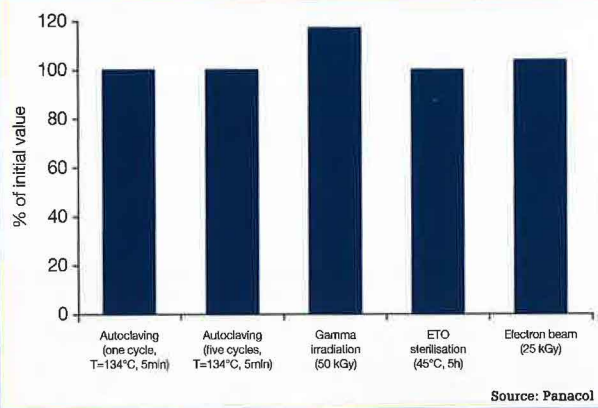
Acrylates generally maintain high bond strengths after undergoing autoclaving, gamma, electron-beam or ETO sterilisation. Even after several cycles of autoclaving, acrylates have high strength, long-lasting adhesion and good sealing properties.

To prove this, Panacol and Tangent conducted pull-out strength tests of needles bonded with Vitalit 6108 acrylate adhesive before and after sterilisation. The results showed that sterilisation had no impact on the adhesives, which maintained 100% of their bond strength.

Those that underwent gamma and electron beam sterilisation actually showed slightly increased bond strengths. The chart shows the needle pull out forces of Panacol's Vitalit 6108 after different sterilising processes.

Non-polar substrates, which are typically comprised of plastics, including polyethylene and polypropylene, but also steel, will often achieve a better and more lasting bond after surface pretreatment, such as corona or plasma. The treated surface allows better wetting of the dispensed adhesive,

Needle pull-out forces of Vitalit 6108



which results in higher adhesion. With some acrylate adhesives, pretreating the substrates improves bond strength by up to 50%.

Fast curing increases productivity

Panacol and Tangent's acrylate adhesives are solvent-free, environmentally friendly and ideally suited to manual and automated production processes for high-volume manufacturing. Being single-component systems, they are easy to handle. In many cases they are cured in a matter of seconds with LED light devices at wavelengths in the visible range. LED technology is especially important for bonding temperature-sensitive parts.

Acrylates take between 0.5 and 60.0 seconds to cure, the times depending partly on the adhesives and substrates used, but mainly on the size of the bond surfaces and the thicknesses of the adhesive layers.

For example, when bonding needles in syringes, complete curing takes much less than a second. To achieve the shortest possible curing time, Panacol and Tangent's adhesives are perfectly matched to the spectra of Hönle's UV and LED equipment.

Despite a short curing time, a very high mechanical bond strength can be achieved with LED-cured acrylates from Panacol and Tangent Industries. ■

Further information

Panacol-Elosol
www.panacol.com
 Tangent Industries
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