

LOCTITE[®]

INDUSTRIES GET THEIR FIX

WITH LOCTITE UNIVERSAL STRUCTURAL BONDRS



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Adhesives are used for a multitude of applications and are common to every industry, whether that be in the assembly of products, or in the maintenance and repair of equipment. It can be challenging, however, to find an adhesive that will provide a strong bond between two substrates with very different characteristics – and to find one that can do this in an efficient timeframe. This white paper explains how the unique hybrid technology of LOCTITE Universal Structural Bonders work to solve these industry issues in the face of a growing global demand. It also discusses the suitability of the adhesive to a wide range of industrial applications with successful case study examples that demonstrate its effectiveness.

A DEMANDING MARKET FOR ADHESIVES

The use of adhesives in the manufacture and assembly of equipment has been growing steadily across all industries around the world. According to a market research reports published by Technavio, the global adhesives market is increasing at a sturdy rate with an average compound annual growth rate (CAGR) of five per cent in the period 2017-2021.¹ The electronics adhesive market is growing particularly fast with a CAGR rate of 10 per cent in the same period.² Even among industries such as the automotive industry that have traditionally used mechanical fastening or welding as the predominant joining methods, adhesives are being used instead.³

In response to growing industrial demand, adhesive vendors have been developing new products and technologies. One particularly notable adhesive solution by Henkel was introduced to the Australian market recently, the LOCTITE Universal Structural Bonder – an adhesive that combines the strength of an industrial-level structural bonder and the speed of an instant adhesive. This patented, world-first technology has been a gamechanger in the adhesive market, catering to a diverse spectrum of industries including electronics, automotive, aerospace, mining, biomedical, manufacturing, 3D printing and general maintenance and repair.⁴



THE TECHNOLOGY BEHIND LOCTITE

Henkel's LOCTITE General Purpose Structural Adhesives were released to the Australian market in 2018. As Andrea Campi, Henkel's Product Manager for Adhesives in the ANZ region explains, the product is a combination of two different technologies – the instant adhesives and the structural bonders.

"You get the best of both. The fast curing time of the instant adhesive and then the strength and versatility of the structural bonders" said Mr Campi. "But the main characteristic is that this is now the go-to adhesive for binding different substrates, including substrates that are typically difficult to bond together."

The LOCTITE products can be used on a wide range of substrates including various metals, rubber and most plastics. Different substrates have different adhesion properties and reactions to factors such as thermal cycling, humidity, and impact stress. The LOCTITE Universal Structural Bonder not only adheres to a multitude of substrates but has high resistance to factors such as impact, vibration, temperature and moisture. This ability alone addresses one of the key problems that industries face when sourcing an adhesive. The fact that the product also has such a fast curing time – a demonstrated one hour in certain scenarios – makes it all the more appealing and this is why the new technology is considered a breakthrough for assembly design and maintenance repair. By combining the technologies, it manages to overcome the limitations of both.⁵

"For example, with the instant adhesive, you need two components that join perfectly together – and are obviously made of the same material – for it to be effective. There can be no gaps. But while the structural bonders are designed for this, their curing time is often too long to be practical. The LOCTITE hybrid technology solves those issues," Mr Campi explained. "Also, the chemicals used in structural bonders are often more hazardous, but that's not the case with new LOCTITE Universal Structural Bonder. From a safety perspective, these are excellent products, with minimal health hazards."

Essentially, the LOCTITE hybrid range consists of four Universal Structural Bonders. They are:

LOCTITE HY 4060 GY: A durable, 5-minute grey coloured structural repair adhesive. This is the go-to adhesive for general purpose repair.

LOCTITE HY 4070: An ultra-fast, universal repair adhesive. This can solve any repair challenge with high strength performance.

LOCTITE HY 4080 GY: A tough and versatile grey coloured structural bonder that is low odour and non-flammable. It's an ideal replacement for traditional two-part methyl methacrylate adhesives and acrylic structural bonding adhesives.

LOCTITE HY 4090 and LOCTITE HY 4090 GY: A fast and versatile structural bonder that solves a wide range of design and assembly challenges with high strength bonding on a variety of substrates.



You get the **best of both**. The **fast curing time** of the instant adhesive and then the **strength and versatility** of the structural bonders.

HELPING LOCAL BUSINESSES SAVE MONEY AND TIME

There are numerous examples where LOCTITE products have demonstrated their ability. In some scenarios, the product has been proven beyond the scope of a normal industrial application. As Michael Hajj, Henkel's Head of Technical Adhesives for the ANZ region, has said though, LOCTITE technology has "been designed to reach beyond the conventional industry approaches."⁶

The most publicised case study was an experiment performed in the US involving a freight train. A challenge was set to a team of Henkel engineers in the US to prove the speed, strength and durability of the LOCTITE Universal Structural Bonders by pulling

a 208-tonne freight train. The engineers designed a connecting rig for the assignment consisting of two metal plates which would be bonded with the product. After cleaning and sanding the plates, they applied three grams of LOCTITE Universal Structural Bonder to one plate and then fixed them together and allowed them to cure for 60 minutes. Their experiment was a success, proving that the bond was tough enough to haul the train with just 1 hour of fixing time.⁷

There are also a number of case studies where the technology has been successful in an Australian context. The following summaries provide an overview of each of these scenarios.

BONDI SEWAGE TREATMENT PLANT

LOCTITE Universal Structural Bonders were successfully used to bond rubber and glass reinforced plastic at the Bondi Sewage Treatment Plant in Sydney. The plant was experiencing an issue with gas and odours leaking from the louver vents of their fans due to aged rubber seals and adhesive failing. Henkel Application Engineer Stefano

Giacometti came up with a successful solution. "It was a challenging repair job for the Bondi Sewage Treatment Plant as it is situated 40 metres underground and eight louver doors needed to be repaired, each with 36 fins and at 1.8 metres long," Mr Giacometti explained. "The job needed to be done quickly as the plant had to be shut down for repairs and the stench from the sewage was becoming problematic."

Mr Giacometti resolved the issue by employing the following strategy: "The surfaces were first cleaned with Teroson VR10, then primed with LOCTITE SF 770. The LOCTITE HY 4090 was used to bond the rubber seal to the edge of the louver fin. The rubber seals were then clamped for 24 hours to allow for cure."



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SPARKLING WINE PRODUCER

One of Australia's largest sparkling wine producers were looking for a solution that could successfully bond the components of their conveyor system. This included bump stops to make sure bottles were kept in a straight line for high speed filling – if not functioning properly, it could potentially shut down the entire production of the plant and posed a safety hazard. Henkel Application Engineer Stefano Giacometti suggested and successfully used LOCTITE HY 4090 for this project. He explained: "The client was very happy with the result, which was a success, despite the various components being a challenge to bond."



ENERGY SERVICES PROVIDER

The energy services team of a leading Australian steel mill had an issue with ageing condenser units that were suffering wear on the end plates. Acetal bushes were manufactured with the objective to press fit them into place, however, due to the irregular wear, not all bushes were a tight fit. This resulted in water leaks. A strong adhesive was required to bond acetal to brass. Henkel Application Engineer Stefano Giacometti was able to achieve this result for the client with one of the new LOCTITE Universal Structural Bonders. Mr Giacometti saved the client a significant amount of



money with his actions. He explained: "The provider would have otherwise had to replace the condenser units and so the total cost saving for the provider was an estimated \$200,000."

CONCLUSION

The proven abilities of LOCTITE Universal Structural Bonders include their versatility, high performance bonding strength, durability, fast fixture, impact resistance and lowered health and safety risk. These attributes combine to ensure higher productivity and

cost savings in an industrial setting. The documented examples of the products' success in a variety of applications is also testament to its value as the go-to adhesive for assembly or repair.

For more information on LOCTITE technology in Australia, please visit: <http://www.loctite.com.au>

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2. Global Electronic Adhesives Market 2017-2021, Technavio
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3. Adhesive uses expanding in automotive OEM
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4. Hybrid adhesive aims for best of both worlds, Manufacturer's Monthly
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