LOCTITE

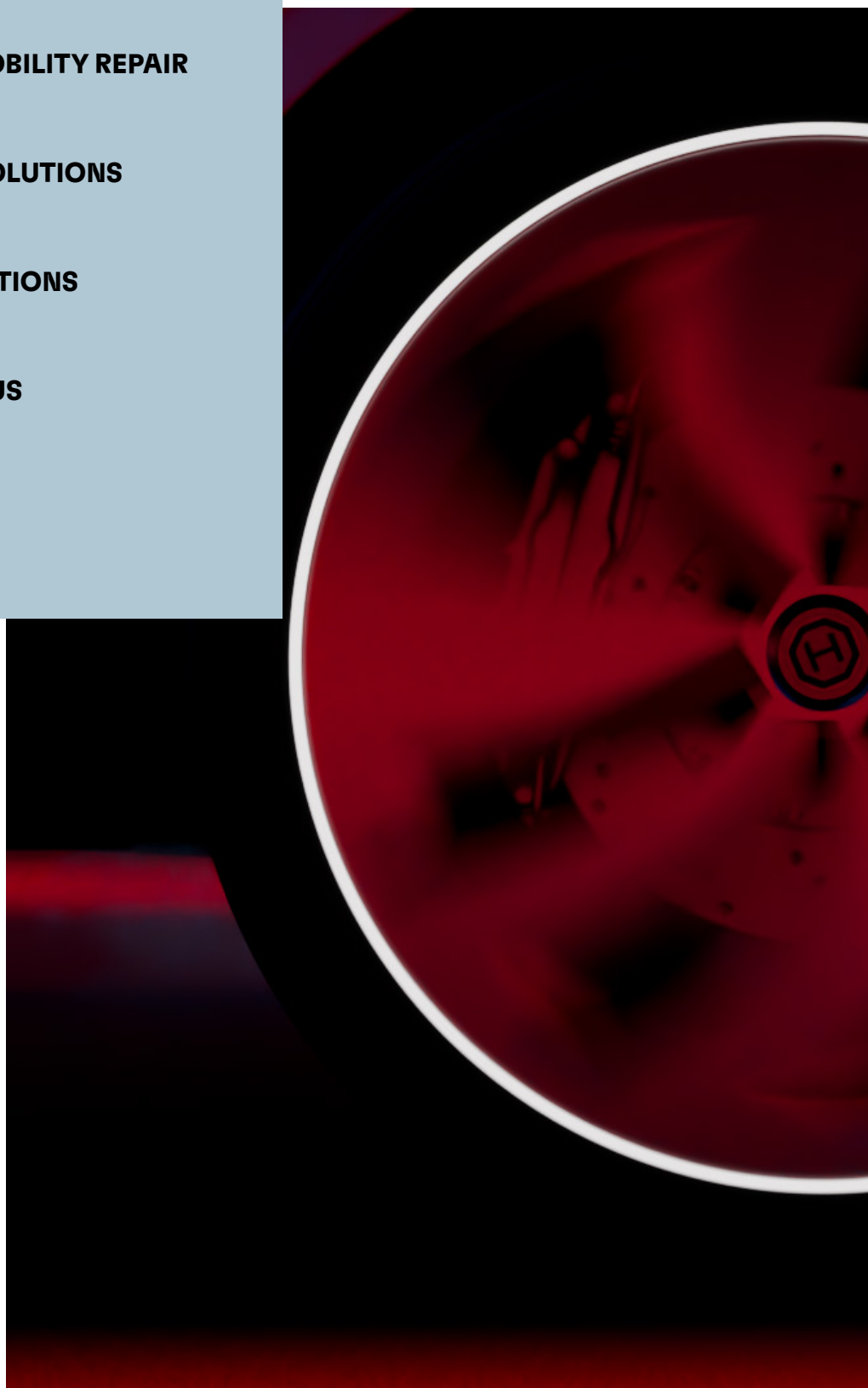
E-MOBILITY REPAIR SOLUTIONS *FOR BATTERY & E-DRIVE SYSTEMS*

*IT'S TIME TO **MOVE** BEYOND*

Henkel

Henkel Adhesive Technologies

CONTENTS



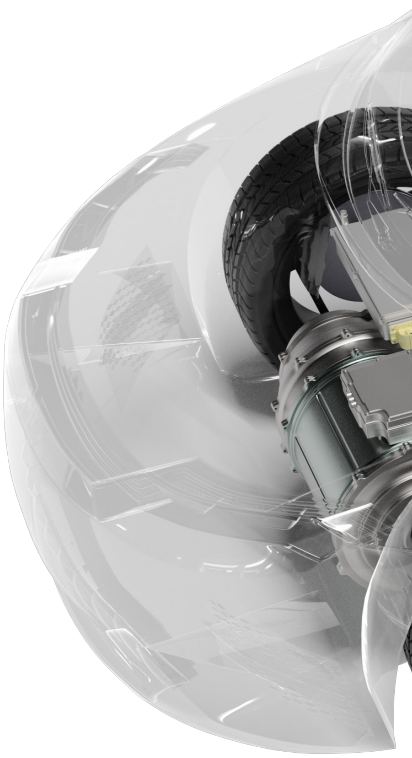
UNDERSTANDING THE CHALLENGES OF *E-MOBILITY REPAIR*

The push for sustainability is transforming the automotive industry. This global shift is leading to the rapid growth of e-Mobility, changing not only how we drive but also how we repair and maintain electric vehicles, which presents significant challenges for the repair ecosystem.

BATTERY SYSTEM:

The battery system is the core component of any electric vehicle, accounting for up to 40% of the total cost. This makes cost-efficiency and reliability critical throughout the battery's lifecycle. Challenges include:

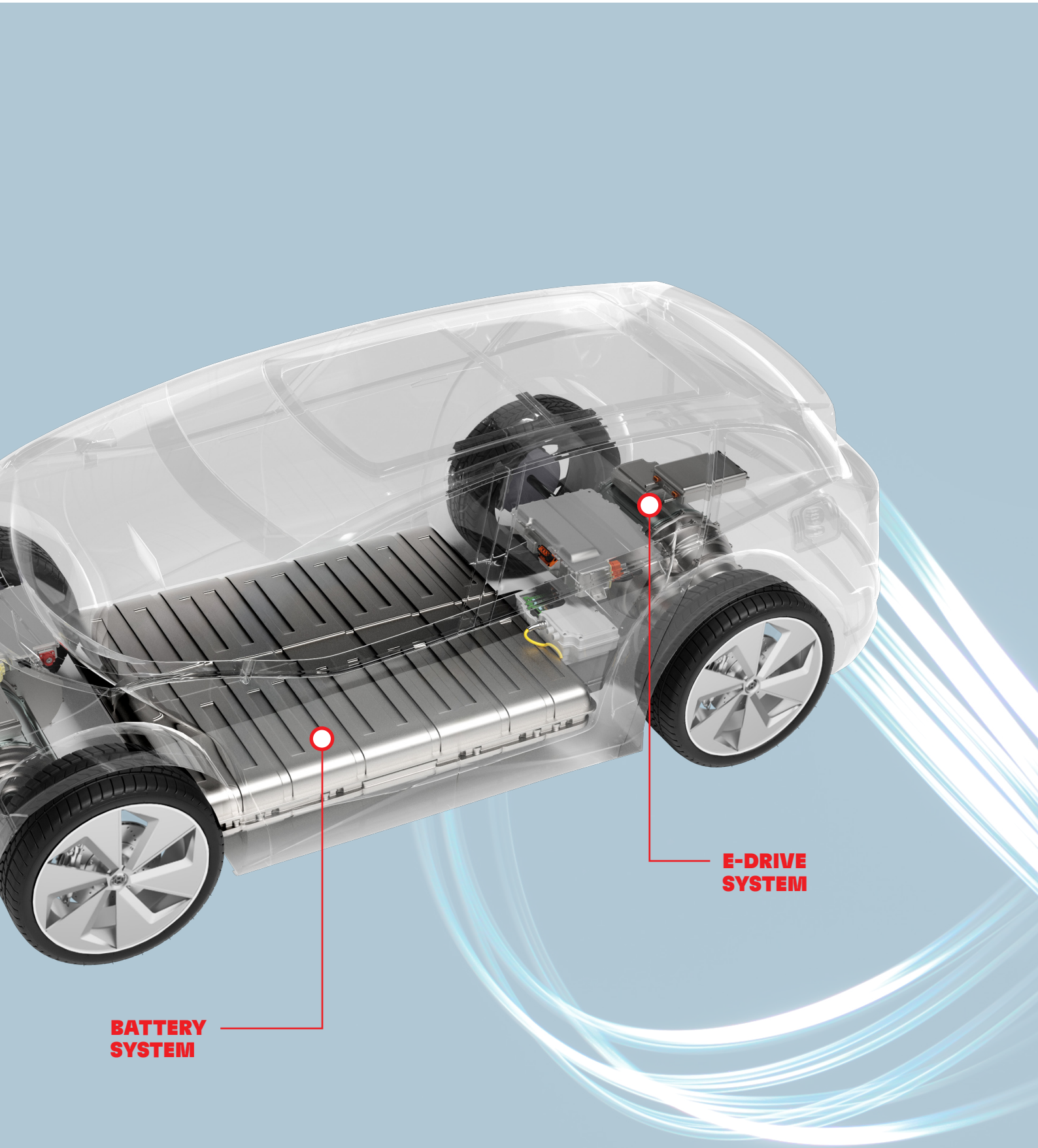
- ensuring reliable sealing of the battery after opening
- restoring efficient thermal management after the replacement of faulty battery modules
- ensuring a high-quality repair: crucial for passenger safety.



E-DRIVE SYSTEM:

The electric motor of an EV operates under high mechanical stress and environmental exposure. The high motor speeds of up to 20,000 RPM lead to increased wear in the bearings and strong vibrations, which can cause bolts to loosen. Therefore, it is essential to...

- replace bearings using high-performance retaining solutions
- ensure bolts are protected against loosening using threadlockers
- restore a reliable seal after repair to protect against moisture and dust.


E-DRIVE
SYSTEM
BATTERY
SYSTEM

LOCTITE

PIONEERING *EV REPAIR*

EMPOWER SUSTAINABLE E-MOBILITY WITH EV BATTERY REPAIR

Repairing EV batteries is more than a service—it's a transformative step toward building a thriving circular economy for battery systems. By extending the life of existing batteries, we can significantly reduce environmental impact, minimize greenhouse gas emissions, and optimize the use of valuable resources.

But the benefits don't stop there. Battery repair also opens up exciting new revenue opportunities, making it a compelling solution for stakeholders across the entire battery value chain.

The impact is clear: repairing a typical BEV battery pack by replacing individual modules to restore functionality can achieve up to 77% cost savings and up to 91% emission reductions compared to replacing it with a new pack. Read more in our whitepaper.

(Source: PEM RWTH Aachen University & Henkel Adhesive Technologies - EV Lifecycle Optimization Through Battery Repair whitepaper)

DOWNLOAD WHITEPAPER

Find out more in our whitepaper

Repairing an average BEV battery pack by replacing individual modules to restore functionality can save up to 77% of cost and up to 91% of emissions compared to replacing with a new pack.

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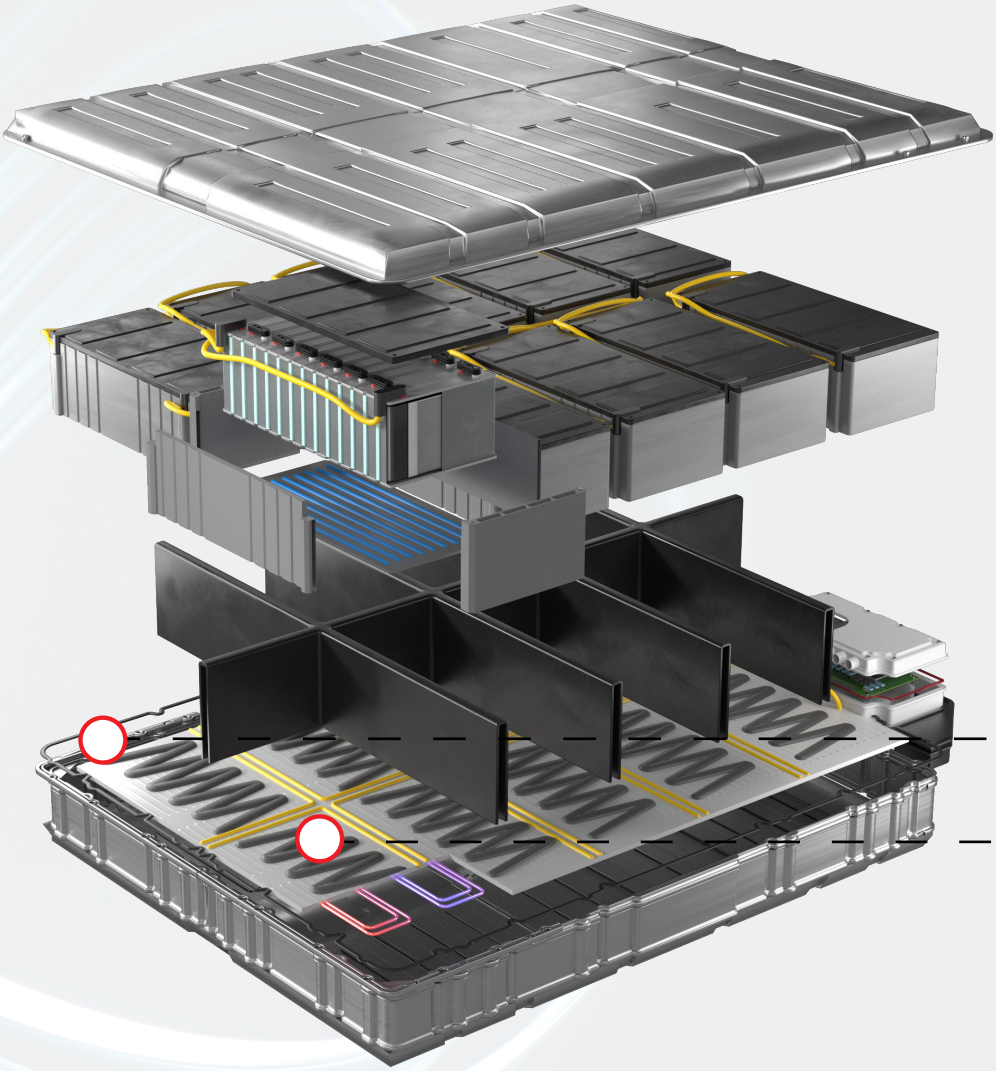
EV BATTERY REPAIR

THERMAL GAP FILLERS AND GASKETING SOLUTIONS



01

LOCTITE® GASKETING SOLUTIONS

When it comes to the battery housing, achieving a secure seal is essential for protecting against moisture, dust, and external contaminants. Proper gasketing is critical to ensure the reliability and safety of the electric vehicle—especially after repairs when the housing must be opened and resealed.

With **LOCTITE® Gasketing Solutions,** you gain access to a versatile portfolio of advanced polyurethane, silicone, and rubber-based formulations. Our products are specifically engineered to deliver robust, long-lasting seals that meet the demands of diverse battery designs.

02

LOCTITE® THERMAL GAP FILLERS

Ensure optimal thermal management with **LOCTITE® Thermal Gap Fillers** in EV battery systems. Engineered to seamlessly transfer heat from battery modules to the cooling system, these innovative gap fillers deliver consistent, reliable performance in even the most demanding environments.

When replacing a faulty battery module, renewing the thermal gap filler is critical to maintaining performance and thermal stability. LOCTITE Thermal Gap Fillers are designed for effortless application, efficient heat transfer, and long-term reliability, empowering your EV battery to perform at their best.

DISCOVER OUR SOLUTIONS FOR *EV BATTERY REPAIR*

Thermal Gap Filler Solutions	Key Properties	Chemistry	Curing	Thermal Conductivity
LOCTITE® TFX 3010	▪ 2-component SMP Thermal Gap Filler ▪ Thermal conductivity: 3 W/mK ▪ Silicon-free, low compressive force, flame-retardant (UL 94 VO), compressible (Shore 00 75), 12-month shelf life	Silane-modified polymer/ silicone-free	RT	> 3 W/mK
LOCTITE® TFX 3018	▪ 2-component SMP Thermal Gap Filler ▪ Thermal conductivity: 3 W/mK ▪ Silicon-free, low compressive force, flame-retardant (UL 94 VO), compressible (Shore 00 75), available in APAC	Silane-modified polymer/ silicone-free	RT	> 3 W/mK

Gasketing Solutions	Key Properties	Chemistry	Bonding & Sealing	Curing
LOCTITE® PU EV 9780	▪ 1-component polyurethane gasketing adhesive ▪ Quick and easy application ▪ Fast sealing performance, available in Europe	Polyurethane	Bonding & Sealing	Moisture curing
LOCTITE® PU EV 9785	▪ 1-component polyurethane gasketing adhesive ▪ Quick and easy application ▪ Fast sealing performance, available in APAC	Polyurethane	Bonding & Sealing	Moisture curing
LOCTITE® PU EV 9790	▪ 2-component polyurethane gasketing adhesive ▪ Warm applied, easy and fast application ▪ Moisture independent curing	Polyurethane	Bonding & Sealing	Chemical curing
LOCTITE® SI EV 9910	▪ 1-component silicone sealant ▪ Long open time and multi-substrate adhesion ▪ Excellent sealing properties and moisture barrier	Silicone	Sealing	Moisture curing
LOCTITE® RB EV 9740	▪ Rubber butyl cord ▪ Immediate sealing performance (no cure time) ▪ Excellent resistance to environmental influences	Butyl rubber cord	Sealing	No cure
LOCTITE® RB EV 9745	▪ 1-component rubber butyl ▪ Multi-substrate adhesion, permanently tacky ▪ Secondary sealing option in addition to formed gaskets	Butly rubber	Sealing	No cure

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SUCCESSFUL APPLICATION CASE

GLOBAL STANDARD SOLUTION FOR *LEADING EV BATTERY MANUFACTURER*

SITUATION

A leading automotive battery manufacturer faced a significant challenge: identifying the optimal thermal gap filler for EV battery repair operations. This critical material, applied between battery modules and cooling plates, ensures peak performance and safety by effectively dissipating heat. To meet the demands of global markets, the company sought a unified aftermarket standard and a trusted partner capable of delivering consistent, high-performance solutions worldwide.

In addition to a product with an extended shelf life to streamline inventory management, the manufacturer prioritized collaboration with a partner that could provide expert training for technicians. By aligning with a solutions provider dedicated to innovation, education and reliability, the company aimed to redefine EV battery repair processes—focusing on safety, efficiency, and seamless global implementation.

LOCTITE® SOLUTION

LOCTITE® TFX 3010 is a 2-part SMP Thermal Gap Filler specifically designed for high-performance thermal management in EV batteries. Delivering thermal conductivity of up to 3 W/mK, this silicon-free solution ensures efficient heat transfer and cures conveniently at room temperature. Ideal for EV repair and maintenance applications, it offers extended shelf life, smooth dispensability, and low compressive stress during installation—making it a workshop-friendly choice for reliable and effective use.

LOCTITE® experts offer hands-on training to demonstrate how to use the product for improved performance, along with technical support.

COLLABORATION WITH LEADING EV BATTERY MANUFACTURER

BENEFITS

High Thermal Conductivity
LOCTITE® TFX 3010 delivers 3.0 W/(mK) thermal conductivity for efficient heat dissipation, while its silicone-free formula prevents contamination of sensitive components

User-Friendly Application
The product is easy to apply manually, reducing the time needed for installation and ensuring consistent application, which enhances both repair quality and efficiency.

Extended Shelf Life
With a shelf life of 12 months, LOCTITE® TFX 3010 is well suited for global distribution and simplified inventory management.

LOCTITE® TFX 3010 THERMAL GAP FILLER APPLICATION

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E-DRIVE REPAIR

RETAINING, GASKETING, THREADLOCKING

01

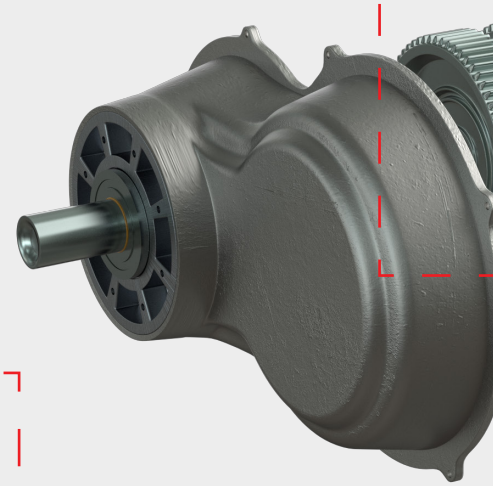
LOCTITE® RETAINING SOLUTIONS

Retaining solutions play a crucial role in the repair of cylindrical parts such as bearings and gears in the e-Drive. LOCTITE® retaining solutions extend the e-Drive's life by providing strong, reliable bonds even under high-speed and high-torque conditions.

02

LOCTITE® GASKETING SOLUTIONS

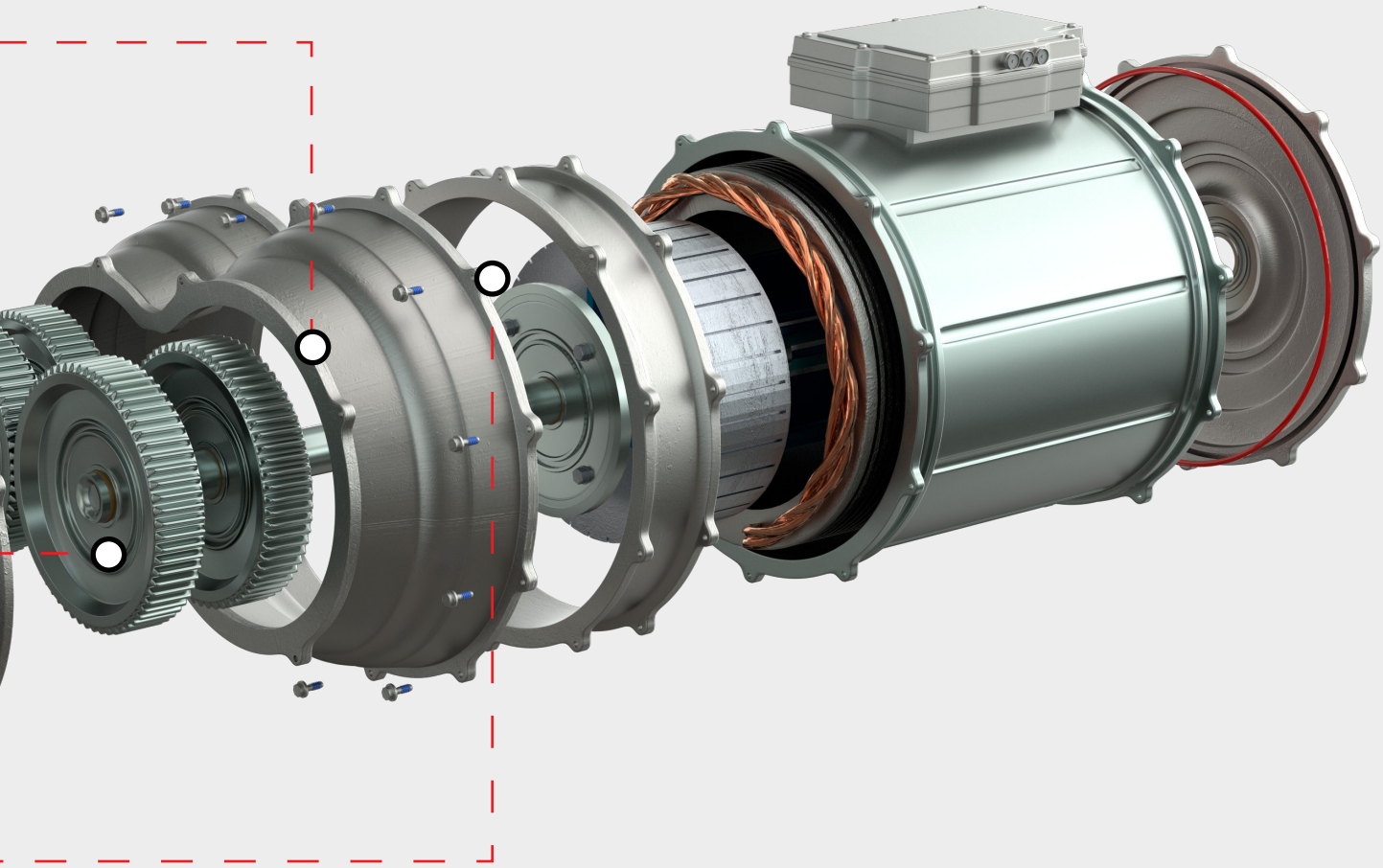
Gasketing solutions play a critical role in ensuring the reliability and longevity of e-Drive systems by providing robust seals that protect against leaks, contaminants, and harsh environmental conditions. LOCTITE® advanced gasketing solutions ensure secure, durable seals that withstand high temperatures and vibrations, helping maintain optimal performance while extending the life of the e-Drive.



03

LOCTITE® THREADLOCKING SOLUTIONS

Threadlocking solutions are vital for the durability and reliability of e-Drive systems in EVs, as they secure fasteners against vibrations. Designed to prevent loosening of threaded fasteners, LOCTITE® Threadlockers help maintain the structural integrity of the e-Drive even under demanding conditions.



DISCOVER OUR PORTFOLIO FOR *E-DRIVE SYSTEMS*

Threadlocking Solutions	Key Properties	Chemis-try	Strength	Tempera-ture Re-sistance
LOCTITE® 222	Low strength	Acrilyc	Low	150°C
LOCTITE® 243	Medium strength	Acrilyc	Medium	180°C
LOCTITE® 290	Medium-high strength, low viscosity (penetrates assembled fasteners	Acrilyc	Medium-High	150°C
LOCTITE® 2400	Medium strength, no labelling (no hazard symbols, risks or safety phrases)	Acrilyc	Medium	150°C
LOCTITE® 2700	High strength, no labelling (no hazard symbols, risks or safety phrases)	Acrilyc	High	150°C

Gasketing Solutions	Description	Chemistry	Flexibility	Temperature Resistance
LOCTITE® SI 5699	Great for flange sealing and rigid flange sealing on, for example, transmissions and cast metal housings.	Silicone	High	200°C
LOCTITE® SI 5910	Excellent oil resistance	Silicone	High	200°C
LOCTITE® 518	Certain flexibility, suitable for aluminum flanges	Acrilyc	Medium	150°C
LOCTITE® 510	High temp resistance, easy process	Acrilyc	Low	200°C

Retaining Solutions	Description	Chemistry	Flexibility	Temperature Resistance
LOCTITE® 603	High strength, oil tolerant	Acrilyc	High	150°C
LOCTITE® 638	High strength, increased temperature resistance	Acrilyc	High	180°C
LOCTITE® 620	High temperature resistance (curing at 180°C/356°F required)	Acrilyc	High	230°C

DISCOVER OUR *COMPLEMENTARY RANGE*

DISPENSERS

Complementary Range	Description	Use for
LOCTITE® EQ HD 16 2C Pneumatic Dispenser	Pneumatic dispenser for 2-component sealants and adhesives in 2 x 200ml cartridges	Thermal gap filler application (LOCTITE® TFX 3010)
LOCTITE® HD14 Handheld Manual Dual Cartridge Dispenser	Manual dispenser for 2-component adhesive products in up to 400ml twin cartridges	Thermal gap filler twin cartridge application (LOCTITE® TFX 3018)
TEROSON® POWERLINE II	High-pressure pneumatic dispenser ideal for 1-component aluminum and plastic cartridges	1-component gasketing applications
TEROSON® ET STAKU HAND GUN	Manual dispenser ideal for aluminum and plastic cartridges	1-component gasketing applications

CLEANERS

Complementary Range	Description	Use for
LOCTITE® SF 7063	Colorless, methylal-free, solvent-based cleaning agent for pre-assembly cleaning and degreasing of surfaces	Cleaning e-Drive sub-component parts prior to threadlocking, gasketing, and retaining applications
TEROSON® VR 10	Transparent, liquid cleaner designed for the pre-treatment of substrates before bonding or sealing. Free of chlorinated hydrocarbons (will not harm car paints when used on a short-term basis)	Cleaning battery prior to thermal gap filler and gasketing applications

PRIMER

Complementary Range	Description	Use for
TEROSON® BOND ALL IN ONE PRIMER	Promoting the adhesion of PU gasketing products for EV battery repair	PU gasketing applications

MOVE BEYOND *WITH US*

ENGINEERED FOR SUSTAINABILITY

Our new comprehensive range of e-Mobility repair products is engineered to improve circularity, efficiency and safety across electric vehicle (EV) applications. We are providing tools and resources to help repair shops adopt sustainable practices in their operations by improving repair quality, extending the life of batteries, reducing waste, and ensuring safe use in application.

IN PARTNERSHIP WITH YOU

We are committed to building strong partnerships with workshops and industry leaders to tackle the challenges of e-Mobility repair. By offering step-by-step instructions, tailored solutions, and hands-on technical support, our aim is that every repair professional can confidently address high-voltage safety standards, component complexity, and sustainability demands.

INNOVATION AT THE HEART

Our e-Mobility adhesive portfolio has been specifically designed to meet the evolving needs of e-Mobility repair. And we invest in research and development, working continuously with technicians and engineers to ensure our solutions are at the cutting edge of e-Mobility repair and maintenance.

EXPERTISE AROUND THE WORLD

We bring decades of experience in adhesives and advanced materials to solutions for e-Mobility repair and maintenance. From production to repair and ongoing technical support, we equip professionals with the tools and knowledge needed to succeed in this high-growth market. We operate 14 world-class Training & Application Centers located in major industry hubs worldwide. Each center is staffed with expert application engineers who are ready to address your e-Mobility challenges and needs. These centers also provide comprehensive training programs to equip you with the knowledge and skills needed for efficient and effective solutions.

TEROSON® FOR E-MOBILITY

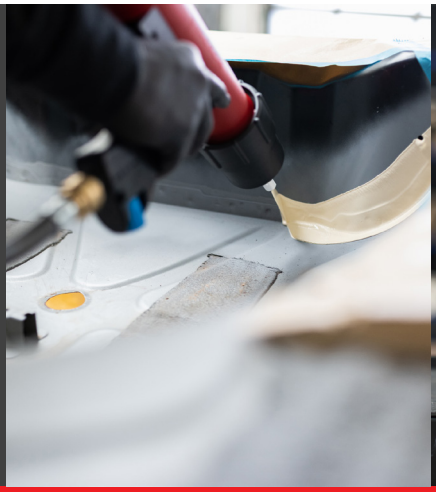
AND ALL TYPES OF VEHICLE REPAIR

TEROSON® products are made for professionals who repair vehicles to the highest standards, never back down from challenges, and set new industry benchmarks. With over 120 years' history, TEROSON® collision repair offers reliable, safe and efficient solutions for bonding, coating, sealing, acoustics, stiffening, and reinforcing.

Discover how we restore your vehicle with precision and care, from rebuilding OEM parts with tailored adhesives to expertly replacing damaged components using high-strength TEROSON® bonding solutions for structural integrity. For quick fixes, our 'smart repairs' ensure your car looks and performs its best. Trust us to keep you on the road safely and reliably.

REBUILD

Common tasks that involve rebuilding OEM seams, metal or plastic parts. The adhesive range for rebuilding is broad and mainly chosen based on the substrate(s) that need(s) to be rebuilt. Common technologies are MS, EP and PU. Remember: rebuilding is often a time- and resource-saving alternative to replacing parts.



REPLACE

Structural damage requires cutting old old parts and replacing them with new ones. Due to the size of the replaced parts, and the need to retain the structural integrity of the car, high-strength structural bonding power is needed. This is the premium class within collision repair and requires comprehensive knowledge and practice to re-establish original structural integrity.

REPAIR

Small repair tasks. The things that can be fixed relatively easily, e.g., broken bumper clips, or components of similar complexity. These can be solved quickly with a selection of TEROSON® solutions for smart repair. Note: small repair tasks are also referred to as ‘smart repair’.

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BEYOND THE BOND

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