

BONDERITE®

TEROSON®

CAR BODY SOLUTIONS ALONG THE ENTIRE VALUE CHAIN



Henkel Adhesive Technologies

MEETING RAPIDLY CHANGING VEHICLE DESIGN NEEDS



By 2030, IHS Markit expects at least **one in four passenger cars sold will be an electric vehicle**. This industry transformation means vehicle body design & manufacturing is evolving faster than ever.

Material solutions help enable these changes, offering solutions across the automotive value chain to deliver:






- › Increased process efficiency
- › Design & manufacturing flexibility
- › Reduced complexity & cost
- › High performance at reduced weight
- › Decreased carbon footprint
- › Comfortable and safe driving experience

Henkel aims to boost the car development process by addressing customers' engineering demands from the earliest design and simulation stages, utilizing advanced CAD/CAE simulation.

Our mission is to re-imagine vehicle and component designs to deliver net weight and cost savings, while meeting or exceeding performance standards.

Full Engineering & Simulation Services

Key Applications and Functions around the Car

<p>1 PRESS SHOP</p>  <ul style="list-style-type: none"> › Stamping Lubricants › Cleaning and Corrosion Preventatives 	<p>2 BODY SHOP</p>  <p><small>Source: Atlas Copco</small></p> <ul style="list-style-type: none"> › Structural adhesives › Structural inserts › Panel reinforcements › Acoustic sealing baffles › Acoustic, structural & sealing tapes › Sound damping & deadening material 	<p>3 PAINT SHOP</p>  <ul style="list-style-type: none"> › Metal pretreatment › Paint Shop Sealants & Coatings › Sound deadening materials 	<p>4 TRIM & FINAL ASSEMBLY</p>  <ul style="list-style-type: none"> › Multi-Substrate Bonding › Module Bonding › Glass Bonding 	<p>5 REPAIR & MAINTENANCE</p>  <ul style="list-style-type: none"> › Body Repair Adhesives › Glass Repair › Coating and Corrosion Protection
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STAMPING LUBRICANTS

Stamping and forming operations of ferrous and non ferrous metals.

BENEFITS:

- › Provides superior stamping results
- › Improves stamping tool and die life



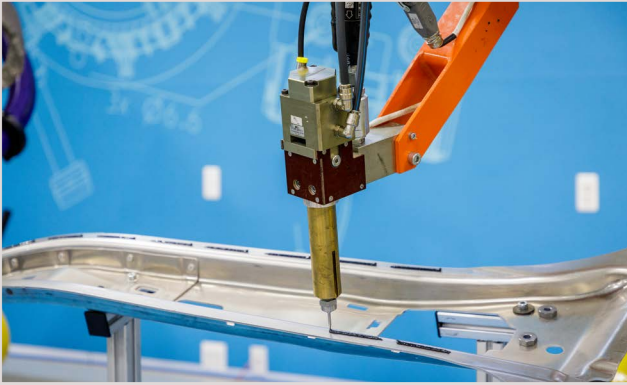
CLEANING AND CORROSION PREVENTATIVES

Complementary cleaners from BONDERITE series such as parts cleaners, maintenance cleaners and corrosion preventives.

BENEFITS:

- › Better stability and performance
- › First class Aluminium surface preparation prior to welding or bonding operations
- › Safety-Health-Environmental (SHE) proven materials for enhanced workplaces



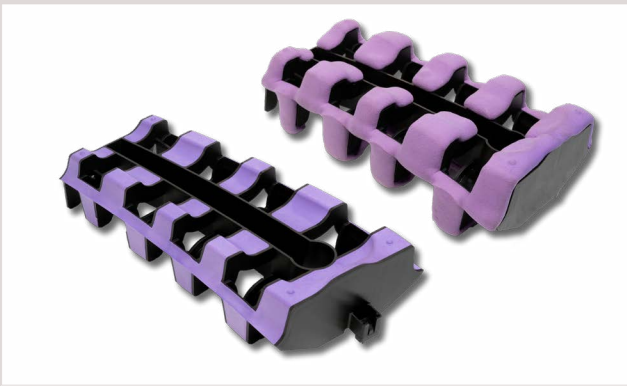


STRUCTURAL ADHESIVES

Increase of impact resistance and body stiffness. Reduction of panel vibration.

BENEFITS:

- › High bond strength to multi-metal substrates
- › Fast cure speeds
- › Excellent tensile and shear strength
- › High impact energy absorption
- › Process efficiency, including high wash-off, humidity & flammability resistance



STRUCTURAL INSERTS

Improve vehicle safety & performance

BENEFITS:

- › Downgauge or eliminate existing metal reinforcements
- › Meet or exceed strength-to-weight ratio standards
- › Increase NVH
- › Low cure capability
- › High expansion for material savings
- › Improved crash performance

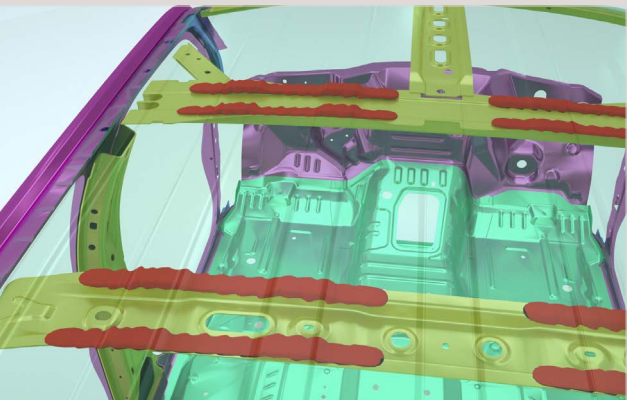


PANEL REINFORCEMENTS

Reinforce and stiffen body panels; hand-applied or sprayable methods

BENEFITS:

- › Downgauge metal without oil canning or panel deformation
- › Magnetic and non-magnetic options for application flexibility
- › Good adhesion to oily steel substrates
- › Wash-off resistant



STRUCTURAL TAPES

Reduce NVH, stiffen and strengthen local vehicle areas

STRUCTURAL TAPES:

- › Improves localized strength
- › High expansion for material savings
- › Compatible on steel & aluminum
- › Low density for weight savings

ACOUSTIC SEALING BAFFLES

Reduction of noise propagation and sealing cavities in body structure.

BENEFITS:

- › Full sealing - prevent noise, water and dust from entering the vehicle
- › Low to ultra-high expansion for design flexibility & material savings
- › Best-in-class flow-sag behavior
- › Pumpable option for fully automated application - simplify design, logistics & processing



ACOUSTIC & SEALANT TAPES

Reduce NVH, stiffen and strengthen local vehicle areas

ACOUSTIC TAPES:

- › Seal large gaps (5-20 mm) to form a sound absorbing barrier
- › Varied expansion for design flexibility
- › Low density for weight savings

SEALANT TAPES:

- › Prevent water, wind & fumes from entering the joint (<5 mm)
- › Custom die cuts available



SOUND DAMPING & DEADENING MATERIALS

Reduce noise, vibration and harshness.

ANTI-FLUTTER:

- › Peroxide-cure option compatible with all e-coat types

HIGH DAMPING FOAM:

- › Eliminates the need for a bitumen pad
- › Further dampens movement of exterior panels
- › Increased acoustic performance and vehicle weight savings

LIQUID APPLIED SOUND DEADENER

- › Rubber-based for body shop application
- › Potential for 2.5 kg weight reduction per vehicle vs traditional bitumen melt sheets
- › Robotic application up to 4mm without dripping or slipping



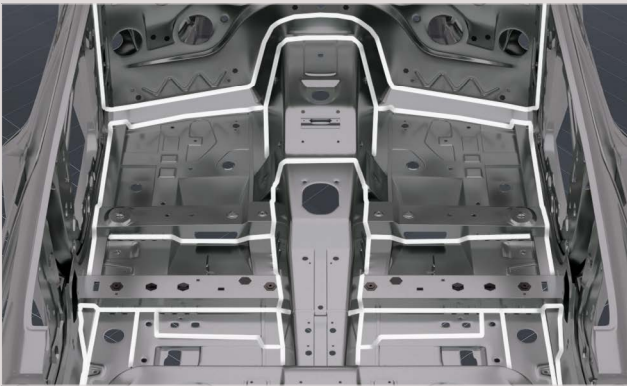


METAL PRETREATMENT

Robust paint adhesion and corrosion prevention.

BENEFITS:

- › Diverse processes to support increasing amounts of aluminum
- › Sustainable coatings including nickel-free & heavy metal phosphate free
- › Energy reduction through low temperature & ambient temperature conversion baths
- › Up to 90 percent sludge free with BONDERITE Thin Film process
- › 20 to 40 percent cost savings per year with BONDERITE Thin Film process

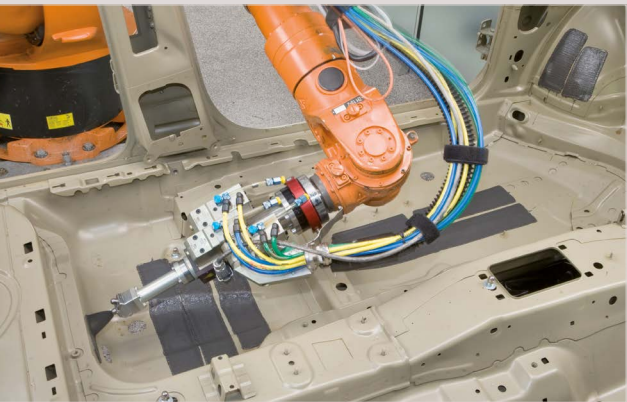


SEALING & COATING

Pumpable seam sealing to prevent joints from water leaks and rust.
Pumpable coating to cover underbody panels and provide stone chipping and abrasion resistance.

BENEFITS:

- › Long-term vehicle durability & protection
- › Enables appearance, paintability & evenness
- › High flexibility at low temperatures
- › Potential weight savings of up to 2.5 kg per vehicle through density reduction
- › Compatibility with 3Wet, 4Wet and Integrated Paint Processes



LIQUID APPLIED SOUND DEADENER

Robotic application of liquid applied sound deadener on e-coated car bodies and parts.

BENEFITS:

- › Spray on materials for precision, speed & improved cleanliness
- › Water-based technology for reduced CO2 footprint



PAINT BOOTH PRODUCTS & BONDERITE LINEGUARDX SERVICES

Remote Monitoring & Predictive Maintenance.

BENEFITS:

- › Manufacturing analytics platform to improve production efficiency
- › Constant monitoring to enable more control of plant maintenance operations
- › Early warning of potential issues
- › Proactive suggestions for line & plant maintenance optimizations

MULTI-SUBSTRATE BONDING

Bonding of mixed substrates and Surfaces with low surface energy.
Structural Bonding of composites.

BENEFITS:

- › Bonding without surface pretreatment
- › Fibre re-inforced plastics such as CFRP, GFRP
- › Elastic and structural bonding
- › 1K, 2K, dual cure systems

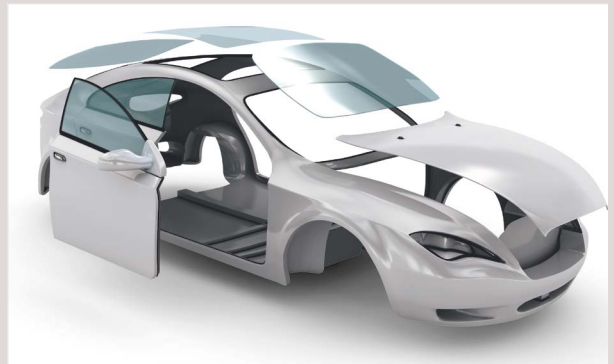


MODULE BONDING

Various technologies for elastic and structural bonding of modules.

BENEFITS:

- › Structural joints
- › Low specific gravity
- › Fast curing speed
- › 1K, 2K, dual cure systems

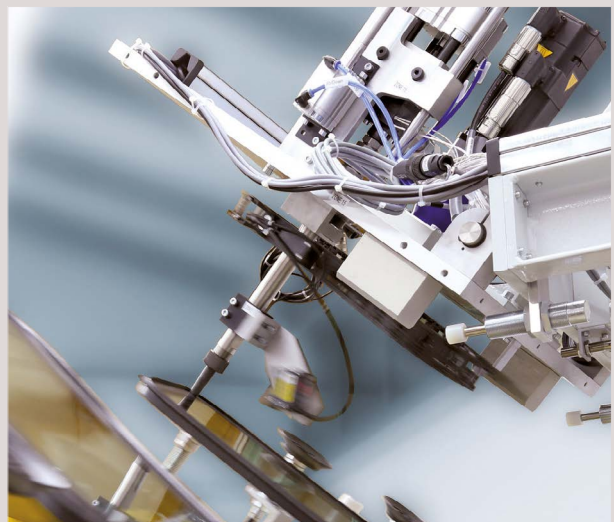


GLASS BONDING

Windshield adhesives from TEROSON range with high performance properties.

ATTRIBUTES:

- › High position tack
- › Application at warm and ambient temperatures
- › Low specific Gravity
- › Primerless on glass and paint
- › low and high conductivity
- › 1K, 2K, 1K accelerated systems





BODY REPAIR ADHESIVES

Repair as it was new (original texture).

BENEFITS:

- › Crash resistant structural bonding
- › Isocyanate free products
- › Micro emission products for plastic repair



DIRECT GLAZING

Glass Repair.

BENEFITS:

- › Safe drive away times according to European standards
- › Primer less systems
- › Micro emission DGX



UNDERBODY COATING

Coating and corrosion protection of the repaired area.

BENEFITS:

- › Perfect recreation of original textures
- › Water based formulas
- › No smell

SOLUTIONS FOR BODY ASSEMBLY MARKET TRENDS

	1 PRESS SHOP	2 BODY SHOP	3 PAINT SHOP	4 TRIM & FINAL ASSEMBLY	5 REPAIR & MAINTENANCE
COATING	×	×	×		×
SEALING		×	×	×	×
CLEANING	×	×	×	×	×
SURFACE TREATMENT			×		×
BONDING		×			×
ACOUSTIC		×	×	×	×
SPECIALTIES & SERVICES	×	×	×	×	×



SOLUTIONS TO INCREASE VALUE WHILE REDUCING COST

Cost-efficiency through stable application process and simplified bath maintenance in Body shop.



SUSTAINABILITY

Sustainable solutions across the full lifecycle of the vehicle from cradle to grave.



LIGHTWEIGHT

Solutions to enable weight reduction, while maintaining or exceeding performance requirements.



PROCESS EFFICIENCY

Solutions to streamline the manufacturing process.

Henkel is **committed to enabling a circular** and **net-zero carbon future** by transforming our business, products and raw materials underpinned by science and innovation.



CLIMATE

Decarbonize our operations

Decarbonize our operations and raw materials on the way to a carbon-neutral business



CIRCULARITY

Circular practices in our operations

Embed circular practices in our operations, products and packaging, and enable circularity through our industrial solutions.



NATURE

Restore biodiversity

Protect and restore biodiversity, with focus on forests, land and water, through more regenerative ingredients and resource stewardship.

TARGETS AND AMBITIONS



CO₂ from raw materials and packaging per ton of products²

tons of CO₂ with partners along the value chain¹



AIM FOR CIRCULAR USE OF PRODUCTION WASTE MATERIAL²



AIM FOR CIRCULAR WATER USE AT KEY MANUFACTURING SITES²



responsible sourced and externally assured palm (kernel) oil¹



Water consumption per ton of product¹

¹Until 2025

²Until 2030



Regenerative Planet



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