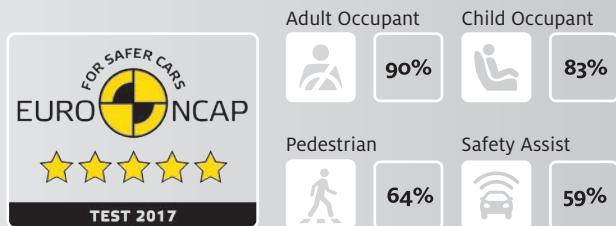


Best Practice

ACHIEVE SUPERIOR RIDE HANDLING AND CRASH SAFETY WITH HENKEL STRUCTURAL ADHESIVES

CHALLENGE

A leading global OEM using more than 65% high strength steel in the body structure was challenged to maximize vehicle dynamics and optimize vehicle weight, while still meeting Euro NCAP crash test safety requirements.



SOLUTION

To master these challenges, Henkel introduced TEROSON EP 5089 – a highly crash-resistant structural adhesive. This product is designed to achieve high fracture toughness and allows the bonded structure to absorb high impact energy. With a modulus of >1500MPa, the product delivers high crash resistance, and maintains the stiffness and rigidity of the bonded structures across substrates – ultimately enabling advanced, lightweight vehicle design, while meeting crash safety requirements. Henkel worked closely with the OEM to implement the right structural adhesive at the vehicle design stage, to maximize the application benefits and usage in all body joining. TEROSON EP 5089 is manufactured in all regions, enabling the OEM to easily implement it in the manufacturing process for its global platform.



BENEFITS

- The improved structural performance of the vehicle is reflected in meeting crash test standards
- The product's properties in the uncured state – such as humidity, flammability and wash-off resistance – help support automated product application and contribute to cost savings, efficiency and sustainability
- Meets the new body/chassis durability test cycle standard
- Better ride quality with top-class durability



PORTFOLIO OF HIGH CRASH-RESISTANT STRUCTURAL ADHESIVE

Henkel Product	E-Modulus	LSS	Impact Peel Strength	Special Properties
TEROSON	(ISO 527-1)	(ISO 4587, 2 mm/DCo4)	(ISO 11343, 1mm/DCo4)	
EP 5014	1500 MPa	38 MPa	36 N/mm	Medium viscosity
EP 5016 C	1600 MPa	30 MPa	35 N/mm	Medium viscosity
EP 5018	1600 MPa	34 MPa	40 N/mm	Excellent impact peel resistance and medium viscosity
EP 5089	1700 MPa	32 MPa	32 N/mm	Medium viscosity
EP 5089 EU	2000 MPa	28 MPa	32 N/mm	High viscosity and wash-off resistance
EP 5090	2400 MPa	32 MPa	34 N/mm	Medium viscosity and excellent humidity resistance
EP 5091	2000 MPa	28 MPa	34 N/mm	Medium viscosity, special wash-off resistance and excellent humidity resistance
EP 5092	1800 MPa	28 MPa	34 N/mm	Medium viscosity and excellent wash-off resistance
EP 5095	1600 MPa	30 MPa	33 N/mm	Medium viscosity, non-heated follower plate application, high wash-off resistance
EP 5150	1800 MPa	30 MPa	42 N/mm	Excellent stress durability, excellent impact peel resistance with low to medium viscosity

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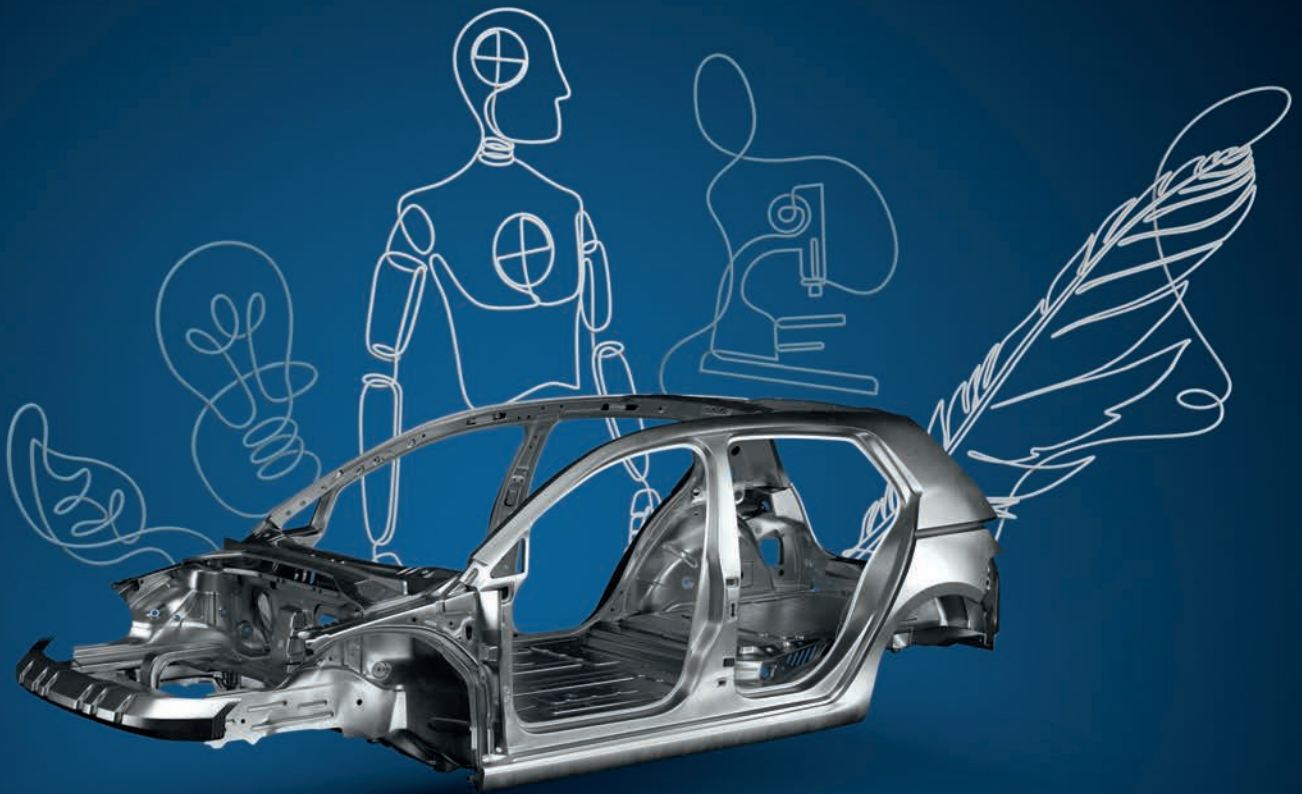
For more information on our Structural Adhesives, visit:

www.henkel-adhesives.com

Or contact us directly at:

aaoglobalmarketing@henkel.com





Best Practice

IMPROVE NCAP SAFETY RATINGS THROUGH BEST-IN-CLASS RIGIDITY WITH HENKEL STRUCTURAL ADHESIVES

CHALLENGE

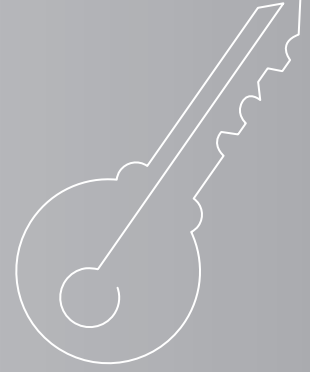
In the highly competitive 4x4 off-road segment, a leading OEM was challenged to achieve best-in-class torsional rigidity to earn advanced safety ratings without increasing vehicle weight.



Henkel

SOLUTION

To help the customer achieve optimal torsional rigidity without increasing vehicle weight, Henkel looked to its next generation of structural adhesives – Teroson EP 4560 and Teroson EP 5016. Both deliver high crash resistance while allowing for increased manufacturing flexibility and efficiency. Teroson EP 4560 was applied to areas needing localized joint stiffness, or those where spot-welding creates difficulties. In the event of a crash, strong joints enable the parts to be deformed as intended and consume significant energy by plastic deformation. For main crash zones like the front rail crash member joinery and the firewall dashboard in the front structure, Henkel relied on Teroson EP 5016. This approach also enabled the manufacturer to use thinner metal – reducing vehicle weight – while also delivering increased all-wheel drive performance.



BENEFITS

- Improved NCAP safety ratings from 1 star to 4 star-rating for a 4x4 SUV model
- Delivered best-in-class durability and crashworthiness
- In the case of a crash, the weld-plus-adhesive-bonded rail member crumples without splitting at the seam, absorbing more energy for better protection of car occupants
- Enhanced torsional rigidity and up to 10% improved ride-handling and body stability
- Superior ride quality

PORTFOLIO OF HIGH CRASH-RESISTANT STRUCTURAL ADHESIVE

Henkel Product	E-Modulus (ISO 527-1)	LSS (ISO 4587, 2 mm/DCo4)	Impact Peel Strength (ISO 11343, 1mm/DCo4)	Special Properties
TEROSON	(ISO 527-1)	(ISO 4587, 2 mm/DCo4)	(ISO 11343, 1mm/DCo4)	
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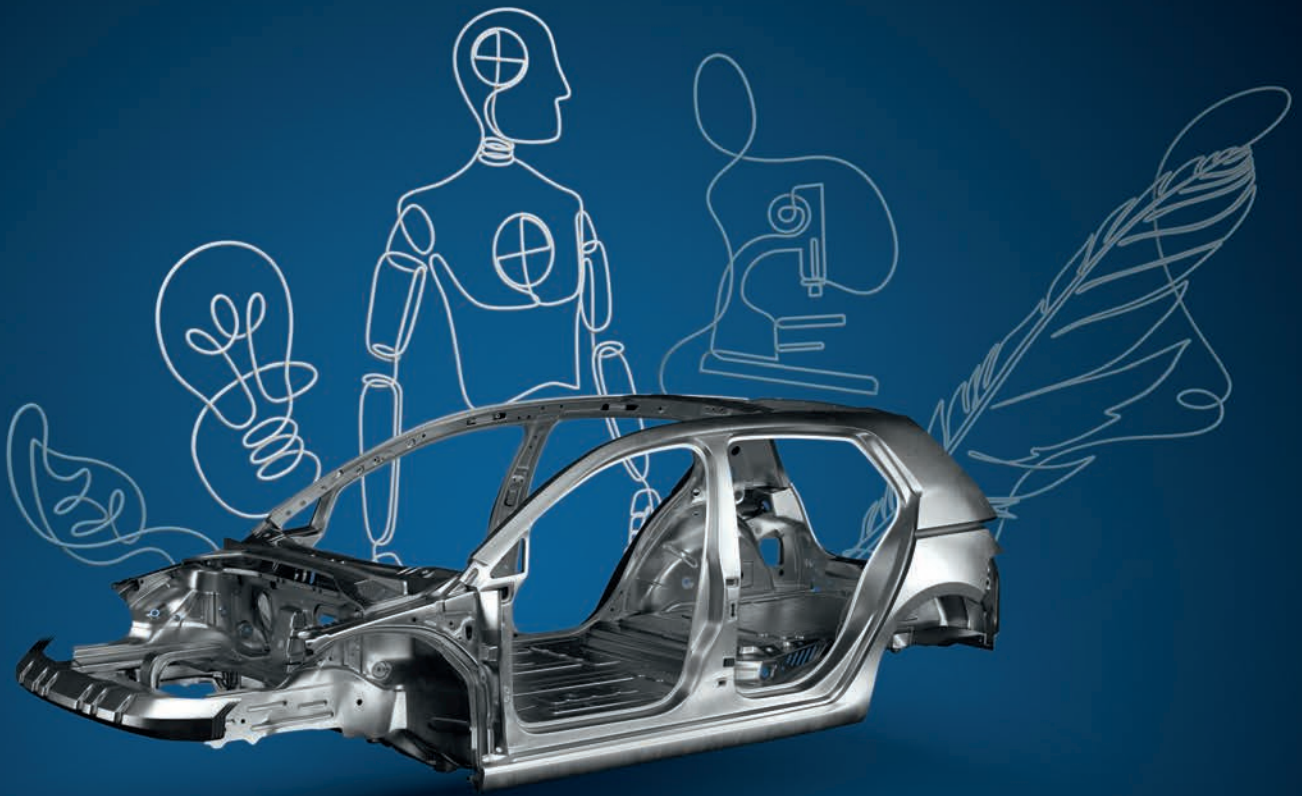
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Best Practice

COMBINE BEST-IN-CLASS CRASH RESISTANCE WITH SUPERIOR RIDE COMFORT WITH HENKEL STRUCTURAL ADHESIVES

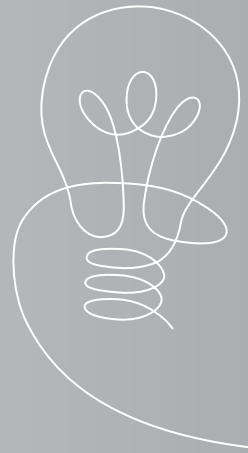
CHALLENGE

A leading OEM was challenged to develop a sub-4-meter platform architecture that features excellent ride handling and maximized crash resistance for best-in-class NCAP safety ratings.



SOLUTION

To meet the market needs of the expanding small vehicle segment, Henkel helped a leading OEM maximize vehicle dynamics and crash performance for scalable sub-4-meter platforms – while also optimizing weight efficiency. Best-in-class durability and body stiffness targets were set to gain 5-star NCAP safety ratings. To achieve this, Henkel recommended the strategic use of structural adhesive Teroson EP 5089 – a proven technology for multi-substrate bonding in vehicle construction having 20% AHSS steel. Teroson EP 5089 features a modulus greater than >1400 MPa and a fracture toughness greater than 20N/mm – which makes it suitable for applications requiring joint stiffness and crash resistance. The outstanding performance of Henkel's structural adhesives establishes a comprehensive answer to the specific needs of the small-car segment.



BENEFITS

- Improved structural performance that gained 5-star NCAP crash test ratings
- Up to 10% improved ride handling versus exclusively welded joinery
- Met application requirements
- Higher energy absorption in weld seam adhesive joinery resulted in uniform crumpling (Certification agency quote: "The bodyshell was rated as stable and it was capable of withstanding further loadings.")

PORTFOLIO OF HIGH CRASH-RESISTANT STRUCTURAL ADHESIVE

Henkel Product	E-Modulus (ISO 527-1)	LSS (ISO 4587, 2 mm/DCo4)	Impact Peel Strength (ISO 11343, 1mm/DCo4)	Special Properties
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