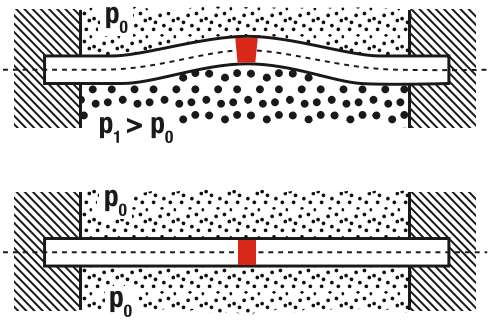
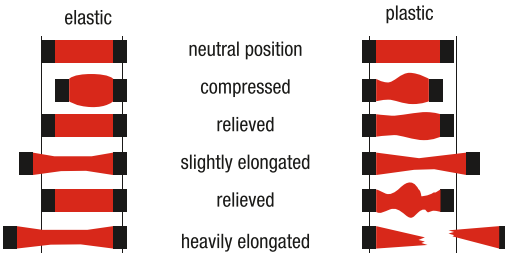
Why use Henkel products for elastic / plastic bonding and sealing?

The Henkel portfolio of industrial elastic / plastic bonding and sealing products offers a wide range of solutions to meet the different requirements and conditions that apply to industrial design and construction.



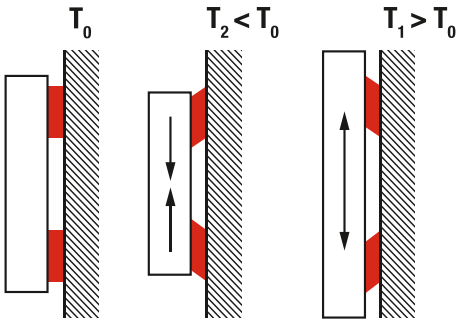
Elastic Sealing

Elastic sealing involves applying an appropriate product in the joint in order to prevent the penetration of moisture/or the passage of air between elements, components and assemblies made of the same or dissimilar materials. The elastic sealing material seals by adhesion to the substrates. The elastic behaviour of the sealant acts as a media barrier while relative part movements are tolerated.



Plastic Sealing

Plastic sealing involves applying an a appropriate product in the joint in order to act as a media barrier. The primary criterion for selection of a plastic sealant (besides the sealing/ media barrier performance) is its mechanical behaviour under deformation. When exposed to forces, each sealant shows both a plastic (deformable) and an elastic (e.g. rubber like) reaction. If the plastic response is dominant, the sealant is referred to as plastic.



Elastic Bonding

Elastic bonding is a process in which two similar or dissimilar materials are joined with an elastic adhesive. Elastic bonding adhesives are selected mainly for their capability to tolerate relative movements of the parts while the parts are bonded by adhesion to the substrates. Besides their elastic properties, many elastic adhesives from Henkel exhibit high inherent strength (cohesion) and a relatively high modulus, producing friction-locked joints which, at the same time, have elastic properties.

Advantages of Elastic / Plastic Bonding and Sealing

- Improved aesthetic aspects
- New designs
- Use of new materials incl. advanced composites
- Fewer parts
- Increased reliability & durability
- Higher quality
- Weight reduction, light weight design
- Efficient production process, fewer production steps
- Cost reduction

Choosing the right Henkel Industrial Elastic / Plastic Adhesive or Sealant

Technical aspects/considerations of elastic/plastic bonding and sealing

- Elastic bonding and sealing assembly needs a gap for elasticity to achieve more even stress distribution and higher elasticity (figure 1 and 2)
- Adhesion to the substrates enables elongation of the product during relative movements without loosening surface contact (figure 3)
- Joint design needs to take into account service conditions, environmental factors and specific durability, compatibility and aesthetic requirements

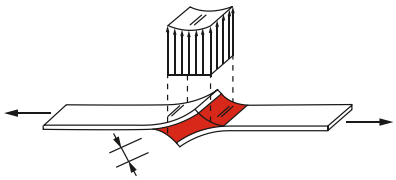


Figure 1: Larger gap

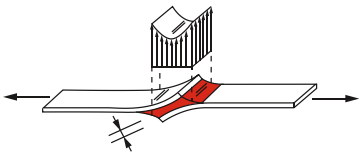


Figure 2: Smaller gap

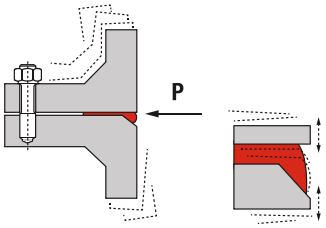


Figure 3: Adhesive & sealant

Silicones

The LOCTITE Silicones are based on silicon – oxygen backbones with organic side groups. Products incorporating this technology undergo moisture curing (1K, RTV*), after mixing (2K) or by temperature (1K, heat cure) to a high performance rubber-like elastomer.

- Elastic bonding and sealing with high flexibility
- 1K or 2K solution
- Outstanding temperature resistance
- Excellent UV and chemical resistance - e.g. in the presence of oil, water and glycol
- Primerless adhesion to many substrates

*Room Temperature Vulcanization

Silane Modified Polymers

The TEROSON MS line is based on silane-modified polymers (SMP). Products incorporating this technology undergo moisture curing and react to form high-performance elastomers. SMP products contain an adhesion promoter (primer) as part of the formulation.

- 1K or 2K solution
- Excellent adhesion on almost all substrates
- Excellent weathering and ageing resistance
- Elastic bonding, sealing and coating

Butyls

The TEROSON RB line is based on butyl rubber and/or polyisobutylene. Due to their inherent tackiness, butyl and PIB sealants adhere to metals, glass, ceramics, mineral substrates, wood, PS, EPDM and other plastics.

- Plastic sealing
- 1K solution
- Final properties directly upon application
- High flexibility even at low temperatures
- Excellent adhesion to almost all substrates
- Good resistance to water and ageing
- Low permeability to water vapour and gases
- Self-welding

Henkel classification of plastic sealants

Flat, Round, Pre-Cut Profiles

- Wound on reels or cut to length
- No application equipment required

Putties

- Easily shapeable kneading mass
- Shaped by hand and pressed into gaps, joints or openings
- Excellent seal against water, moisture, gases and dust

Hotmelt Butyls

- Highly viscous and very tacky at room temperature
- Must be heated to 80°C to 120°C (or even higher) for application
- Applied from hobbocks (pails) or drums

Gun Grade Butyl Sealants

- Cold processable sealants applied at room temperature
- Applied from cartridges or foil cartridges

Industrial Sealants / Adhesives – Butyls

Product Table

How do you want to apply the product?

- Manual application
- Pre-formed
- Cold applied
- Can be applied after the release paper / foil has been pulled off

	Low tackiness	High tackiness	
		Medium cohesion	High cohesion
Solution	**TEROSON RB VII**	**TEROSON RB 276**	**TEROSON RB 81**
			
Density	1.69 g/cm³	1.41 g/cm³	1.26 g/cm³
Solids content	100%	100%	100%
Adhesion strength	Low	High	Very high
Processing temperature	Room temperature	Room temperature (hot applied: +120°C to +140°C)	Room temperature (hot applied: +80°C to +160°C)
Service temperature range	-40°C to +80°C	-40°C to +80°C	-40°C to +80°C
Pack sizes on request	**TEROSON RB VII** • Easy to remove • Very good water and ageing resistance • Good for spacing	**TEROSON RB 276** • High tackiness • Very good ageing resistance • Pumpable at elevated temperatures	**TEROSON RB 81** • High quality sealing tape • High tackiness and self-welding • Very good water and ageing resistance • No corrosive constituents

Automated application

Formed in place

Cold applied | Hot applied

Gun grade butyls | Hotmelt butyls

Kneadable | Heat conductive

TEROSON RB IX	TEROSON RB 2759	TEROSON RB 6814	TEROSON RB 301
			
1.8 g/cm³	1.48 g/cm³	1.3 g/cm³	1.25 g/cm³
100%	87%	100%	100%
Low	Medium	Very high	Very high
Room temperature	Room temperature	+80°C to +150°C	+80°C to +160°C
-30°C to +80°C	-30°C to +80°C	-40°C to +80°C	-40°C to +80°C
TEROSON RB IX • Slight tackiness • Very good water and ageing resistance • Good for spacing	**TEROSON RB 2759** • Easy to dab off • Very good water and ageing resistance	**TEROSON RB 6814** • High tackiness • Pumpable • Soft plastic	**TEROSON RB 301** • High thermal conductivity • Pumpable and hot extrudable • Also available as profiled grade

Industrial Sealants / Adhesives – Butyls

Product List

Product	Characteristic	Colour	Density	Solid content	Adhesion strength	Processing temperature
TEROSON RB IX	Putty	Light grey	1.80 g/cm³	100%	Low	Room temperature*
TEROSON RB VII	Putty	Light grey	1.69 g/cm³	100%	Low	Room temperature*
TEROSON RB 81	Pre-formed and hot applied butyl	Black	1.26 g/cm³	100%	Very high	Room temperature* hot applied**: +80°C to +160°C
TEROSON RB 276	Pre-formed and hot applied butyl	Grey and black	1.41 g/cm³	100%	High	Room temperature* hot applied**: +120°C to +140°C
TEROSON RB 276 Alu	Composite	Silver black	1.41 g/cm³	100%	High	Room temperature*
TEROSON RB 279	Hot applied butyl	Black	1.40 g/cm³	100%	Very high	+80°C to +160°C
TEROSON RB 285	Hot applied butyl	Grey	1.33 g/cm³	100%	Very high	+80°C to +160°C
TEROSON RB 301	Hot applied butyl	Anthracite	1.25 g/cm³	100%	Very high	+80°C to +160°C
TEROSON RB 302	Hot applied butyl	Anthracite	1.25 g/cm³	100%	High	+80°C to +160°C
TEROSON RB 2759	Cartridge grade, room temperature extrudable	Grey	1.48 g/cm³	87%	Medium	Room temperature*
TEROSON RB 2761	Pre-formed butyl	Black	1.30 g/cm³	100%	High	Room temperature*
TEROSON RB 2785	Hot applied butyl	Black	1.05 g/cm³	> 98%	Very high	Room temperature* hot applied**: +90°C to +130°C
TEROSON RB 3631 FR	Pre-formed parts	Black	1.40 g/cm³	100%	Medium	Room temperature*
TEROSON RB 4006	Cartridge grade, room temperature extrudable	Grey	1.40 g/cm³	85%	Low	Room temperature***
TEROSON RB 6814	Hot applied butyl	Black	1.30 g/cm³	100%	Very high	+80°C to +150°C

* Pack size: tape
** Pack size: drum or hobbock
*** Pack size: cartridge or sausage

	Service temperature range	Penetration 1/10 mm	Comments
	-30°C to +80°C	75	Kneadable sealant for gap and breakthrough filling
	-40°C to +80°C	56	Sealing of metal sheet overlap
	-40°C to +80°C	71	Very high tackiness, improved performance
	-40°C to +80°C	55	Multi-purpose, high strength
	-40°C to +80°C	–	Laminated with an aluminium composite foil for excellent weathering and UV resistance, water vapour diffusion (DIN 53 122): μ = 645,000
	-40°C to +80°C	85	Excellent pumpable hot butyl with high adhesion strength
	-40°C to +80°C	160	Fungus resistant pumpable hot butyl
	-40°C to +80°C	70	High thermal conductivity, pumpable hot butyl
	-40°C to +80°C	85	Very high thermal conductivity, pumpable and hot extrudable, also available as profiled grade
	-30°C to +80°C	–	Solvent-based gun grade
	-40°C to +80°C	50	Vacuum bagging tape for infusion processes up to +80°C mould temperature
	-40°C to +100°C	55	Good adhesion, high temperature resistance
	-40°C to +105°C	48	Flame retardant tape, high temperature resistance
	-20°C to +80°C	–	Gun grade, solvent-based sag resistant sealant
	-40°C to +80°C	105	High performance hot butyl