

PROTECTIVE COATING 6 COMPOUNDS

Rebuild, Repair and Protect Industrial Equipment



Whatever You Rebuild, Repair and Protect...

Henkel's Solutions for all Surface Engineering Needs

Henkel offers you more than state-of-the-art adhesives, sealants and surface treatment products. We give you access to our unique expertise covering the entire value chain. So whatever you rebuild, repair or protect, with our technical consultancy and expert training we are able to offer you specific solutions for your industry and your maintenance needs.

TECHNICAL CONSULTANCY

Our products have been designed to meet the specific challenges of your industry. With an extensive network of sales and technical engineers around the world we offer you professional consultancy to find the best solution for your specific surface engineering needs.

• Technical Consultancy for Surface Engineering Needs: page 5





CLEANING & PRE-TREATMENT

Bonding

Sealing

Correct surface preparation is the most important factor affecting the total success of any surface treatment. Without proper surface profile and surface cleanliness coating systems will quickly fail. To ensure high quality applications we offer superior cleaning and pre-treatment products like surface cleaners and corrosion inhibitors.

• LOCTITE Cleaning & Pre-Treatment Products: page 6

...Find the Right Solution!



FILLING & PROTECTING

To permanently repair, rebuild and restore damaged machinery, equipment, floors and walls specific products are required to put worn parts back to a serviceable condition. Our range includes putty or pourable formulations for aluminum, steel and concrete.

- LOCTITE Metal Repair Solutions: page 8
- LOCTITE Concrete Repair Solutions: page 8



EXPERT TRAINING

Maintenance Workshop Training from Henkel provides maintenance engineers with the necessary skills, knowledge and tools to reduce plant downtime and drive down maintenance costs.

• Expert Training for Surface Engineering Needs: page 20



COATING

The protection of machinery and equipment against external attack is a challenge in any industry. Protective coatings and compounds offer maintenance solutions to the problems caused by wear, abrasion, erosion, chemical attack, and corrosion. Our products are available in sprayable, brushable as well as trowelable formulations.

• LOCTITE Protective Coatings & Compounds: page 12



Solutions for all Surface Engineering Needs



THE CHALLENGE

The protection of industrial equipment and machinery is crucial for any kind of harsh industrial environments.

Industrial parts are very often worn out by wear, abrasion, erosion, chemical attack, corrosion, impingement and mechanical damage. If parts are not protected properly the efficiency impairs; initial functionality and safety at work is no longer guaranteed, leading to costly acquisition of new parts.

HENKEL'S SOLUTION

At Henkel, we understand plant maintenance - and the challenge that you face in ensuring reliability, safety and durability. We offer you an extensive network of experts, knowledge and innovative technologies to master this challenge.

Partner with us to benefit from our competencies and to achieve the best results for your maintenance and repair needs:



Increase Reliability of worn parts by restoring them to a serviceable condition



Improve Safety by preventing occupational accidents due to part failure



Save Time by minimizing downtime and extending part life



Reduce Costs by avoiding part replacement and reducing spare part inventories

This brochure is designed to give you a detailed overview of our extensive product portfolio for surface engineering needs. To ensure that you achieve the best solution for your maintenance need, please contact a Henkel Technical Engineer for technical consultancy.

Technical Consultancy



Our highly experienced Henkel Technical Engineers are committed to provide the highest level of technical support and assistance in the industry.

Working closely with local industrial suppliers and selected engineering service agents, our Application Engineers provide full process support – from maintenance assessment, performance and analytical testing to implementation of solutions – to find the right solution for your needs.

For your surface engineering needs we offer you technical consultancy for:

- Surface cleaning
- Surface preparation
- Surface pre-treatment
- Repair product selection
- Surface protection product selection
- Application process
- Control recommendation
- Application tips

Cleaning & Pre-Treatment



Correct surface preparation is crucial for the successful application of both, metal repair products and protective coatings and compounds. Good surface preparation will:

- Improve adhesion to parts
- Prevent corrosion between the surface and product used
- Extend maintenance intervals

The two main important factors for a successful application are surface profile and surface cleanliness.



The best way to achieve the correct surface profile is abrasive blasting. It does not only remove visible surface rust and contaminates, but also creates a surface roughness ideal for bonding to. See following table for surface specification.

Surface preparation grades of blast



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Rust grade

Α	Steel with mill scale layer intact and very minor, or no rusting				
В	Steel with spreading surface rust and the mill scale commenced flaking				
с	Rusty steel with mill scale layer flaked and loose or lost but only minor occurrence of pitting				
D	Very rusty steel with mill scale layer all rusted and extensive occurrence of pitting				
Blast class					
1	[SP-7/N4]	Very light over clean with removal of loose surface contaminants			
2	[SP-6/N3]	Substantial blast clean with wide spread, visible contaminate removal and base metal colour appearing			
2,5	[SP-10/N2]	Intensive blast clean leaving shading grey metal with only contaminates			

[SP-5/N1] Complete blast clean with consistent metal colour all over and no visible contaminates

2. SURFACE CLEANLINESS

Chemical contaminants that are not readily visible, such as chlorides and sulphates, attract moisture through coating systems resulting in premature failure. For this reason it is fundamentally important to clean all substrates with an industrial strength cleaner and degreaser. Heating up the device before cleaning can facilitate the removal of contaminents.

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LOCTITE SF 7840 - Cleaner and degreaser

- Before abrasive blasting
- Meets the requirements of a wide range of industrial cleaning applications
- Biodegradable, solvent free, non-toxic and non-flammable, diluted with water (Rated USFA-C1)

LOCTITE SF 7063 / SF 7064 - Cleaner and degreaser

- After abrasive blasting
- Compatible with metal, glass, rubber, most plastics and painted surfaces
- No residue, rapid flash off cleaner ideal for removing greases and contaminates prior to adhesive bonding, coating and sealing applications

LOCTITE SF 7515 - Flash rust prevention

- Pre-treatment on large surfaces to avoid any flash rust
- Easy and fast to apply on freshly blasted surface steel
- Increases surface working time up to 48 hours







Filling & Protecting



LOCTITE METAL REPAIR COMPOUNDS

are designed to repair, rebuild and restore worn metal parts without the need of heat or welding.

Typical applications include cracks in housings, worn keyways in shafts and collars, worn cylindrical shafts, etc.

LOCTITE CONCRETE REPAIR

products are designed to guarantee fast, reliable and long lasting repairs. They bond to concrete, wood, glass, steel and other construction materials.

Typical applications include ramps and loading areas, support beam and footer repairs, bridge decking and supports, concrete bunds and walls etc.

Why choose LOCTITE Metal Repair Solutions?

Traditional repair methods such as hard face welding are time consuming and expensive.

Alternatively, LOCTITE Metal-filled Compounds are easily applied and offer superior compressive strength and protection qualities.

KEY BENEFITS:

- Low-shrinking
- Can be drilled, tapped, or machined after cure
- Superior adhesion to metal, ceramic, wood, glass and some plastics
- Excellent resistance to aggressive chemicals
- Choice of mild steel, aluminium or non-metalic fillers
- Create durable repairs



Why choose LOCTITE Concrete Repair Solutions?

Traditional repair methods such as repairing floors or walls with conventional concrete need extensive time for curing.

Alternatively, LOCTITE Concrete Repair products are easily mixed, applied and cured after 45 minutes already.

KEY BENEFITS:

- Easy to mix and apply
- Can be applied at temperatures even below o °C
- Can be applied on damp surfaces
- Does not shrink or crack
- Fast curing: reduces repair time, labor costs and downtime
- Very good adhesion on old concrete
- Chemical resistant
- Impact resistant
- Can be coloured with standard cement colouring powders



Metal & Concrete Surface

Repair or rebuild damaged parts?





LOCTITE EA 3463

- Emergency sealing of leaks in pipes and tanks
- Smoothes welds
- Repairs small cracks in castings

Sets in 10 minutes. Steel filled kneadable stick. Adheres to damp surfaces and cures under water. Chemical and corrosion resistant. Can be drilled, filed and painted.

ANSI/NSF Standard 61



LOCTITE EA 3478

- Rebuilding keyways and spline assemblies
- Rebuilding of bearings, clamp connections, tensioning elements, gear wheels or bearing seats
 Ferro-silicon filled with outstanding compression strength. Ideal for renewing surfaces subjected to compression, thrust, impact and harsh environments.



LOCTITE EA 3471

- Seal cracks in tanks, castings, vessels and valves
- Patch non-structural defects in steel casings
- Resurface worn air seals
- Repair pitting caused by cavitation and/or corrosion

General-purpose steel-filled, non-sagging 2K-Epoxy. Used to rebuild worn metal parts.



LOCTITE EA 3472

• Form moulds, fixtures and prototypes

 Repair threaded parts, pipes and tanks
Pourable, steel-filled, self levelling.
Recommended for casting into hard to reach areas, anchoring and levelling, forming moulds and parts.





LOCTITE EA 3473

- Repair holes in tanks, leaks in pipes and elbows
- Renew stripped threads
- Rebuild worn steel parts

Fast curing, steel filled, non-sagging. Ideal for emergency repair and repairing worn metal parts to prevent downtime.



LOCTITE EA 3475

 Repair aluminium castings, cracked or worn aluminium parts and stripped aluminium threads

A non-sagging, heavily reinforced, aluminium powder filled 2K-Epoxy. Easily mixed and moulded to form odd shapes if required. Cures to a non-rusting, aluminium-like finish.



LOCTITE EA 3479

 Rebuilding and repairing worn metal parts in high operating temperature applications.

A non-sagging, heavily reinforced, aluminium powder filled 2K-Epoxy. Easily mixed and moulded to form odd shapes if required. Cures to a non-rusting, aluminium-like finish.



LOCTITE PC 7257

• Repair / rebuild of ramps and loading areas, support beam and footer repairs, bridge decking and supports, concrete bunds and walls etc. Two-component, rapid setting concrete repair and grouting system designed for making reliable, long lasting repairs. Bonds to concrete, wood, glass, steel and construction materials. Can be mixed and applied from -25 °C to 45 °C.



LOCTITE PC 7352

• Trowelable paste that can be used for flexible rubber repair in every position or shape. Ideal to fill gaps in vertical and overhead poistiions wherever rubber liners and parts are applied. Polyurea based paste, presented in a 400 ml cartridge and especially designed for rubber reparations. Thixotropy and sag resistance. Abrasion resistant. To be used with LOCTITE etching agent.

Coating



LOCTITE PROTECTIVE COATINGS AND COMPOUNDS

offer maintenance solutions to problems caused by wear, abrasion, erosion, chemical attack and corrosion. They are available in trowelable, brushable and sprayable formulations with special fillers for tough conditions and are ideal for all those largescale repairs that have to last.

Typical applications for this product range include for example air ducts, pumps, heat exchangers, centrifuges, impellers, fan blades, cyclones, pipes, tanks, retention areas, etc.

LOCTITE Protective Compounds

provide excellent wear resistance and superior adhesion. Filled with ceramic particles, specific to the different service conditions, they protect against abrasion and therefore extend the service life of a wide range of plant areas and plant equipment.

Their key advantage is their capability to create a sacrificial and renewable working surface, protecting the structural integrity of the original substrate.

LOCTITE Protective Coatings

are designed to protect against corrosion and chemical attack. They do not contain any ceramic fillers and therefore allow a very smooth surface.

Why choose LOCTITE Protective Coatings and Compounds?

Traditional repair methods such as hard metal welding or flame spraying are expensive and difficult to use for large surfaces.

Alternatively, LOCTITE Protective Coatings and Compounds are easily applied on all surface sizes and offer the extra benefit of corrosion protection. In addition LOCTITE Protective Coatings and Compounds don't create heat stress during the application.

KEY BENEFITS:

- Restore worn surfaces and extend part life of new as well as old parts
- Increase part efficiency
- Save costs by avoiding part replacement and reducing spare part inventories
- Protect parts against abrasion, erosion, chemical attack and corrosion
- Excellent chemical resistance for effective protection of assemblies



Key factors to consider when choosing the right LOCTITE Protective Coating or Compound:

Particle size

To improve abrasion resistance, particle sizes of the abrasive materials and of the LOCTITE Protective Coatings and Compounds should be similar. The range of LOCTITE Protective Coatings and Compounds offers grades for coarse particles as well as fine particle protection and some specific products for pure chemical attack or corrosion protection. A special product offering high impact resistance is also included in the range.

Temperature resistance

Operating temperatures of LOCTITE Coatings and Compounds range from -30 to +120 °C. Some special grades, such as LOCTITE PC 7234, can be used up to 205 °C. These special grades require post curing to achieve their ultimate high temperature performance.

Chemical and corrosion resistance

Thanks to the special epoxy matrix of LOCTITE Coatings and Compounds, this range of products is resistant to most types of chemical aggression. All our products offer good protection against fresh water and sea water, ammonium sulphate and sodium hydroxide. Specific products also resist strong chemicals such as sulphuric acid and urea.

A comprehensive overview for the chemical resistance of LOCTITE Coatings and Compounds is available – please contact your local Henkel Technical Support Team for further information.

Application Tips & Tricks

Preventing flash rusting

In high humidity conditions, flash rusting of a newly prepared metal surface can develop within minutes, causing contamination which will need to be removed again before a coating is applied.

A thin coat of LOCTITE PC 7515 applied as soon as possible after preparing a metal surface will prevent flash rusting.

Moisture free surface

It is critical to the success of most coating systems that the surface is completely free of moisture prior to and during product application and curing.

Dewpoint

Condensation of water [dew] from the atmosphere onto the surface can occur, given the right conditions.

For a given set of conditions, the temperature at which condensation will occur is called the dewpoint. As long as the surface temperature is 3 °C [or more] above the dewpoint temperature, it is generally considered safe to coat as far as risk of condensation is concerned.



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Pre-coating for maximum adhesion

After surface preparation, pre-coat the application surface by rubbing the mixed composite into the substrate. This technique, called [wetting out the surface], helps the repair material fill all the crevices in the application surface, creating a superior bond between the composite and substrate. The rest of the mixed product can then be applied over the pre-coat to finish the application.

Creating a smooth finish

Smooth out the uncured product with a warm trowel for a smooth, glossy finish. A heat gun can also be used to create a smooth finish.

Wear indicator

When applying two coats of LOCTITE Coatings and Compounds, different colors can be used as wear indicator. When the first coat begins to wear the second coat colour will show through, providing an accurate visual indicator of wear.

SPECIAL RECOMMENDATIONS FOR SPRAYABLE PRODUCTS

As for all LOCTITE Protective Coatings and Compounds best coating results are obtained by applying the product specific layer thickness. This is especially important for application on vertical surfaces.

For best results also in corners and edges, it is recommended to smooth angles to a radius of 3 mm.

When using LOCTITE PC 7255 it is recommended to heat the product prior to application to ensure easy spraying and a smoother surface.







Protective Coatings & Underfill

Which attack to be resisted ?



PRACTICAL HINTS:

Apply LOCTITE SF 7515 at the end of surface preparation and before applying the final coating/compound. **Benefit:** Temporary corrosion protection

which prolonges the working time of the surface to up to 48 h.

Badly worn surfaces are rebuilt using LOCTITE PC 7222 Wear Resistant Putty or LOCTITE PC 7234 High Temperature Wear Resistant Compound, prior to applying protective LOCTITE composite coatings.

Please refer to your local Henkel Technical Engineer for further information.



LOCTITE PC 7221 Protects from extreme chemical attack.

- Smooth finishing
- Superior adhesion



LOCTITE PC 7255 Ultra-smooth, ceramic reinforced twopart epoxy for

- Lining tanks and chutes
- Rudders and pintle housings
- Heat exchangers
- Condensers
- Cooling pump impellers



LOCTITE PC 7117 Brushable ceramic filled two-part epoxy for

- Impellers, butterfly valves
- Pump housings
- Cyclones
- Lining tanks

*It is recommended for sprayable and brushable products to apply minimum two layers to achieve total layer thickness.





LOCTITE PC 7234 Brushable ceramic filled two-part epoxy for

- Exhausters
- Heat exchangers and condensers
- Lining tanks and chutes
- Butterfly valves

*post-cure necessary to reach max. service temperature resistance



LOCTITE PC 7226 Ceramic filled two-part epoxy for

- Dredge pump liners
- Flumes and troughs
- Pump impellers
- Vibrating feeders
- Chutes/hoppers



LOCTITE PC 7218

Trowelable, ceramic filled two-part epoxy for

- Cyclone and separator bodies
- Dust collectors and exhausters
- Pump liners and impellers
- Fan blades and housings
- Chutes and hoppers
- Elbows and transition points

LOCTITE PC 7219

Rubber modified, ceramic filled two-part epoxy for

- Dredge pump liners
- Flumes and troughs
- Pump impellers
- Vibrating feeders
- Chutes/hoppers



LOCTITE PC 6315

 Heavy duty anti-slip finish for concrete and steel ramps, walkways, locker rooms, loading docks, marine applications, machine rooms, assembly areas and stairs

2-part, solvent-free epoxy, creates an durable anti-slip coating that withstands heavy vehicular traffic on various surfaces in odorsensitive areas, under typical dry service temp. of -29 °C to +60 °C.

Protective Coatings & Compounds

Product	Product description	Particle size	Colour	Mix ratio by volume [A:B]	Mix ratio by weight [A:B]	Working time	Surface drying time	
LOCTITE PC 7117	Ceramic filled epoxy compound	Fine	Dark grey	3.38:1	100:16	60 min.	3.5 h	
LOCTITE PC 7218	Ceramic filled epoxy compound	Large	Grey	2:1	100:50	30 min.	7 h	
LOCTITE PC 7219	Ceramic filled epoxy compound	Large	Grey	2:1	100:50	30 min.	6 h	
LOCTITE PC 7221	Epoxy coating	Fine	Grey	2.3:1	100:29.4	20 min.	16 h	
LOCTITE PC 7222	Ceramic filled epoxy compound	Small	Grey	2:1	100:50	30 min.	6 h	
LOCTITE PC 7226	Ceramic filled epoxy compound	Fine	Grey	4:1	100:25	30 min.	6 h	
LOCTITE PC 7227	Ceramic filled epoxy compound	Fine	Grey	2.75:1	100:20.8	30 min.	6 h	
LOCTITE PC 7228	Ceramic filled epoxy compound	Fine	White	2.8:1	100:22.2	15 min.	5 h	
LOCTITE PC 7234	Ceramic filled epoxy compound	Fine	Red	2.6:1	100:21	30 min.	8 h + 3 h post cure	
LOCTITE PC 7255	Ceramic filled epoxy compound	Fine	Green/grey	2:1	100:50	40 min.	4 h	
LOCTITE PC 7352		-	Black	2:1	100:50	4 min.		
LOCTITE PC 6315	2К-Ероху	-	Black	4.25:1 / 8.5:1	-	60 min.	12 - 24 hrs	

Fillers used in these products can request special tools for machining. Please contact your local Henkel Technical Support Team for further information.

Recommended layer thickness	Hardness shore D	Compressive strength N/mm²	Shear strength N/mm²	Service temperature range	Pack sizes	Comments	
min. 0.5 mm	87	105	23.2	-30 to +95 °C	1 kg, 6 kg	Brushable ceramic compound	
min. 6 mm	90	110.3	-	-30 to +120 °C	1 kg, 10 kg	Trowelable ceramic compound	
min. 6 mm	85	82.7	-	-30 to +120 °C	1 kg, 10 kg	High impact trowelable ceramic compound	
min. 0.5 mm	83	69	17.2	-30 to +64 °C	5.4 kg	Brushable ceramic compound, high chemical resistance	
-	89	80	10	-30 to +107 °C	1.3 kg	Trowelable ceramic putty	
min. 6 mm	85	103.4	34.5	-30 to +120 °C	1 kg, 10 kg	Pneu-Wear ceramic compound	
min. o.5 mm	85	86.2	24.2	-30 to +95 °C	1 kg	Brushable ceramic compound, self-levelling [grey]	
min. 0.5 mm	85	86	24	-30 to +95 °C	1 kg, 6 kg	Brushable ceramic compound, self-levelling [white]	
min. o.5 mm	-	-	-	-29 to +205 °C	1 kg	High temperature brushable ceramic compound	
min. o.5 mm	86	106	31	-30 to +95 °C	900 ml, 30 kg	Sprayable ceramic compound	
-			3.5		400 ml	Flexible Repair paste	
-	-	>70	-	-29 to +60°C	5.99 kg	Anti-slip coating	

Expert Training



LOCTITE MAINTENANCE WORKSHOP TRAINING FROM HENKEL

provides maintenance engineers with the necessary skills, knowledge and tools to reduce plant downtime and drive down maintenance costs.

The workshops are suitable for all engineers. Conducted at the customer's premises, training can be tailored to meet individual needs through a plant tour and pre-survey.

The training includes training materials and a review of the common causes of plant and equipment failure and their prevention.

Contact Henkel now for more details and to arrange training for your maintenance team.

Application Case Histories

SHAFT

CHALLENGE

Metal shaft is worn out resulting in device failure and being not able to properly assemble the counterpart anymore.



SOLUTION

Rebuild shaft by using LOCTITE EA 3478 to recreate smooth surface and ensure needed fit between shaft and bearing.



BENEFIT

Shaft is put back to serviceable condition in 4 hours only.

SCREW CONVEYOR

CHALLENGE

Conveyor of waste water plant is exposed to aggressive media and solid particles resulting in heavy corrosion and worn surface (conveyor) as well as damaged surrounding (foundation).



SOLUTION

Overhaul by using LOCTITE PC 7255 (conveyor) and LOCTITE PC 7257 (foundation).



BENEFIT

Extended service life by up to 10 years and significant cost savings.

DECANTER CENTRIFUGE

CHALLENGE

Centrifuge of waste water plant made of mild steel is exposed to moisture resulting in heavy corrosion of the outer wall.



SOLUTION

Coat with LOCTITE PC 7227 to rebuild and avoid steady corrosion.



BENEFIT

Protect against device failure caused by corrosion and extend service intervals.

Application Case Histories

PUMP

CHALLENGE

Pump of a refinery made of stainless steel is exposed to aggressive chemicals and moisture resulting in abrasion as well as galvanic corrosion.



SOLUTION

Coat with LOCTITE PC 7221 (outer wall) and LOCTITE PC 7255 (inner wall).



BENEFIT

High wear resistance of the inner wall and improved efficiency, insulation of outer wall against corrosion.

CENTRIFUGAL PUMP

CHALLENGE

Centrifugal pump of a chemical plant is exposed to strong abrasion and corrosion. Rebuild and protect the surface of the pump to extend Mean Time Between Failure.



SOLUTION

Rebuild with LOCTITE EA 3478 and coat with LOCTITE PC 7255 to overhaul and improve resistance against chemical and mechanical attacks.



BENEFIT

Prevent replacement, extend lifetime and improve efficiency.

PUMP IMPELLER

CHALLENGE

Pump impeller made of cast iron is exposed to high temperature, aggressive fluids and particles resulting in abrasion and corrosion.



SOLUTION

Rebuild with LOCTITE EA 3478 metal filled epoxy, and finish with LOCTITE PC 7234 to create a smooth and resisting surface.



BENEFIT

Downtime reduction, improve efficiency and facilitate visual inspection.

Notes



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