Efficient Surface Repairs for Aluminium Wheels.
Felgenaufbereitung mit Standox.

Rationelle Oberflächenaufbereitungen.
Aluminium Wheel repair

Efficient surface repairs

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1. Preface

- Wheels are highly stressed vehicle components of high safety relevance. For Safety reasons, leading car makers have until now not approved any refinish processes for wheels. And this principle has also applied so far to Aluminium Alloy wheels.

- Modern metal stopper and paint materials and the latest repair processes now make it possible to repair their surface of Aluminium Alloy wheels, albeit within bounds.

- This guide describes what is currently technically possible. To what extend a repair makes economic sense depends on many factors, however.

- This guide merely contains recommendations and cannot serve as a basis for warranty claims against Standox GmbH.
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2. Guidelines

• ISO 14400, point 5: After removal, wheels, studs and nuts shall be checked closely to ensure that they are in good condition: namely that any fracture, crack, deformation, corrosion, heavy wear or other kind of non-conformity are not present. Moreover, no technical modification on the wheel shall be made. Repair by means of welding or by the addition of material on wheels or wheel centres having breakage, fissures, cracks or high wears, shall not be made, as they can introduce additional stresses in the critical areas.

• EUWA (Association of European Wheel Manufactures): Repair of a damaged wheel or disc by heating, welding or addition or removal of material is absolutely forbidden.
2. Guidelines

• **ETRTO – (The European Tyre and Rim Technical Organisation)**

  Damaged or deformed wheels or wheels with cracked or deformed bolt holes must not be repaired or put into service.

• **What does „cosmetic repair“ mean?**

  The term „cosmetic repair“ always refers to the expert technical restoration of the wheel in terms of visible defects by polishing, local sanding, smoothing of nicks/notches, and possibly by applying surfacer, primer and paint.

• Such repairs relate to superficial, visible blemishes that, in the event of further use of the untreated wheels, would result in neither technical nor legal restrictions (e.g. during on MOT inspection under Art. 29 StVZO (German vehicle roadworthiness regulations)).
2. Guidelines

• Source:

Final position paper on cosmetic wheel repairs of the Vehicle Engineering Committee, special committee on wheels and tyres at the German Federal Ministry of Transport, building and urban development (BMVBS).

The restrictions on repair and preparation issued by the wheel manufacturer remain unaffected by these guidelines.

A repair may only be carried out with the tested and prescribed paint materials.

The approval of a repair must ultimately be granted by the skilled refinisher and cannot be forcibly obtained from an expert under third-party liability claims.
2. Guidelines.

The following may be repaired and refinished without reservation:

- Wheels whose damage has a maximum depth in the metal substrate not exceeding 1 mm.
- Wheels on which the maximum depth of damage of 1 mm is only within a radial range of 25 mm from the rim flange.
- In the range exceeding 25 mm from the rim flange, only paint application is permitted.
2. Guidelines.

The following must **never** be repaired and refinished:

- Aluminium Alloy wheels whose paint has been removed in a thermal process or which have been blasted or mechanically straightened.
- Aluminium wheels treated with the application of heat or by the addition or removal of material.
- Cracked Aluminium Alloy wheels
- Wheel bolt holes, wheel centre hole and wheel mounting surface, valve stem hole, rim well and inside of rim flange (bead seats).
- Aluminium Alloy wheels whose axial and lateral run-out characteristics (DIN 70050, Part 5) already exceed the production tolerance of 0.5 mm.
- Wheels that have already been repaired.
- Burnished wheels with a coating of pure clear coat.
2. Guidelines.

Further limitations:

• Stopper may **only** be applied to cast Aluminium Alloy wheels with the designations **AlSi 7 Mg** and **AlSi 7 Wa** - within certain limits.

• Forged Aluminium Alloy wheels must **not** be treated with stopper. They may only be painted.
2. Guidelines.

Avoid exposing the wheel to high or unevenly distributed heat loads.

- Aluminium Alloy wheels may only be heated to **max. 90°C** for **max. 40 min**.

- Aluminium Alloy wheels must **not** be strongly heated locally with IR, a hot air dryer or similar.
2. Guidelines.

Repairs without stopper

- **Only** visible damage to the visible side of the wheel (face) may be treated.
- Use approved materials only!
- Paint and primer/ filler must **not** be applied to the wheel mounting surface and hub hole, inside of spokes, rim well or inside of rim flange (bead seats) nor to the wheel's drum side (inside of wheel).
2. Guidelines.

Repairs with stopper

• Stopper may **only** be applied to the wheel face, up to max. 25 mm measured from the rim flange.

• Material addition must not exceed 1 mm thickness!
  In the metal substrate, the max. depth of damage must not exceed 1 mm!

• Use approved stopper materials only!
Aluminium Alloy wheels.

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Damaged paint on wheel face
= repair possible

Tip
Micro Repair is also suitable for straightforward paint repairs on the rim flange and edge.
3. Examples of damage with pictures.

Damage deeper than 1 mm
= repair **not** permitted
3. Examples of damage with pictures.

Damaged paint on wheel face
= repair possible

Tip
Micro Repair is also suitable for straightforward paint repairs on spokes and rim edge.
3. Examples of damage with pictures.

Rim flange is deformed, axial and lateral run-out are not OK = repair not permitted!
3. Examples of damage with pictures.

Paint damage on wheel face
= repair possible

Tip
Micro Repair is also suitable for straightforward paint repairs on spokes and rim edge.
3. Examples of damage with pictures.

2-part aluminium wheel: external ring is burnished.

Damaged clear coat on exterior ring = repair not possible
3. Examples of damage with pictures.

Paint damage on wheel face
= repair possible
3. Examples of damage with pictures.

Damage deeper than 1 mm = repair not permitted
3. Examples of damage with pictures.

Paint damage on wheel face
= repair possible
3. Examples of damage with pictures.

Damage to metal outside the 25 mm range
= repair not permitted!
Caution:
First glances can be deceptive. Here we can mainly see damaged paint and minor substrate damage (less than 1 mm) close to the rim flange.

Substrate damaged at the rim flange (deeper than 1 mm and too close to bead seat)
**Repair not possible**
Aluminium Alloy wheels.

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Wheel bolt holes

Wheel mounting surface

Rim well and inner rim flange

For reasons of safety and roadworthiness, the marked areas must never be additionally coated. The manufacturer’s designations and type approval marks must be retained in their original form!

Always cover
(e.g. with masking tape, soft edge tape or wheel nuts)
4. Repair process.

Avoid exposing the wheel to high or unevenly distributed heat loads.

- Aluminium Alloy wheels may only be heated to **max. 90 °C** for **max. 40 min**.

- Aluminium Alloy wheels must **not** be strongly heated locally with IR, a hot air dryer or similar.
4. Repair process.

Remove tyre, valve and weights. Depending on the type of damage, it may be sufficient to merely deflate the tyre in order to shift the tyre away the rim flange into the well and cover it.

Pre-cleaning inside and outside with soapy water, preferably with high-pressure cleaner.

Post-cleaning inside and outside with cleaning agent, depending on degree of soiling, with: Standofleet Degreaser, Standox Precleaner or Standox TB50.
4. Repair process.

Color identification with:
- Standox Colorbox
- Standowin
- Sprayout card
4. Repair process.

Color Information

MERCEDES BENZ

RELATED COLORS / ANBAUTEILFARBSTOENE

<table>
<thead>
<tr>
<th>MODEL YEAR</th>
<th>MODEL</th>
<th>COLOR</th>
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<tbody>
<tr>
<td>1972-2001</td>
<td>6755</td>
<td>9775</td>
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4. Repair process.

Tip
Light, fine silver metallic

A large number of Aluminium Alloy wheels are originally coated with an extremely light, fine silver metallic.

Standohyd Pure Silver:
- Readymix Color in 0.5 ltr. can
- Use with Standohyd Special Effect Additive
- Specific mixing and application must be followed
4. Repair process.

Deep, sharp-edged damage should be carefully deburred and rounded to reduce notching.

The maximum permitted damage depth of 1 mm in the metal substrate must not be exceeded here.

Prevent contact corrosion with iron/steel debris by using separate tool, sand afterwards and clean.
4. Repair process.

Sand area of damage.
Remove old paint in stopper area.
Sand the edges well for a smooth feather-edge.

Clean with:
Standox Silicone Remover
Standox TB50 or
Standox Precleaner
4. Repair process.

DIAMANT Plasticmetal (1425)

1 part hardener for aluminium stopper
2 parts aluminium metal powder

Pot-life approx. 7 min / +20 C

See datasheet
4. Repair process.

Well mixed. Material should have a consistency making it easy to apply.

Too runny. Not sufficiently stiff for application. Add more metal powder.

Too thick and dry. Stopper has uneven consistency and may not adhere after drying. Add more hardener liquid.
4. Repair process.

Apply Polyester Stopper
First apply an adhesion layer with pressure and then smooth uneven areas with the remaining material.

Air drying at approx. 20-30 min / 20 °C metal temperature

IR drying
15-20 min / 80 °C metal temperature

The maximum approved layer thickness (1 mm) for wheel repairs will also harden without IR. Additional post-hardening with IR is better, however, if subsequent films of Primer Filler and paint are also to be dried with IR.
4. Repair process.

Initial sanding
P80-240

Subsequent paint damage sanding
P120-240

Feather edge sanding
P320-500

Lightly sand existing paint surface
P500 or P800 Wet sand by hand.
4. Repair process.

Clean with:
Standox Silicone Remover
Standox TB50 or
Standox Precleaner

Mask and avoid getting primer/surfacer on rim well, inside of rim or in wheel bolt holes.
Soft edge tape or soft edge masking on contours are helpful for smooth fadeout
4. Repair process.

System 1

Standox EP Primer Filler 3:1
2 – 3 Spray coats, max, 90 μm

Oven bake
30-40 min / 60 - 65°C Object temp.

or IR Drying
3–5 min 50% power plus
12–14 min 100% power

Refer to datasheet
4. Repair process.

Optional process 1.

Standox
SprayMax EP Primer Filler
2 – 3 Spray coats, max. 70 μm

Oven bake
45-50 min / 60 - 65°C Object temp.

or IR Drying
3 min 50% power plus
12 min 100% power

Refer to datasheet
4. Repair process.

Optional process 2.

Standox Etching Adhesion Primer
1.5 - 2 Spray coats, 8 - 10 μm
Only apply to bare metal surfaces
Flash-off 30 min / 20°C

Standox VOC Xtra Filler
1-2 Spray coats, max. 100 μm
Filler must cover all areas of Etching Adhesion primer

Airdry overnight / 20°C
Or oven bake
25-30 min / 60-65°C Object temp.
or IR Drying
10–15 min
4. Repair process.

Sanding P500 (Wet sand P800)

Mask bolt holes to prevent paint from entering central area and the bolt holes

Cleaning:
Standox Silicone Remover or Standox Precleaner
4. Repair process.

Recommended step only when using Standohyd Pure Silver

**Variant A**

To achieve an extremely smooth, metal-like effect

- **Spray Coating**:
  - Standox VOC Clear (VOC Express recommended)
  - 1 Spray coat, e.g. 20 -25 μm

- **Drying**:
  - Oven or IR drying as TDS

- **Surface Preparation**:
  - Machine sand P1000 or Wet sand by hand P3000

- **Cleaning**:
  - Cleaning
  - Standox Precleaner

Standohyd Pure Silver
4. Repair process.

**Variant B**
To achieve a slightly grainy effect

Standox 2K VOC Fillsealer
Mixed with VOC Thinner Special 1 Spraycoat, e.g. 15-20 μm
Do not spray thicker coats!

Oven drying
10-20 min / 60 - 65 °C Object temp.

After allowing to cool, directly apply Standohyd Pure Silver

Recommended step *only* when using Standohyd Pure Silver
4. Repair process.

For Standoblue Basecoat or Standohyd Basecoat process and drying refer to the relevant TDS

Standox VOC Klarlack
(Only Standox Clears are approved)
1.5 or 2 Spraycoats as TDS,
e.g. 50-60 μm

Oven or IR drying as TDS

Tip:
To achieve sufficient final hardness for tyre mounting, allow more time in the drying oven or follow up with extra IR drying.
Aluminium Alloy wheels.

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✓ Repair process