Mercedes-Benz Paintwork Guideline.

Spies Hecker – simply closer.

An Axalta Coating Systems Brand
Dear Reader of the Spies Hecker paintwork guideline,

We are pleased to present to you the new paintwork guideline for professional refinishes of Daimler AG vehicles. This new version meets the standards we set today for well-arranged repairs with Spies Hecker refinish systems that meet the Mercedes Benz requirements.

With regard to contents, we mainly focus on providing the technical information necessary to enable a paintshop to use the Spies Hecker products and refinish processes which are required for refinishes of Mercedes Benz vehicles under all quality-relevant warranty aspects.

We specially go into details of Mercedes Benz refinish systems for three-stage base coat colors, the so-called Bright colors and describe the steps necessary to refinish Magno colors with matt clear coat. Special aspects of refinishes on aluminum substrates and on carbon fiber substrates (carbon fiber composite material CFRP) are treated separately.

Mercedes Benz offers fair-value refinish systems to its bodyshops for older vehicles with expired new-car warranty and for cars from other manufacturers. In this guideline, we describe only the wet-on-wet refinish systems for metal and plastic substrates.

For any general product-specific and applicational information, data sheets and general notes on the application of Spies Hecker products, please refer to the Spies Hecker website www.SpiesHecker.com and the country-specific websites which are available in many languages.

We would specially like to point out to you that all Technical Data Sheets, Material Safety Data Sheets and the always up-to-date online formula search tool Phoenix can be found there.

Mercedes Benz’s long-term product strategy is to use, if possible on a global basis, VOC-compliant refinish systems for warranty refinishes which meet the existing European VOC directives. Any locally deviating legal requirements are, of course, to be fulfilled. Paint systems consisting of products of different paint manufacturers are to be avoided not least for product liability reasons.

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1. General notes on refinishing

Mercedes Benz defines a warranty refinish system, which is required when special quality specifications must be fulfilled. The usage of certain materials and work processes is specified therein. These specifications may apply to certain material properties but also to the existence of defined bodyshop equipment and its use by trained personnel.

Besides the technological quality aspects of a warranty refinish it is just as important for a car owner that color and gloss matches on all vehicle substrates. Today, blending the repair area into the adjacent original paintwork is a perfect and efficient work method in view of the large number of ever more complicated colors. Panel repair is also possible for certain colors, however, this has to be decided individually in the bodyshop.

Fair-value refinishes for older vehicles are characterized by the use of alternative work processes limiting the time needed for the repair and are therefore less expensive. Limitations in the finish of the paint system are accepted in this case.

1.1 Mercedes Benz internal information systems

When we visit bodyshops and hold trainings, we realize again and again that the internal information systems of Mercedes Benz are not used intensively. Important resources providing the latest data for daily work remain concealed.

We want to encourage you to use the following systems after login to the Mercedes Benz XENTRY system as they provide fundamental information on professional vehicle repair. Groups 40, 97 and 98, in particular, are directed to topics that concern the paintshop. WIS, ASRA and different Service Information will make your work easier. Good knowledge in how to use this electronic service literature is a prerequisite for participation in future paintwork training modules offered by Mercedes Benz Global Training.

https://XENTRYportal.i.daimler.com/wps/portal

1.2 Safety and environmental regulations in the paintshop area

Unfortunately, we still realize today that working and environmental conditions prescribed by law are not consistently followed. Information is provided in the abovementioned systems and we explicitly want to make you aware of the regulations that you need to comply with. It concerns your health and compliance with regulations is a proof of quality work.

The Spies Hecker safety video and tips for health and safety deal with all the important regulations and instructions and are a good basis to train your staff in this important subject area. Please get in direct touch with your Spies Hecker contact.
2. Substrate pretreatment

Good and thorough pretreatment is better than rework afterwards – this is essential for a perfect refinish. No insurance company or other sponsor accepts the costs incurring for corrections during the refinish or even redoing the paint job. This makes any damage calculation incorrect and reduces the productivity of the company as a whole. Professional substrate pretreatment is an essential part of all refinishes and may not be regarded as a minor work. Considering the substrates currently used in Mercedes Benz models, this work fulfills additional quality and safety requirements and must be carried out.

In accordance with the requirements of Mercedes Benz which are based on the current quality of our refinish materials, we recommend dry sanding only. Professional sanding equipment with efficient dust extraction and sanding paper of different grains suited for the respective substrates help to achieve a perfect surface finish. This creates a substrate that is optimally pretreated for the following base coat and clear coat application.

For information on manufacturers of abrasives and random orbital sanders including dust extraction systems, please refer to your Spies Hecker consultant.

2.1 Metal with special focus on aluminum

In the case of warranty refinishes, sanding through to bare metal is the standard.

Composite constructions of today’s modern Mercedes Benz vehicles force the bodyshop to have separate aluminum workplaces. All the working equipment and materials needed for aluminum substrates may only be used in this area to avoid contact corrosion. Dust from sanding must be discharged separately to rule out aluminum dust explosions.

2.2 Plastic with special focus on fiber

Standard plastic substrates are pretreated with a pad soaked in cleaning agent. Furthermore, we recommend to heat untreated plastic substrates to avoid any adhesion problems.

Damaged old paintwork, e.g. on bumpers can be dry sanded with P400. Small scratches in the surface can be levelled with putty.

When treating carbon substrates by sanding and thereby removing carbon fibers from CFRP components, a separate workplace with efficient particle extraction is required. Visible carbon must be treated particularly carefully as every damage to the carbon fiber structure is irreversible and the part has to be replaced.
Mercedes Benz prefers a clearly defined paint system for these repairs which fulfills internal quality specifications, but also takes local legal VOC requirements into account. We have therefore agreed to limit the confusingly high number of possible high-quality paint systems and mention just the most recently approved product developments in the respective paint systems. This does not mean, however, that products and thus also paint systems approved in the past are no longer supported.

3. Spies Hecker product list for warranty refinishes and goodwill refinishes, for Mercedes Benz-specific refinish systems as well as all important Spies Hecker products generally approved for fair-value repairs on Mercedes Benz passenger car

Putty
Raderal Fine Putty 0911
Raderal IR Premium Putty 2035
Raderal Hardener 0909

Primer
Priomat Wash Primer 4075
(with Priomat Activator 4076)

Primer Surfacer
Permasolid HS Vario Primer Surfacer 5340
(also for painting the body flange in the glazing area)
Permasolid EP Primer Surfacer 4500
(also for painting the body flange in the glazing area)

Surfacer
Permasolid HS Performance Surfacer 5320

Base coats – top coats
Permahyd Hi-TEC Base Coat 480
Permahyd Hi-TEC Hardener 3080
Permahyd WT Additive 6050/6052
Permahyd Blend-in Additive 1050/1051

Clear coats and additives
Permasolid HS Clear Coat 8055
Permasolid HS Clear Coat Additive 9034
Permasolid HS Clear Coat 8030
Permasolid Matting Component MA 110 for Magno colors

Hardeners and reducers
Permasolid VHS/VHS Performance Hardener
Permacron Reducer 3380/3385

Products for painting plastics
Permasolid Elastic Additive 9050

Products for pretreatment and cleaning
Permahyd Silicone Remover 7080
Permaloid Silicone Remover 7010 and 7799

Aerosols
All corresponding SprayMax technology products

Note:
In general, Permasolid EP Primer Surfacer 4500 is still approved for warranty and goodwill refinishes, however, we decided to refer only to the highly productive three-stage product system with 2K Wash Primer and 2K PUR Surfacer in the current version of the paintwork guideline. From our experience, today’s corrosion damages are very small defects which can be repaired very well with Priomat Wash Primer 4075 (also available in a 2K aerosol version). The original standard prescribing the use of EP Primer Surfacer 4500 for corrosion damage is no longer valid from today’s perspective of the quality of Mercedes Benz cars. Products and refinish systems of the past continue to be supported, of course.
Spies Hecker products generally approved for fair-value repairs on Mercedes-Benz passenger cars

Putty / Spray polyester
- Raderal Fine Putty 0911
- Raderal IR Premium Putty 2035
- Raderal Spray Polyester 3508
- Raderal Plastic Putty 2015

Primer
- Priomat Wash Primer 4075
- Priomat 1K Wash Primer 4085
- Priomat 1K Spot Primer 4074 SprayMax

Primer Surfacer
- Permasolid EP Primer Surfacer 4500 light grey
- Permasolid HS Vario Primer Surfacer 5340
- Permasolid 2 K UV Starlight Primer Surfacer 9000
- Permasolid 1K UV Primer Surfacer 9002

Surfacer
- Permasolid HS Vario Surfacer 8590 grey
- Permasolid HS Premium Surfacer 5310
- Permasolid HS Performance Surfacer 5320
- Permasolid 2.1 VHS Surfacer 5150 (US only)
- Permasolid HS Express surfacer 5250
- Permasolid Express Surfacer Accelerator 9250

Base coats – top coats
- Permahyd Hi-TEC Base Coat 480
- Permahyd WT Additive 6050
- Permahyd WT Additive 6052
- Permahyd Blend-in Additive 1050/1051
- Permahyd Base Coat 280/285
- Permahyd Blend-in Additive 9005
- Permacron Base Coat 293/295
- Permasolid HS Automotive Top Coat 275

Clear coats and additives
- Permasolid HS Clear Coat 8030
- Permasolid Matting Component MA110
- Permasolid HS Diamond Clear Coat 8450
- Permasolid HS Clear Coat 8035
- Permasolid HS Optimum Clear Coat 8650
- Permasolid HS Clear Coat 8055
- Permasolid HS Clear Coat Additive 9034
- Permacron Speed Blender 1036
- Permasolid Low VOC Clear Coat 8096 (US only)
- Permasolid HS Speed Clear Coat 8800
- Permasolid HS Speed Clear Coat 8655 (only Asia)
Hardeners and reducers
Permasolid EP Hardener 4501
Permasolid VHS Hardener 3220/3225/3230/3240
Permasolid VHS Performance Hardener 3425/3440
Permasolid HS Hardener 3307/3309/3310/3312/3315
Priomat Activator 4076
Raderal Hardener 0909 red/ 0940 blue
Permacron MS Hardener 3333/3344/3355
Permacron Reducer 3380
Permacron Reducer 3364/3365/3380/3385
Permacron Reducer 3369/3370/3371 (US only)

Products for painting plastics
Permasolid Elastic Additive 9050
Priomat Elastic Primer 3304
Priomat Pore Filler 3311
Permacron 1:1 Elastic Primer Surfacer 3300
Permacron Elastic Clear Coat satin gloss 8070

Waterborne products
Permahyd Stone Chip Protector 7100

Products for pretreatment and cleaning
Permahyd Silicone Remover 7080
Permaloid Silicone Remover 7010
Permaloid Silicone Remover 7799
Permaloid Cleaning Agent 7020

Spies Hecker SprayMax aerosols for professional use
All corresponding products in SprayMax aerosols are approved for use.
3.1 Warranty and goodwill refinish systems for metal substrates

<table>
<thead>
<tr>
<th>Cleaning</th>
<th>Pre-clean with Permaloid Silicone Remover 7010/7799 and allow to dry</th>
<th>Mechanically dent areas of corrosion with P80-P120</th>
<th>Clean again with Permaloid Silicone Remover 7010/7799 and allow to dry</th>
</tr>
</thead>
<tbody>
<tr>
<td>Putty</td>
<td>Raderal IR Premium Putty 2035</td>
<td>2-3% Raderal Hardener 0900</td>
<td>Short wave 2-3 min</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Sand with P80-P120 (coarse)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Control paint black</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Sand with P120-P280 (fine)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Clean again with Permaloid Silicone Remover 7010/7799 and allow to dry</td>
</tr>
<tr>
<td>Primer surfacer</td>
<td>Permasolid HS Vario Primer Surfacer 5340</td>
<td>5:1 with any Permasolid VHS Hardener</td>
<td>20% Permacron Reducer 3480</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>HVLP 1.4 - 1.8 mm 0.7 bar atomizing pressure</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1 - 25 μm</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>5 min final flash-off</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2 min 50% plus 8 min 100% power</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>P400-P600</td>
</tr>
<tr>
<td>Waterborne base coat</td>
<td>Permahyd Hi-TEC Base Coat 480</td>
<td>Permahyd WT Additive 6050 10% for solid colors, 10% for effect colors</td>
<td>HVLP 1.2 - 1.3 mm 0.7 bar atomizing pressure</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Application in one spray operation 10 - 25µm</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Final flash-off until matt</td>
</tr>
<tr>
<td>Clear coat</td>
<td>Permasolid HS Clear Coat 8055</td>
<td>3:1 with Permasolid VHS Hardener 3140</td>
<td>5% Permasolid HS Clear Coat Additive 9534</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>HVLP 1.3 - 1.4 mm 0.7 bar atomizing pressure</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Application in one spray operation 45 - 50μm</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>5-10 min final flash-off</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Short wave 10 - 15 min</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>60°C 30 min</td>
</tr>
</tbody>
</table>

Warranty and goodwill refinish systems for metal substrates.

If it is not necessary to apply putty, passivate bare metal substrates with Priomat Wash Primer 4075 or Priomat Reactive Pretreatment Wipes 4000 before applying Permasolid HS Vario Primer Surfacer 5340.
### 3.2 Warranty and goodwill refinish systems for plastic substrates

<table>
<thead>
<tr>
<th>Cleaning</th>
<th>Pre-clean with sanding pad ultra fine and Permaloid Silicone Remover 7010 and allow to dry</th>
<th>Sand the damage area with P400 - P600</th>
<th>Clean again with Permaloid Silicone Remover 7010 and allow to dry</th>
</tr>
</thead>
<tbody>
<tr>
<td>Putty</td>
<td>Raderal Fine Putty 0811</td>
<td>Short wave 2 - 3 min</td>
<td>Sand with P80 - P120 (coarse)</td>
</tr>
<tr>
<td></td>
<td>2-3% Raderal Hardener 0809</td>
<td></td>
<td>Sand with P120 - P280 (fine)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Clean again with Permaloid Silicone Remover 7010 and allow to dry</td>
</tr>
<tr>
<td>Surfacer</td>
<td>Permasolid HS/Varis Primer Surfacer 5340</td>
<td>HUPE 1,3 - 1,4 mm 0,7 bar atomizing pressure</td>
<td>15-20 min at 20°C final flash-off</td>
</tr>
<tr>
<td></td>
<td>Permahyd Hi-TEC Base Coat 480</td>
<td>1.2 - 1.3 mm 0.7 bar atomizing pressure</td>
<td>Final flash-off until matt</td>
</tr>
<tr>
<td>Waterborne base coat</td>
<td>Permahyd WT Additive 6050 10% for solid colors, 20% for effect colors</td>
<td>Application in one spray operation 10 - 25µm</td>
<td>Final flash-off until matt</td>
</tr>
<tr>
<td>Clear coat</td>
<td>Permasolid HS Clear Coat 8055</td>
<td>1.2 - 1.3 mm 0.7 bar atomizing pressure</td>
<td>Application in one spray operation 10 - 25µm</td>
</tr>
<tr>
<td></td>
<td>2% Permasolid Elastic Additive 9050</td>
<td>HUPE 1,3 - 1,4 mm 0,7 bar atomizing pressure</td>
<td>5-10 min final flash-off</td>
</tr>
<tr>
<td></td>
<td>3% Permasolid HS Clear Coat Additive 8054</td>
<td></td>
<td>Short wave 10 - 15 min</td>
</tr>
<tr>
<td></td>
<td>Permahyd Hi-TEC Base Coat 480</td>
<td></td>
<td>60°C 30 min</td>
</tr>
</tbody>
</table>

Warranty and goodwill refinish systems for plastic substrates.

Normally, all Mercedes-Benz plastic detachable parts are precoated and directly recoatable. Nevertheless we want to point out to the cleaning process that includes heating the substrate, as also uncoated spare parts are available for the latest Smart models.
Individualization of vehicles’ exteriors by using extraordinary effects and / or colors is progressing. With the so-called Bright colors, Designo and Magno colors, Mercedes Benz offers a wide variety of these special valuable finishes.

The particularities are described in the respective paint systems.

Carbon substrates as well as the special substrate visible carbon are often used for AMG cars and are therefore also mentioned. First of all, however, we would like to point out to you a safety-relevant process when it comes to painting the body flange in the glazing area. Here, Permasolid EP Primer Surfacer 4500 can be used. Bonding of components on other substrates is not permitted.
4.1 Painting the body flange in the glazing area

<table>
<thead>
<tr>
<th>Cleaning</th>
<th>Pre-clean with Permaloid Silicone Remover 7010/7799 and allow to dry</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primer</td>
<td>Permasolid EP Primer Surfacer 4500 3:1 with Permasolid EP Hardener 4501 25% Permacron Reducer 3380 HVLP 1.3 - 1.6 mm 0.7 bar atomizing pressure 2 – 60 µm 5-10 min final flash-off 3-5 min 50% plus 14 min 100% power or 60°C 50 min P800 or by hand</td>
</tr>
<tr>
<td>Primer</td>
<td>Permasolid HS Vario Primer Surfacer 5340 5:1 with VHS Hardener 20% Permacron Reducer 3380/3385 HVLP 1.3 - 1.6 mm 0.7 bar atomizing pressure RP 1.4 mm / 2 bar 2 coats = 60 µm 5-10 min final flash-off 3-5 min 50% plus 14 min 100% power or 60°C 50 min P900 or by hand</td>
</tr>
<tr>
<td>Clear coat</td>
<td>Permasolid HS Clear Coat 8055 3:1 with Permasolid VHS Hardener 5% Permasolid HS Clear Coat Additive 9034 HVLP 1.3 - 1.4 mm 0.7 bar atomizing pressure Application in one spray operation 45 - 60 µm 5-10 min intermediate and final flash-off Short wave 10-15 min 60°C 30 min</td>
</tr>
<tr>
<td>Mask flange with 12 mm wide adhesive tape</td>
<td></td>
</tr>
<tr>
<td>Demask flange for preparation of glazing</td>
<td>Apply primer 5 min final flash-off max. open time 24h Bonding of component, as per repair instructions, on demasked and primed adhesive flange</td>
</tr>
</tbody>
</table>

Painting the body flange in the glazing area with Permasolid HS Vario Primer Surfacer 5340 or Permasolid EP Primer Surfacer 4500.
4.2 Bright Colors

These are three-stage colors consisting of a base coat ground color, base coat effect color and clear coat. Examples are Hyazinth red, Diamond white, Solarbeam, Le Mans red or Cadmium red for the Smart. The whole color impression is mainly determined by the even film thickness of the effect color, so that it is here very important to apply the effect color very accurately and in an even film.
### 4.2 Bright colors / three-stage base coat colors

<table>
<thead>
<tr>
<th>Cleaning</th>
<th>Pre-clean with Permaloid Silicone Remover 7050/7790 and allow to dry</th>
<th>Mechanically deburr areas of corrosion with PRIA 920</th>
<th>Clean again with Permaloid Silicone Remover 7050/7790 and allow to dry</th>
<th>Waterborne</th>
<th>Waterborne</th>
<th>Waterborne</th>
<th>Clear coat</th>
</tr>
</thead>
<tbody>
<tr>
<td>Putty</td>
<td>P Reducer Primer Putty 8005, 2-3% Reducer Primer 3980</td>
<td>Short wave 3–5 min</td>
<td>Sand with PRIA 920 (coarse)</td>
<td>Permaloid HS Silane Primer Surfacer 5480</td>
<td>Permaloid HS Blend Additive 1050/1051</td>
<td>Permaloid HS CLEAR Coat 8005</td>
<td>3% with Permaloid HS Remover 4000</td>
</tr>
<tr>
<td>Primer</td>
<td>S Reducer Primer Surfacer 5480</td>
<td>20% Permaloid HS Reducer 4060</td>
<td>WSP 1.6 – 1.8 mm, 0.7 bar atomizing pressure, 3.3–4.0/0.8–1.0 µm</td>
<td>Permaloid Hi-TEC Base Coat 460</td>
<td>Permaloid Hi-TEC Additive 6000/1050</td>
<td>Permaloid Hi-TEC Base Coat 460</td>
<td>5% Permaloid HS CLEAR Coat Addition 9004</td>
</tr>
<tr>
<td>surfacer</td>
<td>PMA-9200</td>
<td>WSP 1.6 – 1.8 mm, 0.7 bar atomizing pressure</td>
<td>Application in one spray operation 10 – 20 µm</td>
<td>Permaloid Hi-TEC Base Coat 460</td>
<td>Permaloid Hi-TEC Additive 6000/1050</td>
<td>Permaloid Hi-TEC Base Coat 460</td>
<td>WSP 1.2 – 1.3 mm, 0.7 bar atomizing pressure</td>
</tr>
<tr>
<td></td>
<td>1-3 with Permaloid HS Reducer 4060</td>
<td>Application in one spray operation to the surrounding area or the adjacent area</td>
<td>Final flash-off until matt</td>
<td>Permaloid HS Blend Additive 1050/1051</td>
<td>Permaloid HS CLEAR Coat Addition 9004</td>
<td>Permaloid Hi-TEC Base Coat 460</td>
<td>Application in one spray operation 45 – 50 µm</td>
</tr>
<tr>
<td></td>
<td>5% Permaloid HS CLEAR Coat Addition 9004</td>
<td>Application in one spray operation up to the wet Permaloid Blend in the adjacent area plus 20% Permaloid Blend and beyond into the adjacent area/part</td>
<td>Final flash-off until matt</td>
<td>Permaloid HS CLEAR Coat 8005</td>
<td>WSP 1.2 – 1.3 mm, 0.7 bar atomizing pressure</td>
<td>Permaloid HS CLEAR Coat 8005</td>
<td>Short wave 30–60 min</td>
</tr>
<tr>
<td></td>
<td>5% Permaloid HS CLEAR Coat Addition 9004</td>
<td>WSP 1.2 – 1.3 mm, 0.7 bar atomizing pressure</td>
<td>Final flash-off until matt</td>
<td>Permaloid HS Clear Coat 8005</td>
<td>WSP 1.2 – 1.3 mm, 0.7 bar atomizing pressure</td>
<td>Permaloid HS Clear Coat 8005</td>
<td>Final flash-off until matt</td>
</tr>
</tbody>
</table>

**Bright colors / three-stage base coat colors.**

Blending with Permahyd Hi-TEC 480 using the example of MB 9799 Diamond white metallic.

If it is not necessary to apply putty, passivate bare metal substrates with Priomat Wash Primer 4075 or Priomat Reactive Pretreatment Wipe 4000.
4.3 Magno colors

Customers who like matt finishes can order Mercedes Benz colors from the Magno series. Here, instead of a „clear“ clear coat, a very matt clear coat is applied. Some special details need to be observed and as these are very high-grade vehicles of the Designo Exclusive Series from AMG Performance Studio, only trained painters are to carry out this type of repair job.

Examples for Magno colors of the current color program are: Alanite grey 0044 (designo), Cashmere white 0049 (designo) and Cerussite grey 0281 (designo).

The degree of gloss of the current Magno colors is set to 23 (+7) gloss units at a 60° angle.

Dust inclusions in matt finishes cannot be polished out. Polishing will even the diffuse surface and thereby, the degree of gloss will increase.

The care of matt clear coat surfaces and approved care products are described in detail in the Service Information in WIS.
### Cleaning

Basicall all vehicles must be cleaned thoroughly before being moved into the painting facility.

- Pre-clean with Permaloid Silicone Remover 7010/7799 and allow to dry
- Mechanically denot areas of corrosion with P80-P120
- Clean again with Permaloid Silicone Remover 7010/7799 and allow to dry

### Putty

If necessary

- Raderal IR Premium Putty 2035
- 2.3% Raderal Hardener 0909
- Short wave 2-3 min
- Sand with P80-P120 (coarse)
- Control paint black

### Primer surfercer

Keep the surfercer area as small as possible

- Permasolid HS Vario Primer Surfercer 5340
- 5:1 with any Permasolid VHS Hardener
- 20% Permacron Reducer 3380
- HVLP 1.4 - 1.8 mm 0.7 bar atomizing pressure 2.3 - 60 - 100 µm
- 5-10 min intermediate and final flash-off
- 2 min 50% plus 8 min 100% power
- or 60°C 30 min

### Waterborne base coat

- Permahyd Hi-TEC Base Coat 480 Selenite grey MB 7297
- Permahyd WT Additive 6050 20% for effect colors
- HVLP 1.1 - 1.5 mm 0.7 bar atomizing pressure
- Application in one spray operation 10 - 25 µm
- Final flash-off until matt

### Clear coat

- Permasolid HS Clear Coat 8010
- Permasolid Matting Component MA 110 Mixing ratio 75:25 % by weight. It is necessary to spray a sample
- HVLP 1.5 mm 0.7 bar atomizing pressure
- 2 coats in cross direction
- 5-10 min intermediate and final flash-off
- 60°C 50 min; air drying not possible

### Magno - colors.

Blending with Permahyd Hi-TEC 480 using the example of Selenite grey MB 7297.

If it is not necessary to apply putty, passivate bare metal substrates with Priomat Wash Primer 4075 or Priomat Reactive Pretreatment Wipe 4000.
4.4 Alubeam MB 047

Chrome effects on vehicle substrates are normally produced by electrochemical processes. For the first time, Mercedes has succeeded in achieving a comparable effect with waterborne base coat with the Mercedes Benz Alubeam base coat. The specific feature is described in the following paint system.

<table>
<thead>
<tr>
<th>Cleaning</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Alubeam MB 047</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Blending with Permahyd Hi-TEC 480 using the example of Selenite grey MB 7297.

If it is not necessary to apply putty, passivate bare metal substrates with Priomat Wash Primer 4075 or Priomat Reactive Pretreatment Wipe 4000.
4.5.1 Carbon fiber composite plastics

CFRP is made of filament yarn embedded in resin. The material is characterized by extremely high stability at comparably low density and thus weight. This is also the main reason why it is used for automotive engineering.

Today, production processes are so advanced that they help to avoid the formerly dreaded voids in the surface. Only these perfect parts are used today in the Aftersales component range of Mercedes-Benz.

The main challenge when coating CFRP is to avoid that the texture noticeably shines through the clear coat.

The use of the following products and careful method of working guarantees a perfect surface finish for color-coated CFRP, and also for visible carbon.

<table>
<thead>
<tr>
<th>Cleaning</th>
<th>Surfacer</th>
<th>Waterborne base coat</th>
<th>Clear coat</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heat carbon components for 60 minutes at max. 80°C</td>
<td>Permasolid HS Performance Surfacer 5320, 5% Permasolid VHS Performance Hardener 3425</td>
<td>Permasolid Hi-TEC Base Coat 480</td>
<td>Permasolid Hi-Clear Coat 8055</td>
</tr>
<tr>
<td>Permahyd Silicone Remover 7080 and wipe with clean cleaning tissue</td>
<td>Permahyd Silicone Remover 7080 and wipe with clean cleaning tissue</td>
<td>Permahyd Silicone Remover 7080 and wipe with clean cleaning tissue</td>
<td>Permahyd Silicone Remover 7080 and wipe with clean cleaning tissue</td>
</tr>
<tr>
<td>P340-P400; avoid sanding through</td>
<td>P120-P240, 10 min intermediate and final flash-off</td>
<td>MR-U 2.1 - 1.3 mm 0.7 bar atomizing pressure</td>
<td>Permasolid HS Clear Coat Additive 8054</td>
</tr>
<tr>
<td>Permahyd Silicone Remover 7080 and wipe with clean cleaning tissue</td>
<td>Permahyd Silicone Remover 7080 and wipe with clean cleaning tissue</td>
<td>Application in one spray operation 10 - 25µm</td>
<td>5-10min intermediate and final flash-off</td>
</tr>
<tr>
<td>2 min 30% plus 6 min 100% power</td>
<td>or 60°C, 30 min</td>
<td>Final flash-off until matt</td>
<td>60°C, 40 min</td>
</tr>
<tr>
<td>or P340-P400; avoid sanding through</td>
<td>or 60°C, 30 min</td>
<td>or 60°C, 30 min</td>
<td>60°C, 40 min</td>
</tr>
</tbody>
</table>

Carbon fiber composite plastics.
Carbon fiber reinforced plastic (CFRP), coated.
4.5.2 Visible carbon matt

<table>
<thead>
<tr>
<th>Cleaning</th>
<th>Heat carbon components for 60 minutes at max. 80°C</th>
<th>Permahyd Silicone Remover 7080 and wipe with clean cleaning tissue</th>
<th>P240-P320; sanding through destroys the substrate</th>
<th>Blow surface dry; Permahyd Silicone Remover 7080 and wipe with clean cleaning tissue</th>
<th>Matt clear coat</th>
<th>Matt clear coat</th>
<th>Matt clear coat</th>
</tr>
</thead>
<tbody>
<tr>
<td>Matt clear coat</td>
<td>Permasolid HS Clear Coat 8030</td>
<td>Permasolid Matting Component MA 110 Mixing ratio 70:30 % by weight. It is necessary to spray a sample</td>
<td>4:1 with Permasolid VHS Hardener 3240</td>
<td>10% Permacron Reducer 3385</td>
<td>60°C 50 min</td>
<td>P800</td>
<td>2 coats in cross direction approx. 100 µm</td>
</tr>
<tr>
<td>Matt clear coat</td>
<td>Permasolid HS Clear Coat 8030 finish coat</td>
<td>Permasolid Matting Component MA 110 Mixing ratio 70:30 % by weight. It is necessary to spray a sample</td>
<td>4:1 with Permasolid VHS Hardener 3240</td>
<td>10% Permacron Reducer 3385</td>
<td>60°C 50 min</td>
<td></td>
<td>2 coats in cross direction approx. 70µm</td>
</tr>
</tbody>
</table>

Carbon fiber reinforced plastic visible carbon-matt.
5. Fair-value refinishes

Fair-value refinishes for vehicles are characterized by the use of alternative work processes limiting the time needed for the repair and are therefore less expensive. In these cases, certain limitations in the appearance of the entire paint system are accepted.

5.1 Wet-on-wet refinishing process for metal substrates

<table>
<thead>
<tr>
<th>Cleaning</th>
<th>Putty</th>
<th>Surfer</th>
<th>Waterborne base coat</th>
<th>Clear coat</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basically all vehicles must be cleaned thoroughly before being moved into the painting facility</td>
<td>Raderal IR Premium Putty 2035</td>
<td>Permasolid HS Vario Primer Surfacer 5340</td>
<td>Permahyd Hi-TEC Base Coat 480</td>
<td>Permasolid HS Clear Coat 8055</td>
</tr>
<tr>
<td>Pre-clean with Permaloid Silicone Remover 7010/7799 and allow to dry</td>
<td>2-3% Raderal Hardener 0900</td>
<td>5:1 with any Permasolid VHS Hardener</td>
<td>Permahyd WT Additive 6050 10% for solid colors, 20% for effect colors</td>
<td>3-1 with Permasolid VHS Hardener</td>
</tr>
<tr>
<td>Mechanically derust areas of corrosion with P80-P220</td>
<td>Short wave 2-3 min</td>
<td>30% Permasolid Reducer 3380</td>
<td>HVLP 1.2 - 1.3 mm 0.7 bar atomizing pressure</td>
<td>5% Permasolid HS Clear Coat Additive 9034</td>
</tr>
<tr>
<td>Clean again with Permaloid Silicone Remover 7010/7799 and allow to dry</td>
<td>Sand with P80-P120 (coarse)</td>
<td>HVLP 1.3 - 1.4 mm 0.7 bar atomizing pressure 1.2 - 30-50 µm</td>
<td>Application in one spray operation 10 - 25µm</td>
<td>HVLP 1.3 - 1.4 mm 0.7 bar atomizing pressure</td>
</tr>
<tr>
<td>Putty if necessary</td>
<td>Sand with P120-P280 (fine)</td>
<td>15-20 min final flash-off!</td>
<td>Final flash-off until matt</td>
<td>Application in one spray operation 45 - 55µm</td>
</tr>
<tr>
<td>Clean again with Permaloid Silicone Remover 7010/7799 and allow to dry</td>
<td></td>
<td></td>
<td></td>
<td>5-10 min intermediate and final flash-off</td>
</tr>
</tbody>
</table>

Wet-on-wet refinishing process for metal substrates.

If it is not necessary to apply putty, passivate bare metal substrates with Priomat Wash Primer 4075 or Priomat Reactive Pretreatment Wipes 4000 before applying Permasolid HS Vario Primer Surfacer 5340.
### 5.2 Wet-on-wet refinishing process for plastic substrates

<table>
<thead>
<tr>
<th>Cleaning</th>
<th>Putty</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heat for 60 min at 60°C</td>
<td>Raderal Fine Putty 0911</td>
</tr>
<tr>
<td>Poorly cleaned vehicles must be thoroughly cleaned before being moved into the painting facility</td>
<td>2-3% Raderal Hardener 0909</td>
</tr>
<tr>
<td>Pre-clean with sanding pad ultra fine and Permaloid Silicone Remover 7010 and allow to dry</td>
<td>Short wave 2-3 min</td>
</tr>
<tr>
<td>Sand the damage area with P400 - P600</td>
<td>Sand with P80-P120 (coarse)</td>
</tr>
<tr>
<td>Clean again with Permaloid Silicone Remover 7010 and allow to dry</td>
<td>Sand with P120-P280 (fine)</td>
</tr>
<tr>
<td>Clean again with Permaloid Silicone Remover 7010 and allow to dry</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Surfacer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Permasolid HS Vario Primer Surfacer 5340</td>
</tr>
<tr>
<td>5:1 with any Permasolid VHS Hardener</td>
</tr>
<tr>
<td>15-20 min final flash-off</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Waterborne base coat</th>
</tr>
</thead>
<tbody>
<tr>
<td>Permahyd Hi-TEC Base Coat 480</td>
</tr>
<tr>
<td>HVLP 1.2 - 1.3 mm 0.7 bar atomizing pressure</td>
</tr>
<tr>
<td>Final flash-off until matt</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Clear coat</th>
</tr>
</thead>
<tbody>
<tr>
<td>Permasolid HS Clear Coat 8055</td>
</tr>
<tr>
<td>15% Permasolid Elastic Additive 9050</td>
</tr>
<tr>
<td>5.1 with Permasolid VHS Hardener</td>
</tr>
<tr>
<td>Application in one spray operation 45 - 55μm</td>
</tr>
<tr>
<td>10-15 min short wave</td>
</tr>
</tbody>
</table>

Wet-on-wet refinishing process for plastic substrates.
5.3 Mercedes Benz spot repairs

<table>
<thead>
<tr>
<th>Cleaning</th>
<th>Putty (if necessary)</th>
<th>Surfacer</th>
<th>Waterborne base coat</th>
<th>Waterborne base coat</th>
<th>Clear coat</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basically all vehicles must be cleaned thoroughly before being moved into the painting facility.</td>
<td>Permaloid HS Vario Primer Surfacer 5340</td>
<td>Permasolid HS Vario Primer Surfacer 5340</td>
<td>For approx. 80% of all Mercedes-Benz colors Permahyd Hi-TEC Base Coat 480</td>
<td>For light, coarse Mercedes-Benz metallic colors, e.g. MB 9-762 Palladium silver Permahyd Hi-TEC Base Coat 480</td>
<td>Permasolid HS Clear Coat 8055</td>
</tr>
<tr>
<td>Pre-clean with Permaloid Silicone Remover 7030/7799 and allow to dry.</td>
<td>Radaral IR Premium Putty 2035</td>
<td>1:1 with any Permasolid VHS Hardener</td>
<td>Permahyd HT Additive 6050: 10% for solid colors, 20% for effect colors</td>
<td>Permasolid HS Vario Primer Surfacer 5340</td>
<td>3.1 with Permasolid VHS Hardener 3340</td>
</tr>
<tr>
<td>Mechanically derust areas of corrosion with P80-P220</td>
<td>Short wave 1-3 min.</td>
<td>30% Permacron Reducer 3080</td>
<td>Permahyd Blend in Additive 1050/1051: 1:1</td>
<td>5% Permasolid HS Clear Coat Additive 3034</td>
<td>5% Permasolid HS Clear Coat Additive 3034</td>
</tr>
<tr>
<td>Clean again with Permaloid Silicone Remover 7030/7799 and allow to dry.</td>
<td>Sand with P80-P120 (coarse)</td>
<td>HVLP 1.3 - 1.4 mm 0.7 bar atomizing pressure 1-2 + 80-100 µm</td>
<td>Apply in 3-5 thin coats from outside-in</td>
<td>HVLP 1.3 - 1.4 mm 0.7 bar atomizing pressure</td>
<td>HVLP 1.3 - 1.4 mm 0.7 bar atomizing pressure</td>
</tr>
<tr>
<td></td>
<td>15-20 min final flash-off.</td>
<td></td>
<td></td>
<td></td>
<td>Application in one spray operation 45 - 50µm</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>5-10 min final flash-off.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Short wave 10 - 15 min.</td>
</tr>
<tr>
<td></td>
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<td></td>
<td></td>
<td></td>
<td>60°C 30 min</td>
</tr>
</tbody>
</table>

Permahyd Hi-TEC 480 Spot Repair on defined areas of the vehicle.
6. Color identification

6.1 Color code on model plate

We strongly recommend to identify the best color match (or variant) before starting with the actual repair work. This is the only way to make sure that all mixing colors needed to mix the right formula are available.

For the younger model series, the Mercedes Benz color code can be found on the model plate which is located on the B pillar at the driver’s side.

For production reasons, there are two codes for the Smart: one for the tridion cell and one for the plastic body panels.

6.2 Mixing formula

To verify the formula found, we recommend to spray a sample panel. To identify the right mixing formula, please use the Hi-TEC Variant Index, Phoenix as most up-to-date online color search tool, the CR-plus DVD or the direct color measurement with the ColorDialog Delta Scan spectrophotometer.

The effort needed for this is covered by the Mercedes Benz repair times.
Spies Hecker develops optimum and practical paint systems for bodyshops. The Spies Hecker principle is greater efficiency in environmentally compatible vehicle refinishing thanks to high-grade product systems, competent advice and targeted training. Its close partnership with the vehicle refinishing trade and the auto industry at large has over 130 years of success behind it. The German company based in Cologne is one of the world’s leading makers of vehicle refinishes, and is active in over 65 countries worldwide.

Spies Hecker – simply closer.