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Recommendation for the Quality Assessment of Paint Care Products for Motor Vehicles

Part 1: Paint Cleaners

The German Cosmetic, Toiletry, Perfumery and
Detergent Association (IKW)

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1. Foreword

IKW member companies make their expert knowledge of the products they manufacture available to the general public; this is done in the form of quality assessment recommendations.

The recommendations for the quality assessment are elaborated in working groups and are intended to enable a qualified testing of the relevant products by the manufacturers and test institutes. Quality characteristics are described that need to be fulfilled by the products concerned in order to achieve the effects expected by consumers and manufacturers.

The companies working within the framework of IKW want optimal quality standards for their products. Their aim is a consistent orientation to sustainability as a guiding principle, preparing to successfully face the future in a constantly changing world.

This commitment to sustainability as a guiding principle is built up on experiences expressed in numerous exemplary initiatives. Taking as starting points the declarations of Rio 1992, "92 plus 10" of Johannesburg and the Agenda 21, sustainability is understood as a balanced linking of economic, social and ecological aspects, with a view to meeting the needs of the present without compromising the ability of future generations to meet their own needs.

With this in mind, quality assessment recommendations have to encourage company staff to act responsibly toward humans and the environment in product development and manufacture. They also serve consumers who can expect efficient, safe and environmentally sound products.

The recommendations describe which qualities are relevant to a given product and how such qualities can be measured. It should be noted that every finished product has a certain efficacy spectrum in its intended use; this spectrum is largely determined by consumer expectations as to each individual quality characteristic – so that in each product some characteristics are deliberately emphasised while others will be less important. Moreover, the desired combination of product properties is subject to constant change, depending on the latest technical possibilities and new consumer habits.

Quality assessment recommendations must not impair such developments. Consequently, for each product only one overall result is valid to determine whether the product meets the quality recommendations or not. Emphasis on isolated test criteria is not admissible and may be misleading.

2. Rules, Standards and Voluntary Agreements

With regard to composition, packaging and labelling, inter alia, the following statutory requirements must be observed in their existing versions or to the extent that they still apply, respectively:

- German Code on Foodstuffs, Consumer Items and Animal Feed (Lebensmittel-, Bedarfsgegenstände- und Futtermittelgesetzbuch – LFGB),
- German Chemicals Act (Chemikaliengesetz – ChemG),
- German Dangerous Substances Ordinance (Gefahrstoffverordnung – GefStoffV),
- Chemicals Prohibition Ordinance [Chemikalienverbotsverordnung – ChemVerbotsV],
- German Detergents and Cleaning Products Act (Wasch- und Reinigungsmittelgesetz – WRMG),
- German Ordinance on Pre-packaged Products (Fertigverpackungsverordnung – FPV),
- German Ordinance on the Transport of Dangerous Goods by Road (Gefahrgutverordnung Straße – GGVS),
- German Ordinance on the Transport of Dangerous Goods by Rail (Gefahrgutverordnung Eisenbahn – GGVE),
- as well as the following legislation by the European Union which serves as basis for the German ordinances or to which reference is made:
 - Detergents Regulation (EC) No. 648/2004,
 - REACH Regulation (EC) No 1907/2006,
 - Regulation on the Classification, Labelling and Packaging (EC) No. 1272/2008 ("CLP Regulation"),
 - Biocidal Products Regulation (EU) No. 528/2012,
 - Regulation (EU) No. 98/2013 on the Marketing and Use of Explosives Precursors.

The following international standards were taken into account in respect of individual aspects:

- ASTM D3836-13 (USA): "Standard Practice for Evaluation of Automotive Polish"
- ASTM D4955-89 (Reapproved 2008, USA): "Standard Practice for Field Evaluation of Automotive Polish"
- DIN EN ISO 2813 (June 1999, updated 2015): "Paints and Varnishes – Determination of Gloss Value at 20°, 60° and 85°"
- JIS K 2236:1997 (Japan): "Polish for automobiles"
- JIS K 2236: 2009 (Amendment 1, Japan): "Polish for automobiles"

Moreover, the following voluntary agreementsⁱ apply, amongst others, to IKW member companies which can be relevant for paint care products:

- Ban on volatile chlorinated hydrocarbons (CHC) in Detergents and Cleaning Products (1987),
- Recommendation concerning the Packaging Imprint on Residual Emptying (1992),
- Ban of Musk Xylene (1993),
- Ban of the Use of Alkylphenol Ethoxylates (APEO) (1986),
- Ban on Ethylenediaminetetraacetic Acid (EDTA) (1991),
- Ban on Triclosan (2001).

3. Introduction

This Recommendation for the quality assessment includes test methods for the assessment of paint care products for motor vehicles. They are applied on larger, painted body components and can be classified in accordance with **Diagram 1** in respect of their polishing, paint conditioning and cleaning properties in a product group triangle. The considered product groups differ in terms of these properties. The boundaries between the product groups are fluid in accordance with the representation in **Diagram 1** and are partly only determined by the application concentration of certain ingredients.

The three properties or edges of the product group triangle of **Diagram 1** can be allocated to the following typical ingredients and assessment criteria according to **Tab. 1**.



The paint surfaces are usually two-component paint systems which are used in the automotive industry. The products are applied as a rule with an application medium (e.g. sponge, cloth). The paint surfaces are exposed to daily strains and soiling and are usually cleaned prior to the application of the above-mentioned three product groups (paint cleaner, paint conditioner, paint polish) e.g. by a car wash (car shampoo). The three product groups (paint cleaner, paint conditioner, paint polish) are as a rule used for value preservation and optical upgrading of the paint surfaces and differ in terms of composition of the ingredients and proper use. The products are commercially available in bottles, tubes or glass jars, tin cans or plastics boxes or other containers as well as in other presentations. They are available in a liquid, solid or pasty condition.

Paint cleaners for motor vehicles are used for older, already matt or scratched, pre-cleaned paint surfaces and prepare the paint for the subsequent application of paint conditioners or paint polish. Paint cleaners are products which contain a particularly high share of abrasives. They serve for the removal of weathered, loose pigment and paint particles as well as superficial scratches and scrapes on strongly affected already matt paint surfaces and paint layers. In accordance with their claim in conjunction with Article 2 of the Detergents Regulation (EC) No. 648/2004 detergents may possibly have to be labelled in accordance with Annex VII of the Detergents Regulation. In addition, a list of ingredients must be made available on the internet.

Paint conditioners for motor vehicles are abrasive-free and contain hydrophobing components such as waxes and silicones, for the conditioning and sealing of paint surfaces. After their application and subsequent polishing, they provide the paint with a high-gloss look. They protect and condition the paint. Paint conditioners are intended for the care of intact new paints as well as paints pre-cleaned with paint cleaner or paint polish and are, according to their intended use, not to be detached after the single cleaning with a detergent. Consequently, they come neither under the German Detergent and Cleaning Product Act (WRMG) nor under the Detergents Regulation (EC) No. 648/2004.

Paint conditioners, which are, however, mainly detached after a single cleaning with detergents and can then, based on experience, reach waters, come in accordance with § 2 Para 1 Sentence 2 No. 3 under WRMG. In this case they must not be labelled in accordance with the Detergents Regulation but manufacturers must publish no later than from the placing

	Property	Typical Ingredient Groups	Assessment Criteria
“Polishing”	Polishing	Abrasives	Gloss
“Preserving”	Paint conditioning	Functional silicones and waxes, polydimethylsiloxanes	Gloss, hydrophobing
“Washing / Cleaning”	Cleaning	Surfactants	Cleaning performance

Tab. 1 Typical ingredient groups and assessment criteria for the properties of paint care products from **Diagram 1**.

on the market a list of ingredients on the internet in accordance with Annex VII Section D of the Detergents Regulation and print the corresponding internet address on the packaging.

Paint polishes for motor vehicles are combination products of paint cleaners and paint conditioners and include abrasives as well as paint protecting components. They serve for the optical improvement of already affected paint surfaces. After polishing they provide the paint again with high gloss and protection. Paint polishes, which are also claimed for cleaning, represent detergents within the meaning of Article 2 of the Detergents Regulation (EC) No. 648/2004.

Without a cleaning claim they represent as a rule products in accordance with § 2 Para 1 Sentence 2 No. 3 WRMG which are intended to be applied to surfaces and are primarily detached after a single cleaning with detergents and according to experience can then reach waters. In this case they must not be labelled in accordance with the Detergents Regulation, but manufacturers must publish no later than from the placing on the market a list of ingredients on the internet in accordance with Annex VII Section D of the Detergents Regulation and print the corresponding internet address on the packaging.

4. Aim

In 2014 the Working Group "EQ Paint Care Products" was mandated by the IKW Expert Committee on Cleaning and Care Products to revise the "IKW Recommendations on the Quality Assessment for Car Care and Cleaning Products" of 1992. The work within the working group involved both experts from industrial companies and also from a test institute. The updated recommendation represents a collection of methods which are to permit in their non-binding form a qualified testing of the relevant products for the application at private end consumers by the companies themselves, by the consumers and by the test institutes. The recommendation makes available three separate test methods for the following three products groups (cf. **Diagram 1**):

1. **Paint cleaners** for motor vehicles (Part 1 of the Recommendation for the quality assessment of paint care products for motor vehicles)
2. **Paint conditioners** for motor vehicles (Part 2 of the Recommendation for the quality assessment of paint care products for motor vehicles)ⁱⁱ
3. **Paint polishes** for motor vehicles (Part 3 of the Recommendation for the quality assessment of paint care products for motor vehicles)ⁱⁱ

PLEASE NOTE: Part 2 ("Paint conditioners for motor vehicles") and 3 ("Paint polishes for motor vehicles") of the

Recommendation for the quality assessment of paint care products for motor vehicles will be published separately in later issues of SOFW Journal.

The three test methods are to fulfil the following criteria:

- ✓ Practical relevance
- ✓ Reproducibility
- ✓ Differentiability
- ✓ As simple conduct as possible

In order to fulfil these criteria, the tests are to be conducted in blind studies with reference products in respect of which the testers do not know whether they test a reference or a test product. The reference products can be manufactured based on the information in the Annex to the test methods.

PLEASE NOTE: Neither the reference products nor the individual chemicals or test specimens, equipment or auxiliary materials can be obtained from the IKW office.

5. Paint Cleaners, Paint Surfaces and Application Method

Paint cleaners for motor vehicles are products which contain a high share of abrasives. They serve for the removal of weathered, loose pigment and paint particles as well as superficial scratches and scrapes on strongly affected already matt paint surfaces and paint layers. (**Fig. 1**)

The working procedure stated in the test method for the application and/or polishing of the product is based on cross application. The application and/or polishing is carried out in accordance with **Diagram 2** with 50% overlapping of the wiping paths and beyond the edge of the surface to be treated.ⁱⁱⁱ Under the following website a video for instructions concerning the crosswise application can be accessed:



<https://www.youtube.com/watch?v=uyYTBKij9c&feature=youtu.be>

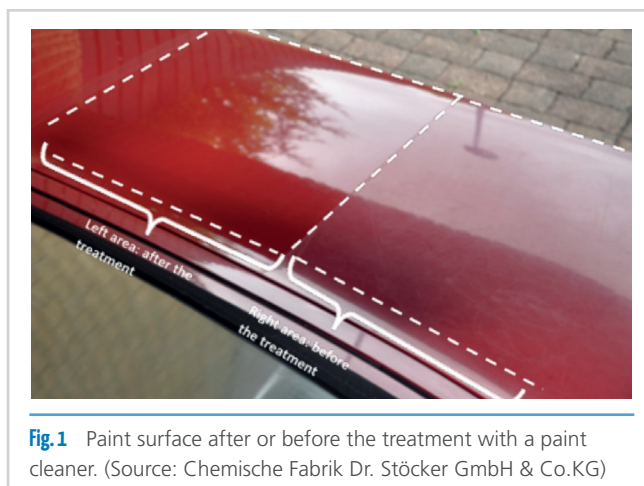


Fig. 1 Paint surface after or before the treatment with a paint cleaner. (Source: Chemische Fabrik Dr. Stöcker GmbH & Co.KG)

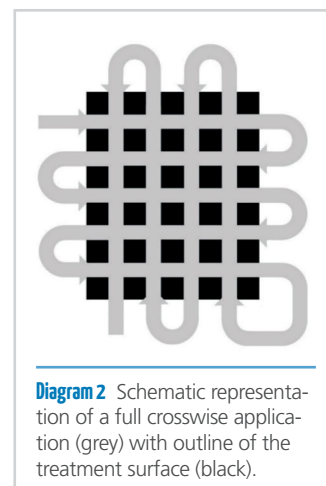


Diagram 2 Schematic representation of a full crosswise application (grey) with outline of the treatment surface (black).

6. Test Method for Paint Cleaners for Motor Vehicles

(Part 1 of the Recommendation for the Quality Assessment of Paint Care Products for Motor Vehicles)

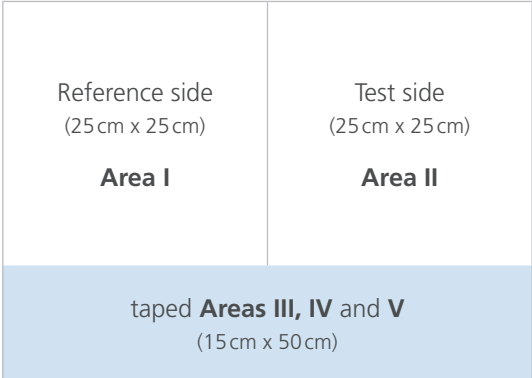
General Information		
1.	Product designation (including brand name, article number, possibly batch number)	
2.	Manufacturer and/or distribution	
3.	Scope of application (information by the manufacturer)	
4.	Testing of the paint cleaner in the delivered condition	
4.1	Presentation (e.g. solid, liquid, paste)	
4.2	Recipient (e.g. bottle, tube, can)	
4.3	Intended type of application (e.g. with a cloth, sponge or as a spray)	
Properties		Test
5.	Serviceability test	In order to secure the result statistically, the steps from 5.3 to 5.6 should be carried out by three persons in each case independently from one another. For the pre-treatment of the sheets (Step 5.2.2) it is recommended that it is carried out by an experienced person. The tests are to be carried out at a temperature between 15 and 30°C and a relative air humidity of 20 to 80%. ^{iv}
5.1	Documentation of the test conditions (temperature, air humidity)°C% air humidity
5.2	Equipment, procedures and materials	
5.2.1	Test specimens/sheet test panels (cf. "Test specimens/sheet test panels" in the Annex)	<p>In order to cover the paint grades occurring in practice, the test is carried out on absolutely plane^v, sufficiently stable, painted test specimens with a minimum size of 50 cm x 40 cm with original paint (OEM quality)^{vi} with the paint plain black (no metallic paint).</p> <p>1st step: Reference and test side are pre-treated in accordance with 5.2.2. The taped^{vii} areas III, IV and V (15 cm x 50 cm) remain untreated.</p> 

Diagram 3 Schematic representation of the sheet test panel for the pre-treatment of the Areas I and II.

2nd step: The application and testing of the reference and test paint cleaner is carried out in accordance with 5.3

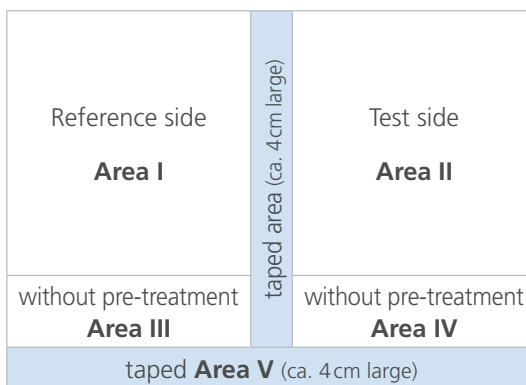


Diagram 4 Schematic representation of the sheet test panel with the Areas I to IV to be tested.

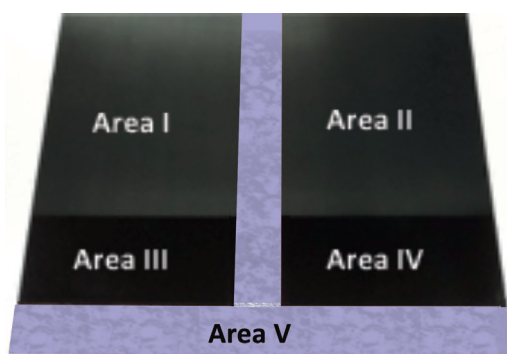


Fig. 2 Photo of the sheet test panel with the Areas I to IV to be tested as well as the taped areas. (Source: DEKRA Automobil GmbH)

5.2.2 Pre-treatment

The Areas I and II of the test specimen are pre-treated as follows:

- Clean with basic car shampoo, rinse with demineralised water (DM water) and then treat with isopropyl alcohol and dry.
- Treat with matting agent 1500, random orbit sander and felt pad in crosswise application (cf. **Diagram 2**/video). Wet felt pad completely with matting agent and matt five times by crosswise application with 50% overlapping.
 - Matting is carried out for each measurement point up to a gloss level of 60 ± 2 units with a measurement angle of 60 degrees (Please note: if the matting leads to a gloss value < 58 units, the gloss value can be increased by treating with the matting agent 2000).
 - Prior to every measurement cleaning is carried out with a basic car shampoo. Then rinse with DM water and treat with isopropyl alcohol and dry.

5.2.3 Gloss measurement and gloss meter

The single measurements in the Areas I to IV are carried out in an evenly distributed manner based on DIN EN ISO 2813 with a fixed measurement angle of 60 degrees at five measurement points (in each case at least 4 cm distance from the edge) per sheet test panel stating the measured gloss levels and the determined standard deviation^{viii} across all five measurement points.

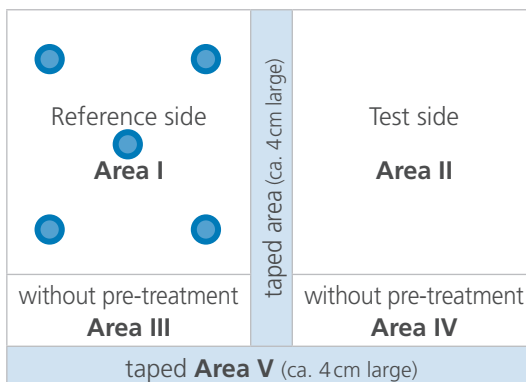
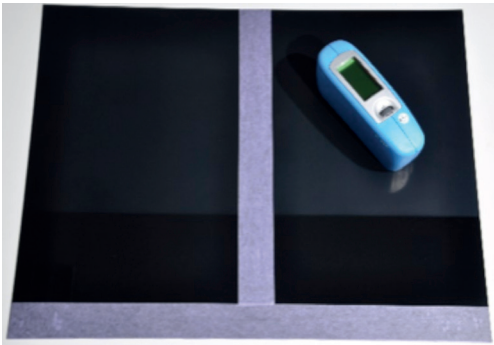
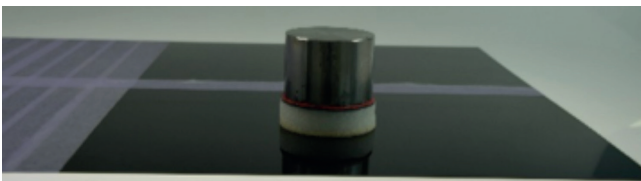



Diagram 5 Schematic representation of the sheet test panel with the five measurement points in Area I.

		
		<p>Fig. 3 Photo of the sheet test panel with gloss meter (Source: Chemische Fabrik Dr. Stöcker GmbH & Co.KG)</p>
5.2.4	Reference paint cleaner	Composition see Annex "Test specimens, equipment, auxiliary materials, formulas and suppliers"
5.2.5	Degreaser	Composition see Annex "Test specimens, equipment, auxiliary materials, formulas and suppliers"
5.2.6	Processing media	<p>a) For application (5.3.1): For the reference paint cleaner, an unused, newly produced, moistened^x PUR ether sponge (e.g. T28065, Pahlke Company) should be used. For the test paint cleaner, the same auxiliary material should be used unused if the manufacturer does not provide any other information on the processing medium. For every application an unused, newly produced, moistened sponge must be used.</p> <p>b) For polishing: For the reference paint cleaner, an unused defined microfiber cloth (e.g. Art. No. 615.900.337, De Witte S. A. Company) should be used. For the test paint cleaner, the same auxiliary material should be used, if the manufacturer does not provide any other information on the auxiliary material. For every polishing, an unused microfiber cloth must be used.</p>
5.3	First test performance	<ol style="list-style-type: none"> 1. Reference paint cleaner for the Areas I and III (Areas: cf. 5.2.1) 2. Test paint cleaner for the Areas II and IV (Areas: cf. 5.2.1)
5.3.1	Application of the paint cleaner	<p>Before applying the paint cleaner, shake up thoroughly. For every application an unused, moistened sponge must be used in each case.</p> <p>If the manufacturer of the test paint cleaner has not provided any information on dosage and application medium, approximately 5 +/- 0.5 gramme^x paint cleaner are distributed thinly and evenly over the entire area of the moist sponge in accordance with 5.2.6 a) and then applied to the Areas I and III (reference paint cleaner) and/or II and IV (test paint cleaner).</p> <p>Apply all paint cleaners to be tested in a five times crosswise application (cf. Diagram 2/video) with 50% overlapping of the wipe paths and the same pressure (1.5 kg). The sponge must be moved over the sheet test panel with a weight without manual pressure.</p>
		
		<p>Fig. 4 Photo of the sheet test panel with weight and sponge (Source: Wigo Chemie GmbH)</p>
5.3.2	Testing of the distributability	<p>The test paint cleaner should be easily and evenly distributable already during the first of five crosswise applications (cf. Diagram 2/video).</p> <p>Assessment scheme of distributability concerning the reference paint cleaner (RPC):</p> <ul style="list-style-type: none"> 5 Points = significantly easier than RPC 4 Points = easier than RPC 3 Points = comparable to RPC 2 Points = more difficult than RPC 1 Point = significantly more difficult than RPC <p>Intermediary marks in increments of 0.5 are admissible (e.g. 1.5 etc).</p>

5.3.3	Drying time	<p>Documentation of the time between application and polishability: Polishing is carried out directly after the respective product no longer smears and appears to be dry. The testing of the drying of the respective product can be carried out by careful polishing at the edge of the sheet. Information provided by the manufacturer on drying may have to be considered. (Please note: the paint cleaners may no longer smear during polishing. For the reference paint cleaner experience has shown that at least 10 minutes drying time is necessary).</p>
5.3.4	Testing of Polishability	<p>Both the reference paint cleaner and the test paint cleaner are polished with separate microfibre cloths in accordance with 5.2.6 b) fully as well as residue-free on the Areas I and III and/or II and IV. For polishing, the microfibre cloth is applied in crosswise application (see Diagram 2/video) with the same pressure (ca. 1.5 kg) over the area. The microfibre cloth may not be turned during polishing. The number of crosswise applications up to the full removal of the product must be noted. If the paint cleaner can be polished completely with less than five crosswise applications, up to five crosswise applications are finished polishing. The test paint cleaner should be polishable without effort. Assessment scheme of the polishability compared to the reference paint cleaner (RPC): 5 Points = two or more cross applications less than with RPC required 4 Points = one cross application less than with RPC required 3 Points = the same number of cross applications as with RPC required 2 Points = one cross application more than with RPC required 1 Point = two and more cross applications more than RPC required</p>  <p>Fig. 5 Photo of a microfibre cloth with weight (Source: Wigo Chemie GmbH)</p>
5.3.5	Testing of dust formation	<p>The test paint cleaner should not develop any dust during polishing. Assessment scheme of dust formation compared to the reference paint cleaner (RPC): 5 Points = significantly less than RPC 4 Points = less than RPC 3 Points = comparable to RPC 2 Points = more than RPC 1 Point = significantly more than RPC Intermediary marks in 0.5 increments are admissible (e.g. 1.5 etc).</p>
5.4	First assessment of the treated area	<p>The visual assessment is carried out immediately, preferably at daylight or with corresponding artificial light, from different angles.</p>
5.4.1	Surface appearance (clouds, veils, streaks)	<p>The test paint cleaner should produce a uniform surface appearance free from clouds, veils and streaks. Assessment scheme of the surface appearance compared to the reference paint cleaner (RPC): 5 Points = significantly better than RPC 4 Points = better than RPC 3 Points = comparable to RPC 2 Points = worse than RPC 1 Point = significantly worse than RPC Intermediary marks in 0.5 increments are admissible (e.g. 1.5 etc).</p>
5.4.2	Colour refreshment (colour strength)	<p>The test paint cleaner should generate an intensification of the shade. Assessment scheme for colour refreshment compared to the reference paint cleaner (RPC): 5 Points = significantly better than RPC 4 Points = better than RPC 3 Points = comparable to RPC 2 Points = worse than RPC 1 Point = significantly worse than RPC Intermediary marks in 0.5 increments are admissible (e.g. 1.5 etc).</p>

5.4.3	Gloss	The assessment is carried out through the average gloss value increase in gloss units (Δ GU). Assessment scheme of gloss compared to the reference paint cleaner (RPC): 5 Points = $> + 5 \Delta$ GU 4 Points = $+ 1$ to $+ 5 \Delta$ GU 3 Points = $> - 1$ to $< + 1 \Delta$ GU 2 Points = $- 5$ to $- 1 \Delta$ GU 1 Point = $< - 5 \Delta$ GU
5.4.4	Touchability and smear resistance	Apply cotton swabs under strong pressure on the areas treated with the test paint cleaner and assess whether traces can be seen. Assessment scheme of the touchability and smear resistance (visually): 5 Points = good (no traces to be seen) 3 Points = satisfactory (weak traces to be seen) 1 Point = bad (strong traces to be seen)
5.5	Degreasing	Degreasing is carried out residue-free with a degreaser in accordance with 5.2.5 in the Areas I and III and/or II and IV by spraying with a lab squeeze bottle and wiping with a microfibre cloth in accordance with 5.2.6 b). Full degreasing is reached at gloss value constancy. Degreasing is carried out to permit an assessment of an effective polishing effect (scratch removal, greyness removal and generation of additional scratches by the paint cleaner).
5.6	Second assessment of the treated surface	The visual assessment is carried out preferably at daylight or corresponding artificial light from different angles.
5.6.1	Surface appearance after degreasing	Assessment in accordance with 5.4.1
5.6.2	Colour refreshment (colour strength, intensification of the shade) after degreasing	Assessment in accordance with 5.4.2
5.6.3	Gloss measurement after degreasing	The assessment of degreasing is carried out through the average gloss value increase in gloss units (Δ GU) without comparison to the reference paint cleaner: 5 Points = $> + 5 \Delta$ GU 4 Points = $+ 1$ to $+ 5 \Delta$ GU 3 Points = $> - 1$ to $< + 1 \Delta$ GU 2 Points = $- 5$ to $- 1 \Delta$ GU 1 Point = $< - 5 \Delta$ GU
5.6.4	Assessment of the surface pattern	The testing for scratches and greyness is carried out in the untreated previously taped Areas III and IV of the test specimen (cf. 5.2.1). The assessment is carried out compared to the untreated Area V. The treated Areas III and IV are not to present any scratches or greyness after visual assessment. Assessment scheme of the surface pattern for Area IV (visually): 5 Points = good (no scratches and no greyness visible) 3 Points = satisfactory (weakly matt surface without deep scratches) 1 point = bad (deep, uneven scratches, matt paint surface)



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7. Assessment of the Test Results

The assessment of the test results of the product group is carried out by a weighted point system. Under the following internet address an Excel table can be downloaded for the evaluation of the test method for a paint cleaner (assessment scheme) including the following assessment table and calculation of the overall results:



https://www.ikw.org/fileadmin/ikw/downloads/Haushaltspflege/Ass_Scheme_Paint_Cleaner_2018_09_18_engl.xlsx

The values obtained from the assessment scheme for the test method of a paint cleaner can be weighted in accordance with the following **Tab. 2** on the basis of empirical values of the Working Group "EQ Paint Care Products" and an overall score can be determined. The table is also electronically available and is attached as additional rider "Paint Cleaner Score" to the Excel table above.

The higher the number of points in the overall assessment, the better the assessment of the test paint cleaner.

Criterion	Points from the assessment scheme of the test method	Weighting	Weighted Score
5.3.2 Distributability		5 %	
5.3.4 Polishability		10 %	
5.3.5 Dust formation		5 %	
5.4.1 Surface appearance		15 %	
5.4.2 Colour refreshment		5 %	
5.4.3 Gloss value increase (Area II)		10 %	
Gloss value change (Area IV)		5 %	
5.4.4 Touchability and smear resistance		5 %	
<i>After degreasing</i>			
5.6.1 Surface appearance		15 %	
5.6.2 Colour refreshment		5 %	
5.6.3 Gloss value increase (Area II)		10 %	
Gloss value change (Area IV)		5 %	
5.6.4 Assessment of the surface pattern		5 %	
Overall assessment	13 to 65	100 %	1 to 5

Tab. 2 Assessment table of the weighted test results of a paint cleaner for motor vehicles.

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8. References and Explanations

This Recommendation for the Quality Assessment of Paint Care Products for Motor Vehicles (Part 1: Paint Cleaners), including the video and the Excel table, can also be accessed via the following web address:



<https://www.ikw.org/haushaltspflege/themen/detail/lackreiniger-fuer-kraftfahrzeuge-2018-empfehlung-zur-qualitaetsbewertung-fuer-lackpflegemittel-teil/>

References

- ⁱ https://www.ikw.org/fileadmin/ikw/downloads/Schoenheitspflege/SP_HP_Freiwillige-Selbstverpflichtungen.pdf (Retrieved September 2018).
- ⁱⁱ At the time of publication of the test method for the recommendation for quality assessment of a paint cleaner for motor vehicles (Part 1) still in progress.

- ⁱⁱⁱ As a result of the application and/or polishing beyond the edge of the area to be treated, a uniform treatment of the area is to be ensured.
- ^{iv} ASTM D3836-13 (USA): "Standard Practice for Evaluation of Automotive Polish"
- ^v A test on bent vehicle surfaces does not make sense, because no correct measurement results can be obtained for gloss measurement.
- ^{vi} Original equipment manufacturer (OEM) quality.
- ^{vii} Cf. Adhesive tape (residue-free) in the appendix under "Auxiliary Materials".
- ^{viii} On a homogeneously matted area the standard deviation should be < 1 gloss unit.
- ^{ix} Wetted sponge: sponge soaked with water which has been fully squeezed.
- ^x The application amount can possibly also be defined through the volume: 5 +/- 0.5 millilitres.

9. Members of the Working Group

Claudia Figulla-Kroschel, Hartmut Hauber, Oliver Kerp, Thorsten Kessler, Stephan Kollig-Eid, Thilo Kunst, Manfred Pitsch, Dieter Prippenow, Helmut Schumacher.

Appendix

Test Specimens, Equipment, Auxiliary Materials, Formulas and Suppliers

Test specimens / sheet test panels

- e.g. plain steel or aluminium sheet
- Original paint layering in OEM qualityⁱⁱ: base paint plain black, e.g. clear paint PPG APO 1.2 (e.g. Thierry GmbH, Motorstraße 30, 70499 Stuttgart)
- Minimum size: 500 mm x 400 mm x 1 mm
- Use of the test specimens three weeks after manufacturing at the earliest or expose test specimen to accelerated ageing: e.g. 16 hours at 60°C including at least one day at ambient temperature for conditioning. The relative air humidity should amount to ca. 30 to 80%.

Equipment

- Gloss meter (e.g. Firma Byk-Gardner GmbH, Lausitzer Strasse 8, 82538 Geretsried, Germany, Tel.: +49 8171 3493-0, Fax +49 8171 3493-140, Email: info.BYK.Gardner@altana.com, www.byk.com or ERICHSEN GmbH & Co. KG, Am Iserbach 14, 58675 Hemer, Germany, Tel.: +49 (0) 2372 – 9683-0, Fax: +49 (0) 2372 – 6430, E-Mail: info@erichsen.de, <https://www.erichsen.de/erichsen-de>) with measurement geometry and measurement conditions based on DIN EN ISO 2813
- Random orbit sander e.g. with 2 to 2.5 mm stroke

Auxiliary materials

- Adhesive tape (residue-free): e.g. adhesive tape 5959, width 48 mm (3M Deutschland GmbH, Carl-Schurz-Str. 1, 41453 Neuss)
- Felt pad (e.g. SONAX Felt Pad Art. No. 493 300, SONAX GmbH, Münchener Str. 75, 86633 Neuburg, Germany, Tel.: +49 (0)84 31 53-0, E-Mail: info@sonax.de, www.sonax.de)
- PUR ether sponge round; 7.5 cm diameter and 2 cm thick (e.g. T28065, Oskar Pahlke GmbH, Linzer Straße 95, 53562 St. Katharinen, Tel.: +49 (0)2645 9523-0, Fax: +49 (0)2645 9523-40, info@pahlke-schaumstoffe.de, <http://www.pahlke-schaumstoffe.de/>)
- Microfibre cloth (e.g. Art. No. 615.900.337, De Witte SA, Kluzenmeersen 7, B-9170 Sint-Gillis-Waas, Belgium, Tel : +32 (0)3 766 46 83, Fax : +32 (0)3 766 46 84, Email: info@dewitte.biz, <http://www.dewitte.biz/Dewitte/index.html>)
- Cotton swabs (e.g. B. CLASSIQSwabs™, Copan Flock Technologies Srl, Via Perotti 18, 25125 Brescia, Italy, Tel.+39 030 3666100, Fax: +39 030 2659932, Email: info@copanflock.com, www.copanflock.com)
- Metal weight to be applied on sponge and/or microfiber cloth: ca. 1.5 kg (cf. Fig. 4 or 5)

Formulas

- Basic car shampoo: 0.5% sodium lauryl ether sulphate (2 EO) solution (e.g. Emal 228D/KAO or Texapon® NSO/BASF)
- Demineralised water (DM water)
- Degreaser: technical isopropyl alcohol (Propanol-2)
- Matting agent 1500
20% by weight abrasive (silicon carbide F1500)
15% by weight sodium lauryl ether sulphate (e.g. Emal 228D/KAO or Texapon® NSO/BASF)
8% by weight glycerine
15% by weight N,N-Bis-(carboxymethyl)-DL-alanine trisodium salt solution complexing agent (CAS No. 164462-16-2, e.g. BASF Trilon® M/BASF)
0.2% by weight preservative
Ad 100% by weight DM water
- Matting agent 2000
20% by weight abrasive (silicon carbide F2000)
15% by weight sodium lauryl ether sulphate (e.g. Emal 228D/KAO or Texapon® NSO/BASF)
8% by weight glycerine
15% by weight N,N-Bis-(carboxymethyl)-DL-alanine trisodium salt solution (CAS No. 164462-16-2, e.g. Trilon® M/BASF)
0.2% by weight preservative
Ad 100% by weight DM water
- Abrasive
Silicone carbide F1500 and F2000 [e.g. Stähli Läpp-Technik GmbH, Max-Brose-Straße 3, 71093 Weil i.S. – Industriegebiet SOL in Holzgerlingen, Tel. +49 (0) 7031-757796 (HQ), <http://www.stahli.com>, <http://www.stahli-lohnfertigung.de> or Bierther Submikron GmbH, In den zehn Morgen 21, 55559 Bretzenheim, Tel. +49 (0) 671-79 61 41 9-10, <http://submikron.com/>]
- Reference paint cleaner:
5% by weight paraffin wax emulsion (e.g. Hansa Care 4670 (40%));
8% by weight 350 silicone oil emulsion (e.g. Korasilon NPF 60);
4% by weight paraffin hydrocarbon (e.g. Exsol D80);
12% by weight silica (e.g. Sillitin Z 86);
0.2% by weight xanthan gum (e.g. Kelzan ST Plus);
0.2 % by weight preservative
Ad 100% by weight water (DM)