

# **BLUE ANGEL**

**The German Ecolabel**



## **Dishwasher detergents**

**DE-UZ 201**

**Basic Award Criteria**

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**The Environmental Label is supported by the following four institutions:**



Federal Ministry  
for the Environment, Nature Conservation  
and Nuclear Safety

The Federal Ministry for the Environment, Nature Conservation and Nuclear Safety is the owner of the label. It regularly provides information on the decisions taken by the Environmental Label Jury.



The German Environmental Agency with its specialist department for "Ecodesign, Eco-Labeling and Environmentally friendly Procurement" acts as office of the Environmental Label Jury and develops the technical criteria of the Basic Criteria for Award of the Blue Angel.



The Environmental Label Jury is the independent, decision-making body for the Blue Angel and includes representatives from environmental and consumer associations, trade unions, industry, the trade, crafts, local authorities, academia, the media, churches, young people and the German federal states.



The RAL gGmbH is the awarding body for the Environmental Label. It organises the process for developing the relevant award criteria in independent expert hearings – which involve all relevant interest groups.

If you require further information please contact:

RAL gGmbH

**RAL ENVIRONMENT**

Fränkische Straße 7

53229 Bonn

Tel.: +49 (0) 228 / 6 88 95 - 0

E-mail: [umweltzeichen@ral.de](mailto:umweltzeichen@ral.de)

[www.blauer-engel.de](http://www.blauer-engel.de)

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**This document is a translation of a German original. In case of dispute, the original document should be taken as authoritative.**

# 1 Introduction

## 1.1 Preface

In cooperation with the Federal Ministry for the Environment, Nature Conservation and Nuclear Safety, the Federal Environmental Agency and considering the results of the expert hearings conducted by RAL gGmbH, the Environmental Label Jury has set up these Basic Criteria for the Award of the Environmental Label. RAL gGmbH has been tasked with awarding the Environmental Label.

Upon application to RAL gGmbH and on the basis of a Contract on the Use of the Environmental Label to be concluded with RAL gGmbH, the permission to use the Environmental Label may be granted to all products, provided that they comply with the requirements as specified hereinafter.

The product must comply with all the legal requirements in the country in which it is to be marketed. The applicant shall declare that the product meets these conditions.

## 1.2 Background

Washing and cleaning agents are used on a daily basis for maintaining cleanliness and hygiene. Approx. 480,000 tonnes of these cleaning and care agents are sold each year in Germany, whereby dishwashing detergents account for around 260,000 tonnes.<sup>1</sup> All of these products contain ingredients that find their way into the wastewater system and can have a negative effect on the environment and human health. If these components cannot be completely retained or degraded in sewage treatment plants, they will enter into bodies of water and can be ingested by water organisms and, in some circumstances, enriched. Furthermore, washing and cleaning agents can negatively affect human health when substances hazardous to health such as fragrance allergens and preservatives are used.<sup>1</sup>

An important component of cleaning agents are surfactants. These can be manufactured based on petrochemicals and/or renewable raw materials. The use of sustainably produced raw materials makes a significant contribution to sustainable development. In order to ensure this is the case, the cultivation of the plants is subject to ecological, social and economic requirements. Criteria for sustainable cultivation are currently being discussed in different initiatives and reliable certification systems for recording and labelling this type of cultivation are being developed or are establishing themselves on the market.

The separation and traceability of the raw materials (segregation) is currently only possible to a very limited extent in the case of palm (kernel) oil for the manufacturing of surfactants. An interim solution that currently exists is the possibility of verifying sustainable cultivation using the mass balance of raw materials. In this process, the end product does not necessarily contain the certified palm (kernel) oil.

However, it is important to ensure in the longer term that certified palm (kernel) oil is exclusively used in the product and other natural resources e.g. other oil plants or raw materials for the manufacture of citric acid or bioalcohol are integrated into the certification system. In future updates to the environmental label criteria, the further development of these certification systems for sustainable cultivation will be taken into account.

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<sup>1</sup> [www.umweltbundesamt.de/themen/chemikalien/wasch-reinigungsmittel/umweltbewusst-waschen-reinigen](http://www.umweltbundesamt.de/themen/chemikalien/wasch-reinigungsmittel/umweltbewusst-waschen-reinigen)

### 1.2.1 Overview of possible future requirements

The following points will be taken into account, where possible, in future revisions of these Basic Award Criteria:

- The inclusion of an obligatory proportion of carbon from renewable raw materials in the surfactant system;
- Inclusion of other renewable raw materials in the requirements for sustainable cultivation;
- The general biodegradability of all substances;
- Other requirements for the use of recycled materials in the packaging and associated design requirements;
- Testing other prohibitions for the labelling of the end product in accordance with the CLP Regulation (Regulation (EC) No. 1272/2008/EC).

### 1.3 Objective of the environmental label

The following criteria are designed to promote the use of those dishwasher detergents that in the interests of the environment, climate and nature conservation have been produced in such a way that they have the least possible impact on the environment and human health during their production, use and disposal. In addition, they should also help to reduce and prevent the risks posed to the environment and human health through the use of hazardous substances and to minimise packaging waste. Furthermore, information should be provided that enables consumers to use the product both efficiently and with the least possible impact on the environment.

Preserving natural resources is also an important focus of this environmental label. Cleaning agents with the Blue Angel ecolabel should thus make a contribution to the protection of the environment through the use of renewable raw materials in their production that have been cultivated under sustainable conditions or which support sustainable cultivation.

### 1.4 Definitions

For the purpose of their use in these Basic Award Criteria, the following definitions are valid:

- **Substance<sup>2</sup>:** means a chemical element and its compounds in the natural state or obtained by any manufacturing process, including any additive necessary to preserve its stability and any impurity deriving from the process used, but excluding any solvent which may be separated without affecting the stability of the substance or changing its composition.
- **Impurity<sup>3</sup>:** An unintended constituent present in a substance as manufactured. It may originate from the starting materials or be the result of secondary or incomplete reactions during the manufacturing process. While it is present in the final substance it was not intentionally added.
- **Mixture:** Mix, mixture or solution composed of two or more substances.
- **End product:** Within the scope of these Basic Award Criteria, the end product describes the dishwasher detergent offered for sale on the market that should be labelled with the Blue Angel ecolabel.
- **Microplastic:** Plastic particles with a size of  $\leq 5$  mm.

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<sup>2</sup> REACH, Article 3, and CLP Regulation, Article 2

<sup>3</sup> Guidance for identification and naming of substances under REACH and CLP, Version 1.2 March 2012, Chapter 2.2, P. 8, [http://echa.europa.eu/documents/10162/13643/substance\\_id\\_de.pdf](http://echa.europa.eu/documents/10162/13643/substance_id_de.pdf)

- **Plastic:** A macromolecular substance with a water solubility < 1 mg/L, obtained through:
  - a) a polymerisation process such as e.g. polyaddition or polycondensation or a similar process using monomers or other starting substances; or
  - b) chemical modification of natural or synthetic micromolecules; or
  - c) microbial fermentation.
- **Nanomaterial:** means a natural, incidental or manufactured material containing particles, in an unbound state or as an aggregate or as an agglomerate and where, for 50 % or more of the particles in the number size distribution, one or more external dimensions is in the size range 1 nm - 100 nm.<sup>4</sup>
- **Monofunctional dishwasher detergent:** Cleaning agent without a rinse aid function for cleaning dishes in household dishwashers.
- **Multifunctional dishwasher detergent:** Cleaning agent with a rinse aid function and possibly further functions for cleaning dishes in household dishwashers.
- **Rinse aid:** Agent for reducing the surface tension and improving the drainage of water to avoid the formation of lime stains during the drying process on previously cleaned dishes in household dishwashers.
- **Household dishwasher:** A machine which cleans, rinses, and dries dishware, glassware, cutlery and cooking utensils by chemical, mechanical, thermal, and electric means and which is designed to be used principally for non-professional purposes.<sup>5</sup>
- **Sales packaging (in the context of these Basic Award Criteria):** All of the packaging contained in one sales unit (primary packaging = direct contact with the contents and, if relevant, a secondary packaging) as it is offered to the end user or consumer at a retail outlet in its smallest sales unit.
- **Transport packaging:** Transport packaging or delivery packaging is packaging that facilitates the transport of goods, protects the goods against damage during transport or which is used for reasons of safety of the transport.
- **Identity preserved:** Palm (kernel) oil from a specific production location that is sourced from sustainable plantations is kept separate from other palm oils along the whole supply chain.
- **Segregation:** Palm (kernel) oil from different production locations that is sourced from sustainable plantations is kept separate from other non-certified palm oils along the whole supply chain.
- **Mass balance:** In the mass balance model, sustainable palm oil from certified plantations is mixed with conventional, non-certified palm oil in the value added chain. In this process, the proportion of the certified goods is checked and verified so that no more of the end product is labelled as being certified than the amount of certified palm oil before the mixing process. The certified palm oil is recorded and monitored administratively as it is transferred. The mass balance option thus enables sustainable goods to be verified at every stage of the product chain, without having to establish an additional infrastructure for a parallel supply chain. Due to the fact that the certified and conventional goods are not physically separated,

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<sup>4</sup> <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2011:275:0038:0040:DE:PDF>

<sup>5</sup> Commission Regulation (EC) No. 1016/2010 of 10 November 2010 implementing Directive 2009/125/EC of the European Parliament and of the Council with regard to ecodesign requirements for household dishwashers

it enables the mass balance goods to be really easily traded within the supply chain. This option is especially relevant for the use of palm kernel oil and its derivatives.

- **Book & claim:** Sustainable plantations are promoted through the sale of certificates. Companies purchase these certificates via a trading platform (e.g. RSPO Credits) based on the quantity of oil required for the production of surfactants.

## 2 Scope

The product group "dishwasher detergents" comprises detergents for dishes (monofunctional, multifunctional and rinse aids) that are exclusively designed for use in automatic household dishwashers and/or for automatic dishwashers designed for commercial use that are comparable in terms of their size and use to household dishwashers.

## 3 Requirements

The end products named under Paragraph 2 can be labelled with the environmental label illustrated on the first page of these Basic Award Criteria if they fulfil the following requirements.

If the applicant is required to submit declarations, documentation, analysis reports or other documentation in order to verify compliance with the criteria, these can come from the applicant and/or his/her suppliers and/or their suppliers, etc.

The substance requirements defined by Regulation (EC) No. 648/2004 (Detergents Regulation, DetVO)<sup>6</sup> on detergents and the CLP Regulation (Regulation (EC) No. 1272/2008)<sup>7</sup> are observed.

### 3.1 Assessment and testing requirements

Paragraph 3.5 refers to the "Detergent Ingredient Database" (DID list 2016), which contains the most widely used substances in detergent formulations. The data found in this list shall be used for deriving the calculations for the Critical Dilution Volume (CDV) and for assessing the biodegradability of the substances. In the case of those substances not found on the DID list, guidance is given on how to calculate or extrapolate the relevant data. The DID lists are published as annexes.

In certain cases, RAL gGmbH can request additional verification and carry out independent tests.

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<sup>6</sup> Regulation (EC) No. 648/2004 of the European Parliament and of the Council of 31 March 2004 on detergents

<sup>7</sup> Regulation (EC) No. 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), establishing a European Chemicals Agency, amending Directive 1999/45/EC and repealing Council Regulation (EEC) No 793/93 and Commission Regulation (EC) No 1488/94 as well as Council Directive 76/769/EEC and Commission Directives 91/155/EEC, 93/67/EEC, 93/105/EC and 2000/21/EC  
Regulation (EU) No. 1272/2008 of the European Parliament and of the Council of 16 December 2008 concerning the classification, labelling and packaging of substances and mixtures



### **3.1.1 Measurement thresholds**

Every substance that exceeds a concentration of 0.010% by mass in the final formulation must comply with these Basic Award Criteria. This also applies to the raw materials used in the product, any listed additives and impurities.

In the case of substances dealt with by the following criteria, a deviating measurement threshold of 0.0010% by mass in the final formulation applies:

- 3.4 Biodegradability
- 3.5 Toxicity to aquatic organisms
- 3.7 Exclusion of substances
- 3.8 Requirements for specific substances

There is no lower measurement threshold for colouring agents.

**Table 1: Overview of the measurement thresholds for the requirement criteria**

Chapter	Criterion	Measurement threshold in percent by mass [% (w/w)]
3.2	Renewable raw materials in <b>surfactants</b>	≥ 0.010
3.3	Requirements for renewable raw materials in the production of <b>surfactants</b>	≥ 0.010
3.4.1	Biodegradability of <b>surfactants</b>	≥ 0.010
3.4.2	Biodegradability of organic substances	≥ 0.0010 (Colouring agents: no lower limit)
3.5	Toxicity to aquatic organisms	≥ 0.0010 (Colouring agents: no lower limit)
3.6 a)	General exclusion of substances with certain properties – a) Substances of very high concern (SVHC)	≥ 0.010 (Colouring agents: no lower limit)
3.6 b)	General exclusion of substances with certain properties – b) Substances classified with the H-phrases listed in accordance with Regulation (EC) No 1272/2008	≥ 0.010 (Colouring agents: no lower limit)
3.7	Exclusion of substances	≥ 0.0010
3.8.1	Requirements for specific substances – <b>biocides</b>	≥ 0.0010
3.8.2	Requirements for specific substances – <b>fragrances</b>	≥ 0.0010
3.8.3	Requirements for specific substances – <b>colouring agents</b>	no lower limit
3.8.4	Requirements for specific substances – <b>phosphorous</b>	≥ 0.0010
3.8.5	Requirements for specific substances – <b>enzymes</b>	≥ 0.0010

### 3.1.2 Functional unit

The functional unit is the quantity of the product that is required to clean 12 place settings with a standard level of soiling in accordance with the definition in DIN or ISO standards.

### 3.1.3 Reference dosage

The reference dosage for monofunctional and multifunctional dishwashers under standard conditions is the dosage recommended by the manufacturer for normally soiled dishes (12 place settings), as defined in the IKW cleaning performance test (criterion 3.11).

In the case of rinse aids, a reference dosage of 3 ml should be used.

### **3.1.4 Testing institutions**

The tests to be submitted to verify compliance with the requirements, with the exception of the tests for the product's fitness for use, shall be carried out by testing institutions that fulfil the following requirements:

- The tests comply with the requirements of Good Laboratory Practice (Annex 1 of German Chemicals Act (ChemG)) or
- The testing institution has been notified or accredited according to DIN EN 17025 and these tests form part of this accreditation in terms of the fields being tested and the processes and specifications used.

#### **Compliance verification**

*Verification of compliance is to be provided in the form of certification in accordance with Article 19b of the German Chemicals Act (ChemG) and a written declaration from the testing institution that the test was carried out according to the principles of Good Laboratory Practice or through submission of the accreditation certificate from Germany's National Accreditation Body (DAKKS) or another national accreditation system that has been included in the Multilateral Agreement (MLA).*

### **3.2 Renewable raw materials in surfactants**

The proportion of renewable carbon in the total carbon in the surfactant system must be stated.

#### **Compliance verification**

*The applicant shall confirm compliance with the requirement in Annex 1. The proportion of renewable carbon is calculated based on the organic carbon (Annex 2) and verified with a declaration by the surfactant manufacturer. The calculation shall be based on the annual production volume. (see Appendix A)*

### **3.3 Requirements for renewable raw materials produced from palm oil and palm kernel oil**

If raw materials produced from palm oil and palm kernel oil are used, the sustainable cultivation of the oil plants on certified plantations must be verified.

The renewable raw materials for all of the ingredients added to the product that are produced from palm oil and/palm kernel oil must be sourced from plantations cultivated under sustainable conditions. Raw materials produced from palm (kernel) oil must be certified at least in accordance with the "mass balance" model.

#### **Compliance verification**

*The applicant shall confirm compliance with the requirement in Annex 1.*

*In the case of RSPO certification, the manufacturing company must verify their membership of the RSPO (in the case of first-time applications, to be applied for after the issuing of the contract).*

*A supply chain audit via a corresponding certificate shall be submitted to RAL gGmbH at the latest after the Blue Angel ecolabel has been used for the first 15 months and then annually. Verification via the Book & Claim system is not sufficient.*

The following certification systems are recognised: RSPO (Roundtable on Sustainable Palmoil), ISCC+ (International Sustainability & Carbon Certification) or RSB (Roundtable on Sustainable Biomaterial).<sup>8</sup> (Appendix A)

### 3.4 Biodegradability

#### 3.4.1 Biodegradability of surfactants

All of the surfactants contained in the end product must be readily biodegradable<sup>9</sup> under aerobic conditions and biodegradable under anaerobic conditions.

##### **Compliance verification**

*The applicant shall confirm compliance with the requirement in Annex 1.*

*The precise formulation of the end product shall be submitted to RAL gGmbH together with an explanation of the function of every individual substance in Annex 2. Part A of the DID list indicates whether a certain surfactant is aerobically or anaerobically biodegradable (those surfactants with an "R" in the column for aerobic biodegradability are readily biodegradable, while those surfactants with a "Y" in the column for anaerobic biodegradability are biodegradable under anaerobic conditions). The list is not comprehensive, but guidance is given in Part B of the list concerning the determination of the relevant calculation parameters for substances not present on the DID list. For those surfactants which are not included in Part A of the DID list or those surfactants classified with an "O" in the column for anaerobic biodegradability, relevant information from literature or other sources or corresponding test results shall be submitted to verify that these surfactants are biodegradable under anaerobic conditions.*

*The reference test for anaerobic degradability shall be the OECD test 311, the ISO standard 11734, the ECETOC test No. 28 (June 1988) or an equivalent test method, with the requirement of 60 % ultimate degradability under anaerobic conditions. In order to verify at least 60% ultimate degradability under anaerobic conditions, test processes can also be used that simulate the conditions in a corresponding anaerobic environment.*

#### 3.4.2 Biodegradability of organic substances

The content of aerobically not readily biodegradable (aNBO) and anaerobically non-biodegradable (anNBO) organic substances in the product must not exceed the following limits for the reference dosage.

Type of product	aNBO	anNBO
Monofunctional dishwasher detergent	1.00 g/cleaning cycle	3.00 g/cleaning cycle
Multifunctional dishwasher detergent	1.00 g/cleaning cycle	3.00 g/cleaning cycle
Rinse aid	0.15 g/cleaning cycle	0.50 g/cleaning cycle

<sup>8</sup> It is possible that other certification systems will be accepted after they have been investigated by the Federal Environmental Agency.

<sup>9</sup> According to the regulations in EU Regulation No. 648/2004/EC

### Compliance verification:

The applicant shall confirm compliance with the requirement in Annex 1.

In order to calculate the aNBO and anNBO values, there is an Excel file available for this purpose on the Blue Angel website (Annex 2).

The DID list is authoritative here. In the case of ingredients not included in Part A of the DID list, relevant information from literature or other sources or corresponding test results shall be submitted to verify that these ingredients are biodegradable under aerobic and anaerobic conditions (as described in Part B of this list).

### 3.5 Toxicity to aquatic organisms

The critical dilution volume toxicity ( $CDV_{\text{chronic}}$ ) is calculated for each substance (i) using the following equation:

$CDV_{\text{chronisch}} = \sum_{i=1}^n CDV_{(i)} = CDV_{(1)} + CDV_{(2)} + \dots + CDV_{(n)}$
<p>with</p> $CDV_{(i)} = \frac{\text{Weight}_{(i)} \cdot DF_{(i)} \cdot 1000}{TF_{\text{chronisch}(i)}}$

where the weight(i) is the weight of the substance (in grams) in the recommended dosage.

DF(i) is the degradation factor and  $TF_{\text{chronic}}(i)$  is the value for the chronic toxicity of the substance (in milligrams/litre).

The parameters DF and  $TF_{\text{chronic}}$  shall be taken from Part A of the Detergent Ingredient Database (DID list) (Appendix). If the substance in question is not included in Part A of the DID list, the applicant shall estimate the values in accordance with the approach stated in Part B of the DID list (Appendix). The sum of  $CDV_{\text{chronic}}$  for the individual substances gives the  $CDV_{\text{chronic}}$  for the end product.

The  $CDV_{\text{chronic}}$  must not exceed the following limits for the reference dosage:

Type of product	Maximum permissible $CDV_{\text{chronic}}$
Monofunctional dishwasher detergent	20 000 l/cleaning cycle
Multifunctional dishwasher detergent	24 000 l/cleaning cycle
Rinse aid	5 000 l/cleaning cycle

### Compliance verification

The applicant shall confirm compliance with the requirement in Annex 1.

The precise formulation of the end product, together with the individual details of the calculation of the  $CDV_{\text{chronic}}$  demonstrating compliance with this criterion, shall be submitted to RAL gGmbH in Annex 2.

### 3.6 General exclusion of substances with certain properties

The use of the following substances is not permitted in order to protect the environment and human health. In the case of mixtures e.g. fragrances where it is not possible to obtain information about the individual substances, the classification rules for mixtures shall be applied.

a) Substances of very high concern (SVHC)

It is prohibited to use substances in end products labelled with the Blue Angel ecolabel that have been identified in accordance with Article 57 of Regulation (EC) No. 1907/2006 and listed in accordance with Article 59 of the same regulation on the list of candidates<sup>10</sup> for inclusion on the Annex of substances subject to authorisation. Impurities in substances added to the end product that correspond to the above named criteria are not permitted. The label holder is obligated to take into account current developments on the list of candidates.

b) Substances which according to the criteria of Regulation (EC) No 1272/2008<sup>11</sup> are assigned the following H Phrases named in Table 2 or which meet the criteria for such classification.

**Table 2: Restrictive hazard classifications and their assignment to the categories**

<b>EC Regulation 1272/2008 (CLP Regulation)</b>	<b>Wording</b>
<b>Toxic substances</b>	
H300	Fatal if swallowed
H301	Toxic if swallowed
H304	May be fatal if swallowed and enters airways
H310	Fatal in contact with skin
H311	Toxic in contact with skin
H330	Fatal if inhaled
H331	Toxic if inhaled
EUH070	Toxic by eye contact
H370	Causes damage to organs
H371	May cause damage to organs
H372	Causes damage to organs through prolonged or repeated exposure

<sup>10</sup> <http://echa.europa.eu/web/guest/candidate-list-table>

<sup>11</sup> Regulation (EC) No. 1272/2008 of the European Parliament and of the Council of 16 December 2008 on classification, labelling and packaging of substances and mixtures, amending and repealing Directives 67/548/EEC and 1999/45/EC, as well as amending Regulation (EC) No. 1907/2006 (GHS Regulation) The GHS Regulation (Global Harmonization System) that came into force on 20 January 2009, replaces the old Directives 67/548/EEC (Dangerous Substances Directive) and 1999/45/EC (Dangerous Preparations Directive). According to the said regulation, substances are classified, labelled and packed until 1 December 2010 according to Directive 67/548/EEC while mixtures (formerly preparations) are classified, labelled and packed until 1 June 2015 according to Directive 1999/45/EC. Thereafter, the GHS Regulation shall be applied. The new indications of danger (H Phrases) as well as the hitherto applicable risk phrases (R Phrases) shall be indicated for substances until 1 June 2015.

<b>EC Regulation 1272/2008 (CLP Regulation)</b>	<b>Wording</b>
H373	May cause damage to organs through prolonged or repeated exposure
<b>Carcinogenic, mutagenic and reprotoxic substances</b>	
H340	May cause genetic defects
H341	Suspected of causing genetic defects
H350	May cause cancer
H350i	May cause cancer if inhaled
H351	Suspected of causing cancer
H360F	May damage fertility
H360D	May damage the unborn child
H360FD	May damage fertility May damage the unborn child
H360Fd	May damage fertility Suspected of damaging the unborn child
H360Df	May damage the unborn child Suspected of damaging fertility
H361f	Suspected of damaging fertility
H361d	Suspected of damaging the unborn child
H361fd	Suspected of damaging fertility Suspected of damaging the unborn child
H362	May cause harm to breast fed children
<b>Water-hazardous substances</b>	
H400	Very toxic to aquatic life
H410	Very toxic to aquatic life with long-lasting effects
H411	Toxic to aquatic life with long-lasting effects
H412	Harmful to aquatic life with long lasting effects
H413	May cause long lasting harmful effects to aquatic life
<b>Other Health and Environmental Effects</b>	
H420	Hazardous to the ozone layer
<b>Sensitizing substances</b>	
H334	May cause allergy or asthma symptoms or breathing difficulties if inhaled
H317	May cause an allergic skin reaction

The use of substances or mixtures which upon processing change their properties (e.g. become no longer bioavailable, undergo chemical modification) in a way that the identified hazard no longer applies are exempted from the above requirement.

Deviations: The following substances or mixtures are specifically exempted from the above requirement:

<b>EC Regulation 1272/2008 (CLP Regulation)</b>	<b>Wording</b>
Surfactant (*)	H400 Very toxic to aquatic life
	H412 Harmful to aquatic organisms with long lasting effects
Enzymes (**)	H334 May cause allergy or asthma symptoms or breathing difficulties if inhaled
	H317 May cause an allergic skin reaction
Proteases (e.g. subtilisin)	H400 Very toxic to aquatic life
	H411 Toxic to aquatic organisms with long lasting effects
NTA as an impurity in MGDA and GLDA (***)	H351 Suspected of causing cancer

(\*) This is also valid for impurities from the starting substances.

(\*\*) Including stabilisers and other auxiliary substances in the preparations.

(\*\*\*) In concentrations lower than 0.2 % in the raw material as long as the total concentration in the end product is lower than 0.10 %.

### **Compliance verification**

*The applicant shall declare compliance with the requirements in Annex 1.*

*In the event of changes to the list of candidates, the applicant shall inform RAL gGmbH within one month in the event that the end product does not comply with this criterion.*

*The applicant shall submit the exact formulation of the end product in Annex 2. The applicant shall verify that the substances contained in the end product comply with this criterion by providing information that fulfils at least those requirements according to Annex VII of Regulation (EC) No. 1907/2006. Such information shall be specific to the particular form of the substance, including nanoforms, used in the end product. For that purpose, the applicant shall submit a declaration of compliance with this criterion, together with information on the type (IUPAC nomenclature and CAS number) and content (% by mass) of all substances added to the product and the related safety data sheets in accordance with Annex II to Regulation (EC) No 1907/2006 for the end product, as well as for all substances or mixtures listed in the formulation(s). Concentration limits shall be specified in the safety data sheets in accordance with Article 31 of Regulation (EC) No. 1907/2006. The safety data sheets may not be older than two years. The manufacturer shall verify that he/she has requested that the suppliers of primary/intermediate products submit information on the content of substances up to 0.010 % by mass.*

### **3.7 Exclusion of substances**

The following substances are not permitted in the end product, either as part of the formulation or as part of any preparation included in the formulation:

- Alkyl phenol ethoxylates (APEOs) and derivatives thereof
- EDTA (ethylenediaminetetraacetic acid) and its salts



- DTPA (diethylenetriaminepentaacetic acid) and its salts
- Inorganic phosphate(\*) (e.g. monophosphoric, diphosphoric, triphosphoric and polyphosphoric acids and their salts)
- Reactive chlorine compounds (e.g. hypochlorite)
- Borate and perborate
- Perfluorinated organic compounds
- Halogenated hydrocarbons
- Aromatic hydrocarbons
- Triclosan
- 3-Jod-2-propinylbutylcarbamate
- Glutaraldehyde
- Quaternary organic ammonium compounds that are not readily biodegradable
- Formaldehyde and formaldehyde releasers(\*\*), e.g. (INCI designations):
  - ◆ 2-Bromo-2-Nitropropane-1,3-Diol
  - ◆ 5-bromo-5-nitro-1,3-dioxane
  - ◆ Diazolidinyl Urea
  - ◆ Sodium Hydroxymethylglycinate
  - ◆ Dimethylol Glycol
  - ◆ Dimethylol Urea
  - ◆ DMDM-Hydantoin
  - ◆ Quaternium-15
  - ◆ Tetramethylolglycoluril
- Nitromusks and polycyclic musks including e.g.:
  - ◆ Musk xylene: 5-tert-butyl-2,4,6-trinitro-m-xylene,
  - ◆ Musk ambrette: 4-tert-butyl-3-methoxy-2,6-dinitrotoluene,
  - ◆ Moskene: 1,1,3,3,5-Pentamethyl-4,6-dinitroindan,
  - ◆ Musk tibetine: 1-tert-butyl-3,4,5-trimethyl-2,6-dinitrobenzene,
  - ◆ Musk ketone: 4'-tert-Butyl-2',6'-dimethyl-3',5'-dinitroacetaphenol,
  - ◆ HHCB (1,3,4,6,7,8-Hexahydro-4,6,6,7,8,8-hexamethylcyclopenta(g)-2-benzopyran),
  - ◆ AHTN (6-acetyl-1,1,2,4,4,7-hexamethyltetrali)
- Nanosilver
- Hydroxyisohexyl 3-cyclohexene carboxaldehyde (HICC)
- Atranol
- Chloratranol
- Rhodamine B
- Benzotriazole and benzotriazole derivatives
- Microplastics

(\*) Except for impurities or stabilisers with concentrations lower than 1.0% in the raw material and a total concentration in the end product lower than 0.010 %.

(\*\*) Except for impurities of formaldehyde in surfactants based on polyalkoxy compounds up to a concentration of 0.010 % by mass in the ingredient

### **Compliance verification**

*The applicant shall confirm compliance with the requirement in Annex 1.*

*The applicant shall submit a declaration, which is also supported by declarations from the manufacturers of the substances, that the listed substances are not contained in the end product.*

*In the event that quaternary ammonium salts have been added to the product, the applicant shall submit documentation demonstrating their biodegradability.*

### **3.8 Requirements for specific substances**

These special requirements for specific substances are valid in addition to the general requirements for substances.

#### **3.8.1 Biocides**

- a) The end product may only include biocides in order to preserve the product and in the appropriate dosage for this purpose. This does not refer to surfactants, which may also have biocidal properties.

##### **Compliance verification**

*The applicant shall confirm compliance with the requirement in Annex 1.*

*The applicant shall submit the safety data sheets for every preservative added to the product, as well as information about the exact concentrations of these substances in the end product. The manufacturer or supplier of the preservatives shall submit information about the dosage required to preserve the end product.*

- b) It is prohibited to claim or suggest on the packaging or by any other means that the product has an antimicrobial action.

##### **Compliance verification**

*The applicant shall confirm compliance with the requirement in Annex 1.*

*The applicant shall submit the texts and layouts used for each individual type of packaging and/or a sample copy of each individual type of packaging to RAL gGmbH.*

- c) Biocides, either as part of the formulation or as part of any mixture included in the formulation, that are used to preserve the end product are permitted, but only if their log Pow (octanol-water partition coefficient) is < 3.0 or their experimentally determined bioconcentration factor (BCF) is < 100.

##### **Compliance verification**

*The applicant shall confirm compliance with the requirement in Annex 1.*

*The applicant shall submit the log Pow or BCF value for the biocides (Annex 2).*

- d) Isothiazolinone

2-methyl-4-isothiazolin-3-one (MIT) and 5-chlor-2-methyl-4-isothiazolin-3-one/2-methyl-4-isothiazolin-3-one (CIT/MIT) may only be added up to the maximum permitted limits stated in Annex V (List of preservatives allowed in cosmetic products) of Regulation (EC) No. 1223/2009 of the European Parliament and of the Council of 30 November 2009 on cosmetic products.

- ♦ 5-chlor-2-methyl-4-isothiazolin-3-one/2-methyl-4-isothiazolin-3-one: 0.0015 % by mass.
- ♦ 2-methyl-4-isothiazolin-3-one: 0.0015 % by mass.

If the permissible value according to Annex V of Regulation (EC) No. 1223/2009 at the time of application is lower, this lower value applies.

The content of 1,2-benzisothiazol-3(2H)-one (BIT) must not exceed the following content in the product:

- ♦ 1,2-benzisothiazol-3(2H)-one: 0.0050 % by mass

### **Compliance verification**

*The applicant shall confirm compliance with the requirement in Annex 1.*

### **3.8.2 Fragrances**

- a) All of the substances added to the end product as fragrances must have been manufactured and/or handled in accordance with the code of practice of the International Fragrance Association (IFRA)<sup>12</sup>.
- b) Fragrances that are subject to labelling as detergents in accordance with Annex VII of Regulation (EC) No. 648/2004 and which are not already excluded by criteria 3.6, as well as (other) fragrances classified as H317 (May cause an allergic skin reaction) and/or H334 (May cause allergy or asthma symptoms or breathing difficulties if inhaled) must not be present in the end product in concentrations  $\geq 0.010$  % ( $\geq 100$  ppm) per substance.

### **Compliance verification**

*The applicant shall confirm compliance with the requirement in Annex 1.*

*The applicant shall submit a declaration of compliance with every requirement. For criterion (b), the applicant shall submit a declaration about compliance with this criterion with information about the amount of fragrances contained in the end product. In addition, the applicant shall also submit a declaration from the fragrance manufacturer specifying the content of each of the substances contained in the fragrance which are listed in Annex III of Regulation (EC) No. 1223/2009<sup>13</sup>, as well as the content of (other) substances which have been assigned the risk phrases H317 and/or H334.*

### **3.8.3 Colouring agents**

The end product must not contain any colouring agents that are bioaccumulating.

A colouring agent is considered to be non-bioaccumulating if it has a bioconcentration factor (BCF)  $< 100$  or a log Pow  $< 3.0$ . If the values for both the BCF and the log Pow are available, the highest measurement for the BCF is valid. If using colouring agents that have been approved for use in foodstuffs, no documentation about the bioconcentration factor needs to be submitted.

### **Compliance verification**

*The applicant shall submit a signed declaration of conformity and, if relevant, supplier declarations or safety data sheets about all colouring agents added to the product and the values for their BCF or log Pow or documentation that verifies that the colouring agent is approved for use in foodstuffs.*

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<sup>12</sup> The code of practice is available on the IFRA website: <http://www.ifraorg.org>.

<sup>13</sup> OJ L 342 from 22.12.2009

### 3.8.4 Phosphorous

The total phosphorous content (P) of elemental phosphorous must not exceed the following values for the reference dosage.

Type of product	Phosphorous content
Monofunctional dishwasher detergent	0.20 g/cleaning cycle
Multifunctional dishwasher detergent	0.20 g/cleaning cycle
Rinse aid	0.030 g/cleaning cycle

#### **Compliance verification**

*The applicant shall confirm compliance with the requirement in Annex 1. In order to calculate the total phosphorous content (P), there is an Excel file available for this purpose on the Blue Angel website (Annex 2).*

### 3.8.5 Enzymes

It is only permitted to add encapsulated enzymes (solid) and enzymes in liquid form or as a suspension.

#### **Compliance verification:**

*The applicant shall submit a signed declaration of conformity and, if relevant, supplier declarations or safety data sheets for the enzymes added to the product.*

### 3.9 Labelling of the end product

- a) It is not permitted for the end product to be assigned a H phrase named in Table 2 of Paragraph 3.6 b) in accordance with the CLP Regulation (1272/2008/EC)<sup>14</sup>.

#### **Compliance verification**

*The applicant shall confirm compliance with the requirement in Annex 1. In addition, the applicant shall submit the exact formulation of the end product in Annex 2, as well as the product label and safety data sheet for the end product.*

### 3.10 Dosage requirements

The recommended reference dosage for normally soiled dishes (12 place settings) must not exceed the following maximum values:

Type of product	Dosage
Monofunctional dishwasher detergent	19.0 g/cleaning cycle
Multifunctional dishwasher detergent	21.0 g/cleaning cycle

#### **Compliance verification**

*The applicant shall declare compliance with the requirement in Annex 1 and submit a product label.*

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<sup>14</sup> Regulation (EC) No. 1272/2008 of the European Parliament and of the Council of 16 December 2008 on classification, labelling and packaging of substances and mixtures, amending and repealing Directives 67/548/EEC and 1999/45/EC, as well as amending Regulation (EC) No. 1907/2006 (CLP Regulation)

### 3.11 Fitness for use

The monofunctional or multifunctional dishwasher detergent must achieve a cleaning performance using the recommended dosage that at least corresponds to a reference detergent or reference rinse aid in accordance with the standard test developed by the IKW.

If a multifunctional product also has rinse aid and salt functions, the effectiveness of these functions must also be verified in a test.

In the case of rinse aids, only the rinse aid function needs to be verified in a test.

The precise testing and evaluation conditions are defined in Appendix B to these Basic Award Criteria.

### Compliance verification

*The applicant shall declare compliance with the requirement in Annex 1 and submit the test results in accordance with the guidelines stated in Appendix B to verify compliance.*

### 3.12 Packaging requirements

- a) The weight utility ratio (WUR) of the primary packaging must not exceed the following values:

Type of product	WUR
Dishwasher detergents	2.0 g/cleaning cycle
Rinse aid	0.4 g/cleaning cycle

Primary packagings consisting of more than 80% renewable materials are exempt from this requirement.

The WUR is only calculated for the primary packaging (including caps, stoppers and label) based on the following formula:

$$WUR = \Sigma((W_i + U_i) / (D_i * R_i))$$

Key for the calculation formula:

- ♦  $W_i$ : the weight [g] of the primary packaging (i);
- ♦  $U_i$ : the weight [g] of non-recycled materials in the primary packaging (i).  $U_i = W_i$ , unless the applicant can verify a different number;
- ♦  $D_i$ : the number of reference doses in the primary packaging (i). In the case of ready-to-use products,  $D_i =$  product volume (in litres);
- ♦  $R_i$ : recycling figure.  $R_i = 1$  (if the packaging is not reused for the same purpose) or  $R_i = 2$  (if the applicant can verify that the packaging components are used for the same purpose and he/she sells refill packs).

- b) Packagings, sleeves, labels or closures made of halogenated polymers e.g. PVC are not permitted.

- c) Paper/cardboard used in the sales packaging must be manufactured using at least 80% recycled materials. In the case of secondary packaging that also serves as transport packaging, the proportion of recycled materials must be at least 70%. Packaging materials are considered recycled if product waste (post-consumer waste) has been subjected to a material recycling process.
  
- d) Recycling-oriented design  
Plastic packaging must be designed for the purpose of easy recycling i.e. where possible no potentially hazardous materials and incompatible materials should be used that are known to hinder the separation or recycling of the materials or reduce the quality of the recycled materials. No individual or combination of materials or components listed in Table 3 may be contained in the labels or sleeves, closures and, if relevant, barrier coatings. Pump mechanisms (including in sprays) are exempt from this requirement.

**Table 3: Materials and components that are excluded from use as a packaging component:**

Packaging component	Excluded materials and components (*)
All components	<ul style="list-style-type: none"> <li>• Components in the EuPIA list (exclusion list for printing inks and related products)</li> </ul>
Label or sleeve	<ul style="list-style-type: none"> <li>• PS label or PS sleeve in combination with a PP, HDPE or PET bottle</li> <li>• A PETG or PETC label or a PETG sleeve or PETC sleeve in combination with a PET bottle</li> <li>• Other plastic materials for sleeves/labels with a density &gt; 1 g/cm<sup>3</sup> in combination with a PET bottle</li> <li>• Other plastic materials for sleeves/labels with a density &lt; 1 g/cm<sup>3</sup> in combination with a PP or HDPE bottle</li> <li>• Labels or sleeves that are metallised or labels or sleeves that are welded without a seam to a packaging body (in mould labelling) with PET bottles</li> <li>• Non water-soluble adhesives in combination with moisture-resistant labels with a PE or PP bottle, non-soluble adhesive (in water or alkaline at 80°C) for PET bottles</li> </ul>
Closures	<ul style="list-style-type: none"> <li>• A PS closure in combination with a PP, HDPE or PET bottle</li> <li>• PETG closures and/or PETG closure material and other plastic closure components with a density of above 1 g/cm<sup>3</sup> in combination with a PET bottle</li> <li>• Closures made of metal, glass, EVA</li> <li>• Closures made of silicone. Exempted are silicone closures with a density &lt; 1 g/cm<sup>3</sup> in combination with a PET bottle and silicone closures with a density &gt; 1g/cm<sup>3</sup> in combination with a PP or HDPE bottle</li> <li>• Silicon components with PE and PP bottles</li> <li>• Components made out of foamed elastomers with a PE and PP bottle</li> <li>• Elastomer components with a density &gt; 1 g/cm<sup>3</sup> with a PET bottle</li> <li>• Metallic foils or seals which remain fixed to the bottle or its closure after the product has been opened</li> </ul>
<p>(*) EVA — Ethylene vinyl acetate, EVOH — Ethylene vinyl alcohol, HDPE — High-density polyethylene, PET — Polyethylene terephthalate,            PETG — Polyethylene terephthalate glycol-modified, PETC — Crystalline polyethylene terephthalate,            PP — Polypropylene, PS — Polystyrene, PVC — Polyvinyl chloride            Please note: the combinations PP and HDPE and also PE and LLDPE, LDPE or HDPE are permitted.</p>	

**Compliance verification**

*The applicant shall confirm compliance with the requirement in Annex 1.*

*The applicant shall submit a calculation of the WUR for the end product in Annex 2.*

### **3.13 Consumer information**

#### **3.13.1 Advertising claims**

If the product is classified and labelled as hazardous to human health according to Regulation (EC) No. 1272/2008, advertising claims such as “less environmentally damaging”, “less hazardous to water”, “less hazardous substances” or comparable statements which could be considered to play down the risks are prohibited.

#### ***Compliance verification***

*The applicant shall declare compliance with the requirement in Annex 1 and submit a product label to RAL gGmbH.*

#### **3.13.2 Dosage instructions**

The dosage instructions shall be stated on the packaging in accordance with Regulation (EC) No. 648/2004. This includes the standard dosage in grams or millilitres or the number of tabs for the main washing cycle for normally soiled dishes in a fully loaded dishwasher for 12 place settings, if necessary with information on the dosages for the water hardness levels of soft, medium and hard.

A dosing aid must be provided free of charge on request for dishwasher detergents that need to be measured out by the end consumer. If the dosing aid is not enclosed with every packaging unit or it cannot be stocked at the retail outlet, it must be possible to request it via a free hotline, via email or via the Internet and the subsequent delivery must be completed free of charge.

#### ***Compliance verification***

*The applicant shall declare compliance with the requirement in Annex 1 and submit a product label to RAL gGmbH.*

#### **3.13.3 Information on the packaging**

- a) The type of enzyme contained in the product must be stated on the packaging.
- b) The packaging must also contain the following or comparable instructions:
  - Clean at the lowest possible temperature.
  - Only clean dishes with a completely full machine and not to add more detergent to the machine than recommended.
  - Information on obtaining a dosage aid (if relevant).
- c) The primary packaging must contain information on reuse, recycling and the proper disposal of the packaging.

#### ***Compliance verification***

*The applicant shall declare compliance with the requirement in Annex 1 and submit a product label to RAL gGmbH.*



### **3.13.4 Safety Instructions**

End products must carry the following safety instructions (or an equivalent text) in either text form or as a pictogram: "Keep away from children!"

#### **Compliance verification**

*The applicant shall declare compliance with the requirement in Annex 1 and submit a product label to RAL gGmbH.*

## **4 Applicants and parties involved**

Manufacturers or distributors of products according to Paragraph 2 shall be eligible for application.

Parties involved in the award process are:

- RAL gGmbH to award the Blue Angel environmental label,
- the federal state being home to the applicant's production site,
- Umweltbundesamt, (Federal Environmental Agency) which after the signing of the contract receives all data and documents submitted in application for the Blue Angel in order to be able to further develop the Basic Award Criteria.

## **5 Use of the Environmental Label**

The use of the environmental label by the applicant is governed by a contract on the use of the environmental label concluded with RAL gGmbH.

Within the scope of such contract, the applicant undertakes to comply with the requirements under Paragraph 3 while using the environmental label.

Contracts on the Use of the Environmental Label are concluded to fix the terms for the certification of products under Paragraph 2. Such contracts shall run until June 30, 2023.

They shall be extended by periods of one year each, unless terminated in writing by December 31, 2022 or March 31 of the respective year of extension.

After the expiry of the contract, the Environmental Label may neither be used for labelling nor for advertising purposes. This regulation shall not affect products being still in the market.

The applicant (manufacturer) shall be entitled to apply to RAL gGmbH for an extension of the right to use the ecolabel on the product entitled to the label if it is to be marketed under another brand/trade name and/or other marketing organizations.

The Contract on the Use of the Environmental Label shall specify:

- Applicant (manufacturer/distributor)
- Brand/trade name, product description
- Distributor (Label User), i.e. the marketing organization.
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## Appendix A Renewable raw materials in surfactants

The proportion of renewable carbon in the total carbon in the surfactant system must be stated. A declaration from the manufacturer or supplier of the surfactant shall be enclosed with the application as verification for every surfactant (or surfactant raw material) added to the product. (Declaration from the raw material manufacturer).

In Section 16 of the declaration, the manufacturer or supplier of the surfactant shall certify the proportion of renewable carbon in the total carbon for the surfactant or surfactant raw material. In Annex 2 (Excel file), this value shall be entered in the sheet "Result-3" in column E for every surfactant or surfactant raw material added to the product (value between 0 and 100). The subsequent calculation is carried out in Annex 2 as follows:

For every surfactant/surfactant raw material added to the product:

$G_{(i)}$  = Proportional weight of the surfactant/surfactant raw material i (column C)

$R_{(i)}$  = Proportion of renewable carbon in the total carbon for the surfactant or surfactant raw material i (column E)

The proportion of renewable carbon in the total carbon in the surfactant system (value in cell F62) is calculated using the following formula:

$$\frac{\sum G_{(i)} \times R_{(i)}}{G_{(i)}}$$

If the surfactant system in the formulation changes during the term of the contract, an amended Annex 2 and a declaration from the new manufacturer of the surfactant shall be submitted.

$P_1$  = Production volume in the calendar year with the "old" surfactant system

$P_2$  = Production volume in the calendar year with the "new" surfactant system

$R_1$  = Proportion of renewable carbon in the total carbon in the "old" surfactant system

$R_2$  = Proportion of renewable carbon in the total carbon in the "new" surfactant system

$R_J$  = Average yearly proportion of renewable carbon in the total carbon.

$$R_J = ((P_1 \times R_1) + (P_2 \times R_2)) / (P_1 + P_2)$$

## **Requirements for renewable raw materials produced from palm oil and palm kernel oil**

If surfactants produced from palm oil and palm kernel oil are used, the sustainable cultivation of the oil plants on certified plantations must be verified.

In section 16 of the "Declaration from the raw material manufacturer", the manufacturer or supplier shall confirm whether the raw material contains palm/palm kernel oil.

If raw materials produced from palm oil and palm kernel oil have been added to the product, this shall be stated in Annex 2 (Excel file) in the sheet "Ingoing substances" in column P.

In the case of RSPO "Mass Balance", "Segregation" or "Identity Preserved" certification, the manufacturing company must verify their membership of the RSPO (in the case of first-time applications, to be applied for after the issuing of the contract). Normally, the manufacturing company will either be a "Supply Chain Associate" (purchasing less than 500 tonnes of palm oil products) or an "Ordinary Member" (purchasing more than 500 tonnes of palm oil products). A list of RSPO members is published here: <https://www.rspo.org/members/all>

The following shall be submitted to RAL gGmbH at the latest after the Blue Angel ecolabel has been used for the first 15 months and then annually: RSPO membership number and proofs of purchase (delivery notes/invoices) for the corresponding raw materials. The documents must state the RSPO certificate number for the raw material manufacturer.

To verify that sufficient raw materials have been purchased, the annual production volume (for the formulation included in the application) must be stated in the sheet "Results-2" of the Excel table and the form of verification "Delivery notes/invoices (segregated or MB)" must be selected in column E. For raw materials produced from palm oil and palm kernel oil, the amount of the raw material required can then be calculated for a defined period. If multiple products are certified with the Blue Angel ecolabel, the calculations must be carried out for all products and the results (for identical raw materials) added together.

Alternatively, a supply chain audit can be carried out. This must be verified by submitting a corresponding certificate and the audit report. The audit must be carried out by a certification body accredited by the RSPO: <https://www.rspo.org/certification/bodies/page/>

A supply chain audit is obligatory:

- for ordinary RSPO members
- if using "MB claim transfer cross referencing"
- if products are produced by contract manufacturers who are not RSPO members themselves and are bound to the applicant via "outsourcing agreements".

Verification via the Book & Claim system (RSPO credits) is not sufficient.

## **Appendix B Fitness for use of dishwasher detergents**

**1. The product must be fit for use and meet the requirements of the consumer.**

### **2. Monofunctional and multifunctional dishwasher detergents**

The monofunctional or multifunctional dishwasher detergent must achieve a cleaning performance using the recommended dosage that at least corresponds to a reference detergent in accordance with the standard test developed by the IKW (SOFW journal 06/2016).

If a multifunctional product also has rinse aid and salt functions, the effectiveness of these functions must also be verified in a test.

For the rinse aid function, the materials stainless steel, glass, plastic and porcelain must be used at minimum. The average rinse aid performance must be comparable to or better than that of the reference rinse aid.

The detergent IEC 60436 Type D<sup>15</sup> (dosage 20g) should be used as the reference detergent for testing the cleaning performance.

A cleaning temperature of 45°C or 50°C and a rinse temperature of 55°C should be used.

The rinse aid IEC 60436 Formula III KS-C (acid)<sup>16</sup> should be used as the reference rinse aid for testing the rinse aid function.

A cleaning temperature of 45°C or 50°C and a rinse temperature of 65°C should be used.

#### **2.1 Evaluation of the cleaning performance:**

The cleaning performance is considered acceptable when it fulfils one of the following alternatives:

##### **A) All 7 soils are tested:**

A1) The tested product cleans the soiled items as well as or better than the reference product in all 4 soil classes (bleachable, persistent/alkali-sensitive, starchy/amylase-sensitive, proteinaceous, protease-sensitive) – meaning that the results for each soil class are as good as or better than the reference product for each soil class.

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<sup>15</sup> <http://www.testmaterial.com/en/products/detergents/detergents-dw/>

<sup>16</sup> <http://www.testgewebe.de/en/products/detergents/detergents-dw/ks/>

**Table 1:** Examples for the test results.

Soil class	Soil	Reference	Product 1	Product 2
Bleachable	Black tea	7.1	8.3	7.1
Persistent/alkali-sensitive	Milk (or milk skin)	6.2	8.4	6.3
Starchy/amylase-sensitive	Starch mix	85%	<b>80%</b>	90%
	Pasta	7.0	<b>6.4</b>	8.2
Proteinaceous protease-sensitive	Egg yolk	80%	82%	80%
	Minced meat	7.9	9.0	<b>7.8</b>
	Crème Brûlée	8.1	8.1	<b>7.2</b>

Product 1 does **not** satisfy the criteria because the results for **both** soils in soil class "starchy/amylase-sensitive" are worse than those for the reference product.

Product 2 satisfies the criteria, as in each soil class the result for at least one soil is as good as or better than for the reference product.

A2) The **average value** for all 7 soils for the tested product is better than the average value for the reference product. For this purpose, the results first need to be standardised to achieve a comparative basis.

**Table 2:** Examples for the test results.

Soil class	Soil	Reference	Reference (standardised to 1 to 10)	Product 3	Product 3 (standardised to 1 to 10)
Bleachable	Black tea	7.1	7.1	7.1	7.1
Persistent/alkali-sensitive	Milk (or milk skin)	7.7	7.7	<b>7.5</b>	<b>7.5</b>
Starchy/amylase-sensitive	Starch mix	85%	8.5*	<b>82%</b>	<b>8.2*</b>
	Pasta	7.0	7.0	<b>6.7</b>	<b>6.7</b>
Proteinaceous protease-sensitive	Egg yolk	80%	8.0*	82%	8.2*
	Minced meat	7.9	7.9	9.0	9.0
	Crème Brûlée	8.1	8.1	8.2	8.2
Average			<b>7.76</b>		<b>7.84</b>

\* percent value / 10

Product 3 satisfies the criteria because the average value for all soils is better than the average value for the reference product.

### B) Only 4 soils are tested:

If only 4 soils are tested, these must be black tea, starch mix, egg yolk and milk (or alternatively milk skin). The tested product cleans as well as or better than the reference product for **all** 4 soils. Calculating an average value for the 4 results in comparison to the reference product is not permitted.

### **3) Rinse aid**

For rinse aid, only the rinse aid performance must be demonstrated by testing at a cleaning temperature of 45° or 50°C and a rinse temperature of 65°C. The reference rinse aid IEC 60436 Formula III KS-C (acid) should be used as reference. The detergent IEC 60436 Type D (dosage 20g) should be used as the reference detergent. The test should be carried out at a water hardness of 8-10 °d. The materials stainless steel, glass, plastic and porcelain must be used at minimum. The average rinse aid performance must be comparable to or better than that of the reference rinse aid.

**Table 3: Summary**

	Monofunctional dishwasher detergent	Multifunctional dishwasher detergent	Multifunctional dishwasher detergent	Rinse aid
Test criterion	Cleaning performance	Cleaning performance	Rinse performance	Rinse performance
Detergent	Test product	Test product	Test product	IEC 60436 Type D (dosage 20g)
Reference detergent	IEC 60436 Type D (dosage 20g)	IEC 60436 Type D (dosage 20g)	IEC 60436 Type D (dosage 20g)	IEC 60436 Type D (dosage 20g)
Rinse aid	-*	Is part of the test product	Is part of the test product	Test product
Reference rinse aid	-*	-*	IEC 60436 rinse aid Formula III KS-C (acid)	IEC 60436 rinse aid Formula III KS-C (acid)
Cleaning temperature	45°C or 50°C	45°C or 50°C	45°C or 50°C	45°C or 50°C
Rinse temperature	55°	55°	65°	65°
Water hardness	8 – 10 °d	Highest water hardness indicated on the sales packaging (usually 21° d)	Highest water hardness indicated on the sales packaging (usually 21° d)	8 – 10 °d
Test conditions	IKW standard test (sofwjournal 06/2016)	IKW standard test (sofwjournal 06/2016)	At minimum the materials stainless steel, glass, plastic and porcelain	At minimum the materials stainless steel, glass, plastic and porcelain
Evaluation	See 2.1	See 2.1	Rinse aid performance on average comparable to or better than reference	Rinse aid performance on average comparable to or better than reference

\* According to the IKW regulation, the use of rinse aids is optional when determining the cleaning performance, but is usually not used by the test laboratories