

BLUE ANGEL

The German Ecolabel



Low-Emission Interior Wall Paints

DE-UZ 102

Basic Award Criteria

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Version 3

The Environmental Label is supported by the following four institutions:



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.



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.

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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 German 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 this requirement.

1.2 Background

Emulsion paints are used as large-surface coating materials for interior ceilings and walls. According to production statistics, around 581,010 tons of emulsion paints were produced in Germany in 2016, 430,000 tons of which (valued at 531 million Euros) were used in Germany for interior painting.

Water-based wall paints have generally been protected against microbial attacks up to now by adding in-can preservatives, i.e. preservatives that ensure the stability of the paint in the container until its application and then lose their effect. The substances and concentrations that were approved for use in paints awarded the Blue Angel were limited from the very beginning. In the past, the most commonly used in-can preservative was a mixture of the isothiazolinones methylisothiazolinone (MIT) and benzisothiazolinone (BIT), whereby the permitted dose for products awarded the Blue Angel was far below the permitted limit according to the Biocidal Products Regulation (BPV). An increasing level of sensitivity amongst the general public triggered by the use of isothiazolinones in cosmetics and cleaning agents has led to a new assessment of MIT by the RAC (Risk Assessment Committee) at the European Chemicals Agency, which has resulted in stricter labelling requirements. In the case of wall paints, there is evidence that already presensitised people can suffer an allergic reaction in rare cases simply by being present in a freshly painted room. The debate surrounding isothiazolinones and the lack of any suitable alternatives mean that some manufacturers are producing preservative-free wall paints. In order to protect consumers, these new Basic Award Criteria for the Blue Angel for wall paints thus no longer permit the use of biocides (neither in-can nor film preservatives).

Film preservatives, i.e. preservatives that combat microorganisms in the paint applied to the wall over a long period of time, were not permitted from the very beginning.

As other wall paints with similar properties to low-emission emulsion paints are also available on the market, such as emulsion paints in powder form or silicate emulsion paints (with a proportion of plastic dispersion), they have now been included in the scope of validity for these Basic Award Criteria.

1.3 Objectives of the environmental label

Wall paints are used as large-surface coating materials for interior ceilings and walls. Due to their large-scale application, the emissions from the wall paints should be kept as low as possible from an environmental and health perspective.

The environmental label is designed for the labelling of low-emission products. The environmental label places requirements on the raw materials and substances added during production, as well as on the usage phase and disposal of the containers and any residual paint left in the container. In addition, proper application of the products is also important.

The environmental label for "Low-Emission Interior Wall Paints" may be awarded to products that – above and beyond the legal regulations:

- are manufactured using raw materials and substances that place less burden on the environment
- do not contain any substances that could have significant diverse effects during the intended use of the product

Therefore, the following benefits for the environment and health are stated in the explanatory box:



1.4 Definitions and abbreviations

BIT Benzisothiazolinone

CIT Chlormethylisothiazolinone

Constituent components

are substances added to the product as such or as part of a mixture in order to achieve or influence certain product properties and those required as chemical cleavage products for achieving the product properties. This does not apply to residual monomers that have been reduced to a minimum.

MIT Methylisothiazolinone

Product-type (PT) 6 Preservatives for products during storage:

Products used for the preservation of manufactured products, other than foodstuffs, feeding stuffs, cosmetics or medicinal products or medical devices by the control of microbial deterioration to ensure their shelf life. Products used as preservatives for the storage or use of rodenticide, insecticide or other baits.

Product-type (PT) 7 Film preservatives:

Products used for the preservation of films or coatings by the control of microbial deterioration or algal growth in order to protect the initial properties of the surface of materials or objects such as paints, plastics, sealants, wall adhesives, binders, papers, art works.

Product-type (PT) 10 Construction material preservatives:

Products used for the preservation of masonry, composite materials, or other construction materials other than wood by the control of microbiological and algal attack.

SVOC Semi Volatile Organic Compound, retention range >C16-C22

TiO₂ Titanium dioxide

TVOC_{spez} Sum of all individual substances found $\geq 5 \mu\text{g}/\text{m}^3$ in the retention range C6 – C16 (total volatile organic compounds)

TSVOC Sum of all individual substances $\geq 5 \mu\text{g}/\text{m}^3$ in the retention range > C16 – C22.

VOC Volatile Organic Compounds, retention range C6-C16

VVOC Very Volatile Organic Compounds, retention range <C6

2 Scope

These Basic Award Criteria are valid for wall paints according to DIN EN 13300, Point 3, Definitions:

- Emulsion paints according to VdL Guideline 11, also in powder form
- Primers for wall paints according to DIN EN 13300
- Silicate emulsion paints according to DIN 18363
- Paint mixing systems (base paint and pigment pastes)¹

that are intended for use as interior wall and ceiling paint and meet the requirements for class 1-3 wet scrub resistance according DIN EN 13300 and produce a coating thickness of < 400 μm according to DIN EN 1062-1.

The term “wall paints” will be used below to describe those paints that fall under the scope of validity.

The following are excluded:

- Wall paints in the sense of these Basic Award Criteria that require labelling according to the German Ordinance on Hazardous Substances (GefStoffV)
- Wall paints in the sense of these Basic Award Criteria that contain biocides, i.e. architectural paints according to VdL Guideline 01 that are intended for use outside (façade paints)
- Varnishes
- Primers for non-mineral subsurfaces²

¹ If the base paint or a wall paint is toned using a pigment paste that does not conform to the Blue Angel, the toned paint no longer complies with the criteria for the Blue Angel.

- Emulsion varnishes
- Other coating materials with paint properties
- Pickling solutions
- Fillers
- Waxes
- Printing inks
- Wall paints that provide a function, such as thermal insulating paints, anti-graffiti paints, anti-mould paints, formaldehyde scavenger paints, etc.
- Pigment pastes

3 Requirements

3.1 General substance requirements

Observance of European and German chemical law, as well as standard rules for the sector, is a prerequisite (especially the REACH Regulation Annex XVII, POP Regulation Annex I, CLP Regulation, the German Ordinance on Banned Chemicals (ChemVerbotsV), Directives on CFCs and Fluorinated greenhouse gases, the Decopaint Directive, the German Ordinance on Hazardous Substances (GefStoffV), VdL Guideline 01, Directive 92/112/EEC, the 25th German Federal Immission Protection Ordinance (BImSchV), the Biocidal Products Regulation (BPV) and the German Packaging Act (VerpackG)).³

The ready-to-use products (wall paints) may not contain any substances with the following properties as a constituent component⁴:

- a) Substances which are identified as particularly alarming under the European Chemicals Regulation REACH (1906/2006/EC) and which have been incorporated into the list drawn up in accordance with Article 59, Paragraph 1 of the REACH Regulation (so-called "SVHC list of candidates"). The version of the list of candidates at the time of application is valid.⁵
- b) Substances that according to the CLP Regulation (EC) No. 1272/2008 have been classified in the following hazard categories or which meet the criteria for such classification⁶:
 - ♦ acutely toxic (poisonous) in categories Acute Tox. 1, Acute Tox. 2 or Acute Tox. 3
 - ♦ toxic to specific target organs in categories STOT SE 1, STOT SE 2, STOT RE 1 or STOT RE 2
 - ♦ carcinogenic in categories Carc. 1A, Carc. 1B or Carc. 2⁷

² These products fall under the scope of DE-UZ 12a or DE-UZ 113

³ If substance restrictions from other regulations also apply to the specific product, these also need to be observed.

⁴ Constituent components are substances added to the wall paint as such or as part of a mixture in order to achieve or influence certain product properties and those required as chemical cleavage products for achieving the product properties. This does not apply to residual monomers that have been reduced to a minimum.

⁵ The list of candidates in its relevant version can be found at: REACH list of candidates.

⁶ The harmonized classifications and labellings of dangerous substances can be found in Annex VI, Part 3 of the CLP Regulation. Furthermore, a comprehensive classification and labelling inventory, which also includes all of the self-classifications of hazardous substances made by manufacturers, has been made available to the public on the website of the European Chemicals Agency: ECHA classification and labelling inventory and other substance lists, such as SIN; ETUC, EDCs, etc.

- ♦ germ cell mutagenic in categories Muta. 1A, Muta. 1B or Muta. 2
- ♦ reprotoxic (teratogenic) in categories Repr. 1A, Repr. 1B or Repr. 2
- ♦ hazardous to water in categories Aquatic Acute 1, Aquatic Chronic 1 or Aquatic Chronic 2

hazardous to the ozone layer in category Ozone 1

The corresponding H phrases for the hazard classes and categories can be found in Appendix A.

c) Substances that are classified in TRGS 905⁸ as:

- ♦ carcinogenic (K1A, K1B, K2),
- ♦ mutagenic (M1A, M1B, M2)
- ♦ reprotoxic (R_F1A, R_F1B, R_F2, R_D1A, R_D1B, R_D2)

Compliance Verification:

The applicant shall declare compliance with the requirements in Annex 1. In addition, the applicant shall state the brand names and suppliers of the individual primary/intermediate products for the wall paints, as well as their proportions and functions in the manufactured wall paint (Annex 4 for white wall paints and base paints, Annex 4a or 4b for coloured wall paints). In the case of paint mixing systems (tinting systems), Annex 4 should be enclosed for the base paints and Annex 4b for the entire system.

The pH value of the wall paint or the base paint shall be stated in Annex 4.

To comply with the requirements, declarations from the manufacturer or distributor of the primary/intermediate products (Annex R), as well as the corresponding safety data sheets⁹ for the primary/intermediate products used (Annex 5) and the wall paint (Annex 10), must be submitted.

3.2 Special requirements for specific substances

3.2.1 Pigments

Pigments containing lead compounds may not be added to the wall paint. The pigment may not contain more than 200 ppm of lead as process-related, technically unavoidable (natural or production-related) impurities.

3.2.2 Alkylphenol ethoxylates

Products containing alkylphenol ethoxylates (APEO) and/or their derivatives may not be added to the wall paint and the raw substances.

⁷ Except titanium dioxide, if the product is sold as a liquid mixture because its classification only applies to inhalable powders.

⁸ TRGS 905, directory of carcinogenic, mutagenic or teratogenic substances from the Committee for Hazardous Substances (AGS): TRGS 905. The current version at the time of application is valid (08/05/2018). The TRGS lists such CMR substances that have not received harmonised classifications up to now or where the AGS has come to a different classification. The CMR complete list published by the Institute for Occupational Safety and Health of the German Social Accident Insurance can also be used as a reference tool: CMR complete list.

⁹ In accordance with Annex II of Directive (EC) No. 1907/2006.

3.2.3 Plasticisers

Products that contain plasticising substances from the group of phthalates or group of organophosphates or other comparable substances with a high boiling point may not be added to the low-emission wall paints (except for plasticisers in the sense of VdL Guideline 01¹⁰). This requirement is considered to be fulfilled if the plasticiser content in the end product does not exceed 1 g/l.

3.2.4 Perfluorinated and polyfluorinated chemicals

It is not permitted for any perfluorinated or polyfluorinated chemicals (PFC), such as fluorocarbon resins and fluorocarbon emulsions, perfluorinated surfactants, perfluorinated sulfonic and carboxylic acids, and substances that could be broken down into these chemicals to be added to the product. This also applies to primary/intermediate products treated with PFCs.

3.2.5 Labelling of environmental and health hazards

Substances with other hazardous properties in concentrations that result in classification and labelling of the end product with a GHS hazard pictogram for health and environmental hazards may not be added to the wall paint.

Verifications for Paragraphs 3.2.1 to 3.2.5

The applicant shall declare compliance with the requirements in Annex 1. In addition, the applicant shall state the brand names and suppliers of the individual primary/intermediate products for the wall paints, as well as their proportions and functions in the manufactured wall paint (Annex 4 for white wall paints and base paints, Annex 4a or 4b for coloured wall paints). In the case of paint mixing systems (tinting systems), Annex 4 should be enclosed for the base paints and Annex 4b for the entire system.

The pH value of the wall paint or the base paint shall be stated in Annex 4.

To comply with the requirements, declarations from the manufacturer or distributor of the primary/intermediate products (Annex R), as well as the corresponding safety data sheets⁹ for the primary/intermediate products used (Annex 5) and the wall paint (Annex 10), must be submitted.

3.3 Volatile organic compounds

The VOC content (VOC - Volatile Organic Compounds) of the wall paint according to Paragraph 2 in its ready-to-use form (this also applies e.g. to paint mixing systems) may not exceed a maximum value of 700 ppm. The term VOC covers all organic substances (e.g. residual monomers, solvents, film-forming aids, preservatives and other production-related accompanying substances) that following total evaporation and subsequent gas chromatographic analysis are eluted at retention times lower than that of tetradecane (boiling point: 252.6°C) on a non-polar separation column.

¹⁰ Guideline on the declaration of paints, lacquers, varnishes, renders, fillers, primers and related products (VdL Guideline 01), <http://www.wirsindfarbe.de/service-publikationen/vdl-richtlinien/>

Compliance Verification

The applicant shall declare compliance with the requirement in Annex 1 and submit the test report¹¹ in accordance with the DIN EN ISO 17895 test method (determination of the in-can VOC content in water-soluble emulsion paints) or according to DIN EN ISO 11890-2 (Paints and varnishes – determination of the volatile organic compound (VOC) content) by a testing institution accredited for the relevant method according to DIN EN ISO/IEC 17025 (Annex 2). In addition, the applicant shall submit the corresponding certificate or accreditation from the German Accreditation Council (DAR) or another accreditation system listed in the multinational agreement (MLA) (Annex 3). If testing is carried out according to DIN EN ISO 11890-2, the testing laboratory must verify a detection limit of 100 ppm¹².

3.4 Semi-volatile organic compounds

The SVOC content (SVOC - Semi-Volatile Organic Compounds)¹³ of the wall paint according to Paragraph 2 in its ready-to-use form (this also applies e.g. to paint mixing systems) may not exceed a maximum value of 500 ppm.

Compliance Verification

The applicant shall state the SVOC content for the ready-to-use product and submit the test report according to the method described in ISO 11890-2 / CEPE guidance 2015-10-26¹⁴ (Appendix) (Annex 2). In addition, the applicant shall submit the corresponding certificate or accreditation from the German Accreditation Council (DAR) or another accreditation system listed in the multinational agreement (MLA) (Annex 3).

3.5 Preservation

In wall paints and paint mixing systems according to Paragraph 2, the use of in-can and film preservatives is not permitted.¹⁵

The isothiazolinone content in the wall paints and paint mixing systems according to Paragraph 2 in their ready-to-use form must not exceed the following individual limits:

- ♦ BIT ≤ 10 ppm
- ♦ MIT < 1.5 ppm
- ♦ CIT < 0.5 ppm
- ♦ All other isothiazolinones < 2 ppm based on the individual substance
- ♦ Free formaldehyde < 10 ppm

It is only permitted to use preservatives in the primary/intermediate products if they do not have any preservative effect in the end product. These wall paints must be labelled with the phrase "may contain traces of preservatives" on the container and the technical data sheet.

¹¹ Test reports must not be more than 2 years old at the time the application is submitted.

¹² This sentence is not required with the new standard if the verification limit is 100 ppm.

¹³ Semi-volatile organic compounds (SVOC) are all volatile organic compounds with a boiling point above 250 °C and below 370°C at a standard pressure of 101.3 kPa, which elute in a capillary column in a retention time window from n-Tetradecane (C₁₄H₃₀) to n-Docosane (C₂₂H₄₆).

¹⁴ If ISO 11890-2 is subsequently adopted, the test must be carried out according to this standard.

¹⁵ Product-type 6, product-type 7 and product-type 10 according to Regulation (EU) No. 528/2012 concerning the making available on the market and use of biocidal products.

If the product is advertised as a preservative-free wall paint, all individual substances classified as preservatives including formaldehyde must not exceed a limit of 2 ppm, except for CIT < 0.5 ppm and MIT < 1.5 ppm.

Compliance Verification

The applicant shall declare compliance with the requirements in Annex 1 and submit the analytical verification in accordance with Appendix B for isothiazolinones (Annex 7). The applicant shall also determine the free formaldehyde in accordance with Appendix B and submit the test report (Annex 6).

The sealed sample must not have been stored for longer than 20 days at room temperature at the time of the test.

To comply with the requirements, declarations from the manufacturer or distributor of the primary/intermediate products (Annex R), as well as the corresponding safety data sheets⁹ for the wall paint (Annex 10) and the primary/intermediate products used (Annex 5), must be submitted.

3.6 Titanium dioxide pigment

Emissions and waste resulting from the production of titanium dioxide pigments may not exceed the following values¹⁶:

For the sulphate process:

- SO_x calculated as SO₂: 7.0 kg/t of TiO₂ pigment
- Sulphate waste: 500 kg/t of TiO₂ pigment

For the chloride process:

- If natural rutile ore is used, 103 kg chloride waste/t of TiO₂ pigment
- If synthetic rutile ore is used: 179 kg chloride waste/t of TiO₂ pigment
- If slag ore is used: 329 kg chloride waste/t of TiO₂ pigment
-

If more than one type of ore is used, the values apply in proportion to the quantities of the individual types of ore used.

Note: SO_x emissions only apply to the sulphate process.

The definition of waste given in Article 3 of the Waste Framework Directive 2008/98/EC of the European Parliament and of the Council applies¹⁷. If the TiO₂ producer can satisfy Article 5 (by-product production) of the Waste Framework Directive for solid waste, this waste will be exempted.

Compliance Verification

The applicant shall declare compliance with the requirement in Annex 1. In addition, the applicant shall state the trade names and suppliers for all titanium dioxide pigments (raw materials), as well as their percentage in the manufactured wall paint (Annex 4).

To verify compliance with this requirement, the applicant shall also submit declarations from the manufacturers or distributors of the titanium dioxide pigments (Annex T).

¹⁶ Derived from the Best Available Techniques Reference Document for the Production of Large Volume Organic Chemicals (BREF) (August 2007).

¹⁷ Directive 2008/98/EC of the European Parliament and of the Council of 19 November 2008 on waste and repealing certain Directives (OJ L 312 from 22/11/2008, p. 3).

3.7 Special requirements

3.7.1 Fitness for use

The wall paint according to Paragraph 2 must fulfil the usual quality requirements with respect to fitness for use for the respective product group (e.g. adhesion, hardness, drying properties, light fastness, elasticity, and, where applicable, surface resistance to household chemicals and wet scrub resistance according to existing DIN standards).

The specified spreading rate must not be $\geq 1\text{m}^2/\text{l}$ higher than the specified coverage capacity. The spreading rate¹⁸, wet abrasion resistance class and coverage capacity¹⁸ of the wall paint must be stated on the container.

Compliance Verification

The applicant shall declare compliance with the requirement in Annex 1 and submit the corresponding technical data sheet (Annex 8) and the container text (Annex 9).

3.7.2 Advertising claims

- The type of paint according to Paragraph 2 must be stated on the container together with the product designation. The binder base must also be stated on the technical data sheet.
- Advertising claims that are likely to result in the emulsion paint being confused with other coating systems and any product designations containing terms such as "Bio", "Eco", "Natural", "Wood protection", "Fungal" "Insect" or "Nano" as part of the name or description are not permitted.
- Advertising claims must not include any information such as "tested for its biological living quality" or claims in the sense of Article 25 (4) of the CLP Regulation (EC) No. 1272/2008 that could play down the risks such as e.g. "non-toxic", "non-harmful to health" or similar claims. An exception is the phrase "preservative-free"¹⁹, see here Paragraph 3.5.

Compliance Verification

The applicant shall declare compliance with the requirement in Annex 1 and submit the corresponding technical data sheet (Annex 8) and the container text (Annex 9).

3.7.3 Information on the container and the technical data sheet

In addition to the obligatory P-phrases in accordance with the CLP Regulation (EC) No. 1272/2008, the following information must also be stated on the container and the technical data sheet in an easy to read form (comparable wording / P-phrases are permitted):

- "Keep out of the reach of children."
- "Ensure good ventilation during application and drying."
- If the product can be applied by spraying: "Use an A2/P2 combination filter and protective goggles for the spray mist."
- "Do not eat, drink or smoke when handling the wall paint."
- "Wear protective goggles if there is a risk of spraying."
- "In case of contact with skin or eyes, rinse immediately with plenty of water."

¹⁸ Only for white wall paints

¹⁹ According to VdL Guideline 01.

- "If the base paint or a wall paint is toned using a pigment paste or toning paste that does not conform to the requirements of the Blue Angel, the toned paint no longer complies with the criteria for the Blue Angel."²⁰
- If the product is not advertised as being preservative-free: "May contain traces of preservatives."
- "Do not allow to enter drains, water bodies, ground or soil."
- "Clean tools with plenty of water and soap immediately after use."
- "Only pass on empty containers for recycling. Dried product residues can be disposed of as household waste."

The ingredients in the wall paint according to Paragraph 2 must be stated on the technical data sheet in accordance with the "Guideline on the declaration of paints, lacquers, varnishes, renders, fillers, primers and related products" (VdL Guideline 01)¹⁰.

In addition, the container must contain a clear reference to the technical data sheet, information on where it can be found and a telephone number²¹ for the manufacturer or distributor where the consumer can receive further information. The technical data sheet must be available on the Internet on the manufacturer's or distributor's website and/or under the product information on www.blauer.engel.de

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Compliance Verification

The applicant shall declare compliance with the requirement in Annex 1 and submit the corresponding technical data sheet (Annex 8) and the container text (Annex 9).

4 Applicants and Parties Involved

Manufacturers of final 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 (German Environmental Agency) which after the signing of the contract receives all data and documents submitted in applications 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 December 31, 2023.

²⁰ This applies to base paints and white wall paints

²¹ At fixed-line telephone costs

They shall be extended by periods of one year each, unless terminated in writing by March 31, 2023 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 organisations.

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

- Applicant (manufacturer)
- Brand/trade name, product description
- Distributor (label user), i.e. the above-mentioned marketing organisations.

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Appendix A Assignment of hazard categories and hazard statements

The following table assigns the hazard categories stated in Paragraph 3.1 to the corresponding hazard statements (H Phrases) according to the CLP Regulation (EC) No. 1272/2008.

CLP Regulation (EC) No 1272/2008		
Hazard category	Hazard Statements	
	H Statement Codes	Wording
Carcinogenic Substances		
Carc. 1A	H350	May cause cancer.
Carc. 1B	H350	May cause cancer.
Carc. 1A, 1B	H350i	May cause cancer by inhalation.
Carc. 2	H351	Suspected of causing cancer.
Substances classified for Germ Cell Mutagenicity		
Muta. 1A	H340	May cause genetic defects.
Muta. 1B	H340	May cause genetic defects.
Muta. 2	H341	Suspected of causing genetic defects.
Reprotoxic Substances		
Repr. 1A, 1B	H360D	May damage the unborn child.
Repr. 1A, 1B	H360F	May damage fertility.
Repr. 1A, 1B	H360FD	May damage fertility. May damage the unborn child.
Repr. 1A, 1B	H360Df	May damage the unborn child. Suspected of damaging fertility.
Repr. 1A, 1B	H360Fd	May damage fertility. Suspected of damaging the unborn child.
Repr. 2	H361	Suspected of damaging fertility. Suspected of damaging the unborn child.
Repr. 2	H361d	Suspected of damaging the unborn child.
Repr. 2	H361f	Suspected of damaging fertility.
Repr. 2	H361fd	Suspected of damaging fertility. Suspected of damaging the unborn child.
Acutely toxic substances		
Acute Tox. 1 Acute Tox. 2	H300	Fatal if swallowed.
Acute Tox. 3	H301	Toxic if swallowed.
Acute Tox. 1 Acute Tox. 2	H310	Fatal in contact with skin.
Acute Tox. 3	H311	Toxic in contact with skin.
Acute Tox. 1 Acute Tox. 2	H330	Fatal if inhaled.
Acute Tox. 3	H331	Toxic if inhaled.
Substances classified for Specific Target Organ Toxicity		
STOT SE 1	H370	Causes damage to organs.
STOT SE 2	H371	May cause damage to organs.
STOT RE 1*	H372	Causes damage to organs through prolonged or repeated exposure.
STOT RE 2*	H373	May cause damage to organs through prolonged or repeated exposure.

CLP Regulation (EC) No 1272/2008		
Substances classified for Environmental Hazards		
Aquatic Acute 1	H400	Very toxic to aquatic life.
Aquatic Chronic. 1	H410	Very toxic to aquatic life with long lasting effects.
Aquatic Chronic. 2	H411	Toxic to aquatic life with long lasting effects.

* If the classification and toxicological evaluation of the substance is based on the classification of the respirable fraction of the substance (dusts) and does not relate to the substance in general, classification as STOT RE 1 and STOT RE 2 does not represent a criterion for exclusion in accordance with Paragraph 3.1 "Exclusion of Substances". Asbestos-containing dust is excluded from this exemption.

Appendix B Liquid chromatography analysis (HPLC/UV detection) for determining the preservatives (Isothiazolinone) content and determining the free formaldehyde

1 Liquid chromatography analysis (HPLC/UV detection) for determining the isothiazolinone content

Methanol is added to the sample to be analysed and homogenised using a magnetic stirrer. The suspension is then centrifuged and the remaining solution (supernatant) is filtered using a syringe filter unit (pore size: 0.2 µm).

The resulting methanol extract is analysed using liquid chromatography (HPLC/UV detection) and any isothiazolinones present are identified based on their retention times.

The analytical tests for the isothiazolinone content must be performed twice (double determination) and quantified using the method described in the external standard.

If other preservatives are detected during the analysis, these must also be stated in the test report.

2 Determining the free formaldehyde:

Two test methods are permitted:

a) according to the Guideline for the determination of the formaldehyde concentration in water-soluble paints and varnishes, and polymer dispersions ("VdL Guideline 03 on Formaldehyde Determination")²²,

b) the same as a), although the concentration of free formaldehyde in the product can be determined using high pressure liquid chromatography (HPLC) if the testing laboratory can establish the comparability with VdL Guideline 03.

The verification test must be performed twice (double determination).

²² <http://www.wirsindfarbe.de/service-publikationen/vdl-richtlinien/vdl-richtlinie-zur-bestimmung-der-formaldehydkonzentration-in-wasserverduennbaren-beschichtungsstoffe/>

Appendix C Bibliography

- [1]** Decopaint Directive: Implemented in Germany in the "German chemical directive limiting VOC emissions by restricting the sale of paints and varnishes containing solvents (Directive for solvent-based paints and varnishes – ChemVOCFarbV) from 16 December 2004, as amended.
- [2]** 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), as amended.
- [3]** Regulation (EC) 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, in short: CLP Regulation (Classification, Labelling and Packing), as amended.
- [4]** From 1 December 2010, the European Chemicals Agency (ECHA) introduced a classification and labelling inventory ("C&L Inventory") according to Article 113 / 114 of Regulation (EC) No. 1907/2006 of the European Parliament and of the Council of 18 December 2006 (REACH Regulation), see http://echa.europa.eu/clp/c_l_inventory_de.asp
- [5]** TRGS 905, directory of carcinogenic, mutagenic or teratogenic substances from the Committee for Hazardous Substances (AGS), as amended: TRGS 905. The TRGS lists such CMR substances that have not received harmonised classifications up to now or where the AGS has come to a different classification. The CMR complete list published by the Institute for Occupational Safety and Health of the German Social Accident Insurance can also be used as a reference tool: CMR complete list.
- [6]** List of MAK and BAT values, Senate Commission for the investigation of health hazards of chemical compounds in the work area, as amended.
- [7]** DIN 18363 German construction contract procedures (VOB) - Part C: General technical specifications in construction contracts (ATV) - Painting and coating work
- [8]** DIN EN 1062-1 Paints and varnishes - Coating materials and coating systems for exterior masonry and concrete - Part 1: Classification; German version EN 1062-1:2004
- [9]** DIN EN 13300 Paints and varnishes - Water-borne coating materials and coating systems for interior walls and ceilings - Classification; German version EN 13300:2001 + AC:2002
- [10]** DIN EN ISO 11890-2 Paints and varnishes - Determination of volatile organic compound (VOC) content - Part 2
- [11]** DIN EN ISO 17025 General requirements for the competence of testing and calibration laboratories (ISO/IEC 17025:2017)
- [12]** DIN EN ISO 17895 Paints and varnishes - Determination of the volatile organic compound content of low-VOC emulsion paints (in-can VOC) (ISO 17895:2005)
- [13]** VdL Guideline 01: Guideline on the declaration of paints, lacquers, varnishes, renders, fillers, primers and related products, 6th revised version January 2018; publisher: German Paint and Printing Ink Association (Verband der deutschen Lack- und Druckfarbenindustrie e. V.), Frankfurt am Main
- [14]** VdL Guideline 03: Guideline for the determination of the formaldehyde concentration in water-dilutable paints and varnishes, and polymer dispersions
- [15]** VdL Guideline 11: Consumer products
- [16]** Test method for wood-based materials (Federal Health Bulletin, 34, 10 (1991), 488-489)