# BLUE ANGEL

## The German Ecolabel

# Low-Emission Sealants for Interior Use

## DE-UZ 123

**Basic Award Criteria**

**Edition April 2009**

**Version 4**

**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.

Umwelt Bundesamt

The German Environmental Agency with its specialist department for "Ecodesign, Eco-Labelling 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.

Jury Umweltzeichen

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

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.

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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

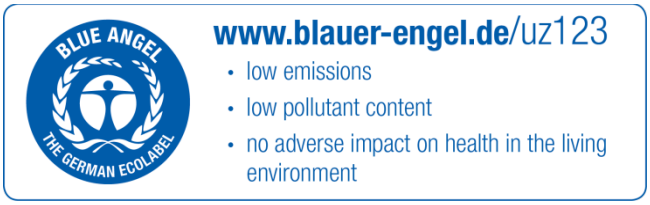
Sealants may pose significant environmental problems at every stage of their life cycle. That is why the requirements for award of the eco-label refer not only to the materials and substances used during manufacture but also to the period of actual use and the after-use disposal of sealants.
In addition to this, the pollutant load of sealants must be low to make sure that emissions from these products are kept as low as possible. Here, the eco-label is a good means to distinguish low-emission products.
To allow the evaluation of emissions from sealants these Award Criteria are set up by analogy with the evaluation scheme developed by the Committee for Health-related Evaluation of Building Products (Ausschuss zur gesundheitlichen Bewertung von Bauprodukten) - a federal and länder committee of experts from German environmental and health authorities.
The Environmental Label for low-emission sealants for interior applications may be awarded to products which - beyond the legal provisions –

- distinguish themselves by an environmentally compatible manufacture,
- from the health point of view do not have an adverse impact on the living environment

and

- do not contain any hazardous substances that might well impede recycling.

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



## 2 Scope

These Award Criteria apply to sprayable and plastically processable sealants in accordance with DIN EN 26 927 (jointing products, sealants): products which are filled into joints to seal the latter by making complete contact to the joint flanks.
These Award Criteria only apply to sealants that are designed for interior use. Included are sealants for surface application.
Accordingly, these Award Criteria apply to[1]:

- water-based, acetate-based silicone joint sealants and neutral curing silicones (except for oxime curing systems),
- acrylate-based joint sealants.

## 3 Requirements

The Environmental Label shown on page 1 may be used for the marking of products under paragraph 2, provided that they comply with the following requirements:

### 3.1 Manufacture

#### 3.1.1 General Substance Requirements

The materials used in the manufacture of a sealant may not contain any substances or preparations[2] as constituent components with the following properties:

a) Substances that have been identified as substances of very high concern under the Chemicals Regulation REACH (EC/1907/2006) and have been included on the list draw up in accordance with Article 59 (1) of the REACH Regulation (so-called "candidate list").[3]

b) Substances that are classified in the following hazard classes and categories in accordance with the criteria of Regulation (EC) No 1272/2008 or meet the criteria for such classification:[4,5]

- Acute toxic of category Acute Tox. 1, Acute Tox. 2 or Acute Tox. 3
- Specific target organ toxicity of category STOT SE 1 or STOT RE 1
- Carcinogenic of category Carc. 1A, Carc. 1B or Carc.2
- Mutagenic of category Muta. 1A, Muta. 1B or Muta. 2
- Reprotoxic of category Repr. 1A, Repr. 1B, Repr. 2

The H statements (R phrases) corresponding to the hazard classes and categories can be seen from Appendix B.

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[1] On the proposal of the Federal Environmental Agency the Environmental Label Jury may include additional sealants within the scope of the Award Criteria.

[2] Terms within the meaning of Section 3, Nos. 1-4, Publication of the Revised Version of the German Chemicals Act of 20 June 2002, last amended on 13 May 2004 (German Federal Law Gazette I, page 934)

[3] The Candidate List, as amended at the time of application, shall be applicable. For the current version of the Candidate List please go to: http://echa.europa.eu/chem_data/authorisation_process/candidate_list_table_en.asp.

[4] The harmonised classifications and labelling of hazardous substances can be seen from Part 3 of Annex VI to the CLP Regulation. Moreover, the European Chemicals Agency's (ECHA) website provides public access to a comprehensive classification and labelling inventory which also includes the manufacturers' self-classifications of hazardous substances: ECHA Einstufungs- und Kennzeichnungsverzeichnis (Classification & Labelling Inventory).

[5] Here, substances with additional hazardous properties are not excluded but reduced by an emission assessment (see paragraph 3.1.1).

c) Substances that are classified in TRGS 905[6] as
- carcinogenic (K1, K2, K3)
- mutagenic (M1, M2, M3)
- reprotoxic ($R_F1$, $R_F2$, $R_F3$);
- teratogenic ($R_F1$, $R_E2$)

d) Substances that are classified in the MAK Value List[7] as:
- carcinogenic working materials of category 1 or category 2
- germ-cell mutagenic working materials of category 1 or category 2

***Compliance Verification:***

*The applicant shall establish compliance with the requirements under para. 3.1.1 by submitting a declaration from the suppliers (Annex 2 to the Contract pursuant to DE-UZ 123). In addition to this, the applicant shall submit a paper (Annex 3 to the Contract pursuant to DE-UZ 123) listing trade names and suppliers of all individual products (raw materials) and present the suppliers' Safety Data Sheets in German and English.*

### 3.1.2 Preservation

The sealants under paragraph 2 may not contain any biocides except for the microbicides listed in Annex 1 to Award Criteria DE-UZ 123 used as in-can preservatives or to protect sanitary silicones against attack by mould in the contents listed therein.

***Compliance Verification:***

*The applicant shall declare compliance with the requirement in Annex 1 to the Contract pursuant to DE-UZ 123.*

### 3.1.3 Pigments

Pigments containing lead, cadmium or chromium VI compounds as constituent elements shall not be added to the sealant.
Process-related, technically unavoidable (natural or production-related) impurities may be contained in the raw material up to 100 ppm, or, with regard to lead, up to 200 ppm.

***Compliance Verification:***

*The applicant shall submit a declaration from its pre-suppliers (Annex 4 to the Contract pursuant to DE-UZ 123).*

### 3.1.4 Plasticizers

No plasticizing substances from the class of phthalates may be used in the manufacture of sealants.

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[6] TRGS 905, List of carcinogenic, mutagenic or reprotoxic substances of the Committee on Hazardous Substances (AGS): TRGS 905. The TRGS 905 list , as amended at the time of application, shall be applicable. The total CMR list of the statutory accident insurance may also be used as a tool. (Combined list of CMR substances according to CLP Regulation and TRGS 905): CMR-Gesamtliste.

[7] MAK and BAT Values list, the Senate Commission for the Investigation of Health Hazards of Chemical Compounds. Last modified by message 48 (2012). It is the currently valid version at the time of the application.

***Compliance Verification:***

*The applicant shall declare compliance with the requirement in Annex 1 to the Contract pursuant to DE-UZ 123. In the event of detection, the content of phthalates is to be determined by extraction of a sample in a Soxhlet apparatus and subsequent analysis by use of GC/MS. The quantitative determination of the target substances is achieved by using an internal standard and a reference compound. The cured sealant shall not contain more than 0.1 percent by mass of phthalates as impurities.*

### 3.1.5 Organotin Compounds

If organotin compounds are used as catalysts in the curing reaction the following requirements must be met:

- The product may contain only those organotin compounds that are listed in "Bedarfgegenständeverordnung" (Ordinance on Food and Other Commodities)[8], except for dibutyl tin compounds.

***Compliance Verification:***

*The applicant shall declare compliance with the requirement in Annex 1 to the Contract pursuant to DE-UZ 123.*

- Impurities of tributyl and dibutyl tin compounds (TBT/DBT) in the catalyst must not exceed 0.1 percent.

***Compliance Verification:***

*The applicant shall submit a corresponding declaration from its pre-suppliers (Annex 5 to the Contract pursuant to DE-UZ 123).*
*In the event of detection, the content of TBT/DBT is to be determined by extraction of a sample with n-hexane, alkylation with pentyl magnesium bromide or sodium tetraethyl borate and subsequent analysis by use of GC-FPD, GC-AED, GC-MS or LC-MS. The quantitative determination of the target substances shall be done by using an internal standard and a reference compound.*

### 3.1.6 Additional Requirements for Sealants that may come into contact with Food and Drinking Water

Sealants that may come into contact with food (e.g. kitchen silicone) and/or drinking water and which are identified as such on the container or in the Technical Data Sheet must be accompanied by a current test certificate from a certified testing laboratory.

***Compliance Verification:***

*For sealants that may come into contact with food (commodities within the meaning of the "Food and Other Commodities Act") the applicant shall submit a current test certificate in accordance with the corresponding plastics recommendation of the „Bundesinstitut für Risikobewertung" (Federal Institute for Risk Assessment). For sealants that may come into contact with drinking water the applicant shall submit a current test certificate according to*

[8] BGBl (Federal Law Gazette) I 1992, 866; revised by publication of 23 December 1997; 1998 I 5; last amended by Article 1 V of 13 July 2005 I 2159

*KTW-Empfehlung (Plastics and Drinking Water Recommendation) and DVGW-Working Sheet W 270 (DVGW - German Association for the Gas and Water Sector).*

## 3.2 Use

### 3.2.1 Indoor Air Quality

The products under para. 2 must not exceed the following emission values in the test chamber by analogy with the „health risk assessment process for emissions of volatile organic compounds (VOC) from building products" developed by the Committee for Health-Related Evaluation of Building Products[9].

Table 1: Emission Values

| Substance | 3rd day | Final Value[10] (28th day) |
|---|---|---|
| Total organic compounds within the retention range $C_6 - C_{16}$ (TVOC)[11] | < 2000 µg/m³ | < 300 µg/m³ |
| Total organic compounds within the retention range > $C_{16} - C_{22}$ (TSVOC) | - | < 30 µg/m³ |
| C-Substances [12] | < 10 µg/m³ **Total** | < 1 µg/m³ **per single value** |
| Total VOC without LCI [13,14] | - | < 100 µg/m³ [15] |
| R-Value [13] | - | < 1 14 |
| Formaldehyde | - | < 0.05 ppm |
| Other aldehydes [16] | - | < 0.05 ppm |

[9] The requirements for VOC emissions are aimed at limiting the contribution of joint sealants to the VOC content of the indoor air to 300 µg/m³ after 28 days in an average-sized living room with an air change of 0.5/h.

[10] Testing shall be done in test chambers with a volume of 20 l to 1 m³ and an area-specific flow rate of 44 m³/m² h. The sealant mass is inserted into inert glass or stainless steel sections (section width = 10 mm, thickness of the sealant layer = 3 mm).

[11] When measuring the emissions of methanol-releasing silicone sealants an additional measurement shall be made to determine the methanol emission by means of GC/MS by use of a proper adsorbent and included into the calculation of the TVOC value.

[12] C-Substances = cancerogenic substances classified according to Directive 67/548/EEC or TRGS 905, each as amended, pursuant to Cat. K1 and K2.

[13] including the non-identifiable substances.

[14] LCI - Lowest Concentration of Interest cf. "Health risk assessment process for emissions of volatile organic compounds (VOC) from building products", Homepage of the Umweltbundesamt (Federal Environmental Agency): http://www.umweltbundesamt.de, http://www.umweltdaten.de/daten/bauprodukte/agbb.pdf

[15] During the first term of the Basic Criteria the total VOC without LCI is determined by the testing laboratories and indicated in the test report but even if the limits are exceeded this will not result in a refusal. The hearing on the revision of these Basic Criteria will decide on the adoption of these data taking the results into consideration.

[16] Other aldehydes which may be determined by using a BAM test method (Method for the measurement of emissions of formaldehyde and other volatile compounds). Aldehydes can also be determined by use of the DNPH method (DIN ISO 16000-3).

The test may be stopped prematurely (but not before the 7th day after charging) if on each of four consecutive measurement days the admissible emission values are not exceeded and if during this period none of the substances to be detected shows a rise in concentration.

***Compliance Verification:***

*The applicant shall submit a test report pursuant to the BAM Test Method[17] (Method for the detection of emissions of volatile compounds for award of the eco-label according to DE-UZ 113) based on the two Standards ENV 13419-1 and ENV 13419-2[18] issued by a testing laboratory recognized for this test by BAM Bundesanstalt für Materialforschung und Prüfung (Federal Institution for Material Research and Testing) (Annex 2 to the Award Criteria pursuant to DE-UZ 123) which confirms compliance with this requirement.*

### 3.2.2 Serviceability

The sealants must meet the usual quality standards for serviceability taking into account the standards DIN 53 504 (Determination of tensile strength at break, tensile stress at yield, elongation at break and stress values in a tensile test) and DIN 53 505 (Hardness test) as well as the usual requirements for processability, e.g. considering DIN ISO 2137 (Lubricating grease and petrolatum - Determination of cone penetration).
In addition, the admissible total deformation shall be determined and indicated on the container.

***Compliance Verification:***

*The applicant shall declare compliance with the requirements in Annex 1 to the Contract pursuant to DE-UZ 123 and submit a test report including a tensile stress diagram according to IVD Magazine No. 2 of March 1999.*

## 3.3 Recycling and Disposal

With regard to recycling and disposal neither material protection agents (fungicides, insecticides, flame-retardants) nor halogenated organic compounds may be added to sealants. Exempted are fungicides according to para. 3.1.2 which are exclusively used for in-can preservation and to protect sanitary silicones against attack by mould as well as flame retardants using inorganic ammonium phosphates (diammonium phosphate, ammonium polyphosphate etc.), other water-releasing minerals (aluminium trihydrate or the like) or expandable graphite for flame retarding purposes.

***Compliance Verification:***

*The applicant shall declare compliance with the requirement in Annex 1 to the Contract pursuant to DE-UZ 123.*

## 3.4 Declaration and Consumer Information

Container text shall indicate the type of sealant in connection with the production designation. The Technical Data Sheets shall additionally indicate the curing system.

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[17] Official Journal of BAM - Bundesanstalt für Materialforschung und -prüfung (Federal Institution for Material Research and Testing), vol. 33 (2/2003), page 160 ff.

[18] ENV 13419 - Determination of the emission of volatile organic compounds (VOC); Part 1: Emission Test Chamber Method and Part 2: Emission Test Cell Method

Container text and Technical Data Sheet shall include the following easy-to-read instructions (similar wording shall be permissible):

- „Keep out of the reach of children“
- „Ensure proper ventilation during and after application“
- „When using the sealant do not eat, drink or smoke“
- „In case of contact with eyes or skin, rinse immediately with plenty of water“
- „Sealant contains:…… (indication of the name(s) of the preservative agent(s) according to Annex 1, No. 1) and should not come into contact with food or drinking water; Information for allergic persons, please call at ……“

Also, the container text shall distinctly refer to the Technical Data Sheet, contain information where the latter can be obtained and give the manufacturer's telephone number where consumers may obtain additional information.

***Compliance Verification:***

*The applicant shall declare compliance with the requirements in Annex 1 to the Contract pursuant to DE-UZ 123 and submit the corresponding Technical Data Sheet as well as the container text.*

### 3.5 Advertising Messages

Advertising messages shall not include any statements which within the meaning of Article 23, para. 4, Directive 67/548/EEC would play down the risks, such as, for example, "non toxic", "not harmful to health" or the like.

***Compliance Verification:***

*The applicant shall confirm compliance with the requirement in Annex 1 to the Contract pursuant to DE-UZ 123.*

## 4 Applicants and Parties Involved

Distributors 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, 2019. They shall be extended by periods of one year each, unless terminated in writing by March 31, 2019 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 (distributor)
- Brand/trade name, product description
- Distributor (label user), i.e. the above-mentioned marketing organisations.

## Appendix A to the Basic Award Criteria DE-UZ 123

**Preservation**

The following substances or substance combinations may be used alternatively for the purpose of in-can preservation as well as to protect sanitary silicones against attack by mould. However, the sealant manufacturer shall add no more than the quantity specified below:

| Active substance | Content in the sealant |
|---|---|
| Thiabendazole | 400 ppm |

**Admission Process for Additional Substances**

Additional preservative ingredients may be used if a MAK value is available and/or if sufficient data regarding inhalation toxicology and analytics of the pure active substance and, if applicable, relevant degradation products, isomers and impurities as well as other by-products of the active substance and/or sufficient examinations relating to inhalative exposure are submitted to the Federal Environmental Agency for evaluation and setting of a maximum content.

The applicant shall give the reasons for using preservatives and details of how the minimum required quantity of preservative preparation has been determined. This value shall not be exceeded in the sealant.

To facilitate application for admission of a new active substance the Umweltbundesamt (Federal Environmental Agency) has prepared a Check List which may help the applicant in selecting and compiling the data.

## Appendix B to the Basic Award Criteria DE-UZ 123

Table 1: H Statements and R Phrases applicable to the award of the Blue Angel Ecolabel

| Regulation (EC) No. 1272/2008 (GHS Regulation) | Directive 67/548/EWG (Dangerous Substances Directive) | Wording |
|---|---|---|
| **Toxic substances:** | | |
| H300 | R28 | Fatal if swallowed. |
| H301 | R25 | Toxic if swallowed. |
| H310 | R27 | Fatal in contact with skin. |
| H311 | R24 | Toxic in contact with skin. |
| H330 | R26 | Fatal if inhaled. |
| H331 | R23 | Toxic if inhaled. |
| H370 | R39/23/24/25/ 26/27/28 | Causes damage to organs. |
| H372 | R48/23/24/25 | Causes damage to organs through prolonged or repeated exposure. |
| **Carcinogenic, mutagenic and reprotoxic substances:** | | |
| H340 | R46 | May cause genetic defects. |
| H350 | R45 | May cause cancer. |
| H350i | R49 | May cause cancer by inhalation. |
| H360D | R61 | May damage the unborn child. |
| H360F | R60 | May damage fertility. |
| H360FD | R60/61 | May damage fertility.<br>May damage the unborn child. |
| H360Df | R61/62 | May damage the unborn child.<br>Suspected of damaging fertility. |
| H360Fd | R60/63 | May damage fertility.<br>Suspected of damaging the unborn child. |