

BLUE ANGEL

The German Ecolabel



Vacuum Cleaner Bags

DE-UZ 211

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.



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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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

There is a huge range of different vacuum cleaner bags available on the German market because these bags cannot be universally used in all vacuum cleaner models. This means that there are many different types of vacuum cleaner bags that are each designed for use in different vacuum cleaner models. Assuming that every one of the 40 million households in Germany has a vacuum cleaner and the vacuum cleaner bag needs to be replaced on average five times a year, this means that around 200 million vacuum cleaner bags are required each year in Germany alone. If we reduce this figure by 30 percent to take account of bagless vacuum cleaners, the final figure is 140 million bags per year. Due to their non-biodegradable content, vacuum cleaner bags may only be disposed of via household waste, i.e. the waste undergoes thermal processing. The bags can be made out of paper or non-woven fabric. The latter have almost fully replaced paper bags on the market over the last ten years due to their better performance characteristics. Non-woven fabric bags mainly consist of plastics such as polypropylene or polyester. In addition, plastic is also used for their collars.

Alongside original bags produced by the vacuum cleaner manufacturers, a wide variety of bags produced by third parties are also available. These bags are often cheaper than the originals. Overall, the price per bag can range from 0.80 cents to more than three euros. According to Stiftung Warentest, however, the use of third party bags can also result in higher costs because some of the third party bags perform worse than original bags when it comes to their dust removal efficiency (Stiftung Warentest 2016) [11]. This means that a new third party bag is required more frequently in order to achieve the same vacuuming results.

The vacuum cleaner bags labelled with the Blue Angel environmental label are thus required to meet high standards with respect to their fitness for use. Amongst other things, they are required to have a good dust holding capacity and thus also a long service life. In addition, the bags must be made using a high proportion of recycled materials.

1.3 Objectives of the environmental label

Climate protection, a reduction in power consumption, increased use of sustainable resources and the avoidance of pollutants and waste are key objectives of environmental protection.

The Blue Angel environmental label for vacuum cleaner bags may be awarded to products featuring the following environmental properties:

- high proportion of recycled materials (predominantly made using recycled materials where possible)
- good fitness for use
- high retention of dust particles

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

- At least 60% recycled materials | From 01/01/2022: at least 80% recycled materials
- good fitness for use
- high retention of dust particles



1.4 Definitions

- **Dust holding capacity:** The ability of the bag (while it is being loaded) to retain dust up to a specified pressure drop across the bag. The dust holding capacity is a decisive indicator for the service life of the bag. As a parameter that is independent of a specific type of bag and thus also the volume of the bag, the pressure drop is often used to describe the dust holding capacity.
- **Pressure drop:** The difference between the static pressure in front of and behind the bag. At a constant incoming air flow rate, the pressure drop is a measurement for the dust holding capacity (bag saturation) and is given in Pascals per gram of dust (Pa/g of dust).
- **Household dust:** Collective term for particulate and fibrous emissions in enclosed rooms. It is a mixture of various different inorganic and organic substances that is also dependent on the relevant living conditions (e.g. the presence of a pet). In general, dust can be subdivided into the following categories based on its size¹:
- **Course dust:** Dust particles with a diameter greater than 10 µm (PM10). Due to the size of the particles, this dust is caught by nose hairs or the mucous membranes in the nasal passage in humans.
- **Fine dust:** Dust particles with a diameter less than 10 µm (PM10). These particles can penetrate deep into the lungs via the trachea and bronchial tubes. Fine dust is thus described as respirable (alveolar) dust.
- **Fine dust separation efficiency:** This describes how efficient the bag is at separating fine dust. The higher the value (given in %), the more the emitted air can be cleaned. The separation efficiency is thus a parameter that describes how much of a specified amount of fine dust that has been sucked into the bag also remains in the bag.
- **Post-consumer material:** Material generated by households or by commercial, industrial and institutional facilities in their role as end-users of the goods or service which can no

¹ in accordance with DIN EN ISO 16890-1 [5]

longer be used for its intended purpose. This includes returns of material from the distribution chain. (see DIN EN ISO 14021) [8].

- **Pre-consumer material:** Material diverted from the waste stream during a manufacturing process. Excluded is reutilization of materials such as rework, regrind or scrap generated in a process and capable of being reclaimed within the same process that generated it. (see DIN EN ISO 14021) [8].

2 Scope

The Basic Award Criteria cover vacuum cleaner bags for use in vacuum cleaners.

Vacuum cleaner bags designed for use in industrial vacuum cleaners and outdoor vacuum cleaners are excluded.

Vacuum cleaner bags made out of paper are excluded from the scope of these Basic Award Criteria due to their lower fitness for use.

3 Requirements

3.1 Fitness for use

3.1.1 Dust holding capacity

The increase in the pressure drop – at the same suction rate and a constant flow velocity through the walls of the bag – must not exceed an average level of 15 Pa/g of dust when filling the bag.

The dust holding capacity is determined in a test channel independent of the vacuum cleaner. It is necessary to measure three vacuum cleaner bags. The results are evaluated by taking the average from the three measurements.

The average flow velocity through the walls of the bag must be 20 cm/s. The flow velocity is defined as the volumetric flow rate of the suction air (m^3/s) divided by the surface area of the vacuum cleaner bag (m^2).

A special test dust (“simulated house dust” according to DIN EN 60312-1) [2] must be used for filling the vacuum cleaner bag and applied in 10 equal steps. The corresponding pressure drop must be recorded using measurement technology until the bag has been filled with a defined amount of test dust. The defined filling amount is calculated as a threshold based on the surface area of $325 \text{ mg}/\text{cm}^2$ of bag surface area.

Compliance verification

- a) *The applicant shall declare compliance with the requirement in Annex 1 and state the average for the measured pressure drop (Pa/g) and the filling capacity of the bag (mg/cm^2). The applicant shall submit a test report from a testing laboratory accredited according to ISO/IEC 17025 [6] or an authorised SMT (Supervised Manufacturer Testing) laboratory in Annex 2.*

3.1.2 Fine dust separation efficiency

The fine dust separation efficiency must be ≥ 99.5 percent.

The fine dust separation efficiency is determined in a test channel independent of the vacuum cleaner. It is necessary to measure three vacuum cleaner bags.

The average flow velocity through the walls of the bag must be 26 cm/s. The flow velocity is defined as the volumetric flow rate of the suction air (m^3/s) divided by the surface area of the vacuum cleaner bag (m^2).

A2 fine test dust (Arizona test dust) according to ISO 12103-1 [9] must be used for filling the bag, while maintaining a dust concentration in the suction air flow of 100 mg/m³.

The number of particles in the suction and clean air flows must be determined over a range of sizes from 0.3 to 10 μm .

Compliance verification

The applicant shall declare compliance with the requirement in Annex 1 and submit a test report from a testing laboratory accredited according to ISO/IEC 17025 [6] or an authorised SMT (Supervised Manufacturer Testing) laboratory (Annex 2).

3.1.3 Tensile strength of the welded seams

The tensile force required to tear the welded seams of the vacuum cleaner bag must be ≥ 50 Newton.

This value must be determined as the average of ten individual measurements.

Compliance verification

The applicant shall declare compliance with the requirement in Annex 1 and submit a test report from a testing laboratory accredited according to ISO/IEC 17025 [6] or an authorised SMT (Supervised Manufacturer Testing) laboratory (Annex 2). The tensile test using the strip method (maximum tensile force measurement) must be carried out in accordance with DIN EN 29073-3.

3.1.4 Tear-off strength of the collar

The separating force required to tear off the collar must be ≥ 50 Newton.

For this purpose, the tensile strength of the connection between the collar and bag must be determined with the aid of hang test apparatus (see Appendix B). The duration of the measurement should be 10 minutes. The separating force must not be below the threshold of 50 N.

This value must be determined as the average of ten individual measurements.

Compliance verification

The applicant shall declare compliance with the requirement in Annex 1 and submit a test report from a testing laboratory accredited according to ISO/IEC 17025 [6] or an authorised SMT (Supervised Manufacturer Testing) laboratory (Annex 2). The separating test (separating force

measurement) shall be carried out in accordance with DIN EN 29073-3 with the aid of hang test apparatus (see Appendix B).

3.2 Material properties

3.2.1 Proportion of recycled materials

The proportion of recycled materials in the vacuum cleaner bag must be at least 80 percent. Based on the total weight of the vacuum cleaner bag, at least 80 percent of the materials used must be sourced from post-consumer and pre-consumer material. A tolerance of 5 percent is permitted.

Compliance verification

The applicant shall declare compliance with the requirement in Annex 1 and state the qualitative and quantitative composition of the product labelled with the environmental label, i.e. the proportion of post-consumer and pre-consumer materials and primary materials, as well as the relevant sources of the materials.

For recycled plastic from post-consumer materials, the applicant shall verify their source and composition in the form of a certificate in accordance with the EuCertPlast certification scheme² or with the Global Recycled Standard (GRS)³ and submit a report (audit report) with calculated and plausibly justified verification of the proportion of post-consumer plastics used.

The records and the calculations for the proportions of recycled materials in the end product shall be checked, evaluated for their plausibility and confirmed in the form of a test report in accordance with Annex 3 to the contract by an independent specialist body at the site where the end product (vacuum cleaner bag) or its processed starting materials (e.g. non-oven material, fabric, collar) are produced.

The verification (Annex 3) shall be provided once a year and must be submitted by the end of the first quarter of the following year.

An independent specialist body is:

- *an independent environmental verifier in accordance with Article 9 of the German Environmental Audit Act (Umweltauditgesetz) for approval area 38 (recycling, waste disposal)*

or

- *a publicly certified expert in accordance with Article 36 of the German Industrial Code for the Specialist Areas of Waste Recycling, Waste Disposal Technology, Plastic Recycling, Plastic Technology and the Disposal of Packaging (Gewerbeordnung für die Sachgebiete Abfallverwertung, Abfalltechnik, Kunststoffrecycling, Kunststofftechnik bzw. Verpackungsentsorgung)*

or

- *an environmental verifier in accordance with Directive (EG) No. 2017/1505 Article 2, Definition no. 20. If the verification checks are carried out by environmental verification organisations (i.e. not by natural persons), the person responsible for the completion of the tests shall be specifically named by the organisation.*

² <https://www.eucertplast.eu>

³ The recognition of further certificates can take place after examination by the German Environmental Agency.

3.2.2 Exclusion of certain materials

The following post-consumer and pre-consumer materials are excluded from use in the production of the vacuum cleaner bags and their starting materials³:

- Materials that contain a SVHC on the list of candidates above a limit of 0.1% by mass.
- Materials that contain halogenated blowing agents, halogenated flame retardants or halogenated polymers.

Compliance verification

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

- *In addition, the applicant shall provide the following verifications based on a random sample of the post-consumer and pre-consumer materials (Annex 4):*
- *The halogenated compound content shall be determined using a non-destructive spectroscopic measurement in accordance with DIN EN 62321-3-1 [3]. A general limit of 0.1% by mass is valid for verifying that the materials are halogen-free.*

3.2.3 Requirements for added substances

In the production of the primary plastics and the preparation of the post-consumer and pre-consumer materials, as well as their further processing into vacuum cleaner bags, it is not permitted to add any substances that have one or more of the classifications according to Table 1. This requirement encompasses both the harmonised classifications according to Annex VI (Part III) of the CLP Regulation [1] and also self-classifications made by the distributors of the substances.

Furthermore, no substances⁴ may be added during the described processing stages that have been included in the so-called "list of candidates" in accordance with Article 59 of the REACH Regulation [10]. The version of the list of candidates at the time of application is valid.

Table 1: List of prohibited added materials and their classification

Hazard class	Hazard category	H Phrases according to the CLP Regulation
Carcinogenicity	Carc. 1A, 1B	H350 May cause cancer
Carcinogenicity	Carc. 1A, 1B	H350i May cause cancer if inhaled
Carcinogenicity	Carc. 2	H351 ⁵ Suspected of causing cancer
Germ cell mutagenicity	Muta. 1A, 1B	H340 May cause genetic defects
Germ cell mutagenicity	Muta. 2	H341 Suspected of causing genetic defects
Reproductive toxicity	Repr. 1A, 1B	H360 May damage fertility or the unborn child
Reproductive toxicity	Repr. 2	H361 Suspected of damaging fertility or the unborn child

³ It is generally assumed that the materials and the finished product meet all of the requirements in the applicable chemical regulations (e.g. restrictions according to Annex XVII of the REACH Regulation).

⁴ Above the classification threshold for the safety data sheet.

⁵ Except titanium dioxide, because its classification only applies to inhalable powders.

Specific target organ toxicity single exposure	STOT SE1	H370 Causes damage to organs
Specific target organ toxicity single exposure	STOT SE2	H 371 May cause damage to organs
Specific target organ toxicity repeated exposure	STOT RE1	H372 Causes damage to organs through prolonged or repeated exposure
Environmental hazards	Hazardous to water Chronic 1	H410 Very toxic to aquatic life with long-lasting effects
Aspiration hazard	Cat. 1	H304 May be fatal if swallowed and enters airways.
Acute toxicity	Cat. 1 and 2	H330 Fatal if inhaled
Respiratory or skin sensitisation	Respiratory sensitisation Cat. 1	H334 May cause allergy or asthma symptoms or breathing difficulties if inhaled.

Compliance verification

The applicant shall declare compliance with this requirement in Annex 1. The applicant shall also submit corresponding declarations from the producers of the primary plastics, the producers of the post-consumer and pre-consumer materials, the producers of individual components of the vacuum cleaner bags, where relevant, and the producer of the vacuum cleaner bag.

If it is legally required for the relevant substance or the added mixture according to Annex VI of the CLP Regulation, the applicant shall enclose a safety data sheet with the application.

If desired, these verifications can also be provided directly to RAL gGmbH by the suppliers of a substance or mixture in order to protect any existing trade secrets.

The applicant shall notify the awarding body for the label immediately about any changes to the composition of the recycled substances that are relevant to this requirement.

3.3 Exclusion of biocides

It is not permitted to treat the vacuum cleaner bags with biocides.

Compliance verification

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

3.4 Origin of the wood in fluff pulp production

If fluff pulp from virgin fibres is used in the vacuum cleaner bags, the wood added to the product must be sourced from sustainable cultivation on cultivation areas that can verify that they are managed in an ecological and socially responsible manner.

The origin of the wood must be verified in the form of a certificate from one of the following certification systems:

- Forest Stewardship Council (FSC): FSC Mix Credit or FSC 100%,
- Programme for the Endorsement of Forest Certification Schemes (PEFC): PEFC certified,

- or a comparable certification system whose scope and requirement standards is equivalent to one of the named certification systems. The equivalence of the certification system must be confirmed by an independent environmental verifier.

Compliance verification

The applicant shall declare in Annex 1 to the contract whether fluff pulp from virgin fibres or non-recycled paper products are used to produce the vacuum cleaner bags. If this is the case, the applicant shall submit a certificate from his/her supplier (fluff pulp manufacturer) verifying sustainable forestry and a chain of custody (CoC) (Annex 5). FSC Mix Credit or FSC 100%, PEFC certified or equivalent systems will be recognised as certification systems. An example delivery note for the fluff pulp shall be submitted which includes the certification number and verifies the use of certified wood.

Alternatively, individual verifications in accordance with the criteria and verification requirements of one of the named certification systems may be presented if an equivalent level of protection can be achieved. The equivalence of the individual verifications must be confirmed by an independent environmental verifier.

3.5 Use of renewable raw materials

The use of renewable raw materials including wood must be documented by stating the type, source and proportions by mass of the renewable raw materials used.

Compliance verification

The applicant shall declare in Annex 1 to the contract whether renewable raw materials are used to produce the vacuum cleaner bags. If this is the case, the applicant shall document the origins and proportions by mass of the renewable raw materials used in Annex 6 to the contract.

3.6 Advertising claims

The applicant declares that they refrain from using advertising claims for its product such as "made from renewable raw materials", "made from renewable resources", "biodegradable material", "compostable", "made from recyclable materials" or similar.

Compliance verification

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

3.7 Requirements for the secondary packaging

Secondary packaging may only be made out of paper or cardboard. This must be produced using recycled fibres accounting for at least 90% by mass, a tolerance limit of 5% is permitted.

Compliance verification

The applicant shall declare compliance with the requirement in Annex 1 and, if paper or cardboard are used for the packaging, verify the source of the materials and the composition of the packaging in the form of written confirmations from the suppliers and, if necessary, by providing further verification in Annex 7.

3.8 Outlook

It is recommended that the following criteria are examined for inclusion in a future revision of these Basic Award Criteria:

- The vacuum cleaner bag must contain a minimum proportion of post-consumer material (e.g. old textiles, plastic waste).
- The value for the pressure drop (dust holding capacity) should be lowered.
- The fine dust separation efficiency should be increased.
- For the filling of the vacuum cleaner bags, a minimum dust filling quantity at a defined maximum pressure drop will be required.

4 Applicants and Parties Involved

{Manufacturers}{Manufacturers or 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, 2025. They shall be extended by periods of one year each, unless terminated in writing by March 31, 2025 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/distributor)
- Brand/trade name, product description
- Distributor (label user), i.e. the above-mentioned marketing organisations.

Appendix A Quoted laws and standards, literature

- [1]** CLP Regulation: 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, and amending Regulation (EC) No 1907/2006 (Text with EEA relevance), OJ L 353, 31.12.2008, p. 1–1355, <https://eur-lex.europa.eu/eli/reg/2008/1272/oj>
- [2]** DIN EN 60312-1: Vacuum cleaners for household use - Part 1: Dry vacuum cleaners - Methods for measuring the performance (IEC 60312-1:2010, modified + A1:2011, modified); German version EN 60312-1:2017
- [3]** DIN EN 62321-3-1: Determination of certain substances in electrotechnical products - Part 3-1: Screening - Lead, mercury, cadmium, total chromium and total bromine by X-ray fluorescence spectrometry (IEC 62321-3-1:2013); German version EN 62321-3-1:2014
- [4]** DIN EN 29073-3: Textiles; test method for nonwovens; part 3: Determination of tensile strength and elongation (ISO 9073-3:1989); German version EN 29073-3:1992.
- [5]** DIN EN ISO 16890-1: Air filters for general ventilation - Part 1: Technical specifications, requirements and classification system based upon particulate matter efficiency (ePM) (ISO 16890-1:2016); German version EN ISO 16890-1:2016,
- [6]** DIN EN ISO/IEC 17025:2018-03: General requirements for the competence of testing and calibration laboratories (ISO/IEC 17025:2017); German and English version prEN ISO/IEC 17025:2017
- [7]** DIN EN ISO 18856 Water quality - Determination of selected phthalates using gas chromatography/mass spectrometry (ISO 18856); German version EN ISO 18856:2005
- [8]** DIN EN ISO 14021: Environmental labels and declarations - Self-declared environmental claims (Type II environmental labelling) (ISO 14021:2016); German and English version EN ISO 14021:2016
- [9]** ISO 12103-1:2016-03: Road vehicles - Test contaminants for filter evaluation - Part 1: Arizona test dust.
- [10]** REACH regulation: 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 (text with EEA relevance);

Official Journal of the European Union L 396, 30.12.2006, P. 1, consolidated text at <https://eur-lex.europa.eu/eli/reg/2006/1907/2014-04-10>

[11] Stiftung Warentest 2016: Partnerwahl fürs Beuteltier (Choosing a partner for marsupials).
Test by Stiftung Warentest, Edition 07/2016.

Appendix B Test setup for the “Tear-off strength of the collar”

The tensile strength of the connection between the collar and bag must be determined in accordance with the test setup illustrated in Diagram 2 using hang test apparatus. The separating force must not be below the threshold of 50 N.

Diagram 1 Hang test apparatus for determining the tear-off strength of the collar

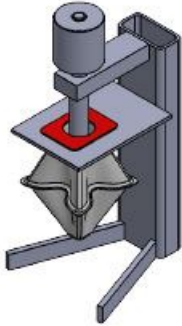


Diagram 2 Illustration of the test setup for determining the tear-off strength of the collar

