

BLUE ANGEL

The German Ecolabel



**Graphic paper and cardboard made from
100% recovered paper (recycled paper and
cardboard)**

DE-UZ 14a

Basic Award Criteria

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Version 5

The Environmental Label is supported by the following four institutions:



The Federal Ministry for the Environment, Nature Conservation, Nuclear Safety and Consumer Protection 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.

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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, Nuclear Safety and Consumer Protection, 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

The use of recovered paper in the production of graphic paper contributes to the preservation of resources, especially ecosystems such as forests, and thus helps to protect species and the climate. The use of recovered paper from household and commercial collections also reduces the amount of waste generated.

In a comparison of their impact on ecological systems, those paper products made from recovered paper perform significantly better in terms of their use of resources, waste water load and water and energy consumption than paper products made from virgin fibres that use wood as a source of fibrous raw materials – when the products have comparable performance characteristics.

In Germany, the average consumption of semi-finished paper products and finished paper products per capita after deducting export surpluses is approximately 210 kg of paper, paperboard and cardboard (semi-finished goods)¹. This figure also includes consumption outside of the home, such as in commerce, media and administration. According to a recent study conducted by INTECUS GmbH on behalf of the German Pulp and Paper Association, a total of between 95 and 105 kg of paper is consumed per person in German households.

The proportion of recovered paper used in the German paper industry is increasing continuously. It stood at 49 percent in 1990 but had already risen to 76 percent in 2018.² A significantly higher proportion of recovered paper is also being used for graphic paper. According to statistics from the German Pulp and Paper Association, the proportion of recovered paper used for graphic paper had risen from 33 % in 1995 to 51 % in 2018. The collection and sorting of recovered paper are important prerequisites for making the recovered paper available to the paper industry. This process involves removing non-paper substances from the collected materials and then sorting the paper into defined grades of recovered paper (according to EN 643). The Blue Angel promotes the use of 100 percent recovered paper in its criteria. At least 65 percent of the

¹ Study 18-11-60 on paper consumption per capita in the Federal Republic of Germany, INTECUS GmbH Dresden, Jörg Wagner, commissioned by the German Pulp and Paper Association (Verband Deutscher Papierfabriken e.V.), May 2019

² VDÜ 2019

recovered paper must be sourced from ordinary, medium and kraft paper grades and special grades (1, 2, 4 or 5). Ordinary paper grades are primarily recovered from household collections. By requiring the use of ordinary and kraft paper grades, the Blue Angel aims to ensure that almost all of the paper fibres recovered in the paper cycle are preserved and used for high quality applications such as for graphic paper. In the production of graphic paper, the use of especially high-quality recovered paper is also permitted, up to a maximum of 35% of the total recovered paper. This enables virgin fibre paper to be replaced by recycled paper even for high-quality applications and thus contributes to the preservation of the forests. The use of recovered paper also contributes to the avoidance of waste.

The Blue Angel restricts the addition of critical production aids and paper refining agents in its criteria in order to, on the one hand, minimise the pollution of waste water and, on the other hand, reduce the pollutant load in the paper. For example, the use of optical brighteners and halogenated bleaching agents is prohibited except for in a few exceptional cases. Requirements for waste water emissions from paper production will also be set from 2020. In order to protect human health, recycled graphic paper designed for use with electrophotographic processes (e.g. copying paper) must be tested for its potential for the emission of volatile organic compounds (TVOC and TSVOC and DIPN).

1.3 Objectives of the Environmental Label

The requirements in these Basic Award Criteria are intended, in particular, to promote the use of lower and medium grades of recovered paper and prevent the use of substances that are not required for technical reasons during production. The use of recycled paper that has been awarded the Blue Angel makes an important contribution to the preservation of resources and the protection of species and the climate.

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



1.4 Definitions

Printing paper is paper used for the production of printed matter such as books, brochures, magazines, catalogues, prospectuses, posters and billboards. There is printing paper containing wood and also wood-free printing paper, as well as coated and uncoated versions, for e.g. offset, pot, flexo and digital printing. Printing paper according to DE-UZ 14a is exclusively made out of recycled paper, manufactured 100% using recovered paper. Digital printing paper must comply with the requirement according to Paragraph 3.13.

Graphic paper in the sense of these Basic Award Criteria includes sheets and rolls of unworked, unprinted (white or colour) paper or cardboard made out of recycled papers, manufactured 100% using recovered paper (secondary fibres), which is suitable for writing, printing or further processing.

HWC paper is high-quality roll printing paper, coated on both sides, containing either wood or recovered paper and with a basis weight of $> 75\text{g/m}^2$. HWC stands for high weight coated.

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.

Copying paper is a standard uncoated paper that is suitable for the production of copies of a template in physical and/or chemical processes and must meet the requirements according to Paragraph 3.13.

Multifunctional paper is suitable for use in printing devices and also as writing paper and must comply with the requirement according to Paragraph 3.13.

Office paper (copying and multifunctional paper) Office paper is coated or uncoated paper, either containing wood or wood-free, in white and coloured versions and in the formats DIN A4 and DIN A3. Office paper in the sense of these Basic Award Criteria is exclusively made out of recycled paper, manufactured 100% using recovered paper. It must meet the requirements according to Paragraph 3.13.

Recycled paper describes paper and cardboard produced using fibres sourced 100% from recovered paper (secondary fibres).

SC paper is calendered paper that contains a filler, in versions containing wood or recovered paper: SC stands for supercalendered.

Writing paper is an uncoated paper, which is suitable for writing on with ink on both sides, made out of recycled paper, manufactured 100% using recovered paper.

VOC A "volatile organic compound" describes any organic compound having a vapour pressure of 0.01 kPa or more at 293.15 K, or having a corresponding volatility under the particular conditions of use. In the sense of Directive 2010/75/EU, the fraction of creosote that exceeds this vapour pressure at 293.15 K is considered a volatile organic compound.

2 Scope

These Basic Award Criteria apply to:

- a) Recycled graphic paper and cardboard. This includes:
 - ♦ Recycled paper for the production of graphic paper according to the grade statistics for "Graphic Paper" from the German Pulp and Paper Association (Verband Deutscher Papierfabriken e.V.) (Appendix B to these Basic Award Criteria). This includes, for example:
 - ♦ Paper for printed matter such as books, newspapers, magazines, brochures, catalogues, prospectuses, posters and billboards
 - ♦ Paper for printed matter primarily for use in offices and schools such as exercise books, envelopes and notebooks as well as gift paper and bags
 - ♦ Office paper (multifunctional and copying paper)
 - ♦ Writing paper
 - ♦ Continuous paper for IT applications
- b) Selected types of paper and paperboard for technical and special applications.

The grades of paper covered by the scope of these Basic Award Criteria are listed in Appendix B.

Printed matter comes under the scope of the Basic Award Criteria for DE-UZ 195. Finished products made from recycled paper and gift paper come under the scope of DE-UZ 14b.

3 Requirements

3.1 Use of fibrous raw materials and grades of recovered paper

The paper fibres in the recycled graphic paper must have been sourced 100% from recovered paper. Recovered paper is the umbrella term for paper and paperboard that is collected after use or processing.

For the production of the products, a maximum of 35 % of the recovered paper – based on the total content of fibrous raw materials – may be sourced from the better grades (group 3) and at least 65% of the recovered paper – based on the total content of fibrous raw materials – must be sourced from the ordinary, medium and kraft paper grades and special grades (groups 1, 2, 4 and 5).

If the grades 2.05.00 ordinary sorted office paper, 2.05.01 sorted office paper, 2.06.00 ordinary sorted coloured letters, 2.06.01 sorted coloured letters and 5.09.00 carbonless copy paper (NCR) are used, the product must comply with the requirement according to Paragraph 3.2 (DIPN content).

Refer to DIN EN 643 for specifications about the different grades of recovered paper.

Compliance verification

The applicant shall characterise the paper in Annex 2 by stating the sort key, format, weight, surface treatment (coated or uncoated), whiteness and opacity.

The applicant shall state the average percentage of the paper grades from groups 1, 2, 3, 4 and 5 used in the product in Annex 2 to the contract and declare compliance with the requirement in Paragraph 3.1. The applicant shall also state the percentages of the individual grades 2.05.00

ordinary sorted office paper, 2.05.01 sorted office paper, 2.06.00 ordinary sorted coloured letters, 2.06.01 sorted coloured letters and 5.09.00 carbonless copy paper (NCR) in Annex 2.

The correctness of the data provided in Annex 2 to the contract shall be verified on request once a year in accordance with Annex 6 to the Basic Award Criteria by:

- a certification body for ISO 14001 accredited by the German Accreditation Body (DAkKS) for the scope of paper manufacturers (NACE 17.12) or
- an environmental verifier approved for this scope (NACE 17.12) by the German Society for the Accreditation and Registration of Environmental Verifiers (DAU) in accordance with the Environmental Audit Act or
- an accredited FSC/PEFC certifier or
- an expert recognised by the UBA in the areas of fibrous raw materials, grades of recovered paper and the recycling of recovered paper.

3.2 Diisopropylnaphthalene (DIPN)

The content of diisopropylnaphthalene (DIPN) in paper and cardboard should be kept as low as technically possible. It is thus generally not permitted to use the grades of recovered paper 2.05.00 ordinary sorted office paper, 2.05.01 sorted office paper, 2.06.00 ordinary sorted coloured letters, 2.06.01 sorted coloured letters and 5.09.00 "carbonless copy paper (NCR)".

Alternatively, grades of recovered paper containing DIPN (2.05.00, 2.05.01, 2.06.00, 2.06.01 and 5.09.00) may be used if an efficient technical system (e.g. deinking) exists that largely removes the DIPN from the fibre cycle and the DIPN content in the finished paper does not exceed a maximum of 50 mg/kg.

Compliance verification

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

If the grades of recovered paper 2.05.00, 2.05.01, 2.06.00, 2.06.01 and 5.09.00 have been used, the applicant shall state the maximum DIPN content in the finished product in Annex 2 to the contract and submit a test report from an independent testing institution accredited according to ISO 17025 or a selected testing institution recognised by the UBA e.g. Chair of Paper Technology and Mechanical Process Engineering (PMV) at TU Darmstadt.

The DIPN content shall be determined **once a year** in accordance with EN 14719 (DIPN in acetone extract).

The applicant shall submit a product sample.

3.3 Bisphenol A and bisphenol S

The content of bisphenol A and bisphenol S in the finished paper must be determined once a year.

Compliance verification

The content of bisphenol A (CAS 80-05-7) and bisphenol S (CAS 80-09-1) must be determined in a cold water extract prepared according to EN 645 using liquid chromatography with UV/fluorescence detection or MS detection.

The applicant shall submit a test report for statistical purposes once a year from an independent testing institution accredited according to ISO 17025 or a testing institution recognised by the UBA. If multiple products are produced based on the same composition of recovered paper (Annex 2), it is sufficient to submit an analysis of a sample of the paper **once a year**.

3.4 General exclusion of substances with certain properties

No substances or mixtures may be added as colourants, coating materials, production aids and paper refining agents that contain constituent components with the following properties:

- a) It is prohibited to add substances of very high concern (SVHC) that have been identified as being particularly alarming in accordance with Article 57, Paragraph 1 of Regulation (EC) No 1907/2006 (REACH) and added to the so-called "candidate list" according to Article 59, Paragraph 1 of the same regulation.
- b) No substances may be added to the product that
 - ♦ according to the criteria of Regulation (EC) No 1272/2008 are classified with the following H Phrases named in Table 1 or which meet the criteria for such classification.
 - ♦ or which are classified as carcinogenic, mutagenic or reprotoxic substances in the currently valid version of TRGS 905³.

Table 1: H Phrases according to the CLP Regulation

H Phrases according to the CLP Regulation	Wording
H340	May cause genetic defects.
H341	Suspected of causing genetic defects.
H350	May cause cancer.
H350i	May cause cancer if inhaled.
H351 ⁴	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.

Compliance verification

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

The applicant shall verify compliance with the requirement by listing the colourants, coating materials, production aids and paper refining agents used and submitting declarations from the

³ http://www.baua.de/nn_16812/de/Themen-von -A-Z/Gefahrstoffe/TRGS/pdf/TRGS-905.pdf

⁴ An exception is made for titanium dioxide because its classification is only based on the respirable dust.

suppliers of the colourants, coating materials, production aids and paper refining agents in accordance with Annex 3 to the contract pursuant to DE-UZ 14a. If requested to do so by RAL gGmbH, the applicant shall submit the relevant safety data sheets.

3.5 Further requirements for production aids and paper refining agents, exclusion of glyoxal

Only those production aids and paper refining agents that are listed in Recommendation XXXVI from the BfR for "Paper and board for food contact"⁵ (positive list) in sections B (production aids) and C (special paper refining agents) may be added to the product. The maximum quantities and concentrations stated in this list must be observed.

No production aids containing glyoxal may be used to manufacture the recycled paper.

Compliance verification

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

The applicant shall verify compliance with the requirement by listing the production aids and paper refining agents used and submitting declarations from the suppliers of the production aids and paper refining agents in accordance with Annex 3 to the contract pursuant to DE-UZ 14a.

If requested to do so by RAL gGmbH, the applicant shall submit the relevant safety data sheets.

3.6 Bleaching and complexing agent

The recovered paper must be processed without the use of chlorine, halogenated bleaching agents and not readily biodegradable complexing agents such as e.g. ethylenediaminetetraacetic acid (EDTA) and diethylenetriaminepentaacetic acid (DTPA).

Compliance verification

The applicant shall declare compliance with the requirement in Annex 1 to the contract and also state the bleaching chemicals and complexing agents used in Annex 2.

3.7 Biocides

In the production of the recycled paper, only those slimicides (substances in product type 12) and material preservatives for fibres (substances in product type 9) in the sense of the Biocidal Products Regulation that have been approved in accordance with the Biocidal Products Regulation 528/2012 (EU list of approved active substances) or are still being examined as a notified existing active substance for the relevant type of biocides as part of the EU work programme for the systematic examination of all existing active substances may be used

Accordingly, it is only permitted to use those biocidal products classified in product types 9 and 12 that have been explicitly approved for the desired application.

For a transitional period, biocidal products that contain notified existing active substances of product types 9 and 12 that are still being examined as part of the EU examination process can also be used without approval if they have been registered in accordance with the German

⁵ <http://bfr.ble.de/kse/faces/DBEmpfehlung.jsp>

ordinance on the notification of biocidal products pursuant to the German Chemicals Act (Biocide Notification Ordinance – ChemBiozidMeldeV).

In addition, the biocidal products used in the product must not contain any substances that have been considered as candidates for substitution according to Article 10 of the EU Biocidal Products Regulation 528/2012.

Until the approval requirements for the biocidal products containing notified existing active substances come into force, only those substances that are also listed in Recommendation XXXVI from the BfR are permitted.

It is also possible that production aids and paper refining agents used for the production of the recycled paper contain biocidal products in product type 6 (protection of finished products in containers against microbial deterioration to ensure their shelf life) that have been made available on the market. Residual content of these biocidal products will be accepted.

Compliance verification

The applicant shall declare compliance with the requirement in Annex 1 to the contract and state which biocidal substances from which product type have been used with their IUPAC names and CAS numbers, as well as the quantities used per kilogram of dry pulp in Annex 2.

3.8 Whiteness

It is not permitted for any of the products to exceed a maximum grade of whiteness of 100 % (including the UV proportion) according to ISO 2470 and a maximum CIE whiteness of 135 according to DIN ISO 11475. Coloured paper is excluded from this requirement.

Compliance verification

The applicant shall declare compliance with the requirement in Annex 1 to the contract and state the grade of whiteness according to ISO 2470 and the CIE whiteness according to DIN ISO 11475 in Annex 2.

3.9 Optical brighteners

The use of optical brighteners is not permitted.

An exception applies for the production of:

SC papers > 110 g/m² and

HWC papers > 75 g/m² (according to Appendix B)

The following optical brighteners may be added to these products:

- C.I.220, benzenesulfonic acid, 2,2'-(1,2-ethenediyl) bis[5[4-[bis(2-hydroxyethyl) amino]-6-[(4-sulfophenyl)amino]-1,3,5-triazin-2-yl]amino]-, tetra sodium salt (CAS no. 16470-24-9);
- C.I. 113 or C.I. 28 disodium salt 4,4'-bis[6-anilino-4-[bis(2-hydroxyethyl)amino]-1,3,5-triazin-2-yl]amino]stilbene-2,2'-disulphonate; sulfonated stilbene derivatives may be used up to a maximum level of 0.3 %.

- Tetrasodium 4,4'-{ethene-1,2-diylbis[(3-sulfonato-4,1-phenylene)imino{6-[bis(2-hydroxyethyl)amino]-1,3,5-triazine-4,2-diyl}imino]}dibenzoate (CAS RN 32257-57-1) and isomeric mixtures of Tetrasodium 4,4'-{ethene-1,2-diylbis[(3-sulfonato-4,1-phenylene)-imino{6-[bis(2-hydroxyethyl)amino]-1,3,5-triazine-4,2-diyl}imino]}dibenzoate (CAS-RN 32257-57-1), Tetrasodium 2,2'-{ethene-1,2-diylbis[(3-sulfonatobenzene-4,1-diyl)imino{6-[bis(2-hydroxyethyl)amino]-1,3,5-triazine-4,2-diyl}imino]}dibenzoate (CAS RN 158256-89-4) and Tetrasodium 2-({4-[bis(2-hydroxyethyl)amino]-6-[(4-{2-[4-({4-[bis(2-hydroxyethyl)amino]-6-[(4-carboxylatophenyl)amino]-1,3,5-triazin-2-yl}amino)-2-sulfonatophenyl]-ethenyl}-3-sulfonatophenyl)amino]-1,3,5-triazin-2-yl}amino)benzoate (CAS no. 1271742-13-2)
- C.I.397 (benzenesulfonic acid, 2,2'-(1,2-ethenediyl)bis[5-amino-, reaction products with aniline, diethanolamine, ethanolamine and 2,4,6-trichloro-1,3,5-triazine, sodium salts, 2-(Dimethylamino) ethanol compounds (CAS no. 1627851-12-0)

Compliance verification

The applicant shall state the grade of manufactured paper based on the grade statistics (according to Appendix B) in Annex 2 to the contract and name the optical brighteners used.

In addition, the applicant shall verify compliance with the requirement by submitting a test report from an independent testing institute certifying compliance with the bleeding test according to DIN EN 648 or DIN EN 646 and achievement of valuation level 5.

Alternatively, the applicant shall submit a declaration from the manufacturer of the optical brightener as Annex 3 to the contract stating that at least 95 % of the optical brighteners cling to the substrate to be brightened.

3.10 Azo dyes and pigments in colourants

No azo dyes or pigments may be added in colourants that can cleave into one of the amines stated in Regulation (EC) No. 1907/2006, Annex XVII, No. 43, Appendix 8 or 9, or in TRGS 614⁶ (see Appendix D).

Compliance verification

The applicant shall verify compliance with the requirement by submitting Annex 3 to the contract according to DE-UZ 14a.

3.11 Mercury, lead, cadmium or chromium VI compounds in colourants

It is not permitted to add any colourants (pigments or dyes) containing mercury, lead, cadmium or chromium (VI) compounds as constituent ingredients.

⁶ <https://www.baua.de/DE/Angebote/Rechtstexte-und-Technische-Regeln/Regelwerk/TRGS/TRGS-614.html>

Compliance verification

The applicant shall verify compliance with the requirement by submitting a declaration from the colourant supplier in Annex 3 to the contract pursuant to DE-UZ 14a.

3.12 Mineral oil-based additives and mineral oil-based colourants

No mineral oil-based additives, colourants or base oils that contain aromatic hydrocarbons (with ≥ 10 carbon atoms) as a component may be added during the production of the recycled paper. In the case of aliphatic hydrocarbons, only those substances with a chain length of C10 to C20 may be used as constituent components. In addition, the following high-molecular compounds without solvent properties may be used if they have a carbon number $C > 35$ and the proportion of those with a carbon number of C20 to C35 does not exceed a maximum of 5 %: microcrystalline waxes, Vaseline, polyolefin waxes, paraffin waxes or Fischer-Tropsch waxes.

Plant-based substitutes for mineral oil should be free of genetic engineering and sourced from sustainable cultivation⁷.

Compliance verification

The applicant shall state the additive, colourant or base oils used in the product in Annex 3. The applicant shall declare compliance with the requirement in Annex 1 to the contract and submit Annex 3 to the contract.

If plant-based substitutes have been used, the applicant shall state in Annex 3 which substitutes (which plant-based raw material) are added and where they are sourced.

3.13 Emissions of volatile organic compounds in copying, multifunctional and digital printing paper

Recycled paper designed for use with electrophotographic printers or copiers (office paper/digital printing paper) must be tested for its emission potential for the emission of volatile organic compounds (TVOC and TSVOC and DIPN).

The test must be carried out using thermal extraction (TE) on a batch of the packaged paper in accordance with the test guidelines in Appendix C to the Basic Award Criteria DE-UZ 14a. The TE values determined during the test indicate the emission potential and must not exceed the following values:

- TVOC: 60 micrograms per gram of paper ($\mu\text{g/g}$)
- TSVOC: 180 micrograms per gram of paper ($\mu\text{g/g}$)
- DIPN: 20 micrograms per gram of paper ($\mu\text{g/g}$)

⁷ The following certification systems are considered suitable for renewable raw materials: RSP (Roundtable on Sustainable Palmoil), ISCC+ (International Sustainable & Carbon Certification), RSB (Roundtable on Sustainable Biomaterial), Roundtable Responsible Soy (RTRS) or a comparable certification system whose scope and requirement standards are equivalent to one of the named certification systems.

Compliance verification

The applicant shall submit a test report from a testing institution that has provided evidence of its qualifications for carrying out the tests to BAM (Federal Institute for Materials Research and Testing, Specialist Group "Environmentally-relevant material and product properties/emissions from materials) both at the time of application and subsequently **every two years**.

Three values shall be determined and stated for one batch during each test.

3.14 Requirements for waste water

The following requirements apply with respect to waste water:

3.14.1 Direct discharge

In the production of recycled paper, the emission limits for the waste water load that are listed by the EU Commission in the "Best Available Techniques (BAT) Reference Document for the Production of Pulp, Paper and Board" must be complied with by **direct dischargers**. These limits are also listed in Table 2 below:

Table 2: Maximum limits for the average annual emission parameters (waste water) in the paper production process

Parameter	Lower reference value according to BREF and Appendix 28 of the German Waste Water Ordinance ⁸
Volumetric flow rate of waste water	15 m ³ /Adt
COD	3 kg/Adt
BSB5	0.15 kg/Adt or 25 mg/l
AOX	< 0.01 kg/Adt
Total N (inorganic + organic N) (TN _b)	0.07 kg/Adt or 15 mg/l
Total P	0.008 kg/Adt or 1.2 mg/l

Adt = air dried ton

TN_b = total nitrogen bound. This parameter defines the total pollution of water by nitrogen compounds, which can appear in the form of e.g. ammonia, nitrites, nitrates or organic nitrogen compounds. A suitable method for determining this parameter is DIN EN 12260.

3.14.2 Indirect discharge

Indirect dischargers must declare compliance with the emission limits for the parameters stated in Table 2 after treatment.

⁸ BREF (Best Available Techniques Reference Document) full version and BAT conclusions in German and English at <https://www.umweltbundesamt.de/themen/wirtschaft-konsum/beste-ver-fuegbare-techniken/sevilla-prozess/bvt-merkblaetter-durchfuehrungsbeschluesse>
Appendix 28 Production of paper and cardboard of the German Waste Water Ordinance: https://www.gesetze-im-internet.de/abwv/anhang_28.html

Compliance verification

If the manufacturer of the recycled paper is a **direct discharger**, he/she shall declare compliance with the emission limits according to Table 2 in Annex 1 to the contract and state the measured emission values in Annex 4 to the contract.

If the manufacturer of the recycled paper is an **indirect discharger**, he/she shall declare:

- compliance with the emission limits according to Table 2 after treatment in the waste water treatment plant and
- compliance with the limit for the volumetric flow rate of waste water and
- compliance with the AOX value at the mixing location in Annex 1 to the contract and shall submit confirmation from the operator of the waste water treatment plant that provided the emission values for the other parameters in the downstream waste water treatment plant as Annex 5 to the contract.

3.15 Fitness for use

The fitness for use of the recycled paper must be guaranteed. If relevant DIN standards include technical requirements for individual products, these must be observed in the versions valid at the time of application. This applies to e.g.

- Continuous paper: DIN EN 12858
- Envelope paper: DIN 6733
- Paper and board for office purposes: DIN 19307
- Paper for copying purposes: DIN EN 12281

Compliance verification

The applicant shall declare compliance with the requirement in Annex 1 to the contract and state the corresponding DIN standard.

3.16 Durability of the paper

Office paper and paper used for the production of printed matter and press products must comply with the durability requirements according to DIN 20494. Alternatively, verification of the durability of the paper used for the production of printed matter and press products can be provided by complying with the requirements pursuant to LDK 24-85 in accordance with DIN 6738. A classification of the paper grades is provided in Appendix E.

Compliance verification

The applicant shall verify compliance with the requirements by submitting a test report from an independent testing institution. Refer to Appendix E⁹ for information on which reports are required for which paper.

⁹ It is possible to adapt the reports required for each paper on a case-by-case basis in consultation with RAL gGmbH.

3.17 Outlook

Any future revision of the environmental label will require verifications that renewable raw materials, which are used e.g. for the production of mineral oil-free colourants, are obtained from responsible, GMO-free sources that are located in the local region as far as possible and have been tested by a suitable certification system.

4 Applicants and Parties Involved

Manufacturers (paper mills) 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.

The compliance verifications submitted by the applicant will be handled with complete confidentiality.

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, 2024.

They shall be extended by periods of one year each, unless terminated in writing by March 31, 2024 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 Cited legislations and standards, literature

The currently valid versions of the relevant regulations and standards at the time of application apply, unless reference is made to a particular version of the regulation or standard in the criteria.

Directive 2010/75/EU of the European Parliament and of the Council of 24 November 2010 on industrial emissions (integrated pollution prevention and control) (Recast)

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 (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

Regulation (EU) No. 528/2012 of the European Parliament and of the Council of 22 May 2012 concerning the making available on the market and use of biocidal products

German ordinance on the notification of biocidal products pursuant to the German Chemicals Act (Biocide Notification Ordinance – ChemBiozidMeldeV) of 14 June 2011

DIN EN 643:2014-11 Paper and board - European list of standard grades of paper and board for recycling

ISO 14001:2015-11 Environmental management systems - Requirements with guidance for use

DIN EN ISO/IEC 17025:2018-03 General requirements for the competence of testing and calibration laboratories

DIN EN 14719:2005-10 Pulp, paper and board - Determination of the Diisopropylnaphthalene (DIPN) content by solvent extraction

DIN EN 645:1994-01 Paper and board intended to come into contact with foodstuffs; preparation of a cold water extract

DIN EN 646:2019-02 Paper and board intended to come into contact with foodstuffs - Determination of colour fastness of dyed paper and board

DIN EN 648:2019-02 Paper and board intended to come into contact with foodstuffs - Determination of the fastness of fluorescent whitened paper and board

DIN CEN/TS 13130-13:2005-05 Materials and articles in contact with foodstuffs - Plastic substances subject to limitation - Part 13: Determination of 2,2-bis(4-hydroxyphenyl)propane (Bisphenol A) in food simulants

TRGS 905 Directory of carcinogenic, mutagenic or teratogenic substances

ISO 2470 Paper, board and pulps — Measurement of diffuse blue reflectance factor

DIN ISO 11475:2019-04 Paper and board - Determination of CIE whiteness, D65/10° (outdoor daylight)

TRGS 614 Restrictions on use for azo dyes, which may release aromatic amines classified as carcinogens

DIN EN 12260:2003-12 Water quality - Determination of nitrogen - Determination of bound nitrogen (TNb), following oxidation to nitrogen oxides

DIN EN 12858:1999-06 Paper - Printing and business paper - Requirements for continuous stationery

DIN 6733-2010-04 – Paper - Envelope paper - Requirements, test methods

DIN 19307:1997-06 Paper and board - Office paper, uncoated - Requirements, test methods

DIN EN 12281:2003-01 Printing and business paper - Requirements for copy paper for dry toner imaging processes

ISO 20494:2017-12 Paper - Requirements for stability for general graphic applications

Appendix B Grades of graphic paper

The grades of graphic paper listed below are a selection from the grade statistics published by the German Pulp and Paper Association (Verband Deutscher Papierfabriken e.V.), version 2009, that are made out of recycled paper and can be awarded the Blue Angel.

As paper made out of secondary fibres/recovered paper is by definition wood-containing paper (irrespective of the grade of recovered paper), any wood-free grades of paper are not listed here because they cannot be awarded the Blue Angel. The composition and the proportions of pulp and cellulose fibre may vary greatly between the different grades of recycled paper.

Graphic paper: Press and catalogue paper

Newsprint paper

- 01 05 05 05 Standard newsprint paper
- 01 05 10 05 Improved newsprint paper

Non-coated magazine paper (rolls)

- 01 10 05 05 SC-A rotogravure paper
- 01 10 10 05 SC-B rotogravure paper
- 01 10 15 05 SC-A offset
- 01 10 20 05 SC-B offset

Graphic paper: Wood-containing printing and writing paper

Other wood-containing, non-coated paper

- 01 80 05 05 Wood-containing printing and writing paper, in rolls
- 01 80 10 05 Wood-containing printing and writing paper, in formats

Coated, wood-containing roll printing paper

- 01 85 05 06 Wood-containing printing and writing paper, coated on two sides, in rolls, LWC for rotogravure printing
- 01 85 05 07 Wood-containing printing and writing paper, coated on two sides, in rolls, LWC for offset
- 01 85 05 11 Wood-containing printing and writing paper, coated on two sides, in rolls, HWC for rotogravure printing
- 01 85 05 12 Wood-containing printing and writing paper, coated on two sides, in rolls, HWC for offset

Coated, wood-containing format paper

- 01 85 10 05 Wood-containing printing and writing paper, coated on two sides, in formats, consumption, standard and special coating

Graphic paper: 100% recycled printed and writing paper

Non-coated recycled paper

- 01 90 05 05 100% recycled printing and writing paper, non-coated, in rolls
- 01 90 05 10 100% recycled printing and writing paper, non-coated, in formats

Coated recycled paper

- 01 90 10 05 100% recycled printing and writing paper, coated on two sides, in rolls
- 01 90 10 10 100% recycled printing and writing paper, coated on two sides, in formats

Recycled envelope paper

01 90 15 05 Envelope 100% recycled

Paper and paperboard for special applications
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Construction paper and paperboard

06 15 25 05 Masking paper and paperboard

Cover, coating, bookend, envelope, binding paper and cardboard

06 45 05 05 Binding paper

06 45 10 05 Envelope paper and card

Bookbinder board

06 45 15 05 Winding paper

06 45 15 10 Machine-made paperboard

Other machine-made cardboard and machine-made paperboard for special applications

06 60 05 05 Beer mat paperboard

06 55 10 05 Other

Other special paper and cardboard

06 60 05 05 Diagram and register base paper

06 60 10 05 Template and pattern paper

06 60 15 05 Auxiliary paper and paperboard for printing works

06 60 20 05 Garden, flower and decorative crêpe paper

06 60 25 05 Playing card

06 60 30 05 Album card

06 60 35 05 Other

Appendix C Method for testing the emission potential of volatile organic compounds from copying, multifunctional and digital printing paper

1 Definitions

Test specimen

A part of the paper sample that has been prepared for the thermal extraction (TE) process to determine the emission potential of the paper.

VOC (Volatile Organic Compounds)

Organic compounds emitted from the test specimen and detected by thermal extraction. In the context of this test method, these are the identified and unidentified organic compounds eluting between and including n-hexane and n-hexadecane.

TVOC (Total Volatile Organic Compounds)

The sum of all concentrations ($\mu\text{g/g}$) of identified and unidentified volatile organic compounds eluting between and including n-hexane and n-hexadecane – quantified as toluene equivalent according to formula 1.

SVOC (Semi-Volatile Organic Compounds)

Semi-volatile organic compounds (identified and unidentified) eluting after n-hexadecane and up to n-docosane.

TSVOC (Total Semi-Volatile Organic Compounds)

The sum of all concentrations ($\mu\text{g/g}$) of identified and unidentified volatile organic compounds eluting after n-hexadecane up to n-docosane – quantified as alkane equivalent according to formula 2.

2 Testing equipment

- Scalpel or scissors to cut out a strip of paper from the middle of a sheet of paper
- A pair of tweezers to move the strip of paper to the TE glass tube
- Thermal extractor (TE) from the company Gerstel
- Gas chromatograph with thermal desorption unit, coupled to a mass spectrometer equipped with an analyser unit

3 Test material

3.1 Selection

Samples produced no longer than 4 weeks ago must be selected for the test. The client ordering the test is responsible for supplying fresh test material. In general, a sample is supplied in its original packaging (500 pages). The manufacturing date and the batch number must be stated.

3.2 Producing the specimen

Take care not to contaminate the test specimen while preparing it. The test specimen must not be touched with the hands but only with a clean pair of tweezers.

A sheet of paper from the middle of the original packaging is removed. This sheet is placed on an inert surface. Three strips of about 3 mm x 60 mm are then cut out of this sheet using a scalpel. A strip of paper should weigh around 13 ± 1 mg. The weight must be determined accurate to 0.1 mg.

The paper strips are moved to the TE glass tube using a pair of tweezers. Three test specimens must be produced from the test materials for the test.

4 Analysis method and evaluation

4.1 Principle

The thermal extraction analysis method is based on the principle of dynamic headspace analysis. The test specimen is heated from 40°C to 180°C in a stream of nitrogen and this temperature is maintained for 12 minutes. The substances extracted during this process are collected on a Tenax tube doped with an internal standard (ISTD) and then subsequently analysed using thermal desorption. The substances are separated here using gas chromatography and then identified and quantified by the mass spectrometer. The emission potential of the paper is then derived and given as a TE value.

4.2 Example of a proven analysis method

Thermal extraction: Nitrogen flow rate 80 ml/min splitless, start temperature 40°C, end temperature 180 °C, maintain end temperature for 12 minutes.

Gerstel TDS-2 / KAS-4 thermal desorption/cold injection system with a glass wool liner (temperature programme 40-180°C with 40°C/min, maintain at 180°C for 5 minutes / cryofocussing at -100 °C, heat up at a rate of 12°C/sec to 300°C / He flow rate: 51 ml/min) Agilent GC 7890 / MSD 7973 (column DB 5 1; 30 m; 0.25 mm; 1 µm; temperature programme 40°C for 6 minutes, 4°C/min up to 80°C for 0 minute, 10°C/min up to 110°C for 0 min, 30°C/min up to 300°C, maintain for 5 min / MSD: scan 35 - 550; 2 scans/sec; transfer line: 300°C; NIST02 – data base)

This method can also be used to detect semi-volatile compounds, such as, for example, diisopropylnaphthalene and dibutyl phthalate [1].

When using a thermal extractor from another manufacturer, the equivalence to the Gerstel TE must be guaranteed. Verification of the equivalence of the thermal extractor must be provided to BAM as described in Paragraph 6.

4.3 Evaluation

For all substances in the VOC range, the TVOC cumulative value is determined as a toluene equivalent in µg/g. For all substances in the SVOC range, the TSVOC cumulative value is determined as an alkane equivalent in µg/g. For diisopropylnaphthalene, the cumulative value of all isomers is determined by means of an external calibration using 2,6-diisopropylnaphthalene or a mixture of diisopropylnaphthalene isomers in µg/g.

Desorption tubes packed with Tenax TA are spiked with calibration solutions of ISTD, toluene, alkane and 2,6-diisopropylnaphthalene in methanol or ethanol for the calibrations. For this purpose, a microlitre of the solution is sprayed onto the glass wool plug or glass frit in front of the Tenax TA and 1 litre of VOC-free air is sucked through the tube to remove the solvent. The calibration standard is analysed following the thermal desorption of the Tenax using gas chromatography coupled with mass spectrometry.

To determine the TVOC and TSVOC cumulative parameters, the total area of all substance peaks extracted from the test specimen is determined, also see [2]. The course of the base line must be known by analysing the empty glass tubes (blanks).

The TE value – which is a measure of the emission potential of the paper – is calculated in micrograms per gram using the following formula:

$$EP_{VOC} = R_T \times \frac{A_S}{m_P} \quad \text{Formula 1}$$

EP: Emission potential in µg/g (here: TE value)

RT: Toluene response factor = toluene mass in nanograms (ng) / toluene peak area AS:
Peak areas (VOC)

mP: Initial weight of the sample in mg

$$EP_{SVOC} = R_A \times \frac{A_S}{m_P} \quad \text{Formula 2}$$

EP: Emission potential in µg/g (here: TE value)

RA: Toluene response factor = toluene mass in nanograms (ng) / alkane peak area

AS: Peak areas SVOC

mP: Initial weight of the sample in mg

5 Test report

The test report must include all test data and the full test evaluation for the product.

The following information must be provided as a minimum:

Manufacturer

Precise product description (incl. batch number and manufacturing date)

Date of receipt, test date/test period

Production of the test specimens (dimensions, weight)

Testing and analysis conditions

TE TVOC in µg/g = cumulative value of extracted VOCs as TVOC in toluene equivalents

TE TVOC in µg/g = cumulative value of extracted SVOCs as TSVOC in alkane equivalents

TE DIPN in µg/g = cumulative value of extracted diisopropylnaphthalene isomers quantified as 2,6-diisopropylnaphthalene or diisopropylnaphthalene isomers. The cumulative value is the average value from the three measurements for a batch.

6 Testing institutions

The emission test required for applying for the Blue Angel environmental label for recycled copying paper under DE-UZ 14a may only be performed by qualified laboratories.

Testing institutions are considered to be qualified if they possess the necessary apparatus and a quality management system (or are accredited for these tests) and have demonstrated their qualifications to perform such tests by successfully participating in relevant round robin tests. Verification of compliance with these requirements must be submitted to the Bundesanstalt für Materialforschung und Prüfung (Federal Institution for Material Research and Testing), Division 4.2 "Materials and Air Pollutants".

7 Literature

- [1]** Jann, O., Wilke, O.: Möglichkeiten und Grenzen bei der Bestimmung von SVOC-Emissionen aus Materialien und Produkten (Methods and limits for determining SVOC emissions from materials and products). VDI Colloquium "Neuere Entwicklungen bei der Messung und Beurteilung der Luftqualität" (Recent developments in measuring and evaluating air quality), 11.-13.06.2002, Schwäbisch Gmünd, VDI Report 1656 p:357 -367, VDI-Verlag, 2002
- [2]** DIN ISO 16000-6: Indoor air. Part 6: Determination of volatile organic compounds in indoor and test chamber air by active sampling on Tenax TA® sorbent, thermal desorption and gas chromatography using MS or MS-FID (ISO/DIS 16000-6:2012).

Appendix D Dyes and pigments that are not permitted

In accordance with Paragraph 3.10, the azo dyes listed below may not be added.

Azo dyes that may cleave to one of the following aromatic amines (according to Directive (EC) No. 1907/2007, Annex XVII, No. 43)

4-aminobiphenyl	(92-67-1)
benzidine	(92-87-5)
4-chloro-o-toluidine	(95-69-2)
2-naphtylamine	(91-59-8)
o-amino-azotoluene	(97-56-3)
2-Amino-4-nitrotoluene	(99-55-8)
p-chloroaniline	(106-47-8)
2,4-diaminoanisol	(615-05-4)
4,4'-diaminodiphenylmethane	(101-77-9)
3,3'-dichlorobenzidine	(91-94-1)
3,3'-dimethoxybenzidine	(119-90-4)
3,3'-dimethylbenzidine	(119-93-7)
3,3'-dimethyl-4,4'-diaminodiphenylmethane	(838-88-0)
p-cresidine	(120-71-8)
4,4'-methylene-bis-(2-chloro-aniline)	(101-14-4)
4,4'-Oxydianiline	(101-80-4)
4,4'-Thiodianiline	(139-65-1)
o-toluidine	(95-53-4)
2,4-diaminotoluene	(95-80-7)
2,4,5-trimethylaniline	(137-17-7)
4-aminoazobenzene	(60-09-3)
o-anisidine	(90-04-0)
2,4-xylidine	(95-68-1)
2,6-xylidine	(87-62-7)

Appendix E Reports required for the durability of the paper

Publication paper and newsprint paper:	Office paper (and paper used for the production of printed matter and press products, if they have <u>not</u> been tested according to DIN 6738):	Other types of paper:
Report according to DIN 6738.	Report according to ISO 20494	No report
01 05 05 05 Standard newsprint paper	01 90 05 05 100% recycled printing and writing paper, non-coated, in rolls	06 15 25 05 Masking paper and paperboard
01 05 10 05 Improved newsprint paper	01 90 05 10 100% recycled printing and writing paper, non-coated, in formats	06 45 05 05 Binding paper
01 10 05 05 SC-A rotogravure paper	01 90 10 05 100% recycled printing and writing paper, coated on two sides, in rolls	06 45 10 05 Envelope paper and card
01 10 10 05 SC-B rotogravure paper	01 90 10 10 100% recycled printing and writing paper, coated on two sides, in formats	06 45 15 05 Winding paper
01 10 15 05 SC-A offset	01 90 15 05 Envelope 100% recycled	06 45 15 10 Machine-made paperboard
01 10 20 05 SC-B offset		06 60 05 05 Beer mat paperboard
01 80 05 05 Wood-containing printing and writing paper, in rolls		06 55 10 05 Other
01 80 10 05 Wood-containing printing and writing paper, in formats		06 60 05 05 Diagram and register base paper
01 85 05 06 Wood-containing printing and writing paper, coated on two sides, in rolls, LWC for rotogravure printing		06 60 1 05 Template and pattern paper
01 85 05 07 Wood-containing printing and writing paper, coated on two sides, in rolls, LWC for offset		06 6 15 05 Auxiliary paper and paperboard for printing works
01 85 05 11 Wood-containing printing and writing paper, coated on two sides, in rolls, HWC for rotogravure printing		06 60 20 05 Garden, flower and decorative crêpe paper
01 85 05 12 Wood-containing printing and writing paper, coated on two sides, in rolls, HWC for offset		06 60 25 05 Playing card
01 85 10 05 Wood-containing printing and writing paper, coated on two sides, in formats, consumption, standard and special coating		06 60 30 05 Album card
		06 60 35 05 Other