

BLUE ANGEL

The Environmental Label



Printed matter

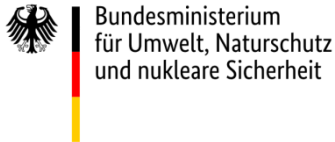
DE-UZ 195

Basic Award Criteria

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Version 6

The environmental label is underpinned by the following institutions:



The Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (Bundesministerium für Umwelt, Naturschutz und nukleare Sicherheit) is the owner of the label. It regularly provides information on the decisions taken by the Environmental Label Jury.



The Federal Environmental Agency (Umweltbundesamt) in the specialist department "Ecodesign, Eco-Labeling and Environmentally friendly Procurement" acts as the office of the Environmental Label Jury and develops the specialist criteria in the form of the Basic Award Criteria for the Blue Angel environmental labels.



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 Federal Environmental Agency and considering the results of the expert hearings conducted by RAL gGmbH, the Environmental Label Jury has set up these Basic Criteria for the Award of the Environmental Label. RAL gGmbH has been tasked with awarding the Environmental Label.

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

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

1.2 Background

Printed matter are products that are highly disseminated. The manufacturing process requires a high level of energy and resources (primarily paper, inks, metal printing plates). The printing process and the cleaning of the machines can lead to the emission of organic solvents that contribute to the production of ozone ("summer smog"). Some components in the printed matter can hamper the recycling of the paper. Auxiliary substances can be linked to environmental and health-related hazards during their use and when discharged into bodies of water.

The impact on human health and the environment is dependent on the relevant printing process used and can be reduced or prevented through the use of suitable technologies.

1.3 Objectives of the environmental label

In a comparison of their impact on ecological systems, those paper products made out of recovered paper perform significantly better in terms of their use of resources, wastewater load and water and energy consumption than paper products made predominantly from virgin fibres. Insofar as low proportions of virgin fibres are used in the manufacture of printing and publication papers, it is imperative from an ecological viewpoint that the wood is sourced from certified sustainably managed forests and forestry companies with high ecological standards. Harvesting timber from forests that are particularly worthy of protection e.g. tropical or boreal forests is not acceptable.

The use of paper with a high proportion of recovered paper contributes to the preservation of resources, especially ecosystems such as forests, and to a reduction in waste during the manufacture of printed matter. This is particularly true when recovered paper from households and commercial collections is used in the manufacture of the paper.

The printed matter should allow for the recycling of its paper fibres through the use of suitable inks, varnishes and adhesives as well as their applications. In order to guarantee a resource-conserving material cycle, it should be possible to separate coating substances during the preparation of recovered paper (removal of inks, varnishes and adhesives) at a reasonable cost. If chemicals are used in the printing process, including the pre-press process and any further processing stages, there are products available that have a lower impact on the environment and health than comparable products.

Optimising procedures during the printing process can also reduce energy usage, waste paper and air and water emissions.

The "Blue Angel for Printed Matter" should inform users that products issued with this label - in contrast to other products - provide greater preventative protection for the environment and human health.

Therefore, the environmental label provides those customers who commission printed matter with a decision-making aid if they want to pay particular attention to environmental and health aspects in the manufacture of the printed matter and wish to make this clear to the users of the printed matter.

It is a voluntary label that is designed to motivate publishing houses and other customers of printing companies to select printing processes that consume less resources, enable high-quality recycling, cause lower emissions and create lower amounts of waste. Customers ordering printed matter can thus utilise the environmental label to convey this aspect of the product in a simple manner.

The environmental label should be awarded to printed matter that has the following environmental properties:

- Enables high-quality recycling due to the use of a high proportion of recovered paper in the paper and cardboard used and the use of inks, varnishes and adhesives as well as their applications that do not prevent the high-quality recyclability of the paper fibres, as well as the use of renewable raw materials.
- Avoids the use of additives and materials that are damaging to the environment and health.
- Reduces energy usage, waste and environmentally harmful emissions.

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



1.4 Compliance with legal requirements

The observance of relevant laws and legal requirements for those systems on which the products labelled with the environmental label are manufactured is expected as a matter of course.

1.5 Overview of environmentally-damaging materials and technologies under development

For the manufacture of printing inks and cleaning agents from renewable raw materials, there are a limited number of additives available that are certified in accordance with environmental or social criteria. The traceability of raw materials is something that is being encouraged by large purchasers of renewable raw materials (biofuels, palm oils). It is expected that an increasing number of raw materials from certified sustainable cultivations will be available in the future and

can thus also be used by manufacturers of printing inks and cleaning agents at a reasonable economic cost.

Other practical and technical aspects that are currently being developed:

- Energy-efficient recovery of high-quality solvents – which evaporate in the heatset web offset dryer – and can be reused as an ink solvent.
- Energy-efficient technologies for drying and waste air purification.
- Offset printing inks and varnishes in which less than 0.1 % by mass of aromatic hydrocarbons sourced from mineral oil are used as constituent ingredients.
- Reduction of hazardous materials to a large extent in the production of printing plates.
- Verification in accordance with INGEDE Method 12 for all non water-based or non-redispersible adhesives.
- Exclusion of polytetrafluorethene

Exclusion of deforestation and verification of freedom from genetic engineering in the cultivation of raw materials.

1.6 Glossary

- **Aliphatic hydrocarbons:** Saturated hydrocarbons from mineral oils that consist of open chain hydrocarbons (paraffin) and alkylated and non-alkylated cyclic hydrocarbons (naphthalenes).
- **Aromatic hydrocarbons:** Highly alkylated aromatic hydrocarbons from mineral oils that have one or more aromatic rings.
- **DIBP:** Diisobutyl phthalate.
- **Display:** Printed form of a product presentation for promoting sales (e.g. large packaging, sales stand, rack).
- **DIPN:** Diisopropylnaphthalene.
- **Auxiliary printing substances:** All materials except for the paper and inks.
- **EVA:** Ethylene-vinyl acetate.
- **Constituent ingredient:** Ingredient of a substance that is part of the formulation and not present only as an impurity.
- **Volatile organic solvents (VOC):** "Volatile organic solvents" in the context of these Basic Award Criteria are organic compounds (VOC) that have a vapour pressure of 0.01 kPa or more at 293.15 K (20°C) or a corresponding volatility under the particular conditions of use (e.g. dryer in heatset web offset printing).
- **MDI:** Methylene diphenyl diisocyanate.
- **PAH:** Polycyclic aromatic hydrocarbons.
- **Paraffin waxes:** A microcrystalline product formed during either the processing of petroleum or synthetically produced. Other descriptions: Fischer-Tropsch waxes (synthetic), mineral oil waxes (from petroleum), microcrystalline waxes. They are used for abrasion protection in printing inks and hot melt adhesives.
- **Polyolefin waxes:** Waxes manufactured from olefins, for example: polyethylene wax. They are used for abrasion protection in printing inks and hot melt adhesives.
- **PVC:** Polyvinyl chloride.
- **PUR:** Polyurethane.
- **Siccative:** A drying agent.

- **Transport packaging:** Packaging that facilitates the transport of goods, protects the goods against damage during transport or which is used for reasons of safety of the transport and is used by the distributor.¹
- **Secondary packaging:** Packaging that is used as an additional layer of packaging over sales packaging and which is not needed for reasons of hygiene, preservation or protection of the goods against damage or soiling for sale to the final consumer.¹
- **Vaseline:** Aliphatic hydrocarbon compound (from petroleum or plant-based raw materials), which is used as abrasion protection in printing inks.
- **Printed packaging:** Printed materials for holding, protecting, handling, delivery or presentation of goods (incl. displays), which may range from raw materials to processed products and are passed on by the manufacturer to the distributor or final consumer.¹
- **Applicant/label holder:** The respective contractual partner. This is generally the printing company that has submitted the application and produces the printing products.
- **Distributor/label user:** The company under whose name the product is placed on the market (e.g. whose address can be found on the printed product).
- **Client:** The company who orders the printed product from the printing company. This does not necessarily have to be the same as the distributor.

2 Scope

- a) These Basic Award Criteria are valid for graphical printed matter that consists primarily of paper and cardboard and is not designed for packaging purposes. The scope of the Basic Award Criteria thus includes:
- ◆ Newspapers
 - ◆ Magazines, brochures, journals
 - ◆ Books
 - ◆ Catalogues
 - ◆ Prospectuses, advertising inserts, newspaper supplements
 - ◆ Flyers
 - ◆ Operating instructions, assembly instructions
 - ◆ Posters, billboards, displays made of cardboard
 - ◆ Annual reports, telephone books, directories
 - ◆ Loose leaf publications
 - ◆ Photo work envelopes
 - ◆ Printed postcards
 - ◆ Printed envelopes and padded envelopes
 - ◆ Decorative calendars
- b) The printed matter within the scope of these Basic Award Criteria must be produced using one or more of the following printing processes:
- ◆ Sheet-fed offset printing
 - ◆ Coldset web offset printing
 - ◆ Heatset web offset printing
 - ◆ Rotogravure printing

¹ This corresponds to the definition given in the Packaging Ordinance (Verpackungsverordnung), last amended on 17 July 2014.

- ♦ Flexographic printing
 - ♦ Digital printing
- c) Printed packaging is excluded from the award of the environmental label. Therefore, secondary packaging and transport packaging are also excluded from the scope of these Basic Award Criteria. Finished products according to DE-UZ 14b are also excluded.
- d) An application can be submitted for:
- ♦ defined product groups (e.g. summarised as "advertising prospectuses and brochures", stapled or glued, 2-96 pages, format A2-A5"). The following must be stated in the application: all printing machines, chemicals, types of paper and other components used for this product group, the maximum number of pages, the formats used, all possible types of further processing, etc. The basic contract is always concluded with the printing company. The printing company is thus permitted to advertise that they are authorised to print products in this specific product group with the Blue Angel.
 - ♦ For all actually printed products, the respective distributor must apply for an extension contract with RAL gGmbH so that the contract on the use of the environmental label can be transferred to these products. In the case of printed matter that is published on a recurring basis e.g. telephone books, periodicals, catalogues, etc., it is necessary to apply for a defined product group of this type.
 - ♦ defined individual products (e.g. certain yearly reports) that are defined in advance according to their title and will only be printed once. The application is examined based on the product stated in the application.

Supplements loosely inserted into the product are not covered by the Basic Award Criteria. If these loosely inserted supplements also comply with the criteria and have a valid contract on the use of the environmental label, the logo should be additionally displayed on these supplements.

3 Requirements

3.1 Requirements for the printing process

The printed matter must be manufactured using a permissible printing process named under Paragraph 2 b).

Compliance verification

The applicant shall state the printing process used for manufacturing the printed matter in Annex 1.

3.2 Requirements for the material composition

3.2.1 Proportion of the total mass accounted for by the materials

In the end product, the proportion of paper and cardboard, as well as printing inks and varnish, must be greater than 90 percent by mass.

Compliance verification

The applicant shall estimate the proportion of the total mass that is accounted for by the materials in the printed matter, especially if materials that are not made out of paper or cardboard are used to bind the product or provide it with protection, and declare compliance with the requirement in Annex 1. On request, the applicant shall supply a sample that corresponds to the individual product or the product group according to Paragraph 2 d) that are stated in the application.

3.2.2 Special material requirements

It is not permitted for the following materials to be added to the printed matter:

- PVC
- Chrome-plated metal (except for loose leaf publications in folders, which are certified in accordance with DE-UZ 56)
- Adhesives containing diisobutyl phthalate (DIBP)

The minimisation principle applies to all materials added to the product. They should only be used in the quantities required to fulfil certain functions. Varnishes should only be used – where absolutely necessary – to protect the jackets/cover sheets of brochures, magazines, books and catalogues. Film coatings should only be used for jackets on books (soft and hard covers).

Compliance verification

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

3.2.3 Use of adhesives

- a) If hot melt adhesives with a thermoplastic character are used, the following requirements must be fulfilled:
 - ◆ Observance of the processing temperature for the adhesive according to the technical data sheet
 - ◆ A gluing machine with integrated overheating protection
 - ◆ Air extraction in the workplace
- b) When PUR adhesives are used, the following requirements must also be fulfilled:
 - ◆ Only polyurethane (PUR) hot melt adhesives (max. processing temperature 130°C) with a monomeric MDI content < 0.1 % that are not classified with one of hazard statements listed in Table 1 may be used.
 - ◆ An extraction system must be available on the application system and retracted adhesive tanks; the rooms must also be adequately ventilated.

Compliance verification

The applicant shall declare compliance with the requirements in Annex 1 or, if external companies are commissioned for further processing steps, shall ensure that these companies confirm compliance with the requirements in writing with their signature and using the company's own letterheaded paper. In addition, the applicant shall name the companies commissioned for these further processing steps in Annex 1.

3.3 Requirements for paper and cardboard

The paper or cardboard used in the manufacture of the printed matter must comply with the requirements of DE-UZ 14a (recycled paper) or DE-UZ 14b (finished products made from

recycled paper for office and school supplies) or DE-UZ 72 (printing and publication papers primarily made of recovered paper) or DE-UZ 56 (recycled cardboard). A valid contract on the use of the environmental label in accordance with one of these Basic Award Criteria must have been concluded with RAL gGmbH for the paper or cardboard.

In the case of digital printing using the electrophotographic process, in which the paper is subjected to a thermal load, the paper must comply with the requirement in DE-UZ 14a Paragraph 3.13.

Compliance verification

The applicant shall declare compliance with the requirements in Annex 1. In the case of paper, the applicant shall state the name of the paper and the registration number in accordance with DE-UZ 14a (for digital printing with verification of compliance with Paragraph 3.13), DE-UZ 14b (printed labels) or DE-UZ 72 in Annex 2. In the case of cardboard, the applicant shall state the name of the cardboard and the registration number in accordance with DE-UZ 56 in Annex 2.

3.4 Requirements for the recyclability of the materials added to the printed matter

Sustainable printed matter must be produced in such a way that it does not hinder the reuse of the fibres in recycling. An important prerequisite here is the deinkability of the printed matter. The printed matter is considered verifiably recyclable if in accordance with the INGEDE methods it complies with the reference values in the "Deinkability Scorecard" and, in terms of its adhesive applications, the reference values in the "Removability Scorecard" from the European Paper Recycling Council (EPRC).

If non water-based or non-redispersible adhesives are used, it must be verified that the adhesive components can be separated during the processing of the fibres.² Information on the precise methods and number of required tests is provided in Appendix A.

Compliance verification

The applicant shall verify compliance with the requirements by submitting a test report from an approved testing institution in accordance with the Deinkability Scorecard from the European Paper Recycling Council (EPRC) in the form of a conformity declaration according to INGEDE Method 11 ("Assessing the Recyclability of Printed Products – Deinkability Test")³ as Annex 3 and, for the use of adhesives, a conformity declaration according to INGEDE Method 12 ("Assessment of the Recyclability of Printed Paper - Product Testing of the Fragmentation Behaviour of Adhesive Applications") as Annex 4. The verification of the deinkability/adhesive removability is considered to have been provided if the same material configuration (paper, ink, adhesive) with the same maximum ink coverage and adhesive application as that used for an already tested product is selected.

3.5 Requirements for all substances and mixtures added to the printed matter

In the pre-press process, printing process and further processing stages, no substances or mixtures may be used – even for cleaning or as an auxiliary substance – which according to the

² In the case of water-based or redispersible adhesives, there were no reliable test methods at the time these Basic Award Criteria were defined.

³ The methods can be found at www.ingede.org.

criteria of Regulation (EC) No. 1272/2008⁴ (or Directive 67/548/EEC⁵) are assigned the following H Phrases named in the table or which meet the criteria for such classification or are classified as carcinogenic, mutagenic or reprotoxic in the currently valid version of TRGS 905⁶.

The requirement relates to the labelling of the substance or mixture and not to the individual substances they contain.

The following are excluded from this requirement:

- Toluene in rotogravure printing machines using capsules that are fitted with a toluene recovery system from the waste air.
- Chromium VI and copper sulphate if used for manufacturing the cylinders in rotogravure printing.
- Hardening additives used in the electroplating process that are classified with the H Phrases H351, H361d, H411 and H412 and only contain up to a maximum of 5% of thiourea.
- Cleaning agents and rubber blanket regeneration agents with the H Phrase H304, burn-in gums and end gums with the H Phrases H411, H412 and H413, as well as developers with the H Phrases H371 and H373.

Table 1:

Hazard statement (H Phrase)	Hazard category	Wording
Toxic substances		
H300	Acute Tox. 1 Acute Tox. 2	Fatal if swallowed.
H301	Acute Tox. 3	Toxic if swallowed.
H304	Asp. Tox. 1	May be fatal if swallowed and enters airways.
H310	Acute Tox. 1 Acute Tox. 2	Fatal in contact with skin.
H311	Acute Tox. 3	Toxic in contact with skin.
H330	Acute Tox. 1 Acute Tox. 2	Fatal if inhaled.
H331	Acute Tox. 3	Toxic if inhaled.
Carcinogenic, mutagenic and reprotoxic substances		
H340	Muta. 1A Muta. 1B	May cause genetic defects.
H341	Muta. 2	Suspected of causing genetic defects.
H350	Carc. 1A Carc. 1B	May cause cancer.
H350i	Carc. 1A Carc. 1B	May cause cancer if inhaled.
H351	Carc. 2	Suspected of causing cancer.
H360F	Repr. 1A Repr. 1B	May damage fertility.

⁴ Regulation (EC) No. 1272/2008 on classification, labelling and packaging of substances and mixtures (CLP Regulation).

⁵ Directive 67/548/EEC on the approximation of laws, regulations and administrative provisions relating to the classification, packaging and labelling of dangerous substances

⁶ <http://www.baua.de/de/Themen-von-A-Z/Gefahrstoffe/TRGS/pdf/TRGS-905.pdf>

Hazard statement (H Phrase)	Hazard category	Wording
H360D	Repr. 1A Repr. 1B	May damage the unborn child.
H360FD	Repr. 1A Repr. 1B	May damage fertility. May damage the unborn child.
H360Fd	Repr. 1A Repr. 1B	May damage fertility. Suspected of damaging the unborn child.
H360Df	Repr. 1A Repr. 1B	May damage the unborn child. Suspected of damaging fertility.
H361f	Repr. 2	Suspected of damaging fertility.
H361d	Repr. 2	Suspected of damaging the unborn child.
H361fd	Repr. 2	Suspected of damaging fertility. Suspected of damaging the unborn child.
Other potential hazards		
H362	Lakt.	May cause harm to breast fed children.
H370	STOT SE 1	Causes damage to organs.
H371	STOT SE 2	May cause damage to organs.
H372	STOT RE 1	Causes damage to organs through prolonged or repeated exposure.
H373	STOT RE 2	May cause damage to organs through prolonged or repeated exposure.
H400	Aquatic Acute 1	Very toxic to aquatic life.
H410	Aquatic Chronic 1	Toxic to aquatic organisms.
H411	Aquatic Chronic 2	Toxic to aquatic organisms with long-lasting effects.
H412	Aquatic Chronic 3	Harmful to aquatic organisms with long lasting effects.
H413	Aquatic Chronic 4	May cause long lasting harmful effects to aquatic organisms.
H420	Ozone 1	Hazardous to the ozone layer.
EUH029		Contact with water liberates toxic gas.
EUH031		Contact with acids liberates toxic gas.
EUH032		Contact with acids liberates very toxic gas.
EUH070		Toxic by eye contact.

Compliance verification

The applicant shall verify compliance with the requirements by submitting an up-to-date safety data sheet in accordance with Regulation (EC) No. 1272/2008 (CLP Regulation) in digital form (not as an e-mail attachment) for all substances and mixtures (printing inks, varnishes, thinners, dampening agents including alcohol additives, cleaning agents, rubber blanket regeneration agents and other auxiliary substances) added to the printed matter as Annex 5 that demonstrates that none of the above named labelling obligations exist for the products used. The safety data sheets should not be older than 2 years. Exemption: The use of toluene is permissible in rotogravure printing.

If the printed matter is finished or further processed in another company to that owned by the applicant, up-to-date safety data sheets according to the CLP Regulation for the substances and mixtures added by this company shall also be submitted.

In addition, a list of all of the substances and mixtures used (the name must be identical to the name stated on the safety data sheet) including their function, manufacturer/supplier and area of application shall be submitted as Annex 6.

3.6 Requirements for renewable raw materials

If the printing ink, varnish, solvent or cleaning agent contains or is produced on the basis of renewable raw materials, it must be certified that they are not sourced from genetically modified plants or from rainforest deforestation.

Compliance verification

The applicant shall verify compliance with the requirements by submitting a declaration from the manufacturer as Annex 7 that certifies the exclusion of rainforest deforestation and genetically modified plants. The certification system used to certify the renewable raw materials shall be stated when the application is made and the certificates submitted. In addition, the applicant shall state which renewable raw materials are used in the product and in what quantities. If verification cannot currently be provided, the applicant shall justify the reasons.

3.7 Requirements for the dyes, toners, printing inks and varnishes

The requirements relate to the entire colour system, meaning the ready-for-use dyes, toners, printing inks and varnishes ("ready for printing").

3.7.1 Additives added at a later stage

No additives may be added to the printed matter at a later stage (exemption: anti-skin sprays for offset printing inks that correspond to the requirements in Paragraph 3.5).

3.7.2 Heavy metals

The following heavy metals may not be added to dyes, toners, printing inks and varnishes as a constituent component (dye, pigment, siccativ): lead, cadmium, chromium VI, cobalt, mercury, nickel, and copper compounds with the exception of copper phthalocyanine.

3.7.3 Additional requirements for manganese compounds

Manganese compounds may only be added to dyes, toners, printing inks and varnishes as a constituent component (dye, pigment, siccativ) if the proportion of manganese in the mixture does not exceed a maximum of 0.5 % by mass.

3.7.4 Azo dyes

No azo dyes or pigments may be added that can break down into amines. Amines are listed in Directive 2002/61/EEC⁷ or TRGS 614⁸:

Table 2:

Substance	CAS number
benzidine	92-87-5
4-chloro-o-toluidine	95-69-2
2-naphthylamine	91-59-8
o-aminoazotoluene / 4-amino-2',3-dimethylazobenzene / 4-o-tolylazo-o-toluidine	97-56-3
5-nitro-o-toluidine	99-55-8
4-chloroaniline	106-47-8
4-methoxy-m-phenylenediamine	615-05-4
4,4'-methylenedianiline / 4,4'-diaminodiphenylmethane	101-77-9
3,3'-dichlorobenzidine / 3,3'-dichlorobiphenyl-4,4'-ylenediamine	91-94-1
3,3'-dimethoxybenzidine / o-dianisidine	119-90-4
3,3'-dimethylbenzidine / 4,4'-bi-o-toluidine	119-93-7
4,4'-methylenedi-o-toluidine	838-88-0
6-methoxy-m-toluidine / p-cresidine	120-71-8
4,4'-methylene-bis-(2-chloro-aniline) / 2,2'-dichloro-4,4'-methylene-dianiline	101-14-4
4,4'-oxydianiline	101-80-4
4,4'-thiodianiline	139-65-1
o-toluidine / 2-aminotoluene	95-53-4
4-methyl-m-phenylenediamine	95-80-7
2,4,5-trimethylaniline	137-17-7
o-anisidine / 2-methoxyaniline	90-04-0
4-amino azobenzene	60-09-3
4-Amino-3-fluorophenol*	399-95-1
6-Amino-2-ethoxynaphthalene*	-
* Azo dyes that can break down into this amine are not known. Analytical proof is not required here.	

Compliance verification

The applicant shall verify compliance with the requirements 3.7.1 to 3.7.4 by submitting a declaration from the manufacturer of the dyes, toners, printing inks and varnishes in Annex 7.

⁷ Directive 2002/61/EC of the European Parliament and of the Council of 19 July 2002 amending for the nineteenth time Council Directive 76/769/EEC relating to restrictions on the marketing and use of certain dangerous substances and preparations (azo dyes)

⁸ Technical Rules for Hazardous Substances - Restrictions on use for azo dyes, which may release aromatic amines classified as carcinogens (Edition: March 2001)

3.7.5 Hydrocarbons in printing inks and varnishes in the offset printing process

In order to avoid unhealthy contamination during the reuse of the paper fibres, the following requirements must be fulfilled for offset printing inks and varnishes:

- In the case of aliphatic hydrocarbons, only those substances with a chain length of C10 to C20 may be used. In addition, the following high-molecular compounds without solvent properties may be used if they have a carbon number $C > 30$ and the proportion of those with a carbon number of C20 to C30 does not exceed a maximum of 1.5%: microcrystalline waxes, Vaseline, polyolefin waxes, paraffin waxes or Fischer-Tropsch waxes.
- Only those printing inks in which less than 1 % by mass of aromatic hydrocarbons from mineral oil are used as constituent ingredient may be used for printing the printed matter. In addition, the defined limit values for PAH that are regulated in EU Regulation No. 1272/2013 are valid.
- An exception applies to coldset web offset printing and compliance with the criteria described above is only obligatory from 01/01/2021.

Compliance verification

The applicant shall verify compliance with the requirements by submitting a declaration from the manufacturer of the printing inks and varnishes in Annex 7. In addition, the applicant shall ensure that the manufacturer of the printing inks and varnishes submits information about the ingredients used in the formulations for the printing inks and varnishes to RAL gGmbH as Annex 8.

3.8 Requirements for emissions of organic solvents

3.8.1 Cleaning agents, rubber blanket regeneration agents and other auxiliary printing substances in offset printing processes

In the case of all offset printing processes, the following requirements apply for cleaning agents, rubber blanket regeneration agents and other auxiliary printing substances:

- The proportion of toluene, xylene and other aromatic hydrocarbons with a carbon number of more than C9 must not exceed a maximum of 1% by mass.
- The benzene content must not exceed a maximum of 0.1% by mass.
- Halogenated hydrocarbons, terpenes, n-hexanes, secondary amines and amides may not be used.

Compliance verification

When using offset printing processes, the applicant shall verify compliance with the requirements by submitting a declaration from the manufacturer of the auxiliary printing substances used as Annex 7.

3.8.2 Cleaning of machines and machine parts in offset printing

For cleaning machines and machine parts (except dampening rollers) in offset printing processes:

- it is a requirement that only those cleaning agents that cause low emissions of volatile organic compounds and thus have a flash point of at least 55°C stated in their safety data sheet are used.

- only those cleaning agents that cause the lowest emissions of volatile organic compounds and thus have a flash point of at least 100°C stated in their safety data sheet are used in the best case scenario.
- If these cleaning agents are not used for an **automatic cleaning system**, justification must be provided to demonstrate that:
 - ♦ these cleaning agents cannot be used
- or
 - ♦ there are other reasons why it is not possible to use them.
- If these cleaning agents are not used for **manual cleaning**, justification must be provided to demonstrate that:
 - ♦ these cleaning agents have been tested
- and
 - ♦ the reasons for deciding against their use.

Compliance verification

When using offset printing processes, the applicant shall mark all of the substances and mixtures that are used as cleaning agents or rubber blanket regeneration agents in the safety data sheets submitted in accordance with Paragraph 3.5.1. The safety data sheet must demonstrate a flash point of at least 55°C. If the flash point is between 55°C and 100°C, the use of this cleaning agent or rubber blanket regeneration agent must be justified by the applicant in Annex 9.

3.8.3 Dampening solution additives in offset printing processes

In the case of all offset printing processes, the following requirements apply for dampening solution additives:

- The isopropanol or ethanol content in the dampening solution must not exceed 3% by volume. In order to reduce the amount of alcohol used, correspondingly designed rollers and dampening solution additives should be used.
- Dampening solution additives should not have a volatile organic compound – i.e. substances with a vapour pressure greater than 0.1 hPa (0.01 kPa) – content of greater than 10% by mass. If the additives have a higher volatile organic compound content, justification must be provided.
- Continuous monitoring of the isopropanol or ethanol content with an infra-red or ultrasonic measurement system must be available when using heatset web offset printing machines and sheet-fed offset printing machines with four or more ink or coating units.

Compliance verification

The applicant shall verify in Annex 1a or 1b that the isopropanol or ethanol content in the dampening solution is set to a maximum of 3%. The applicant shall submit the safety data sheet to verify that the dampening solution additive does not have a highly volatile organic compound (substances with a vapour pressure greater than 0.1 hPa) content of greater than 10%. If the substances used have higher contents, this must be justified in Annex 10. The applicant shall name the measure selected for reducing and monitoring the alcohol content in Annex 1a or 1b.

3.8.4 Emissions of volatile organic compounds in sheet-fed offset printing and coldset web offset printing

When using sheet-fed offset and coldset web offset printing processes, the following requirements for the emission of volatile organic compounds must be observed:

- The quantity of volatile solvents purchased (i.e. cleaning agents and rubber blanket regeneration agents with a flash point less than 100°C, dampening solution additives such as isopropanol and substances in dampening solution additives with a vapour pressure greater than 0.1 hPa) over a 12 month period in relation to the amount of paper purchased and provided (paper which is used in the printing processes at the company) during the same period must not exceed the following values:
 - ♦ For sheet-fed offset printing: Key figure for the quantity ≤ 4 kg/t.
 - ♦ For coldset web offset printing: Key figure for the quantity ≤ 2 kg/t.
- The quantity of volatile solvents purchased over a 12 month period should also be compared to the surface area of the paper purchased and provided (paper which is used in the printing processes at the company) during the same period.

Compliance verification

The applicant shall verify compliance with the requirement by submitting a tabular list of the amount of paper purchased and provided as Annex 11, the purchased quantities of the named solvents contained in the product over a 12 month period as Annex 12 and state the values in Annex 1a. The content of volatile organic solvents (according to the definition in Paragraph 1.6) in the respective products must be requested from the suppliers or this information must be stated in Annex 7. The end of the 12 month period must not be earlier than 12 months before the application.

3.8.5 Emissions of volatile organic compounds in heatset web offset printing

When using heatset web offset printing, the following requirements for the emission of volatile organic compounds must be observed:

- Irrespective of the solvent consumption, the waste gases from the dryer must be continuously measured and must not exceed 20 mg C/Nm³.
- Those dryers for which it has been verified through continuous measurement of their waste gases over a period of 10 days that the emissions do not exceed 15 mg C/m³ or a value of 5 mg C/m³ was not exceeded in any of the individual measurements are exempt from the requirement for continuous measurement. The measurements must be carried out by testing institutions accredited in accordance with DIN ISO 17025 and must not be more than 3 years old.
- Irrespective of the solvent consumption, the annual average figure for the diffuse emissions of volatile organic compounds must not exceed a proportion of 20% of the solvents used.
- The quantity of volatile solvents purchased (i.e. cleaning agents and rubber blanket regeneration agents with a flash point less than 100°C, dampening solution additives such as isopropanol and substances in dampening solution additives with a vapour pressure greater than 0.1 hPa) over a 12 month period in relation to the amount of paper purchased and provided (paper which is used in the printing processes at the company) during the same period must not exceed 2 kg/t.

- The quantity of volatile solvents purchased over a 12 month period should also be compared to the surface area of the paper purchased and provided (paper which is used in the printing processes at the company) during the same period.

Compliance verification

The applicant shall verify compliance with the requirement for the waste gas emissions by submitting a measurement report from an approved testing institution as Annex 13.

The applicant shall verify compliance with the requirement for the diffuse emissions by submitting a solvent balance in accordance with the Solvent Ordinance (31st BImSchV)⁹ as Annex 14 and state the values in Annex 1b.

The applicant shall verify compliance with the requirement by submitting a tabular list of the amount of paper purchased and provided as Annex 11, as well as the purchased quantities of the named solvents contained in the product over a 12 month period as Annex 12. The content of volatile organic solvents (according to the definition in Paragraph 1.6) in the respective products must be requested from the suppliers or this information must be stated in Annex 7. The end of the 12 month period must not be earlier than 12 months before the application.

3.8.6 Emissions of volatile organic compounds in rotogravure printing

When using rotogravure printing, the following requirements for the emission of volatile organic compounds must be observed:

- Toluene must be regenerated out of the waste gas and the emissions from the regeneration plant must be continuously measured. The emissions must not exceed 50 mg C/Nm³.
- The total emissions of volatile organic compounds must not exceed a proportion of 3% of the solvents used over a 12 month period. The solvents used comprise the quantity of solvents purchased and the quantity reused after the recovery process. Volatile organic compounds contained in waste or which result from the recovery process and were subsequently sold do not count as emissions (see Appendix B Point 2 for the calculation formula).
- The quantity of volatile solvents purchased (toluene as an ink solvent, as a cleaning agent or for correcting the cylinder, etc.), less the volatile organic compounds sold after the recovery process, over a 12 month period in relation to the amount of paper purchased and provided over the same period must not exceed 2 kg/t (see Appendix B Point 2 for the calculation formula).
- The quantity of volatile solvents purchased, less the volatile organic compounds sold after the recovery process, over a 12 month period should also be compared to the surface area of the paper purchased and provided (paper which is used in the printing processes at the company) over the same period (see Appendix B Point 2 for the calculation formula).
- The emissions of toluene in the ready-to-deliver printed matter must not exceed 300 mg per kilogram of printed matter, measured in accordance with the method described in Appendix C.

⁹ 31st Ordinance for the implementation of the Federal Immission Protection Act (ordinance for limiting the emission of volatile organic compounds due to the use of organic solvents in certain installations) from 21 August 2001 (BGBl. I S. 2180), which was last amended by Article 5 of the Ordinance from 24 March 2017 (BGBl. I S. 656).

Compliance verification

The applicant shall verify compliance with the requirement for the waste gas concentration by submitting a measurement report as Annex 15.

The applicant shall verify compliance with the requirement for the maximum total emissions by submitting a solvent balance in accordance with the Solvent Ordinance (31st BImSchV)⁹ as Annex 14 (see also Appendix B Point 1) and state the values in Annex 1c.

The applicant shall verify compliance with the requirement by submitting a tabular list of the amount of paper purchased and provided as Annex 11, as well as the purchased quantities of the named solvents contained in the product over a 12 month period as Annex 12. The content of volatile organic solvents (according to the definition in Paragraph 1.6) in the respective products must be requested from the suppliers or this information must be stated in Annex 7. The end of the 12 month period must not be earlier than 12 months before the application.

The applicant shall verify compliance with the requirement for the residual toluene emissions in the form of an illustrative test certificate in accordance with the "COWI II test method for determining toluene emissions from printed matter" as Annex 16, which may not be more than 3 months old (see Appendix C). The measurement uncertainty must not exceed a maximum of 15%.

3.8.7 Emissions of volatile organic compounds in flexographic printing

When using flexographic printing, the following requirements for the emission of volatile organic compounds must be observed:

- Irrespective of the solvent consumption, the captured waste gases must be continuously measured and must not exceed the following values:
 - ♦ 50 mg C/Nm³ when using a biological waste gas cleaning process.
 - ♦ 20 mg C/Nm³ in all other cases.
- Irrespective of the solvent consumption, the annual average figure for the diffuse emissions of volatile organic compounds must not exceed a proportion of 20% of the solvents used.
- The quantity of volatile solvents purchased (i.e. thinners or cleaning agents with a vapour pressure greater than 0.1 hPa) over a 12 month period in relation to the amount of paper purchased and provided over the same period must not exceed 2 kg/t.

Compliance verification

The applicant shall verify compliance with the requirement by submitting a measurement report as Annex 15.

The applicant shall verify compliance with the requirement for the maximum total emissions by submitting a solvent balance in accordance with the Solvent Ordinance (31st BImSchV)⁹ as Annex 14 and state the values in Annex 1d.

The applicant shall verify compliance with the requirement by submitting a tabular list of the amount of paper purchased and provided as Annex 11, as well as the purchased quantities of the named solvents contained in the product over a 12 month period as Annex 12. The content of volatile organic solvents (according to the definition in Paragraph 1.6) in the respective products must be requested from the suppliers or this information must be stated in Annex 7. The end of the 12 month period must not be earlier than 12 months before the application.

3.8.8 Emissions of chromium VI in wastewater in rotogravure printing

When using rotogravure printing, the following requirements for wastewater from the chromium treatment process before mixing in wastewater treatment plants must be observed:

- The treatment of the wastewater containing chromium waste must be carried out in batches separately to other wastewater.
- The concentration of chromium VI in the wastewater after the chromium treatment process and before mixing with other wastewater must not exceed 0.08 mg/l in any of the eligible samples (no utilisation of the 4 out of 5 rule). The measurements must be carried out every 2 years.
- The content of chromium VI in every batch must be additionally monitored and documented by internal inspections. The measurement values do not need to be verified using the standard reference process but using quick tests.
- The wastewater treatment system must be fitted with a final filter (e.g. consisting of an ion exchanger or activated carbon) to hold back surfactants added to the chrome bath for the purposes of occupational safety.

Compliance verification

The applicant shall declare compliance with the requirements in Annex 1c and submit the latest three measurement reports from an approved testing institution in Annex 17. In addition, the applicant shall describe their electroplating and wastewater treatment plants in Annex 18.

3.9 Requirements for the pre-press process

3.9.1 Illustrations

No films may be used to illustrate the printing plates, only digital processes are permissible.

Compliance verification

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

3.9.2 Development

In the development of offset printing plates, the developer fluid should be regenerated in the machine.

Compliance verification

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

3.10 Requirements for waste paper management

The waste management system must contain key figures that show the amount of waste paper and cardboard, as well as the amounts of paper and cardboard purchased and provided. The following key figures for the last three years in each case must be provided as a minimum:

- Annual amount of waste based on the paper waste code numbers¹⁰.
- Annual amount of waste paper in relation to the paper purchased/used (paper and cardboard purchased or, if relevant, provided) in percent.

¹⁰ These include the waste code numbers: 15 01 01 paper and cardboard packaging or 20 01 01 paper and cardboard.

The following maximum values for the amount of waste per year should be observed:

Printing process	Maximum amount of waste
Sheet-fed offset printing	20 % by mass
Newspaper coldset web offset printing	10 % by mass
Other coldset web offset printing	18 % by mass
Heatset web offset printing	20 % by mass
Rotogravure printing	15 % by mass
Flexographic printing	11 % by mass
Digital printing	10 % by mass

If multiple printing processes are carried out at one location, for which it is not possible to collect separate measurements for the amounts of waste paper, the waste paper is to be allocated according to the ratio of the paper purchased for each of the different printing processes.

If the maximum amount of waste is exceeded, the reasons for this must be analysed, documented and justified on a yearly basis.

The following measures for reducing the amount of waste paper must also be documented as a minimum:

- Cause analysis
- Countermeasures
- Training

The cause analysis must focus on the following measures as a minimum:

- Improving the utilisation of the paper.
- Reducing maculature.
- Reducing faulty prints.
- Reducing storage damage.

The economic viability of purchasing a press container for waste paper is to be regularly checked and documented (at least every 5 years).

Compliance verification

The applicant shall state the maximum amounts of waste for the last three years in Annex 19. In addition, the applicant shall verify compliance with the maximum amounts of waste by submitting a tabular list of the amount of paper purchased and provided as Annex 11, as well as notifications from the paper disposal company as Annex 20 about the amount of paper disposed of over a 12 month period in each case for a total of three years.

The notifications from the paper disposal company must contain weight measurements in kilograms or tonnes. The end of the last 12 month period must not be earlier than 12 months before the application.

The applicant shall submit documentation on reducing the volume of waste paper in Annex 21, insofar as the maximum permitted value for the waste has been exceeded.

In addition, the applicant shall submit verification about the economic viability of purchasing a press container for waste paper as Annex 22 that is not more than 5 years old, insofar as a press container is not already available.

3.11 Requirements for energy management

3.11.1 Energy management by the printing company

The following requirements apply to the energy management system followed by the printing company:

- When using rotogravure, flexographic, headset and newspaper coldset web offset printing processes, the printing company must either demonstrate an energy management system according to ISO 50001 or DIN EN 16247 Part 1 that also includes the other printing processes used at the location. Certification according to EMAS should also include the energy management system.
- Or if only other permissible printing process are used and no certification according to ISO 50001 and EMAS or according to DIN EN 16247 Part 1 has been received, the printing company must document the following elements of an environmental management system in accordance with the definition in the EMAS III Regulation¹¹:
 - ♦ A current environmental policy for the company, not more than 3 years old.
 - ♦ A current environmental programme for a maximum period of 3 years.
 - ♦ Quantifiable environmental goals resulting from the environmental programme, defining the relevant timescales and responsibilities.
 - ♦ Important environmental aspects of the company.

Compliance verification

The applicant shall verify compliance with the requirements in Annex 23 in accordance with ISO 50001 or, in the case of an annual electricity consumption of < 10 GWh, in accordance with DIN EN 16247 Part 1 either in the form of a validation certificate according to EMAS or certification according to ISO 50001 or DIN EN 16247 Part 1¹².

Alternatively, the applicant shall verify compliance with the requirements for the stated elements of an environmental management system by documenting them in Annex 24.

3.11.2 List of energy consumers

The energy management system must include a list of all energy consuming machines, devices, heating/air conditioning and lighting (this requirement has generally been completed when introducing an energy management system in accordance with ISO 50001 or EMA or DIN EN 16247 Part 1). The list of energy consumers must contain at least the following information:

- Maximum output of the energy consumers (in KW) and the estimated average output (in kW).
- Measurement or estimate of the annual operating times for the energy consumers (h).
- Sum of the calculated energy consumption values and the actual energy consumption values (in kWh).
- Identification of the largest energy consumers and corresponding improvement measures.

¹¹ Regulation (EC) No. 1221/2009 of the European Parliament and of the Council of 25 November 2009 on the voluntary participation by organisations in a Community eco-management and audit scheme (EMAS), repealing Regulation (EC) No 761/2001 and Commission Decisions 2001/681/EC and 2006/193/EC.

¹² The current validation of the company according to EMAS completely covers the requirements for the energy management system according to ISO50001. Also see here: http://www.emas.de/fileadmin/user_upload/06_service/PDF-Dateien/EMAS-und-DIN-EN-ISO-50001.pdf

Compliance verification

The applicant shall verify compliance with the requirement by submitting a list of energy consumers as Annex 25.

3.11.3 Key energy figures

The energy management system must include key figures for the printing production. Information about whether the administration area of the company could be separated or is included in the key figures should be provided (this requirement will also generally have been fulfilled during the introduction of an energy management system according to ISO 50001, EMAS or DIN EN 16247 Part 1). The following key figures for the previous three years must be provided as a minimum:

- Annual energy consumption data for the air conditioning system per square meter or cubic meter of area covered, climatically adjusted for regional heating degree days.
- Annual energy consumption data for the compressed air in relation to the paper purchased.
- Annual energy consumption data in relation to the paper purchased.

Compliance verification

The applicant shall verify compliance with the requirement by submitting the key energy figures as Annex 26.

3.11.4 Heatset web offset dryer

The following requirements apply to the waste heat from the heatset web offset dryer:
The energy used to dry the printing inks must be used within an integrated heating/cooling concept. The concept must be regularly checked and documented in a catalogue of measures. This shall include the results of an economic viability check of the following measures as a minimum:

- Possibilities for combined heat and power.
- Possibilities for integrated drying (burning of expelled solvents for creating heat in the dryer).
- Possibilities for using the waste heat for conditioning of the room air (heating/cooling) and generating hot water.

Compliance verification

The applicant shall verify compliance with the requirements by submitting documentation of the examination of the energy concept as Annex 27, which is no more than 5 years old.

3.11.5 Compressed air system

The energy efficiency of the compressed air system must be regularly checked and optimised:

- Monthly: Inspection of the compressed air system for leakages.
- Every 5 years: Checking the efficiency of the centralisation of the compressed air system.
- Every 5 years: Checking whether it is viable to amend the compressed air network for the separate supply of power units with higher and lower pressure requirements.
- In the case of a planned or existing room humidification system with compressed air: Checking the efficiency of an energy-efficient room humidification system that uses a high pressure water system.

Compliance verification

The applicant shall describe the compressed air system operated on-site, its maintenance and submit suitable documentation to explain the process for energy optimisation of the compressed air system as Annex 28.

4 Applicants and parties involved

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

Parties involved in the award process are:

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

5 Use of the Environmental Label

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

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

If the environmental label is depicted on the printed matter, particularly on those used to advertise one or more products, the applicant (publisher or client) must ensure that the environmental label is kept clearly separate from this content (e.g. by depicting it in the imprint, the header or footer of the relevant printed matter). It must be sufficiently clear that the environmental label has been issued exclusively for the printed matter being used. In the case of advertising leaflets, brochures, flyers, catalogues, posters and similar, the following note must be printed next to the environmental label: "This printed matter has been awarded the Blue Angel."

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 31/12/2021.

They shall be extended by periods of one year each, unless terminated in writing by 31/03/2021 or 31 March 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 shall be entitled to apply to RAL gGmbH for an extension of the right to use the ecolabel on the product entitled to the label if it is to be marketed under another brand/trade name and/or other marketing organizations.

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

- Applicant (manufacturer/distributor)

- Brand/trade name, product description
- Distributor (Label User), i.e. the marketing organization.

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Appendix A INGEDE methods – instructions for completion

1 Deinking test according to INGEDE Method 11

Ideally in cooperation with the printing company and the ink/varnish manufacturers, the applicant will arrange for the completion of deinking tests in accordance with INGEDE Method 11.

The test is carried out on two types of paper: coated and uncoated paper, which have been awarded the environmental labels DE-UZ 14a, DE-UZ 14b, DE-UZ 56 or DE-UZ 72. In the case of inkjet printing, it is not permissible to simplify the types of paper into coated and uncoated because the deinkability is highly dependent here on the paper, printing ink and, if used, primer. Therefore, it is only possible in this case to certify the ink used in combination with the paper used. If only one type of paper is used, it is only necessary to carry out the test on this type of paper. Precisely specified series of printing inks or varnishes from one manufacturer must be used for the test. The test report must state both the paper (trade name, coated/uncoated, manufacturer) used for the test and the precise description of the printing inks (trade name, colour tone, manufacturer).

If additional varnishes or other coating materials that could influence the deinkability are used, verification of the deinkability of these defined substances must be additionally provided (paper + printing ink + varnish/coating material). These additional substances must also be stated in the test report with their trade names and manufacturers.

If printing ink series are very similar¹³, it is possible to cover multiple series with one test if a declaration from the printing ink manufacturer is submitted.

Example: "Fictitious ink 200" has been tested and approved for all four colour tones. The composition of the inks in the series "Fictitious ink 300" differs only slightly from "Fictitious ink 200". The ink manufacturer must provide a declaration about this matter. Approval will also be issued for "Fictitious ink 300" subject to the results of the test. If there is verification in accordance with the Deinkability Scorecard from the EPRC, approval will be issued by RAL gGmbH for all printed matter that is produced with these specifications without each one requiring special individual verification.

This approval can also be issued for products from other label holders if the corresponding verification of the deinkability (e.g. from the supplier of the ink and/or varnish) is provided to the relevant applicant. The verification of the deinkability must not be more than 3 years old.

In the case of reasonable doubt about the conformity of the product in the application and the boundary conditions in the submitted verification of deinkability, RAL gGmbH can request a special deinking test from the applicant for the product stated in the application.

If printing ink tests from more than one manufacturer are used, the test must be carried out separately for each manufacturer.

¹³ This means that the chemicals in the printing inks are identical, differences only relate to the quantities used and are permitted as long as there is no suspicion that they will change the deinkability. For example, amending the viscosity of the inks by changing the proportion of solvent used is permitted. However, adding or omitting additives is not permitted.

Examples:

Composition of the printed matter	Number of tests
coated paper + 1 set of printing inks	1
uncoated + coated paper + 1 set of printing inks	2
coated paper + 2 sets of printing inks (same manufacturer)	1 + manufacturer declaration; if a declaration is not possible: 2
coated paper + 2 sets of printing inks (different manufacturers)	2
uncoated + coated paper + 2 sets of printing inks (same manufacturer)	2 + manufacturer declaration; if a declaration is not possible: 4
uncoated + coated paper + 2 sets of printing inks (different manufacturers)	4
coated paper + 1 set of printing inks + 1 varnish	1
coated paper + 1 set of printing inks with and without varnish	2
coated paper + 1 set of printing inks + 2 varnishes	2
coated paper + 2 sets of printing inks (different manufacturers) + 2 varnishes	4
1 paper + 1 set of inks (inkjet printer)	1
2 papers + 2 sets of inks (inkjet printer)	4

2 Removability of the adhesive applications

A test according to INGEDE Method 12 must be submitted for all non water-based or non-redispersible adhesives.

A test must be carried out for each adhesive used. An exception is made here for side and back gluing. These can be tested in combination in a joint test.

The test report must state both the paper (trade name, coated/uncoated, manufacturer) used for the test and the precise description of the adhesive (trade name, type of adhesive, manufacturer). In addition, the coating thickness and the type of application used for the adhesive (selective, full surface) must be stated. These factors must not differ in any of the printing products produced compared to the sample tested.

If more than one adhesive is used in combination for side and back gluing, a test must be carried out separately for each combination.

Examples:

Composition of the printed matter	Number of tests
1 adhesive	1
2 adhesives	2
Adhesive for 1 side gluing + 1 back gluing	1
Adhesive for 2 side gluings + 1 back gluing	2
Adhesive for 1 side gluing + 2 back gluings	2
Adhesive for 2 side gluings + 2 back gluings	4

If there is successful verification of compliance with the requirements of the "EPRC-Scorecard for the Removability of Adhesive Applications", either in the form of a corresponding test, or

compliance with the conditions stated in the ANNEX (Exempted from testing) of the EPRC Scorecard, RAL gGmbH will issue approval for all of the printed matter produced in accordance with these specifications, without requiring special individual verification.

Appendix B Calculating the solvent emissions

3 Definitions (based on the Industrial Emissions Directive 2010/75/EU)

Volatile organic solvents (VOC, also see Paragraph 1.6)

“Volatile organic solvents” in the context of these Basic Award Criteria are organic compounds (VOC) that have a vapour pressure of 0.01 kPa or more at 293.15 K (20°C) or a corresponding volatility under the particular conditions of use (e.g. dryer in heatset web offset printing).

Paper

In the context of these Basic Award Criteria, “paper” in the following calculations refers to printable materials (paper, cardboard) incl. maculature and trimmings. Packaging paper and cardboard packaging are not included in the calculations. Paper and cardboard provided by clients must be taken into consideration.

Reference period

Any previous 12 month period can be selected by the applicant as the reference period for the following calculations. However, the end of the 12 month period must not be earlier than 12 months before the application.

Measurement values

All reference values in the following calculations shall be given in units of mass. If only the volumes of the purchased quantities is known, this information shall be converted into mass using the density stated in the safety data sheet.

4 Calculation formulas

- **Total emissions:**
Total emissions (G) [kg]: $E - Z - A - R - L$
- **Key figure for the quantity:**
Key figure for the quantity [kg/t]: $G / P1$
- **Key figure for the surface area:**
Key figure for the surface area [kg/m²]: $G / P2$

5 Explanation of the abbreviations

Input paper (P):

- P1 Amount of paper [t] that was purchased or provided over a 12 month period.
P2 Surface area of paper [m²] that was purchased or provided over a 12 month period.

Quantity of volatile solvents purchased [kg]:

E Quantity of volatile solvents purchased or the proportion of volatile organic solvents in the quantity of mixtures purchased (e.g. toluene, ethanol, ethyl acetate in purchased printing inks or ethanol in dampening solution additives for offset printing), as well as the proportion of organic solvents that are volatile under the particular conditions of use (e.g. dryer in heatset web offset printing). If the safety data sheet does not state a precise value for the proportion of solvents but rather a range, the average of this range or a precise value documented by the manufacturer must be used.

Discharge of volatile organic solvents [kg]:

Q Waste gas emissions downstream of a treatment plant for volatile organic compounds (oxidation/combustion or recovery), which is calculated by determining the volumetric flow rate [m³] and total concentration of carbon [mg] (stated for standardised conditions of 273.15 K and 1013.25 hPa), as well as by converting the total carbon into total VOC [mg]. The conversion factor "C->VOC" for individual substances corresponds to the ratio of the molecular weight of the carbon content relative to the complete substance. For emissions from mixtures, a conversion factor for the mixture containing the volatile organic solvent recommended by a testing institution shall be used.

Z Amount of volatile organic solvents destroyed by waste gas treatment (e.g. oxidation/combustion). The destroyed amount is defined as the difference between the amount of volatile organic solvents before the waste gas treatment plant and fraction "Q". The conversion of total carbon to VOC is carried out in the same way as for fraction "Q". A continuous measurement of the volumetric flow rate and total carbon in the untreated gas (e.g. lower explosive limit (LEL) measurement) should be used where possible as the basis for the calculations.

A Proportion of volatile organic solvents in waste, which is properly disposed of and whose destruction or recovery is certified by the waste disposal company. The proportion of organic solvents in the waste should be determined using a representative measurement for every typical fraction of the waste (e.g. volatile organic residues in ink residues, contaminated cleaning agents or distillation sludge). The amount of volatile organic solvents in cleaning cloths that are properly disposed of after being stored in closed containers can be estimated by using the number of cleaning cloths delivered and taking comparative weight measurements of the cleaning cloths with/without solvents.

R Recovered volatile organic solvents or their proportion in recovered mixtures, insofar as the solvent has not been reused within the 12 month period being considered but is instead intended for future internal use and thus increases the company's own stocks compared to the initial stock levels.

L Volatile organic solvents contained in commercially produced products (e.g. the manufacture of printing inks, varnishes or adhesives) or recovered during operation and delivered to external companies (e.g. ink manufacturers) for direct recycling. Solvents that are delivered to waste disposal companies for treatment do not belong to the fraction "L" but rather to the fraction "A".

Other fractions not relevant for the calculation:

W Volatile organic solvents recovered internally within the company in the 12 month period and reused in the same 12 month period. Increases in the stock levels of recovered solvents (between the start and end of the 12 month period) are to be recorded as fraction "R". Determining the fraction "W" is not required for calculating the key figures.

X Volatile organic solvents that find their way into wastewater. It is assumed that these solvents evaporate from the wastewater before they are destroyed by microorganisms and thus escape into the environment as diffuse emissions. Determining the fraction "X" is not required for calculating the key figures.

V Volatile organic solvents that are contained in products as impurities or residues (e.g. residual emissions from toluene, ethanol or isopropanol from finished printed matter). It is assumed that these solvents evaporate and thus escape into the environment as diffuse emissions. Determining the fraction "V" is not required for calculating the key figures.

D Diffuse emissions of volatile organic solvents insofar as they are not contained in X, V or U – meaning emissions through windows and doors. Roof fans and other discharge outlets without waste gas treatment belong to the fraction “D”. Determining the fraction “D” is not required for calculating the key figures.

U Volatile organic solvents that are unintentionally released e.g. due to accidents or other unplanned, uncontrolled emissions into the environment. Determining the fraction “U” is not required for calculating the key figures.

Appendix C COWI II test method for determining toluene emissions from printed matter

The sample is taken at room temperature using a 5 litre glass container with a leak-tight rubber stopper. Toluene is stripped out and collected on activated carbon. The activated carbon is then tested using gas chromatography with FID. The result is given in "mg toluene/kg of sample".

Materials and equipment:

- Test container (5 litre glass container)
 - Rubber stopper with two gas inlets
 - Pump for a low flow rate (1.5 litres/minute)
 - Activated carbon vials
 - Prepurified ambient air
 - Carbon disulfide, analysis quality
 - Gas chromatograph with FID
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- a) Add the sample – ¼ of a brochure corresponding to 10-50 grammes – to the test container and attach the rubber stopper. Handle the sample quickly and carefully in order to minimise the evaporation of the toluene when preparing the sample.
 - b) Attach the activated carbon vials to preliminarily clean the ambient air at the inlet.
 - c) Connect the pump and another activated carbon vial to the outlet from the container.
 - d) Channel preheated ambient air at a temperature of 23°C through the container at a volumetric flow rate of 1.5 l/min for a period of 60 minutes.
 - e) Desorb the toluene from the activated carbon vials by adding 1.5 ml of carbon disulfide and shaking for 30 minutes.
 - f) Analyse the extract using gas chromatography with FID.

The results are given in milligrams of toluene per kilogram of paper.

Typical measurement uncertainty: 5-10% (standard deviation).

Determination limit: 0.2 mg/kg.