

Eco-labels – universal approach

Report on a performance instalment within the framework of the UFOPLAN Project “Feasibility studies, expert opinions and market surveys for the development of existing eco-labels in selected product groups as recall service”, FKZ 202 95 382

Expert opinion on the risks of hazardous materials and fundamentals for the allocation of the “Blue Angel” (German „Blauen Engel“)

Abstract



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Overall co-ordination

Ökopol – Institute for Environmental Strategies (Institut für Ökologie und Politik) GmbH, Hamburg
Nernstweg 32 – 34; D-22765 Hamburg, Tel. +49-(0)40/39 100 2-0, Fax.: -33
Internet: www.oekopol.de, e-mail: info@oekopol.de
Dipl. Ing. Dirk Jepsen, Dr. Anne Ipsen

the performance instalment presented here within the framework of the overall project:

Expert opinion

Risks of hazardous materials and fundamentals for the allocation of the “Blue Angel”

Preparation

Project management

Andreas Ahrens

Ökopol - Institut für Ökologie und Politik GmbH, Hamburg
Nernstweg 32 – 34; D-22765 Hamburg, Tel. +49-(0)40/39 100 2-0, Fax.: -33
Internet: www.oekopol.de, e-mail: info@oekopol.de

Collaboration:

**Kerstin Heitmann, Dr. Ute Meyer
Matthias Weiß, Dr. Dieter Großmann**

Ökopol – Institut für Ökologie und Politik GmbH, Hamburg

Risks of hazardous materials and fundamentals for the allocation of the “Blue Angel”

1 Initial position

The first six fundamentals for the allocation of the German *Blauen Engel* (*Blue Angel*) were adopted in 1978. Today, the eco-label is allocated in 80 product groups. Currently there are some 800 recipients for the label with ca. 3,600 products. The systematics of the allocation requirements for the *Blue Angel* has changed in the 25 years of its history. Parallel to this (eco)toxicological knowledge and hazardous material law have become further developed (in particular the EU Preparation Directive 1999). In addition, the harmonisation of procedures for the evaluation and communication of (eco)toxicological risks within the framework of the European integration process and the universal programmes for the improvement of the safety of chemicals are of considerable significance. Two years ago, at EU level, the discussion on a new chemicals policy started and the practical implementation of the “New Approach” (for example the construction material directive) as well as the integrated product policy are taking on concrete form. Within this process it must inevitably result in inconsistencies for whose correction – insofar as they concern environmental criteria – the formulation of a new strategy for the fundamentals for the allocation of the *Blue Angel* is necessary.

2 Objective and process of the project

Within the framework of the expert opinion, using exemplary cases, possible classification and designation conflicts between the *Blue Angel*, hazardous substance law and the evaluation criteria are to be identified according to construction product directives. Building on this, proposals should be elaborated to show how such conflicts are possible to avoid or (if unavoidable) can be convincingly communicated. In addition to this, ways will be shown as to how the consistency, transparency and comprehensibility of the substance-related allocation requirements can be improved and the development of fundamentals for allocation can be framed efficiently.

The project is divided into **three sub-tasks**. Analysis of the fundamentals for allocation (referred to below as “**hazardous substance expert opinion**”), **specialist interviews** and development of common **guidelines** for the future allocation of the label. In the **first phase** the fundamentals of allocation of eight wastewater-related preparations with a “*Blue Angel*” were investigated with regard to environmentally-related labelling responsibilities and consistency with hazardous substance directives. In the **second phase** the investigation took place with regard to possible health-related labelling conflicts. With this, the consistency with the

evaluation systems used in testing was examined in accordance with the construction material directive. In the **third phase** a transfer of the information to two selected products (hygienic paper and PCs) took place.

Document	Agreed work step	Presentation of the findings
0: Abstract		
Strategy paper (Appx. IV to the hazardous substance expert opinion)	6	Discussion in UBA 22. April 2003 Jury meeting ¹ on 15/16 May 2003
2: Hazardous substance expert opinion	1-7	UBA Workshop on 26 June 2003
3: Interviews with selected protagonists	8	UBA Workshop on 29 September 2003
4: Guidelines	Additionally 26 June	UBA Workshop on 29 September 2003
5: Presentation of the findings in front of the eco-label jury	9	Jury meeting on 20/21 November 2003
5: Presentation of the guidelines	9	Special meeting of the fundamentals of award committee, 27 February 2004, Berlin

Table 1-1: Documents prepared and presented, events carried out within the scope of the project

3 Hazardous substance expert opinion

3.1 Background and terms of reference

Among the products allocated the *Blue Angel* there are both products (e.g. computers, paper products, plastic products) and preparations (e.g. paints, lubricants). While for products the use of hazardous substances does not fundamentally have to be labelled, preparations with hazardous characteristics must be classified and labelled in accordance with the [German] Hazardous Substance Ordinance.

Since 30 July 2002² there now also exists an environmentally-related labelling responsibility for preparations. If necessary from now on products which carry the German eco-label must

¹ Stakeholder forum at which the specialist proposals of the German Environment Agency for the allocation of labels in the respective product groups are discussed and approved.

² Adoption of the Preparation Directive 1999/45/EC dated 31 May 1999 in the German Hazardous Substance Ordinance (BGBl. I S. 2514).

also be labelled as “environmentally hazardous N” (symbol: a dead fish). A depiction of both symbols on one product would, however, be hardly negotiable!

Within the scope of the expert opinion presented it was determined for which product groups the situation could occur that a preparation with eco-label, on meeting the requirements of the product requirements of the respective, valid fundamentals of allocation, at the same time is to be labelled as “environmentally hazardous N”. Analogous to this a comparison was made as to what extent health-related hazard symbols with which products marked with the eco-label can be deliberately accepted or can occur unintentionally. The investigation took place using as examples eight wastewater-relevant products³, for which the *Blue Angel* is allocated. For the transfer of the findings from the investigation of the fundamentals for allocation for the wastewater-relevant preparations, two products labelled with the *Blue Angel*, hygienic paper from old paper (UZ 5) and workstation computers (UZ 78) were selected. In addition, for some fundamentals for allocation, the conformity was checked with applicable European directives and German standard specifications.

3.2 Results and evaluation

The results from the hazardous substance expert opinion can be divided into four allied subjects:

- inconsistencies of the allocation requirements of the eco-label with the EU Hazardous Substance Law
- possible labelling conflicts: *Blue Angel* and hazard symbols in accordance with hazardous substance law
- unclear or inconsistent fundamentals for allocation
- inconsistencies with other product-related approaches to evaluation and regulations at national and EU level (e.g. construction product directive).

The comparison with the **requirements in accordance with hazardous substance law** produced the following summarised findings:

- the classification according to the German WGK-System⁴ always plays a central role with the allocation of the *Blue Angel*, although it only reflects the long-term risks due to

³ Movement area de-icing agents for airfields (RAL-UZ 99), biologically rapid degradable hydraulic fluids (RAL-UZ 79), chain lubricants for engine-driven saws (RAL-UZ 48) and lubricants and forming oils (RAL-UZ 64), low pollution lacquers (RAL-UZ 12a), low emission wall paints (RAL-UZ 102), wastewater treatment plant compatible sanitary admixtures (RAL-UZ 84a) and scouring water admixtures (RAL-UZ 84b).

⁴ Water hazard classes (**W**assser**g**efährdungs**k**lassen: German classification system for substances and preparations with regard to hazards with transportation and storage. The WGK 1-3 and the R-clauses of the EU classification system can be aligned consistently.

PBT/vPvB⁵ types of substances insufficiently⁶.

- The environmentally-related test requirements of the fundamentals for allocation deviate in part from the criteria for environmentally hazardous characteristics within EU substance law:
 - for the evaluation as “potentially degradable” in some fundamentals for allocation of the *Blue Angel* a smaller degradation rate is required (20%) than in the EU Technical Guidance Document⁷ (hydraulic fluids and sanitary admixtures).
 - for the preparations sanitary and scouring water admixtures (RAL-UZ 84 a and b) as well as movement area de-icing agents (RAL-UZ 99) degradation tests on the preparation are foreseen, although the EU Preparation Directive requires the testing of the individual components.

An **environmentally-related labelling conflict** is not to be expected for any of the eight product groups examined. In most fundamentals for allocation this is achieved through limitation or banning of substances of Water Hazard Classes 2 and 3⁸. Through this, due to the precaution-oriented classification mechanism of the VwVwS, substances are also limited, which have gaps in their data with regard to environmentally hazardous characteristics⁹. With low emission wall paints as well as sanitary and scouring water admixtures environmentally hazardous substances are limited according the threshold values of the preparation directive. With hydraulic fluids the criteria of the fundamentals for allocation allow the use of not easily degradable substances up to 5%. Admittedly here an individual testing by experts is foreseen so far as there are indications of an aquatic toxicity for such substances, so that in this way a labelling conflict can be recognised well in time and avoided.

⁵ Substances which are particularly persistent (persistent = P), biologically accumulative (bio-accumulating = B) and toxic (toxic = T), are handled in the current EU discussion as “substances of very high concern”. Substances which are very persistent and are very bio-accumulating (so-called vPvB substances = very persistent, very bio-accumulative) are, due to their ability to concentrate, handled as PBTs even if (eco)toxicological active properties are not verified in a laboratory test.

⁶ The WGK concept refers to accident-related release and therefore also takes account of acute human and ecotoxicological effects of substances. Therefore, the **long-term** risk due to substances which, although they act extremely toxically, are at the same time easily degradable and not bio-accumulating, tend rather to be over-estimated with the assignment to WGK 2. On the other hand, the hazards due to long-term health damaging substances (for example reproduction damaging R 60 or 61), which are at the same time persistent and bio-accumulative (R 53) tend rather to be underestimated with the assignment to WGK 2.

⁷ EU Technical Guidance Document (TGD) for risk assessment in support of Commission Directive 93/67/EEC on Risk Assessment for New, Notified Substances, Commission Regulation (EC), No 1488/94 on Risk Assessment for Existing Substances, Directive 98/8/EC of the European Parliament and of the Council concerning the placing of biocidal products on the market.

⁸ Environmentally hazardous substances, according to the point system of the VwVwS receive six points (N,R50 or N,R51/53) or eight points (N,R50/53) and are therefore classified at least WGK 2 (5-8 points).

⁹ Substances about which nothing is known on persistence, bio-accumulative potential or aquatic toxicity are, according to VwVwS, respectively so classified as if they possessed these characteristics.

Environmentally-related labelling conflicts can only occur if **subsequently**, for certain substances, gaps in data are filled and through this labelling becomes necessary. This could be the case as soon as the adoption of the new European chemicals policy starts and previously non-evaluated content substances are classified as hazardous.

With regard to **health aspects** hazardous substance labels (irritating Xi) will be accepted explicitly in certain fundamentals for allocation (movement area de-icing agents as well as sanitary and scouring admixtures). Otherwise here also with the current formulation of the fundamentals of allocation no labelling conflicts are to be expected. In the fundamentals of allocation for movement area de-icing agents although acutely and chronically toxic substances (T, T⁺) are not excluded from use they do not, from experience, play a role in these products.

The criteria for the environmentally- and health-related product qualities beyond the obligatory labelling threshold are, however, very unclear and in part inconsistent. For the product groups investigated non-uniform criteria for the avoidance of environmentally- and health-related hazards were applied. The differences cannot be traced or completely traced back to the different product areas of application but rather are to be evaluated as inconsistencies:

- various legal references are provided as basis for the classification of substances and preparations (European or German hazardous substance law, VwVwS (WGK), Technical Rules for Hazardous Substances (TRGS), MAK lists).
- the exclusion of CMR substances¹⁰ is limited with some products to Category I and II CMR. With lacquers and wall paints on the other hand Category III are excluded.
- the requirements, as in the hazardous substance law, predominantly refer to the substance content in the preparation. With wall paints in general, with siccatives and pigments in lacquers and with additives in computers, the fundamentals of allocation investigated, however, refer to the exclusion of “added” substances. This means that, already with the raw materials, “imported” substances are not considered¹¹.
- the concentration limits for substances with certain hazard characteristics, in individual fundamentals of allocation, are based on different principles:
 - concentration limits without reference to legal requirements,
 - orientation on the threshold values of the preparation directive for labelling, in part reduced to 50% of the threshold value,

¹⁰ Carcinogenic, mutagenic or reproduction toxic substances.

¹¹ In the new fundamentals for allocation for printers, copiers and multifunction equipment it is already required that added recycled plastics meet the same requirements as for new plastics, provided that large parts are re-used and are appropriately labelled.

- orientation on the threshold values of the preparation directive for the classification of preparations.

A breakdown of the formula is required only for a few product groups; for other product groups the requirements are so formulated that substances with insufficient data remain unrecognised.

The exemplary comparison carried out with the **requirements on construction products** resulted in a range of systematic differences. This is due to the fact that, in the fundamentals for allocation of the *Blue Angel* for lacquers, wall paints and forming oils investigated, requirements were placed on the composition of the product, while the emphasis of the evaluation methods (AgBB, DIBt¹²) for construction products is on the testing for the release of hazardous substances under service conditions. In addition, with the AgBB approach, limits are described for the emissions of unknown (no effect threshold known) or non-evaluated substances.

For the application of the results to the products hygienic papers from recycled paper (UZ 5) and work station computers (UZ 78) relevant evaluation methods and EU regulations were also enlisted. With regard to hygienic papers it applies that the requirements of the UZ 5 go beyond the criteria of the BfR¹³. The requirements of the fundamentals of allocation for work station computers are, in general, more detailed and higher than the specifications of the EU directives on the return of old electronic equipment (WEEE) and hazardous substances in electronic equipment (ROHS). The ROHS directive, however, refers to the content in the end product. Here, with *Blue Angel* products, deviations from the directive can occur, if relevant substances, for example through recycling plastics, are “imported” into the product¹⁴.

The recommendations resulting from previous investigations are again taken up in the sub-project “Guidelines” (Chapter 5).

¹² Committee for the Evaluation of Construction Products with Regard to Health (AgBB): Procedure with the Evaluation of Emissions of Volatile Organic Compounds (VOC) from Construction Products with Regard to Health, October 2000; German Institute for Structural Engineering (DIBt): new DIBt Advisory Leaflet for the Evaluation of the Effects of Construction Products on Soil and Groundwater, 2001.

¹³ Recommendations of the German Federal Agency for Risk Assessment (BFR) XXXVI.: Papers, Cartons and Cardboard for Contact with Foodstuffs, as at 01.01.03.

¹⁴ In order to prevent the import of FSM it is required in a new set of fundamentals for allocation for printers, copiers and multifunction equipment, that recycling plastics used meet the same requirements as for new plastics, provided that large parts are reused and are appropriately labelled. These requirements, in future, are also recommended for computers.

4 Interviews with selected protagonists

4.1 Background and objective

Using the *Blue Angel*, labelled products are to contribute in a replicable manner to the prevention of important environmental and health problems. Toxic risks for humans and the environment can be prevented or reduced in two different ways:

- “**Low pollution** product design”: no generally known harmful substances accepted in the product and/or
- “**Low emission** product design”: no outgassing or leaching of product components

In order to achieve this product quality specialist, risk-related requirements on the labelled products have to be developed and communicated in a clear manner to the recipient of the label, the user of the product and the public.

Within the scope of interviews it is to be documented in a systematic manner how selected key actors assess the significance of the “*Blue Angel*” with regard to chemistry-related environment and health protection. In agreement with the Federal Environment Agency in all, 14 individuals were selected who are involved with product evaluation:

- members of the eco-label jury
- staff of environmental and user organisations
- staff from authorities who carry out risk assessment
- manufacturers of products or industrial associations
- institutions which carry out product tests.

4.2 Assessment and results

In the interviews the different points of view with regard to the objective of and expectations on the *Blue Angel* were clear. These points of view are related in part to the “chemistry competence” of those questioned and in part to the interest group which they represent. However, it was clear that differentiated points of view predominated and the areas of actual dissent with an open dialogue would be relatively small.

The assessment of the survey is shown in extract form in the following table. The results have been included as basis in the guidelines.

The allocation process for the <i>Blue Angel</i> is sufficiently transparent.	Yes 9	No 7
The <i>Blue Angel</i> should label products which are relatively better or absolutely “safe”.	Relative 14	Absolute 2
The consumer can be expected to accepted simple risk information and precautionary measures; the <i>Blue Angel</i> should be used to convey such information.	Yes 14	No 2
Sanitary admixtures contain caustic substances. Is the Xi label acceptable for a <i>Blue Angel</i> product?	Yes 14	No 2
Are cobalt siccatives (R43, R49) ¹ acceptable in <i>Blue Angel</i> lacquers?	Yes 13	No 3
Environmentally hazardous (N) but degradable ship’s bottom paint replaces products containing TBT: acceptable for labelling with the <i>Blue Angel</i> ?	Yes 12	No 4
Wall paint emits no known carcinogenic substances, however 0.01 mg/m ³ unknown substances in indoor air; acceptable?	Yes 9	No 7
Are toners (sensitising and/or non-tested substances) acceptable in <i>Blue Angel</i> printers with technical avoidance of the release of dust?	Yes 9	No 7

Table: Examples for questions from the interview process and summary of the answers

In their answers those questioned showed that they evaluate the respective products as **risk-related** and they do not orient themselves solely on the harmfulness of the content substances. It is also clear that for half of those questioned it does appear to be acceptable if a *Blue Angel* product contains unknown or non-evaluated substances.

5 Guidelines for the avoidance of (eco)toxicological risks

5.1 Background and terms of reference

The inconsistencies between the historically developed fundamentals of award of the *Blue Angel* and new regulatory documents (EU Chemicals Policy, Construction Product Directives, IPP, ...) initially prognosticated and confirmed within the scope of project tasks make the formulation of a new strategy for the fundamentals of allocation (common umbrella) of the *Blue Angel* necessary. The use of common guidelines exists in:

- increasing the efficiency of the process of the development of the fundamentals for allocation,
- making the fundamentals for allocation and the basic philosophy for all involved transparent and reproducible, and
- establishing the integrated and comprehensive evaluation (taking into account the complete product cycle) of risks covering all product groups.

The guidelines can serve the completion and definition of the general process for the eco-label Type 1 (ISO 14024) and define product requirements with regard to toxic and ecotoxic effects (supplementing of purely ecological balancing considerations).

5.2 Main principles of guidelines for the *Blue Angel*

Derived from the investigations within the scope of this project, the team of experts, independent of the actual user circle or the technical form of the product, for all product groups recommend the maintenance of the following principles with the development of fundamentals for allocation of the *Blue Angel*:

- the technical efficiency (fitness for use) of the labelled product must correspond at least with the technical efficiency (fitness for use) of non-labelled products, however, if possible, exceed these.
- the minimisation of the risk of eco- and human-toxic effects can be achieved through the elimination of hazardous substances in the product itself and /or through the avoidance of emissions.
- fundamentally the risks over all phases of the service life cycle are taken into account. With this, however, for reasons of practicability, a transparent setting of the emphasis is necessary. This is determined via exposition scenarios¹⁵.
- very hazardous substances¹⁶, non-essential heavy metals¹⁷ and significant allergens¹⁸ should be excluded from use in *Blue Angel* products. Concentration limits are to be defined for unintentional impurities in the raw materials. Deviation from these basic rules can take place only in justified individual cases.
- unavoidable uncertainties about possible eco- and human-toxic effects and possible levels of exposure with labelled products (gaps in data for product components, prognosis uncertainties about the actual level of exposure) have to be communicated in the fundamentals for allocation.
- as a rule, substances should be excluded or limited due to general criteria. Nevertheless, the exclusion or limitation of certain individual substances can be sensible.

¹⁵ Under an exposure scenario is understood to be a set of information (statistics, surveys, assumptions) which describes how the substance is produced and /or how it is to be used in the course of its further service life cycle (example: processing to lacquers; application [including disposal of paint residues]; technical usage period of the lacquer; removal of the lacquer; disposal of old lacquer).

¹⁶ “*Substances of very high concern*” in accordance with the proposal of the EU Commission: carcinogenic, mutagenic and reproduction toxic substances of Categories I and II (CMR); persistent and bio-accumulative and toxic substances (PBT); very persistent and very bio-accumulative substances (vPvB).

¹⁷ Lead, cadmium, mercury.

¹⁸ Contact allergen list of the BfR: to be found under www.bfr.bund.de; -> Datenbanken ->Chemikalien und Kontaktallergie -> [Databases – chemicals and contact allergy].

- labelled products are, as far as possible, to be simply application safe¹⁹. If this cannot be securely guaranteed the risks are to be limited through notes on application.
- requirements for allocation for products for which other environmental and health-related evaluation systems already exist (for example construction products), which are accepted by the (European) market protagonists should, as far as possible be oriented to these evaluation systems.

The communication of the allocation requirements necessitates different, target group oriented information: product information sheet (target group: user), technical allocation requirements (target group: recipient of the label/specialist public), justification for the allocation of the label (target group: user, recipient of the label, specialist public).

The following six-step procedure is recommended for the development of specialist allocation requirements:

Step 1: Definition of the technical product performance

The performance characteristics of the labelled product are described using existing standard specifications, whereby the “better product” is to be at least equal in its technical quality with non-labelled products.

Step 2: Definition of the exposure scenario

Using a catalogue of questions the relevant exposures in the service life of the product are determined and the labelled product group is assigned a certain exposure type. The assignment takes place using the following matrix.

¹⁹ A product is considered application safe if it can be handled without special safety measures by the user.

	Preparation	Preparation	Preparation	Product	Product	Product
	No precipitation hardened matrix	Precipitation hardened matrix	As operating material in equipment	Mono-material substances	Furniture, textiles	Equipment
Use in the environment (soil and surface waters)						
Use in the environment (air)						
Placing in wastewater treatment plants						
Interior use						
Use with skin and mouth contact						

Table 2: Exposure scenarios for *Blue Angel* products

Step 3: Definition of the desired product characteristics (environment and health)

In this step the desired product characteristics are determined depending on the exposure scenario. With this, the design strategy can refer to the minimisation of diffuse substance losses, the exclusion of particularly hazardous substances or the maximisation of components with verifiable biological degradability.

In addition, the following sub-steps are important for this:

Step 3.1: Agreement on which types of hazardous substances are not to be contained or are acceptable up to which level.

Step 3.2: Agreement on which types of very hazardous substances are to be excluded.

Step 3.3: Agreement on to what extent significant contact allergens and respiratory tract sensitizers are to be excluded.

Step 3.4: Determination of exposure-determining substance or product characteristics.

Step 3.5: Selection of the options for the definition of desired product characteristics

Step 4: Definition of the required minimum data

The minimum requirement for data on production evaluation is determined using laid-down rules. With this, the difficulty can lie on the evaluation of the individual components (recipe allocation) or the determination of the release rate in the standard test.

Step 5: Communication of the uses and risks for the user

Both the technical efficiency and the environmental- and health-related uses of the product should be presented in a reproducible manner. In particular the product advantages presented of the labelled product should refer to the following areas:

- avoidance of direct effects on health
- avoidance of indirect effects on health, e.g. through accumulation of hazardous substances in the food chain
- reduced or avoided effects on ecosystems and species diversity

These new guidelines, in comparison to current procedures, inter alia lead to the following changes:

- with the products labelled with the Blue Angel they may contain hazardous substances as intended component if other advantages justify this and an exposure is less probable or easily avoidable.
- placing of emphasis with the formulation of product requirements along the service life of the product takes place using exposure scenarios.
- the process of developing fundamentals for allocation can be simplified in that standard evaluation modules sorted over the exposure scenarios, are combined.
- gaps in knowledge on remaining environmental risks and health risks as well as measures for the safe application of the product are communicated actively.
- a formulation of the product requirements takes place to satisfy the target group.