BLUE ANGEL

The German Ecolabel

Corded
Voice Over IP Phones

DE-UZ 150

Basic Award Criteria

Edition June 2010

Version 6

The Environmental Label is supported by the following four institutions:

Federal Ministry
for the Environment, Nature Conservation
and Nuclear Safety

The Federal Ministry for the Environment, Nature Conservation and Nuclear Safety is the owner of the label. It regularly provides information on the decisions taken by the Environmental Label Jury.

Umwelt Bundesamt

The German Environmental Agency with its specialist department for "Ecodesign, Eco-Labelling and Environmentally friendly Procurement" acts as office of the Environmental Label Jury and develops the technical criteria of the Basic Criteria for Award of the Blue Angel.

Jury Umweltzeichen

The Environmental Label Jury is the independent, decision-making body for the Blue Angel and includes representatives from environmental and consumer associations, trade unions, industry, the trade, crafts, local authorities, academia, the media, churches, young people and the German federal states.

RAL gGmbH

The RAL gGmbH is the awarding body for the Environmental Label. It organises the process for developing the relevant award criteria in independent expert hearings – which involve all relevant interest groups.

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Version 6 (04/2020): Changes in chapter 3.2.1 and appendix B

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This document is a translation of a German original. In case of dispute, the original document should be taken as authoritative.

1 Introduction

1.1 Preface

In cooperation with the Federal Ministry for the Environment, Nature Conservation and Nuclear Safety, the German Environmental Agency and considering the results of the expert hearings conducted by RAL gGmbH, the Environmental Label Jury has set up these Basic Criteria for the Award of the Environmental Label. RAL gGmbH has been tasked with awarding the Environmental Label.
Upon application to RAL gGmbH and on the basis of a Contract on the Use of the Environmental Label to be concluded with RAL gGmbH, the permission to use the Environmental Label may be granted to all products, provided that they comply with the requirements as specified hereinafter.
The product must comply with all the legal requirements in the country in which it is to be marketed. The applicant shall declare that the product meets this requirement.

1.2 Background

The communication structures of companies and private households are currently being unified („Unified Communication"). For telephone terminals this means an increased replacement of conventional ISDN or analog phones with so-called voice over IP (VoIP) technology.
In addition to the basic function of making and receiving telephone calls VoIP phones often have extra functions to provide access to additional communication media (Email, Internet) and supportive communication information (caller ID, customer data, conversation history, etc). Other extra functions can be made available by integrating hardware and software (e.g. camera for video conferences, software for door-opening systems).
Such additional functions may, however, lead to an energy consumption of VoIP phones that is 1.5 to 5 times higher than that of traditional ISDN or analog lines. That is why the present criteria for VoIP phones are intended to provide the buyer with an orientation for his or her purchase decision already at the early stages of market penetration in order to encourage the increased use of environmentally friendly products with the lowest possible energy consumption.

1.3 Environmental Aspects

The minimization of electric power consumption of telephones is a major goal of environmental protection in order to preserve energy resources and to protect the climate. This environmental goal should be supported by reducing the energy consumption of the individual devices to the technologically achievable minimum, especially in the proportionately most often used energy-saving or low-power mode. Other major goals of environmental protection are the avoidance of waste and emissions during manufacture and disposal of used appliances. The environmental impact can be minimized, among other things, by long-lived high-quality products.
Hence, the Blue Angel eco-label shall be awarded to VoIP phones meeting the following environmental criteria:

- lowest possible energy consumption, above all in standby or ready mode
- long-lived and recyclable design
- avoidance of environmentally harmful materials

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

1.4 Objectives of the Environmental Label

The Blue Angel eco-label for VoIP phones is to signal to the purchaser of such an appliance that the eco-labelled product – compared with other devices – better takes into account the aspects of preventive environmental, health and consumer protection. Thus, the eco-label can help the consumer make an informed decision when buying new products.
As a voluntary label the Blue Angel's objective is to motivate manufacturers to develop devices featuring an optimized lowest-possible energy consumption. It also allows them to inform the customers about this aspect of product properties in an easy-to-understand way.

1.5 Legal Standards

The legal requirements have been taken into consideration in developing these Basic Award Criteria and must be complied with by the label user. This includes, above all, requirements regarding pollutant contents, waste collection, treatment and disposal according to the German Elektro- und Elektronikgesetz (Electrical and Electronic Equipment Act) (ElektroG)[1], transposing EC Directives 2002/96/EC[2] and 2002/95/EC[3] into German.

1.6 Definitions

- **Deep sleep mode**
  The telephone must be able in deep sleep mode to give the caller ID while all other functions of the device must be switched off. The user must be able to put the device into this deep sleep mode.
- **Low-power mode**
  Low-power mode is the mode which the device automatically enters after a programmed period of time and in which all electricity consumers not needed do not function. The device must be able to directly identify incoming calls and ready for outgoing calls within no more than 0.5 seconds.

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1 Gesetz über das Inverkehrbringen, die Rücknahme und die umweltverträgliche Entsorgung von Elektro- und Elektronikgeräten (Act Governing the Sale, Return and Environmentally Sound Disposal of Electrical and Electronic Equipment - Electrical and Electronic Equipment Act), Federal Law Gazette 2005, Part I, No. 17, Bonn, 23 March 2005 http://www.umweltbundesamt.de/uba-info-daten/daten/elektrog/index.htm

2 Directive 2002/96/EC of the European Parliament and of the Council of 27 January 2003 on Waste Electrical and Electronic Equipment (WEEE) (Official Journal of the European Union L 37/24, 13 February 2003)

3 Directive 2002/95/EC of the European Parliament and of the Council of 27 January 2003 on the Restriction of the Use of Hazardous Substances in Electrical and Electronic Equipment (Official Journal of the European Union L 37/19, 13 February 2003)

- **Ready mode - 'On-Hook'**
  In ready mode 'On Hook' the phone is in inactive state with the handset on the hook from which it may be instantly activated using a function (active mode). In ready mode the phone provides a reduced set of functions. (Example: switch-off of the display backlight and other additional consumers).
- **Active mode 'Active Call'**
  In this active mode the phone is in active call mode or conversation mode. In active mode, distinction is made between hands-free mode and handset mode.
- **Active mode 'Ringing'**
  The active mode 'ringing' refers to the mode in which the telephone rings to alert the user of incoming calls.

1.7 Outlook on Possible Future Requirements

The EU plans to set maximum values for power consumption in networked standby (EU-EuP Preparatory Studies „Lot 26: Networked Standby Mode"). To the extent VoIP phones as network devices fall under this regulation the limits specified therein will have to be taken into account when next revising the criteria for power consumption in network standby mode.
The next revision should include standards for power management optimization taking into account the technological development. The LLDP-MED protocol (Link Layer Discovery Protocol - Media Endpoint Devices) or a protocol which at the time of revision has been further developed or a comparable protocol could serve as a standard. The goal should be the adoption of criteria taking into account the energy-optimised interaction between VoIP phones and other network terminals.

2 Scope

These Basic Criteria apply to telephones using an Ethernet cable for making phone calls via IP technology (IP= Internet Protocol) – that is to make phone calls across computer networks based on internet standards.
These Basic Criteria do not apply to telecommunication terminals based on the ISDN-standard (ISDN=Integrated Services Digital Network – international standard for a digital telecommunication network) nor do they apply to telecommunication terminals processing an analog transmitted signal.
These Basic Criteria only apply to corded phones where the handset is attached to the base unit. Telephones complying with DECT standard fall – even with the VoIP function integrated - under the criteria of DE-UZ 131 (Digital Cordless Phones).

3 Requirements and Compliance Verifications

3.1 General Requirements

3.1.1 Recyclable Design

Blue Angel eco-labelled products must meet the following requirements for recyclable design:

- The devices shall be so designed as to allow an easy disassembly for recycling purposes to make sure that case plastics and metals can be separated as fractions from materials of other functional units and, if possible, be recycled.
- The devices shall be so designed as to support specialist disassembly by intelligently designed connections or allow disassembly by use of ordinary tools.
- Specialist firms hired by the manufacturer for device recycling shall receive information for device disassembly.
- The device recycling strategy developed with respect to the above points shall be published on the internet.

Compliance Verification

The applicant shall declare compliance with the requirements in Annex 1 to the Contract and give (also in Annex 1 to the Contract) the web address providing information on the recycling strategy. The applicant shall present the recycling strategy with respect to the above-mentioned points as Annex 4 to the Contract.

3.1.2 Product Take-Back

The applicant undertakes to take back eco-labelled and own-manufactured products after use in order to channel them with preference to reuse or to material recycling in accordance with the Electrical and Electronic Equipment Act (ElektroG). Non-recyclable device parts shall be disposed of in an environmentally sound manner. Waste equipment from private households may always be given to municipal collection facilities. Waste equipment from the business sector shall be returned free of charge to the applicant or a return facility to be named by applicant. It must be possible to return the device either personally or by shipping services. The product literature shall include details on the return options.

Compliance Verification:

The applicant shall declare compliance with the requirement in Annex 1 to the Contract and provide evidence of a corresponding customer information by submitting an extract from the German version of the user manual as Annex 8 to the Contract.

3.2 Material Requirements

3.2.1 Material Requirements for Plastics used in Case and Case Parts

The plastics may not contain as constituent parts[4] any substances classified as:

[4] Constitutional components are substances which are added to the product as such or as constituents of mixtures and remain there unchanged in order to achieve or influence certain product properties. This does not apply to residual monomers that have been reduced to a minimum.

a) Substances which are identified as particularly alarming under the European Chemicals Regulation REACH (1906/2006/EC) and which have been incorporated into the list drawn up in accordance with Article 59, Paragraph 1 of the REACH Regulation (so-called "SVHC list of candidates").[5]
b) Substances that according to the CLP Regulation (EC) No. 1272/2008 have been classified in the following hazard categories or which meet the criteria for such classification[6]:
   - carcinogenic in categories Carc. 1A, Carc. 1B or Carc. 2
   - germ cell mutagenic in categories Muta. 1A, Muta. 1B
   - reprotoxic (teratogenic) in categories Repr. 1A, Repr. 1B

Halogenated polymers shall not be permitted. Neither may halogenated organic compounds be added as flame retardants. In addition, the use of flame-retardant materials that are rated as carcinogenic of category Carc. 2 or as acutely toxic to aquatic organisms with long-term effects.

The corresponding H phrases for the hazard classes and categories can be found in Appendix B.

The following shall be exempt from this rule:
- process-related, technically unavoidable impurities
- fluoroorganic additives (e.g. anti-dripping agents) used to improve the physical properties of plastics, provided that they do not exceed a proportion of 0.5 percent by mass plastic parts with a mass of less than 25 grams

Compliance Verification

The applicant shall declare compliance with the requirements in Annex 1 to the Contract and submit a written declaration of the plastic manufacturers or suppliers according to the form as Annex 2 to the Contract. Such declaration shall confirm that the substances to be banned have not been added to the plastics used in the device. Also, the applicant shall give the chemical designation of the flame retardants used as well as their CAS number.

3.2.2 Display

- The display backlight must not contain mercury.
- The liquid crystal mixtures must not be classified as carcinogenic, mutagenic or reprotoxic in categories 1, 2 or 3 nor as toxic or very toxic according to Annex VI to Regulation (EC) No. 1272/2008 effective at the time of filing the application.

Compliance Verification

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

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[5] The version of the list of candidates at the time of application is valid. The list of candidates in its relevant version can be found at https://echa.europa.eu/candiate-list-table

[6] The harmonized classifications and labellings of dangerous substances can be found in Annex VI, Part 3 of the CLP Regulation. Furthermore, a comprehensive classification and labelling inventory, which also includes all of the self-classifications of hazardous substances made by manufacturers, has been made available to the public on the website of the European Chemicals Agency: ECHA Classification and Labelling Inventory.

The applicant shall submit a written declaration from the manufacturer of liquid crystal substances as Annex 5 to the Contract.

3.2.3 Systems using Biocidal Silver

The use of systems using biocidal silver ions shall not be permitted.

Compliance Verification

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

3.2.4 Printed Circuit Boards

Chlorinated paraffin may not be added to the carrier material of printed circuit boards.

Compliance Verification

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

3.2.5 Electronic Components

The electronic components shall not contain beryllium or beryllium compounds.

Compliance Verification

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

3.2.6 Packaging

The plastics used in product packaging shall be marked according to the German Verpackungsverordnung (Packaging Ordinance) as amended.

Compliance Verification:

The applicant shall declare compliance with the requirement and give the marking of packaging plastics in Annex 6 to the Contract.

3.3 Special Requirements for the Devices

3.3.1 Energy Consumption / Power Consumption

The key energy-relevant components of VoIP phones serve the classification of the devices into 4 product classes as described in Table 1. Distinction is made within each class between the capacity of switches supporting varying network bandwidths.

Table 1: Mandatory Functions of the Product Classes and Minimum Number of Extra Functions

Product Class / Component	Class 1	Class 2	Class 3	Class 4
Additional Ethernet switch	optional	mandatory	mandatory	mandatory
Monochrome display	mandatory	mandatory	---	---
Colour display	optional	optional	mandatory	mandatory
		+ 2 extra functions	+ 3 or 4 extra functions	+ 5 or more extra functions
Wideband Codec	optional	optional	optional	optional
Hands-free set	optional	optional	optional	optional
USB host interface	optional	optional	optional	optional
Video	optional	optional	optional	optional
Touch screen	optional	optional	optional	optional
Bluetooth	optional	optional	optional	optional
WLAN	optional	optional	optional	optional

The energy consumption of the devices classified according to Table 1 shall be equal to or lower than the levels listed in Table 2. The annual load cycle forming the basis of the energy consumption values in Table 2 is described in Appendix A.

Table 2: Maximum Energy Consumption for a given Annual Load Cycle

	Class 1	Class 2	Class 3	Class 4
Annual energy consumption in kWh (Ethernet network bandwidth 10/100 Mbps – megabits per second)	< 22.8	< 28.0	< 36.8	< 42.0
Annual energy consumption in kWh (Ethernet-network bandwidth 1 Gbps – gigabits per second)	< 35.9	< 42.9	< 52.6	< 56.1

Compliance Verification

The applicant shall declare compliance with the requirement in Annex 1 to the Contract. For this purpose, applicant shall use the form of Annex 3 to the Contract to classify the device into the product class according to the functions and give the annual energy consumption. Moreover, the applicant shall submit a test protocol prepared by a DIN EN ISO/IEC 17025 accredited testing laboratory as Annex 7 to the Contract.

3.3.2 Power Management

The devices must provide an optimum power management in each operating mode. The device must - after a specified time of inactivity - automatically switch from ready mode 'On Hook' to an energy-efficient low-power mode where all non-needed functions (e.g. display or display backlight) are deactivated. In factory-default mode the device must switch to low-power mode

after no more than 5 minutes. The user must be able to set the time that elapses before the device enters low-power mode.
The display brightness in ready and active mode must be either user-adjustable or controlled by the ambient light conditions. In factory-default mode the display backlight shall be turned off in low-power mode. In all other modes the display backlight shall be set to a low level in factory-default mode.
In factory-default mode the controls for adjusting the ring tone loudness and all other controls shall be set to medium (50% at the most).
The user manual shall include a clear and easy-to-follow presentation of the adjusting functions for optimum power management. The respective most energy-efficient setting shall be identified in the user manual.

Compliance Verification

The applicant shall state in Annex 1 to the Contract that the requirements are met and submit the pages of the User Manual providing information on the energy efficiency-setting functions as Annex 8 to the Contract.

3.3.3 Security (Protocols)

To ensure basic security of transmission the telephone shall provide the following standards or use equivalent standards:

- Encryption of the voice channel: SRTP
- Encryption of the signalling channel: TLS

Compliance Verification

The applicant shall declare compliance with the requirements in Annex 1 to the Contract and submit a declaration of equivalency of the standards used as Annex 9 to the Contract.

3.3.4 Voice Quality

To ensure a good voice quality the following quality standards are mandatory for all product classes, unless otherwise stated:

- Acoustic echo cancellation (echo cancellation in the acoustic echo path of the handset as well as in hands-free mode)
- Comfort noise (to prevent the impression of a "dead line" when the remote party is not speaking)
- Packet loss concealment (intelligent integration of lost voice data after packet data loss)
- Full-duplex hands-free function (optional feature in basic product class)
- Transmitted voice spectrum and codec support
  - Wideband/high definition audio (bandwidth >= 7 kHz) - supported codecs – e.g. G.722 (optional in basic product class)
  - Standard bandwidth (bandwidth: 4kHz) - supported codecs – e.g.: G.711, as well as G.729 for compression during signal transmission

Compliance Verification

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

3.3.5 Administration and Device Management

The device must provide basic network standards to ensure functionality in all networks.

Compliance Verification

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

3.4 Longevity

3.4.1 Repair Guarantee

The applicant undertakes to make sure that the supply of spare parts for product repair and the infrastructure required for such repair is guaranteed for at least 5 years following the termination of production and that the customer is informed about this guaranteed availability of spare parts.
Replaceable parts are those parts which, typically, may break down within the scope of the ordinary use of a product - whereas those parts which normally exceed the average life of the product need not be kept available as spare parts.

Compliance Verification:

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

3.4.2 Expandability

It must be possible to update the software and expand the basic functions of the product, e.g. via FTP/TFTP (File Transfer Protocol/Trivial File Transfer Protocol). The User Manual must include information on the software update options.

Compliance Verification:

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

3.5 User Information

If printed product literature is enclosed with the product when delivered it should preferably be printed on recycled paper, if possible on Blue Angel eco-labelled paper. The operating instructions or product literature shall at least include the following information which must be presented in a well-organized and easy-to-read form:

- Information on the internet publication of the recycling strategy according to para. 3.1.1,
- Information on the take-back obligation according to para. 3.1.2,
- Information on the energy-saving modes of the devices and their setting according to para. 3.3.2,
- Reparability and repair guarantee according to para. 3.4.1,
- Expandability options according to para. 3.4.2.

Compliance Verification

The applicant shall declare compliance with the requirement in Annex 1 to the Contract and submit the corresponding pages of the product literature.

4 Applicants and Parties Involved

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

Parties involved in the award process are:
- RAL gGmbH to award the Blue Angel Environmental Label,
- the federal state being home to the applicant's production site,
- Umweltbundesamt (German Environmental Agency) which after the signing of the contract receives all data and documents submitted in applications for the Blue Angel in order to be able to further develop the Basic Award Criteria.

5 Use of the Environmental Label

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

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

Contracts on the Use of the Environmental Label are concluded to fix the terms for the certification of products under Paragraph 2. Such contracts shall run until December 31, 2021. They shall be extended by periods of one year each, unless terminated in writing by March 31, 2021 or March 31 of the respective year of extension.
After the expiry of the contract, the Environmental Label may neither be used for labelling nor for advertising purposes. This regulation shall not affect products being still in the market.

The applicant (manufacturer) shall be entitled to apply to RAL gGmbH for an extension of the right to use the ecolabel on the product entitled to the label if it is to be marketed under another brand/trade name and/or other marketing organisations.

The Contract on the Use of the Environmental Label shall specify:
- Applicant (manufacturer/distributor)
- Brand/trade name, product description
- Distributor (label user), i.e. the above-mentioned marketing organisations.

Appendix A Measurement Rules for Determining Power and Energy Consumption

The device under power consumption measurement shall not be supplied via Ethernet but via a 230V power supply unit of its own. If the device comes with a power supply this power supply unit shall be used. The power supply used for measurement and/or the one belonging to the device shall meet the requirements of Commission Regulation (EC) No 278/2009[7] (no-load condition power consumption for devices < 51 W: < 0.5 W or from 27 April 2011: < 0.3 W, respectively).

The device shall be connected to a manufacturer-specific system and successfully registered by the latter.

The load cycle applied to the devices under measurement shall correspond to the set-up in Table 3 with the following assumptions for an eight-hour working day with 0.13 Erlang (unit of traffic intensity of a communication channel): 1.04h in active mode 'active call' = 4.33%, 40 percent of which in hands-free mode (without sound transmission, with the handset switched off); active mode 'ringing': 25 incoming calls per 30 seconds = 12.5 min = 0.86 percent.

The measurement of the operating modes - except for active ringing and ready mode 'On Hook' - shall be made for a period of at least 30 minutes. The active ringing mode shall be measured for 2 minutes, ready mode for 5 minutes.

The mode which in factory-default mode automatically activates itself after five minutes according to para. 3.3.2 shall be recorded as low-power mode.

On devices with no deep-sleep mode the corresponding time shall be determined in low-power mode.

Table 3: Set-Up of the Load Cycle for Determination of the Annual Energy Consumption

Operating Modes	**Measured value [W]**	**Week-end**	**Holidays**	**Vacation days**	**Working days**	**Total per year**	**Percentage**
Days in mode		*104*	*7*	*30*	*224*	*365*	
Deep sleep mode	P_{dsm}	24.0 h	24.0 h	0.0 h	0.0 h	2,664 h	30.4%
Low-power mode	P_{esm}	0.0 h	0.0 h	24.0 h	15.8 h	4,259 h	48.6%
Ready mode 'on hook'	P_b	0.0 h	0.0 h	0.0 h	7.0 h	1,568 h	17.9%
Active mode 'call' handset mode	P_{ah}	0.0 h	0.0 h	0.0 h	0.6 h	134 h	1.6%
Active mode 'call' hands-free mode	P_{af}	0.0 h	0.0 h	0.0 h	0.4 h	90 h	1%
Active mode 'ringing'	P_r	0.0 h	0.0 h	0.0 h	0.2 h	45 h	0.5%
Total per year						8,760 h	100%

[7] Commission Regulation (EC) No 278/2009 of 6 April 2009 implementing Directive 2005/32/EC of the European Parliament and of the Council with regard to ecodesign requirements for no-load condition electric power consumption and average active efficiency of external power supplies

The annual energy consumption E (given in kWh) shall be calculated as follows using the measured electric power values:

$$E = P_{dsm} * 2664\ h + P_{esm} * 4259\ h + P_b * 1568\ h + P_{ah} * 134\ h + P_{af} * 90\ h + P_r * 45\ h$$

The electric work measured during the time (wh) divided by the measurement time (h) shall be used as average power values.

During the measurement all controls for adjusting the display settings (brightness, contrast, backlight), ringing loudness, handset loudness and hands-free loudness shall be set to maximum level (100%) and all other adjusting controls to medium level (50%). If the device is equipped with an automatic brightness control that adjusts the display brightness based on ambient light conditions power consumption shall be measured with a minimum illuminance of 300 lux at the ambient light sensor.

Appendix B Assignment of hazard categories and hazard statements

The following table assigns the hazard categories to the corresponding hazard statements (H Phrases).

Table 1: Hazard categories and H Statements

CLP Regulation (EC) No 1272/2008		
Hazard category	**Hazard Statements**	
	H Statement Codes	**Wording**
Carcinogenic Substances		
Carc. 1A Carc. 1B	H350	May cause cancer.
Carc. 1A Carc. 1B	H350i	May cause cancer by inhalation.
Carc. 2	H351	Suspected of causing cancer.
Substances classified for Germ Cell Mutagenicity		
Muta. 1A Muta. 1B	H340	May cause genetic defects.
Reprotoxic Substances		
Repr. 1A Repr. 1B	H360D	May damage the unborn child.
Repr. 1A Repr. 1B	H360F	May damage fertility.
Repr. 1A Repr. 1B	H360FD	May damage fertility. May damage the unborn child.
Repr. 1A Repr. 1B	H360Df	May damage the unborn child. Suspected of damaging fertility.
Repr. 1A Repr. 1B	H360Fd	May damage fertility. Suspected of damaging the unborn child.
Substances classified for Environmental Hazards		
Aquatic Chronic. 1	H410	Very toxic to aquatic life with long lasting effects.