

# A.6 Environmental requirements

The TCO Certified requirements combine a unique integrated balance of indoor and outdoor environmental issues. Achieving a good working environment should not be at the expense of the natural environment. This document details the environmental requirements of the TCO Certified label.

The Environmental requirements are divided into the following sections:

- 1. Organisation requirements focusing on the production phase and environmental management
- 2. Climate energy consumption, one of the most important issues in the environmental impact of IT products.
- 3. Hazardous Substances heavy metals, flame retardants, plastics.
- 4. Product Lifetime factors to extend the life of the product.
- 5. Preparation for Recycling factors to stimulate recycling.
- 6. Packaging hazardous substance content and recycling.

Potential environmental effects are evident at each stage of the product life cycle. Due to the complexity of the production of ICT products, it is often most effective to refer to indirect requirements on the production such as requirements for an environmental management system. Should a more direct quality-assured system for manufacturing processes become possible, then TCO Development would consider that option for future requirements. The environmental requirements TCO Development has focused on are those that we consider most relevant to the product group. They have also proved to be attainable in volume production and are verifiable. Future updates of the criteria will likely focus on hazardous substances and climate issues.

All requirements except section *A.6.3 Climate* shall be verified by sending the requested information to a verifier at a test laboratory approved by TCO Development. The energy consumption requirements in section *A.6.3* shall be tested at a test laboratory approved by TCO Development.



## A.6.1 Product description

### **Background**

The aim of this product description is to provide information about the product that is to be reviewed for compliance with the environmentally related requirements of Section A.6 and also for information collection.

#### **Definitions**

Marking plate /Marking label is the label that contains the product's electrical rating in terms of voltage, frequency, current and the manufacturer's name, trademark or identification mark together with the manufacturer's model or type reference. The label shall be in accordance with IEC 60 950:1 clause 1.7.1.

### **Applicability**

All Notebook computers and the equipment specified in requirement A.1.1 supplied with them.

#### Clarification

B.6.1

#### References

63

#### Mandate A.6.1:

A product declaration shall be provided for the Notebook computer.

The following information shall be submitted to an approved verifier:

- 1. The declaration below, completed where applicable.
- 2. A copy of the marking label for the Notebook computer and external power supply.

The information submitted shall be signed by the responsible person at the applicant company.

The following information shall be submitted with the application to TCO Development:

A copy of a verification report from a verifier at a laboratory approved by TCO Development and a copy of the marking label.



Notebook computer	Information
Manufacturer	
Brand name	
Brand Owner	
Type/Model name	
Product Family name	
Panel	Information
Brand name	
Model name	
Size and technology (e.g. 15" / TN type)	
External Power supply: Brand & model name	Rating and Class
Battery: Brand & model name	Technology (e.g. Li-ion), rating & characteristics
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## A.6.2 Organisation

### A.6.2.1 Environmental management system certification

### **Background**

A certified environmental management system is proof that the company shows concern for the environment and has chosen to work in a systematic way with constant improvement of the environmental performance of the company and its products in focus. A certified environmental management system includes external independent reviews.

#### **Definitions**

*Manufacturing plant:* Production facility where the final assembly of the TCO certified product is taking place.

### **Applicability**

The company or companies which manufacture the Notebook computer.

#### Clarification

B.6.2.1

#### References

64 and 65.



#### **Mandate A.6.2.1:**

Each *manufacturing plant* must be certified in accordance with ISO 14001, or EMAS registered. If the product is manufactured by a third party, it is this company that shall be certified or registered.

If the *manufacturing plant* does not have an ISO 14001 certificate or EMAS registration at the time of application, the *manufacturing plant* is given a 12-month grace period to obtain ISO14001 certification or EMAS registration.

### The following information shall be submitted to an approved verifier:

- 1. A document showing the names and addresses of the manufacturing plants.
- 2. Copy of the ISO 14001 certificate or EMAS registration or, when not available, an estimated date of certification/registration.
- 3. A written guarantee that the certificate/registration is valid and that the mandate above is fulfilled, signed by the responsible person at the applicant company.

The following information shall be submitted with the application to TCO Development:

We hereby guarantee that the above mane	date is fulfilled.
Product brand name and model name	
Signature	Name and title in block capitals
Date	Company



### A.6.3 Climate

### A.6.3.1 Energy consumption

### **Background**

Energy is the single most important topic in the issue of climate change. Energy efficient equipment is an important and effective way to fight climate change. With an ever-increasing volume of IT equipment in use, the efficiency of each product is vital.

This requirement and test method is based on the most recently published Energy Star standard for computers.

#### **Definitions**

The energy consumption requirement in accordance with the most recently published Energy Star® standard for computers.

### **Applicability**

All Notebook computers.

#### **Test procedure**

B.6.3.1

#### References

70.

#### Mandate A.6.3.1:

The energy consumption requirements in the most recently published Energy Star® standard for computers on the date of application shall be fulfilled and verified through testing by a test laboratory approved by TCO Development.

The following information shall be submitted with the application to TCO Development:

A copy of a test report from a test laboratory approved by TCO Development.



### A.6.3.2 Energy consumption – external power supply

### **Background**

Energy is the single most important topic in the issue of climate change. Energy efficient equipment is an important and effective way to fight climate change. With an ever-increasing volume of IT equipment in use, the efficiency of each product is vital. To reduce energy consumption from the product the external power supply shall comply with the International Efficiency Marking Protocol for External Power Supplies.

#### **Applicability**

All external power supplies.

#### Clarification

B.6.3.2

#### References

71.

#### Mandate A.6.3.2:

The external power supply shall meet at least the International Efficiency Protocol requirement for level V

The following information shall be submitted to the verifier at the test laboratory:

A copy of the marking label for the external power supply

The following information shall be submitted with the application to TCO Development:

A copy of the marking label for the external power supply



## A.6.4 Environmentally hazardous substances

### A.6.4.1 Mercury (Hg) free product

### **Background**

The effects of mercury (Hg) are well documented as an environmental hazardous substance. EU regulates mercury in the RoHS directive (2011/65/EU), however exempting the use of mercury in the backlighting of FPDs. Today the LED backlight technology for FPDs makes it possible to go beyond the RoHS Directive and ban the use of mercury altogether.

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All Notebook computers.

Clarification

B.6.4.1

References

73.

### **Mandate A.6.4.1:**

The product shall not contain mercury.

Note: The maximum concentration value tolerated for the product, including the FPD lamps is 0.1 % by weight in homogeneous materials.

The following information shall be submitted to an approved verifier:

A written guarantee that the above mandate is fulfilled. The guarantee shall be signed by the responsible person at the applicant company.

The following information shall be submitted with the application to TCO Development:

we hereby guarantee that the above mandate is fulfilled.			
Product brand name and model name			
Signature	Name and title in block capitals		
Date	Company		



### A.6.4.2 Cadmium (Cd), lead (Pb) and hexavalent chromium (CrVI)

### **Background**

The effects of the listed substances are well documented as environmental hazardous substances. EU regulated these substances in the RoHS directive (2002/95/EC) and continues to do so in the RoHS2 Directive (2011/65/EU).

### **Applicability**

All Notebook computers.

#### Clarification

B.6.4.2

#### References

72 and 73.

#### Mandate A.6.4.2:

The Notebook computer shall not contain cadmium, lead and hexavalent chromium.

Note: This applies to components, parts, and raw materials in all assemblies and sub-assemblies of the product e.g. paint, surface treatment, plastics and electronic components.

The following information shall be submitted to an approved verifier:

A written guarantee that the mandate above is fulfilled. The guarantee shall be signed by the responsible person at the applicant company.

The following information shall be submitted with the application to TCO Development:

We hereby guarantee that the above mandate is fulfilled.		
Product brand name and model name		
Signature	Name and title in block capitals	
Date	Company	



### A.6.4.3 Halogenated substances

### **Background**

Brominated and chlorinated flame retardants and other halogenated substances are often persistent, can bioaccumulate in living organisms and have been detected in flora and fauna.

A series of international elimination activities in respect to brominated and chlorinated flame retardants is currently in progress within several national and international bodies, e.g. EU, OECD, and North Sea Conference.

#### **Definitions**

*Plastic parts* are parts made mainly of plastics, e.g. the housing. Parts containing other materials in any significant amounts, e.g. cables with metal conductors, are not included in the definition.

*Printed wiring board laminate* is a printed board that provides point-to-point connections but not printed components in a predetermined configuration on a common base.

### **Applicability**

All Notebook computers.

#### Clarification

B.6.4.3

#### References

74.



#### Mandate A.6.4.3:

1. *Plastic parts* weighing more than 25 grams shall not contain flame retardants or plasticizers that contain organically bound bromine or chlorine.

Note: The requirement applies to plastic parts in all assemblies and sub-assemblies. Exempted are *printed wiring board laminates*, electronic components and all kinds of cable insulation.

2. The Notebook computer shall not contain PBB, PBDE and HBCDD.

Note: The requirements apply to components, parts and raw materials in all assemblies and sub-assemblies of the product e.g. batteries, paint, surface treatment, plastics and electronic components.

### The following information shall be submitted to an approved verifier:

A written guarantee that the above mandate is fulfilled. The guarantee shall be signed by the responsible person at the applicant company.

The following information shall be submitted with the application to TCO Development:

We hereby guarantee that the above mand	late is fulfilled.
Product brand name and model name	
Signature	Name and title in block capitals
Date	Company



### A.6.4.4 Non-halogenated substances

#### **Background**

The purpose of this mandate is to ensure that the phase out of halogenated flame retardants not risk a shift towards substances with other known hazardous effects.

The mandate focuses on 14 hazardous statements. All substances relevant for the IT industry that have been assigned a hazardous statement and where there are less hazardous commercially available alternatives will be restricted from TCO Certified products. The list of these substances is evaluated and revised in each new version of the criteria document.

To date in this version, only harmonized substances found on the European chemical Substance Information System (ESIS) at: <a href="http://esis.jrc.ec.europa.eu/">http://esis.jrc.ec.europa.eu/</a> have been restricted. In the future version of the criteria document TCO Development have the ambition to also restrict substances that are not at this time harmonized. An example of such not yet harmonized substances may be found in B.6.4.3.

#### **Definitions**

*Plastic parts* are parts made mainly of plastics, e.g. the housing. Parts containing other materials in any significant amounts, e.g. cables with metal conductors, are not included in the definition.

*Printed wiring board laminate* is a printed board that provides point-to-point connections but not printed components in a predetermined configuration on a common base.

*Hazardous statements* (Risk phrases) according to EU Regulation 1272/2008 (EU Directive 67/548/EEC)

- H340 (R46) (may cause heritable genetic damage)
- H341 (R68) (suspected of causing genetic defects)
- H350 (R45) (may cause cancer)
- H350i (R49) (may cause cancer by inhalation)
- H351 (R40) (limited evidence of a carcinogenic effect)
- H360F (R60) (may impair fertility)
- H360D (R61) (may cause harm to the unborn child)
- H361d (R63) (suspected of damaging the unborn child)
- H361f (R62) (suspected of damaging fertility)
- H362 (R64) (may cause harm to breast-fed children)
- H372 (R48/25/24/23) (danger of serious damage by prolonged exposure)
- H373 (R48/20/21/22) (may cause damage to organs through prolonged exposure)
- H400 and H410 (R50/R53) (very toxic to aquatic organisms / may cause longterm adverse effects in the aquatic environment)
- H411 (R51/53) (Toxic to aquatic life with long-lasting effects)

### **Applicability**

All Notebook computers.

Clarification

B.6.4.4

References:

75 and 76.



### **Mandate A.6.4.4:**

The following non halogenated flame retardants shall not be used in plastic parts weighing more than 25 grams:

- Antimony(III) oxide (Sb2O3), CAS: 1309-64-4
- Tri-o-cresyl phosphate, CAS: 78-30-8

Exempted are *printed wiring board laminates*, electronic components and all kinds of cable insulation.

### The following information shall be submitted to an approved verifier:

A written guarantee that the above mandate is fulfilled. The guarantee shall be signed by the responsible person at the applicant company.

The following information shall be submitted with the application to TCO Development:

We hereby guarantee that the above mandate is fulfilled.			
Product brand name and model name			
Signature	Name and title in block capitals		
Date	Company		



### A.6.4.5 Plastics with chlorine and bromine as part of the polymer

### **Background**

PVC is by far the most common halogen containing plastic. There are however other plastics that contain chlorine or bromine in the plastic itself. As the requirement concerning permissible flame retardants tightens, the risk increases that halogenated plastics will become more common. TCO Development sees a future environmental risk with such a development.

PVC is a much-debated plastic that can pose environmental problems in most parts of its life cycle. The magnitude of the environmental problems relating to PVC differs depending on the environmental status of a particular manufacturing facility and the uses of additives. At present there are very limited possibilities to distinguish between harmful and less harmful production facilities for PVC.

#### **Definitions**

*Plastic parts* are parts made mainly of plastics, e.g. the housing. Parts containing other materials in any significant amounts, e.g. cables with metal conductors, are not included in the definition.

*Printed wiring board laminate* is a printed board that provides point-to-point connections but not printed components in a predetermined configuration on a common base.

### **Applicability**

All Notebook computers.

Clarification

B.6.4.5

References

73 and 77.



#### **Mandate A.6.4.5:**

Plastic parts in the Notebook computer weighing more than 25 grams shall not contain chlorine or bromine as a part of the polymer.

Note: *Printed wiring board laminates*, and all kinds of internal and external cable insulation are not considered to be part of *plastic parts* and are therefore not included in the mandate.

The following information shall be submitted to an approved verifier:

A written guarantee that the above mandate is fulfilled. The guarantee shall be signed by the responsible person at the applicant company.

The following information shall be submitted with the application to TCO Development:

We hereby guarantee that the above mandate is fulfilled.			
Product brand name and model name			
Signature	Name and title in block capitals		
Date	Company		



### A.6.4.6 Information regarding plastics, flame retarding agents and plasticizers

### **Background**

This requirement is intended to give information about the plastics and flame retarding agents in the product to be reviewed for compliance with the environment requirements in this criteria document.

#### **Definitions**

*Plastic parts* are parts made mainly of plastics, e.g. the housing. Parts containing other materials in any significant amounts, e.g. cables with metal conductors, are not included in the definition.

*Printed wiring board laminate* is a printed board that provides point-to-point connections but not printed components in a predetermined configuration on a common base.

### **Applicability**

All Notebook computers.

#### Clarification

B.6.4.6

### References

74 and 78.



#### **Mandate A.6.4.6:**

The material specifications shall be provided for *plastic parts* and *printed wiring board laminates* weighing more than 25 grams. Plasticizers or flame retardants that have concentrations above 1% by weight in the plastic part shall be stated, in accordance with ISO 1043-3 or ISO 1043-4.

### The following information shall be submitted to an approved verifier:

The table below shall be completed and the guarantee signed by the responsible person at the applicant company.

Manufacturers of plastic materials who consider such information confidential may submit the information to a verifier approved by TCO Development.

The following information shall be submitted with the application to TCO Development:

A copy of a verification report from a verifier approved by TCO Development.

**Note**: The table below is only symbolic; please provide your answers on the appendix: Material Specifications

Plastic part and PWB name	Weight in grams	Type of plastic	Plastic manufacturer name	Plastic model name	Flame retardant/ plasticizer type	Flame retardant/plast icizer CAS number*)	Plastic label code **)

<sup>\*)</sup> Chemical Abstract Service number <a href="www.cas.org">www.cas.org</a>

We hereby guarantee that the above mandate is fulfilled.		
Product brand name and model name		
Signature	Name and title in block capitals	
Date	Company	

<sup>\*\*)</sup> Labelling according to ISO 11469



### A.6.5 Product lifetime

### A.6.5.1 Warranty and spare parts

### **Background**

A longer product lifetime has a significant positive contribution to resource use as well as the reduction of air and water pollution. A pre-condition for prolonged lifetime is that the product is of high quality, which is supported by good guarantees. Another requirement is the availability of spare parts for the product once it is taken out of production.

#### **Definitions**

*Brand owner*: The company or organization owning or controlling the *Brand Name*. *Brand Name*: The name or sign, including but not limited to a trademark or company name, used to identify, amongst users and customers, the manufacturer or seller of a product.

*Product warranty* is a period where the Brand owner offers to repair or replace broken products during a period of time without charge.

*Spare parts* are those parts which have the potential to fail during the normal use of the product. Product parts whose life cycle usually exceeds the average usual life of the product need not be provisioned as spare parts.

### **Applicability**

All Notebook computers.

#### Clarification

B.6.5.1

#### **Mandate A.6.5.1:**

The brand owner shall provide a product warranty for a period of at least one year.

The *brand owner* shall guarantee the availability of *spare parts* for at least three years from the time that production ceases.

The following information shall be submitted to an approved verifier:

A written guarantee that the above mandate is fulfilled. The guarantee shall be signed by the responsible person at the *brand owner* company.

The following information shall be submitted with the application to TCO Development:

A copy of a verification report from a verifier approved by TCO Development.

We hereby guarantee that the above mandate is fulfilled.

, 2	
Product brand name	Model name(s) or "All products"
Signature	Name and title in block capitals
Date (Declaration valid 1 year from date)	Brand Owner Company



## A.6.6 Preparation for Recycling

### A.6.6.1 Material coding of plastics

### **Background**

Recycling of used electronic products is an important environmental issue. Material recycling and reuse are the best options from an environmental point of view. With material coding there is a better possibility for plastics to be recycled and used in new IT equipment.

#### **Definitions**

*Plastic parts* are parts made mainly of plastics, e.g. the housing. Parts containing other materials in any significant amounts, e.g. cables with metal conductors, are not included in the definition.

*Printed wiring board laminate* is a printed board that provides point-to-point connections but not printed components in a predetermined configuration on a common base.

### **Applicability**

All Notebook computers.

#### Clarification

B.6.6.1

#### References

75, 78 and 79.



#### **Mandate A.6.6.1:**

Plastic parts weighing more than 25 grams shall be material coded in accordance with ISO 11469 and ISO 1043-1, -2, -3, -4. Such parts shall be listed in the table at Section A.6.4.5.

Exempted are printed wiring board laminates.

### The following information shall be submitted to an approved verifier:

A written guarantee that the above mandate is fulfilled. The guarantee shall be signed by the responsible person at the applicant company.

The following information shall be submitted with the application to TCO Development:

We hereby guarantee that the above mandate is fulfilled.		
Product brand name and model name		
Signature	Name and title in block capitals	
Date	Company	



### A 6.6.2 Variety of plastics

### **Background**

Recycling of used electronic products is an important environmental issue. Material recycling and reuse are the best options from an environmental point of view. Therefore TCO Development presents requirements that facilitate material recycling.

### **Applicability**

All Notebook computers.

#### Clarification

B.6.6.2

#### **Definitions**

Types of *plastic material* (using the abbreviation terms, symbols and concepts for plastics in ISO 1043 Part 1, 2, 3, and 4) are:

- Basic polymers
- Mixtures of polymers
- Basic polymers with flame retardants
- Mixtures of polymers with flame retardants

#### References

78 and 79.



#### **Mandate A.6.6.2:**

No more than two different types of *plastic materials* are accepted for parts weighing more than 100 grams in the product

The following information shall be submitted to an approved verifier:

A written guarantee that the above mandate is fulfilled. The guarantee shall be signed by a responsible person at the applicant company.

The following information shall be submitted with the application to TCO Development:

We hereby guarantee that the above mandate is fulfilled.  Product brand name and model name		
Date	Company	



### A.6.6.3 Take back system

### **Background**

The amount of electronic waste in the world today is enormous and a growing environmental problem. It is important that manufacturers provide mechanisms to take back their equipment at end-of-life under the principle of individual producer responsibility wherein each producer must be financially responsible for managing its own brand products at end-of-life. Currently much electronic waste is being exported to developing countries where it is managed unsustainably and disproportionately burdens developing countries with this global environmental burden. The Basel Convention and its decisions govern the export of many types of electronic waste. However not all countries have properly implemented these decisions. With this mandate TCO Development aims to put more influence into spreading better electronic waste management practice to more countries.

#### **Definition**

*Brand owner*: The company or organization owning or controlling the *Brand Name*. *Brand Name*: The name or sign, including but not limited to a trademark or company name, used to identify, amongst users and customers, the manufacturer or seller of a product.

*Take back system* is a system that makes sure that the customer can return used products to be recycled. The system can be with or without a fee.

Environmentally acceptable recycling methods are:

- Product and component reuse
- Material recycling with secured handling of hazardous chemicals and heavy metals
- Pollution-controlled energy recovery of parts of the product

### **Applicability**

All Notebook computers.

### Clarification

B.6.6.3

#### References

80.



#### Mandate A.6.6.3:

The *brand owner* (or its representative, associated company or affiliate) shall offer their customers the option to return used products for *environmentally acceptable recycling methods* in at least one market where the product is sold and where electronics take back regulation is not in practice at the date of application.

The following information shall be submitted to an approved verifier:

The information stated in the list below shall be submitted and the guarantee signed by the responsible person at the *brand owner* company.

The following information shall be submitted with the application to TCO Development:

The requirement can be fulfilled by one of	the following options (to be verified):	
☐ 1. Product only sold on man ☐ 2. World-wide product take	kets with WEEE legislation or similar back*	
☐ 3. One additional market lacking WEEE legislation where product take back is offered*		
Name of market		
*The brand owner shall also submit a short description, to an approved verifier, of the take back system or reference to the representative, associated company or affiliate taking care of the take-back system		
We hereby guarantee that the above mandate is fulfilled.		
Product brand name	Model name(s) or "All products"	
Signature	Name and title in block capitals	
Date (Declaration valid 1 year from date)	Brand Owner Company	



## A.6.7 Product packaging

### A.6.7.1 Hazardous substances in product packaging

#### **Background**

Packaging constitutes a well-known environmental problem and is regulated in many countries worldwide. Packaging material has a short lifetime and generates large volumes of waste.

There are three main areas of concern, content of hazardous substances, use of resources and transport volume.

### **Applicability**

All packaging material.

#### **Definition**

*Brand owner*: The company or organization owning or controlling the *Brand Name*. *Brand Name*: The name or sign, including but not limited to a trademark or company name, used to identify, amongst users and customers, the manufacturer or seller of a product.

#### Clarification

B.6.7.1

#### References

81.

### **Mandate A.6.7.1:**

The packaging material shall not contain lead (Pb), cadmium (Cd), mercury (Hg) or hexavalent chromium (Cr6).

Plastic packaging material shall not contain organically bound halogens.

#### The following information shall be submitted to an approved verifier:

A written guarantee that the mandate above is fulfilled. The guarantee shall be signed by the responsible person at the *brand owner* company.

# The following information shall be submitted with the application to TCO Development:

We hereby guarantee that the above mandate is fulfilled.		
Product brand name	Model name(s) or "All products"	
Signature	Name and title in block capitals	
Date (Declaration valid 1 year from date)	Brand Owner Company	



### A.6.7.2 Preparation for recycling of product packaging material

### **Background**

Packaging constitutes a well-known environmental problem and is regulated in many countries worldwide. Packaging material has a short lifetime and generates large volumes of waste.

There are three main areas of concern, content of hazardous substances, use of resources and transport volume.

#### **Applicability**

All packaging material.

#### **Definition**

*Brand owner*: The company or organization owning or controlling the *Brand Name*. *Brand Name*: The name or sign, including but not limited to a trademark or company name, used to identify, amongst users and customers, the manufacturer or seller of a product.

#### **Mandate A.6.7.2:**

Non-reusable packaging components weighing more than 25 grams shall be possible to separate into single material types without the use of tools.

Exempted is reusable packaging.

#### The following information shall be submitted to an approved verifier:

A written guarantee that the mandate above is fulfilled. The guarantee shall be signed by the responsible person at the *brand owner* company.

The following information shall be submitted with the application to TCO Development:

We hereby guarantee that the above mandate is fulfilled.		
Product brand name	Model name(s) or "All products"	
Signature	Name and title in block capitals	
Date (Declaration valid 1 year from date)	Brand Owner Company	