

TCO Certified Headsets 3.0



11 November 2015

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Certification Support

If you would like to certify your products and need support in understanding TCO Certified, this criteria document and the certification process, TCO Development's test and verification partners around the world are available to help clarify this document and assist you with certification in your native language.

For a list of accredited test and verification partners, contact certification@tcodevelopment.com or log onto www.tcodevelopment.com

Introduction

TCO Certified is an international third party sustainability certification for IT products. By choosing TCO Certified computers, displays and other devices, businesses and organizations around the world are able to help meet environmental and social challenges associated with electronics.

Since the end of the 1980s, TCO Development has advanced the sustainable development of IT products. Today our international certification system – TCO Certified – makes it easier to choose sustainably designed and manufactured IT products such as displays, computers, smartphones and tablets. TCO Certified is a third party certification, Type 1 Eco Label according to ISO14024.

Sustainability in all life cycle phases

Electronics are associated with many different sustainability risks throughout the life cycle, including manufacturing, use and end of life phases. Criteria in TCO Certified aim to address many of these challenges throughout the life cycle, making it the most comprehensive third party certification for IT products. For each criteria area in this document, the relevant life cycle phase is indicated by the following icons:



Criteria - Manufacturing phase
Socially responsible manufacturing, environmental management system.



Criteria - use phase
Climate, ergonomics, health and safety, extended product life and emissions.



Criteria - end of life phase
Reduction of hazardous content and chemicals, design for recycling

With every major update we aim to enhance the criteria in line with technology innovation and sustainability challenges. Updates are a result of dialog with key stakeholders, such as purchasers, users, industry, and subject matter experts. This criteria document, TCO Certified Headsets 3.0, is the third version of TCO Development's certification of Headsets. Moving forward, subsequent versions, 3.1, 3.2 etc., may be released. However, these are to be considered only as updates within the third version, with improved precision of the mandates and test methods.

Citing from these criteria (e.g. in procurement contracts) is permitted, provided that the source is disclosed and the extent of the quotation is consistent with sound copyright practice. For further information, please visit www.tcodevelopment.com.

TCO Development, Stockholm, November, 2015

A Criteria

A.1 General information

This document contains requirements, test methods and references for both corded and cordless headsets for professional use. For a cordless headset the charging station is included as well. The definition below is to clarify what we refer to when specifying a headset.

Definition of a headset

A headset is a device used for two-way audio communication over telephone, mobile phone or IP telephony. A headset is worn by the user in order to leave both hands free while communicating.

The criteria document setup

The aim of this criteria document is to provide relevant criteria and test methods for the actual life cycle of the product. This criteria document consists of two parts; Part A- the mandated criteria and Part B - clarifications and test methods.

Mandate compliance

Compliance with the mandates in this criteria document can be achieved in one of two ways; either through a test report or through a verification report.

1. A test report is defined as a report based on:
 - Testing conducted by the facility issuing the test report for the product identified in the report.
2. A verification report is defined as a summary report and a verdict (pass or fail) based on either:
 - A test report issued by the same facility
 - A test report issued by a different facility.
 - Declarations from the Company or Brand owner applying for the certificate.

The options accepted by TCO Development for each criterion can be found under each mandate.

A.1.1 Information to End-Users

Background

It is important that the purchaser of a product that has been certified in accordance with TCO Certified Headsets receives information concerning the quality, features and capabilities of the product. This information is based on the viewpoint from the user's perspective that TCO Development represents.

Applicability

All headsets

Life Cycle Phases



Clarification

[See B.1.1](#)

References

The contract between TCO Development and the applicant company.

Mandate A.1.1:

An information document called “TCO Certified Document” provided by TCO Development shall accompany the product to describe why these particular criteria have been chosen for the products within the TCO Certified program, and what is expected to be achieved by them. The document shall be written in English or the native language where the product is to be sold.

Examples of how the document can accompany the product are presented below:

- As a separate printed document.
- As a digital file or printed in the user manual.
- As a direct link from the user manual or digital file to the document on the manufacturer’s web site.

Submit the following to an approved verifier:

1. Information on how the TCO Certified Document accompanies the product
2. A written guarantee that the above mandate is fulfilled. The document shall be signed by the responsible person at the applicant company.

Submit the following together with the application to TCO Development:

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

We hereby guarantee that the above mandate is fulfilled.

| | |
|-----------------------------|---|
| Product brand name | Model name(s) |
| Signature | Name and title in block capitals |
| Date | Company |

A.2 Ergonomics

Good ergonomics is a very important aspect of quality that can also have a direct effect on the health, comfort and performance of the user. Good ergonomics, such as a high sound quality, noise reduction and individual adjustment and adaptation can influence our productivity and extend the usable life of a product. In this way, ergonomic design can also offer sustainability benefits.

In developing criteria for ergonomics, the possible health effects of various parameters have been taken into account. Other features that characterise high sound quality have also been in focus when developing these criteria.

TCO Development used three main methodologies to determine suitable levels and test methods for the ergonomic criteria:

1. Acceptable sound levels, as determined by scientific research.
2. Statistics from tests carried out in accordance with TCO Development, ISO, EU regulations and from specialized tests.
3. Manufacturers' knowledge and experience, which is invaluable. Manufacturers, consumer groups and other organisations with interests in the ergonomics field have contributed a great deal of valuable information and ideas throughout the development process.

Life Cycle Phase



A.2.1 Acoustics

A.2.1.1 Acoustic impulse test

Background

The acoustic signal produced by headsets used for voice communication should fulfil several requirements. The quality of the signal in terms of frequency response, distortion and signal-to-noise ratio are factors that affect the speech intelligibility. The sound level produced is also of importance in regards to speech intelligibility, since the human auditory sense has an optimum sound level range over which normal-hearing listeners perform best in terms of speech recognition in background noise.

Significantly higher sound levels than this optimum range must be avoided since they will be uncomfortably loud and present a risk for hearing impairment. Such risk is related to the instantaneous (peak) sound pressure level of sounds with impulse character and a maximum sound pressure level of the continuous noise signal, e.g. faxes, whistles and feedback howls etc.

The aim is that the risk for hearing impairment caused by use of telephones and headsets shall be negligible.

Users of headsets often refer to problems with sudden “sound spikes”. Interference on telephone lines is experienced as unpleasant and stress-inducing. Acoustic limit protection is one of the most common and important requirements from headset users.

Applicability

All headsets.

Test procedure

[See B.2.1.1](#)

References

1, 2, 3, 4, 5, 6, 7 and 8.

Mandate A.2.1.1:

The diffuse-field related peak C-weighted sound pressure level,

$L_{DF,M,Cpeak}$, shall be ≤ 137 dB.

The ERP (Ear Reference Point) Long-duration sound A-weighted pressure level,

$L_{DF,M,Ccontinuous}$, shall be ≤ 118 dB.

Acoustic limit protection shall be built into the headset.

The following shall be included in the test report:

- 1. Pictures of the headset mounted on the HATS from front, back and each side.**
- 2. Specify if the headset is a monaural or binaural headset.**

Submit the following together with the application to TCO Development:

A copy of a test report and a verification report from a test facility approved by TCO Development.

A.2.1.2 Sound quality test

Background

A low distortion level is an important quality, since it allows for a more accurate reproduction of the audio. For Audio systems the Total harmonic distortion (THD) is a measurement of the harmonic distortion present. The present mandate covers only analogue headsets since it is considered that an objective and standardised measurement for digital headsets (DSP based) is not yet available.

Applicability

All analogue headsets.

Test procedure

[See B.2.1.2](#)

References

1, 2, 6, 7 and 8.

Mandate A.2.1.2:

For analogue headsets:

The Total harmonic distortion, THD, for an analogue headset shall not exceed 8% at 2 kHz

Submit the following together with the application to TCO Development:

A copy of a test report and a verification report from a test facility approved by TCO Development.

A.2.1.3 Volume control

Background

In a working environment, a headset should feature a high level of individual adaptability. High quality volume control (for cordless headsets) is considered very important.

Applicability

All Cordless headsets.

References

3, 6 and 9.

Mandate A.2.1.3:

The sound level for a cordless headset shall be adjustable through a volume control. The volume control shall be adjustable with a range of at least 15 dB but less than 25 dB. It shall be clearly marked where the user should adjust the volume as well as how to increase respectively decrease the volume.

Submit the following together with the application to TCO Development:

A copy of a test report and a verification report from a test facility approved by TCO Development.

A.2.1.5 Replaceable parts

Background

Headsets are used in many different work situations and often for long periods. Therefore parts can be worn out and should be changed regularly for hygienic reasons. It is recommended to change ear tips, ear cushions and microphone shields regularly.

Applicability

All headsets.

Mandate:

The following spare part and accessories shall be made available for TCO-certified headsets when applicable for the headset type:

- Headband
- Ear loop
- Neckband
- Ear tips
- Ear cushions
- Microphone shield.

And for cordless headsets the following parts as well

- Battery charger

The manual, product catalogue or other publicly available document shall specify the part or model number of the replaceable parts .

Submit the following to an approved verifier at the test facility:

1. A list of the manufacturers, models and types for each of the mandatory accessories.
2. A written guarantee that the above mandate is fulfilled. The guarantee shall be signed by the responsible person at the applicant company.

Submit the following together with the application to TCO Development:

A copy of a test report and a verification report from a test facility approved by TCO Development.

We hereby guarantee that the above mandate is fulfilled.

| | |
|--------------------|----------------------------------|
| Product brand name | Model name(s) |
| Signature | Name and title in block capitals |
| Date | Company |

A.2.2.2 Head and ear attachment flex test

Background

Headsets for professional users should be of high quality. Therefore the attachment to head and ear, such as a headband, neckband, ear hook etc shall be durable and constructed to ensure that it can withstand normal usage without breaking during the expected life time of the headset.

Applicability

All headsets

Mandate A.2.2.2:

A flex test shall be performed on the attachment to head and ear, i.e. headband, neckband, ear hook or other part with purpose to ensure that they are durable enough to put on and taken of the head / ear at least 20000 times.

The manufacturer of headsets shall provide information on how the test is performed and show a copy of the test report performed in an optional test facility.

Submit the following to an approved verifier at the test facility:

1. A copy of a test report from an optional test facility.
2. A written guarantee that the above mandate is fulfilled. The guarantee shall be signed by the responsible person at the applicant company.

Submit the following together with the application to TCO Development:

A copy of a test report and a verification report from a test facility approved by TCO Development.

We hereby guarantee that the above mandate is fulfilled.

.....
Product brand name

.....
Model name(s)

.....
Signature

.....
Name and title in block capitals

.....
Date

.....
Company

A.2.2.3 Microphone attachment flex test

Background

Headsets for professional use should be of high quality. Therefore the microphone attachment; microphone arm, microphone boom etc. shall be constructed to withstand normal usage without breaking.

Applicability

All headsets

Mandate A.2.2.3:

Flexing and rotating of the microphone attachment; microphone arm, microphone boom or other with same purpose shall be performed at least 25000 times to ensure that the microphone attachment will be durable for the expected life time of the headset.

The manufacturer of headsets shall provide information on how the test is performed and show a copy of the test report performed in an optional test facility.

Submit the following to an approved verifier at the test facility:

1. A copy of a test report from an optional test facility.
2. A written guarantee that the above mandate is fulfilled. The guarantee shall be signed by the responsible person at the applicant company..

Submit the following together with the application to TCO Development:

A copy of a test report and a verification report from a test facility approved by TCO Development.

We hereby guarantee that the above mandate is fulfilled.

.....
Product brand name

.....
Model name(s)

.....
Signature

.....
Name and title in block capitals

.....
Date

.....
Company

A.4 Emissions

There is still an awareness and concern about emission risks from the use of wireless devices that are attached to the head; such as headsets. Emission protection authorities in many countries have not ruled out health risks and generally share the opinion that more research is needed. Therefore it is important that cordless headset users are able to reduce exposure to the head substantially by being able to choose cordless headsets with a low emission level.

The use of wireless devices that are attached to the head; such as cordless headsets based on Bluetooth class 2 with a maximum output power of 2.5 mW, ensure low emission levels. For cordless headsets based on other wireless communication standards, the SAR-level shall not exceed 0.04 W/kg.

Life Cycle Phase



A.4.1 SAR measurements

Background

SAR measurements are the only internationally accepted and utilised method for measuring the absorbed emission energy in unit volumes of brain tissue.

Most countries in the world apply a SAR value of maximum 2.0 W/kg measured in any cube of 10 gram of biological tissue according to EN 62209-1

TCO Development has therefore chosen a SAR value for a wireless headset of maximum 0.04 W/kg. The mandatory criteria shall not be regarded as hygienic limit values.

Applicability

All cordless headsets.

References

13 and 14.

Mandate A.4.1:

The SAR value shall be equal to or less than 0.04 W/kg for any cube of 10 g phantom tissue¹.

Submit the following to an approved verifier at the test facility:

A copy of a test report from a test facility accredited for EN 62209-1 by an EA (European co-operation for Accreditation) recognised accreditation body.

If the output power of the headset is so low that the SAR value of 0.04 W/kg will not be exceeded, SAR tests are not needed. More information can be found in the guideline document issued by TCO Development.

Further information as regards test positions for the SAR tests will be specified in the guideline document issued by TCO Development.

Submit the following together with the application to TCO Development:

A copy of a test report and a verification report from a test facility approved by TCO Development.

A.5 Electrical safety

A.5.1 Electrical safety

Background

Electrical safety concerns the electrical design of apparatus with respect to its electrical insulation and other arrangements that are intended to prevent accidents resulting from contact with live components, and the risk of fire or explosion as a result of electrical flash-over due to inadequate or faulty electrical insulation.

Applicability

All headset chargers.

Life Cycle Phase



References

15, 16 and 17.

Mandate A.5.1:

The Headset charger and the internal or external power supply/supplies shall be certified in accordance with EN/IEC 60 950-1, UL 60950 or EN/IEC 60065 (home usage) or EN 62368-1.

Submit the following together with the application to TCO Development:

A copy of the CB or UL certificate or a national certificate from a CB member (NCB) or a compliant test report from an accredited test facility to the appropriate standards for the intended geographic market of the product.

A.6 Environment

This section details the environmental criteria in TCO Certified, which offer a unique, integrated balance of environmental issues in the manufacturing, use and end of life phases of the product.

The environmental criteria are divided into the following sections:

1. Manufacturing – criteria focusing on the manufacturing 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. Material resource efficiency – factors to extend the life of the product and influence better use of material resources.
5. End of life – factors to stimulate recycling and minimize the impact of e-waste.

Potential environmental effects are evident at each stage of the product life cycle. The environmental criteria TCO Development has focused on in this document are those that we consider most relevant to the product group. They have also proved to be attainable in volume manufacturing and are verifiable. Future criteria updates will likely focus on the manufacturing phase, hazardous substances and climate issues.

Compliance with these criteria (except section A.6.3 *Climate*) is verified by sending the requested information to a verifier approved by TCO Development. The energy consumption requirements in section A.6.3 shall be tested at a test facility approved by TCO Development or an EPA approved test facility.

Life Cycle Phases



A.6.1 Product description

Background

Background

The aim of this product description is to provide third party verified information about the product. The information is used by TCO Development to verify that the product complies with the criteria in TCO Certified.

The information is also provided on the certificate to buyers so that it helps them calculate the sustainability impact of the products and the benefit of buying products that fulfil TCO Certified.

Using the declared sustainability information a buyer can, for example, implement climate compensation or other sustainability-related measures connected to the sustainability impact of the product. This data is often used by organisations in their annual sustainability report or internal programs aimed at minimizing the environmental impact of IT.

Definition

Recycled plastic is post-consumer recycled plastic, which has been used in products.

Plastic parts are all product parts made out of plastic except panels, electronic components, cables, connectors, PWBs, insulating mylar sheets and labels. This is primarily due to insufficient available alternatives. This also means that the weight of these items is not included when calculating the total weight of the plastic in the product in this requirement.

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 headsets and peripheral equipment supplied with them (for example charging station and the replaceable parts mentioned in A.2.1.5).

Life Cycle Phases



Clarification

[B.6.1](#)

References

16

Mandate A.6.1:

A product declaration shall be provided for the Headset. The following information shall be verified by the third party facility and is printed by TCO Development on the certificate.

Submit the following to an approved verifier:

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

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

Submit the following together with the application to TCO Development:

A copy of a verification report including all information in the table below from a verifier approved by TCO Development and a copy of the marking label.

Headset declaration

| Headset | Information |
|-----------------|-------------|
| Manufacturer | |
| Brand name | |
| Type/Model name | |

| External power supply: Brand & model name | Rating and Class |
|--|------------------|
| | |
| | |

| Battery: brand & model name | Technology (e.g. Li-ion), rating & characteristics |
|-----------------------------|--|
| | |
| | |

Declared sustainability information

| | |
|--|--|
| Percentage of <i>recycled plastic</i> by weight of total weight of plastic parts | |
| Total weight of the product and power supply (without packaging) in Kg | |

We hereby guarantee that the above mandate is fulfilled.

| | |
|-----------------------------|---|
| Product brand name | Model name(s) |
| Signature | Name and title in block capitals |
| Date | Company |

A.6.2 Manufacturing

A.6.2.1 Environmental management system certification

Background

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

Definitions

Manufacturing plant: Manufacturing facility where the final assembly of the TCO Certified product takes place.

Applicability

The company or companies manufacture the headset and peripheral equipment supplied with them (for example applicable charging station and the replaceable parts mentioned in A.2.1.5).

Life Cycle Phase



Clarification

[B.6.2.1](#)

References

19 and 20

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.

Submit the following 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 from each manufacturing plant.
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.

Submit the following together 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.

.....
Product brand name

.....
Model name(s)

.....
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. To reduce energy consumption from headset chargers, the chargers should follow the International Efficiency Marking Protocol for External Power Supplies

Applicability

All cordless headsets and the supplied charging station.

Life Cycle Phase



Test procedure

[B.6.3.1.](#)

References

24, 25, 26 and 27

Mandate A.6.3.1:

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

Submit the following to the verifier at the test facility:

A copy of the marking label for the external power supply

Submit the following together with the application to TCO Development:

A copy of the marking label for the external power supply

A.6.4 Hazardous substances

A.6.4.1 Cadmium (Cd), mercury (Hg), lead (Pb) and hexavalent chromium (CrVI)

Background

The effects of cadmium, mercury, lead and hexavalent chromium are well documented as substances that are hazardous to both our health and the environment. This criterion is harmonized with EU RoHS2 Directive (2011/65/EU), except that TCO Certified does not allow for any exemptions. As TCO Certified is a global label this also effect products sold outside the EU.

Applicability

All headsets and peripheral equipment supplied with them (for example charging station and the replaceable parts mentioned in A.2.1.5).

Life Cycle Phase



Clarification and exemptions

[B.6.4.1](#)

References

28 and 29

Mandate A.6.4.1:

The product shall not contain cadmium, mercury, lead and hexavalent chromium.

Submit the following 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.

Submit the following together 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.

.....
Product brand name

.....
Model name(s)

.....
Signature

.....
Name and title in block capitals

.....
Date

.....
Company

A.6.4.2 Halogenated substances

Halogenated flame retardants and plasticizers are often persistent, can bio accumulate in living organisms and have been detected in both humans and the environment. These substances may be problematic in the manufacturing and end of life phases where workers or the environment can be exposed. They can also migrate from the products during the use phase with unknown health effects as a result.

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.

Halogens are a group of five chemically related non-metallic elements in the Periodic Table; fluorine, chlorine, bromine, iodine and astatine.

Polybrominated biphenyls (*PBB*) and Polybrominated diphenyl ethers (*PBDE*) are restricted in the RoHS directive (2002/95/EC) due to the hazardous properties of these substances. Hexabromocyclododecane (*HBCDD*) has been identified as a Substance of Very High Concern in accordance with EU REACH criteria due to PBT (persistent, bio accumulative, toxic) properties.

Applicability

All headsets and peripheral equipment supplied with them (for example charging station and the replaceable parts mentioned in A.2.1.5).

Clarification and exemptions

[B.6.4.2](#)

References

30.

Mandate A.6.4.2:

1. *Plastic parts* weighing more than 10 grams shall not contain flame retardants or plasticizers that contain halogenated substances.

Note: This 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 product shall not contain PBB, PBDE and HBCDD.

Note: This applies 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.

Submit the following 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.

Submit the following together 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.

| | |
|-----------------------------|---|
| Product brand name | Model name(s) |
| Signature | Name and title in block capitals |
| Date | Company |

A.6.4.3 Non-halogenated substances

Background

The purpose of this mandate is to increase the knowledge of substances with regards to their human and environmental impacts and to drive a shift towards less hazardous alternatives. These substances may be problematic in the manufacturing and end of life phase where workers or the environment can get exposed and can also migrate from the products during the use phase with unknown health effects as a result.

The mandate uses the hazard assessment and decision logic framework called GreenScreen™ for Safer Chemicals developed by the non-profit organization Clean Production Action (CPA). The GreenScreen methodology can be used for identifying substances of high concern and safer alternatives.

The GreenScreen criteria are in line with international standards and regulations including the Globally Harmonized System of Classification and Labelling of Chemicals (GHS), OECD testing protocols and the European REACH Regulation. The U.S. EPA's Design for Environment (DfE) Alternatives Assessment is also an important influence on the GreenScreen™ for Safer Chemicals.

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.

Licensed Profilers are organisations approved by CPA with the capacity to provide GreenScreen assessments.

Accepted substances are considered the most sustainable alternatives which are possible for the industry to use, also taking into consideration aspects such as availability and functionality. Accepted substances are found on the TCO Development website under "*Accepted Substances list*".

Applicability

All headsets and peripheral equipment supplied with them (for example charging station and the replaceable parts mentioned in A.2.1.5).

Clarification and exemptions

[B.6.4.3](#)

Mandate A.6.4.3:

Non halogenated flame retardants used in plastic parts that weigh more than 10 grams shall be on the publically available Accepted Substance List for TCO Certified. This means that the substance has been assessed by a licensed profiler according to GreenScreen™ and been assigned a benchmark score ≥ 2

The following acceptance decisions apply to substances given Benchmarks 4, 3, 2, 1 or designated U (undefined):

- 4: Accepted – (Few concerns)
- 3: Accepted – (Slight concern)
- 2: Accepted – (Moderate concern)
- 1: Not accepted - (High concern)
- U: Not accepted - (Unspecified)

All substances of a flame retardant mixture shall be accounted for. Non-accepted components shall not exceed concentration levels of 0.1% by weight of the flame retardant.

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

A grace period for the above may be granted, see B.6.4.3 for rules

TCO Development will conduct spot-checks and require full disclosure of the flame retardants, including CAS number, used in the product to verify that the obligations according to this mandate are fulfilled.

Submit the following 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.

Submit the following together 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.

| | |
|-----------------------------|---|
| Product brand name | Model name(s) |
| Signature | Name and title in block capitals |
| Date | Company |

A.6.4.4 Halogenated plastics

Background

PVC is by far the most common halogen containing plastic. There are however other plastics that contain halogens in the plastic itself. Halogens are problematic from both a health and environmental perspective throughout the product life cycle and should be phased out.

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.

Halogens are a group of five chemically related non-metallic elements in the Periodic Table; fluorine, chlorine, bromine, iodine and astatine.

Applicability

All headsets and peripheral equipment supplied with them (for example charging station and the replaceable parts mentioned in A.2.1.5).

References

33

Mandate A.6.4.4:

***Plastic parts* in the product weighing more than 10 grams shall not contain intentionally added halogens 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.

Submit the following 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.

Submit the following together 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.

| | |
|-----------------------------|---|
| Product brand name | Model name(s) |
| Signature | Name and title in block capitals |
| Date | Company |

A.6.4.5 Phthalates

Background

Phthalates are substances mainly used as plasticizers. The substances restricted in the mandate are listed as Substances of Very High Concern and are included in REACH Annex XIV classified as toxic to reproduction. These substances are problematic from both a health and environmental perspective throughout the product life cycle and should be phased out.

Applicability

All headsets and peripheral equipment (for example applicable charging station and the replaceable parts mentioned in A.2.1.5).

Clarification

[B.6.4.5](#)

References

37, 38, 39 and 40

Mandate A.6.4.5:

The product shall not contain Bis (2-ethylhexyl) phthalate (DEHP), Butyl benzyl phthalate (BBP), Dibutyl phthalate (DBP), and Diisobutyl phthalate (DIBP). No parts of the product are exempted.

Submit the following 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.

Submit the following together 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.

| | |
|-----------------------------|---|
| Product brand name | Model name(s) |
| Signature | Name and title in block capitals |
| Date | Company |

A.6.5 Material Resource Efficiency

A.6.5.1 Lifetime extension

Background

A longer product lifetime makes a significant positive contribution to more efficient 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 warranties. Another requirement is the availability of spare parts for a number of years once the product model is taken out of production. During this period, products should, if possible, be repaired and not replaced.

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 at no charge.

Spare parts are those parts that have the potential to fail during 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. When the cost for replacing a broken part (e.g. panel) exceeds the cost of replacing the whole product, then that part need not be considered as a spare part under this mandate.

Applicability

All headsets

Life Cycle Phases



Clarification

[B.6.5.1](#)

Mandate A.6.5.1:

1. The *brand owner* shall provide a *product warranty* for at least one year on all markets where the product is sold.
2. The *brand owner* shall guarantee the availability of *spare parts* for at least three years from the time that production ceases. Instructions on how to replace these parts shall be available to professionals upon request.

Submit the following 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.

Submit the following together 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.

| | |
|---|----------------------------------|
| | |
| 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 End of life

A.6.6.1 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 manufacturer must be financially responsible for managing its own branded products at end-of-life. Currently much electronic waste is being exported to developing countries where it is managed unsustainably and disproportionately burdens those regions with this global environmental problem. The Basel Convention and its decisions govern the export of many types of electronic waste, however it is not properly implemented in all countries. With this mandate TCO Development aims to influence the expansion of better electronic waste management practices to more countries.

Definition

Brand owner is the company that owns the brand name visible on the 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 headset.

Applicability

All headsets and peripheral equipment supplied with them (for example charging station and the replaceable parts mentioned in A.2.1.5).

Life Cycle Phase



Clarification

[B.6.6.1](#)

References

35

Mandate A.6.6.1:

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:

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

The requirement can be fulfilled by any of options below (to be verified):

- 1. Product only sold on markets with WEEE legislation or similar
- 2. World-wide product take back*
- 3. Take back is offered on one additional market where the product is sold and lacks WEEE legislation*

Name of market.....

*The brand owner shall also submit a short description, to an approved eco-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.6.6.2 Preparation for recycling of product packaging material

Background

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

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

Applicability

All packaging material.

Definition

Brand owner is the company that owns the brand name visible on the product.

Mandate A.6.6.3:

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:

A copy of a verification report from a verifier approved by 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 |

**DECLARATION FORM FOR TCO CERTIFIED HEADSETS
3.0 ENVIRONMENTAL REQUIREMENTS**

Applicant company

By signing this Declaration Form the Company confirm that the Company has read and accepts to be bound by the below listed environmental requirements as stated in this criteria document. The signature of this form is to be considered equal to a signature under each of the below listed individual mandates in this criteria document. The text in this form is compressed to save space so please make sure to read the full explanation under each mandate. Check the boxes for the documents that have been attached to this form.

- A.1.1 TCO Certified Document
- A.6.1 Product description
 - Completed product declaration form
 - Copy of the marking label for Headset and external power supply
- A.6.2.1 Environmental management system certification
 - Addresses of manufacturing plants
 - Valid EMAS certificate or ISO 14001 certificate
- A.6.4.1 Cadmium, mercury, lead and hexavalent chromium
- A.6.4.2 Halogenated substances
- A.6.4.3 Non-halogenated substances
- A.6.4.4 Halogenated plastics
- A.6.4.5 Phthalates
- A.6.4.6 Hazardous substances in product packaging
- A.6.6.3 Preparation for recycling of product packaging material

We hereby guarantee that the above mandate is fulfilled.

| | |
|-----------------------------|---|
| Product brand name | Model name(s) |
| Signature | Name and title in block capitals |
| Date | Company |

**DECLARATION FORM FOR TCO CERTIFIED HEADSETS
3.0 ENVIRONMENTAL REQUIREMENTS**

Brand owner

By signing this Declaration Form the Company confirm that the Company has read and accepts to be bound by the below listed environmental requirements as stated in this criteria document. The signature of this form is to be considered equal to a signature under each of the below listed individual mandates in this criteria document. The text in this form is compressed to save space so please make sure to read the full explanation under each mandate. Check the boxes for the documents that have been attached to this form.

A.6.5.1 Lifetime extension

A.6.6.3 Take back system

1. Product only sold on markets with WEEE legislation or similar

2. World-wide product take back*

3. One additional market lacking WEEE legislation where product take back is offered*

* Short description or reference of the above

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)

.....
Company

A.7 Socially responsible manufacturing

Shorter product cycles and growing demand for new technologies put increasing pressure on industry and its complex supply chain to deliver new devices faster and at a low cost. The result is often inadequate working conditions at manufacturing facilities, long working hours, low wages and a lack of health and safety measures.

TCO Development aims for greater brand engagement throughout the supply chain by setting criteria and verification routines that create strict social policies toward suppliers, as well as factory audit structures and an open dialog within the IT industry.

Life Cycle Phase



A.7.1 Supply chain responsibility

Background

It is TCO Developments opinion that codes of conducts and factory audits are currently the tools that are most practical to help the majority of brands to work with socially responsible manufacturing in a structured way. It is also TCO Developments opinion that these tools are improving the situation incrementally as long as they are used in the correct and committed way by the brand.

The contribution of TCO Certified is:

- TCO Certified defines a minimum level of the Brand owner's code of conduct.
- TCO Certified is a control system to ensure that the brand takes the responsibility and work in a structured way in accordance with their code of conduct.
- TCO Certified creates an incentive for Brand owners to work proactively.

Definitions

Brand owner: The company or organization owning or controlling the Brand Name.

First tier manufacturing facility: Manufacturing plant where the final assembly of the TCO certified product is taking place.

Corrective action plan: A list of actions and an associated timetable detailing the remedial process to address a specific problem

Applicability

The Brand owner.

Clarification

[B.7.1](#)

References

22 and 23

Mandate A.7.1:

By signing this mandate the Brand owner agrees to the (1. Commitment) and agrees to conduct the (2. Structured work). Additionally TCO Development requires that the Brand owner show (3. Proof) of the commitment and the structured work by allowing random inspections, by sharing audit reports and corrective action plans and by providing other documented proof described below.

1. Commitment:

The *Brand owner* shall have a code of conduct that is considered consistent with the following in the manufacturing of TCO Certified products:

- ILO eight core conventions: 29, 87*, 98*, 100, 105, 111, 138 and 182.
- UN Convention on the Rights of the Child, Article 32.
- Relevant local and national Health & Safety and Labour laws effective in the country of manufacture.

*In situations with legal restrictions on the right to freedom of association and collective bargaining, non-management workers must be permitted to freely elect their own worker representative(s) (ILO Convention 135 and Recommendation 143).

2. Structured work:

- The Brand owner shall ensure that routines are in place to implement and monitor their code of conduct in the manufacturing of TCO Certified products.
- In the final assembly factories the Brand owner shall ensure the implementation of their code of conduct through factory audits.
- In the final assembly factories and in the rest of the supply chain the Brand owner shall ensure that a corrective action plan is developed and fulfilled within reasonable time for all violations against their code of conduct that the Brand owner is made aware of.

3. Proof:

- TCO Development may conduct/commission random factory inspections (spot-checks) at any final assembly factory manufacturing TCO Certified products for the Brand owner and may require full audit reports during the certification period in order to assess social commitment and advancement.
- TCO Development may also require seeing corrective action plans and auditing reports from factories further down the supply chain to ensure that corrective actions have been successfully implemented.
- TCO Development additionally requires the documentation below to be verified by a third party approved verifier.

Submit the following to an approved verifier:

The Brand owner shall submit all of the following as proof of their commitment and structured work:

1. The Brand owner shall submit their code of conduct, which must be considered consistent with the criteria under 1. Commitment.
2. The Brand owner shall annually submit proof that management and workers at all final assembly factories manufacturing TCO Certified products have been informed about the Brand owner’s code of conduct.
3. The Brand owner shall annually submit a list of all final assembly factories manufacturing TCO Certified products. This list shall include the dates of the most recent social audits covering the Brand owner’s code of conduct and the dates of planned audits for each factory. The list shall show that all factories have or will be audited at least once over a 3-year period.
4. The Brand owner shall annually submit for review one third party audit report from one final assembly factory manufacturing TCO Certified products to demonstrate that the audits are conducted in a serious manner. The audit report shall at least cover the criteria in A.7.1 of TCO Certified and be of equal quality as an EICC audit. It shall not be more than 12 months old.
5. The Brand owner shall submit a corrective action plan for all nonconformities against A.7.1 of TCO Certified found in the submitted third party factory audit..

If this is the first time the *Brand owner* certifies products to this generation of the criteria and time is needed to develop the proof above then the Brand owner can seek a 12 months grace period on the first application. TCO Development reserves the right to deny grace period if the Brand owner is considered a high risk for not meeting the 12 month due date. When seeking grace period an agreement must be completed/signed by the senior management representative at the *Brand owner* company.

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.

Submit the following together with the application to TCO Development:

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

We hereby guarantee our commitment to fulfilling the mandate.

| | |
|---|----------------------------------|
| 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.7.2 Senior Management Representative

Background

It is beneficial to all parties that an open and transparent dialogue between TCO Development and the Brand owner exists for the monitoring of compliance with the criteria or when issues concerning working conditions at manufacturing facilities require clarification. A contact person responsible for the organization's efforts to enforce the social responsible manufacturing criteria needs to be consistently available for dialogue with TCO Development throughout the validity of the certificate.

Applicability

The Brand owner.

Clarification

[B.7.2](#)

Mandate A.7.2:

The Brand owner shall have an appointed Senior Management Representative (SMR) who, irrespective of other responsibilities, has the authority to ensure that the social criteria in the manufacturing of TCO Certified are met and who reports directly to top management.

- The contact details of the SMR shall be submitted and the SMR shall be available for dialogue in English with TCO Development throughout the validity of all the Brand owners' certificates.
- To ensure that the SMR has the necessary authority and is working in a structured and proactive way implementing the code of conduct, a review of the SMR shall be done every year according to B.7.2.2.

Submit the following to an approved verifier:

1. Name, Title, Telephone Number and Email Address of the SMR.
2. A written guarantee that the above mandate is fulfilled. The guarantee shall be signed by the SMR at the Brand owner company.

Submit the following together with the application to TCO Development:

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

Complete the table using block lettering

| | |
|----------------|--|
| Name | |
| Business title | |
| Telephone | |
| E-mail | |

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.7.3 Conflict minerals

Background

The exploitation and trade of the natural resources, Tantalum, Tin, Tungsten and Gold (3T+G) from conflict-affected areas is commonly regarded as a major source of conflict financing. TCO Development supports the underlying goal of the EU conflict minerals measures and those contained in the Dodd Frank Act 1502, but believes it is also vital to support in-region responsible sourcing programs in order to help suppliers meet these Due Diligence requirements, maintain trade and develop mining that directly benefits the people whose livelihoods depend on a legitimate trade. TCO Development now requires all Brand owners who use TCO Certified to address the issue of conflict minerals in their certified products in a progressive and proactive way.

Definitions

Conflict minerals: Tantalum, Tin, Tungsten and Gold = 3T+G

DRC: Democratic Republic of the Congo

Applicability

The Brand owner.

Clarification

[B.7.3](#)

Reference

20

Mandate A.7.3:

The Brand owner shall have a public conflict minerals policy and also indicate all the initiatives they are using/funding. It is TCO Developments opinion that the OECD Due Diligence Guidance for Responsible Supply Chain of Conflict-Affected or High-risk Areas is the most ambitious approach in the list.

At least one of the following options shall be marked:

- A Due Diligence process based on the OECD Due Diligence Guidance for Responsible Supply Chains of Minerals from Conflict-Affected or High-risk Areas
- iTSCi (International Tin Research Institute (ITRI) Tin Supply Chain Initiative).
- CFTI (Conflict-free Tin Initiative).
- PPA (The Public-Private Alliance for Responsible Minerals Trade).
- Other relevant DRC in-region initiative:.....
- CFSI (EICC/GeSi Conflict-Free Sourcing Initiative).

Submit the following to an approved verifier:

- 1 The completed TCO Certified Conflict Minerals Questionnaire and supporting documents
- 2 A written guarantee that the above mandate is fulfilled. The guarantee shall be signed by the responsible person at the Brand owner company

Submit the following together 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.

| | |
|--|---|
| 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 |

References

International standard organisations referred to in the reference list below and their Web sites.

1. Zheng X-Y, Henderson D, McFadden SL, Hu B-H 1997. The role of the cochlear efferent system in acquired resistance to noise-induced hearing loss. *Hearing Research* 104, 191-203.
2. IEC 61672-1 Electro acoustics – Sound level meters – Part 1: Specifications.
3. ISO 11904-2 2004. Acoustics – Determination of sound immission from sound sources placed close to the ear – Part 2: Technique using a manikin.
4. ITU-T P.58 1996. Head and torso simulator for telephonometry
5. Call centre work, Doctoral Thesis, K Norman, University of Linköping, Sweden, 2005
6. Directive 2003/10/EC of the European Parliament and of the Council of 6 February 2003 on the minimum health and safety requirements regarding the exposure of workers to the risks arising from physical agents (noise)
7. ISO 1999:1990 Acoustics - Determination of occupational noise exposure and estimation of noise-induced hearing impairment
8. ETSI EG 202 518 v1.1.1 (2006-09) Speech Processing, Transmission and Quality Aspects (STQ); Acoustic Output of Terminal Equipment; Maximum Levels and Test Methodology for Various Applications.
9. Acoustics – Determination of sound immission from sound sources placed close to the ear – Part 1: Technique using a microphone in a real ear (Mire technique) (ISO 11904-1: 2002)
10. Ihde W, Methods of noise control in the foundry, problems and limitation. *Applied Ergonomics*, June 1984
11. Morse L H et al. Localised Muscle fatigue in Telephone Work. Institute for Motion injuries, Sta Clara Valley Medical Centre, CA 1995
12. IEC 60320 Appliance and Interconnection Couplers
13. EN 50360. Product standard to demonstrate the compliance of mobile telephones with the basic restrictions related to human exposure to electromagnetic fields (300 MHz – 3 GHz).
14. EN 62209-1:2006 Human exposure to radio frequency fields from hand-held and body-mounted wireless communication devices. Human models, instrumentation, and procedures. Procedure to determine the specific absorption rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300 MHz to 3
15. EN /IEC 60065 Audio, video and similar electronic apparatus – Safety requirements.
16. EN 60950-1 (IEC 60950-1). Safety of information technology equipment including business equipment.
17. UL 60950 Information Technology Equipment – Safety
18. ISO 14001 Environmental management systems - Specification with guidance for use.
19. EMAS EU regulation no 1836/93 concerning the voluntary participation of industrial companies in the Union's environmental control and review structure.
20. <http://www.oecd.org/corporate/mne/mining.htm>
- 21.
22. Electronic Industry Citizenship Coalition (EICC), <http://www.eicc.info>
23. SA8000, <http://www.sa-intl.org>
24. Energy Star International_Efficiency_Marking_Protocol.pdf
25. Energy Star Technical Specifications For Single Voltage External Ac-Dc and Ac-Ac Power Supplies Qualifying Criteria (Version 2.0)
26. ErP Directive (2009/125/EC)

27. www.energystar.gov and (http://www.energystar.gov/index.cfm?c=partners.pt_index)
28. EU Directive 2006/66/EC on batteries and accumulators containing certain dangerous substances
29. EU Directive 2011/65/EU on the restriction of the use of certain hazardous substances in electrical and electronic equipment
30. Regulation concerning Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), EC 1907/2006
31. EU Directive 67/548/EEC on the approximation of laws, regulations and administrative provisions relating to the classification, packaging and labelling of dangerous substances
32. EU Directive EC 1272/2008 on classification, labelling and packaging of substances and mixtures
33. The EU Green Paper “Environmental questions concerning PVC” KOM (2000) 469
34. ISO 11469 Plastics - Generic identification and marking of plastics products
35. EU Directive 2002/96/EC on waste electrical and electronic equipment (WEEE)
36. Directive 94/62/EC on packaging and packaging waste.
37. http://www.umweltbundesamt.at/fileadmin/site/umweltthemen/abfall/ROHS/finalresults/Annex6_RoHS_AnnexII_Dossier_DEHP.pdf [DEHP]
38. http://www.umweltbundesamt.at/fileadmin/site/umweltthemen/abfall/ROHS/finalresults/Annex7_RoHS_AnnexI_I_Dossier_BBP.pdf [BBP];
39. http://www.umweltbundesamt.at/fileadmin/site/umweltthemen/abfall/ROHS/finalresults/Annex8_RoHS_AnnexI_I_Dossier_DBP.pdf [DBP].
40. http://rohs.exemptions.oeko.info/fileadmin/user_upload/reports/20140520_DIBP_AnnexII_Dossier_final.pdf [DIBP].

Miscellaneous references

- ETSI TS 126 132 v.9.2.0 Universal Mobile Telecommunication System (UMTS); LTE; Speech and video telephony terminal acoustic test specification.
- MUSE_DTF4 4_TestMeth_V11

B Test Methods

The following definitions, test conditions, requested specifications, and other information apply to the test methods described in this document.

The test results are valid only for the presentation form(s) and configuration(s) tested.

B.0 General test conditions

B.0.1 Definition of a test object

- The types of headsets covered by this document are:

Corded headsets

Cordless headsets and the belonging charging station

Some tests do only apply to cordless headsets and the charging station used with it.

Some tests do only apply to corded headsets connected to an amplifier.

The testing procedures are the same and so as to simplify the instructions in this section of the document, both styles will be referred to as Equipment under Test, EUT.

- A headset shall be delivered to the test facility in test-ready condition including any required accessories. All necessary information about how to operate and adjust the headset shall be provided.
- The performance of the tested headset shall in all aspects be fully in accordance with the performance of the final product.

B.0.2 Required test object information

The client shall specify the name(s), type designation(s) and manufacturer for all different parts of the test object.

B.0.3 Conditions for the equipment under test

- The headset being tested shall be physically prepared for testing.
- Testing shall be performed with the cordless headset fully charged.
- The charging station shall be tested under nominal conditions of input voltage, current, etc.

B.0.4 Instruments used for testing

All instruments used for testing of a headset and its charging station shall be of good quality and validated by a recent test certificate from a certified testing facility. Any necessary instrument calibration shall be done before the tests are performed.

B.0.5 Setting of the headset

A cordless headset should be fully charged.

B.0.6 Test report

- The test results are valid only for the presentation form(s) and configuration(s) tested.
- The manufacturer, brand name, type/model name and serial number shall be stated in the test report.
- The supply voltage and frequency used during the test and the electrical safety classification shall be stated in the test report.
- The degree of uncertainty for each given measurement result shall be stated in the test report.

B.1 General information

B.1.1 Information to end users

The TCO Certified Document shall accompany the product as provided by TCO Development. No editorial changes without TCO Development's consent are accepted. The Document is available at www.tcodevelopment.com.

If the product that is to be TCO Certified is branded differently from the applicant name, the applicant company signing the guarantee shall be sure that the brand owner agrees with the requirement.

Compliance is through one of the following options:

1. Separate printed document

The TCO Certified Document is placed in the packaging and accompanies the product to the end user

2. In the user manual or digital file

The TCO Certified Document is found in the user manual or digital file and accompanies the product to the end user. The TCO Certified Document shall be printed under a headline for TCO Certified. This headline shall be visible in the table of contents of the user manual or digital file.

The TCO Document must be separated from other text portions of the user manual or digital file so that it is obvious that the TCO Document is not accountable for the content of any other texts.

3. On the brand web site.

A direct link to the TCO Certified Document on the brand owner's web page is placed in the user manual or digital file and accompanies the product to the end user. There shall be a headline for TCO Certified in the user manual or digital file. Either by or under this headline shall be visible in the table of contents. With this headline there shall be a direct link to the TCO Certified document on the brand owner's website. Also accepted are TCO logos or icons that redirect the visitor by a link to the TCO Certified Document

[Back to A.1.1](#)

B.2 Ergonomics

B.2.1 Acoustic

B.2.1.0.1 Test object alignment for testing

Headsets which are used with a headband shall be placed in normal position on the head of the head and torso simulator HATS according to ITU-T P.58, with pinna v.3.3. Headsets shall be mounted on the HATS in a position according to EN 50332-1:2000 paragraph 6.2.

B.2.1.0.2 Instruments used for testing

All instruments used for testing shall be of good quality, fulfil the requirements of specified standards and be validated by a recent test certificate from a certified testing facility. Instrument calibration shall be done before the tests are performed. The precision sound level meter shall conform to IEC 61672-1.

B.2.1.0.3 Settings of test object

If a volume control is present on the test object, this shall be set in its maximum position.

B.2.1.0.4 Test signals

The speech simulating signals according to ITU-T Recommendation P.59 Artificial conversational speech. The input signal level shall be increased until it reaches 10 VRMS across the set's terminals or until the steady-state acoustic output from the headset reaches its limiting value, whichever occurs first. P.59 shall be used for the acoustic impulse test as a background signal and for the amplifier volume control tests.

The impulse test signal as well as the test signal for assessing the sound pressure level for long duration signals shall as specified in ETSI EG 202 518 V1.1.1 clause 6.2.2.

B.2.1.1 Acoustic impulse test

B.2.1.1.0 Test facility requirements

The A-weighted sound pressure level in the room used for measurement shall not exceed 45dB.

B.2.1.1.1 Preparations of the EUT for testing

All necessary preparations described in B.1 and B.2.1. shall be done.

B.2.1.1.2 Equipment

The EUT shall be set up in accordance with clause B.2.1.0.1.

A head and torso simulator HATS shall be used fitted with a soft pinna v.3.3 simulator. When testing headsets the headset shall be mounted on the HATS in a position according to EN 50332-1:2000 paragraph 6.2.

B.2.1.1.3 Test method

The test method described in ETSI EG 202 518 v1.1.1 paragraph 6.2.2 shall be used.

The results from measurements with brief impulses shall be reported as diffuse-field related peak C-weighted sound pressure level and the ERP (Ear Reference Point) Long-duration sound pressure level

Calculation of the equivalent sound pressure level of the received speech in the diffuse field shall follow the procedure according to ISO 11904-2 clause 6 and 7.

B.2.1.1.4 Test evaluation

Results shall be presented as the diffuse-field related peak C-weighted sound pressure level.

(The mandate in accordance with clause A.2.1.1. is the following:

The diffuse-field related peak C-weighted sound pressure level,
 $L_{DF,M,Cpeak}$, shall be ≤ 137 dB.

The ERP (Ear Reference Point) Long-duration A-weighted sound pressure level,
 $L_{DF,M,Ccontinue}$, shall be ≤ 118 dB.)

B.2.1.1.5 Overall uncertainty

The test shall be performed in such a way that the total extended uncertainty in the test result will be less than ± 3 dB.

[Back to A.2.1.1](#)

B.2.1.2 Sound quality test

B.2.1.2.0 Test facility requirements

The A-weighted sound pressure level in the room used for measurement shall not exceed 45dB.

B.2.1.2.1 Preparations of the EUT for testing

All necessary preparations described in B.1 and B.2.1 shall be done.

B.2.1.2.2 Equipment

The EUT shall be set up in accordance with clause B.2.1.0.1.

A head and torso simulator HATS shall be used fitted with a soft pinna v.3.3 simulator. When testing headsets the headset shall be mounted on the HATS in a position according to EN 50332-1:2000 paragraph 6.2.

B.2.1.2.3 Test method

1. Discrete headsets shall be directly driven using a voltage source having an electrical output impedance characteristic of the system normally used to drive the headset.
DECT headsets and headset telephones supplied with their own headsets shall be driven via their telephone line interfaces where an analogue interface is provided.
2. The headset shall be coupled to an appropriate ear simulator (e.g. a head and torso simulator or equivalent). The ear simulator output shall be monitored with a frequency analyser.
3. The headset shall be conditioned by applying a speech-like signal producing an acoustic level of at least 74 dB(A) for 10 minutes.
Tests of the receive distortion shall be made at the input frequencies and test levels specified in paragraphs 4 and 5 below.
Tests shall be performed with the volume control set to the highest gain position, the mid position (or nearest equivalent) and the lowest position.
4. The frequency response and total harmonic distortion (THD) shall be measured at third octave frequency intervals, for the range of frequencies specified in each product category. Analogue products shall be tested in the frequency range 500 Hz to 8000 Hz
5. Define the input test level per product category:
 - For analogue products two input test levels shall be determined. Level 1 shall be the input level required to produce +5dBPa output for the test frequency 1 kHz. Level 2 shall be the input level required to produce +10dBPa for the test frequency 1 kHz.
If the maximum output is less than +10dBPa the actual maximum output shall be noted in the test report, and level 2 shall be the input level for 90% of the maximum output

Report

All results shall be reported in dB(A).

- Tables of total harmonic distortion versus frequency. For analogue products this shall be measured using both Level 1 and Level 2 input levels
- The headphone frequency response at level 1 input voltage for maximum, minimum and mid-position volume control settings.
- Graphs of acoustic level versus volume control setting for at least five equally distanced frequencies within the specified frequency interval.
- Graphs of distortion versus volume control setting for five equally distanced frequencies within the specified frequency interval.

B.2.1.2.4 Test evaluation

The Total harmonic distortion, THD, for an analogue headset shall not exceed 8% at 2 kHz.

The following result of the test shall be reported in a test report sent to TCO Development:

- Table of distortion versus frequency at input level 1
- Table of distortion versus frequency at input level 2
- The frequency response graph at input level 1 (maximum volume setting)
- The frequency response graph at input level 1 (middle volume setting)
- The frequency response graph at input level 1 (minimum volume setting)
- Table of distortion versus volume control setting

B.2.1.2.5 Overall uncertainty

The test shall be performed in such a way that the total extended uncertainty in the test result will be less than ± 3 dB.

[Back to A.2.1.2](#)

B.6 Environment

B.6.0 General clarification

B.6.0.1 Signatures

The date of signature shall not be older than 12 months at the time of the application. The templates in the ecological declaration shall be sent either with original signatures or as copies of original documents with original signatures. “Copies” are for example telefaxes or pdf-files of scanned signed documents. TCO Development and/or the responsible test facility may later request the original signed document.

However, copies will not be accepted where the signature has been scanned and pasted into the document.

TCO Development accepts digital signature as an alternative to traditional signature on test reports and declarations submitted as pdf files. To approve a digital signature it is necessary to also submit a digital key to the verifier to facilitate identification.

B.6.1 Product description

The A.6.1 template shall be completed with the requested information about the Headset. This includes the display, panel and external power supply.

The type key that includes an Asterisk (*) for unidentified characters, if any, in the model name and panel identification name shall be submitted to the eco-verifier. Only two * may be used in the model type key and each * must include two or more options. For the most up-to-date information about type keys, see the appropriate product Application Process at www.tcodevelopment.com

[Back to A.6.1](#)

B.6.2 Manufacturing

B.6.2.1 Environmental management system certification

The certificate shall be issued by a certification body that is accredited by an accreditation body covered by the International Accreditation Forum, www.iaf.nu, Multilateral Arrangement on Environmental Management Systems.

The applicant shall submit an ISO 14001 certificate or EMAS registration for every final assembly plant used to manufacture products certified according to TCO Certified.

For applicants submitting several applications, it is sufficient to attach ISO 14001 certificate(s) or EMAS registration(s) with the first application. The certificate(s) or an appendix to the certificate(s) shall show the scope of the certification.

Manufacturing plants that are not yet certified (and that do not fall into the above mentioned category) can seek a 12 months grace period on the first application to obtain ISO14001 certification or EMAS registration. TCO Development reserves the right to deny grace period if the applicant is considered a high risk for not meeting the 12 month due date. When seeking grace period an agreement must be completed/signed by the Applicant company.

[Back to A.6.2.1](#)

B.6.3 Climate

B.6.3.1 Energy consumption – external power supply

TCO Development has decided that energy consumption of the external power supply shall follow the EPA demands for compliance with The International Efficiency Protocol requirement for level V, equivalent to the Energy Star version 2.0 for external adapters, also covering battery chargers.

The international efficiency mark consists of a Roman numeral (I – VI) that corresponds to specific minimum Active and No-Load efficiency levels (as well as a power factor requirement for level V) and is printed/applied by the manufacturer on the external power supply marking label.

A test facility approved by TCO Development will require a copy of the display's external power supply marking label where The International Efficiency Protocol requirement for level V symbol is visible as proof of compliance.

[Back to A.6.3.1](#)

B.6.4 Hazardous substances

B.6.4.1 Cadmium (Cd), mercury (Hg), lead (Pb) and hexavalent chromium (CrVI)

Exemptions are according to EU Directive 2011/65/EU (RoHS) and the documents supporting the directive.

The maximum concentration values tolerated by weight in homogeneous materials for cadmium, mercury, lead and hexavalent chromium are according to EU Directive 2011/65/EU (RoHS) and the documents supporting the directive. No exemption for mercury in lamps is allowed.

The limit value for batteries is 0.0005 % for mercury, 0.002 % for cadmium per and 0.004 % lead per listed part, according to EU Directive 2006/66/EC.

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B.6.4.2 Halogenated substances

Mandate 1. The requirement applies to plastic parts in all assemblies and sub-assemblies. LCD panels are included in the requirement.

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

Mandate 2. The requirement applies to the whole of the Headset product, including components, parts and raw materials in all assemblies and sub-assemblies e.g. batteries, paint, surface treatment, plastics and electronic components. Printed Wiring Boards are also included in the requirement.

HBCDD has been identified as a Substance of Very High Concern in accordance with EU REACH criteria. The main application of HBCDD in EEE is as a flame retardant in HIPS plastic being used for closures and structural parts of different types of EEE. TCO Development considers that the use of HBCDD in EEE is not deemed essential as technically suitable alternative substances and materials are available and already used extensively today.

Maximum concentration values tolerated for a restricted substance (including decaBDE) is 0.1 % by weight in homogeneous materials.

Fluoroorganic additives, used to modify the dripping behaviour of plastics in fire conditions or to improve the processing behaviour, are exempted provided that they do not exceed 0.5 weight percent.

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B.6.4.3 Non-halogenated substances

Non-halogenated flame retardants can be used in TCO Certified products once they receive an accepted benchmark. TCO Development makes a list of accepted substances available on its website. The Accepted Substances list is dynamic, which allows new substances that have undergone a valid assessment to be added or for accepted substances to come under reassessment in light of new scientific findings. If an accepted substance is reassessed and given a benchmark score lower than 2 TCO Development reserves the right to remove the substance from the accepted substance list. Any substance to be removed will be set a sunset date. The sunset date shall give adequate time (at least one year) for equipment manufacturers to switch to a flame retardant alternative.

When considered necessary, TCO Development reserves the right to request a substance undergo further assessment in order to assess the completeness, quality and validity of a draft benchmark score, such as a GreenScreen Verification assessment.

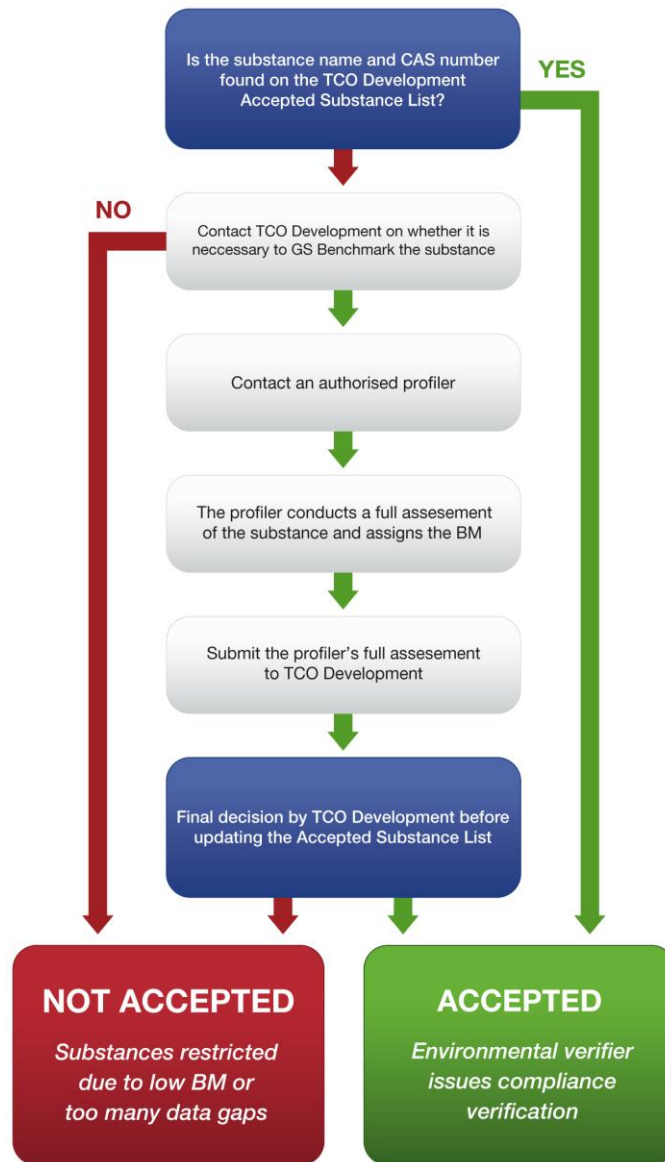
Full GreenScreen Assessments of substances are made publicly available on databases such as IC2 (Interstate Chemicals Clearinghouse) <http://theic2.org/hazard-assessment> or Techstreet <http://www.techstreet.com/searches/3638231>. If no public assessment report is available, then TCO Development may place interested persons in contact with the owner of the report.

Table B.6.4.3.1

| Benchmark key | | |
|-----------------|---|------------------|
| Benchmark 4 | Few concerns, i.e. safer chemical | Approved for use |
| Benchmark 3 | Slight concern | Approved for use |
| Benchmark 2 | Moderate concern | Approved for use |
| Benchmark 1 | High concern | Not accepted |
| Unspecified (U) | Insufficient data to assign a benchmark | Not accepted |

B.6.4.3.1 Compliance procedures (See also Flow chart B.6.4.3.1)

- First contact your suppliers such as the plastic and panel manufacturer and ask them to confirm that they only use flame retardants including substances on the accepted substance list.
- **If all flame retardants only include substances on the Accepted Substances List the procedure is as follows:**
 1. Sign template A.6.4.3 and submit it to the approved environmental verifier. When the verifier considers all environmental documentation is compliant they will issue an Environmental verification to the applicant.
- **If any flame retardant is used that contains a substance that is not on the Accepted Substances List then it will need to be added before approval can be given by the environmental verifier. For this the procedure is as follows:**
 1. Contact TCO Development directly to see if we have any additional information on the substance: Reasons for the substance's absence can be that the substance has received benchmark 1, no assessment has been conducted or it has a benchmark score U (unspecified) due to many data gaps.
 2. If TCO Development requires the substance to be benchmarked, we recommend you contact your supplier and inform them that the substance will need a GreenScreen assessment by a licensed profiler. The list of licensed profilers can be found on the CPA website at <http://www.greenscreenchemicals.org/professionals/profilers>
 3. A draft report per substance (not flame retardant) is assembled from the available information (literature search, structural similarity comparison, expert judgment) by the profiler.
 4. It is the profiler that sets the benchmark score per relevant substance, which is valid for 3 years. Substances are assessed at 3 year intervals since mandates are revised and more data and new knowledge on the substance may lead to other results.
Note: All assessments **and** reassessments shall be conducted by licensed profilers.
 5. Full GreenScreen assessments per substance shall be submitted to TCO Development for final approval before the Accepted Substances List can be updated.
 6. Once a substance is added to the list and the verifier identifies them, then they will issue the environmental verification to the applicant (see above point 1 under: **If all flame retardants only include substances on the Accepted Substances List the procedure is as follows**)



Flow chart B.6.4.3.1. The Compliance procedure

B.6.4.3.2 Grace period

Applicants signing mandate A.6.4.3 have the option to seek a grace period in order to give them time to assess flame retardants used and substitute these if necessary. The request for a grace period shall be sent to TCO Development together with a description on why a grace period is necessary and a timeline for the GreenScreen assessment and/or substitution. On receiving this request, TCO Development will conduct a risk assessment as to whether the applicant can be given a grace period to show compliance. If a grace period is not granted, then the applicant is required to ensure that all used non-halogenated flame retardants only include substances that are on the TCO Accepted Substances list before a certificate can be issued to them. After the grace period, if an approved a grace period exceeds the due date, then the verifier shall contact TCO Development and a course of action will be decided after talking first with the applicant.

[Back to A.6.4.3](#)

B.6.4.5 Phthalates

Maximum concentration values tolerated for a restricted substance is 0.1 % by weight of any plasticised homogenous material.

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B.6.4.6 Hazardous substances in product packaging

Limit values are according to Directive 94/62/EC on packaging and packaging waste.

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B.6.5 Material Resource Efficiency

B.6.5.1 Lifetime extension

That spare parts shall be available for three years from “the time that production ceases” is only applicable to the production of the specific Headset, certified by the brand owner according to TCO Certified.

Regarding spare parts:

- If a part of a product is broken (e.g. bezel, stand) the end user shall not need to replace the whole product, only the broken part. The broken part shall be possible to replace with an equivalent part (this part does not have to be identical to the broken part).
- When the cost for replacing a broken part (e.g. panel) exceeds the cost of replacing the whole product, then that part need not be considered as a spare part under this mandate.

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B.6.6 End of life

B.6.6.1 Take back system

Tick the box of the option chosen.

If the applicant chooses **option 1** (*Product only sold on markets with WEEE legislation or similar*) and signs the declaration, the requirement is fulfilled.

If **option 2 or 3** (*World-wide product take back or One additional market lacking WEEE legislation where product take back is offered*) is chosen, the declaration must be signed and the applicant must provide a short description of how the take-back system on that market works. This can also be done by giving a reference (for example a link to a website) to the representative, associated company or affiliate taking care of the take-back system on that market.

In case of option 3 the applicant must also provide the name of the market (country) where a take back system is provided.

TCO Development has no requirement on the take-back system being free of charge.

It is important to point out that any recycling and waste export control legislation in countries where the applicant company operates must always be met.

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B.7 Socially Responsible Manufacturing

B.7.1 Supply chain responsibility

B.7.1.1 General Clarifications

The mandate is a social performance mandate and criteria are based on the eight ILO (International Labour Organization) core conventions and local legislation. The mandate stipulates the minimum standards for Code of Conduct, Inspection and Corrective Action engagement of the brand owners regarding the situation at their own and/or their supplier's manufacturing facilities of TCO Certified products.

B.7.1.2 Background information

B.7.1.2.1 SA8000

SA8000 is based on the UN Universal Declaration of Human Rights, Convention on the Rights of the Child and various International Labour Organization (ILO) conventions. SA8000 is a global social accountability standard for decent working conditions, developed and overseen by Social Accountability International (SAI). SAI contracts with a global accreditation agency, Social Accountability Accreditation Services (SAAS) that licences and oversees auditing organisations to award certification to employers that comply with SA8000.

For more information visit: <http://www.sa-intl.org/>

B.7.1.2.2 Electronic Industry Citizenship Coalition (EICC)

The Electronic Industry Citizenship Coalition (EICC) is a group of companies working together to create a comprehensive set of tools and methods that support credible implementation of the Electronic Industry Code of Conduct. The EICC Code of Conduct is at the core of member requirements and members are required to commit to it, spread that commitment to their supply chains and undertake a range of assessment activities to ensure they are accountable to their commitment to the Code.

The EICC VAP (Validated Audit Process) is a factory audit framework for identifying risks and driving improvements and robust management systems for labour, ethics, health, safety and environmental conditions in the supply chain. It is a third party validated audit service that provides an independent audit of a supplier, potential supplier, and/or a company's own facilities.

For more information visit: <http://www.eicc.info/>

B.7.1.2.3 Grace Period.

Brand owners signing mandate A.7.1 for the first time have the option to seek a 12 month grace period in order to give them time to improve their supply chain management systems. On receiving this request, TCO Development will conduct a risk assessment as to whether the brand can be given a grace of 12 months to show compliance. If a grace period is not granted, then the brand is required to make all required improvements and actions before a certificate can be issued to them. After 12 months, if an approved a grace period exceeds the due date, then the verifier shall contact TCO Development and a course of action will be decided after talking first with the brand owner.

B.7.1.3 The verification process

B.7.1.3.1 Proof documentation to be submitted to a Social Reviewer approved by TCO Development

1. Submitting the code of conduct

The Brand owner shall submit a copy of their code of conduct signed (on the document copy or declaration of identity) by the SMR (or higher ranking member of the company) to an approved Social Reviewer. If the Code of conduct has not changed since last time it was reviewed the brand does not have to send it again. In this instance the SMR shall declare this.

SA8000: If the brand owners head office is certified according to SA8000 then the code of conduct does not have to be reviewed by the Social Reviewer. It is enough to send a copy of the SA8000 certificate to the Environmental Verifier and the Code of conduct with the application to TCO Development.

2. Submitting the proof of the supply chain being informed of the code of conduct.

The Brand owner shall submit a description on how their first tier manufacturing facilities of TCO Certified products are informed of their code of conduct for review by an approved Social Reviewer.

SA8000: If the brand owners head office is certified according to SA8000 then a description does not have to be reviewed by an approved Social Reviewer.. It is enough to send a copy of the SA8000 certificate to the Environmental Verifier and the description with the application to TCO Development.

3. Submitting the annual factory list

The Brand owner shall submit an annual list of all first tier manufacturing facilities of TCO Certified products to the Environmental Verifier and TCO Development.. The list shall show the factory name, address, date of conducted audit, date of planned audit and type of audit. Each factory shall have an audit date assigned to it. All these audits may be first, second or third party audits (at least one of the audits shall be 3rd party and have been conducted within 12 months from the date the list is submitted). The list shall show that all factories have or will be audited once over a 3 year period.

4. Submitting the annual third party audit report

The Brand owner must submit one annual third party audit report carried-out at a first tier manufacturing facility of TCO Certified products for review by an approved Social Reviewer. The audit report shall at least cover the criteria in A.7.1 of TCO Certified and be of equal quality as an EICC audit. When possible the audit report shall be from a different first tier manufacturing facility than the previous years unless otherwise specified by TCO Development.

SA8000: If the first tier manufacturing facility is certified according to SA8000 then the third party audit report does not have to be reviewed by an approved Social Reviewer. It is enough to send SA8000 certificate to the Environmental Verifier and a copy of the audit report with the application to TCO Development.

5. Submitting the annual corrective action plan (CAP) if relevant.

The Brand owner must submit one corrective action plan (CAP) for review for any non-conformity found in the submitted audit report to an approved Social Reviewer.

SA8000: If the first tier manufacturing facility is certified according to SA8000 then then the CAP does not have to be reviewed by an approved Social Reviewer. It is enough to send a copy of the SA8000 certificate to the Environmental Verifier and a copy of the CAP with the application to TCO Development.

B.7.1.3.2 On-site inspection initiated by the Brand owner (Social revision)

In accordance with the compliance options under A.7.1 the Brand owner shall provide a third party conducted social audit and a CAP for any non-conformities carried out at one of their first tier facilities producing TCO Certified products.

The following applies:

- The Brand owner may choose the third party Audit firm.
- Third party auditors used by the Brand owner to carry-out the factory inspection and issue the report shall have documented experience of carrying out social auditing. The auditor should have undergone the SA8000 Advanced Auditor Training or an equivalent training course
- A third party is considered to be a person or body that is recognised as being independent of the parties involved, as concerns the issue in question. Parties involved are normally the Brand owner (first party) and purchaser (second party).

B.7.1.3.3 Review of the proof documents

The approved Social Reviewer will evaluate the documents according to the following principles.

- **Code of conduct:**
 - The code of conduct shall be considered consistent with the ILO:s eight Core Conventions, art 32 in UN:s Convention on the Rights of the Child, the health and safety legislation in force in the country of manufacture, and the labor law, including rules on minimum wage and the social security protection in the manufacturing country
 - The contents of the code of conduct shall have been adopted by the Board and addressed by management.
 - The code of conduct shall relate to the manufacturing of the specific product being certified.
- **Supply chain being informed of the code of conduct:**
 - Examples may be that the Brand Owner has translated the Code of Conduct into local languages. This shows that the company has made efforts so that management and employees are able to be informed about the code's content in their own language.
 - Or the company has conducted training on the Code for employees and/or management at production facilities.
 - Another common way to inform production facilities can be to have them fill out a questionnaire (self-assessment) on compliance with the code.

- **Audit report reviews:** Central to the compliance options is the review of the factory audit report conducted by a third party Social Reviewer approved by TCO Development. Audit reports sent for review shall not be older than 12 months. It shall be authentic, conducted by an auditor with the correct competence and cover the relevant manufacturing site.
- **Corrective Action Plan (CAP):** If there were findings during the factory inspection then a CAP (remedial plan plus timelines and evidences) for the findings shall be submitted for review together with the audit report. This CAP will be evaluated for effectiveness by the Social Reviewer. A judgement on the remedial effectiveness and a summary will be given in the Verification Report issued by the Social Reviewer..
- **The approved Social Reviewer:** All supporting documentation shall be reviewed by a third party approved by TCO Development. This reviewer shall not be the same person that conducted the factory audit. The reviewer has the authority to review and verify the following types of documents:
 - Code of conducts
 - Communication of the code of conduct
 - Audit reports,
 - CAPs,
 - SA8000 certificates/audits
 - Supporting documentation

After the review the Social Reviewer issues the Audit Report Verification document to the Brand owner or the applicant. It is the final responsibility of the Brand owner to submit this document to TCO Development to show that they are aware of the situation at the factory and accept the report.

A verification report issued by the approved verifier is valid for 12 months from the date of the Brand owner's first issued TCO Certified certificate covering mandate A.7.1. The verification must be updated annually. The list of approved verifier is found at: www.tcodevelopment.com

B.7.1.3.4 On-site inspection initiated by TCO Development (Spot-checks)

TCO Development reserves the right to require full audit reports and conduct or commission on-site inspections at first tier manufacturing facilities to verify that the Brand owner is fulfilling the obligations according to this mandate. The planning of social audits will be done in cooperation with the Senior Management Representative appointed by the Brand owner. Audits will be implemented by TCO Developments partner organisation for the actual geographic region. Social audits initiated by TCO Development will be realized on a judgement sample basis, in each case decided by and financed by TCO Development. Results from the audits will be shared with audited factory (both management and worker representatives) and all the brand owners listed as using the audited factory in order to create a combined effort toward implementing the CAP. For TCO Development, the spot-checks and all other submitted reports contain valuable information on social performance, making it possible to translate findings into metrics and then measure improvement through code of conduct and audit methodology.

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B.7.2 Senior Management Representative

B.7.2.1 General Clarifications

The mandate underlines the importance for the Brand owner to appoint a senior management representative who, irrespective of other responsibilities, has the authority to ensure that the requirements of this mandate are met. This aims to create an open and transparent dialogue between TCO Development and top management at the brand owner company.

B.7.2.2 SMR review

The intention of the review of the SMR is to ensure that the SMR has the necessary authority and is working in a structured way in implementing the Brand owner's code of conduct. The SMR may bring assistants to the review meeting if needed. The following questions will be asked of the SMR:

1. The SMR will be asked questions on how the communication of the Brand owner's code of conduct to first tier factories has been done. (See point 1 of the self-assessment questionnaire)
2. The SMR will be asked questions about the Brand owner's audit schedule and about some of the audits that have been done. (These reports may be first, second or third party audits).
3. The SMR will be asked to show examples of progress for some corrective action plans.
4. The SMR will be asked to fill in the self-assessment questionnaire on proactive work (point 2-19) by TCO Development (B.7.2.2.1) prior to the review and explain in more detail the Brand owner's proactive work to implement their code of conduct during the review. The SMR might be asked to show supporting documentation for this. The self-assessment questionnaire does not have to be reviewed by a verifier approved by TCO Development. It is sent directly to TCO Development prior to the SMR review.

The Questionnaire and Guidelines for the assessment are public and can be downloaded at: www.tcodevelopment.com

As long as the SMR is able to show the relevant documents and explain the Brand owner's structured work to implement their code of conduct the review is accepted. If the SMR is not able to get hold of necessary documents or if he/she cannot explain about the Brand owner's structured work to implement their code of conduct the review is not accepted.

The review may be done through an online meeting. However, it is necessary that documents can be shared (during or prior to the meeting) and that the communication quality is adequate for full understanding.

If it is not possible to set up an online meeting that fulfils the requirements above or if the review does not give an acceptable result then TCO Development has the right to require the SMR to be reviewed by a third party auditor paid by the brand owner. The report from this review is then sent to TCO Development.

TCO Development also has the right to require a face to face review of the SMR. For this type of review, TCO Development will cover their own costs.

B.7.2.2.1 Self-assessment questionnaire on proactive work

The self-assessment questionnaire is provided by TCO Development and is a set of questions covering such areas as the implementation of the Brand owner's code of conduct, auditing and follow-up of social criteria, trade union rights and representation, activities to avoid discrimination and create an open dialogue with suppliers.

The Brand owner SMR is responsible for answering all questions and providing documented proof of how it supports its suppliers in these areas. Each answer is colour graded full- (Green), partial- (Yellow) or non- (Red) compliance level.

In order to highlight the need for progressive improvement and level the commitment between different brands, the questionnaire is required to be submitted annually during the SMR review. However, the self-assessment questionnaire does not have to be reviewed by a verifier approved by TCO Development. It is sent directly to TCO Development prior to the SMR review.

There is currently no minimum level required for the proactive work reported in the questionnaire (point 2-19) in this generation of TCO Certified. The data collected in the questionnaire on proactive work will be used to risk assess Brand owners for the spot-check program. In this program TCO Development make annual third party factory audits according to the code of conduct on a number of Brand owners first tier factories. The questionnaire is also intended to measure the progress in the industry and to be used as a basis for future criteria development in this area.

The Questionnaire and Guidelines for the assessment are public and can be downloaded at: www.tcodevelopment.com

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B.7.3 Conflict minerals

B.7.3.1 General Clarifications

The mandate mainly focuses on the 3T+G minerals which are being mined within the Democratic Republic of Congo (DRC) region and used in a wide range of computer products. Once refined the origins of minerals are hard to trace, therefore we are recommending the importance of participation with legitimate in-region initiatives that directly benefit people in the conflict-affected regions. However, since the number of participants for in-region initiatives are low at this stage we also accept involvement in smelter/refinery certification programs since they complement in-region initiatives. Also we approve brands that can satisfactorily provide proof that they have adopted the *OECD Due diligence guidance*, since it provides a framework for brands to ensure that they respect human rights and do not directly or indirectly contribute to conflict.

B.7.3.2 Background information about the initiatives

TCO Development is demanding brands address the conflict mineral concerns of the private and public sector while delivering solutions that benefit those involved in the responsible minerals trade in the DRC. TCO Development considers participation in the following initiatives facilitates that goal. It is TCO Development's opinion that the OECD Due Diligence Guidance for Responsible Supply Chain of Conflict-Affected or High-risk Areas is the most ambitious approach in the list.

- *The OECD Due Diligence Guidance for Responsible Supply Chains of Minerals from Conflict-Affected and High-Risk Areas* (“the Guidance”). Brands require suppliers to disclose their sourcing origins of conflict minerals by using a questionnaire template such as the EICC ‘Conflict Minerals Reporting Template’ or similar in order to prevent the potential use of conflict minerals.
- *iTSCi* - ITRI represent tin producers and smelters. This program is a supply chain initiative to verify and trace minerals from the mine to smelter (traceability tagging). Although full membership is focused on upstream companies (Mining, Smelters etc) an Associate membership for downstream companies exists (manufacturers etc). Associate members contribute to the financing of the iTSCi program and so keep informed of initiative activities, specific mining sites whilst they support development in Africa.

For more information:

https://www.itri.co.uk/index.php?option=com_zoo&view=item&Itemid=191

- *Conflict-free Tin Initiative* (CFTI); sources conflict-free tin from the South Kivu province of DRC that implements the ITRI Tin Supply Chain Initiative (iTSCi) the due diligence and traceability system
- *The Public-Private Alliance for Responsible Minerals Trade* (PPA) is a multi-sector and multi-stakeholder initiative that provides funding and support to systems that trace and certify mineral supply chains in the DRC and Great Lakes Region. <http://www.resolve.org/site-ppa/>

- Other relevant in-region initiative. Initiatives not given in the list but prove active commitment to an initiative that aims at increasing legitimately sourced minerals.

Examples of other relevant initiatives that are approved:

- *Solutions for Hope* (SfH); sources conflict-free tantalum from the Katanga province of DRC (incorporates the iTSCi process and CFS program).
 - *The Certified Trading Chains* initiative (CTC) is a program supported by the German government and certifies mines to defined performance standards
- Member of the EICC & GeSi *Conflict-Free Sourcing Initiative* (CFSI). Members contribute to a number of tools and resources including the Conflict Minerals Reporting Template; supporting in-region sourcing schemes and the Conflict Free Smelter Program (identification of Smelters and Refiners that source conflict-free minerals).

B.7.3.3 The verification process

At least one of the options in the mandate box shall be marked. Every initiative the Brand is a participant in shall be provided. The following shall occur before the verifier may issue a verification of compliance.

- The template shall be completed by the responsible person at the brand owner company.
- The brand shall complete the TCO Certified Conflict Mineral Questionnaire and submit it and any required supporting documents for review. The verifier then assesses compliance and issues the verification report.

Supporting documents

- If the brand has a management system covering conflict minerals within its supply chain which it states are based on the OECD Due Diligence guidelines, then a supporting document that outlines those due diligence measures shall be submitted. Example of proof are:
 - Due Diligence Roadmap, Sustainability report or Conflict Mineral Report asserting the OECD five step framework.
 - Link to where information/findings are posted on the brand's website.
- The brand shall provide a copy of its conflict mineral policy and state where the information is made public.
- If the brand is part of an in-region initiative or the EICC CFSI, then supporting documents or links to relevant websites shall be provided to the approved verifier in order for them to verify participation.
- If the brand marks the option 'Other relevant initiative', then the name of the initiative shall be entered into the template and information on the initiative (or website) shall be submitted to the verifier and they will contact TCO Development in order to make a joint assessment before it can be accepted as an option. Although unlikely, any additional review fee entailed for an extra assessment will be charged to the applicant, after receiving the applicant's consent.
- When the application is satisfactory, the verifier notes on the verification report the fulfilled options and the type of supporting documentation.

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