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TCO Certified Headsets 2.0

April 7th 2011

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A.0 Introduction

TCO Certified Headset 2.0 is the second version of the TCO certification document for headsets. The first TCO Certification document for headsets was launched 2007 with the purpose to improve working conditions and increase the comfort for people that spend a substantial part of their working time on the phone. Due to the technical development and changes in the environmental legislation TCO Development now launches; TCO Certified Headsets 2.0 which is up to date with technical development and latest legislation. The following requirements are new, changed or updated:

- A level for determining acceptable sound quality for analogue headsets. For digital headsets (DSP based) we have been unable to find a satisfying method but as soon as an objective and standardized measurement method is available TCO Development will include this in the certification document for headsets.
- Durability test of head, ear and microphone attachments shall be performed and assured by the manufacturers.
- Electrical safety requirement is introduced.
- CSR requirement is introduced.
- Hazardous substances in packaging material are introduced.
- Energy consumption level shall now follow The International Efficiency Marking Protocol.
- Warranty for at least two years and availability of spare parts for three years.
- Take back system is revised and include packaging as well.

Stockholm April 7th 2011.

TCO Development

Sören Enholm
Managing Director

Annika Overödder
Business Area Manager,
Product Development

A.0.1 Definitions

A.0.1.1 Definition of headsets

Background

The requirements in this document include 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 and thus leaves both hands free while communicating.

A.1.1 TCO Document

Background

It is desirable that the purchaser of a product that has been certified in accordance with *TCO Certified Headsets 2.0* receives information concerning the quality, the 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

References

The contract between TCO Development and the applicant company.

Mandate:

A TCO Document written in English shall accompany the product, describing why these particular requirements have been chosen for the products within the program of this standard and what is expected to be achieved by them. The document may be provided as an electronic file. The text can be obtained from TCO Development.

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

- A separate printed document.
- As an electronic file or printed on other printed materials.
- At the manufacturers web site, together with information about the product. A reference to the web site shall accompany the product.

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

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

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

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

We hereby guarantee that the above mandate is fulfilled.

.....
Product brand name and model/type

.....
Signature

.....
Name and title in block capitals

.....
Date

.....
Company

A.2 Ergonomics

There is a steadily increasing use of headsets as tools in a large range of IT based workplaces, as well as in mobile work environments and in home offices. The rapid pace of technical development makes it possible for the users to work when and where, according to how work is organised. The market offers a wide variety of headsets, corded or cordless, for different purposes. Headsets are often used during long periods of time, for many different work tasks and by users with a variety of personal needs.

International research results from those working environments focus clearly on the importance of high ergonomic qualities, such as noise reduction and individual adjustment and adaptation. The quality of sound is extremely important for communication so that the various shades of the human voice are grasped. It is of high value to be able to select different types of headsets for different needs and work tasks, including accessories and spare parts.

These are ergonomic usability factors which, together with user advice, good personal training and usage, will promote the possibilities of high usability for professionals when using headsets.

A.2.1 Acoustic

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 regarding 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 affect the listener negatively by being uncomfortably loud and by representing 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 are experienced as unpleasant and stress-inducing. Acoustic limit protection is one of the most accentuated requirements from users of headsets.

Applicability

All headsets.

Test procedure

See B.2.1.1

References

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

Mandate:

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 information shall be submitted

Pictures of the headset mounted on the HATS from front, back and each side.

Specify if the headset is a monaural or binaural headset.

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

We hereby guarantee that the above mandatory requirement is fulfilled and the appended information is correct.

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Signature

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Name and title in block capitals

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Date

.....
Company

A.2.1.2 Sound quality test

Background

To be able to set future requirements on the sound quality of the headset TCO Development collects information of the acoustic output, received distortion, test involving measurements of the harmonic distortion.

Applicability

All analogue headsets.

Test procedure

See B.2.1.2

References

1, 2, 6, 7 and 8.

Mandate:

For analogue headsets:

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 (Analogue products only)

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

For digital headsets, DSP based:

TCO Development will introduce an objective and standardized measurement method as soon as it is available for digital headsets (DSP based).

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

We hereby guarantee that the above mandatory requirement is fulfilled and the appended information is correct.

.....
Signature

.....
Name and title in block capitals

.....
Date

.....
Company

A.2.1.3 Volume control

Background

Communication with headsets as working tools requires as high individual adaptability as possible. Volume control (for cordless headsets) of high quality is referred to as very important.

Applicability

All Cordless headsets.

References

3, 6 and 9.

Mandate:

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.

The following information shall be submitted:

A signed declaration, to confirm that the above requirement has been met. This declaration shall be signed by the person responsible at the applicant company.

We hereby guarantee that the above mandatory requirement is fulfilled.

.....
Signature

.....
Name and title in block capitals

.....
Date

.....
Company

A.2.1.4 Individual adjustment and adaptation

Background

Using headsets for a long time during the work day has pointed out the need of high usability in the respect of personal adjustability and adaptability of the devices. They are expected to have a minimum of weight, to be easy to use and adapt, (tactile feedback), also to be discrete and portable for different purposes. They are also expected to support many different applications and devices. The headband shall be adjustable in length over the head and in the width between the ears to meet the human differences in head size.

Applicability

All headsets.

References

10 and 11

Mandate:

1. For headsets with headband, the headband shall be adjustable in length. The length of the headband shall be able to adjust within a range of 3-10 cm.
2. For monaural headsets, it shall be possible for the user to choose either left or right ear for listening.

The following information shall be submitted:

A signed declaration to confirm that the above requirements have been met. This declaration shall be signed by the person responsible at the applicant company.

We hereby guarantee that the above mandatory requirements are fulfilled.

.....
Signature

.....
Name and title in block capitals

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Date

.....
Company

A.2.1.5 Replaceable parts

Background

Headsets are used in many different work situations and for a long period, therefore parts could be worn out or should be changed regularly due to 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 .

The following information shall be submitted:

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

We hereby guarantee that the above mandatory requirements are fulfilled.

.....
Signature

.....
Name and title in block capitals

.....
Date

.....
Company

A.2.2 Quality durability

A.2.2.1 Cable pull and flexing

Background

Headsets used by professionals should be of high quality. Therefore a pull and flexing testing of the cable is made to ensure that it withstand normal usage without breaking.

Applicability

All corded headsets

References

12

Mandate:

The cable shall meet the requirement according to IEC 60320 clause 22.4 using a weight of 200 g or equivalent standards. If other standards are chosen an explanation of the test method together with an assurance that the cable will last 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 laboratory.

The following information shall be submitted:

A copy of a test report from optional laboratory. A signed declaration, to confirm that the above requirement has been met. This declaration shall be signed by the person responsible at the applicant company.

We hereby guarantee that the above mandatory requirements are fulfilled.

.....
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, I e headband, neckband, ear hook etc or other with same purpose shall be durable and constructed to ensure that it withstand normal usage without breaking during the expected life time of the headset.

Applicability

All headsets

References

Mandate:

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 laboratory.

The following information shall be submitted:

A copy of a test report from optional laboratory.

A signed declaration, to confirm that the above requirement has been met. This declaration shall be signed by the person responsible at the applicant company.

We hereby guarantee that the above mandatory requirements are fulfilled.

.....
Signature

.....
Name and title in block capitals

.....
Date

.....
Company

A.2.2.3 Microphone attachment flex test

Background

Headsets used by professionals 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

References

Mandate:

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 laboratory.

The following information shall be submitted:

A copy of a test report from optional laboratory. A signed declaration, to confirm that the above requirement has been met. This declaration shall be signed by the person responsible at the applicant company.

We hereby guarantee that the above mandatory requirements are fulfilled.

.....
Signature

.....
Name and title in block capitals

.....
Date

.....
Company

A.4 Emissions

Emitted Electric and Magnetic Fields in the Work Environment

The number of electrical equipment in our work places is increasing with a concomitant increase in the presence of electrical and magnetic fields. Users of IT equipment now have several nearby field sources placed in their work environment that are constantly in use. The degree of exposure of users working with this equipment is increasing as well as the permanent proximity of the body to certain field sources from IT equipment.

When the first TCO label was introduced in 1992 one of the main interests was the requirement for limiting electrical and magnetic fields. Scientists and experts still disagree over the question of whether or not they can cause any harm to humans at intensities below legal limits. TCO Development has therefore included requirements on electrical and magnetic fields for the charging stations with built in AC/DC power supplies. Requirements and test methods are basically the same as those used for other TCO-labels such as displays, computers and printers.

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

Cordless headsets based on Bluetooth class 2 with a maximum output power of 2.5 mW, ensures low radiation levels. For cordless headsets based on other wireless communication standards the SAR-level shall not exceed 0.04 W/kg.

A.4.1 Alternating electrical fields

Background

Alternating electrical fields are created between objects that have different levels of electrical potential which change over time. When the potential changes in a periodic manner, an electrical alternating field is set up, with a specific field strength and frequency. A charging station with built in AC/DC power supplies contains many sources of alternating electrical fields. The field characteristics depend on the actual electrical potential difference and the distance from the charging station with built in AC/DC power supplies.

The mandatory requirements are based on the ambition to reduce the alternating electrical fields to such a low level as not to burden the work environment with unnecessary factors. The mandatory requirements shall not be regarded as hygienic limit values.

Applicability

All headsets' charging stations with built in AC/DC power supplies

Test procedure

See B.4.1.

Mandate:

Band I: 5 Hz to 2 kHz, ≤ 10 V/m, measured at 50 cm in front of the charging station.

Band II: 2 kHz to 400 kHz, ≤ 1.0 V/m measured at 50 cm around the charging station.

The following information shall be submitted:

For charging stations with built in AC/DC power supplies, a copy of a test report from a test laboratory accepted by TCO Development.

For charging station with an AC/DC power supply designed to be put directly in the outlet, a written guarantee describing the design signed by the responsible person at the applicant company.

We hereby guarantee that the above mandatory requirements are fulfilled.

.....
Signature

.....
Name and title in block capitals

.....
Date

.....
Company

A.4.2 Alternating magnetic fields

Background

Alternating magnetic fields are created when an alternating electrical current flows through a conductor. Like other electrical equipment, charging station with built in AC/DC power supplies are surrounded by alternating magnetic fields. The field strength depends on the actual electric current and on the distance from the charging station with built in AC/DC power supplies.

The mandatory requirements are based on the ambition to reduce the alternating magnetic fields to such a low level as not to burden the work environment with unnecessary factors. The mandatory requirements shall not be regarded as hygienic limit values.

Applicability

All headsets' charging stations with built in AC/DC power supplies

Test procedure

See B.4.2.

Mandate:

Band I: 5 Hz to 2 kHz, \leq 200 nT, measured at 50 cm around the charging station with built in AC/DC power supplies.

Band II: 2 kHz to 400 kHz, \leq 25 nT measured at 50 cm around the charging station with built in AC/DC power supplies.

The following information shall be submitted:

For charging stations with built in AC/DC power supplies, a copy of a test report from a test laboratory accepted by TCO Development.

For charging station with an AC/DC power supply designed to be put directly in the outlet, a written guarantee describing the design signed by the responsible person at the applicant company.

We hereby guarantee that the above mandatory requirements are fulfilled.

.....
Signature

.....
Name and title in block capitals

.....
Date

.....
Company

A.4.3 SAR measurements

Background

SAR measurements are the only internationally accepted and utilised method for measuring the absorbed radiation 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 the ambition to further reduce the radiation energy taken up by the user and has therefore chosen a SAR value for a wireless headset of maximum 0.04 W/kg. The mandatory requirements shall not be regarded as hygienic limit values.

Applicability

All cordless headsets.

References

13 and 14.

Mandate:

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

The following information shall be submitted:

A copy of a test report² from a test laboratory accredited for EN 62209-1 by an EA (European co-operation for Accreditation) recognised accreditation body.

¹ 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.

² further information as regards test positions for the SAR tests will be specified in the guideline document issued by TCO

We hereby guarantee that the above mandatory requirement is fulfilled and the appended information is correct.

.....
Signature	Name and title in block capitals

.....
Date	Company

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.

References

15, 16 and 17.

Mandate:

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

The following information shall be submitted:

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

A.6 Environmental requirements

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

The Environmental requirements are divided into the following sections:

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

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

All requirements except section *A.6.3 Climate* shall be verified by an eco-verifier at a test laboratory approved by TCO Development. The energy consumption requirements in section A.6.3 shall be tested at a test laboratory approved by TCO Development.

A.6.1 Product description

Background

The aim of this front page is to provide a brief description of the product that is to be reviewed for compliance with the ecological requirements of Section A.6.

Applicability

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

Mandate:

A product declaration (see below) shall be provided.

The following information shall be submitted to an approved eco-verifier:

The following table, completed where applicable. The information submitted shall be signed by the responsible person at the applicant company.

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

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

Headset	
Manufacturer	
Brand name	
Type/Model name	

Battery	
Manufacturer	
Type/Model name	
Brand name	
Technology	

Charger/Converter	
Manufacturer	
Brand name	
Type/Model name	

We hereby guarantee that the above mandate is fulfilled.

.....
Signature

.....
Name and title in block capitals

.....
Date

.....
Company

A.6.2 Organisation

A.6.2.1 Environmental management system certification

Background

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

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).

Definition

Manufacturing plant is the site of the final assembly of the product.

References

19 and 20

Mandate:

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

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

The following information shall be submitted to an approved eco-verifier:

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

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

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

We hereby guarantee that the above mandate is fulfilled.

.....
Product brand name and model name

.....
Signature

.....
Name and title in block capitals

2011-04-07

Date

Company

A.6.2.2 Social Responsibility

Background

Expectations for social and environmental performance are increasing from customers and organisations. An important step towards a sustainable business is control of the effects the business has on both the natural environment and the workforce, throughout the supply chain. TCO Development is therefore introducing a requirement aimed at the situation in the production facilities. TCO Development is accepting several ways of demonstrating commitment to corporate social responsibility.

Definitions

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

Applicability

The *Brand owner*.

Clarification

B.6.2.2

References

20, 21, 22 and 23.

Mandate:

The *brand owner* shall demonstrate that it has working practices that promote good labour relations and working conditions in the production phase.

This can be validated by any one of the following:

- 1) The *brand owner* submits a report according to the GRI Sustainability Reporting Guidelines, G3 level C or higher. The report shall be a maximum of one year old at the time of application.
- 2) The *brand owner* submits a Communication on Progress (COP) report demonstrating active participation in the Global Compact initiative. The report shall be a maximum of one year old at the time of application.
- 3) The *brand owner* is a member of the Electronic Industry Citizenship Coalition.
- 4) The *brand owner* is SA8000 certified or is carrying out the production in SA8000 certified factories.
- 5) The *brand owner* is a member of other relevant initiative(s) proving commitment to social responsibility or is in any other way implementing working practices that promote good labour relations and working conditions in the production phase that correspond with internationally recognised human rights and the laws in the country of production.

If the *brand owner* is not able to meet the requirement according to the alternatives above, the *brand owner* is given a 12- month grace period to obtain this.

The following information shall be submitted to an approved eco-verifier:

- 1. Copy of the report/certificate/membership according to the above mandate. When not yet available, an estimated date when the report/certificate/membership will be available.
- 2. Information on which of option 1-5 above is fulfilled and date of report (in list below).
- 3. A written guarantee that the above mandate is fulfilled. The guarantee shall be signed by the responsible person at the applicant company.

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

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

- Option (to be verified):
- 1. GRI Sustainability Reporting Guidelines
 - 2. Global Compact: Communication on Progress report
 - 3. Member of the Electronic Industry Citizenship Coalition
 - 4. SA8000 certified
 - 5. Own work

Date of report/verification documents sent in:.....

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.6.3 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 headsets charger the chargers should follow the International Efficiency Marking Protocol for External Power Supplies

Applicability

All cordless headsets and the supplied charging station.

Test procedure

B.6.3.1.

References

24, 25, 26 and 27

Mandate:

Until April 30th 2012 The external power supply shall meet at least the International Efficiency Protocol requirement for level IV.

From May 1st 2012 The external power supply shall meet at least the International Efficiency Protocol requirement for level V.

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

A copy of the marking plate on the EPS.

We hereby guarantee that the above mandatory requirements are fulfilled.

.....
Signature

.....
Name and title in block capitals

.....
Date

.....
Company

A.6.4 Environmentally hazardous substances

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

Background

The effects of the listed substances are well documented as environmental hazardous substances. EU regulated these substances in the RoHS directive (2002/95/EC).

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.6.4.1

References

28 and 29

Mandate:

The product shall not contain mercury, cadmium, lead and hexavalent chromium. The requirement applies to components, parts, and raw materials in all assemblies and sub-assemblies of the product e.g. paint, surface treatment, plastics and electronic components. Limit values and exemptions are according to EU Directives 2002/95/EC and 2006/66/EC.

The following information shall be submitted to an approved eco-verifier:

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

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

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

We hereby guarantee that the above mandate is fulfilled.

.....
Product brand name and model name

.....
Signature

.....
Name and title in block capitals

.....
Date

.....
Company

A.6.4.2 Halogenated substances

Background

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

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

Definitions

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

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

Applicability

All 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:

1. Plastic parts weighing over 10 grams shall not contain flame retardants or plasticizers that contain organically bound bromine or chlorine. The requirement applies to plastic parts in all assemblies and sub-assemblies. Exempted are *printed wiring board laminates*, electronic components and all kinds of cable insulation.

2. The headset shall not contain PBB and PBDE. The requirements apply to components, parts and raw materials in all assemblies and sub-assemblies of the product e.g. batteries, paint, surface treatment, plastics and electronic components.

Limit values and exemptions are according to EU Directive 2002/95/EC.

The following information shall be submitted to an approved eco-verifier:

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

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

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

We hereby guarantee that the above mandate is fulfilled.

.....
Product brand name and model name

.....
Signature

.....
Name and title in block capitals

.....
Date

.....
Company

A.6.4.3 Non-halogenated substances

Background

Recently it has been common practice to replace hazardous substances with new substances with unknown effects. This is one important focus of the new European chemical legislation, REACH. This mandate focuses on ensuring that the phase out of halogenated flame retardants doesn't risk a shift towards substances with unknown effects.

Definitions

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

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

Applicability

All 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

References

31 and 32.

Mandate:

Flame retardants used in plastic parts weighing more than 10 grams shall not have been assigned one or more of the following risk phrases at the time of application (according to EU Directive 67/548/EEC (/EU Regulation 1272/2008)):

R40(/H351) (limited evidence of a carcinogenic effect)

R45(/H350) (may cause cancer)

R46(/H340) (may cause heritable genetic damage)

R48(/H372) (danger of serious damage to health by prolonged exposure)

R50/53(/H400 and H410) (very toxic to aquatic organisms / may cause long-term adverse effects in the aquatic environment)

R60(/H360F) (may impair fertility)

R61(/H360D) (may cause harm to the unborn child)

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

The following information shall be submitted to an approved eco-verifier:

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

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

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

We hereby guarantee that the above mandate is fulfilled.

.....
Product brand name and model name

.....
Signature

.....
Name and title in block capitals

.....
Date

.....
Company

A.6.4.4 Plastics with chlorine and bromine as part of the polymer

Background

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

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

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:
Plastic parts that weigh more than 10 grams shall not contain chlorine or bromine as a part of the polymer.
Laminates for printed wiring boards, PWBs and all kinds of cable insulation are exempted.

The following information shall be submitted to an approved eco-verifier:
A written guarantee that the above mandate is fulfilled. The guarantee shall be signed by the responsible person at the applicant company.

The following information shall be submitted with the application to TCO Development:
A copy of a verification report from an eco-verifier approved by TCO Development.

We hereby guarantee that the above mandate is fulfilled

.....
Signature

.....
Name and title in block capitals

.....
Date

.....
Company

A.6.4.5 Information regarding flame retarding agents

Background

The spread of synthetic chemical substances in various products is a global and very widespread environmental problem. Knowledge in respect of the different health and environmental characteristics of these substances is very limited. In order to be able to apply the correct type of measures, good basic information is required.

Applicability

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

References

30 and 34

Mandate:
 The material specifications shall be provided for plastic parts and PWB laminates that weigh more than 10 grams and which have flame retardant concentrations above 0.5 percent by weight.

The following information shall be submitted to an approved eco-verifier:

1. The table below shall be completed and the guarantee signed by the responsible person at the applicant company.
2. Manufacturers of plastic materials who consider such information confidential may submit the information to an eco-verifier approved by TCO Development.

The following information shall be submitted with the application to TCO Development:
 A copy of a verification report from an eco-verifier approved by TCO Development.

Plastic part name	Weight in grams	Type of plastic	Plastic brand name	Plastic model name	Flame retardant type	Flame retardant CAS #	Plastic label code

We hereby guarantee that the above mandate is fulfilled

.....
 Signature

.....
 Name and title in block capitals

2011-04-07

.....
Date

.....
Company

A.6.5 Product lifetime

A.6.5.1 Warranty and spare parts

Background

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

Definitions

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

Applicability

All headsets

Clarification

B.6.5.1

Mandate:

The *brand owner* shall provide a product warranty for a period of at least two (2) years.

The *brand owner* shall guarantee the availability of user replaceable spare parts (specified in A.2.1.5) for at least three years from the time that production ceases.

The following information shall be submitted to an approved eco-verifier:

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

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

A copy of a verification report from an eco-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 Preparation for Recycling

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 producer must be financially responsible for managing its own brand products at end-of-life. Currently much electronic waste is being exported to developing countries where it is managed unsustainably and disproportionately burdens developing countries with this global environmental burden. The Basel Convention and its decisions govern the export of many types of electronic waste. However not all countries have properly implemented these decisions. With this mandate TCO Development aims to put more influence into spreading better electronic waste management practice to more countries.

Definition

Brand owner 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).

Clarification

B.6.6.1

References

35

Mandate:

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 on markets where this is legislated. If the product is sold on markets where electronics take back regulation is not in practice at the date of application, the brand owner shall provide the customer with information on where the product can be recycled using environmentally acceptable recycling methods on this market.

The following information shall be submitted to an approved eco-verifier:

The information stated 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 an eco-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. Product is sold on additional markets. Brand owner submits to an eco-verifier an example of how customers are informed on where to leave the product for environmentally acceptable recycling methods at the end-of-life of the product.

We hereby guarantee that the above mandate is fulfilled.

.....
Product brand name

.....
Model name(s) or "All products"

.....
Signature

.....
Name and title in block capitals

.....
Date (Declaration valid 1 year from date)

.....
Brand Owner Company

A.6.7.2 Preparation for recycling of product packaging material

Background

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

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

Applicability

All packaging material.

Definition

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

Mandate:

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 eco-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 an eco-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 GHz).
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. Global Reporting Initiative (GRI), www.globalreporting.org
21. United Nations Global Compact (UNGC), <http://www.unglobalcompact.org/>
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 2002/95/EC 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.

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.1 General test conditions

B.1.1 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 laboratory 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.1.2 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.1.3 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.1.4 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 laboratory. Any necessary instrument calibration shall be done before the tests are performed.

B.1.5 Setting of the headset

A cordless headset should be fully charged.

B.1.6 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 CLASS I or CLASS III shall be stated in the test report.
- The degree of uncertainty for each given measurement result shall be stated in the test report.

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 laboratory. 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 Laboratory 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.

B.2.1.2 Sound quality test

B.2.1.2.0 Test Laboratory 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 analyzer.
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:
 - Digital narrowband products shall be tested in the frequency range 500 to 3150 Hz.
 - Digital narrowband products shall also be tested in the frequency range 3400 Hz to 6800 Hz by applying third octave frequencies and evaluating the sum of absolute levels of any resulting frequency components produced in the speech band 200 to 3150 Hz
 - (Note – This enables spurious products generated by aliasing to be taken into account)
 - Digital wideband products shall be tested in the frequency range 500 Hz to 6800 Hz.
 - Analogue products shall be tested in the frequency range 500 Hz to 8000 Hz.
5. Define the input test level per product category:
 - For digital products the input test level (Level 1) shall be defined as the input level required to produce +5dBPa output for the test frequency 1 kHz. This input level shall be used to evaluate the distortion for all frequencies.

- 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 mandate in accordance with clause A.2.1.2. is the following:

For analogue headsets:

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 (Analogue products only)
- 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.

B.4 Emission

B.4.0 General test conditions for emissions

B.4.0.1 Basic test requirements

In this section the EUT (Equipment Under Test) is a charging station, belonging to a cordless headset, with built in AC/DC power supply.

As described in section B.1.

For the test methods for emissions described in this document the following conditions apply:

- AC mains voltage* 230 VAC RMS, tolerance $\leq 1\%$
- AC mains frequency* 50 Hz, tolerance $\leq 2\%$

The EUT shall be connected to phase and neutral.

* – or other voltage and frequency combination specified by the client.

B.4.0.2 Conditions and set up for the test object

The EUT shall be connected to mains via a mains cord. The measurement shall be performed with the EUT being connected to mains via a non-shielded mains cord of normal type, (connected to earth for a CLASS I device).

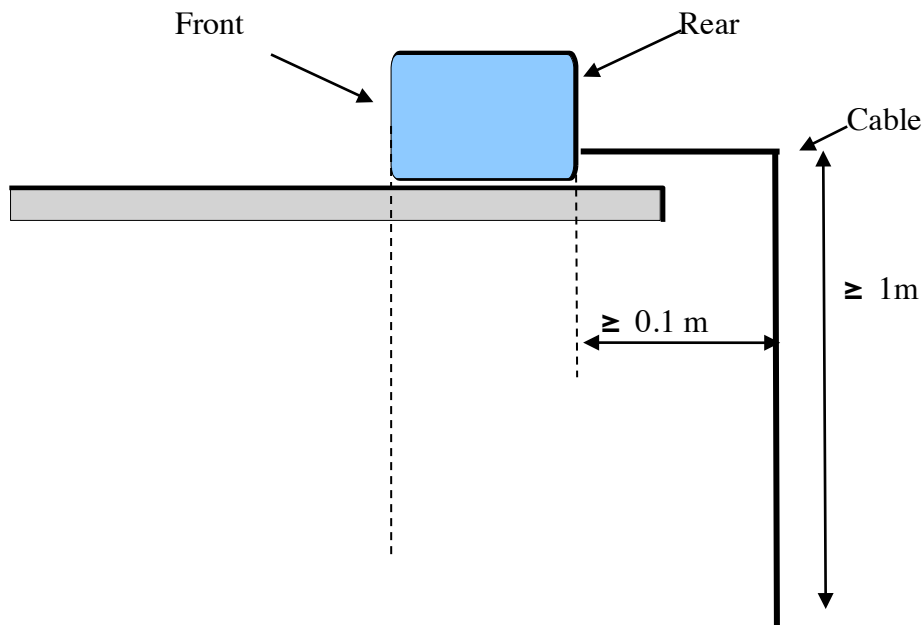


Figure B.4.0.1 EUT with built in external power supply, side view.

B.4.0.3 Emission measurement instruments

The instruments used for emission testing shall comply with the requirements and calibration procedures described below:

Alternating electric field meter

The alternating electrical field emission from the EUT under test shall be determined by measuring the displacement current passing a given surface of the measuring probe. The probe consists of a disc of double sided printed circuit board laminate with a diameter of 300 mm. On the front of the board the copper layer is removed in the annulus between radii 50 and 52 mm, see Figure B.4.0.3.1.

The copper foil surrounded by the annulus is the active measuring surface. It is connected to one input terminal of an operational amplifier, with capacitive feedback. The other input terminal of the operational amplifier, the copper ring outside the active surface, and the back of the board are connected to ground. The output voltage (U) from the probe (active surface with area (A)) is related to the incident electrical field, E, averaged over the active surface in accordance with $U = \varepsilon \cdot E \cdot A/C$ where C is the capacitance in the feedback loop of the operational amplifier and ε is the permittivity for a vacuum.

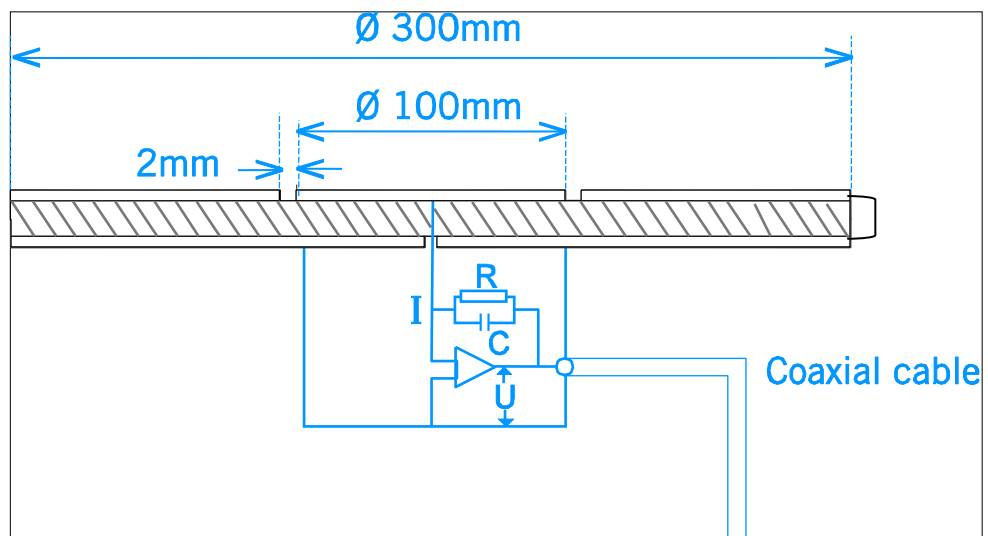


Figure B.4.0.3.1 Sketch and circuit principle of the Alternating electric field meter for alternating electrical field measurements. The feedback circuit of the operational amplifier is a capacitance C in parallel with a high value resistor R to ensure that there is no DC voltage across the plates of the capacitor C.

The specifications for the frequency response of the alternating electric field meter are given by the calibration procedure. The signals from the probe shall be filtered by high-pass and low-pass filters. The specification of the filters is given in Table B.4.0.3.1.

Table B.4.0.3.1 Filter specifications

Frequency Band I					
Frequency	< 5 Hz	5 Hz	100 Hz	2 kHz	> 2 kHz
Attenuation	> 80 dB/decade	3 dB	0 dB	3 dB	> 40 dB/decade

Frequency Band II					
Frequency	< 2 Hz	2 Hz	30 kHz	400 kHz	> 400 kHz
Attenuation	> 80 dB/decade	3 dB	0 dB	3 dB	> 40 dB/decade

After amplification and filtering the output voltage of the measuring probe shall be used to determine the r.m.s. value of the electric field strength in both frequency bands.

The measuring time shall be sufficiently long to enable measurements with an accuracy of $\pm 5\%$ at 50/60 Hz.

The measuring system shall be capable of measuring at least down to 2.0 V/m in Band I and down to 0.20 V/m in Band II.

The measuring probe shall be calibrated using a parallel plate capacitor (air dielectric) consisting of the measuring probe and a metal plate of at least 300 mm diameter. The distance between the surface of the probe and the plate shall be 30 mm.

The calibration shall be performed with sinusoidal fields at the amplitudes and frequencies specified in Table B.4.0.3.2.

Table B.4.0.3.2 Calibration frequencies and amplitudes

	Frequencies	Amplitude
Band I	50, 100, 500, 1000 Hz	10, 25 V/m
Band II	15, 30, 60, 120 kHz	1.0, 2.5, 10 V/m

Recorded values at these calibration points shall be within $\pm 5\%$ of the nominal value. Due to the nature of the specified filters the deviation shall be calculated at 1 kHz from 9.5 and 22.5 V/m and at 120 kHz from 0.95, 2.4 and 9.5 V/m.

Alternating magnetic field meter in Band I and Band II

The magnetic field shall be measured with two coil systems, one covering Band I and the other Band II. Each coil system shall consist of three mutually perpendicular concentric circular coils each with an area of 0.01 m². The coils may depart from a circular shape where they intersect. The minimum inner diameter shall be 110 mm and the maximum outer diameter 116 mm. The measuring coils shall not be sensitive to electric fields.

The resonance frequency of each coil appropriately connected to cables and amplifiers shall be greater than 12 kHz for Band I and greater than 2.5 MHz for Band II. The resonances shall be suppressed by resistive loading of each coil. Amplifiers and integrating networks to make the output voltage proportional to

the magnetic flux density and independent of frequency shall follow each coil. The specifications in respect of the frequency response are given in the calibration procedure.

High-pass and low-pass filters shall filter the signals from the coil systems. The specifications of the filters are given in Table B.4.0.3.1.

After amplification, integration and filtering, the signals from the three coils in each coil set shall be used as input values for calculating the r.m.s. values of the amplitudes of the magnetic flux density vectors in both frequency bands. It is permissible to calculate the r.m.s. value for each of the coil signals and use the root of the squared sum of those r.m.s. values as the test result.

The measuring time shall be sufficiently long, until the measurement results a stable, to enable measurement with an accuracy of $\pm 5\%$ at 50/60 Hz.

The alternating magnetic field meter in Band I and Band II shall be capable of measuring down to at least 40 nT in Band I and down to 5.0 nT in Band II.

The alternating magnetic field meter in Band I and Band II shall be calibrated using a Helmholtz-type calibration coil as shown in the Figure B.4.0.3.2.

Calibration set-up.

Calibration shall be performed with sinusoidal fields at the amplitudes and frequencies specified in Table B.4.0.3.3.

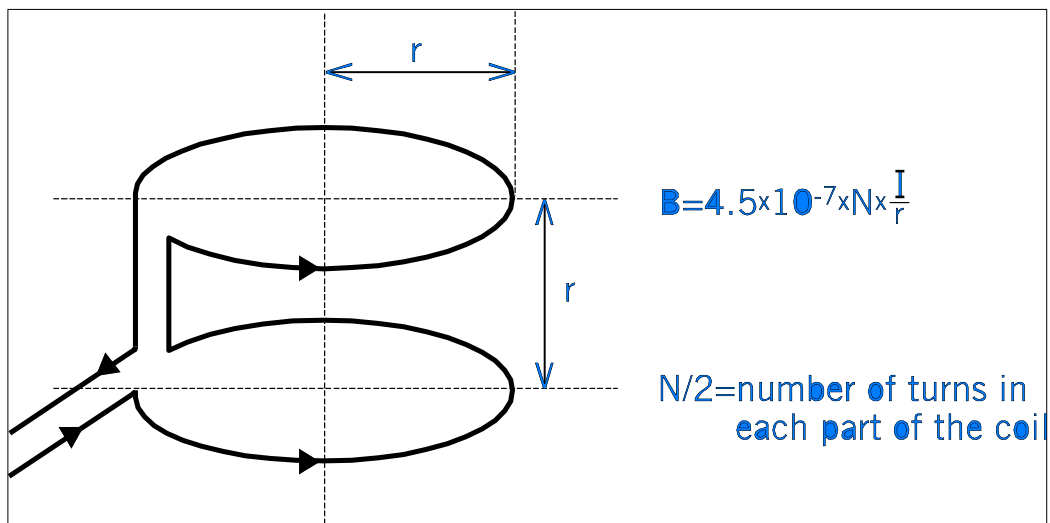


Figure B.4.0.3.2. Calibration using a Helmholtz-type calibration coil.

Table B.4.0.3.3 Calibration frequencies and amplitudes

	Frequencies	Amplitudes
Band I	60, 100, 500, 1000 Hz	200, 2000 nT
Band II	15, 30, 60, 120 kHz	25, 250 nT

Recorded values for these calibrations shall not deviate more than $\pm 5\%$ from the nominal value. Due to the nature of the specified filters the deviation at 1 kHz shall be calculated from 180 nT and 1800 nT and at 120 kHz from 24 nT and 240 nT.

The calibration shall be performed for each of the three individual coils separately exposed and for one situation where approximately the same flux density passes through all three coils.

B.4.1 Alternating electrical fields

B.4.1.0 Test laboratory requirements

Background electric field strengths in the test laboratory, including disturbances transmitted by power lines and internally generated noise in the measuring system, shall together not exceed 2.0 V/m in Band I and 0.20 V/m in Band II.

The mains voltage to the EUT under test shall be within ± 3 % of its nominal value.

B.4.1.1 Preparation of the EUT for testing

All necessary preparations described in B.1 and B.4.0 shall be done.

B.4.1.2 Equipment

Alternating electric field meter

B.4.1.3 Test Method

The EUT shall be set up in accordance with clause B.4.0.1.

The true r.m.s. value of the amplitude of the electric field strength, at the surface of the measuring probe, is measured in front of the test object in Band I and in four azimuths in Band II. The frequency ranges are selected by means of filters in the measuring equipment.

The EUT shall be positioned such that the tangential plane, to the centre-centre point of the EUT, is at a right angle to the horizontal plane. The distance between the centre-centre points of the EUT and the back of the EUT, including, where used, any part of a stand holder, along the normal to this tangential plane is called L , see Figure B.34.1.3.1.

The origin of the cylindrical co-ordinate system is chosen to be situated at a distance $L/2$ behind the front of the EUT on the normal to the tangential plane through the centre-centre point. The z -axis is chosen to be at a right angle to the horizontal plane. The angular reference direction is along the above mentioned normal in the direction pointing outwards from the front. An angle ($'$) is positive in the counter-clockwise direction.

Measurements shall be made at all points which have a minimum clearance of 0.25 m to the outer surface of the EUT and with co-ordinates according to:

$$z = 0$$

$$r = (L/2 + 0.5) \text{ m}$$

$$' = 0^\circ \text{ for Band I}$$

$$' = 0^\circ, 90^\circ, 180^\circ \text{ and } 270^\circ \text{ for Band II}$$

In case of less than 0.25 m clearance the instrument shall be moved out radially until 0.25 m clearance is achieved.

Distances are given in meters and angles in degrees. The co-ordinates are given for the centre of the measuring probe. The surface of the probe shall be perpendicular, within $\pm 5^\circ$, to the radial axis.

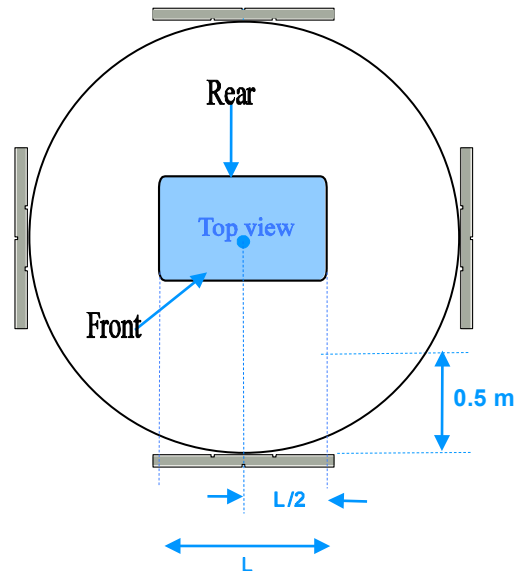


Figure B.4.1.3.1. Measurement geometry for both Band I and Band II for the EUT.

The EUT and the measuring probe shall be positioned at least 1 m away from all significant metallic structures and objects.

Additional units and connecting cables necessary for the operation of the EUT, which are not part of the test, shall be placed so far away from the measuring setup that the fields they emit do not influence the measurement. Shielding may be added to these units and cables, as long as the 1 m clearance is maintained.

The measuring probe shall be connected to ground. Any cables that may run between the measuring probe and the measuring instrument shall be positioned in such a way that they do not influence the measured value.

The power cable of the EUT shall be connected to the phase and the neutral conductors of the mains power supply. If the mains power supply plug permits an interchange of the live and neutral conductors, measurements shall be taken with the connection that gives the highest reading in Band I.

B.4.1.4 Test evaluation

Results shall be presented as r.m.s. values of the alternating electric field expressed in volt per meter (V/m). For Band I, results shall be presented as the measured values at 50 cm in front of the EUT for normal and stand-by operations if they differ. For Band II, the measured values in front of the EUT and the maximum value at rotation shall be presented for normal and stand-by operations if they differ.

If the measured values are less than 10.0 V/m in Band I or less than 1.0 V/m in Band II the result shall be reported as “<_10.0 V/m” or “<_1.0 V/m”, respectively.

(The mandate in accordance with clause A.4.1 is as follows:

Band I: 5 Hz to 2 kHz, ≤ 10 V/m, measured at 50 cm in front of the EUT.

Band II: 2 kHz to 400 kHz, ≤ 1.0 V/m measured at 50 cm around the EUT.)

B.4.1.5 Overall uncertainty

The test shall be performed in such a way that the total extended uncertainty in the test result will be less than $\pm 10\%$ of (the reading + 1.5 V/m) for Band I and $\pm 10\%$ of (the reading + 0.1 V/m) for Band II.

B.4.2 Alternating magnetic fields

B.4.2.0 Test laboratory requirements

Background magnetic fields in the test laboratory, including disturbances transmitted along the power line and internally generated noise in the measuring system, shall together not exceed 40 nT in Band I and 5 nT in Band II.

B.4.2.1 Preparation of the EUT for testing

All necessary preparations described in B.1 and B.4.0 shall be done.

B.4.2.2 Equipment

Alternating magnetic field meter in Band I and Band II

B.4.2.3 Method

The EUT shall be set up in accordance with clause B.4.0.

The true r.m.s. value of the amplitude of the magnetic flux density vector is measured at 48 points on a cylindrical surface around the test object in the two frequency ranges, Band I and Band II. The frequency ranges are selected by specified filters in the alternating magnetic field meter.

The measuring geometry is illustrated in Figure B.4.2.3.1. The measurement points are mathematically defined in the following way.

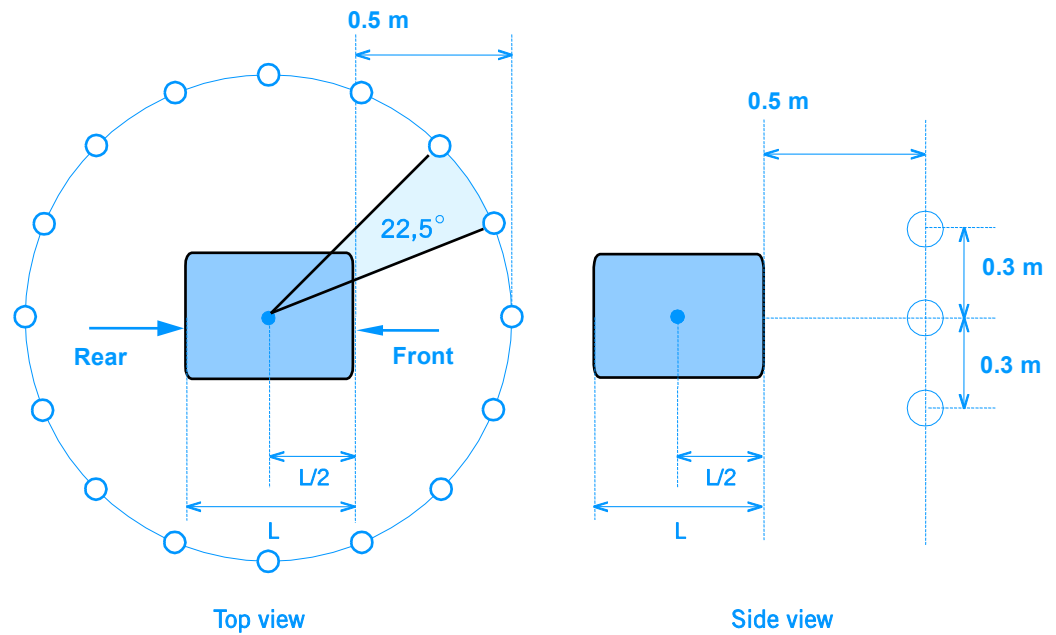


Figure B.4.2.3.1. Measurement geometry for the EUT.

The EUT shall be positioned such that the tangential plane, to the centre-centre point of the EUT surface, is at a right angle to the horizontal plane. The distance between the centre-centre points of the EUT and the back of the EUT, including, where used, any part of a stand holder, along the normal to this tangential plane is called L.

The origin of the cylindrical co-ordinate system is chosen to be situated at a distance $L/2$ behind the surface on the normal to the tangential plane through the centre-centre point. The z-axis is chosen to be at a right angle to the horizontal plane. The angular reference direction is along the above-mentioned normal in the direction pointing outwards from the EUT. An angle (ϑ) is positive in the counter-clockwise direction. Measurements shall be made at all points which have a minimum clearance of 0.25 m to the outer surface of the EUT and with co-ordinates according to:

$$z = -0.3 \text{ m}, z = 0 \text{ and } z = +0.3 \text{ m}$$

$$r = (L/2 + 0.5) \text{ m}$$

$$\vartheta = p \cdot 22.5^\circ \text{ where } p \text{ represents all integers in the range } 1 \leq p \leq 15.$$

In case of less than 0.25 m clearance the instrument shall be moved out radially until 0.25 m clearance is achieved.

Distances are given in metres and angles in degrees.

The measuring coils shall be stationary during the measurements.

The power cable of the test object shall be connected to the phase and the neutral conductors of the mains power supply. The EUT does not need to be measured with the phase and neutral interchanged in this case, as the magnetic fields are not influenced by such a change.

B.4.2.4 Test evaluation

Results shall be presented as r.m.s. values of the magnetic flux density expressed in nanotesla (nT) for the two frequency Bands. The values in front of the EUT and the maximum value and its position shall be given both for normal and for standby operation if they differ. If measured values are less than 200 nT in Band I or less than 25.0 nT in Band II the result shall be reported as “<200 nT” and “<25.0 nT” respectively.

(The mandate in accordance with clause A.4.2 is the following:

Band I: 5 Hz to 2 kHz, ≤ 200 nT, measured at 50 cm around the EUT.

Band II: 2 kHz to 400 kHz, ≤ 25 nT measured at 50 cm around the EUT.)

B.4.2.5 Overall uncertainty

The test shall be performed in such a way that the total extended uncertainty in the test result will be less than $\pm(10\%$ of the reading + 30 nT) for Band I and $\pm(10\%$ of the reading + 1.5 nT) for Band II.

Note

The uncertainties given are worst case limits. In many cases it will be possible to obtain better accuracy, especially in Band II.

B.6 Environmental requirements

B.6.0 General clarification

B.6.0.1 Signatures

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 laboratory 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 accepts digital signature as an alternative to traditional signature on test reports and declarations submitted as pdf files. With digital signature TCO Development means any of the following:

Electronic signatures apply to data in electronic form attached to or associated with other electronic data used to verify that the content originates from the issuer and has not been altered.

Advanced electronic signatures are uniquely linked to a signature and capable of identifying the signatory. They are linked to other electronic data in such a way that any alteration to the data can be detected.

Qualified electronic signatures are advanced electronic signatures based on a qualified certificate and created by a secure signature creation device.

B.6.1 Product description

The type key for unidentified characters, if any, in the model name and panel identification name shall be submitted. The type key must include two or more options.

B.6.2 Organisation

B.6.2.2 Social responsibility

The TCO standards of 2009 are the first to include requirements of social responsibility. At this stage we recognise that the level of implementation often is limited to first-tier suppliers. Although we see the ambition as covering all production we will for now not demand active engagement further down the chain.

To ensure that the documents sent in are really implemented and used, the report/certificate/membership or other document used as verification of this requirement must have a signature by a person at the brand owner company (approved to sign such documents by the brand owner company). All documents must also be dated to ensure that the documentation is up-to-date. The document(s) sent in by the brand owner is valid and verifies requirement A.6.2.2 one year from the signature date.

The different alternatives of verifying social responsibility, described below, are:

1. Global Reporting Initiative (GRI)
2. Global Compact
3. Electronic Industry Citizenship Coalition (EICC)
4. SA8000
5. Other relevant initiative and / or Own work

B.6.2.2.1 Global Reporting Initiative (GRI)

– a reporting standard

The Global Reporting Initiative (GRI) produces a standard in sustainability reporting guidelines. Sustainability reporting is the action where an organization publicly communicates their economic, environmental, and social performance. The GRI's mission is to make sustainability reporting by all organizations as routine and comparable as financial reporting.

The guideline consists of a set of Profile Disclosures and Disclosures of Management Approach as well as *79 performance indicators*, divided into the following six categories:

1. Environmental

Indicators on materials, energy, water, biodiversity, emissions, effluents, waste, transport, products, services etc

2. Human rights

Indicators on Investment and procurement practices, non-discrimination, freedom of association, collective bargaining, child labour, forced and compulsory labour etc

3. Labour practices and decent work

Indicators on Employment, occupational health and safety, labour/management relations, training, diversity and equal opportunity etc

4. Social

Indicators on Community, corruption, public policy etc.

5. Product responsibility

Indicators on Customer health and safety, product and services labelling, customer privacy etc

6. Economic

Indicators on Economic performance, market presence, indirect economic impacts etc

There are 3 Application Levels: A, B and C. These levels can be self-declared, third-party-checked and/or GRI-checked, each with the option of recognizing external assurance (“+”).

Reporting according to “level C” includes reporting on some of the Profile Disclosures and also reporting of a minimum of 10 Performance Indicators, including at least one of each Indicator Dimension (Economic, Environmental, and Social). Reporting on Disclosures of Management Approach is not needed.

Accepted documentation:

A report according to the GRI Sustainability Reporting Guidelines, G3 level C or higher. The report shall be a maximum of one year old at the time of application.

More information:

<http://www.globalreporting.org/Home>

B.6.2.2.2 Global Compact

– an initiative stating principles for sustainable business

The United Nations Global Compact (UNGC) is a United Nations initiative to encourage businesses worldwide to adopt sustainable and socially responsible policies, and to report on their implementation. The Global Compact is a principle based framework for businesses, stating ten principles in the areas of human rights, labour, the environment and anti-corruption:

1. Human Rights

Businesses should:

- Principle 1: Support and respect the protection of internationally proclaimed human rights;
- Principle 2: Make sure that they are not complicit in human rights abuses.

2. Labour Standards

Businesses should uphold:

- Principle 3: the freedom of association and the effective recognition of the right to collective bargaining;
- Principle 4: the elimination of all forms of forced and compulsory labour;
- Principle 5: the effective abolition of child labour; and
- Principle 6: the elimination of discrimination in employment and occupation.

3. Environment

Businesses should:

1. Principle 7: support a precautionary approach to environmental challenges;
2. Principle 8: undertake initiatives to promote environmental responsibility; and
3. Principle 9: encourage the development and diffusion of environmentally friendly technologies.

4. Anti-Corruption

Businesses should:

- Principle 10: work against corruption in all its forms, including extortion and bribery.

The Global Compact is not a performance or assessment tool. It does not provide a seal of approval, nor does it make judgements on performance.

Participants are expected to publish in their annual report or similar corporate report (e.g. sustainability report) a description of the ways in which they are supporting the Global Compact and progress on implementing its ten principles. This is known as the "Communication on Progress" (COP). The Global Compact believes that this sort of openness and transparency encourages good practices by participants. The COP is an important demonstration of a participant's commitment to the Global Compact and its principles. Failure to provide a COP will result in a non-communicating or inactive status for a participant.

Accepted documentation:

A Communication on Progress (COP) report demonstrating active participation in the Global Compact initiative. The report shall be a maximum of one year old at the time of application.

More information:

<http://www.unglobalcompact.org/>

B.6.2.2.3 Electronic Industry Citizenship Coalition (EICC)

– a business cooperation on implementation of social responsibility

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 throughout

the Electronics and Information and Communications Technology (ICT) supply chain.

The Electronic Industry Code of Conduct is a code of best practices adopted and implemented by some of the world's major electronics brands and their suppliers. The goal is to improve conditions in the electronics supply chain. Development of the Code was a multi-stakeholder effort, influenced by internationally-recognized standards.

By consolidating and standardizing compliance, audit and reporting efforts, suppliers can focus on achieving the high standards of performance set forth by the Code. This approach is also conducive to fostering a culture of social responsibility throughout the global electronics supply chain.

EICC sets forth performance, compliance, auditing and reporting guidelines across five areas of social responsibility:

- Labour
- Health and Safety
- Environmental
- Management System
- Ethics

Accepted documentation:

Proof of Brand owner being an active member of the EICC initiative.

More information:

<http://www.eicc.info/>

B.6.2.2.4 SA8000

– a certifiable standard for social accountability

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.

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 covers the following areas of accountability:

- **Child labour:** No workers under the age of 15; minimum lowered to 14 for countries operating under the ILO Convention 138 developing-country exception; remediation of any child found to be working
- **Forced labour:** No forced labour, including prison or debt bondage labour; no lodging of deposits or identity papers by employers or outside recruiters

- **Workplace safety and health:** Provide a safe and healthy work environment; take steps to prevent injuries; regular health and safety worker training; system to detect threats to health and safety; access to bathrooms and potable water
- **Freedom of Association and Right to Collective Bargaining:** Respect the right to form and join trade unions and bargain collectively
- **Discrimination:** No discrimination based on race, caste, origin, religion, disability, gender, sexual orientation, union or political affiliation, or age; no sexual harassment
- **Discipline:** No corporal punishment, mental or physical coercion or verbal abuse
- **Working hours:** Comply with the applicable law but, in any event, no more than 48 hours per week with at least one day off for every seven day period; voluntary overtime paid at a premium rate and not to exceed 12 hours per week on a regular basis; overtime may be mandatory if part of a collective bargaining agreement
- **Remuneration:** Wages paid for a standard work week must meet the legal and industry standards and be sufficient to meet the basic need of workers and their families; no disciplinary deductions
- **Management system for Human Resources:** Facilities seeking to gain and maintain certification must go beyond simple compliance to integrate the standard into their management systems and practices.

Accepted documentation:

Valid SA8000 certificate documenting compliance with the standard. Accepted is either a Brand Owner certificate or if the production is carried out in SA8000 certified production facilities.

More information: <http://www.sa-intl.org/>

B.6.2.2.5 Other relevant initiative and / or Own work

If the Brand Owner is not doing any of the above but in any other way is implementing working practices that promote labour relations and working conditions that correspond with internationally recognised human rights and the laws in the country of production, TCO Development accepts documentation of these practices.

Accepted documentation:

Alternative 1. Proof of Brand owner being an active member of a relevant initiative proving commitment to social responsibility.

Alternative 2. Documentation of one or several of the following:

- An implemented **code of conduct** referring to internationally recognised human rights, labour standards and relevant laws in the country of production.
- Appropriate **records of suppliers/subcontractors commitments to social accountability**, including but not limited to, contractual agreements.

- Appropriate **procedures to evaluate and select suppliers/subcontractors** (and, where appropriate, sub-suppliers) taking into account their performance and commitment to meet the requirements of the code of conduct.
- **Procedures to communicate** regularly to all interested parties data and other information regarding **compliance with the requirements of the code of conduct**.

B.6.3 Climate

B.6.3.1 Energy consumption

TCO Development has decided that energy consumption of the battery charger shall follow the U.S. Environmental Protection Agency's (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) 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 nameplate.

TCO Development demands that at least Efficiency level IV until April 30th 2012 and level V from May 1st 2012 shall be fulfilled. This means that a TCO laboratory will require to see a copy of the headsets charger's external adapter nameplate there The International Efficiency Protocol requirement for level IV or V symbol is visible as proof of compliance.

B.6.4 Environmentally hazardous substances

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

Exemptions are according to EU Directive 2002/95/EC (RoHS) and the documents supporting the directive.

Limit values for cadmium, lead and hexavalent chromium are according to EU Directive 2002/95/EC (RoHS) and the documents supporting the directive. The limit value for batteries are 0,0005 % for mercury and 0,002 % for cadmium per listed part, according to EU Directive 2006/66/EC.

TCO Development supports the use of recycled plastic. To avoid making it more difficult to use recycled plastic, exceptions to this requirement can be accepted. If recycled plastic is used in the product please contact TCO Development for further instructions.

B.6.4.2 Halogenated substances

1. Plastic components weighing more than 10g shall not contain flame retardants or plasticizers that contain organically bound chlorine or bromine.

Electronic components include plastic enclosures for switches and connectors/plugs (Eg plastic cases for USB connectors, power supply cases).

2. The **headset** shall not contain PBB and PBDE.

Printed Wiring Boards are included.

The limit value will be according to EU Directive 2002/95/EC (RoHS), the following amendments to the Directive and other documents supporting the Directive. The limit value for PBB and PBDE, including decaBDE (see list below) is 0.1 % by weight in homogeneous materials.

Monobromodiphenyl ether (monoBDE)	CAS no 101-55-3
Dibromodiphenyl ether (diBDE)	CAS no 2050-47-7
Tribromodiphenyl ether (triBDE)	CAS no 49690-94-0
Tetrabromodiphenyl ether (tetraBDE)	CAS no 40088-47-9
Pentabromodiphenyl ether (mentaBBDE)	CAS no 32534-81-9
Hexabromodiphenyl ether (hexaBDE)	CAS no 36483-60-0
Heptabromodiphenyl ether (heptaBDE)	CAS no 68928-80-3
Octabromodiphenyl ether (octaBDE)	CAS no 32536-52-0
Nonabromodiphenyl ether (nonaBDE)	CAS no 63936-56-1
Decabromodiphenyl ether (decaBDE)	CAS no 1163-19-5
Decabromobiphenyl (DeBB)	CAS nr 13654-09-6

TCO Development supports the use of recycled plastic. To avoid making it more difficult to use recycled plastic, exceptions to this requirement can be accepted. If recycled plastic is used in the product please contact TCO Development for further instructions.

B.6.4.3 Non-halogenated substances

There are currently two EU directives describing classification of chemicals. Classification, Labelling and Packaging of Substances and Mixtures, known as the CLP Regulation, EC 1272/2008 will replace directives 67/548/EEC and 1999/45/EC.

To determine if a substance has been assigned a specific R-phrase, please check the substance against the information in the European chemical Substance Information System (<http://ecb.jrc.ec.europa.eu/esis/>).

See below for a restricted substances list matching:

R-phrase (according to 67/548/EEC)	Phrase	H-statement (according to EC 1272/2008)	Statement
Human health hazards			
R40	Limited evidence of a carcinogenic effect	H351	Suspected of causing cancer
R45	May cause cancer	H350	May cause cancer
R46	May cause heritable genetic damage	H340	May cause genetic defects
R48/23 R48/24 R48/25	Danger of serious damage to health by prolonged exposure	H372	Causes damage to organs through prolonged or repeated exposure
R60	May impair fertility	H360F	May damage fertility
R61	May cause harm to the unborn child	H360D	May damage the unborn child
Environmental hazards			
R51/53	Toxic to aquatic organisms/may cause long-term adverse effects in the aquatic environment	H411	Toxic to aquatic life with long lasting effects

TCO Development supports the use of recycled plastic. To avoid making it more difficult to use recycled plastic, exceptions to this requirement can be accepted. If recycled plastic is used in the product please contact TCO Development for further instructions.

B.6.5 Product lifetime

B.6.5.1 Warranty and spare parts

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.

B.6.6 Preparation for Recycling

B.6.6.1 Take back system

The template should be completed with

- The name of at least one market where the product is sold and where electronics take back regulation is not in practice at the date of application and
- A short description of how the take-back system on that market works. This can also be done by giving a reference to the representative, associated company or affiliate taking care of the take-back system on that market.

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.

B.6.7 Product packaging

B.6.7.1 Hazardous substances in product packaging

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