

Annex A (informative)

Design Guidance and Design for Environment Checklist

Designing a product for optimum environmental performance requires the careful consideration of a number of different environmental aspects along with other product criteria such as functional performance, long-term reliability, safety, and cost competitiveness. In many instances, the designer must evaluate complex tradeoffs among these various criteria to provide a product that is both useful to consumers and protective of the environment.

This informative Annex provides a checklist of both environmental requirements and recommendations derived from Clauses 6 and 7 of this Standard. The purpose of this checklist is to assist designers in the consideration of environmental aspects of their design and to help document, in a Design for Environment Checklist, the specific environmental design attributes that were incorporated into a given electrical and electronic product.

It is important to recognize that few products will be able to incorporate all of the design attributes discussed in this Annex, or even included in a manufacturer's own design checklist. Due to the large number of different types of electrical and electronic equipment and their varying design characteristics, it is not possible to develop a single checklist that will be appropriate for all products. Consequently, manufacturers should develop checklists appropriate to their particular product types providing only those environmental characteristics applicable to their product(s). For this reason, this checklist is offered primarily as a template.

A.0 General Considerations

Life Cycle thinking design strategy implemented in the organisation

Yes

No

A.1 Material efficiency

The variety of materials used in the product has been reduced.

Yes, describe briefly _____

No

The amount of material used in the product has been reduced.

Yes, describe briefly _____

No

The product contains materials that are considered to have lower environmental impact.

Yes, describe briefly _____

No

The product contains recycled materials.

Yes

No

The product uses renewable materials.

- Yes describe briefly _____
- No

A.2 Energyefficiency

A.2.1 Power modes and related energy efficiency measures

Ease of use as related to the selection and operation of power saving features was considered and implemented.

- Yes, considered and implemented;
describe briefly: _____
- Yes, considered but not implemented;
specify reason(s): _____
- Not applicable
- No

List specific power modes that apply to the product.

Detail significant power consumption modules and plans to reduce their consumption.

A.2.2 Operational Modes

Note actions taken to use low power components and design options.

Note actions taken to improve the energy efficiency of power supply components.

Note actions taken to ensure the AC-DC conversion efficiency is highest in the most used power mode.

Note actions taken to ensure overspecification of items such as the power supply has not taken place.

Detail analysis undertaken to ensure operating characteristics such as room temperature have not been over specified.

A.2.3 Energy Saving Modes

Note design actions taken to automatically switch from on mode to save modes.

Note design actions taken to reduce the time taken for the product to switch from save mode to active mode.

List actions taken to reduce energy consumption in save mode similar to those taken in A.2.2 above.

A.2.4 Off Modes

Note design options taken to automatically switch from save mode to off mode.

Note design options taken to reduce energy consumption in soft off mode.

Note options considered in the placing of the power switch to make it more user accessible.

In Hard-Off mode, is the power consumed zero Watts?

Yes

No. If no, what actions have been taken to inform the user of this?

A.2.5 No Load Modes

List design options taken to reduce the power consumption of the no load mode to the lowest possible.

A.2.6 General Energy Efficiency measures

List any power saving features of this product here that have not been noted elsewhere.

Information on power consumption in all relevant power modes has been made available to product users.

- Yes, list sources
 - Manufacturer Environmental Product Declaration
 - Product Specification Document
 - Product User Manual (Hard Copy)
 - Product User Manual (Soft Copy)
 - Product Labels or Packaging
 - Product Packaging Insert
 - Internet. Provide URL _____
 - Other. Describe. _____
- Not applicable
- No

Applicable voluntary agreements aimed at improving energy efficiency of EEE products were considered and recommendations met.

- Yes, considered and recommendations met;
describe briefly:

- Yes, considered but recommendations not met;
specify
reason(s): _____
- Not applicable
- No

The product is compliant to the requirements of the international ENERGY STAR[®] program.

- Yes, according version _____
- Not applicable
- No; give reason(s) for non-compliance.

The effects of improved energy design features have been quantified and communicated to marketing.

- Yes
- No/Not applicable

Default setting is set to the most energy efficient on modes and/or transitions to save mode.

- Yes
- No

Information on proper use of available energy saving controls and/or settings is available to product users.

- Yes, list sources
 - Product User Manual (Hard Copy)
 - Product User Manual (Soft Copy)
 - Product or Packaging Labels
 - Product Packaging Insert
 - Internet. Provide URL. _____
 - Other. Describe. _____
- Not Applicable
- No

A.3 Consumables and batteries

A.3.1 Consumables

The avoidance of hazardous substances and preparations in consumables has been considered.

- Yes
- Not Applicable (no consumables)
- No

The product has been designed such that the use of consumables associated with the product can be optimised relative to the functionality of the product.

- Yes
- Not Applicable (no consumables)
- No

Information on the proper use of consumables associated with the product has been provided to the user.

- Yes, list sources (all that apply):
 - Manufacturer Environmental Product Declaration
 - Product User Manual (Hard Copy)
 - Product User Manual (Soft Copy)
 - Product Service Manual
 - Internet. Provide URL. _____
 - Other. Describe. _____
- Not Applicable (No consumables)
- No

A.3.2 Batteries

All batteries in the product comply with applicable restrictions on hazardous substances and preparations contained in relevant national, regional and international legislation.

- Yes
- Not Applicable (no batteries)
- No

All batteries in the product are labelled according to requirements of relevant regional, national or international legislation.

- Yes
- Not Applicable (no batteries)
- No

All batteries do not exceed a mercury concentration of 5 ppm by weight.

- Yes No. If no provide reason(s) why mercury cannot be avoided:

Consideration has been given to batteries with reduced environmental impact.

- Yes; specify type of batteries considered (check all that apply).
 - Li-Ion
 - Li-Polymer
 - NiMH
 - Other; describe

- Not Applicable (no batteries)
- No; specify reason(s)

The product has batteries containing materials regarded as detrimental to the environment that cannot be avoided.

- No
- Not Applicable (no batteries)
- Yes
 - Identify batteries

Where reported

Reason(s) why material(s) cannot be avoided

All batteries and assemblies containing batteries are easily identifiable and removable.

- Yes
 - Not Applicable (no batteries)
 - No; specify reason(s):
 - batteries are not intended to be removed until the end of life stage and equipment reliant on continuous power supply / no special disposal requirement
 - other
-

Information on proper procedures for removal and safe handling of batteries is available in product user documentation.

- Yes, list sources
 - Manufacturer Environmental Product Declaration
 - Product User Manual (Hard Copy)
 - Product User Manual (Soft Copy)
 - Product Service Manual
 - Product Labels
 - Internet. Provide URL
-

Other: describe.

- Not Applicable (no batteries)
 - No; give reason(s)
-

For NOT easily removable batteries: Advice on service outlets for exchange of non-removable batteries (during product life) is provided in the product documentation.

- Yes
- Not Applicable (no batteries and/or accumulators)
- No

Information on type and location is available in the appropriate product documentation.

- Yes
 - type of battery
-

location

- Not Applicable (no non-removable batteries)
- No

Battery management features that help to prolong battery and/or accumulator life have been considered and implemented.

- Yes, considered and implemented
- Yes, considered but not implemented
- Not Applicable (no batteries)
- No; give reason(s) _____

A.4 Emissions

A.4.1 Chemical Emissions

Product has been designed such that chemical emissions are reduced wherever possible.

- Yes
- Not Applicable (product is not based on electrostatic process)
- No

Product complies with all relevant regulations governing chemical emissions from products.

- Yes
- Not Applicable (product does not consume supplies)
- No
- No relevant regulations available

For a product based on the electrostatic process, chemical emissions (Ozone and VOC) and dust emissions have been evaluated.

- Yes
- Not Applicable (product is not based on electrostatic process)
- No

For a product based on the electrostatic process, emissions measurements have been completed in accordance with Standard ECMA-328.

- Yes
- Not Applicable (product does not consume supplies)
- No

Results of the emissions measurement(s) have been made available to product users.

- Yes, list sources
 - Manufacturer Environmental Product Declaration
 - Product User Manual (Hard Copy)
 - Product User Manual (Soft Copy)
 - Product Service Manual
 - Internet. Provide URL _____
 - Other: describe. _____
- Not Applicable (product does not consume supplies)
- No; give reason(s) _____

A.4.2 Noise Emissions

Noise emissions have been evaluated according to ECMA-74.

- Yes
- No
- Other – describe
- Not applicable

For products outside the scope of ECMA-74, ISO 3741, 3744 or 3745 has been used.

- Yes
- No
- Not applicable

Results of noise emissions measurement are available.

- Yes
- No
- Not applicable

A.5 Extension of Product Lifetime

The product contains common mechanical packages (such as covers and chassis) or common parts or components that are used for multiple models in the product family or in multiple generations of the same product.

Yes, describe.

-
- Not applicable
 - No

The product contains industry standard parts.

Yes, list

-
- No
 - Not applicable

The product contains modular components.

Yes, list.

-
- Not applicable
 - No

The product contains reused components and/or parts.

Yes, list.

-
- Not applicable
 - No

The product contains parts targeted for refurbishment and reuse in maintenance and spare parts applications.

Yes, list.

Not applicable

No

A.6 End of Life

Separation of parts containing hazardous substances and preparations is possible.

Yes

No

Not applicable

Incompatible materials (including electronic modules) connected to case/housing parts or chassis are easily separable.

Yes

No

Not applicable

The product can be disassembled down to the module level using commonly available tools.

Yes

No, list all special tools required for disassembly.

All plastic parts with weight greater than 25 g are marked with the type of polymer, copolymer, polymer blends or alloys in conformance with ISO 11469.

Yes

No

Not applicable

The following design choices have been avoided.

Incompatible coatings on major plastic parts

Coatings and surface finishes on plastic parts that are difficult to recycle without downgrading

Adhesive backed stickers or foams on plastic parts

Metal inserts in plastic parts

The following aspects have been considered and their number and variety reduced.

Welds and Adhesives

Connections (e.g. Fasteners and screws)

Steps necessary for disassembly

tools required for disassembly

position changes that have to be made by the dismantler

The following design choices have been included.

the same polymer is used throughout the design of a product.

If this is not practical, the number of plastic types used in the product has been reduced

Yes

No

The compatibility guidelines found in Annex C has been used in selecting polymers

Yes

No

The product has been designed such that modules can be extracted for reuse

Labels and other identification marks are made from the same material as the body of the products or a compatible material

Snap fits or screws are used to aid disassembly

A plan for the disassembly of the product into major modules or sub assemblies has been created and made available to dismantlers.

Yes

No

A.7 Substances and preparations needing special attention

A.7.0 Content in products

The product complies with the applicable international, regional and national prohibitions on the use of certain hazardous substances and preparations.

Yes, list

Not applicable

No

Use of substances that require special handling or disposal during the recycling process has been reduced or eliminated.

Yes, eliminated;

Yes, reduced; list

Not applicable

No

Appropriate information on parts requiring special handling or disposal has been made available to users and recyclers.

- Yes
- No
- Not applicable

Hazardous substances other than those restricted are used in this product.

- Yes – List the substances and give rationale for their use

- No

A.7.1 General limitations

The product does NOT/ does contain the following substances.

- | | | |
|--|---------------------------------------|--|
| <input type="checkbox"/> Does not contain | <input type="checkbox"/> Does contain | Asbestos |
| <input type="checkbox"/> Does not contain | <input type="checkbox"/> Does contain | Ozone Depleting Substances: |
| Chlorofluorocarbons (CFC), hydrobromofluorocarbons (HBFC), hydrochlorofluorocarbons (HCFC), Halons, carbontetrachloride, 1,1,1-trichloroethane, bromochloromethane | | |
| <input type="checkbox"/> Does not contain | <input type="checkbox"/> Does contain | PCB, PCT, |
| monomethyltetrachlorodiphenylmethane (Ugilec 141), monomethyldichlorodiphenylmethane (Ugilec 121 or 21), monomethyldibromodiphenylmethane (DBBT) | | |
| <input type="checkbox"/> Does not contain | <input type="checkbox"/> Does contain | PCN |
| <input type="checkbox"/> Does not contain | <input type="checkbox"/> Does contain | tin organic compounds: TPT, TBT, TBTO, DBB |
| <input type="checkbox"/> Does not contain | <input type="checkbox"/> Does contain | PentaBDE, OctaBDE |
| <input type="checkbox"/> Does not contain | <input type="checkbox"/> Does contain | PCN |
| <input type="checkbox"/> Does not contain | <input type="checkbox"/> Does contain | Mercury (exception: discharge lamps) |
| Additional from July 2006 (except exemptions made in RoHS Directive): | | |
| <input type="checkbox"/> Does not contain | <input type="checkbox"/> Does contain | Lead |
| <input type="checkbox"/> Does not contain | <input type="checkbox"/> Does contain | Cadmium |
| <input type="checkbox"/> Does not contain | <input type="checkbox"/> Does contain | Hexavalent chromium |
| <input type="checkbox"/> Does not contain | <input type="checkbox"/> Does contain | PBB, PBDE |

Substances recorded to be restricted in the clauses above are present in the product.

- No
- Yes;

provide reason(s) why material(s) cannot be avoided: _____

A.7.2 Limitations on plastic parts, mechanical parts and housings

The plastic parts for the product do NOT/ do contain the following substances.

- | | | |
|---|-------------------------------------|------------------------------|
| <input type="checkbox"/> Do not contain | <input type="checkbox"/> Do contain | Cadmium or cadmium compounds |
| <input type="checkbox"/> Do not contain | <input type="checkbox"/> Do contain | Short chain chloroparaffins |
| <input type="checkbox"/> Do not contain | <input type="checkbox"/> Do contain | Lead or lead compounds |

Substances recorded to be restricted in the clauses above are present in the product.

No

Yes;

provide reason(s) why material(s) cannot be avoided: _____

A.7.3 Limitations on paints, coatings or colouring agents

The paints, coatings or colouring agents for the product do NOT / do contain the following substances.

- | | | |
|---|-------------------------------------|------------------------------|
| <input type="checkbox"/> Do not contain | <input type="checkbox"/> Do contain | Cadmium or cadmium compounds |
| <input type="checkbox"/> Do not contain | <input type="checkbox"/> Do contain | Lead or lead compounds |

Substances recorded to be restricted in the clauses above are present in the product.

No

Yes;

provide reason(s) why material(s) cannot be avoided: _____

A.7.4 Limitations on other parts/products

Textiles and leather coming into direct contact with the skin do NOT /do contain the following substances.

- | | | |
|---|-------------------------------------|---|
| <input type="checkbox"/> Do not contain | <input type="checkbox"/> Do contain | TRIS, TEPA, PBB |
| <input type="checkbox"/> Do not contain | <input type="checkbox"/> Do contain | AZO colourants that split aromatic amines specified in 76/769/EEC (2003/3/EC) |
| <input type="checkbox"/> Do not contain | <input type="checkbox"/> Do contain | Hexavalent chromium |

Wood parts/products do NOT / do contain the following substances.

- | | | |
|---|-------------------------------------|--|
| <input type="checkbox"/> Do not contain | <input type="checkbox"/> Do contain | Arsenic as a wood preservation treatment |
| <input type="checkbox"/> Do not contain | <input type="checkbox"/> Do contain | Mercury for preservation of wood |
| <input type="checkbox"/> Do not contain | <input type="checkbox"/> Do contain | Pentachlorophenol and derivatives |

Toys do NOT / do contain the following substances.

- | | | |
|---|-------------------------------------|---------|
| <input type="checkbox"/> Do not contain | <input type="checkbox"/> Do contain | Benzene |
|---|-------------------------------------|---------|

Articles coming into direct and prolonged contact with the skin do NOT / do contain the following substances.

- | | | |
|---|-------------------------------------|--------|
| <input type="checkbox"/> Do not contain | <input type="checkbox"/> Do contain | Nickel |
|---|-------------------------------------|--------|

Substances recorded to be restricted in the clauses above are present in the product.

No

Yes;

provide reason(s) why material(s) cannot be avoided: _____

A.8 Packaging

The variety of packaging materials used has been reduced.

Yes, describe briefly _____

No

The amount of packaging materials used has been reduced.

Yes, describe briefly _____

No

The used packaging materials are considered to have lower environmental impact.

Yes, describe briefly _____

No

The packaging was manufactured using recycled materials.

Yes

No

The packaging was manufactured using renewable materials.

Yes describe briefly _____

No

The packaging complies with the applicable international, regional and national regulations.

Yes, list

No

The packaging materials have an appropriate marking (e.g. according to ISO 11469).

Yes, list applied standard

No

provide reason(s) why packaging material(s) cannot be marked: _____

A.9 Documentation

Instructions for consumers/users on how to install, use, maintain and, where applicable, dispose of the product is provided – especially as it pertains to the environmental characteristics of the product.

Yes, list sources

Product Specification Document

Manufacturer Environmental Product Declaration

Product User Manual (Hard Copy)

Product User Manual (Soft Copy)

Product Labels or Packaging

Product Packaging Insert

Internet. Provide

URL. _____

Other.

Describe. _____

No

All applicable product environmental information to be made available to product users is provided according to ECMA TR/70.

Yes

No