

# IEEE Standard 1680.1

## Section 4

### Environmental performance criteria

for desktop personal computers, notebook personal computers  
and personal computer displays

This document paraphrases the environmental criteria included in IEEE Standard 1680.1, which includes the requirements for computers and displays. 1680.1 is part of the IEEE 1680 family of standards. IEEE Standard 1680 includes specifications for how the system is intended to work. This document summarizes the contents of the 1680.1 standard but does not provide all the information needed by a manufacturer to determine if their product is in conformance nor to declare its conformance with the Standard.

*Regional variability:* Certain criteria can allow for different declarations in different regions or countries, based on the Registry listing of regions and countries. These regionally variable criteria are identified below. Unless otherwise noted, the declared criteria must be met by all units of the product as they are sold anywhere in the world.

Copies of the full IEEE Standard 1680 or IEEE Standard 1680.1 can be purchased from IEEE at <<http://shop.ieee.org/ieeestore>>. Simply search for the standard number.

Note: **Required criteria** have the criteria number in bold for ease of reference.

## 4.1 Reduction/elimination of environmentally sensitive materials

### 4.1.1 Reduction of use of hazardous substances

#### 4.1.1.1 Compliance with provisions of European RoHS Directive

A required product criterion

All covered products shall comply with the requirements of the European RoHS Directive 2002/95/EC for the restriction on certain hazardous substances in electronic equipment. The Directive addresses cadmium, mercury, lead, hexavalent chromium, and certain brominated flame retardants. For details reference the European RoHS Directive.

### 4.1.2 Cadmium

#### 4.1.2.1 Elimination of intentionally added cadmium

An optional product criterion

All covered products shall have concentrations of cadmium less than half the threshold defined in RoHS, unless the presence of cadmium can be shown to be due to use of recycled content.

### 4.1.3 Mercury

#### 4.1.3.1 Reporting on amount of mercury used in light sources

A required product criterion

For all flat panel video display devices manufacturers shall report on the amount of mercury used in light sources in all covered products.

#### 4.1.3.2 Low threshold for amount of mercury used in light sources

An optional product criterion

All flat panel video display devices shall employ lamps that contain a reduced amount of mercury relative to the current industry standard.

#### 4.1.3.3 Elimination of intentionally added mercury used in light sources

An optional product criterion

All flat panel video display devices shall employ lamps that utilize a technology that does not the presence of mercury.

#### 4.1.4 Lead

##### 4.1.4.1 Elimination of intentionally added lead in certain applications

An optional product criterion

Video display units shall have concentrations of lead less than 5 percent of the threshold defined in the RoHS Directive per listed part, unless the presence of lead can be shown to be due to use of recycled content.

#### 4.1.5 Hexavalent chromium

##### 4.1.5.1 Elimination of intentionally added hexavalent chromium

An optional product criterion

All covered products shall have concentrations of hexavalent chromium that are less than half the threshold defined in the RoHS Directive, unless the presence of hexavalent chromium can be shown to be due to use of recycled content.

#### 4.1.6 Flame retardants and plasticizers

##### **4.1.6.1** Elimination of intentionally added Short Chain Chlorinated Paraffin (SCCP) flame retardants and plasticizers in certain applications

A required product criterion

All covered products shall contain no more than a trace amount of SCCPs in paints, coatings, plastics, rubbers or seals, unless the presence of SCCPs can be shown to be due to use of recycled content.

##### 4.1.6.2 Large plastic parts free of certain flame retardants classified under European Directive 67/548/EEC

An optional product criterion

In all covered products the plastic parts larger than 25 grams shall contain no more than a trace amount of the flame retardants classified as dangerous

substances under the European Directive on the classification, packaging and labeling of dangerous substances. For details reference the European Directive.

#### 4.1.7 Batteries

##### 4.1.7.1 Batteries free of lead, cadmium and mercury

An optional product criterion

In all covered products batteries and accumulators (internal to computer) shall not contain lead, cadmium and mercury over trace amounts. For applicable limiting values reference the European Directive 2006/66/EC on batteries and accumulators containing certain dangerous substances.

#### 4.1.8 Polyvinyl chloride and chlorinated plastics

##### 4.1.8.1 Large plastic parts free of polyvinyl chloride

An optional product criterion

In all covered products, except cables and interconnect parts, parts greater than 25 grams shall not contain polyvinyl chloride (PVC).

## 4.2 Materials selection

#### 4.2.1 Total recycled plastics content

##### 4.2.1.1 Declaration of postconsumer recycled plastic content

A required product criterion

For all covered products that contain plastics, manufacturers shall declare the percentage of postconsumer recycled plastic, excepting for printed circuit boards and packaging.

##### 4.2.1.2 Minimum content of postconsumer recycled plastic

An optional product criterion

All covered products that contain plastic shall include an average of at least 10 percent postconsumer recycled plastic, excepting printed circuit boards.

##### 4.2.1.3 Higher content of postconsumer recycled plastic

An optional product criterion

All covered products that contain plastic, except printed circuit boards, shall contain an average of at least 25 percent postconsumer recycled plastic.

#### 4.2.2 Renewable/biobased plastic materials

##### 4.2.2.1 Declaration of renewable/biobased plastic materials content

A required product criterion

For all plastic parts, except packaging, manufacturer shall declare percentage of renewable/biobased plastic materials.

#### 4.2.2.2 Minimum content of renewable/biobased plastic material

An optional product criterion

All plastic parts, except packaging, shall contain an average of at least 10 percent renewable or biobased plastic.

#### 4.2.3 Dematerialization

##### 4.2.3.1 Declaration of product weight

A required product criterion

For all covered products, except packaging, manufacturer shall declare the product weight.

### 4.3 Design for end of life

#### 4.3.1 Design for recovery through recycling systems that utilize shredding

##### 4.3.1.1 Identification of materials with special handling needs

A required product criterion

For all covered products manufacturer shall provide treatment information to reuse and recycling facilities that identifies materials with special handling needs. This requirement addresses non-standard or new substances and technologies that would not be expected to be well-known to reuse and recycling operators.

##### 4.3.1.2 Elimination of paints or coatings that are not compatible with recycling or reuse

A required product criterion

All covered products shall not contain paints and coatings on larger plastic parts that are not compatible with recycling and reuse. The technical requirements for compatibility with recycling have been defined by the Federal Electronics Challenge Plastics Task Force.

##### 4.3.1.3 Easy disassembly of external enclosure

A required product criterion

All covered products shall have enclosures that are easily removable.

##### 4.3.1.4 Marking of plastic components

A required product criterion

All larger plastic components shall be marked with a resin identification code according to the international (ISO) standard.

##### 4.3.1.5 Identification and removal of components containing hazardous materials

A required product criterion

All covered products shall have larger circuit boards, and other components that contain hazardous materials, safely and easily identifiable and removable. The removal of materials and components is consistent with the requirements of the European WEEE Directive 2002/96/EC on electronic waste management.

#### 4.3.1.6 Reduced number of plastic material types

An optional product criterion

The enclosures for all covered products shall have all the larger parts composed of only one type of plastic.

#### 4.3.1.7 Molded/glued in metal eliminated or removable

An optional product criterion

All covered products shall not contain molded-in or glued-in metal inserts in plastic enclosures unless they are easy to remove.

#### **4.3.1.8** Minimum 65 percent reusable/recyclable

A required product criterion

All covered products shall have at least 65 percent of the materials in the product reusable or recyclable using current infrastructure and technologies. Consistent with the European WEEE Directive 2002/96/EC on electronic waste management, component reuse is counted toward the percentage but not full product reuse.

#### 4.3.1.9 Minimum 90 percent reusable/recyclable

An optional product criterion

All covered products shall have at least 90 percent of the materials in the product reusable or recyclable using current infrastructure and technologies. Consistent with the European WEEE Directive 2002/96/EC on electronic waste management, component reuse is counted toward the percentage but not full product reuse.

### 4.3.2 Design for recovery through disassembly

#### 4.3.2.1 Manual separation of plastics

An optional product criterion

All covered products shall have the plastic parts, except very small ones, easily separable.

#### 4.3.2.2 Marking of plastics

An optional product criterion

All covered products shall have the plastic components, except very small ones, marked with a resin identification code according to the international (ISO) standard.

#### **4.4 Product longevity / life cycle extension**

##### 4.4.1 Manufacturer warranty/service agreement

###### **4.4.1.1 Availability of additional three year warranty or service agreement**

A required product criterion

All covered products shall have an additional three year warranty or service agreement available for purchase.

##### 4.4.2 Upgradeability

###### **4.4.2.1 Upgradeable with common tools**

A required product criterion

All desktop and notebook personal computers shall be upgradeable with common tools, including memory drives, chips and cards that can be changed or extended.

###### **4.4.2.2 Modular design**

An optional product criterion

All desktop and notebook personal computers shall have a modular design such that major components and processor can be changed.

##### 4.4.3 Product life extension

###### **4.4.3.1 Availability of replacement parts**

An optional product criterion

Spare or replacement parts shall be available for five years as well as information on how to obtain the parts

#### **4.5 Energy conservation**

##### 4.5.1 Power management system

###### **4.5.1.1 ENERGY STAR®**

A required product criterion

All covered products shall comply with the version of U.S. ENERGY STAR that is applicable at the time of declaration.

###### **4.5.1.2 Early adoption of new ENERGY STAR specification**

An optional product criterion

All covered products shall be qualified to ENERGY STAR, or in compliance with the ENERGY STAR specification in advance of its effective date. This early adopter point, limited to one for a product, will be retained after the ENERGY STAR specification becomes required under criterion 4.5.1.1.

#### 4.5.2 Use of renewable energy

##### 4.5.2.1 Renewable energy accessory available

An optional product criterion

All covered products shall have a commercially available accessory for powering the product that uses renewable energy.

*Regional variability:* This criterion may be declared to differently for different regions or countries.

##### 4.5.2.2 Renewable energy accessory standard

An optional product criterion

All covered products shall be shipped with a standard component for powering the product that allows for the use of renewable energy.

*Regional variability:* This criterion may be declared to differently for different regions or countries.

## 4.6 End of life management

#### 4.6.1 Product take-back

##### 4.6.1.1 Provision of product take-back service

A required annual corporate declaration criterion

The marketing and sale to institutions of all covered products shall include the option to purchase, at a competitive price, a take-back or recycling service that meets the U.S. EPA environmental standard defined in the “Plug-In to eCycling Guidelines for Materials Management,” published May 2004.

*Regional variability:* This criterion applies only in those regions or countries for which the product is declared as conformant with the standard.

##### 4.6.1.2 Auditing of recycling services

An optional annual corporate declaration criterion

The marketing and sale to institutions of all covered products shall include an annual audit, according to the “Plug-In to eCycling Guidelines,” of all first, second and third tier recycling facilities that are used to provide the services required in criterion 4.6.1.1.

*Regional variability:* This criterion may be declared to differently for different regions or countries.

#### 4.6.2 Rechargeable battery recycling

#### **4.6.2.1 Provision of a rechargeable battery take-back service**

A required annual corporate declaration criterion

The marketing and sale to institutions of all covered products shall include the option to purchase, at a competitive price, a rechargeable, lithium-ion battery take-back service that is equivalent to or better than that provided by the Rechargeable Battery Recycling Corporation (RBRC). Participating as a Licensee in RBRC in the U.S. and Canada qualifies for this criterion.

*Regional variability:* Manufacturer shall declare how they provide the service and may declare that they provide it by different means in different regions or countries. This criterion applies only in those regions or countries for which the product is declared as conformant with the standard.

### **4.7 Corporate performance**

#### 4.7.1 Corporate environmental policy

##### **4.7.1.1 Demonstration of corporate environmental policy consistent with ISO 14001**

A required annual corporate declaration criterion

All manufacturers shall demonstrate the existence and public availability of a written corporate environmental policy consistent with ISO 14001.

#### 4.7.2 Environmental management system

##### **4.7.2.1 Self-certified environmental management system for design and manufacturing facilities**

A required annual corporate declaration criterion

All manufacturers shall self-certify that their owned organizations engaged in the design or manufacture of the product have an operational environmental management system that meets one of three recognized systems: ISO 14001, European EMAS or U.S. EPA Performance Track.

##### **4.7.2.2 Third-party certified environmental management system for design and manufacturing facilities**

An optional annual corporate declaration criterion

All manufacturers shall certify that their owned organizations engaged in the design or manufacture of the product have an operational, third-party certified, environmental management system that meets one of three recognized systems: ISO 14001, European EMAS or U.S. EPA Performance Track.

#### 4.7.3 Corporate Reporting

##### **4.7.3.1 Corporate report consistent with Performance Track or Global Reporting Initiative**

A required annual corporate declaration criterion

All manufacturers shall produce an annual report that meets the first three reporting requirements of the U.S. EPA Performance Track or the Global Reporting Initiative (GRI) Sustainability Reporting Guidelines (2002).

#### 4.7.3.2 Corporate report based on Global Reporting Initiative (GRI)

An optional annual corporate declaration criterion

All manufacturers shall produce an annual public report that is based on the Global Reporting Initiative (GRI) Sustainability Reporting Guidelines.

## 4.8 Packaging

### 4.8.1 Toxics in packaging

#### 4.8.1.1 Reduction/elimination of intentionally added toxics in packaging

A required product criterion

Heavy metals shall not be intentionally added to any packaging or packaging component, with an exception for the use recycled content.

### 4.8.2 Recyclable packaging materials

#### 4.8.2.1 Separable packing materials

A required product criterion

The packaging of products shall have all non-reusable packaging components larger than 25 grams separable into like materials without using tools.

#### 4.8.2.2 Packaging 90 percent recyclable and plastics labeled

An optional product criterion

The packaging of products shall have the plastics identified by material type, and 90 percent of the packaging shall be materials that are readily recyclable (with available recycling options), or can be composted, or can be disposed of in a municipal sewage program. Labeling requirement does not apply to small plastic parts.

### 4.8.3 Recycled Content

#### 4.8.3.1 Declaration of recycled content

A required product criterion

The manufacturer shall declare whether packaging contains recycled content, or does not, and shall declare the approximate recycled content for each material.

*Regional variability:* Manufacturer may declare different content amounts for packaging used in different regions or countries.

#### 4.8.3.2 Minimum postconsumer content guidelines

An optional product criterion

All packaging shall meet or exceed the minimum postconsumer content level for respective packaging in the U.S. EPA Comprehensive Procurement Guidelines.

#### 4.8.4 Take-Back Option

##### 4.8.4.1 Provision of take-back program for packaging

An optional product criterion

The marketing and sale to institutions of all covered products shall include a free service whereby the packaging material can be collected and returned to the manufacturer or to a recycler for reuse or recycling.

*Regional variability:* This criterion may be declared to differently for different regions or countries.

#### 4.8.5 Reuse Option

##### 4.8.5.1 Documentation of reusable packaging

An optional product criterion

Manufacturer shall provide at a competitive price a reusable packaging process that reuses the packaging for a minimum of five reuses for the same or similar product. Certain packaging components are excepted.

*Regional variability:* This criterion may be declared to differently for different regions or countries.