



Importance of Global Harmonization in Product Environmental Regulations and Standards

IEEE Sustain 2014
July 25, 2014

Agenda

- **Goals of product environmental regulations**
- **Why are harmonized product environmental regulations important?**
- **Factors influencing product environmental regulations**
- **Product environmental regulations today**
- **Examples of harmonized regulations**
- **Examples of not so harmonized regulations**
- **Recommendations**
- **Conclusions**

Goals of Product Environmental Regulations

- **Public health and welfare**
 - ▶ Consumer and workplace protection
- **Protection of the environment**
 - ▶ Pollution prevention throughout the product life-cycle
 - Acquisition, mining, or manufacture of materials
 - End-of-life waste reduction, reuse, recycling
 - Manufacturing process
 - ▶ Increase infrastructure for reuse and recycling
 - ▶ Increase recycling / use of recycled materials
- **Promote better product design**
 - ▶ Material selection – use of alternative substances
 - ▶ Service, warranty, and longevity
 - ▶ Ease of assembly and disassembly
- **Product energy efficiency improvement**
 - ▶ Climate change
 - ▶ Security of energy resources
- **Economy**
 - ▶ Employment
 - ▶ Source of income
- **Free movement (or not) of parts and products**

Why are harmonized product environmental regulations important?

- Harmonized requirements are generally clearer
- Uniform requirements for an international part supply chain are easier to communicate
- Streamlined execution is simpler
- Data collection and management becomes standardized and easier
- More consistent and accurate data collection and interpretation
- Ensures a higher degree of compliant products
- Levels playing field for economic operators - manufacturers, importers, retailers, distributors
- Allows a simplified, concise approach and communication for economic operators to implement
- Reduces administrative burden along the entire supply chain and for economic operators
- Clear and simple communication for consumers
 - ▶ Consumers are able to use environmental factors in purchasing decisions
- Easier movement of goods worldwide allowing for a wider variety of products
- Government audits and surveillance are more effective and efficient
- Maintains the goals set out by the public, consumers and regulators
- Protects public health and welfare

Factors influencing environmental regulations for IT equipment

- **Product type and use**
 - IT equipment spans a broad range of uses – from household equipment to data center equipment
- **Product longevity**
- **Product development cycles are longer**
- **High performance and reliability requirements**
- **Globalization**
 - Long extended worldwide supply chains
 - Worldwide part and product movement and sales
- **Technology is rapidly changing products; products are more complex**
 - Difficult to write clear and concise legislation that withstands time

Product environmental regulations today

- **Environmental regulations cover many areas of a product, such as:**
 - ▶ Material composition
 - ▶ Energy efficiency
 - ▶ Public health and welfare
 - ▶ Pollution prevention
 - ▶ Product life cycle
- **Environmental regulations cover many types of products, such as**
 - ▶ Household appliances
 - ▶ Lighting
 - ▶ Tools
 - ▶ Toys and leisure equipment
 - ▶ Medical devices
 - ▶ Automobiles
 - ▶ Information Technology equipment

Regions, states and countries with harmonized regulations

versus

Regions, states and countries with divergent requirements

Examples of Harmonized Product Regulations

■ European Economic Area

- New Legislative Framework (NLF) for RoHS and Energy Related Products Directives



■ UN International Treaties producing fairly uniform regulations worldwide

- Globally Harmonized System of classification and labeling of chemicals (GHS)
 - Chemical hazards are clearly communicated to workers and consumers through common classification and labelling of chemicals and safety data sheets
 - Standard statements and pictograms on labels and safety data sheets
 - Many countries have or will adopt this system, e.g., EU Regulation 1272/2008 on classification, labelling and packaging of substances and mixtures
- The Montreal Protocol on Substances that Deplete the Ozone Layer
- Stockholm Convention on Persistent Organic Pollutants (POPs)



■ Energy Efficiency

- International Testing Protocol and Marking requirements for External Power Supplies
 - One set of symbols for marking
 - Testing protocol is accepted in many jurisdictions, allowing for one compliance test to be accepted



Diverging Product Regulations

- **Significant areas of difference**

- ▶ Scope
- ▶ Differing terminology and definitions used for similar terms and concepts
- ▶ Restrictions
- ▶ Labeling
- ▶ Data required, acquisition and management – e.g., material composition, energy usage testing
- ▶ Reporting – formats, data, timing
- ▶ Fees

Examples of diverging regulations

- **Restriction on the Use of Hazardous Substances (RoHS) variants**
 - ▶ 20 jurisdictions outside of EEA with varying RoHS product requirements
 - Similar substances and restriction levels
 - Varying exemptions
 - Varying product scope
 - Varying compliance documentation
 - Varying labels
 - Varying requirements for spare parts
- **Product take-back aka eWaste, product stewardship, producer responsibility**
 - ▶ 25 US States with take-back requirements for electronic products
 - ▶ 28 EU Member States – WEEE Directive
 - ▶ 5 Latin America countries -plus multiple provincial and city regulations
 - ▶ 5 Canadian provinces
 - ▶ 8 Asia Pacific countries
 - ▶ 1 African country

Diverging definitions of “electronic equipment”

Covered electronic device means:

1. “a computer or video display device with a screen that is greater than 4 inches measured diagonally”
2. “a computer central processing unit, a cathode ray tube, a cathode ray tube device, a flat panel display or similar video display device with a screen that is greater than 4 inches measured diagonally and that contains one or more circuit boards”
3. “a desktop or personal computer, computer monitor, portable computer, printer, CRT-based television and non-CRT-based television sold to consumers:
4. “a television, computer or video display device with a screen that is greater than four inches measured diagonally”
5. “a: computer; computer monitor; device containing a cathode ray tube; printer; or television sold to a covered entity”
6. “any of the following categories of equipment: (1) computer central processing unit; (2) computer keyboard; (3) electronic mouse or similar pointing device; (4) television; (5) printer; (6) monitor; (7) computer; and (8) portable digital music player that has memory capability and is battery-powered”
7. “a computer; computer peripheral; small electronic equipment; small-scale server; cathode ray tube; or television”

Electrical and electronic equipment means equipment which is dependent on electric currents or electromagnetic fields in order to work properly and equipment for the generation, transfer and measurement of such currents and fields and designed for use with a voltage rating not exceeding 1 000 volts for alternating current and 1 500 volts for direct current

Eligible electronic device means a device that is one of the following and that is used by a household primarily for personal use or by a school, unless the device is of a kind exempted by a rule promulgated under s.287.17 (10) (i):
1. A consumer computer. 2. A peripheral. 3. A facsimile machine. 4. A digital video disc player. 4m. A digital video player that does not use a disc and that is not a camera. 5. A video cassette recorder. 5m. A video recorder that does not use a cassette and that is not a camera. 6. A consumer video display device. 6m. A consumer printer.

Diverging definitions of “Computer”

1. Computer - A desktop computer or notebook computer.
2. Computer equipment means a desktop or notebook computer and may include a computer monitor or other display device
3. Computer means an electronic machine which, by means of stored instructions and information, performs rapid, often complex calculations or compiles, correlates, and selects data.
4. Computer means a desktop personal computer or laptop computer, including the computer monitor
5. Computer means an electronic, magnetic, optical, electrochemical or other high-speed data processing device performing logical, arithmetic or storage functions and includes, but is not limited to, a central processing unit or both a computer central processing unit and a monitor, such as a notebook, laptop or portable device, but does not include an automated typewriter or typesetter, a portable handheld calculator, a portable digital assistant or other similar device;
6. Computer means a device which performs logical operations and processes data, is capable of using input devices and outputting information to a display, and normally includes a central processing unit (CPU) to perform operations. If no CPU is present, then the device must function as a client gateway to a computer server which acts as a computational processing unit

Diverging definitions of “Monitor”

1. Computer monitor means a display device without a tuner that can display pictures and sound and is used with a computer
2. Computer monitor means a covered electronic device that is a cathode ray tube or flat panel display primarily intended to display information from a central processing unit or the Internet
3. This Standard applies to cathode ray tube monitoring equipment (hereafter ‘CRT monitor’) and liquid crystal display (hereafter ‘LCD monitor’) used for computers using normal electrical network voltages, and also applies to display equipment with modulator/receivers mainly use for computer.
4. Monitor shall mean a separate visual display component of a computer, including a liquid crystal display, plasma screen, cathode ray tube or other image projection technology, that includes a screen that is greater than four inches, when measured diagonally, and one or more circuit boards, whether sold separately or with a computer central processing unit. A “monitor” includes the screen (including its image projection technology), casing, interior wires and circuitry, all exterior and interior cables, and power cords.
5. This Determination covers computer monitors specified in the table following this subsection which are designed to be connected to 230 or 240 volts mains voltage via:
 - (a) a direct connection; or
 - (b) an external power supply permanently connected to the product; or
 - (c) an external power supply that can be disconnected from the product.

Class 1 Computer monitors with a diagonal screen size less than 76 cm (30 inches) and a screen resolution less than or equal to 1.1 Mega Pixels.

Class 2 Computer monitors with a diagonal screen size less than 76 cm (30 inches) and a screen resolution greater than 1.1 Mega Pixels.

Class 3 Computer monitors with a diagonal screen size equal to or greater than 76 cm (30 inches) and equal to or less than 152 cm (60 inches).

Diverging definitions of “Consumer”

1. Consumer means a person from a household
2. Consumer - an individual who uses computer equipment that is purchased primarily for personal or home business use
3. Consumer means a person who owns or uses a covered electronic device that is purchased primarily for personal or home business use.
4. Consumer means a person located in the state who owns or uses covered electronic equipment, including but not limited to an individual, a business, corporation, limited partnership, not-for-profit corporation, the state, a public corporation, public school, school district, private or parochial school or board of cooperative educational services or governmental entity, but does not include an entity involved in a wholesale transaction between a distributor and retailer.

Diverging Interpretations of “Article”

1. US OSHA - "Article" means a manufactured item: (i) which is formed to a specific shape or design during manufacture; (ii) which has end use function(s) dependent in whole or in part upon its shape or design during end use; and (iii) which does not release, or otherwise result in exposure to, a hazardous chemical under normal conditions of use.

2. EU REACH article definition - an object which during production is given a special shape, surface or design which determines its function to a greater degree than its chemical composition.

EU REACH requires suppliers to provide customer information if an article contains a Substance of Very High Concern in a concentration exceeding 0.1 % weight/weight and provide annual government reports

3. Dissenting EU Member States interpretation- “Once an article, always an article.” “When two articles are joined to form an assembled article, they both maintain their status as articles. The 0.1% trigger limit thus apply to each object within an assembled article that fulfils the definition of an article in REACH, and that was an article already before the assembly.”

Ramifications of the interpretation –

Consumer notifications

Tracking of imports and annual reports



Varying substance definitions and restriction levels

1. Polybrominated diphenyl ethers or PBDEs means chemical forms that consist of diphenyl ethers bound with bromine atoms. Polybrominated diphenyl ethers include, but are not limited to, the three primary forms of the commercial mixtures known as pentabromo diphenyl ether, octabromo diphenyl ether, and decabromo diphenyl ether - “no person may manufacture, knowingly sell, offer for sale, distribute for sale, or distribute for use in this state noncomestible products containing PDBEs.”

2. Polybrominated diphenyl ethers (PBDE) - as a group @ 0.1% in homogeneous material

3. Tetrabromodiphenyl ether equal to or below 10 mg/kg (0.001 % by weight) when it occurs in substances, preparations, articles or as constituents of the flame-retarded parts of articles.

Pentabromodiphenyl ether equal to or below 10 mg/kg (0.001 % by weight) when it occurs in substances, preparations, articles or as constituents of the flame-retarded parts of articles

Hexabromodiphenyl ether equal to or below 10 mg/kg (0.001 % by weight) when it occurs in substances, preparations, articles or as constituents of the flame-retarded parts of articles

Heptabromodiphenyl ether equal to or below 10 mg/kg (0.001 % by weight) when it occurs in substances, preparations, articles or as constituents of the flame-retarded parts of articles

Substance restrictions - phthalates

1. **Four phthalates regulated in a grouping – 0.1% by weight of the part**

It is forbidden to import or sell

1.) Products for indoor use which contain one or more of the phthalates specified in Annex 1 in a concentration greater than 0.1% by weight of the parts which contains phthalates.

2) Products in which parts that may come into contact with skin or mucous membranes contain one or more of the phthalates specified in Annex 1 in a concentration greater than 0.1% by weight of the part which contains phthalates.

4 Phthalates in grouping = Bis (2-ethylhexyl) phthalate (DEHP) Benzyl butyl phthalate (BBP) Dibutyl phthalate (DBP) Diisobutyl phthalate (DIBP)

2. **Three phthalates regulated at the individual level – 0.1% weight by weight**

A manufacturer or importer shall not place a substance on the market for a use or use it himself if that substance is ...above a concentration limit of 0.1% weight by weight-

Bis (2-ethylhexyl) phthalate (DEHP)

Benzyl butyl phthalate (BBP)

Dibutyl phthalate (DBP)

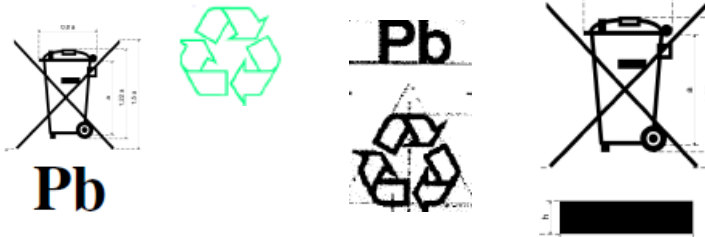
Computer monitors

- **Energy efficiency requirements**
 - ▶ 5 regions with energy efficiency requirements
 - 4 different labels
 - 4 different test reports
 - Multiple declarations



Labeling

"BATTERY MUST BE RECYCLED."



Importador: IBM Brasil Indústria Maq. e Serviços Ltda
CNPJ 33.372.251/0062-78



BATERIA CHUMBO - ÁCIDO SELADA NÃO DERRAMÁVEL

Riscos à Saúde: O contato com componentes internos pode causar irritação ou queimaduras severas nos olhos, sistema respiratório e pele.

Riscos Ambientais: A destinação final inadequada pode poluir a água e o solo, causando impacto negativo ao meio ambiente.

Reciclagem: Ao final da vida útil, por favor, retorne a bateria usada para:

IBM Brasil - Rod Jornalista Francisco A.
Proença SP101 - Hortolândia - São Paulo,
CEP 13186-525,

Aos cuidados de: Coordenador de meio ambiente & químicos,
prédio 10, MM04.

P/N 46T8771
EC L99917



"CONTAINS SEALED LEAD BATTERY. BATTERY MUST BE RECYCLED."

This product/part includes a lithium manganese dioxide battery which contains a perchlorate substance.



Li

Li-ion



Ni-MH



모 델 명 : ABC-12345
최저소비효율기준 만족제품



"Contains Mercury, Dispose According to Local, State or Federal Laws"

ADVERTENCIA

La pila usada es un desecho peligroso para la salud y el ambiente.

La pilas usadas deberán devolverse al momento de adquirir una nueva.



Recommendations

- Harmonized and clear definitions
- Clear and specific scope delineated in the regulation which address the concern
- Simplified and aligned materials restrictions so data can be more readily gathered
- Common metrics
- Use numeric restrictions for substances with a maximum concentration level
- List regulated chemicals with CAS numbers, preferably listing out individually
- Simple graphic labels, avoiding text which takes space and needs translation
- No changes to the meaning of an established label
- Use product labels only for hazard and safety concerns, avoiding consumer confusion and info overload
- Allow use of web based information sources instead of labels and shipping documents
- Common and simple reporting structures and formats
- Acceptance of test reports from competent testing facilities avoiding country unique testing
- Include spare part exemptions to allow for repair and avoid premature product disposal
- Mandatory minimum criteria with voluntary additional criteria allowing consumer choices

Conclusions

- **Product environmental regulations are growing at a rapid rate**
 - ▶ Now is the time to encourage and create harmonized requirements
- **Benefits of globally harmonized requirements**
 - ▶ Requirements generally are clearer
 - ▶ Uniform requirements for an international part supply chain are easier to communicate
 - ▶ Streamlined execution is simpler
 - ▶ Data collection, management and interpretation are more standardized, consistent and accurate
 - ▶ Ensures a higher degree of compliant products
 - ▶ Levels the playing field for economic operators - manufacturers, importers, retailers, distributors
 - ▶ Simplified, concise approach and communication for economic operators to implement
 - ▶ Reduction in administrative burden along the entire supply chain and for economic operators
 - ▶ Reduction in production costs
 - ▶ Clear and simple communication for consumers
 - ▶ Consumers are able to use environmental factors in purchasing decisions
 - ▶ Easier movement of goods worldwide, allowing a wider variety of products
 - ▶ Government audits and surveillance are more effective and efficient
 - ▶ Maintains the goals set out by the public, consumers and regulators
 - ▶ Protects public health and welfare

Thank you!

Questions?