

# BE1M13VES

## Manufacturing of Electrical Components

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CTU in Prague

Prague, 2017

# Overview

- 1 EU Market
- 2 Motivation for Solving WEEE
- 3 Legislation

# TOPIC

## 1 EU Market

## 2 Motivation for Solving WEEE

## 3 Legislation

# EU Members

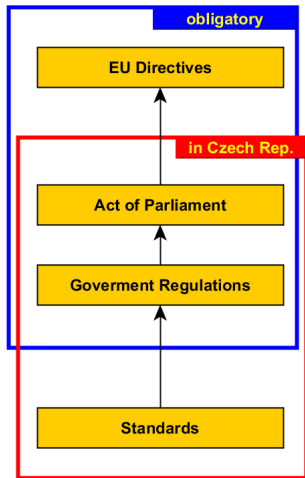


## EU members:

Austria,  
Belgium,  
Bulgaria,  
Croatia,  
Cyprus,  
Czech Republic,  
Denmark,  
Estonia,  
Finland,  
France,  
Germany,  
Greece,  
Hungary,  
Ireland,

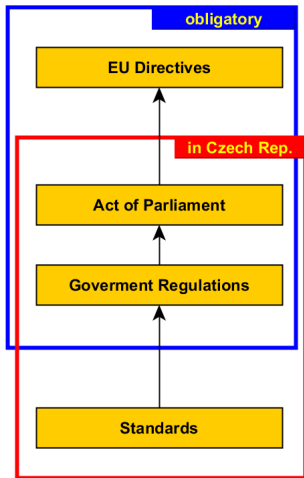
Italy,  
Latvia,  
Lithuania,  
Luxembourg,  
Malta,  
Netherlands,  
Poland,  
Portugal,  
Romania,  
Slovakia,  
Slovenia,  
Spain,  
Sweden,  
United Kingdom

# Documents



- EU Directives are obligatory for all EU members,
- each country includes the directives in its legal system,
- the act of parliament (laws) and government regulations fulfill this task in the legal system of Czech Republic,
- the standards are considered as recommendation (not obligatory) in Czech Republic,

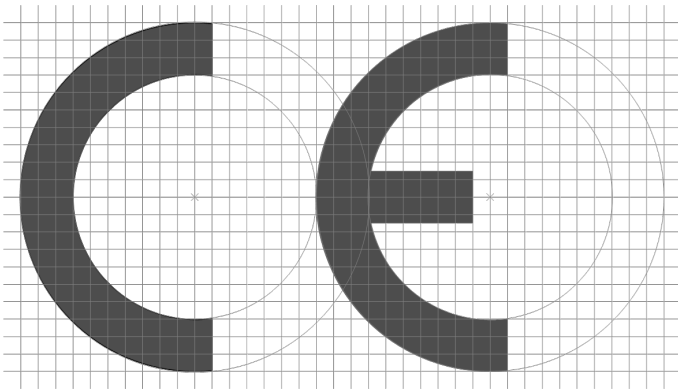
# Documents



- meeting standards requirements is an assumption for meeting Directive requirements,
- a product fulfilling the directive requirements is marked by CE symbol and the declaration of conformity is released.

# CE Mark

**The symbol is defined in regulation ES 765/2008, which is complementary to Decision No. 768/2008/EC on a common framework for the marketing of products:**



# Declaration of Conformity Content - Decision 768/2008/EC

- 1 A product identification number (serial number).
- 2 The name and address of the manufacturer or his authorized representative;
- 3 **This declaration of conformity is issued under the sole responsibility of the manufacturer (or installer).**
- 4 Object of the declaration (identification of product allowing traceability. It may include a photograph, where appropriate);
- 5 **The object of the declaration described above is in conformity with the relevant Community harmonization legislation:** List of directives



# Declaration of Conformity Content - Decision 768/2008/EC

- 6 References to the relevant harmonized standards used or references to the specifications in relation to which conformity is declared.
- 7 Where applicable, the notified body... (name, number)... performed... (description of intervention)... and issued the certificate.
- 8 Additional information.

Signed for and on behalf of: .....

# Declaration of Conformity Example

## DECLARATION OF CONFORMITY

### Manufacturer:

KILOVOLTIK s.r.o  
Amper 789, Prague, 123 45  
IČ: 999 9999

This declaration of conformity is issued under the sole responsibility of the manufacturer (or installer):

Voltage source KVolt  
Type: 100 V/ 500 W  
Serial number: KV978-231

The object of the declaration described above is in conformity with the relevant Community harmonization legislation:

- |                  |                   |
|------------------|-------------------|
| - <b>EMC:</b>    | <b>2014/30/EU</b> |
| - <b>Safety:</b> | <b>2014/35/EU</b> |
| - <b>RoHS:</b>   | <b>2011/65/EU</b> |

List of used standards:

- |                       |                    |
|-----------------------|--------------------|
| - ČSN EN 61010-1:1995 | - ČSN EN 61000-4-3 |
| - ČSN EN 60065:2000   | - ČSN EN 61000-4-4 |
| - ČSN EN 61000-4-2    | - etc.             |

In Prague, 2. 2. 2017    Ing. Miroslav Chrabrý  
Chief Manager

# Notes

- Products fulfilling requirements of EU directives are free to move across EU market.
- Test results from notified laboratory (notified body) are acknowledged in all member countries.
- Producer is responsible for his products. He must elaborate technical documentation and record complaints.

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# Problems of Electronic and Electrical Waste

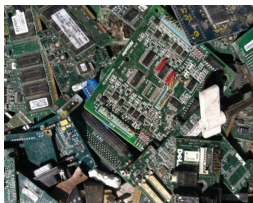
## WEEE = Wasted Electronic and Electrical Equipment

### ■ Material reasons:

- A lot of small equipments are containing very expensive (heavy/precious) metals (Au, Ag, Pb, Ta, Ni, Co, Cd, Pd, ...).

### ■ Ecological reasons:

- Using of hazardous substance during production flow
- Presence of some toxic substances in WEEE (batteries, accumulators, soldering, SMD components etc.)



# Electronic Waste Production

- continual increase of no. of mobile phones, PCs,
- increasing complexity and sophistication of equipments.

WASTE ▼	TIME ▶	2012	2013	2014	2015
		Waste in tonnes			
Automatic dispensers		64	50	52	192
Consumer equipment and photovoltaic panels		13.877	12.308	12.769	13.832
Consumer equipment		:	:	:	13.793
Photovoltaic panels		:	:	:	39
Electrical and electronic tools		827	652	999	1.773
IT and telecommunications equipment		10.047	8.753	8.813	12.481
Large household appliances		24.303	25.925	27.828	36.581
Lighting equipment		263	881	529	590
Gas discharge lamps		813	931	808	781
Medical devices		50	117	92	140
Monitoring and control instruments		94	166	192	187
Small household appliances		2.994	4.112	6.235	7.514
Toys, leisure and sports equipment		352	319	268	219
Total Waste		53.685	54.215	58.585	74.288

Collected waste in CR, source: <http://ec.europa.eu/eurostat/web/waste/key-waste-streams/weee>

# Impact of WEEE on environment

- Consumption of non-renewable sources - use of expensive metals like Hg, Pb and a lot of not-recycled materials
- **Consumption of energy** - necessary for recycling of WEEE
- Using of hazardous chemical materials in WEEE - Cd, Ta, Co, Cr, Pd, Pb, Hg
- Necessity of a new places for junk

# EU Attitude towards WEEE

*The EU sets the obligation for all Member States of retrograde purchasing. Also recycling of WEEE is mandatory.*

## Basic aims:

- prevention in WEEE branch,
- increase of volume of recycled equipments,
- minimizing of WEEE as a municipal waste,
- responsibility is on the producer!!! (basic principle) during the whole life-time of EEE (LCA = Life Cycle Assessment).



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# Law no. 185/2001 Sb.

## Czech law about wasted materials: no. 185/2001 Sb.

- It processes several EU directives about wasted materials handling.
  - **(RoHS1)** 2002/95/ES Restriction of the use of certain Hazardous Substances in electrical and electronic equipment
- Implementation is ensured via specific „Government Regulations“.
- It covers responsibilities, waste sorting, fines, waste treatment etc.

# Law no. 185/2001 Sb.

## ■ Wasted Electronic and Electrical Equipment (WEEE)

*„is product, which functionality depends on electrical current or on electromagnetic field, or which is determinate for production, transport, measuring of electrical current or electromagnetic field. It is dedicated for all equipments supplied from 1000 VAC up to 1500 VDC.“*

- WEEE - all household products are considered as WEEE after finishing their life-time.

# Law no. 22/1997 Sb.

## Czech law about technical requirements for products: no. 22/1997 Sb.

- It considers the requirements for devices released to the market.
- Several EU Directives are covered via „Government Regulations“

- *GR no. 86/2011 Sb. about technical requirements of toys (Directive 2009/48/ES),*
- *GR no. 54/2015 Sb. about technical requirements of medical care equipment (Directives 93/42/EHS, updated in 98/79/ES, updated in 2000/70/ES, ..., updated in 2007/47/ES),*
- *...,*
- ***GR no. 481/2012 about restricted use of dangerous materials in electric devices.***

# Directive 2011/65/ES RoHS

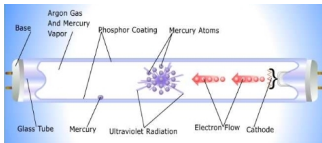
## (RoHS2) 2011/65/ES Restriction of the use of certain Hazardous Substances in electrical and electronic equipment

- It is covered by GR no. 481/2012 Sb. in Czech Republic
- Restricted materials:

	Substance	Concentration
Pb	Lead	0,1 %
Hg	Mercury	0,1 %
Cd	Cadmium	0,01 %
Cr	Hexavalent chromium	0,1 %
PBB	Polybrominated biphenyls	0,1 %
PBDE	Polybrominated diphenyl ethers	0,1 %

# Directive 2011/65/ES RoHS, Consequences

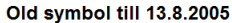
- There is a lot of exceptions in the directive:
  - **Hg** in fluorescent tube,
  - **Pb** in fluorescent tube glass, as an alloying element in steels, in some solders for specific use,
  - **Cd** in LEDs, ...
- Soldering - just Pb and Cd-free !!! (higher temperature, lower reliability, no advantages)
- NiCd batteries are replaced by NiMH batteries (little worse service life)



# What belongs to WEEE?

- 1 Big household appliances (freezers, washing machine, cookers, etc.)
- 2 Small household appliances (fan, kettle, elec. shavers)
- 3 Equipment of ITC, printers, photocopiers
- 4 Consumer equipment (TV, Hi-Fi, DVD player...)
- 5 Lighting systems
- 6 Hand-held electrical tools (screwdrivers, grinders, drills...)
- 7 Toys, sports accessories
- 8 Medical equipments (exception for implanted equipments - pacemakers)
- 9 Regulating apparatus, sensors (e.g. for heating),
- 10 Automatic machines for coins, coffee, etc.

- He must be registered on the Ministry of the Environment of the Czech Department
- He provides marking of products as follows:
  - CE mark - Declaration of Conformity
  - symbol (name) of producer
  - symbol of WEEE





# Waste Management

- *Producers must provide collection point for WEEE,*
- *customers must be informed about these places.*

## Obligations:

- Reverse collection
  - Collecting of used WEEE from household.
  - Collecting of used WEEE from companies, from production lines, etc.
- Usage of WEEE
  - Using once again without any other processing - good idea, but it does not work at all.
  - Separation of basic materials and elements for second usage (energy and processing necessary).

# Companies Recycling WEEE



- ASEKOL
- REMA
- RETELA
- SAFINA a.s.
- Kovohutě Příbram a.s.
- MHM eko s.r.o.



Paper



Plastic



Glass



Paper+Al