



## RoHS /WEEE

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### RoHS - Restriction of the use of certain hazardous substances

### WEEE - Collection and recycling of waste electrical and electronic equipment

The **EU Directive 2011/65/EU** aims to restrict the use of certain hazardous substances in electrical and electronic equipment. It regulates the use and placing on the market of hazardous substances in electrical appliances and electronic components.

Directive 2011/65/EU (*RoHS 2*) replaced the predecessor Directive 2002/95/EC (*RoHS 1*) on 3 January 2013. Both directives are unofficially abbreviated to RoHS, Restriction of [the use of certain] Hazardous Substances.

The **EU Directive 2012/19/EU**, unofficially abbreviated to **WEEE**, regulates financial and other responsibilities of manufacturers of electrical and electronic equipment with regard to the collection and recycling of waste.

The objective of the RoHS Directives is to remove problematic components from the banish. This includes, among other things, replacing leaded soldering of electronic components with unleaded soldering, prohibiting environmentally harmful flame retardants in cable insulation and promoting the introduction of equivalent replacement products as much as possible. Furthermore, the electrical components and components used must also be free of the problematic materials.

Companies that import or distribute such equipment within the EU are directly affected by these directives as they are obliged to ensure compliance.

### RoHS / WEEE implementation in Europe: Different from state to state

Each of the directives contains obligations and requirements to be complied with by EU member states. However, each Member State can define its own framework as to how best to achieve the EU objectives. Therefore, account must be taken of companies operating in the EU that national rules on the implementation of these directives differ from country to country.



## Substances and limit values

Some of the substances used in electrical engineering are considered to be hazardous to the environment. On the one hand, they have a toxic effect from certain quantities, on the other hand they cannot be degraded by the environment or can only be degraded poorly. The RoHS guidelines are intended to minimise the entry of these substances into the environment.

In particular, this affects:

- Lead (Pb), 0.1% => Use in solder joints, among others
- Mercury (Hg), 0.1% => Use among others in inclination switches, mercury vapour rectifiers
- Cadmium (Cd), 0.01% => Use in nickel-cadmium accumulators
- Hexavalent chromium (Cr VI), 0.1% => Use as a component of paints and varnishes, wood preservatives
- Polybrominated biphenyls (PBB), 0.1% => flame retardants in plastic insulation
- Polybrominated diphenyl ethers (PBDE), 0.1% => flame retardants in plastic insulation

On 31 March 2015, the delegated Directive (EU) 2015/863 added the following substances, which EU Member States had to implement until 22 July 2019 (end of the transition period):

- Bis(2-ethylhexyl)phthalate (DEHP), 0.1% => Use as plasticizer in PVC
- Benzyl butyl phthalate (BBP), 0.1% => Use as plasticizer in plastics
- Dibutyl phthalate (DBP), 0.1% => Use as plasticizer in plastics
- Diisobutyl phthalate (DIBP), 0.1% => Use as plasticizer in plastics

According to Annex II of Directive 2011/65/EU (RoHS 2), the percentages are the maximum permissible maximum concentrations in homogeneous materials by weight. In the previous and now superseded Directive 2002/95/EC (RoHS 1, Article 4, paragraph 1), no limit values were defined, which meant that these substances could not in principle be contained in products. This absolute ban on content was replaced in 2005 by economically feasible and measurable limit values.

## CE Declaration of Conformity

Since 2011, compliance with the RoHS Directive has been a prerequisite for the CE mark to be affixed to the affected devices. Compliance with the RoHS Directive must be confirmed in the CE Declaration of Conformity.

## Implementation

The implementation of the RoHS Directives requires a change over many widely used production processes. The use of lead-free soldering tin is often seen as problematic. As a replacement of the lead-containing alloys, tin-silver, tin-copper and tin bismuth are used in non-safety-critical applications, which usually represent a deterioration in the quality of the solder joint or an increase in costs.

Since experience of the long-term reliability of the new soldering alloys is not yet available, and failures of defective soldering points in safety-relevant areas, such as cars, aerospace and medicine, as well as the military, there are a number of exceptions to the use of unleaded soldering tin.

## Exceptions

There are some exceptions for certain device groups, applications, components and materials. The precise list of exceptions is documented in Article 4, Annex III and Annex IV of Directive 2011/65/EU. These exemptions are all temporary, but can be extended or amended in part by applications to the EU Commission.

Examples and incomplete list of some specific exceptions:

- Mercury in compact fluorescent lamps at a maximum of 5 mg per lamp. (From 2012 3.5 mg, from 2013 2.5 mg).
- Lead in the glass of cathode ray tubes, electronic components and fluorescent tubes.
- Lead as an alloying element in steel with a lead content of up to 0.35 % by weight, in aluminium with a lead content of up to 0.4 percent by weight and in copper alloys with a lead content of up to 4 percent by weight.
- Lead in high-melting solders (i.e. lead-based soldering alloys with a mass content) at least 85% lead).
- Hexavalent chromium as a corrosion protection agent of the carbon steel cooling system in absorption refrigerators.
- Lead in lead bronze bearing shells and bushings.
- Lead in press-fit connectors with flexible zone.
- Lead in starter batteries for motor vehicles.

## General obligations

In all cases, manufacturers are obliged to:

- mark devices, so that the manufacturer or placer on the market can be clearly identified.
- make sure, that the listed critical substances are no longer used in new devices (RoHS).
- participate in national return systems prior to the placing on the market of electrical and electronic equipment in the EU or, if necessary, to be registered in appropriate national registers (WEEE).

## GROHE

GROHE takes RoHS requirements into account within the framework of CE compliance and participates in corresponding return systems for electrical and electronic equipment throughout Europe.