

# Implications of RoHS 2 for footwear production

From 22nd July 2019, footwear containing electronics will require 'CE marking' in accordance with the requirements in RoHS 2. This may require additional chemical testing, as LUCY COVE explains.

The highly competitive nature of the footwear industry has driven the innovation of a broad range of design features, as brand owners strive to make their products unique and desirable. Many of these design features use electronic components to enhance the product, which has important implications for both the health and safety of the consumer and the safe disposal of the product. It is essential to ensure that any products placed on the market are compliant with all relevant legislation. For footwear and other products containing electronics, this includes the Restriction of Hazardous Substances in Electrical and Electronic Equipment Directive ('RoHS').

## The RoHS 2 Directive

RoHS was adopted in 2003. It was introduced to protect human health and the environment by imposing restrictions on certain dangerous substances, and to set rules for the safe disposal of electrical and electronic equipment ('EEE'). The scope of RoHS included products dependent upon electrical currents or electromagnetic fields to fulfill their primary function only, and so footwear was not considered within this definition. However, in 2011, an update to the directive (2011/65/EU) – known as 'RoHS 2' – was introduced. This expanded the scope to encompass products with secondary electronic functions, including any

consumer product with enhancements that relies upon electronics.

Examples of such functions in footwear include the addition of light-emitting diodes ('LED') or sound chips to make the item more appealing to children, or the use of heated footbeds in products intended to be worn in extreme weather conditions. When RoHS 2 was introduced, phase-in dates were assigned for categories of products which were not included in the scope of the 2003 directive. The phase in date for Category 11 (which includes footwear) is 22nd July 2019. Any footwear containing an electronic component which is made available on the market after this date



Shoes incorporating lights are covered by the RoHS 2 legislation

will need to comply with the requirements of RoHS 2. This includes all articles which are already on the market prior to this date.

**RoHS 2 requirements – CE marking**

One of the major changes introduced in RoHS 2 is the requirement for EEE to be ‘CE marked’. This means that the manufacturer (or an authorised representative) must issue a written declaration stating that their product conforms with the directive. This declaration must be supported by a technical file, with information relating to the construction of and materials used in the product, as well as test reports to demonstrate compliance. The declaration of conformity does not need to be authorised by a Notified Body, but it is subject to the general principles set out in article 30 of Regulation (EC) No 765/2008. In this respect, the process is identical to the way Category I (‘simple category’) personal protective equipment (PPE) is self-certified.

**Chemical requirements**

The hazardous substances restricted by the RoHS 2 Directive are listed in Annex II of this document, and these are summarised in table 1. An important point to note is that these restrictions apply to all materials contained within the product, not only the electronic components. They include four heavy metals, two groups of flame retardants and four specific phthalate plasticisers, all of which have a variety of uses in the manufacture of a range of consumer goods – not only footwear.

Mercury and lead – two of the restricted heavy metals – can be present in certain types of solders or switches. These elements are both highly toxic and could produce severe environmental effects if they are not correctly disposed of. Another of the restricted metals, cadmium, is used in pigments and stabilisers for plastics and polymers. It is restricted to a maximum of 0.01 per cent (100 parts per million – ‘ppm’), which reflects the REACH Regulation (EC) No 1907/2006 Annex XVII entry 23 requirement. Hexavalent chromium (‘chromium VI’) is restricted to a maximum of 0.1 per cent. This may be present in anti-corrosion finishes of metals, and could also be present as a contaminant in

Substance	Maximum concentration by weight in homogenous articles
Cadmium	0.01 per cent
Lead	0.1 per cent
Mercury	0.1 per cent
Hexavalent chromium	0.1 per cent
Polybrominated biphenyls (PBB)	0.1 per cent
Polybrominated diphenyl ethers (PBDE)	0.1 per cent
Bis (2-ethylhexyl) phthalate (DEHP)	0.1 per cent
Butyl benzyl phthalate (BBP)	0.1 per cent
Dibutyl phthalate (DBP)	0.1 per cent
Diisobutyl phthalate (DIBP)	0.1 per cent



Electronics may also be used to heat footwear worn in extreme weather conditions



Mercury and lead can be present in certain types of solders or switches

## Key obligations for footwear classified as EEE

- manufacturers must ensure that a type, batch or serial number, or means of identification, is included on the item, its packaging or supporting documentation
- manufacturers and importers must ensure that their name and contact address is included on the item, its packaging or supporting documentation
- the manufacturer (or importer if the manufacturer is based outside of the EU) must assume responsibility by drawing up the EU Declaration of Conformity in order to affix the CE mark before the EEE is placed on the market
- manufacturers and importers must keep the technical documentation and EU declaration of conformity for ten years after the EEE has been placed on the market
- producers need to appropriately mark the product with the 'crossed out wheelee bin' symbol indicating separate collection of EEE (instruction from directive 2012/19/EU article 14)
- manufacturers must make sure that procedures are in place to ensure ongoing conformity, taking into account changes to the product design and characteristics, as well as updates to the harmonised standards.

The full list of obligations is included in articles 7 to 10 of Directive 2011/65/EU.

chromium-tanned leather. Chromium VI is classified as a carcinogen, and can also cause skin irritation.

The two flame retardant groups – polybrominated biphenyls (PBBs) and polybrominated diphenyl ethers (PBDEs) – encompass a range of chemicals containing bromine atoms. These compounds have been manufactured to have a long half-life to ensure their continued effectiveness, meaning that they break down very slowly. Because of this, they are classified as persistent organic pollutants, and present a significant environmental hazard.

In 2015, (EU) 2015/863 – an amendment to the RoHS 2 Directive – added four phthalate plasticisers to the list of restricted substances. These plasticisers are often used in the manufacture of polymers such as polyvinyl chloride (PVC) and polyurethane (PU) to increase their softness and suppleness. A common use of PVC is in the insulation of electrical wiring, while both PVC and PU are used in coated textiles and leathers, making these components of particular concern for the restricted phthalates. Three of the four phthalates are also restricted in toys and

childcare articles under REACH Annex XVII entry 51 and, although footwear does not fall within the scope of this restriction, many brand owners and retailers have already included these three phthalates on their restricted substances lists.

## Other legislation

As well as RoHS 2, there are additional European directives that may be relevant to EEE. The 2006/66/EC 'Batteries Directive' introduced regulations on the manufacture, labelling and disposal of batteries within the European Union, in order to reduce the release of dangerous heavy metals such as lead and cadmium into the environment. The Waste Electrical and Electronic Equipment 2002/96/EC Directive ('WEEE'), which was replaced by the 2012/19/EU Directive, introduced similar disposal requirements. The aim of these requirements is to increase the number of electrical products that are recycled. In addition to this, all consumer products must conform to the Annex XVII restricted substances requirements in REACH 1907/2006. Everyone involved in the supply chain must be aware of their legal obligations if any of the Candidate List Substances of Very High Concern are present above 0.1 per cent.

SATRA can help members by assessing footwear containing electronic components to determine the levels of any restricted substances mentioned in the updated RoHS 2 Directive. Testing can be used to show conformity to this directive, and although the restrictions do not apply to products placed on the market until after 22nd July 2019, suppliers, brand owners and retailers will be expected to show compliance before this date. SATRA can also offer REACH and restricted substances training and testing services in our chemical testing laboratory.

## How can we help?

Please contact SATRA's chemistry team for assistance with the testing of products and components in line with the RoHS 2 Directive.



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