

# GUIDE

## FOR THE IMPLEMENTATION OF THE RoHS DIRECTIVE

BY MANUFACTURERS OF ELECTRICAL EQUIPMENT

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This guide will be updated next month, in order  
to integrate the harmonised vision of the European industry.  
This one is being discussed within ORGALIME.



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# 1 | CONTENTS OF THE DIRECTIVE AND SCOPE OF APPLICATION

- 1.1 Purpose of the Directive
- 1.2 Scope
- 1.3 Terms and definitions
- 1.4 Remanufactured equipment
- 1.5 Exemptions

# 2 | WHAT INFORMATION NEEDS TO BE PROVIDED TO THE CUSTOMER?

- 2.1 Products falling within the scope of the RoHS Directive
  - 2.2 Products falling outside of the scope of RoHS Directive
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# FOREWORD

ANY PRODUCT, INCLUDING GOODS AND SERVICES,  
CARRIES WITH IT AN IMPACT ON THE ENVIRONMENT.

Any product, including goods and services, carries with it an impact on the environment. This impact may be manifested at any stage of the life cycle of the product, and can be assessed by certain indicators. This assessment must be based on multiple criteria if it is to avoid pollution transfer, and must consider natural resource depletion, energy consumption, air emission, the discharge of waste into water, etc.

For this reason, manufacturers of electrical equipment are currently promoting a global environmental approach, taking into account a whole range of environmental criteria.

In this general context of environmental concern, which aims to prevent risks to human health and the environment, public authorities in particular have decided to restrict the use of certain substances in Electrical and Electronic Equipment (EEE).

Directive 2002/95/EC (known as the "RoHS<sup>1</sup> Directive") limits the use of lead, cadmium, mercury, hexavalent chromium polybrominated biphenyls and polybrominated diphenylethers in the manufacture of specified items of equipment as from 1 July 2006.

**The purpose of this guide is to explain the content of Directive 2002/95/EC and to define its effect on sectors of electrical equipment manufacturing, from electrical installation devices to automation systems to medium-and high-voltage equipment.**

This guide presents a European vision shared by the electrical industry in the UK, Italy, France and Germany. This document is for informational purposes only and has no legal standing. It should not be substituted for professional legal advice.

Most electrical installation devices, automation systems, and medium-and high-voltage equipment are outside the scope of the RoHS Directive. Nevertheless, this guide provides guidelines to help manufacturers hold intensive "environmental" dialogues with their suppliers and customers, and to meet their customers increasing demands that relate to compliance with **Directive 2002/95/EC** (even if they are not in the scope).

<sup>1</sup> "Restriction of Hazardous Substances"

# 1 CONTENTS OF THE DIRECTIVE AND SCOPE OF APPLICATION

## 1.1 PURPOSE OF THE DIRECTIVE

As of 1 July 2006, Directive 2002/95/EC on the Restriction of Hazardous Substances (RoHS) restricts the use of lead, cadmium, hexavalent chromium, mercury and brominated flame retardants in some types of electrical and

electronic equipment placed on the market within the European Union.

The RoHS Directive is based on Article 95 of the EC Treaty and Member States shall not adopt stricter measures.

## 1.2 SCOPE

The RoHS Directive applies to certain types of electrical and electronic equipment that are "put on the market" (see 1.3) after 1 July 2006. Manufacturers of components, sub-assemblies, and spare parts for such equipment are also affected. In order to address some of the questions relating to the scope of the RoHS Directive, the French industry has developed a decision tree that identifies the various criteria for determining whether specific equipment falls under the scope of the RoHS Directive.

The European industry is defining a common decision tree, validated by all the European countries. The present decision tree will be updated in the next month in order to integrate the conclusions of European discussions.

The Directive relates to Electric and Electronic Equipment (EEE) that are "put on the market" as finished products with a direct function.

However, as the directive addresses material contents, restriction of material use in a given finished product indirectly might imply the same requirements to all of its parts (material, components, sub-assemblies) apart from exempted applications that are listed in the annex to the directive itself.

Single components or parts of finished products are not in the scope of the RoHS Directive and do not need to meet any RoHS compliance requirements.

As a result, table 1 lists examples of products that are not affected by the RoHS Directive.

Actually, only a limited number of product types covered by our industry sector fall explicitly within the scope of the directive (see annex 1A of the Directive), including:

- Large household appliances
  - Small household appliances
  - IT and telecommunications equipment
  - Consumer equipment
  - Lighting equipment
- Electrical and electronics tools, with the exception of large-scale stationary industrial tools<sup>2</sup>
  - Toys, sports and leisure equipment
  - Automatic dispensers

## EXAMPLE OF EXCLUDED PRODUCTS

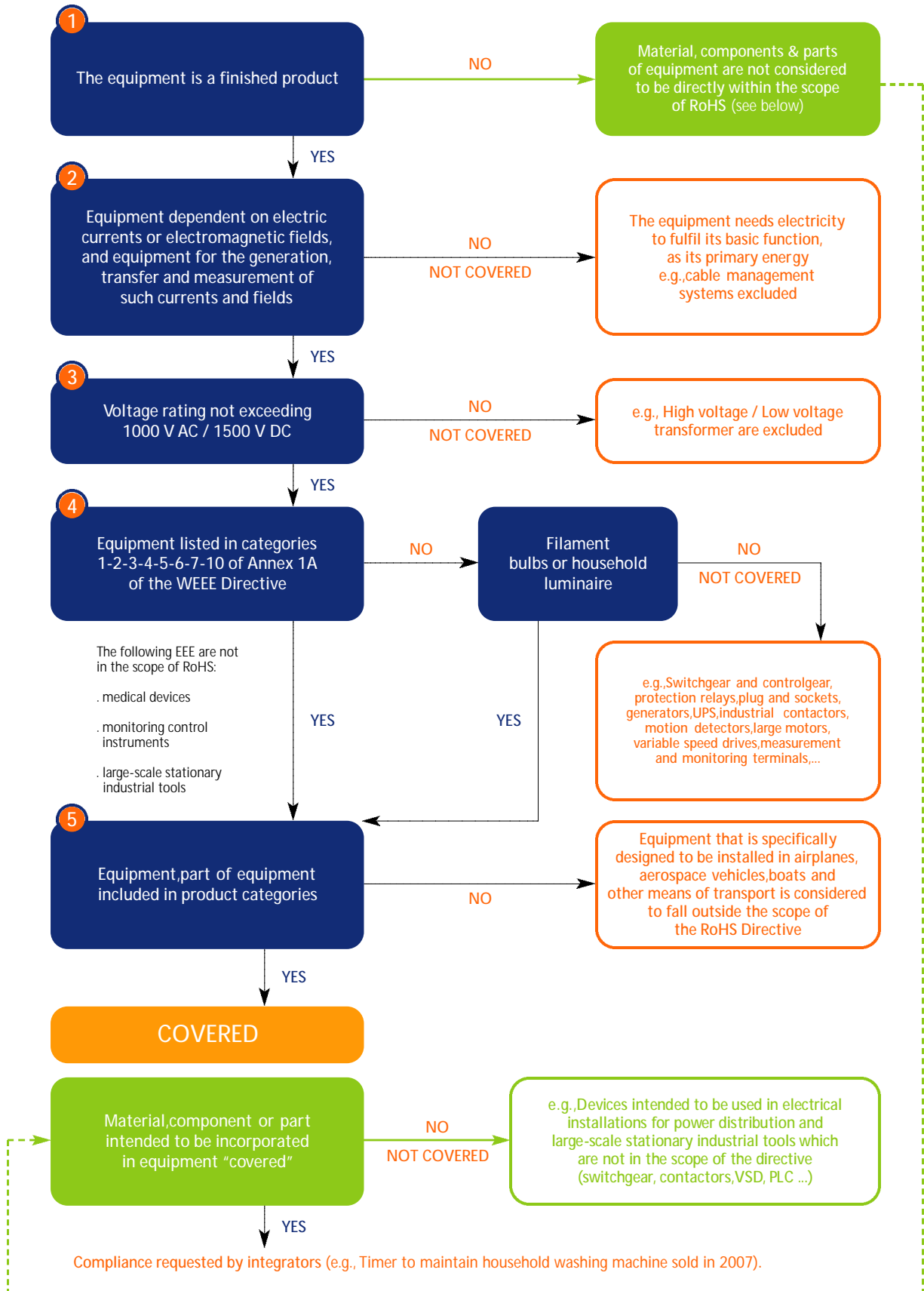
EXAMPLES OF PRODUCTS NOT AFFECTED, unless they are part of product covered by the directive <sup>3</sup>	EXPLANATION
Insulators, trunking and cable trays, generating sets...	The RoHS Directive only applies to "equipment which is dependent on electric currents or electromagnetic fields in order to work properly and equipment for the generation, transfer and measurement of such currents and fields"
<ul style="list-style-type: none"> <li>• Switchgear and controlgear</li> <li>• Distribution Boards and Motor Control Centres</li> <li>• Circuit-breakers</li> <li>• Fuses</li> <li>• Protection relays</li> <li>• Surge protection devices</li> <li>• Installation switches</li> <li>• Plug and sockets, ...</li> <li>• Alternators, generators, uninterruptible power supply (UPS)</li> <li>• Power transformers</li> <li>• Contactors</li> <li>• Industrial robots</li> <li>• Motion detectors</li> <li>• Large Motors</li> <li>• Variable speed drives</li> <li>• Programmable Logic controllers</li> <li>• Electrical meters...</li> </ul>	<ul style="list-style-type: none"> <li>• Not listed in the categories 1, 2, 3, 4, 5, 6, 7 and 10 of Annex 1A of the WEEE Directive</li> </ul> <p>and/or</p> <ul style="list-style-type: none"> <li>• used in electrical installations for power distribution, which are not in the scope of the directive</li> </ul> <p>and/or</p> <ul style="list-style-type: none"> <li>• used in Large-scale stationary industrial tools which are explicitly excluded from the scope of the directive</li> </ul>

**2 Note:** *In contrast to large-scale stationary industrial tools, small and mobile electrical tools (e.g.: electrical screw drivers) are in the scope of the directive. In practice, they can be defined as electrical equipment which meet the following criteria :*

- . they are finished product with a direct function
- . they are placed on the market as a single functional or commercial unit
- . they can be used in any place without specific installation/erection needs. In practice, they shall be fitted with a standard plug that can be connected directly to any standard socket.

**3** See the decision tree overleaf.

### RoHS DECISION TREE EEE TO BE IN OR OUT



## 1.3 TERMS AND DEFINITIONS

A stable legal framework is needed. Common definitions are necessary to ensure that the technical requirements for all "RoHS compliant" electronic and electrical products are exactly the same in all Member States in order to ensure free movement and smooth market access for all electrical and electronic products in the EU once the Directive enters into force.

### MAXIMUM CONCENTRATION VALUES (MCVS)

The RoHS Directive limits the maximum concentration values of certain substances.

For the purposes of Article 5-(1)-(a) the Commission services have published a decision whereby a maximum concentration value of 0.1% by weight in homogeneous materials for lead, mercury, hexavalent chromium, polybrominated biphenyls (PBB), and polybrominated diphenyl ethers (PBDE) and of 0.01% weight in homogeneous materials for cadmium are allowed.

The actual concentration value is obtained by dividing the weight of the substance by **the weight of the homogeneous material that contains this substance**.

### HOMOGENEOUS MATERIAL

Homogeneous material means a material that can not be mechanically disjointed into different materials.

Definitions : The term "homogeneous" means "of uniform composition throughout". Examples of "homogeneous materials" are individual types of: plastics, ceramics, glass, metals, alloys, papers, resins, and coatings.

The term "mechanically disjointed" means that the materials can, in principle, be separated by mechanical actions such as: unscrewing, cutting, crushing, grinding and abrasive processes.

## EXAMPLES

- A plastic cover is a "homogeneous material" if it is made of a single type of plastic and is not coated with or attached to (or if it envelopes) any other kinds of materials. In this case the limit values of the directive would apply to the plastic.
- An electric cable that consists of metal wires surrounded by non-metallic insulation materials is an example of a "non homogeneous material" because the different materials could be separated by mechanical processes. In this case the limit values of the directive would apply to each of the separated materials individually.
- A semi-conductor package contains many homogeneous materials that include; plastic moulding material, tin-electroplating coatings on the lead frame, the lead frame alloy and gold-bonding wires.

### "PUT ON THE MARKET"

"Put on the market" is the initial action of making an EEE available for the first time on the

Community market with a view to distribution or use.

*According to the Frequently Asked Questions on Directives WEEE & RoHS, published in May 2005 by the European Commission, DG Environment, "Put on the market" is the initial action of making a product available for the first time on the Community market.*

*This takes place when the product is transferred (e.g. physical hand-over or transfer of ownership) from the producer to a distributor or final consumer or user on the Community market.*

*"Making a product available for the first time" refers to each individual piece of equipment put on the market after the date of the substance's restrictions (that is, 1 July 2006), and not to the launch of a new product or product line. Moreover the concept of putting on the market refers to each individual product and not to a type of product, irrespective of whether it was manufactured as an individual unit or as part of a series.*

*The same or a similar term is used in many directives, such as internal market directives based on the New Approach and the Global Approach.*

*The guide<sup>4</sup> to the implementation of directives based on the New Approach and the Global Approach defines "placing on the market" as follows:*

*« Placing on the market is the initial action of making a product available for the first time on*

*Retailers and distributors who have non-RoHS compliant products in their warehouses after 1st July 2006 can legally sell such products, provided these products were put on the market*

*the Community market, with a view to distribution or use in the Community.*

*Making available can be either for payment or free of charge [...] A product is placed on the Community market when it is made available for the first time. This is considered to take place when a product is transferred from the stage of manufacture with the intention of distribution or use on the Community market. [...]*

*The transfer of the product takes place either from the manufacturer, or the manufacturer's authorised representative in the Community, to the importer established in the Community or to the person responsible for distributing the product on the Community market.*

*The transfer may also take place directly from the manufacturer, or authorised representative in the Community, to the final consumer or user.*

*The product is considered to be transferred either when the physical hand-over or the transfer of ownership has taken place. This transfer can be for payment or free of charge, and it can be based on any type of legal instrument.*

*Thus, a transfer of a product is considered to have taken place, for instance, in the circumstances of sale, loan, hire, leasing and gift. »*

*before 1st July 2006. Retailers and distributors cannot require producers to take back such products.*

## 1.4 REMANUFACTURED EQUIPMENT

The Directive "does not apply to spare parts for the repair, or to the reuse, of electrical and electronic equipment put on the market before 1 July 2006". However such spare parts cannot be used to repair new equipment.

The key date is therefore the date that the original product was "put on the market," not when it was returned for repair and/or capacity expansion and/or upgrade.

<sup>4</sup> The guide to the implementation of directives based on the New Approach and Global Approach, published in 2000 by the European Commission, DG Enterprise. See : <http://europa.eu.int/comm/enterprise/newapproach/legislation/guide/legislation.htm>

The use of non-RoHS compliant material in EEE products put on the market before 1st July 2006 for the purposes of repair and/or capacity expansion and/or upgrade is allowed in principle provided that the EEE is not put on the market as a new product. If after the repair and/or capacity expansion and/or upgrade the EEE is put on

the market as a new product it should comply with the RoHS Directive.

However, if after repair and/or capacity expansion and/or upgrade the EEE is put on the market as a reused product, the RoHS Directive does not apply.

## 1.5 EXEMPTIONS

The RoHS Directive exempts some applications from the substance restrictions, because the use of hazardous substances in specific materials and components is technically or scientifically unavoidable for maintaining suitability for use and/or safety of EEE. The Annex (B) to the RoHS Directive lists the exempted applications

**The whole exemptions** (included in the RoHS Directive or in its annex) **are presented in the annex of this present document.**

Additional exemptions have been proposed, but have not yet been published in the Official Journal. Trade Associations will monitor any proposed changes to this list.

Pursuant to Article 5(1)c of the directive, each exemption will be reviewed at least every 4 years. Therefore, any response to a customer request which states "compliant with RoHS requirements" should be combined with the date of relevant status of the RoHS legislation.

# 2 WHAT INFORMATION NEEDS TO BE PROVIDED TO THE CUSTOMER?

## 2.1 PRODUCTS FALLING WITHIN THE SCOPE OF THE RoHS DIRECTIVE

The Directive does not make any provisions, so:

- The RoHS Directive does not require producer to provide a material declaration
- Compliance should be based on the principle of the manufacturer's self and voluntary declaration. This means that no third party certification is required.
- If there is a reason to doubt RoHS compliance, the producer who put the product on the market must be able, at the request of the market surveillance authority, to demonstrate compliance through documentation. The producer could provide evidence such as declarations of conformity for components and materials,

test results, evidence of evaluation of suppliers, contractual agreements with suppliers, or other suitable material.

- If tests are necessary, they should be performed according to published standards.

### PRODUCT MARKING

The RoHS Directive does not require any product marking<sup>5</sup>. CE marking is not relevant, presently, for RoHS matters.

Neither does the wheeled bin provided by WEEE directive.

## 2.2 PRODUCTS FALLING OUTSIDE THE SCOPE OF THE RoHS DIRECTIVE

There are no regulatory obligations for any products that fall outside the scope of the RoHS Directive. It is perfectly legal to buy and sell products that are not in the scope

of the Directive, even if they do not meet the material restrictions specified in the RoHS Directive.

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<sup>5</sup> The WEEE Directive requires a specific marking that is not linked to the RoHS Directive.

## HOW TO ANSWER TO THE CUSTOMER'S QUESTIONS

### SHORT ANSWER:

- «All necessary dispositions have been taken in relation with suppliers to ensure that constitutive materials do not include any substance forbidden by the regulations currently applicable on the market.»

#### To be used for a finished product:

- «We hereby confirm (legally binding) that all products supplied to you meet the requirements of the RoHS Directive (Status: ... Date of actual version).»

or

#### To be used as a component:

- «Our components supplied to you meet the material restrictions specified in the RoHS Directive.»

or

- «We are in the process of checking our products and we will inform you of the results no later than (... Date).»

### ANSWER IN CASE OF AN EXEMPTION OR IN CASE OF VOLUNTARY SUBSTITUTION:

- «For new developments we will be able to substitute these substances in future (from date ...).»
- «For technical (or other) reasons, a substitution of these substances is unfortunately not possible today.»
- «Our products supplied to you do not fall under the scope of Directive 2002/95/EC ("RoHS"). They also will not be incorporated – according to our knowledge – into products falling under the scope of this directive. Should you wish our products to still meet the requirements of RoHS, a suitable contract would need to be agreed.»
- «Our products supplied to you contain substances (substance xxx) which are restricted by Directive 2002/95/EC ("RoHS") (add list of products if necessary). As an alternative solution we can offer from (date xxx) the following material(s) substitution(s): xxx. Please give us your approval to release these products.»

### ANSWER FOR PARTS OF A FIXED INSTALLATION

(e.g., industrial monitoring, controls and drive components):

- «This product is intended to be part of a "large-scale stationary industrial tool". Based on Directive 2002/95/EC, published on 13th February 2003 and the European Commission's "Frequently asked questions" paper dated May 2005, "large-scale stationary industrial tool" are explicitly outside the scope of RoHS (and of WEEE) and are therefore not subject to the material restrictions specified in this Directive.»

## EXEMPTIONS INCLUDED in the RoHS Directive 2002/95/EC

- Equipment which falls under categories 8 and 9 set out in Annex IA to WEEE Directive 2002/96/EC
- Spare parts for the repair, or to the reuse, of electrical and electronic equipment put on the market before 1 July 2006
- Batteries and accumulators

## EXEMPTIONS LISTED in the annex to RoHS Directive 2002/95/EC Update 12/08/05

- Mercury in compact fluorescent lamps not exceeding 5 mg per lamp
- Mercury in straight fluorescent lamps for general purposes not exceeding 10 mg for halophosphate, 5 mg for triphosphate with normal lifetime, 8 mg for triphosphate with long lifetime
- Mercury in straight fluorescent lamps for special purposes
- Mercury in other lamps not specifically mentioned in the Annex
- Lead in glass of cathode ray tubes, electronic components and fluorescent tubes
- Lead as an alloying element in steel containing up to 0,35% lead by weight, aluminium containing up to 0,4% lead by weight and as a copper alloy containing up to 4% lead by weight.
- Lead in high melting temperature type solders (i.e. tin-lead solder alloys containing more than 85 % lead)
- Lead in solders for servers, storage and storage array systems, network infrastructure equipment for switching, signalling, transmission as well as network management for telecommunication\*
- Lead in electronic ceramic parts (e.g. piezoelectric devices).
- Cadmium and its compounds in electric contacts\*
- Cadmium plating except for applications banned under Directive 91/338/EEC (1) amending Directive 76/769/EEC (2) relating to restrictions on the marketing and use of certain dangerous substances and preparations.
- Hexavalent chromium as an anti-corrosion of the carbon steel cooling system in absorption refrigerators
- Lead used in compliant pin connector systems\*
- Lead as a coating material for the thermal conduction module c-ring\*
- Lead in solders consisting of more than two elements for the connection between the pins and the package of microprocessors with a lead content of more than 80% and less than 85% by weight\*
- Lead in solders to complete a viable electrical connection between semiconductor die and carrier within integrated circuit Flip Chip packages\*
- Lead and cadmium in optical and filter glass\*

\* Exemptions to be considered as obtained (voted in 2005, but not yet published in the OJEU).

GIMELEC : French industry association for electrical equipment, automation and related services.

DOMERGIE : Manufacturers association of electrical installation equipment and home automation application.