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Scoping of equipment covered by legislation (WEEE)

DPA-System is short for Danish Producer Responsibility System. DPA-System is in charge of administrative tasks associated with the rules on producer responsibility under Danish environmental law regarding waste from electrical and electronic equipment, end-of-life batteries and accumulators, and end-of-life vehicles.

Producer responsibility for these waste types has authority in the Danish Environmental Protection Act. This Act translates into three Statutory Orders for the different waste types: the WEEE Order, the Battery Order, and the End-of-life Vehicles Order (the current statutory texts can be found on www.dpa-system.dk).

The Danish Statutory Orders take offset in three EU directives for the same waste types: the so-called WEEE Directive, the Batteries Directive, and the ELV Directive. Also these directives with exact titles and dates can be found on www.dpa-system.dk.

Producer responsibility rests on the principle that each producer or importer assumes responsibility for collection and management of WEEE, waste batteries, and end-of-life vehicles to the effect that products becoming waste are managed in an environmentally correct manner, with the highest possible utilisation of resources contained in such products.

Producers and importers are in the following referred to as *producers* as the rules applying to both types are the same.

In general, the following abbreviations are used: WEEE for waste electrical and electronic equipment, BAT for batteries and accumulators, and ELV for end-of-life vehicles.

Contents

In pursuance of the rules on producer responsibility for waste electrical and electronic equipment (EEE) this document describes how to assess whether EEE and associated equipment is covered by legislation on producer responsibility. The document describes the directions behind DPA-System's assessments.

1 Definition of electrical equipment and statement of weight

Registration of equipment covered by WEEE legislation is done at a level where equipment is defined as a functional unit dependent on electric currents in order to work properly, i.e. at finished product level in the form the product/equipment appears upon delivery to the user. Therefore it is the weight of the finished product excluding batteries, packaging, instructions for use and similar that is stated in connection with registration of volumes placed on the market.

Categories refer to the ten product categories stipulated in the directive to which affected products must refer, while end user means that the end user of equipment is either a private household and/or a company.

It is the finished product that is covered by producer responsibility, since it will normally be the entire physical product that enters the waste stream at the end of its useful life.

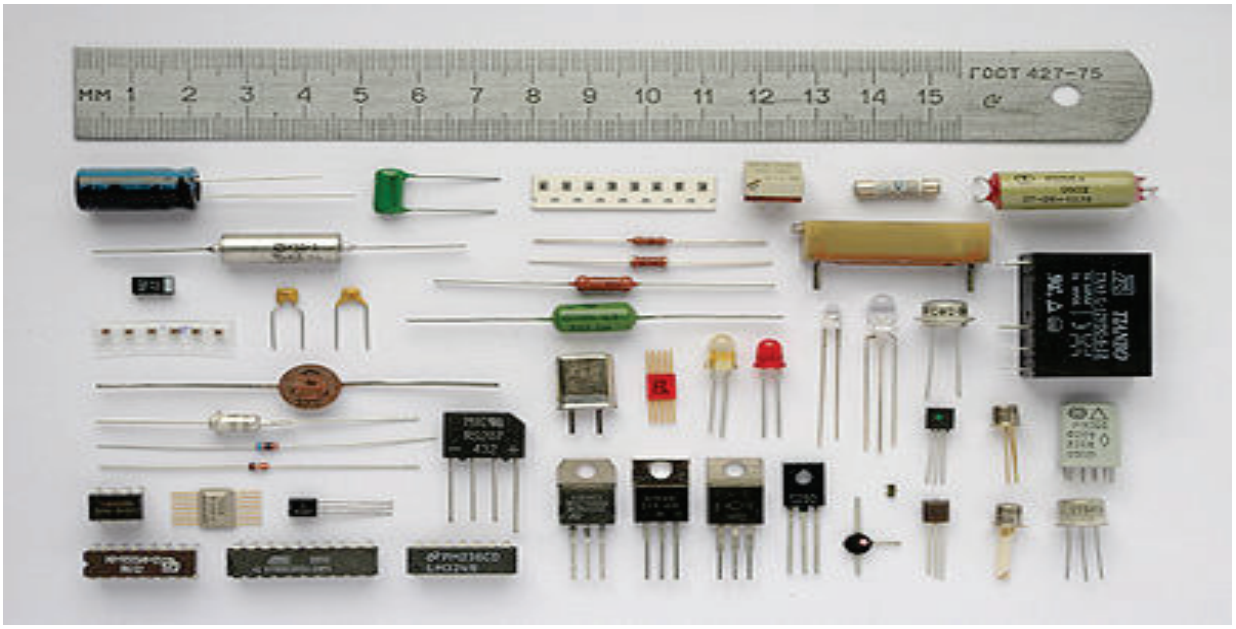
Below are described the directions used by DPA-System in our guidance of producers and importers asking for an assessment of their equipment, including how to state the weight of the equipment.

2 Finished products, accessories, spare parts, components

Components or finished electrical or electronic equipment?
Producer responsibility for electrical equipment is implemented for finished products. This means that a company placing as the first level of the distribution chain finished electrical equipment on the market is subject to producer responsibility. Producers and importers of electrical and electronic components that are only used for the manufacture of finished electrical equipment are therefore not subject to producer responsibility. Thus, it is important to distinguish between components and finished products. Below are described the directions used by DPA-System when deciding when a product is defined as a component and thereby exempt from the rules on producer responsibility.

Electrical and electronic components
Electrical components are units that depend on electric currents or electromagnetic fields and that are used as parts (semi-manufactured products) in the manufacture of electrical or electronic equipment (the finished product). Thus, a component will always find its final application in finished electrical equipment. The below picture shows a number of simple electrical components.

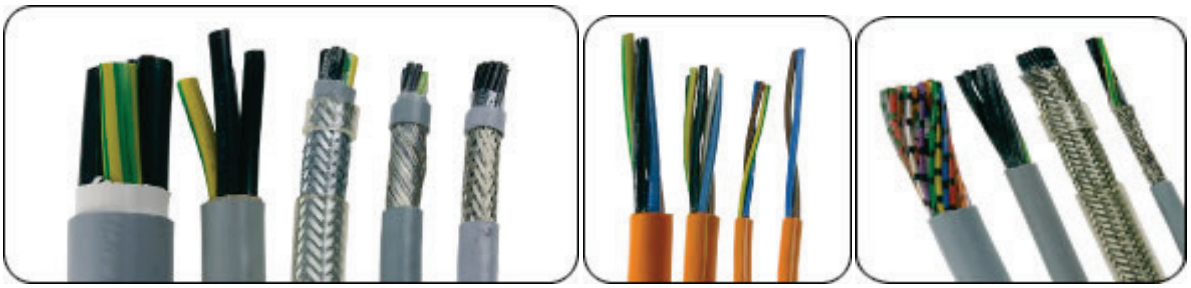
Picture 1 Example of various electrical components



Examples of simple components are resistors, coils, transistors and condensers assembled in an electrical circuit such as on a printed circuit board. Simple cables and wires that are not assembled with plugs and other specific connectors are considered as components in line with the above components that are parts of finished equipment.

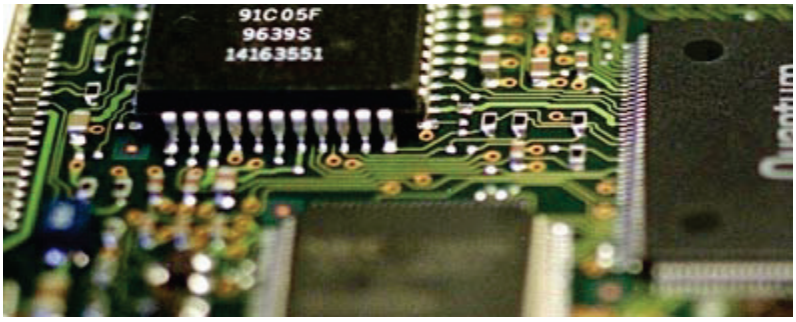
Picture 2 below shows cables that may be included as components. See also a separate document on producer responsibility for cables under Documents on [www.dpa-system.dk.](http://www.dpa-system.dk)

Picture 2 Examples of non-assembled cables.



In many cases a printed circuit board will be a component that can be made into either a new semi-manufactured product or into a finished product together with other components.
Picture **3** shows such a printed circuit board.

Picture 3 Example of a printed circuit board.



Printed circuit boards that are equipped with outer connecting cables, plugs, connectors, wireless connection or other kinds of well-defined connectors to the surroundings or to printed circuit boards packed in a casing will basically go from being a component to becoming a finished product. The same applies when the printed circuit board directly is a unit that is fitted as an accessory or as a module for a finished system. Examples of finished equipment are shown in Picture 4 below.

Picture 4 Examples of finished electrical equipment

Spare parts
Using a product as a spare part is not in itself a criterion for exemption from the producer responsibility. It is the property of the spare parts that decides whether or not they are covered by producer responsibility. Thus, simple components are exempt further to the rules on components, while spare parts in the form of finished equipment such as power supply in a computer are generally covered.

2.1 Components sold as finished products

A number of products are in a grey zone between finished products and components since they can be assessed both as stand-alone, finished products and as components in another piece of electrical equipment. This is particularly the case for product types where the equipment can be modified based on the plug'n play principle: parts can quickly and easily be replaced and upgraded. An example of this type of equipment is a stationary pc or an electric board where all parts can quickly and easily be replaced and upgraded.

For example, equipment for computers can be divided into two groups: the first group consists of units that are connected externally to a computer either wireless or with cables. Examples of this are external hard disk, keyboard and mouse. The other group consists of the units that are fitted inside the cabinet and might therefore be considered as components, but that are in most cases also sold as finished products to the end

user. Examples of such products are power supply, graphics cards, motherboard, sound cards, hard disk, RAM and CPU.

External hard disks, keyboards and mouse will always be considered as finished products and thereby subject to the rules on producer responsibility. By contrast, power supply, graphics cards, motherboard, sound cards, hard disk, RAM and CPU may be considered as components for a pc when they are sold to a company assembling and selling finished computers. In these cases the components will be exempt from the rules on producer responsibility on the condition that the finished pc is covered.

Sales situation
When power supply, graphics cards, motherboard, sound cards, hard disk, RAM and CPU are sold in large volumes (bulk) to a company that exclusively uses the parts to assemble and sell finished computers the different parts are considered as components. In this case the finished PC is covered by the rules on producer responsibility. If, however, the parts are sold separately to an end user (retail packs) they are all considered as finished products and thereby covered by the rules on producer responsibility. Thus, the sales situation becomes the decisive criterion for defining a pci card as a component or a finished product.

2.2 Electrical and electronic equipment

Finished electrical equipment can have different properties:

Finished electrical equipment (finished product) normally consists of an assembly of components together making up a finished unit, i.e. an assembly in some kind of electrical circuit.

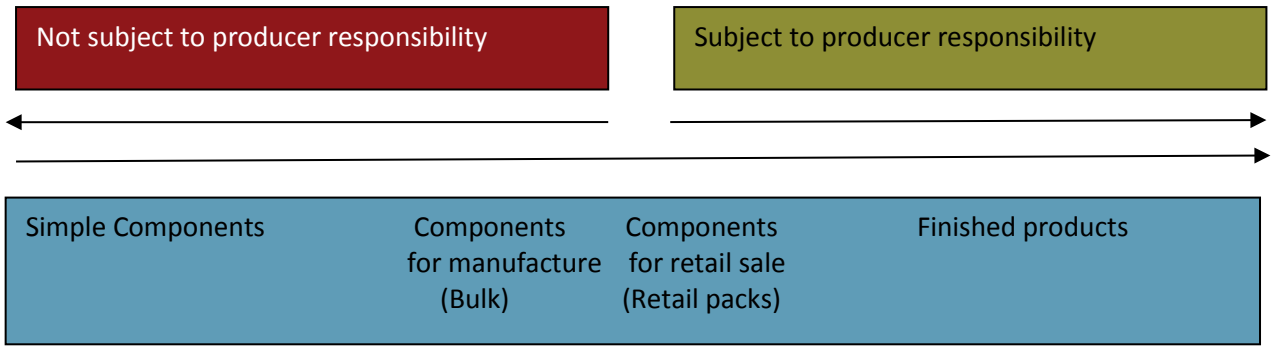
Finished electrical equipment may consist of a number of components in an assembly kit making up a finished unit when assembled. The components are selected in view of having the end user himself make the final assembly of the components.

Finished electrical equipment can also consist of one or more units (modules) of finished equipment that are assembled with one or more components, thereby changing the original electrical equipment into a new unit.

Furthermore, electrical equipment may consist of several units of finished electrical equipment (modules) interconnected into an assembled unit and together making up a new finished unit or system.

The scoping of finished products, accessories, spare parts and components under the producer responsibility scheme is illustrated in the below figure:

Figure 1: Scoping of components and finished products



In case of doubt DPA-System decides whether a given product can be defined as a component and thereby be exempt from the rules on producer responsibility, or whether it is to be considered as a finished product. Complaints against such decisions can be brought before the Danish Environmental Protection Agency.

3 Product design

Introduction of producer responsibility is one of the means of encouraging the design and production of electrical and electronic equipment which take into full account and facilitate repair, possible upgrading, reuse, and disassembly in order to recycle products or parts of products. In this context at least two different design strategies exist for products containing electrical and electronic units and components. The two design strategies have different consequences for producer responsibility in relation to scoping of the products. The design strategies are characterised by the following principles:

- Modularization of products and equipment means a structure where the electrical equipment consists of separate units (modules) each making up a finished product. The electrical modules are separate from the other parts of the assembled product/equipment.

- Compact integration of electrical units means a close physical assembly of electrical and non-electrical units in the product that together make up the finished product.

3.1 Modularization

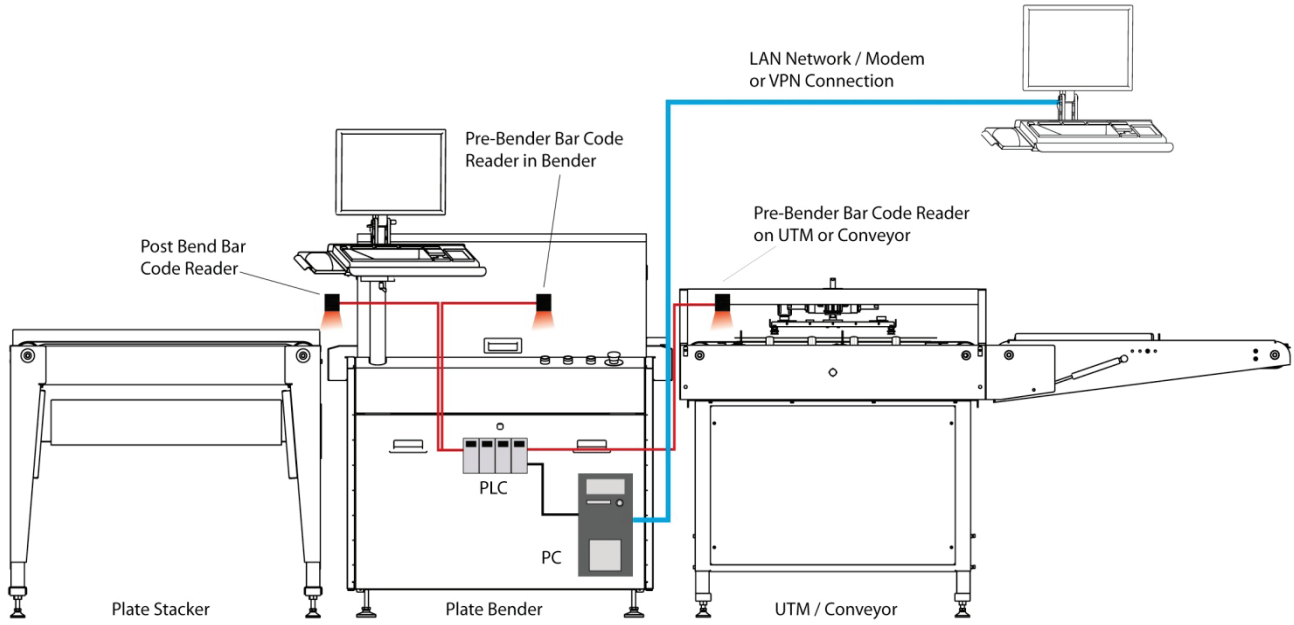
In modularization of the finished product electrical and electronic units and components are gathered in separate functional units – modules – as far as possible physically separated from other parts of the product. Each module makes up a finished product. This means that modules contain all electrical and electronic parts forming a separate, assembled unit. Modules are normally marketed as separate finished products to be assembled by the user or a fitter with other modules without electrical and electronic constituents making up an assembled product. In this modularization only the electrical and electronic modules are covered by producer responsibility. Modularization is particularly used in the design of products for use in commercial enterprises.

Examples of modularization:

<u>Industrial cooling appliances:</u>
By contrast to a refrigerator, which is compact integrated into one product that consists, for example, of seven components: cabinet, door, thermostat, temperature display, regulation device, compressor, power supply and heat distributor, cooling appliances for supermarkets and similar are modularized. Therefore, it is often seen in industrial cooling appliances that the electrical units such as temperature control, compressors and lighting are found outside the cooling unit. Ventilation is for instance placed on the roof, temperature control in a room inside the building, and lights are found in the ceiling of the supermarket and not in the refrigerated counter.

<u>A part of a production line in the graphics industry, see Picture 5 of modules</u>
Example of modularization of industrial electrical equipment in the form of a barcode reader in a conveyor system of a production line in the graphics industry. It is seen that the electronic control units in the form of monitors, PLCs, PC and modem are all loosely fitted on the conveyor units so that the electronic modules can easily be moved to other places in the production or be replaced without affecting the remaining parts of the system.

Picture 5 Modularization of part of a production line



(Ill:Glunz og Jensen ,2010)

Here, each separate electrical and electronic module will be registered in the relevant product category – in this case Category 9: Monitoring and control instruments and category 3: IT and telecommunications equipment. Also, it will often be these modules that will be exchanged and/or upgraded for maintenance. Similarly, the electrical and electronic modules will enter the WEEE waste stream at the end of their useful life.

3.2 Compact integration

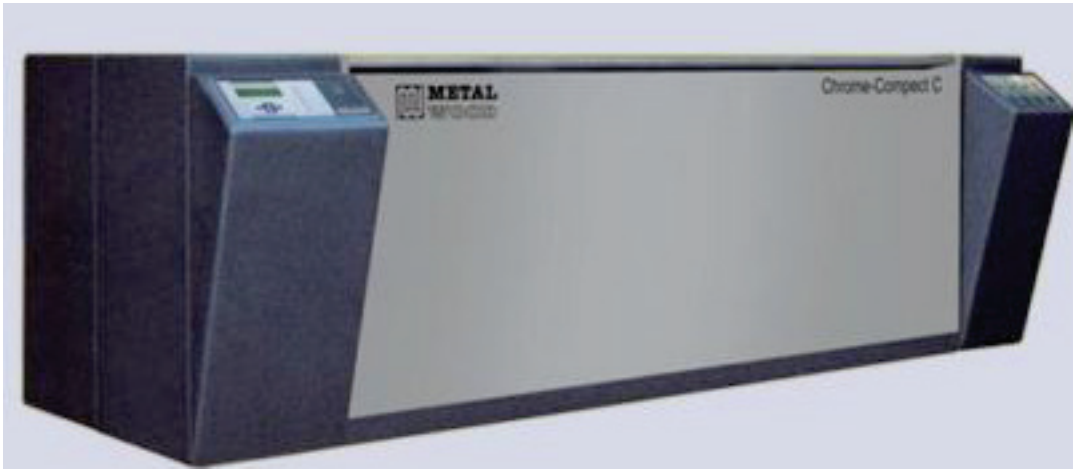
In the design of products/equipment it may be of importance that the product appears physically compact with as limited a volume as possible. In such case the electrical and electronic constituents of the product will typically be closely integrated with and hard to disassemble from parts without electrical or electronic constituents.

Examples of compact integration: A refrigerator, a microwave oven, an electric stove or small multi-function office machines, see Picture 6.

Picture 6 Compact integrated office machine

Most products for use in private households are designed as compact integrated products. However, the compact integrated design model is also used for large equipment for professional use. **Picture 7** shows a fully compact integrated plating machine for the graphics industry. All PLC controls, monitors, displays and print cards are encapsulated in plastics, hampering both repair and disassembly in the waste management stage.

Picture 7 Compact integrated plating machine for the graphics industry

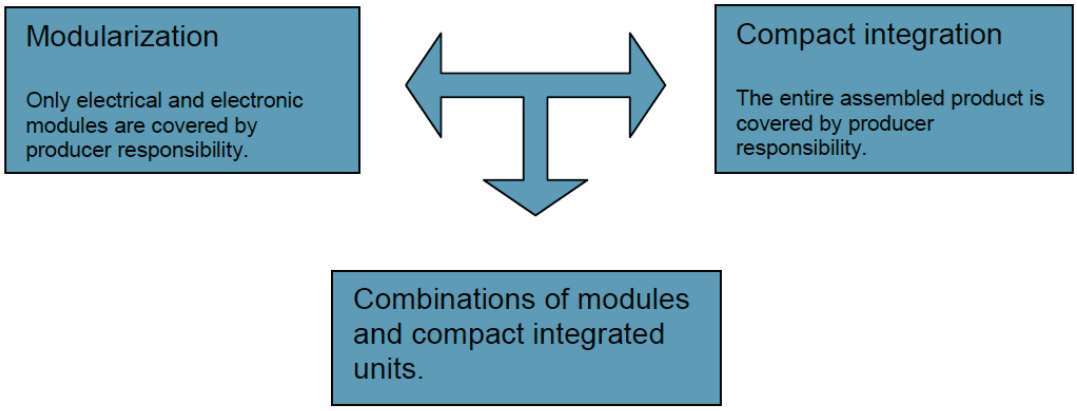


ill: Hard crome plating m/c

The weight of the entire compact integrated product/equipment will be registered under the relevant product category.

Often, the entire compact integrated product will be replaced and enter the waste stream for WEEE at the end of its useful life, and not each electrical unit. The two design strategies are illustrated below:

Figure 2: General design strategies deciding what weight to report.



4 Assembled products and weight

It appears from the objectives of the WEEE Directive that products/equipment are covered by the legislation on producer responsibility irrespective of their end user. Products placed on the market for use in private households are often finished products with a well-defined application sold in assembled form. Therefore, there is rarely doubt about the nature and use of the product. And neither is there any doubt that the product is covered by producer responsibility.

For products/equipment for use in businesses there may be doubt in some cases about the scoping of a given product. This doubt may arise in cases when a business sells a product consisting of several interrelated units or large systems such as entire process lines. The process line may even be physically encapsulated in a way to make it appear as one product (compact design). The assembled product may consist of different types of units as explained below.

4.1 Assembled product consisting of several separate functional units

This type of assembled product arises when a business sells a product exclusively consisting of a combination of several individual finished products coupled into an aggregate system without actual physical integration (assembly) of the units and without having other electrical and electronic equipment in the system than the combined finished products.

In such case each single unit must be registered separately under the producer responsibility in that of the ten product categories which is relevant for the individual product/equipment.

When the weight of the entire product/equipment is to be stated it should be ascertained whether those units integrated in the assembled product are already entirely or partly covered by producer responsibility from a previous seller. If any of those units are registered by a previous seller under the producer responsibility the weight of these finished products should not be included in the statement of the weight of the entire assembled product/equipment.

If producer responsibility has not been registered by a previous seller the weight should be stated as the weight of all individual finished products in each their product category.

4.2 Assembled product consisting of finished products integrated with other EEE

This type of assembled product arises when a business sells a product consisting of an assembled and integrated combination of finished products and/or other electrical and electronic components in a kind of compact integration. The assembled product/equipment thus appears as one individual finished product.

The product must be registered in that of the ten product categories which is relevant for the assembled product/equipment. When the weight of the entire assembled product/equipment is to be stated the total weight of the compact integrated equipment must be used.

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