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## **Classification of gear boxes, electric motors and geared electric motors**

### **1. Introduction**

This position paper is intended to provide the industry with a guide for placing on the market gearboxes, electric motors and geared electric motors. For all products it has to be determined which European directive is applicable. In order to identify criteria, the legal requirements are analysed and reference is made to publications by the Commission.

### **2. Machinery Directive (2006/42/EC) and Low Voltage Directive (2006/95/EC)**

#### **2.1 Gear boxes**

Article 1 of the Machinery Directive states that machinery and partly completed machinery are covered by the Machinery Directive. Machinery is defined as follows: *'Machinery means: an assembly, fitted with or intended to be fitted with a drive system, ..... consisting parts or components, at least one of which moves, and which are joined together for a specific application.'*

A gearbox does not fulfil this definition and therefore it is not considered to be a machine.

Article 2(g) of the Directive defines 'partly completed machinery' as follows:

*'g) partly completed machinery' means an assembly which is almost machinery but which cannot in itself perform a specific application. A drive system is partly completed machinery. Partly completed machinery is only intended to be incorporated into or assembled with other machinery or other partly completed machinery or equipment, thereby forming machinery to which this Directive applies;'*

As such, partly completed machinery does not fulfil a particular function. Its intended purpose is to be installed with other parts in order to get completed machinery or a totality of machines (system), which will be CE-marked. Nevertheless, partly completed machinery must already have a character such that it "almost is a machine". Subassemblies are not almost a machine.

This clearly differentiates partly completed machinery from subassemblies. Subassemblies are not mentioned anymore in the Machinery Directive, but in the guidelines on the Machinery directive as issued in December 2009, the following is stated under §35 with regard to machines:

*Orgalime, the European Engineering Industries Association, speaks for 35 trade federations representing some 130,000 companies in the mechanical, electrical, electronic, metalworking & metal articles industries of 23 European countries. The industry employs some 11.1 million people in the EU and in 2008 accounted for some €1,885 billion of annual output. The industry not only represents more than one quarter of the output of manufactured products but also a third of the manufactured exports of the European Union.*

“The Machinery Directive does not apply as such to separate machinery components, such as, for example, seals, ball-bearings, pulleys, elastic couplings, solenoid valves, hydraulic cylinders, flange-connected gearboxes and the like, that do not have a specific application and that are intended to be incorporated into machinery. The complete machinery incorporating such components must comply with the relevant essential health and safety requirements. The machinery manufacturer must therefore choose components with adequate specifications and characteristics. “

Thus, in the sense of the Machinery Directive, gearboxes such as flange-connected gearboxes are components or subassemblies and therefore they are not covered by this Directive. In order to place separate gearboxes on the market, manufacturers are not required to make available any technical documentation according to Annex VII, assembly instructions to Annex VI or declaration to Annex II.

Manufacturers may provide customers with relevant technical documentation to allow gearboxes to be installed correctly and safely. The scope and language of the documentation to be supplied should be agreed by private contract, if there are no specific requirements in national legislation transposing the General product safety directive 2001/95/EC .

## 2.2 Electric motors

Electric motors have moving parts and therefore the Machinery Directive has to be considered. However, electric motors with operating voltages within the voltage limits of the Low Voltage Directive 2006/95/EC are excluded from the scope of the Machinery Directive 2006/42/EC by Article 1 (2) k, sixth dash and directed to the Low Voltage Directive:

“(2) The following are exempted from the scope of this Directive:

- k) Electrical and electronic products of the following types, insofar as they fall within the scope of the Directive 73/23/EEC of the Commission of 19th February 1973 to harmonise the legal requirements of member states with regard to electrical equipment for use within certain voltage limits (3):
- Domestic appliances intended for household use
  - Audio and video equipment
  - Information-technology devices
  - Usual office machinery
  - Low voltage switchgear and control gear
  - **Electric motors;**

Electric motors are not covered by the Machinery Directive but by the Low Voltage Directive.

## 3. Geared motors

### 3.1 Normal cases

The industry sector involved is considering an electromotor mounted together to a gearbox in most cases as being one product in one casing, which is sold as one product. Although it is visible that such a combination is not only an electromotor, it is delivered by a manufacturer as one product mostly with one type number.

If electric motors in accordance with the Low Voltage Directive 2006/95/EC are combined with a gearbox according to clause 2.1, for example by flange-mounting the gearbox to the electric motor, the only difference with a single electric motor is the speed of the outgoing shaft. It is, however, still the same electric motor and therefore covered by the scope of the Low Voltage Directive. The technical documentation and the CE marking etc. shall be applied on LVD-basis.

The combination of an electric motor and a gearbox is therefore not partly completed machinery within the meaning of the Machinery Directive (see figures 1 and 2).

### 3.2 Exceptions

If a separate electromotor (see figure 3a) and a separate gearbox (see figure 3b) are mounted together with a flange on e.g. a frame, this combination is visible as being two separate elements which are connected. In this case the combination is considered as a partly completed machine. If these geared motors are installed in devices which are machinery within the meaning of the Machinery Directive, the manufacturer of this completed machinery shall carry out a conformity assessment procedure according to Article 12.

For the electric motor the technical documentation and the CE marking etc. shall be applied on LVD-basis.

### GRAPHIC REPRESENTATION

