

# CE Mark

CE Mark stands for "Conformité Européenne", a French term that can be literally translated into English as "European Conformity". Its now familiar logo can be seen below. The foreword to *CE Marking, The New European Legislation for Products*, by Kluwer Business Information, states in bold as a first paragraph:



The CE Marking offers great advantages to trade and industry in the United States. The new European legislation has created a uniform market within Europe. Up to now, American manufacturers and exporters have had to deal with various sets of national legislation within Europe. Thanks to the introduction of CE Marking, the trade constraints between Member States of the European Economic Area (EEA) have disappeared. The CE Marking forms, as it were, the "trade passport" for products within the EEA.

To find out more about CE and its Impact on North American Original Equipment Manufacturers of Low Voltage Electrical Equipment and their Suppliers of Components read further:

## **The CE-Mark and its Impact on North American Original Equipment Manufacturers of Low-Voltage Electrical Equipment and their Suppliers of Components**

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When attempting to export to Europe, many North American original equipment manufacturers wrestled with the CE-Mark. They often inquired about CE Marking on components that they had incorporated into or wished to incorporate into their completed product. The impending requirements for CE-Mark on their own final assembled equipment were often interpreted to mean that the same requirements were applicable to the components utilized. This is understandable in that Underwriters Laboratories certifications required the use of UL recognized components and similarly, Canadian Standards Association required the use of CSA listed parts. Thus North American OEMs similarly assumed that that CE Marking was required on the components in order to obtain CE Marking on their final OEM product. This was exasperating because CE-Mark documentation explicitly listed many component types as not to bear the CE-Mark. In other words, putting the CE-Mark on certain components was not allowed and not to be done. All this while many component manufacturers simply slapped the CE-Mark on their labels, products and catalogs.

## The European Union (EU)

The EU expresses its rules in four ways: regulations, directives, decisions and recommendations (opinions).

A directive in the EU is a European law that is legally binding for every member state and which is above the laws of the individual member states. A directive is not aimed directly at the citizens or companies in the member state. The member states as of 2009 are Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, Spain, Sweden, the United Kingdom, Estonia, Latvia, Lithuania, Poland, the Czech Republic, Slovenia, Bulgaria, Romania, Hungary, Slovakia, Malta and Cyprus. There are numerous directives involved in the CE-Mark legislation.

## The CE-Mark

The CE Marking's goals are primarily safety-related with the protection of the public and consumer being a primary concern. A further goal is the harmonization of related national regulations, the reduction of regulatory barriers between European countries and the facilitation of the movement of goods between them. It is the end result for safety that counts and not how this safety was attained. This is what is more or less meant by the "new approach" whereby what is to be attained is stressed in the directive and how to attain it is left to the producers. The elaboration of risk assessment, the protection of the users and the prevention of injury due to use, misuse or abuse must be handled with due care with proper formalized record keeping, information dissemination and optimized design practice respecting appropriate standards and regulations. This involves the cognizance, evaluation and optimization of health, safety, human, durability, regulatory and environmental factors using accepted methods, guidelines and laws.

## The CE-Mark legislation has issued numerous directives:

A list of EU directives are taken from website:

<http://www.newapproach.org/Directives/DirectiveList.asp>

### Directive reference

90/396/EEC

00/9/EC

89/106/EEC

89/336/EEC

94/9/EC

93/15/EEC

95/16/EC

73/23/EEC

90/385/EEC

### Directive area

Appliances burning gaseous fuels

Cableway installations designed to carry persons

Construction products

Electromagnetic compatibility

Equipment and protective systems in potentially explosive atmospheres

Explosives for civil uses

Lifts

Low voltage equipment

Medical devices: Active implantable

93/42/EEC	Medical devices: General
98/79/EC	Medical devices: In vitro diagnostic
90/384/EEC	Non-automatic weighing instruments
94/62/EC	Packaging and packaging waste
89/686/EEC	Personal protective equipment
97/23/EC	Pressure equipment
99/5/EC	Radio and telecommunications terminal equipment
94/25/EC	Recreational craft
98/37/EC	Safety of machinery
88/378/EEC	Safety of toys
87/404/EEC	Simple pressure vessels

## The Low Voltage Directive, the Machinery Directive and the Electromagnetic Compatibility Directive

This article will focus on the Low Voltage Directive. However it is worthwhile to also discuss the Machinery Directive and the Electromagnetic Compatibility Directive briefly.

The Low Voltage Directive sets the requirements for electrical safety of electro-technical products. It was written in a general way without elaborating on the technical details in the directive. *"The objective of the Low Voltage Directive is only to permit electrical material to be put on the market if it does not jeopardize the safety of persons, domestic animals and goods. The freedom of movement of safe electrical material within the Community must be safeguarded."* This directive is comprised of a general introduction, fourteen articles and four annexes. Low voltage for the purposes of this directive is defined in article 1 as *"electrical equipment' means any equipment designed for use with a voltage rating between 50 V and 1000 V for alternating current and between 75 V and 1500 V for direct current, other than the equipment and the phenomena listed in Annex II"*. A product has been fabricated according to the rules of good craftsmanship if it complies with the appropriate European harmonized standards. What this means in practice will be discussed later.

The Machinery Directive is written so as to promote the design of machinery which is as safe as possible. *"The result must be the safest possible machine in accordance with the current status of technological development"*. This directive applies to machines as per article 1 section 2 and separately marketed safety components. Machines are generally defined as devices with at least one moving part containing actuators, control and power circuits. The directive is concerned with safety and not with the other aspects of performance.

Exceptions to the machinery directive are machines listed in article 1 section 3 and also where the main risk is of electrical origin, in which case only the Low Voltage Directive would apply. Although the CE-Mark may be affixed to machinery by the manufacturer, the manufacturer's authorized agent or importer are very important exceptions whereby machines with increased risk are required to be treated by a notified body as per annex IV. In general, this covers presses, cutting devices, lifting devices, vehicles, rolling machinery and other machinery as well as safety components. Their strength, mass, movement, squeeze points, sharpness, etc. can injure people.

The EMC Directive (Electromagnetic Compatibility Directive) has also been written in a way that targets the end result and not the way in which to achieve it. *"The EMC directive sets the essential requirements for all electrical and electronic equipment that may interfere with other equipment or that may be interfered with by other equipment"*. The gist of this is that electrical devices transmit electromagnetic radiation into the environment. The intensity and reach of the waves depend on the power levels, frequencies and construction of these devices. As frequencies get faster, wavelengths get smaller; enclosures, cables and circuits start to behave as effective antennae. High power levels, defective components, poor enclosures and long cables are also a cause. Similarly, equipment can receive electromagnetic waves and depending on the susceptibility of the device and the type and intensity of the waves received, the device could malfunction. This is of concern to medical, communications and other equipment. *"The result must be a device that cannot be disturbed by electromagnetic interference and that in itself limits the generation of interference in such a way that the other equipment is not disturbed by it. Moreover, the free movement within the European Union of products complying with the EMC directive must be safeguarded"*.

### **Some Pertinent Regulatory Bodies and Experiences**

As was stated before, this article will focus mostly on the Low Voltage Directive. The authors are more experienced with it because of WECO Electrical Connectors Inc.'s dealings with terminal blocks and connectors sold to OEMs wishing to market their goods in Europe.

WECO's dealings with all regulatory and testing bodies such as UL, CSA, VDE, SEV and DEMKO among others and testing agencies such as TÜV have always been positive, effective and worthwhile. Please remember these bodies or agencies. They know of each other, have offices throughout the world and often delegate each other to represent each other or to execute various pertinent activities such as audits, product certifications and testing. The European ones VDE, SEV and DEMKO among others are generally harmonized to EN standards and EN standards are often similar or identical to IEC standards (chicken and egg story here). As such, the use of components (terminal blocks, connecting devices, switch and control gear) certified (listed or recognized) by them greatly eases the access to CE Marking for an OEM's final product in which they were incorporated. The North American ones, UL and CSA, often have agreements with the European agencies to do European and CE Marking under suitable mandates, as does TÜV with its facilities located in North America, Europe and the world. Although there is no obligation to apply standards, it is generally better to do so. Not to do so would create an enormous amount of work because it must be demonstrated in the technical documentation that the product meets the requirements of the directive. One does not want to turn the CE Marking of an appliance, instrument, apparatus or machine into a testing program for individual components. The best path is to utilize and correctly apply components that were tested to the appropriate EN standard by an agency that keeps records in Europe. The certifying inspector applying the CE-Mark would recognize these. Naturally some components are more critical than others so one can expect differences on the demands imposed on them by the certifying body.

## Some Standards and some Testing or Regulatory Agencies or Bodies

VDE, SEV, DEMKO	Maintain regulatory standards that are often harmonized to the pertinent IEC or EN standard
IEC 999 or EN 60999	Connecting devices – Safety requirements for screw-type and screwless-type clamping units for electrical copper conductors
IEC 999-1 or EN 60999-1	Connecting devices – electrical copper conductors Safety requirements for screw-type and screwless-type clamping units – Part 1: General requirements and particular requirements for clamping units for conductors from 0,2 mm to 35 mm (included)
IEC 998-1 or EN 60998-1	Connecting devices for low voltage circuits for household and similar purposes – Part 1: General requirements
IEC 998-2-1 or EN 60998-2-1	Connecting devices for low voltage circuits for household and similar purposes Part 2-1: Particular requirements for connecting devices as separate entities with screw-type clamping units
IEC 998-2-2 or EN 60998-2-2	Connecting devices for low voltage circuits for household and similar purposes Part 2-2: Particular requirements for connecting devices as separate entities with screwless-type clamping units
IEC 998-2-3 or EN 60998-2-3	Connecting devices for low voltage circuits for household and similar purposes Part 2-3: Particular requirements for connecting devices as separate entities with insulation piercing clamping units
IEC 60947-7-1	Low voltage switchgear and control gear Part 7: Ancillary equipment Section One – Terminal blocks for copper conductors
UL 1059	Terminal Blocks
UL 486E	Equipment Wiring Terminals for Use with Aluminium and/or Copper Conductors
CSA C22.2 No.65-93	Wire Connectors Wiring products
CSA C22.2 No. 158	Terminal Blocks
VDE	Verband der Elektrotechnik, Elektronik und Informationstechnik; a German based testing and regulatory agency
SEV	Association for Electrical Engineering, Power and Information Technologies; a Swiss based testing and regulatory agency
DEMKO	Danmarks Elektriske Materielkontrol; a Danish based testing and regulatory agency

EN	European Norms; a European Union (EU) based standards body
IEC	International Electrotechnical Commission; works closely with international partners such as ISO, ITU, WHO, ILO, UNECE, CIGRE, IMO, OIML and EUROELECTRIC and governmental agencies such as the WTO. It cooperates with CANENA and CENELEC among others.
UL	Underwriters Laboratories; a USA based testing and regulatory agency
CSA	Canadian Standards Association; a Canadian based testing and regulatory agency
TÜV-Rheinland	A German based testing and certification facility with worldwide experience

## Conclusion

The goal of this article was to inform about some of our pertinent experiences involving the CE-Mark, the associated directives and the regulatory, testing or standards bodies involved. Knowledgeable and trustworthy people are available to guide all of us, answer our questions and alleviate the fears of a few years ago. Regulations and evaluation technologies are always in a state of flux and most of the smoke seems to have cleared with regards to terminal blocks, components and the Low Voltage Directive. The free movement of goods, the safety of people and the issues of cost will always be of interest to all of us. The authors wish to thank SWBC, Organization for the European Conformity of Products and Kluwer Business Information who has published *CE Marking, The New European Legislation for Products*.