CE Marking for Military, Aerospace & Defence Products
The History

In 1957, the first members of the European Economic Community (later the EU) signed the Treaty of Rome – a document laying the foundations for free trade and common legislation in Europe. Article 223 of this document made provision for members to exclude a list of products from the legislation that were essential to their country security. A year later, on April 15th 1958 the ‘excluded products’ list was created; known as the ‘Munitions of War’, these were:

- Firearms and munitions
- Artillery, smoke and flame throwing weapons
- Bombs, torpedoes, rockets and missiles
- Fire control apparatus, tanks and fighting vehicles
- Toxic and radioactive agents
- Powders, explosives and solid propellants
- Warships, aircraft and apparatus for Military use
- Military electronics and camera apparatus
- Other apparatus and material
- Specialised parts, items or materials insofar as they are of military nature
- Machines, apparatus and items exclusively designed for the study, manufacture, testing and control of arms, munitions and apparatus of an exclusively military nature

As military and defence products were therefore subject to different rules and requirements in each member state, the trade opportunities across the EU were limited. A defence manufacturer couldn’t really tender for a project in another country, as his product wouldn’t necessarily comply with their requirements.

In 1997 the Treaty of Rome was replaced by the Treaty of Amsterdam and Article 296 replaced the old Article 223. It now allowed the excluded products list to be changed by the commission.

“2. The Council may, acting unanimously on a proposal from the Commission, make changes to the list, which it drew up on 15 April 1958, of the products to which the provisions of paragraph 1(b) apply.”

The Commission knew that making defence trade between the EU member states freer would be possible if there was no longer a blanket exclusion of defence products being exempted from legislation – and given the anticipated value of the market at that time – around 170 billion Euros – the commission wanted to make this happen.

In December 2006 and inline with the EU ‘New Approach’ to trade in the community, the European Commission issued an Interpretative Communication to
the defence industry about Article 296 on how exclusions should be applied. This document specified that exclusions could only be justified for the “Protection of Member States’ essential security interests” and as only member States can determine what their own essential security interests are, the MoD would now have to determine on a case by case basis what equipment was essential and what was not. Manufacturers of military products would therefore have to make a special case to the MoD to have their products excluded from the requirements of EU legislation.

**Examples of essential exclusions**

- A warship is excluded but lights fitted to it cannot be considered essential interests of security
- Classified equipment would be excluded but only where using the public procurement regulations would involve the sharing of classified information against the member states national security interests

The MoD’s consideration process for exclusions to EU legislation:

a) Which essential security interest is concerned?

b) What is the connection between this security interest and the specific procurement decision?

c) Why is the non-application of the Directive in the specific case necessary for the protection of this essential security interest?

Around this time the Commission revised the Electro-Magnetic Compatibility (EMC) Directive and the new version 2004/108/EC no longer excluded military equipment from its requirements – so manufacturers now had to consider that.

The EMC Directive is part of a group of legislative measures known as the New Approach Directives – and complying with these required the use of CE Marking on a product. Whereas military and defence manufactures never had to consider this before, they now had to do so for their products that were not ‘essential to national defence’. Accordingly, DEF STAN 59-411 Part 1 Annex F was updated to advise on CE compliance and BERR issued written guidance on the new EMC requirements to help manufacturers get to grips with them.
Overview of the New Approach

Introduced in 1985, the premise of the New Approach is to facilitate free trade within the member states of European Union. Its practical application in the marketplace is via a number of Directives that manage the nature and trade of products. Only goods that meet the essential requirements of the Directives may be placed on the market. Proving that the essential requirements are met is typically done by testing products to Harmonised ‘EN’ Standards that are applicable across the EU (sometimes with small national variations called ‘national deviations’). On the basis of successful testing the manufacturer can then make a Declaration of Conformity and apply CE marking to his products. The CE Marking would mean a product could move freely across the EU.

Directives under the New Approach include:

- 2006/95/EC Low Voltage
- 2009/105/EC (ex. 87/404/EEC) Simple Pressure Vessels
- 2004/108/EC Electromagnetic compatibility (EMC)
- 2006/42/EC Machinery
- 89/686/EEC Personal protective equipment - PPE
- 93/68/EEC Personal protective equipment - PPE
- 93/95/EEC Personal protective equipment - PPE
- 96/58/EC Personal protective equipment - PPE
- 94/9/EC Equipment explosive atmospheres (ATEX)
- 97/23/EC Pressure equipment
- 1999/5/EC Radio Equipment and Telecommunications Terminal Equipment and the Mutual Recognition of their Conformity

Compliance variations in the LVD, EMC and ATEX Directives

All of the Directives have a degree of commonality in the way that you demonstrate compliance, but there are variations between Directives and according to the type of product and its expected performance.

The Low Voltage Directive (LVD) (2006/95/EC)

Objectives:

“Only electrical equipment which does not jeopardise the safety of people, domestic animals and property shall be placed on the market.”

“All electrical equipment which does satisfy the CE Marking requirements will be taken as complying and can be freely circulated in the European Economic Area.”
Essentially this offers

- Protection against hazards arising from electrical equipment
- Protection against hazards which may be caused by external influences on the electrical equipment

The LVD applies to electrical equipment and not components. However components sold separately such as motors, transformers and detachable mains cords are considered as electrical equipment and need to comply.

Whilst testing to EN Product Standards is used to illustrate compliance with the requirements of the Directive, independent third party testing is not mandatory – meaning manufacturers can test in their own in-house laboratories.

- In the UK the LVD it is adopted under “The Electrical Equipment Safety Regulations 1994 (SI 1994/3260)
- The LVD applies to equipment with input or output voltage of :
  - 50 ~ 1000V AC or
  - 75 ~ 1500V DC

NOTE: Equipment operating outside the voltage limits of the LVD may fall under the General Product Safety Directive.

Excluded from the scope of the Directive:

- Equipment for use in an explosive atmosphere;
- Equipment for radiology and medical purpose;
- Specialised electrical equipment for use on ships, aircraft or railways, which complies with the safety provisions drawn up by international bodies in which the Member States participate.
- Electrical equipment for export to a non-EEA Member state;

Given the third point above, does the LVD apply to Military Equipment?

‘Specialised electrical equipment for use on ships, aircraft or railways, which complies with the safety provisions drawn up by international bodies in which the Member States participate’. This does not state that it excludes military equipment.

Objectives

“Equipment shall operate in its intended environment without causing interference with broadcast reception and other equipment.”

“Equipment shall operate in its intended environment without being interfered with.”

Electrical equipment should undergo an EMC assessment and different requirements exist for products intended for environmental, residential or industrial use and test methods are outlined in the EN 61000-4 Standard series.

The EMC Directive requires the creation of a Technical Construction File (TCF) rather than a straight ‘Technical File’ and whilst there is no mandatory requirement for a Notified Body to review a TCF, many manufacturers find a 3rd party certificate of compliance lends greater weight to their own findings.

Some equivalence has been identified between Commercial and Military EMC Standards, however some gaps do exist. Check the requirements of the commercial Standard for that product type and apply the limits of the Military Standard if it is available. If no military equivalent exists, use the commercial Standard. For example:

<table>
<thead>
<tr>
<th>Type</th>
<th>Test</th>
<th>CE Requirements</th>
<th>MIL STD 461E</th>
<th>Gaps</th>
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<tr>
<td>Emissions</td>
<td>Conducted emissions</td>
<td>EN 55022:2006 Class B</td>
<td>CE102</td>
<td>Only covers up to 10MHz not 30 as EN 55022 does</td>
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<tr>
<td>Harmonics</td>
<td></td>
<td>EN 61000-3-2:2006</td>
<td>no equivalent</td>
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<td></td>
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<tr>
<td>Flicker</td>
<td></td>
<td>EN 61000-3-3:1995+A1,A2</td>
<td>no equivalent</td>
<td></td>
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<tr>
<td>Radiated emissions</td>
<td></td>
<td>EN 55022:2006 Class B</td>
<td>RE102</td>
<td>Check report but 90% of limits are higher in Military</td>
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<tr>
<td>Magnetic emissions</td>
<td></td>
<td>no equivalent</td>
<td>RE101</td>
<td></td>
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<tr>
<td>Type</td>
<td>Test</td>
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<td>MIL STD 461E</td>
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<td>-------------------------------------------</td>
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<tr>
<td>Immunity</td>
<td>ESD</td>
<td>EN 61000-4-2:1995</td>
<td>no equivalent</td>
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<td>Radiated Susceptibility</td>
<td>EN 61000-4-3:2006 10V/m</td>
<td>RS103 200V/m</td>
<td>Only GAP if very low Mil levels were used</td>
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<td>Fast transients</td>
<td>EN 61000-4-4:2004</td>
<td>no equivalent</td>
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<td></td>
<td>Surges</td>
<td>EN 61000-4-5:2006</td>
<td>no equivalent</td>
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<tr>
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<td>Conducted RF</td>
<td>EN 61000-4-6:2007 10Vrms</td>
<td>CS114</td>
<td>Test level lower than CS114 and frequency range greater in CS114</td>
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<td>Magnetic immunity</td>
<td>EN 61000-4-8:1998</td>
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<td></td>
<td>Voltage Dips</td>
<td>EN 61000-4-11:2004</td>
<td>no equivalent</td>
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</tr>
</tbody>
</table>

**The ATEX Directive (94/9/EC)**

**Objective**

The prevention of explosions in potential explosive or hazardous environments, through the mandatory assessment of electrical and non-electrical products destined for these environments.

On these products the CE Marking is accompanied by the Notified Body Number below the CE symbol

**Note:** The Military do not have crown immunity from ATEX legislation

The ATEX Directive also incorporates equipment types being used in dust atmospheres and makes specific requirements for safety related devices such as flame arrestors, suppression systems and safe area systems.
Examples of a Potentially Explosive Environment

- Areas of refuelling activities
- Areas where fuelled vehicles, weapons or aircraft are stored
- Paint spraying areas
- Flammable solvents, gas or chemical storage and use
- Sewage systems
- Engine rooms
- Battery charging areas (Uninterruptable Power Supplies, Electric Trucks)

Like the LVD, a technical file is required for compliance, but an additional provision for quality systems is also made by the Directive.

Legal requirements include:

- Product identification, ‘EX’ labelling and classification
- Product area classification through a zone designation
- Inspections and documented systems of manufacture
- Competence training and assessment for installers

Area Classification: Hazardous Zones

- Electrical Products for use in Zone 0 and Zone 1 classified areas have to be tested and assessed by an EU Notified body
- Non-electrical Products for use in Zone 0 classified areas have to be tested and assessed by an EU Notified body.
- Products that do not fall into the above categories can be self certified by the manufacturer. (Zone 2 electrical and Zone 1 & 2 non-electrical)

For the ATEX Directive, products are tested to ‘Electrical Protection Concepts’. These are Standards relating to different types of explosion risk:

- EN 60079-1 ‘d’ explosion proof
- EN 60079-2 ‘p’ pressurisation
- EN 60079-7 ‘i’ intrinsic safety
- EN 60079-7 ‘e’ increased safety
- EN 60079-15 ‘n’ non sparking non incendive

Compliance to these protection concepts must be confirmed by a Notified Body
New Approach Conformity Assessment Routes

Self Declaration

- Manufacturer reviews applicable directives
- Manufacturer decides applicable standards
- Tests product to confirm compliance
- Create test report
- Create Technical File
- Prepare and sign Manufacturers Declaration of Conformity
- Apply the CE Mark to the product
- Ship Product with copy of signed Declaration

Third Party Certification

- Manufacturer reviews applicable directives
- Manufacturer decides applicable standards
- Manufacturer supports Technical File with
  - Third Party Test Report and/or
  - Third Party Certification
- Prepare and sign Manufacturers Declaration of Conformity
- Apply the CE Mark to the product
- Ship Product with copy of signed Declaration

New Approach Compliance Requirements: A Technical File

A technical file is a mandatory part of compliance with the New Approach Directives requirements and should include:

- Equipment’s general description
- Drawings/Service manual
- Information on standards applied
- Test reports / Photos
- Rationale for compliance – If applicable
- Copy of Declaration of Conformity
- Changes control procedure
- ISO 9001 – Approval Related Procedures
- Any other safety related documents/procedures

Note: The technical file must be held in the EU as it will be required by the enforcement authorities in cases of a dispute. The content of the file can be used in a defence against claims of non-conformity and in some cases, product liability.
New Approach Compliance Requirements: Declaration of Conformity

This document is mandatory and must identify:

- Manufacturer (Business Name, Address & Contact Details)
- A Specific Responsible Person (by name and job title)
- Exact product type/name or product identifying number
- Year of affixation of CE Marking
- List of applicable standards to which the product has been tested

It is the written declaration by the manufacturer or his authorised representative that the equipment to which the CE Mark has been affixed, complies with the LVD. The signatory must be empowered to enter into commitments on behalf of the manufacturer or his authorised representative established within the Community.

In making a Declaration of Conformity, the signatory makes himself personally liable for the compliance of the product and runs the risk of a £5,000 fine (in the UK), or a prison sentence in the most extreme case for non-conformity. The manufacturing company will also be liable. Without the Declaration of conformity, the CE Marking is not valid.

Technical Files and Declarations of Conformity must be kept for at least 5 years after the production of the product has ceased.

New Approach Compliance Requirements: Internal Production Control

The Declaration of Conformity applies to all production models in a family and therefore a good quality monitoring process is important to ensure that products manufactured in same way as the tested sample. This can take the form of:

- Quality systems/audits
- Modification Control
- End of line testing
New Approach Compliance Requirements: Applying CE Marking

Before the CE Mark may be affixed to a product and legally sold within the European Union, the manufacturer or exporter must complete the following:

- Prepare a Technical File to show the product’s compliance with applicable essential requirements and conformity assessment procedures undertaken.
- Prepare a Declaration of Conformity which means that you, as a manufacturer, declare that your product fulfils the requirements of the applicable directive.
- According to some directives (e.g. ATEX, Medical Equipment, Gas Appliances) you must also receive a product-specific CE marking certificate from a Notified Body. In this instance CE marking will be accompanied by the designated number of the accredited laboratory. Intertek’s is 0359.

For further advice and guidance on CE Marking your military, aerospace and defence products, please contact your testing and certification partner.

How Intertek can help

Intertek provides a complete suite of safety, EMC, performance and environmental testing and certification services to provide evidence to support your Declaration of Conformity & CE Marking activities. We can also provide a design review early in the product development phase to check your product is on track to comply with appropriate Standard requirements. As well as being a Notified Body under many European Directives we are also a Nationally Recognised Testing Laboratory (NRTL) for the USA and a member of the international CB scheme so we are able to provide expert assessment services to help you meet the requirements of your target markets and aid your market access - providing an efficient, competitive service that gets your product out there faster. Furthermore as a List X facility we are already trusted by dozens of manufacturers in the military, aerospace and defence sector to deliver the services they need in the confidential environment they demand.

For more information on how Intertek can assist with your compliance project, contact Ranjit Bhambra at Ranjit.bhambra@intertek.com or call 01372370900

1-800-WORLDLAB, email icenter@intertek.com, or visit our website at www.intertek.com.

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