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EMC Directive
2014/30/EU

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The EMC Directive 2014/30/EU came into force on 20 April, 2016 and is aligned to the New Legislative Framework. The directive ensures that all electrical and electronic equipment placed on the EU market complies with the allowed adequate level of electromagnetic compatibility. In this regard, the electrical products shall not generate or be affected by any electromagnetic disturbance. The EMC's purpose is to keep all side effects, appearing when electrical devices are interconnected or placed close to each other, under control.

What is the purpose of the EMC Directive?

The Electromagnetic Compatibility (EMC) Directive 2014/30/EU requires manufacturers and suppliers of equipment to comply with essential regulatory requirements before the equipment is placed on the market or taken into service.

There are two primary objectives of the EMC Directive:

1. All electrical and electronic equipment (whether fixed installations or apparatus) that is placed on the EU market must comply with the Directive's requirements when it is correctly installed, maintained and utilised for its intended purpose
2. All fixed installations must be characterised with the application of good engineering practice

Compliance prevents interference with radio services and ensures adequate immunity of the electrical and electronic equipment to electromagnetic noise within the environment, for instance, possible interference between TV sets, radios, electrical power lines and other equipment. The Directive limits electromagnetic emissions from electrical equipment so that the equipment does not disturb the activity of other equipment, such as radio or telecommunication services, when used as intended.

What is covered under the EMC Directive?

The EMC Directive covers a vast range of equipment, including most electrical and electronic appliances, systems and installations, defined as apparatus or fixed installations.

An apparatus is any finished appliance or combination of finished appliances, placed on the EU market as a single functional unit, intended for the end-user, and liable to generate electromagnetic disturbance or the performance of which is liable to be affected by electromagnetic disturbances. An apparatus can also be:

- Plug-in cards for computers
- Computer disk drives
- Programmable logic controllers
- Electric motors
- Power supply units if used as autonomous appliances or sold separately for installation by the end-user
- Electronic temperature controls
- Mobile installations

Fixed installations refer to a particular combination of several types of apparatus and other devices, which are assembled, installed and intended to be used permanently at a predefined location. Within the scope of fixed installations are large machines, if they can be defined as fixed. Fixed installations can typically be:

- Production lines
- Industrial and power plants
- Power supply networks
- Telecommunication, cable TV and computer networks
- Airport luggage handling installations
- Automatic warehouses
- Wind turbine stations
- Water pumping stations
- Railway infrastructures

What is excluded from the EMC Directive?

Radio systems and aeronautical products, parts and appliances, military equipment and equipment covered by other directives like the Radio Equipment Directive or the Medical Device Directive are excluded. Likewise, equipment that does not contain any electrical or electronic components is not covered by the directive's scope. They are often mentioned as being "EMC benign".

Other examples of equipment excluded from the EMC Directive's scope are:

- Resistors, capacitors, filters, inductors
- Integrated circuits
- Diodes, transistors, etc.
- Simple electromagnetic relays and thermostats
- LED
- Cathode ray tubes, and others



Essential requirements

The EMC Directive sets out mandatory essential requirements that all equipment within its scope needs to comply with. These essential requirements do not specify in detail the technical specifications, but define the results that need to be attained. Moreover, they allow the product design of the equipment to be adapted to the technological progress. The essential requirements are legally binding for all equipment within the scope of the directive and allow only compliant equipment to be placed on the EU market. The essential requirements have two parts:

1. General requirements for all equipment.
All electrical equipment, when designed, manufactured and placed on the EU market, must comply with the following criteria:
 - The electromagnetic disturbance generated when specific equipment is utilised must not exceed the level allowing the normal functioning of radio or another type of equipment
 - The equipment has an adequate level of immunity to electromagnetic disturbance, and it can operate without unacceptable degradation of its intended use
 - The equipment shall be designed and manufactured with regards to the state of the art

2. Specific requirements for fixed installations:

- Application of good engineering practice
- All documents required in case of inspection should be kept safely by a responsible person
- Respecting the information on the intended use of all of its components

The new EMC Directive sets out new obligations to manufacturers of electrical equipment (apparatus or fixed installations) in regard to the necessary conformity procedures for placing a product on the EU market. The EMC Directive 2014/30/EU states expressly that it is no longer sufficient that the electromagnetic compatibility of equipment be verified only by test reports containing EMC test data or based on expert analysis. Now, the electromagnetic compatibility of an apparatus or fixed installations must be confirmed by appropriate risk analysis and assessment. Both the analysis and the evaluation of the risk shall be included in the technical documentation of the product.

The directive still requires manufacturers to perform an electromagnetic compatibility assessment of equipment based on electromagnetic phenomena. What they can no longer do is to follow the alternative approach for applying European standards stated in the previous editions of the EMC Directive, which was not aligned with the New Legislative Framework.

How to show compliance

The EMC Directive sets out the following conformity assessment procedures for apparatus and fixed installations:

A. Internal production control:

- Evaluation of the electromagnetic compatibility of the equipment based on the relevant phenomena, with the aim of meeting the essential general requirements
- Creation of a technical construction file that shall contain the following information (see below)
- The manufacturing of the product shall be in accordance with the product's technical documentation and the essential requirements of the directive.
- Every individual product that complies with the EMC's requirements must have affixed the CE mark on it
- Creation of a Declaration of Conformity
Maintain and update the technical design and its documentation to the current technical requirements for every new individual product placed on the market, throughout the lifecycle of the product.

B. An EU-type examination that is followed by conformity to type based on internal production control

- a) EU-type examination refers to the assessment phase when a Notified Body needs to examine the technical design of equipment and verify and attest that the design meets the essential requirements of the EMC Directive. Consequently, the Notified Body issues an EU-type examination certificate to the manufacturer. A copy of the certificate, along with any annexes, additions and the product's technical documentation, shall be at the disposal of the respective national authorities for ten years after the product's introduction to the market.

- b) Compliance to type based on internal production control refers to the assessment phase where the manufacturer fulfils the following obligations:

- Manufacturing of the product according to the essential requirements of EMC Directive 2014/30/EU and the product's technical construction file
- Affixing the CE mark on every individual product that complies with the EMC's essential requirements (learn more about the CE mark itself).
- Creation of a Declaration of Conformity for certifying the CE compliance of the equipment.
- Maintain and update the technical design and its documentation to the current technical requirements for every new individual product which is placed on the market, throughout the lifecycle of the product.

The procedures mentioned above are not mandatory in cases when the apparatus is intended for integration into a particular fixed installation and is otherwise not made available on the market.

Typical relevant tests to show compliance

- Conducted emissions
- Radiated emissions
- Harmonic emissions
- Voltage fluctuation and flicker
- Immunity to electrostatic discharges
- Immunity to radiated RF disturbances
- Immunity to electrical fast transients/burst
- Immunity to surges
- Immunity to conducted RF disturbances
- Immunity to magnetic fields
- Immunity to supply voltage dips
- Immunity to supply voltage interruptions

Important dates

The current EMC Directive 2014/30/EU transposed in April 2016 introduces new responsibilities for 'economic operators' i.e. manufacturers, importers and distributors in order to improve market surveillance.

What can Nemko offer?

- Notified Body services
- Guidance/report to help you determine which standards apply to your product
- Workshops for you and your organisation to improve the understanding of CE marking requirements for your product
- Test plans
- Testing in accordance with the relevant standards
- Test reports
- Risk analysis
- Market access services worldwide
- Pre-compliance services
- Standard surveillance services



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