E-marking of vehicles and vehicle components with respect to EMC

Vehicles and vehicle components are required to meet legal requirements for EMC according to UN ECE R10 (which replaces 72/245/EEC). The procedure is significantly different from normal EMC marking, which can be carried out completely by the manufacturer itself. In this case type approval is required; this is granted by a road transport authority, in Sweden Transportstyrelsen.

The manufacturer’s quality management system must also be checked and the product in question must undergo special tests. Type approval can be granted for a whole vehicle or for components. Approval of a vehicle can be based on approval of the individual components, but in practice a vehicle test is also usually required. Accessories for the aftersales market are approved after component testing.

Scope
The UN’s vehicle regulation UN ECE R10 concerns safety and makes a distinction between equipment and functions involved in safety systems and the driver’s control of the vehicle, and other items such as navigation systems, heating systems and so on. The term "immunity related" functions is used to describe the functions included in a specific list in the text covering the legal requirement. All other equipment is covered by the "normal" EMC Directive (2004/108/EC), and specific standards are constantly being developed.

The production of vehicles and components must additionally be subject to quality management according to ISO 9000, after an initial check by Transportstyrelsen or RISE, which acts as a technical service provider on behalf of Transportstyrelsen.

Testing and checks for type approval are always carried out by a technical service provider
Type approvals themselves are granted by road transport authorities, but testing and checks are undertaken by a technical service provider, for example RISE. Not only is testing delegated, but also checks of the quality management system.
Test reports and quality management system certifications from other organisations cannot automatically be accepted as a basis for type approval. In the case of updates to units that are already E-marked, the technical service provider must be informed about what the relevant changes are. The technical service provider or road transport authority will decide whether retesting is required or whether checking and issuing a certificate is sufficient.

**Testing methods and requirements**

An annex to the legal requirements describes in detail the testing methods for EMC. They are based on international standards produced by ISO and CISPR. There are methods for both whole vehicles and components. It is not possible to use alternative methods, even if they fulfil the requirements in question. The relevant standards for components are CISPR 12 and 25, ISO 11452-2, -3, -4, -5 and ISO 7637.

Further detailed requirements in the Directives mean that the basic methods cannot automatically be applied without modification. For example, quality management systems must be checked according to ISO 9002. There must also be a plan explaining how the manufacturing quality of all type-approved products can be guaranteed.

**Transitional rules**


In UN ECE regulation no. 10, the latest supplement ("series 04") includes EMC requirements for complete electric and hybrid vehicles when in charging mode. The next supplement ("series 05") will also include specific rules and limit values for components for electric and hybrid vehicles. The earlier European EMC Vehicle Directive 72/245/EEC with supplement 2004/104/EC among others has now been replaced by the UN's regulation UN ECE R10 as a result of increased global harmonisation of earlier specifically EU-related requirements.

The UN's vehicle regulations are written into law in over 50 countries around the world, and are accepted by even more. The North American, Taiwanese, Indian and Chinese markets still have their own specific national requirements.

RISE has been given separate approval as the technical service provider for the Taiwanese road traffic authority.

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