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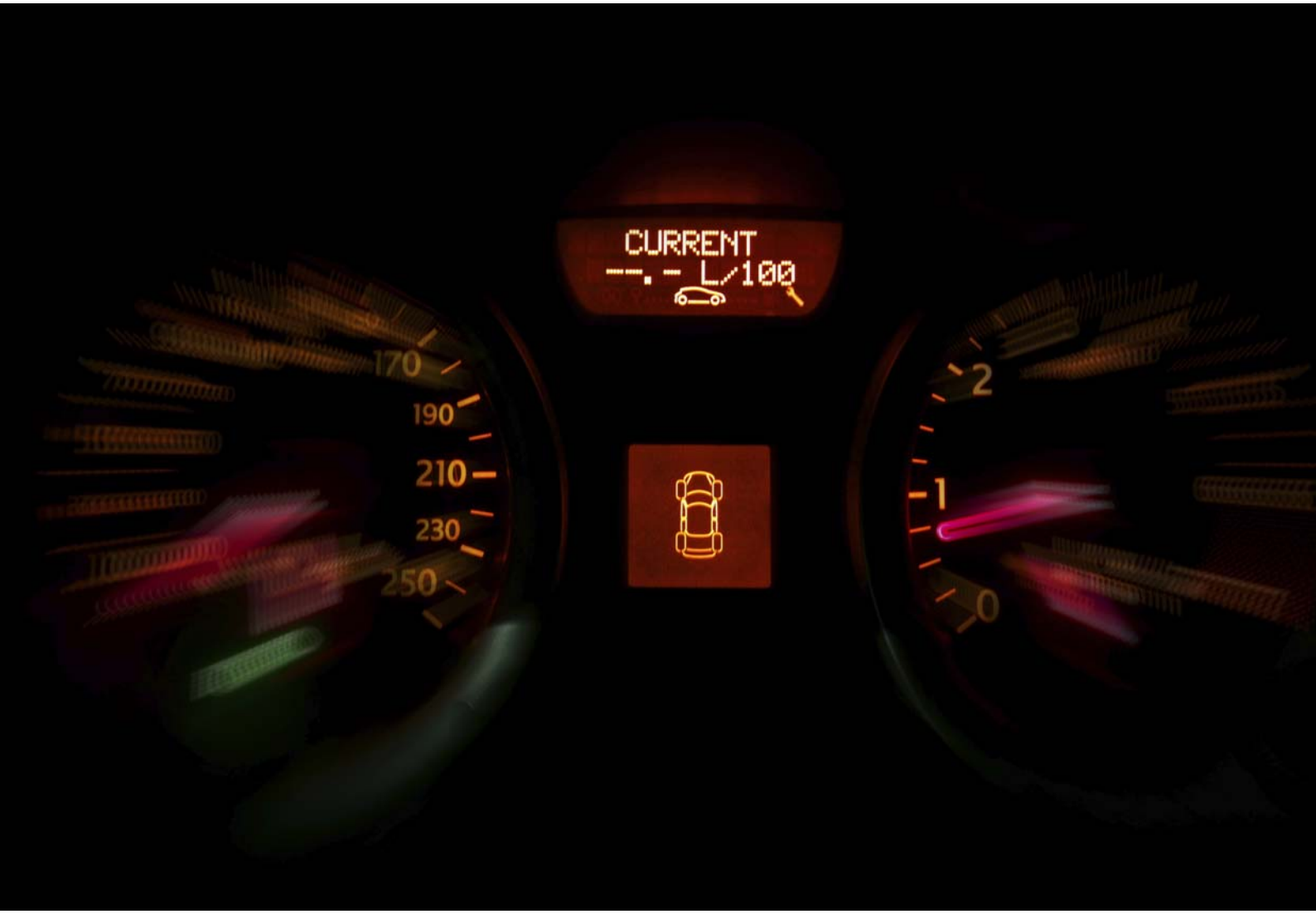
Introduction to Automotive e marking/ E Marking



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Background

With roots as far back as 1952, the UN Economic Commission for Europe (UNECE) conformity assessment requirements for automotive vehicles and components were introduced to increase the safety of vehicles, decrease environmental pollution and reduce energy consumption.

Today this infrastructure this takes the form of e marking /E marking on vehicle and components. e marking/ E Marking is based on a common set of technical prescriptions and protocols for type approval of vehicles and components for the participating countries. Whether from EU or non-EU countries, in general each country's type approvals are recognized by the others, though there are local deviations to the requirements which need to be considered.

This mutual recognition of approvals helps to support the free movement of vehicles and components across the world.

Participating Nations

Albania
Andorra
Armenia
Austria
Azerbaijan
Belarus
Belgium
Bosnia and Herzegovina
Bulgaria
Canada
Croatia
Cyprus
Czech Republic
Denmark
Estonia
Finland
France
Georgia
Germany
Greece
Hungary
Iceland
Ireland
Israel
Italy
Kazakhstan
Kyrgyzstan
Latvia
Liechtenstein
Lithuania
Luxembourg
Malta
Moldova
Monaco
Montenegro
Netherlands
Norway
Poland
Portugal
Republic of Macedonia
Romania
Russian Federation
San Marino
Serbia
Slovakia
Slovenia
Spain
Sweden
Switzerland
Tajikistan
The former Yugoslav
Turkey
Turkmenistan
Ukraine
United Kingdom of Great Britain and Northern Ireland
United States of America
Uzbekistan

Source http://www.unece.org/oes/member_countries/member_countries.html

Electrical Sub-Assemblies (ESAs)

Every electrical component with immunity related functions intended to be installed in a motor vehicle is considered to be an 'Electronic Sub-Assembly' (ESAs) and as such has to meet the EMC requirements of Directive 72/245/EEC and amendments 2004/104/EC and 2009/19/EC.

So what constitutes an ESA?

- Equipment intended to be part of a vehicle including associated electrical connections and wiring
- Equipment mechanically fastened to the vehicle which cannot be disassembled or removed without use of tools
- Equipment not restricted by technical means to immobilize vehicle
- Not passive equipment such as aerials and cables

Equipment with immunity related functions:

1. Equipment related to direct control of the vehicle, such as seating, braking, suspension, gears, steering wheel, windscreen wipers (affecting visibility) etc.

2. Functions related to driver, passenger and other road user protection such as a seatbelt

3. Functions which when disturbed cause confusion to the driver or other road users, such as signalling lights

4. Function related to vehicle data bus functionality

5. Functions which when disturbed affect vehicle statutory data (such as the speedometer)

The Process

- Customer secures System Certification such as ISO9001 or TS16949 or similar with focus to traffic law
- This is sent to a participating national motor or transport authority - such as the Vehicle Certification Agency (VCA) in the UK, or the **Kraftfahrt Bundesamt (KBA) in Germany** for Approval.
- If no system certification is available, the applicants motor or transport authority will typically conduct a 1-2 day audit of the manufacturing site (initial assessment).

- After the approval by the applicants motor or transport authority the manufacturer can request the type approval (e-mark) from a certifying body. Your will need to include:
- An application request
    - 'Pass' test reports to the appropriate product Standards, issued by a certified laboratory provider (technical service)
    - Product schematics, drawings, circuit diagrams and manuals etc.
    - Any other materials specifically relation to the product – such as installation instructions and materials lists
    - Typically, getting e marking takes 2-3 weeks, where no non-conformities are found in the application.

The Standards

e mark/E Mark itself is based on successful testing to UN Economic Commission for Europe (UNECE) Standards. Participating nations have signed up to recommended (but not mandatory) Standards. These nations, can supplement these requirements based on local laws and regulations and will typically accept e marks /E Marks from other participating nations. A list of components covered by UNECE Standards is below:

General lighting

R3 — Retroreflecting devices
R4 — Illumination of rear registration plates
R6 — Direction indicators
R7 — Front and rear position lamps, stop lamps and end-outline marker lamps
R19 — Front fog lamps
R23 — Reversing lights
R37 — Filament lamps (bulbs) (See: Automotive lamp types)
R38 — Rear fog lamps
R48 — Installation of lighting and light-signalling devices
R77 — Parking lamps
R87 — Daytime running lamps
R91 — Side marker lamps
R119 — Cornering lamps
R123 — AFS lamps
R128 — LED light sources

Headlamps

R1 - Headlamps emitting an asymmetrical passing beam and/or a driving beam, equipped with R2 or HS1 bulbs (superseded by R112, but still valid for existing approvals)
R5 - Sealed Beam headlamps emitting an asymmetrical passing beam and/or a driving beam
R8 - Headlamps equipped with replaceable single-filament tungsten-halogen bulbs (superseded by R112, but still valid for existing approvals)
R20 - Headlamps emitting an asymmetrical passing beam and/or a driving beam and equipped with halogen double-filament H4 bulbs (superseded by R112, but still valid for existing approvals)
R31 — Halogen sealed beam headlamps emitting an asymmetrical passing beam and/or a driving beam
R45 — Headlamp cleaners
R98 — Headlamps equipped with gas-discharge light sources
R99 — Gas-discharge light sources for use in approved gas-discharge lamp units of power-driven vehicles (See: Automotive lamp types)
R112 — Headlamps emitting an asymmetrical passing beam and/or a driving beam and equipped with filament bulbs
R113 — Headlamps emitting a symmetrical passing beam and/or a driving beam and equipped with filament bulbs

Instrumentation/controls

R35 — arrangement of foot controls
R39 — speedometer equipment
R46 — rear-view mirrors
R79 — steering equipment
Crashworthiness[edit]
R11 — door latches and door retention components
R13-H — braking (passenger cars)
R13 — braking (trucks and busses)
R14 — safety belt anchorages
R16 — safety belts and restraint systems
R17 — seats, seat anchorages, head restraints
R27 — advance-warning triangles
R42 — front and rear protective devices (bumpers, etc.)
R43 — safety glazing materials and their installation on vehicles
R94 — protection of the occupants in the event of a frontal collision
R95 — protection of the occupants in the event of a lateral collision
R116 — protection of motor vehicles against unauthorized use

Environmental compatibility

R10 — electromagnetic compatibility
R15 — emissions and fuel consumption (superseded by R83, R84 and R101)

R24 — engine power measurement, smoke emissions, engine type approval
R51 — noise emissions
R68 — measurement of the maximum speed
R83 — emission of pollutants according to engine fuel requirements
R84 — measurement of fuel consumption
R85 — electric drive trains — measurement of the net power and the maximum 30 minutes power of electric drive trains
R100 — approval of battery electric vehicles with regard to specific requirements for the construction, Functional Safety and hydrogen emission.[6]
R101 — measurement of the emission of carbon dioxide and fuel consumption
R117 — rolling sound emissions of tyres

Marking

e marking / E Marking, requires the involvement of an independent technical service provider to make the assessment of the vehicle or component, and it is used to demonstrate compliance with all applicable Directives and regulations in the participating territories.

e marking / E Marking comes in 2 formats. The lower case 'e' format is recognised in Europe (in accordance with Directive 2004/104/EC) and the uppercase 'E' format is recognised globally (including Europe), so you will often see both displayed like this:

The number accompanying the e/E denotes the country where the approval was issued.

Europe	Europe	Global	Global
e1 Germany	e26 Slovenia	E1 Germany	E21 Portugal
e2 France	e27 Slovakia	E2 France	E22 Russian Federation
e3 Italy	e29 Estonia	E3 Italy	E23 Greece
e4 Netherlands	e32 Latvia	E4 Netherlands	E24 Ireland
e5 Sweden	e34 Bulgaria	E5 Sweden	E25 Croatia
e6 Belgium	e36 Lithuania	E6 Belgium	E26 Slovenia
e7 Hungary	e49 Cyprus	E7 Hungary	E27 Slovakia
e8 Czech republic	e50 Malta	E8 Czech Republic	E28 Belarus
e9 Spain		E9 Spain	E29 Estonia
e11 United Kingdom		E10 Yugoslavia	E31 Bosnia and Herzegovina
e12 Austria		E11 United Kingdom	E32 Latvia
e13 Luxembourg		E12 Austria	E34 Bulgaria
e17 Finland		E13 Luxembourg	E37 Turkey
e18 Denmark		E14 Switzerland	E40 The former Yugoslav Republic of Macedonia
e19 Romania		E16 Norway	E42 European Community
e20 Poland		E17 Finland	E43 Japan
e21 Portugal		E18 Denmark	E45 Australia
e23 Greece		E19 Romania	E46 Ukraine
e24 Ireland		E20 Poland	E47 South Africa

In Europe the e mark can be used to demonstrate compliance Directive 72/245/EEC and amendments 2004/104/EC and 2009/19/EC.

Exclusions

Aftermarket Electronic Sub-Assemblies (ESAs) - supplemental equipment that is for example plugged into a cigarette lighter by the vehicle driver, does not require type approval. As these products have no immunity-related characteristics, they should not be e marked / E Marked. Rather they should be assessed according to the criteria for equipment not related to immunity functions, carry CE Marking and a Declaration of Conformity should be made for them - as they are subject to the more general Directives covering electrical product safety such as the LVD and EMC Directive.

An LCD screen for passenger, for example would not need an e mark / E Mark. Nor would a charger need an e mark as it is a passive piece of equipment.

However if you plugged a piece of equipment into non e marked charger, then *that equipment* should carry an e mark for use in a vehicle.

If it is something that relates to the safety or operability of the vehicle such as the alarm, then it would need to e marked /E Marked.

How can Intertek Help?

Intertek is an accredited by **Kraftfahrt Bundesamt (KBA),** the German Federal Motor and Transport Authority as a testing and certification body to provide EMC testing for automotive components under the Automotive Electromagnetic Compatibility Directive 2004/104/EC and the Radio Interference (electromagnetic compatibility) of Vehicles Directive 2009/19/EC for e marking / E marking purposes.

Every electrical component intended to be installed in a motor vehicle is considered to be an 'Electronic Sub-Assembly' (ESAs) and as such has to meet the EMC requirements of these Directives.

Intertek can test your ESA's electromagnetic characteristics to United Nations Economic Commission for Europe (UNECE) standards to help you secure e marking /E Marking for your product.

e marking Standards and regulations we test to

- ECE-R10 for E1-mark (EMC testing for components)
- ECE-R100 for E1-mark (battery safety testing for hybrid and electric vehicles)
- 2013/15/EC for e1-mark (EMC testing for components)

If you would like assistance with your next e marking project, please contact us on +44 1372 370900 or email us at info.uk@intertek.com.

About Intertek

Intertek is a leading quality solutions provider to industries worldwide. From auditing and inspection, to testing, training, advisory, quality assurance and certification, Intertek adds value for its customers by helping improve the quality and safety of their products, assets and processes. With a network of more than 1,000 laboratories and offices and over 36,000 people in more than 100 countries, Intertek supports companies' success in the global marketplace, by helping customers to meet end users' expectations for safety, sustainability, performance, integrity and desirability in virtually any market worldwide.

For more information on specific testing and certification information, please contact Intertek at +44 1372 370900, email info.uk@intertek.com, or visit our website at www.intertek.com.