

## CE-MARKING AND DIRECTIVE SERVICES

### MARKING OF ELECTRICAL EQUIPMENT MACHINERY, GAS APPLIANCES AND HEATING BOILERS WITHIN THE EUROPEAN UNION

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Electrical equipment, machinery, gas appliances and heating boilers to be marketed within the European Economic Area must bear the CE marking. This is a declaration by the manufacturer or by an importer located within the European Economic Area that the product complies with the essential health and safety requirements of the relevant EU directives. CE marking generally requires a Technical Construction File, which forms the basis for the Declaration of Conformity. The Technical Construction File indicates the product's conformity with the directives and also includes the test reports for the product. The directives require that the manufacturer is capable of manufacturing products of consistent quality.



In some cases sales of the product also requires an energy efficiency marking or "e" mark, which in turn requires testing and type approval carried out by an impartial accredited assessor. Furthermore, the requirements for the content of the Declaration of Conformity and the Technical Construction File somewhat vary between different directives.

**Some of the most important directives in this field and their special conditions are listed below:**

- Low-Voltage Directive
- EMC Directive
- Machinery Directive
- Gas Appliance Directive
- Boiler Efficiency Directive
- Automotive EMC Directive

#### **LOW-VOLTAGE DIRECTIVE**

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The Low-Voltage Directive and the EMC Directive are applied to the safety of electrical equipment. Safe equipment does not cause danger to people, domestic animals or property when correctly installed and serviced.

#### THE REQUIREMENTS OF THE LOW-VOLTAGE DIRECTIVE IN BRIEF

The Low-Voltage Directive came into force in 1973. It applies to electrical equipment with an operating voltage of 75V -1500 V DC and 50V - 1000V AC, but is not valid for certain electrical equipment covered by other directives. Such products include electromedical equipment, electrical appliances and instruments used in premises where there is an explosion hazard. The Low-Voltage Directive does not apply to household plugs. It requires a declaration of conformity and CE marking.

#### THE LOW-VOLTAGE DIRECTIVE COVERS HAZARD FACTORS CAUSED BY ELECTRICITY AS FOLLOWS:

- General conditions
- Protection against hazards caused by electrical appliances
- Protection of the electrical appliance against external hazards

The directive requires that a product must fulfill the requirements to be in conformity with the standard. If the manufacturer does not apply the standards, in case of dispute, a statement must be provided by a Notified Body (e.g. SGS Fimko) on the way the product's conformity with the standard has been verified.



## SGS FIMKO'S SERVICES RELATIVE TO THE LOW-VOLTAGE DIRECTIVE INCLUDE:

- Establishment of requirements, directives and standards
- Testing and inspections
- Assistance with producing the technical construction files
- Verification of technical construction files
- Assessment and certification of quality systems
- Operation as a Notified Body under the Low-Voltage Directive and many other directives
- Declarations of conformity
- Granting the FI mark and certificate and other international marks and certificates

## **EMC DIRECTIVE**

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### DISTURBANCE-FREE ELECTRICAL APPLIANCES

In addition to being safe, reliable and easy to maintain, electrical appliances must also be disturbance-free in various environments. Appliances that fulfill these requirements are electromagnetically compatible. Electromagnetic compatibility (EMC) means that the equipment does not introduce intolerable electromagnetic disturbances into its environment, and is not affected by such disturbances.

### THE ELECTROMAGNETIC ENVIRONMENT

For the satisfactory functioning of electrical appliances, different disturbance levels have been determined for residential and industrial areas. All electrical equipment can be made compatible with its environment by attending to the following issues:

- No appliance may produce disturbances exceeding the agreed level.
- All appliances must be able to withstand disturbances up to the agreed level.

### ELECTROMAGNETIC EMISSIONS

Any phenomenon by which electromagnetic energy emanates from the equipment (except as originally intended) is considered an electromagnetic emission. Interference on a TV screen, cracking noises on the radio and operational failure of information technology equipment are often caused by other appliances. Such disturbances can be transmitted from one device to another, either through wiring, or electromagnetic radiation.

### IMMUNITY

All electrical equipment must also be able to function properly in the presence of electromagnetic disturbance from the environment. For example, electromedical equipment in hospitals may be disturbed by mobile phones used nearby. The use of mobile phones is, therefore, usually not allowed in such environments.

### SUMMARY OF THE EUROPEAN UNION'S EMC REQUIREMENTS

The manufacturer of the product, the manufacturer's representative or an authorized importer shall make sure that the product to be produced or assembled conforms to the requirements of the EMC directive and any other valid directives. These directives include, among others, the low-voltage machinery and gas appliance directives.

A manufacturer who applies harmonized standards may use a Competent Body, for example SGS Fimko, for product testing. Manufacturers, who do not apply harmonized standards, must submit their products for testing by a Competent Body. The most economical alternative is to use a Competent Body, for example SGS Fimko, in order to avoid having to test all products in a large product series according to a particular standard. The Competent Body can choose the appropriate tests, the extent and costs of which are smaller.



## **MACHINERY DIRECTIVE**

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Safe machinery is machinery that causes no mechanical or electrical danger. It does not overheat or develop high temperatures that could endanger the user, other people or animals. The noise level of safe machinery stays within a permitted range. Manufacturing materials present no danger when safe machinery is used. Safe machinery will not pose any danger of radiation and it is ergonomically designed. The user's guide and service manual gives details on the correct use and servicing of the machinery.

The safety of machinery is assessed with risk assessment, tests and inspections. A Quality System for the production process will ensure that all manufactured products fulfill the manufacturer's quality criteria.

### **THE REQUIREMENTS OF THE EUROPEAN UNION MACHINERY DIRECTIVE IN BRIEF**

The EU Machinery Directive monitors the safety of machinery. The Directive includes the essential health and safety requirements for machinery and safety components marketed and used within the EEA member states. The manufacturer of machinery or safety components, or his representative, must ensure that the machinery to be produced or assembled fulfills the requirements of the Machinery Directive and any other applicable directives such as the Low-Voltage Directive and the EMC Directive.

Certain machinery requires EC type-examination by a Notified Body (e.g. SGS Fimko). The Notified Body tests the machinery to make sure that it complies with the requirements within the EEA member states. Such products include saws for woodworking, chain saws, surface planing machines, thicknessers for woodworking, circular saws and band saws.

### **WHICH STANDARDS ARE RELEVANT?**

We clarify which directives and standards apply to your product and can make a preliminary inspection at the product development stage.

### **RISK ASSESSMENT, TESTING AND INSPECTION**

We carry out the risk assessment required by the Machinery Directive and design a testing and inspection scheme for your product. Our skilled and experienced staff carries out the necessary tests, either at SGS Fimko or at the customer's premises, using our portable measuring equipment.

### **STATEMENT OF CONFORMITY**

You will have a Statement of Conformity or Investigation Report based on the testing and inspection for the Manufacturer's Declaration of Conformity.

### **TECHNICAL CONSTRUCTION FILE**

We help you make the technical construction file and ensure that it fulfills the requirements of the directives. We can also keep your documents for the required period. Our services also include updating the technical construction file to reflect changes in the product.

### **TECHNICAL ADVICE**

Our experts give advice and make sure that the service manual and user's guide fulfill the relevant requirements.

### **QUALITY ASSURANCE**

Our experienced and skilled auditors give you an impartial view of how well your Quality System work. We can also grant a Quality System Certificate to support your marketing both in Finland and abroad.



## **GAS APPLIANCE DIRECTIVE**

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A defective or faulty gas appliance is a huge safety risk. It is not only dangerous to its immediate surroundings but also to the wider gas distribution network. A defective gas appliance can cause extensive unexpected economical damage and financial loss to individuals, the whole of society and our common environment. For this reason, the European Union Gas Appliance Directive has been laid down to ensure safety.

### **TESTING OF GAS APPLIANCES**

Testing in a laboratory can best ensure the safety of gas appliances. The most important targets for testing are the construction and operating requirements of the product. During testing, the rated input and operating curves of the product are checked, as well as its operational performance under fault conditions. The appliance should not overheat or cause an explosion hazard, and flue gases must not include substances that exceed the permitted limits or are hazardous to health and the environment.

Furthermore, the individual components affecting safety must be tested and certified. The appliance is tested according to international standards. Electrically operated gas appliances are also tested according to the low-voltage and EMC requirements. SGS Fimko tests the products at its own premises and in a laboratory leased from Oilon Oy. The Finnish Centre has assessed testing competence for Metrology and Accreditation.

### **THE REQUIREMENTS OF THE GAS APPLIANCE DIRECTIVE (GAD) IN BRIEF**

The European Union Gas Appliance Directive concerns appliances using gas for the production of heat and hot water. It also applies to safety equipment, monitoring and control equipment, and accessories sold separately. Electrically operated gas appliances must be in conformity with the European Union Gas Appliance Directive (GAD), as well as the Low-Voltage Directive (LVD) and the Electromagnetic Compatibility Directive (EMC). The GAD requires CE marking and a technical construction file.

### **CONFORMITY VERIFICATION - TESTING BY A NOTIFIED BODY**

As products are subject to risks, the GAD requires an inspection carried out by an impartial Notified Body (for example SGS Fimko) at both the type testing and quality assurance stages.

The alternatives for conformity verification depend on whether the product is mass-produced, an individual product or a small series.

### **MASS-PRODUCED PRODUCTS**

Mass-Produced Products require EU Type Examination (1) which includes the following:

- The applicant submits the equipment and documents to SGS Fimko
- SGS Fimko examines the documentation
- SGS Fimko carries out tests and inspections
- SGS Fimko issues an EU type examination certificate
- The applicant informs SGS Fimko of any changes in the construction of the appliance

Besides the EU type examination, the manufacturer can choose one of the following alternatives for the EU declaration of conformity to type:

### **EU DECLARATION OF CONFORMITY TO TYPE (2):**

- The manufacturer verifies that the product is identical to the type-tested product
- The manufacturer affixes the CE marking
- The manufacturer takes sufficient steps to ensure that the product will remain identical with the type-tested one
- SGS Fimko carries out supervisory inspections at least once a year



#### PRODUCTION QUALITY ASSURANCE (3):

- The manufacturer has a production quality system in operation that ensures that the products remain identical to the type-tested product
- The manufacturer affixes the CE marking and issues EU type examination verification
- SGS Fimko approves the quality system
- SGS Fimko carries out inspections at least every second year

#### PRODUCT QUALITY ASSURANCE (4):

- At the final examination, the manufacturer has a quality system that ensures that the product remains identical with the type-tested product
- The manufacturer affixes the CE marking and issues EU type examination verification
- SGS Fimko approves the quality system
- SGS Fimko carries out inspections at least every second year

#### EU EXAMINATION (5):

- SGS Fimko examines the product and carries out the tests needed to ensure that the product fulfils the essential requirements
- This is done either by testing every product or by performing a statistical analysis

#### INDIVIDUAL PRODUCTS OR SMALL SERIES

The conformity verification of individual products or small series is carried out in the same way as for mass produced products. Besides these alternatives the manufacturer can choose a product-specific EU examination (6).

#### PRODUCT-SPECIFIC EU EXAMINATION (6):

- SGS Fimko examines the gas appliance and carries out the tests needed to ensure that the product fulfils the essential requirements

The product can also be examined and tested after the gas appliance has been installed.

#### SGS FIMKO'S SERVICES FOR GAS APPLIANCES:

- Clarification of the requirements for the appliance in question
- Clarification of the directives and standards
- Testing and inspection
- Type test certificates
- Assistance in preparing and checking the technical construction file
- Acting as a Notified Body (No. 598) under the GAD and other directives
- Granting of FI and other international certificates and certification marks

#### SGS Fimko tests the following Appliances:

- Gas burners
- Gas boilers
- Gas grills and other cooking appliances
- Gas heaters
- Coolers
- Regulating and monitoring devices
- Other gas and oil appliances
- Gas/oil boilers
- Gas/oil burners
- Gas/oil heating systems



## BOILER EFFICIENCY DIRECTIVE

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How people use energy is a matter of most import to the environment. The aim of the European Union is to develop a common energy saving policy in order to balance human activity with the environment. Energy efficiency has a very significant influence on energy consumption. The Boiler Efficiency Directive concerns the energy efficiency of hot-water boilers. Heating boilers are in most cases affected by the requirements of the Gas Appliance Directive (GAD), the Low-Voltage Directive (LVD) and the EMC Directive on electromagnetic compatibility, in addition to the Boiler Efficiency Directive.

### TESTING OF HOT-WATER AND HEATING BOILERS

The efficiency of hot-water and heating boilers is established by testing them according to international standards. SGS Fimko tests the efficiency characteristics at its own premises and in a laboratory leased from Oilon Oy. The Finnish Centre for Metrology and Accreditation has assessed testing competence. The testing is carried out on a finished product taken from the production site. Conformity to type is checked with follow-up testing on samples randomly taken from production or through quality control of production or products carried out at regular intervals. Most hot-water boilers are affected by the requirements of the Low-Voltage, EMC and Gas Appliances Directives. SGS Fimko is authorized to test and assess a product's conformity to these directives.

### THE REQUIREMENTS OF THE BOILER EFFICIENCY DIRECTIVE IN BRIEF

The Boiler Efficiency Directive covers new hot-water boilers using fluid or gasiform fuels with a rated output of 4 - 400 kW. The Directive does not cover, for example, individual boilers, equipment rapidly producing hot service water, or certain cooking ranges. However, the energy efficiency of these can be established with procedures described in the Boiler Efficiency Directive. If the boiler is intended to heat the premises as well as produce hot water, the Boiler Efficiency Directive covers only the use of the boiler in heating.

Besides the CE marking, the Boiler Efficiency Directive also requires drawing up a technical construction file and testing carried out by a Notified Body (for example SGS Fimko). The manufacturer must have a quality system that ensures equal quality of products or production, or alternatively, a quality system assessed and approved by a Notified Body.

### MARKINGS REQUIRED BY THE BOILER EFFICIENCY DIRECTIVE

The manufacturer shall affix a CE marking to boilers fulfilling the efficiency requirements. Adjacent to the CE marking shall be the last two digits of the year of marking and the number 0598. The manufacturer shall also issue a Declaration of Conformity. The granting of a CE marking requires that the product fulfills all relevant directives.

The energy efficiency marking is a voluntary means to give proof of the energy efficiency of the product. The marking consists of one to four stars, depending on the efficiency class. The more energy-efficient a product is, the higher the efficiency class and, in turn the greater the number of stars.

### DECLARATION OF CONFORMITY

Products require EU type examination (module b), which includes the following steps:

- The applicant submits the products and documents to SGS Fimko
- SGS Fimko examines the documents
- SGS Fimko carries out testing and inspection
- SGS Fimko grants an EU type-test certificate, and
- The applicant informs SGS Fimko of any changes in product construction

Besides the EU Declaration of Conformity, the manufacturer can choose one of the following alternatives (C, D or E):

#### EU Declaration of Conformity (C):

- The manufacturer verifies that the products are identical to the type-tested product
- The manufacturer affixes CE marking and energy efficiency marking (voluntary)
- The manufacturer must take sufficient steps to ensure that the product will remain identical with the type-tested product; and

- SGS Fimko carries out supervisory inspections at least once a year

#### Production Quality Assurance (D):

- The manufacturer has a production quality system in operation that ensures that the product remains identical to the type-tested product
- The manufacturer affixes CE marking and energy efficiency marking (voluntary) and issues EU type examination verification
- SGS Fimko approves the quality system, and
- SGS Fimko carries out inspections at least every second year

#### Product Quality Assurance (E):

- At the final examination, the manufacturer has a quality system in place that ensures that the product remains identical to the type-tested product
- The manufacturer affixes CE marking and energy efficiency marking (voluntary) and issues EU type examination verification
- SGS Fimko approves the quality system, and
- SGS Fimko carries out inspections at least every second year

#### SGS Fimko's Services with regard to Boilers

- Clarification of the requirements, directives and standards for the appliance in question
- Testing and inspection
- Assistance in preparing and checking the technical construction file
- Assessment and certification of quality system
- Acting as a Notified Body under the Gas Appliance Directive and other directives
- Type-test certificates
- Granting of FI and other international certificates and certification marks

SGS Fimko tests boilers, including oil or gas burners according to the Boiler Efficiency Directive. SGS Fimko can test products with a rated output of maximum 1,000 kW.

#### **AUTOMOTIVE EMC DIRECTIVE**

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The Automotive EMC Directive applies to vehicles and electronic devices used in them. If electronics is installed that have influence on the management of the vehicle or its operation under fault conditions may disturb the driver, the directive requires that testing is carried out by an impartial testing laboratory recognized by the appropriate authorities and that type approval is issued by the vehicle administration authorities. Type tested products are marked with the letter "e" and the number code of the country that has granted the approval. If the products must not be type tested the CE marking procedure mentioned in the EMC directive, is applied.



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