

**COMMISSION REGULATION (EU) 2019/1784****of 1 October 2019****laying down ecodesign requirements for welding equipment pursuant to Directive 2009/125/EC of the European Parliament and of the Council****(Text with EEA relevance)**

THE EUROPEAN COMMISSION,

Having regard to Article 114 of the Treaty on the Functioning of the European Union,

Having regard to Directive 2009/125/EC of the European Parliament and of the Council of 21 October 2009 establishing a framework for the setting of ecodesign requirements for energy-related products <sup>(1)</sup>, and in particular Article 15(1) thereof,

Whereas:

- (1) Pursuant to Directive 2009/125/EC the Commission should set ecodesign requirements for energy-related products which account for significant volumes of sales and trade in the Union and which have a significant environmental impact and present significant potential for improvement through design in terms of their environmental impact, without entailing excessive costs.
- (2) The Communication from the Commission COM(2016) 773 final <sup>(2)</sup> (ecodesign working plan) established by the Commission in application of Article 16(1) of Directive 2009/125/EC sets out the working priorities under the ecodesign and energy labelling framework for the period 2016-2019. The ecodesign working plan identifies the energy-related product groups to be considered as priorities for the undertaking of preparatory studies and eventual adoption of implementing measures, as well as the review of the current Regulations.
- (3) Measures from the ecodesign working plan have an estimated potential to deliver a total in excess of 260 TWh of annual final energy savings in 2030, which is equivalent to reducing greenhouse gas emissions by approximately 100 million tonnes per year in 2030.
- (4) The Commission has carried out a preparatory study to analyse the technical, environmental and economic aspects of welding equipment and machine tool products for industrial purposes <sup>(3)</sup>. Welding equipment subject to the study comprises arc and plasma welding equipment for metals, designed and typically used for industrial and professional use <sup>(4)</sup>. It has been considered that welding equipment exclusively powered with engines or batteries should not be regulated.
- (5) The preparatory study was conducted in close cooperation with stakeholders and interested parties in the EU and elsewhere. The results were made public and presented to the Consultation Forum established under Article 18 of Directive 2009/125/EC.
- (6) The environmental aspects of welding equipment that were identified as significant for the purposes of this Regulation are:
  - (a) energy consumption in the use phase, including when the products are in 'idle' mode;
  - (b) resource efficiency aspects.

<sup>(1)</sup> OJ L 285, 31.10.2009, p. 10.

<sup>(2)</sup> Communication from the Commission. Ecodesign working plan 2016-2019 (COM(2016) 773 final, Brussels, 30.11.2016).

<sup>(3)</sup> Machine tools were initially covered in the preparatory work, but they have been excluded from the scope of this Regulation due to the difficulty of determining minimum efficiency requirements on the basis of the currently available information. Additional data collection, especially on the technical options for reducing energy consumption in non-processing states such as standby and other low-power modes, could result in ecodesign measures being proposed for machine tools in the future.

<sup>(4)</sup> As defined in IEC 60 974-1: Arc welding equipment — Part 1: Welding power sources. Specifically excluded from the scope of this Regulation are arc welding and cutting equipment designed for limited-duty operation by the layperson in accordance with IEC 60 974-6: Arc welding equipment — Part 6: Limited duty equipment.

- (7) Annual final energy consumption directly related to welding equipment is expected to be in excess of 6 TWh in 2030, corresponding to 2,4 million tonnes of CO<sub>2</sub> equivalent, excluding the energy used in making the associated consumables (such as shielding gases, welding wire). The preparatory study showed that energy consumption in the use phase and various idle or standby modes can be reduced significantly.
- (8) By 2030, it is estimated that the ecodesign requirements in this Regulation will result in annual energy savings of 1,09 TWh, corresponding to total annual savings of about 0,27 Mt CO<sub>2</sub> equivalent.
- (9) The Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions COM(2015) 614 final <sup>(5)</sup> (circular economy action plan) and the ecodesign working plan underline the importance of using the ecodesign framework to support the move towards a more resource efficient and circular economy. Directive 2012/19/EU of the European Parliament and of the Council <sup>(6)</sup> refers to Directive 2009/125/EC and indicates that ecodesign requirements should facilitate the re-use, dismantling and recovery of waste electrical and electronic equipment (WEEE) by tackling the issues upstream. Accordingly this Regulation lays down requirements on non-energy-related aspects, including:
- (a) disassembly;
  - (b) reparability;
  - (c) critical raw materials.
- (10) In addition, it requires that welding equipment be accompanied by information on the use of shielding gases during welding and the quantities of welding wire or filler material used.
- (11) The energy and resource consumption of welding equipment could be reduced by applying existing non-proprietary techniques without an increase in the combined costs of purchasing and operation.
- (12) The preparatory study has concluded that the proposed ecodesign requirements do not affect the functionality or affordability of welding equipment from the end-user's perspective and do not negatively affect health, safety or the environment.
- (13) The timing for the introduction of ecodesign requirements allows manufacturers to redesign the products covered by this Regulation. It takes account of the impact on costs for manufacturers, in particular the large proportion of small and medium-sized enterprises in the welding equipment manufacturing sector in the EU, while ensuring the timely achievement of the objectives of this Regulation.
- (14) Product parameters should be measured and calculated using reliable, accurate and reproducible methods that take into account recognised state-of-the-art measurement and calculation techniques, including, where available, harmonised standards adopted by the European standardisation organisations following a request from the Commission, in accordance with Regulation (EU) No 1025/2012 of the European Parliament and of the Council <sup>(7)</sup>.
- (15) In accordance with Article 8 of Directive 2009/125/EC, this Regulation should specify which conformity assessment procedures apply.
- (16) To facilitate compliance checks, manufacturers should provide the information contained in the technical documentation referred to in Annexes IV and V to Directive 2009/125/EC where that information relates to the requirements laid down in this Regulation.

<sup>(5)</sup> Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions. Closing The Loop — An EU action plan for the circular economy (COM(2015) 614 final, Brussels, 2.12.2015).

<sup>(6)</sup> Directive 2012/19/EU of the European Parliament and of the Council of 4 July 2012 on waste electrical and electronic equipment (WEEE) (OJ L 197, 24.7.2012, p. 38).

<sup>(7)</sup> Regulation (EU) No 1025/2012 of the European Parliament and of the Council of 25 October 2012 on European standardisation (OJ L 316, 14.11.2012, p. 12).

- (17) In addition to the legally binding requirements laid down in this Regulation, benchmarks for best available techniques should be identified to make information on the lifecycle environmental performance of products subject to this Regulation widely available and easily accessible, in accordance with part 3(2) of Annex I to Directive 2009/125/EC.
- (18) In order to improve the effectiveness and credibility of this Regulation and to protect consumers, products that automatically alter their performance in test conditions to improve the declared parameters should be prohibited.
- (19) A review of this Regulation should assess the appropriateness and effectiveness of its provisions in achieving its goals. The timing of the review should allow for all provisions to be implemented and show an effect on the market.
- (20) In order to improve the operation of the internal market and the environmental performance of welding equipment throughout the Union, ecodesign requirements should harmonise the relevant energy consumption and resource efficiency requirements. The requirements should be revised not later than 2024 in the light of technological evolution, in order to take advantage of further possibilities of improving the equipment's performance and the operation of the internal market.
- (21) The measures provided for in this Regulation were discussed by the Consultation Forum referred to in Article 18 of Directive 2009/125/EC.
- (22) The measures provided for in this Regulation are in accordance with the opinion of the Committee established under Article 19(1) of Directive 2009/125/EC,

HAS ADOPTED THIS REGULATION:

#### *Article 1*

#### **Subject matter and scope**

1. This Regulation establishes ecodesign requirements for the placing on the market or the putting into service of electrical mains-operated welding equipment.
2. This Regulation shall apply to welding equipment using one or more of the following welding and allied processes:
  - (a) manual metal arc welding;
  - (b) shielded metal arc welding;
  - (c) self-shielded flux-cored welding;
  - (d) flux cored arc welding;
  - (e) metal active gas and metal inert gas welding;
  - (f) tungsten inert gas welding;
  - (g) plasma arc cutting.
3. This Regulation shall not apply to welding equipment using the following welding and allied processes:
  - (a) submerged arc welding;
  - (b) limited-duty arc welding;
  - (c) resistance welding;
  - (d) stud welding.

*Article 2***Definitions**

For the purposes of this Regulation, the following definitions shall apply:

1. 'welding equipment' means products that are used for manual, automated or semi-automated welding, brazing, soldering or cutting (or all of the above) via arc welding and allied processes, and that is stationary or transportable, and consists of linked parts or components, at least one of which moves and which are joined together to produce coalescence of metals by heating them to the welding temperature (with or without the application of pressure) or by the application of pressure alone, with or without the use of filler metal, and with or without the use of shielding gas (es), using appropriate tools and techniques, resulting in a product of defined geometry;
2. 'manual metal arc welding' means an arc-welding process with a coated electrode where the operator's hand controls the travel speed of the welding operation and the rate at which the electrode is fed into the electric arc;
3. 'shielded metal arc welding' means an arc-welding process whereby coalescence is produced by heating with an electric arc between a covered metal electrode and the work-piece and work area. Shielding is obtained from decomposition of the electrode covering. Pressure is not used and filler metal is obtained from the electrode;
4. 'self-shielded flux-cored welding' means a wire welding process in which a continuous hollow-wire electrode is fed through the welding gun into the weld joint without the need to use an external shielding gas to protect the weld pool from contamination. Instead of an external shielding gas, a flux compound within the hollow wire reacts with the welding arc to form a gas that protects the weld pool;
5. 'flux cored arc welding' means a welding process that uses composite tubular filler metal electrodes consisting of a metal sheath and a core of various powdered materials, producing an extensive slag cover on the face of a weld bead. The use of external shield gas(es) may or may not be required;
6. 'metal inert gas welding' means a gas metal arc welding process whereby coalescence is produced by heating with an arc between a continuous filler metal (consumable) electrode and the workpiece area. Shielding is obtained entirely from an externally supplied gas, or gas mixture, that is inert;
7. 'metal active gas welding' means a gas metal arc welding process whereby coalescence is produced by heating with an arc between a continuous filler metal (consumable) electrode and the workpiece area. Shielding is obtained entirely from an externally supplied gas, or gas mixture, that is active;
8. 'tungsten inert gas welding' means an arc welding process whereby coalescence is produced by heating with an arc between a single tungsten (non-consumable) electrode and the workpiece area. Shielding is obtained from a gas or gas mixture. Pressure may or may not be used and filler metal may or may not be used;
9. 'plasma arc cutting' means an arc cutting process that uses a constricted arc and removes the molten metal in a high velocity jet of ionised gas (plasma gas) issuing from the constricting orifice. Plasma arc cutting is a direct-current electrode-negative process;
10. 'plasma gas' (also referred to as 'orifice gas' or 'cutting gas') means a gas directed into the torch to surround the electrode, which becomes ionised by the arc to form a plasma and issues from the torch nozzle as the plasma jet;
11. 'shielding gas' (also referred to as 'secondary gas') means a gas that does not pass through the orifice of the nozzle, but instead passes around the nozzle and forms a shield around the electric arc;
12. 'submerged arc welding' means an arc welding process that uses an arc or arcs exceeding 600 amperes between a bare metal electrode or electrodes and the weld pool. The arc and molten metal are shielded by a blanket of granular flux on the workpieces. No pressure is applied and the process uses filler metal from the electrode and sometimes from a supplementary source such as a welding rod, flux or metal granules;

13. 'limited-duty arc welding' means arc welding and allied processes that are not for industrial and professional applications and that:
  - (a) use single-phase public low-voltage input;
  - (b) if engine driven, do not exceed an output power of 7,5 kVA;
  - (c) do not require arc-striking and stabilising devices, liquid cooling systems or gas consoles for operation;
14. 'resistance welding' means a thermo-electrical process in which heat is generated at the interface of the parts to be joined by passing an electrical current through the parts for a precisely controlled time and under a controlled pressure. No consumables such as welding rods or shielding gases are required;
15. 'stud welding' means a welding process in which a metal stud or a similar part is joined (manually, in automated or in semi-automated way) to a workpiece using an arc of electricity to heat both parts;
16. 'equivalent model' means a model which has the same technical characteristics relevant for the technical information to be provided, but which is placed on the market or put into service by the same manufacturer or authorised representative or importer as another model with a different model identifier;
17. 'model identifier' means the code, usually alphanumeric, which distinguishes a specific product model from other models with the same trade mark or the same manufacturer's, authorised representative's or importer's name.

#### Article 3

#### **Ecodesign requirements**

The ecodesign requirements set out in Annex II shall apply from the dates indicated therein.

#### Article 4

#### **Conformity assessment**

1. The conformity assessment procedure referred to in Article 8 of Directive 2009/125/EC shall be the internal design control system set out in Annex IV, or the management system set out in Annex V, to that Directive.
2. For the purposes of conformity assessment pursuant to Article 8 of Directive 2009/125/EC, the technical documentation file shall contain a copy of the product information provided in accordance with Annex II, points 2 and 3, and the details and results of the calculations set out in Annex III to this Regulation.
3. Where the information in the technical documentation for a particular model has been obtained:
  - (a) from a model that has the same technical characteristics relevant for the technical information to be provided but is produced by a different manufacturer;
  - (b) by calculation on the basis of design or extrapolation from another model of the same or a different manufacturer, or both;

the technical documentation shall include the details of such calculation, the assessment undertaken by the manufacturer to verify the accuracy of the calculation and, where appropriate, the declaration of identity between the models of different manufacturers.

The technical documentation shall include a list of all equivalent models, including the model identifiers.

*Article 5***Verification procedure for market surveillance purposes**

Member States shall apply the verification procedure set out in Annex IV when performing the market surveillance checks referred to in point 2 of Article 3 of Directive 2009/125/EC.

*Article 6***Circumvention and software updates**

The manufacturer, authorised representative or importer shall not place on the market products designed to be able to detect they are being tested (e.g. by recognising the test conditions or test cycle), and to react specifically by automatically altering their performance during the test with the aim of reaching a more favourable level for any of the parameters declared by the manufacturer, importer or authorised representative in the technical documentation or included in any documentation provided.

The energy consumption of the product and any of the other declared parameters shall not deteriorate after a software or firmware update when measured with the same test standard originally used for the declaration of conformity, except with explicit consent of the end-user prior to the update. No performance change shall occur as result of rejecting the update.

A software update shall never have the effect of changing the product's performance in a way that makes it non-compliant with the ecodesign requirements applicable for the declaration of conformity.

*Article 7***Benchmarks**

The benchmarks for the best-performing products and techniques available on the market at the time this Regulation is adopted are set out in Annex V.

*Article 8***Review**

The Commission shall review this Regulation in the light of technological progress and shall present the results of this assessment, including, if appropriate, a draft revision proposal to the Consultation Forum no later than 14 November 2024.

The review shall assess, in particular, whether it is appropriate to set specific ecodesign requirements with regard to the following:

- (a) stricter limits to power source efficiency and idle state power consumption;
- (b) the emissions to air associated with the use of welding equipment;
- (c) additional resource efficiency requirements for the products in accordance with the objectives of circular economy;
- (d) products using submerged arc welding, limited duty arc welding, resistance welding and stud welding processes.

Additionally, it shall also assess whether it is appropriate to expand the scope of this Regulation to professional machine tools, and in particular set specific ecodesign requirements for machine tools with regard to minimum efficiency values in non-processing, standby and other low power modes.

*Article 9***Entry into force and application**

This Regulation shall enter into force on the twentieth day following that of its publication in the *Official Journal of the European Union*.

This Regulation shall apply from 1 January 2021.

This Regulation shall be binding in its entirety and directly applicable in all Member States.

Done at Brussels, 1 October 2019.

*For the Commission*  
*The President*  
Jean-Claude JUNCKER

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## ANNEX I

**Definitions applicable for the Annexes**

The following definitions shall apply:

- (1) 'power source efficiency' means the ratio, expressed in a percentage, of the output power at standardised welding conditions and standardised welding load voltages, to the highest power consumption of the power source;
- (2) 'idle state' means the operating state in which the power is switched on and the welding circuit is not energised;
- (3) 'idle state power consumption' means the power demand, in watts, in idle state;
- (4) 'power source' means a device that utilises alternating current (AC) to either power one or more AC power outputs, or which converts AC to one or more DC power outputs, for the purpose of powering a welding equipment;
- (5) 'control panel' means an overall operating interface, containing controls and indicators, between the user and the welding equipment;
- (6) 'equipment housing' means a casing intended to protect the product from the environment, including ambient humidity and possible shock impacts;
- (7) 'battery' means a device as defined in Article 3 of Directive 2006/66/EC of the European Parliament and of the Council <sup>(1)</sup>, in the sense also of 'battery pack' or 'industrial battery or accumulator' in the same Article;
- (8) 'welding torch' means a device which delivers the welding current to the electrode, which may include transferring the current to a consumable electrode, where used, and which also delivers the shielding gas, where used, to the electric arc area;
- (9) 'gas supply hose' means a supply hose specifically designed for supply of fuel gases (such as acetylene), compressed air and shielding gases used in welding, normally consisting of a tube and a protective cover, often specific to the gas type used, and sometimes to the operating conditions;
- (10) 'gas supply regulator' means a device which reduces the higher pressure of the supplied compressed gases to the lower pressure that can be safely used in the welding equipment, often equipped with a metering valve or flowmeter to measure and/or control gas flow;
- (11) 'welding wire drive' means a device, used to feed welding wire or filler material, that may be of the type of push, pull or a push-pull combination;
- (12) 'fan' means a rotary bladed machine used to maintain a continuous flow of gas, typically air, passing through it and acts for instance as the internal cooling system for the power source;
- (13) 'electricity supply cable' means an electric energy supply cable meeting the performance and safety requirements of internationally recognised welding cable standards;
- (14) 'professional repairer' means an operator or undertaking which provides services of repair and professional maintenance for welding equipment;
- (15) 'spare part' means a separate part that can replace a part with the same or similar function in a welding equipment.

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<sup>(1)</sup> Directive 2006/66/EC of the European Parliament and of the Council of 6 September 2006 on batteries and accumulators and waste batteries and accumulators and repealing Directive 91/157/EEC (OJ L 266, 26.9.2006, p. 1).



## ANNEX II

**Ecodesign requirements****1. Energy efficiency requirements**

From 1 January 2023, the power source efficiency of welding equipment, shall not be lower than the values set out in Table 1, and the idle state power consumption shall not exceed the values set out in Table 1.

Table 1

**Power source efficiency and idle state power consumption**

	Minimum power source efficiency	Maximum idle state power consumption
Welding equipment powered by three-phase power sources with direct current (DC) output	85 %	50 W
Welding equipment powered by single-phase power sources with direct current (DC) output	80 %	50 W
Welding equipment powered by single-phase and three-phase power sources with alternating current (AC) output	80 %	50 W

Compliance with the ecodesign requirements on power source efficiency and idle state power consumption shall be assessed, measured and calculated in accordance with the methods set out in Annex III.

**2. Resource efficiency requirements**

From 1 January 2021, welding equipment shall meet the following requirements:

## (a) Availability of spare parts

(1) Manufacturers, authorised representatives or importers of welding equipment shall make available to professional repairers at least the following spare parts for a minimum period of 10 years after the production of the last unit of a welding equipment model:

- (a) control panel;
- (b) power source(s);
- (c) equipment housing;
- (d) battery(ies);
- (e) welding torch;
- (f) gas supply hose(s);
- (g) gas supply regulator(s);
- (h) welding wire or filler material drive;
- (i) fan(s);
- (j) electricity supply cable;
- (k) software and firmware including reset software.

(2) Manufacturers shall ensure that these spare parts can be replaced with the use of commonly available tools and without permanent damage to the equipment and the part.

(3) The list of these spare parts and the procedure for ordering them shall be publicly available on the free access website of the manufacturer, authorised representative or importer, at the latest two years after placing on the market of the first unit of a model and until the end of the availability of these spare parts.

(b) Access to repair and maintenance information

No later than two years after the placing on the market of the first unit of a model, and until the end of the period mentioned under point a.1, the manufacturer, importer or authorised representative shall provide access to the welding equipment repair and maintenance information to professional repairers in the following conditions:

1. the manufacturer's, authorised representative's or importer's website shall indicate the process for professional repairers to register for access to information; to accept such a request, manufacturers, authorised representatives or importers may require the professional repairer to demonstrate that:
  - (i) the professional repairer has the technical expertise to repair and maintain welding equipment and complies with the applicable regulations for repairers of electrical equipment in the Member States where it operates. Reference to an official registration system as professional repairer, where such system exists in the Member States concerned, shall be accepted as proof of compliance with this point;
  - (ii) the professional repairer is covered by insurance covering liabilities resulting from its activity regardless of whether this is required by the Member State;
2. the manufacturer, authorised representative or importer shall accept or refuse the registration within 5 working days from the date of request by the professional repairer.

Once registered, a professional repairer shall have access, within one working day after requesting it, to the requested repair and maintenance information. The information may be provided for an equivalent model or model of the same family, if relevant. The available repair and maintenance information shall include:

- the unequivocal welding equipment identification information,
- a disassembly map or exploded view,
- a list of necessary repair and test equipment,
- component and diagnosis information (such as minimum and maximum theoretical values for measurement),
- wiring and connection diagrams,
- diagnostic fault and error codes (including manufacturer-specific codes where applicable),
- data records of reported failure incidents stored in the welding equipment (where applicable), and
- instructions for installation of relevant software and firmware including reset software.

Manufacturers, authorised representatives or importers may charge reasonable and proportionate fees for access to the repair and maintenance information or for receiving regular updates. A fee is reasonable if it does not discourage access by failing to take into account the extent to which the professional repairer uses the information.

(c) Maximum delivery time for spare parts

During the period mentioned under point a.1, the manufacturer, importer or authorised representative shall ensure the delivery to professional repairers of spare parts for welding equipment within 15 working days after having received the order.

This availability may be limited to professional repairers registered in accordance with point (b).

(d) Information on the display of welding equipment

Where a display is provided for a welding equipment it shall provide indication of the use of welding wire or filler material in grams per minute or equivalent standardised units of measurement.

(e) Requirements for dismantling for material recovery and recycling while avoiding pollution

Manufacturers shall ensure that welding equipment are designed in such a way that the materials and components referred to in Annex VII to Directive 2012/19/EU can be removed with the use of commonly available tools.

Manufacturers shall fulfil the obligations laid down in point 1 of Article 15 of Directive 2012/19/EU.

### 3. Information requirements

From 1 January 2021, manufacturers, their authorised representatives or importers shall ensure that the following information is provided in the instruction manuals for installers and end-users, and for at least 10 years after the first unit of a welding equipment model is placed on the market, on the free-access websites of manufacturers, their authorised representatives or importers:

- (a) the product type;
- (b) the manufacturer's name, registered trade name and registered address at which they can be contacted;
- (c) the product model identifier;
- (d) the power source efficiency (in %);
- (e) the idle state power consumption (in watts);
- (f) a list of equivalent models;
- (g) information relevant to recycling and disposal at end-of-life;
- (h) a list of critical raw materials present in indicative amounts higher than 1 gram at component level, if any, and an indication of the component(s) in which these critical raw materials are present;
- (i) indicative shielding gas utilisation for representative welding schedules and programmes;
- (j) indicative welding wire or filler material utilisation for representative welding schedules and programmes.

The following information shall be provided on the rating plate of welding equipment:

- (a) the year of manufacture.
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## ANNEX III

**Measurements methods and calculations**

For the purposes of compliance and verification of compliance with the requirements of this Regulation, measurements and calculations shall be made using harmonised standards, the reference numbers of which have been published for this purpose in the *Official Journal of the European Union*, or using other reliable, accurate and reproducible methods which take into account the generally recognised state-of-the-art, and produce results deemed to be of low uncertainty.

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## ANNEX IV

**Verification procedure for market surveillance purposes**

The verification tolerances defined in this Annex relate only to the verification of the measured parameters by Member State authorities and shall not be used by the manufacturer, importer or authorised representative as an allowed tolerance to establish the values in the technical documentation or in interpreting these values with a view to achieving compliance or to communicate better performance by any means.

Where a model has been designed to be able to detect it is being tested (e.g. by recognizing test conditions or test cycle), and to react specifically by automatically altering its performance during the test with the objective of reaching a more favourable level for any of the parameters specified in this Regulation or included in the technical documentation or included in any of the documentation provided, the model and all equivalent models shall be considered not compliant.

When verifying the compliance of a product model with the requirements laid down in this Regulation pursuant to Article 3(2) of Directive 2009/125/EC, for the requirements referred to in this Annex, the authorities of the Member States shall apply the following procedure:

1. The Member State authorities shall verify one unit of the model.
2. The model shall be considered to comply with the applicable requirements where the following conditions are met:
  - (a) the values given in the technical documentation pursuant to point 2 of Annex IV to Directive 2009/125/EC (declared values), and, where applicable, the values used to calculate these values, are not more favourable for the manufacturer, importer or authorised representative than the results of the corresponding measurements carried out pursuant to paragraph (g) thereof; and
  - (b) the declared values meet any requirements laid down in this Regulation, and any required product information published by the manufacturer, importer or authorised representative does not contain values that are more favourable for the manufacturer, importer or authorised representative than the declared values; and
  - (c) when the Member State authorities check the unit of the model, they find that the manufacturer, importer or authorised representative has put in place a system that complies with the requirements in the second paragraph of Article 6; and
  - (d) when the Member State authorities check the unit of the model, it complies with the requirement in the third paragraph of Article 6, the resource efficiency requirements in point 2 of Annex II and the information requirements in point 3 of Annex II; and
  - (e) when the Member State authorities test the unit of the model, the determined values (the values of the relevant parameters as measured in testing and the values calculated from these measurements) comply with the respective verification tolerances as given in Table 2.
3. Where the results referred to in points 2(a), 2(b), 2(c) or 2(d) are not achieved, the model and all equivalent models shall be considered not to comply with the Regulation.
4. Where the result referred to in point 2(e) is not achieved, the Member State authorities shall select three additional units of the same model for testing. As an alternative, the three additional units selected may be of one or more equivalent models.
5. The model shall be considered to comply with the applicable requirements if, for these three units, the arithmetical mean of the determined values complies with the respective verification tolerances given in Table 2.
6. Where the result referred to in point 5 is not achieved, the model and all equivalent models shall be considered not to comply with the Regulation.
7. The Member State authorities shall provide all relevant information to the authorities of the other Member States and to the Commission immediately after a decision has been taken on the non-compliance of the model according to points 3 or 6.

The Member State authorities shall use the measurement and calculation methods set out in Annex III.

The Member State authorities shall only apply the verification tolerances that are set out in Table 2 and shall only use the procedure described in points 1 to 7 for the requirements referred to in this Annex. For the parameters in Table 2, no other verification tolerances, such as those set out in harmonised standards or in any other measurement method, shall be applied.

Table 2

**Verification tolerances**

<i>Parameters</i>	<i>Verification tolerances</i>
Power source efficiency (%)	The determined value (*) shall not be lower than the declared value by more than 2 %.
Idle state power consumption (watt)	The determined value (*) shall not exceed the declared value by more than 10 %.

(\*) in the case of three additional units tested as prescribed in point 4, the determined value means the arithmetical mean of the values determined for these three additional units

## ANNEX V

**Benchmarks**

The following benchmarks are identified for the purpose of Part 3, point 2 of Annex I to Directive 2009/125/EC.

The best available technology on the market, at the time of entry into force of this Regulation, for the environmental aspects that were considered significant and are quantifiable is indicated below.

*Table 3***Benchmarks for power source efficiency and idle state power consumption**

Product type	Power source efficiency	Maximum idle state power consumption
Welding equipment powered by three-phase power sources with direct current (DC) output	92 %	10 W
Welding equipment powered by single-phase power sources with direct current (DC) output	90 %	10 W
Welding equipment powered by single-phase and three-phase power sources with alternating current (AC) output	83 %	10 W