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ANNEXES 1 to 4

ANNEXES

to the

COMMISSION REGULATION

**implementing Directive 2009/125/EC of the European Parliament and of the Council
with regard to ecodesign requirements for external power supplies**

**repealing Commission Regulation (EC) No 278/2009 with regard to ecodesign
requirements for no-load condition electric power consumption and average active
efficiency of external power supplies**

ANNEX I
Ecodesign requirements

1. Energy efficiency requirements

- (a) From **1 April 2020**, the no-load condition power consumption shall not exceed the following limits:

	AC-AC external power supplies, except low voltage and multiple voltage output external power supplies	AC-DC external power supplies, except low voltage and multiple voltage output external power supplies	Low voltage external power supplies	Multiple voltage output external power supplies
$P_O \leq 49,0 \text{ W}$	0,210 W	0,100 W	0,100 W	0,300 W
$P_O > 49,0 \text{ W}$	0,210 W	0,210 W	0,210 W	0,300 W

- (b) From **1 April 2020**, the average active efficiency shall be not less than the following limits:

	AC-AC external power supplies, except low voltage and multiple voltage output external power supplies	AC-DC external power supplies, except low voltage and multiple voltage output external power supplies	Low voltage external power supplies	Multiple voltage output external power supplies
$P_O \leq 1,0 \text{ W}$	$0,5 \cdot P_O + 0,160$	$0,5 \cdot P_O + 0,160$	$0,517 \cdot P_O + 0,087$	$0,497 \cdot P_O + 0,067$
$1 \text{ W} < P_O \leq 49,0 \text{ W}$	$0,071 \cdot \ln(P_O) - 0,0014 \cdot P_O + 0,67$	$0,071 \cdot \ln(P_O) - 0,0014 \cdot P_O + 0,67$	$0,0834 \cdot \ln(P_O) - 0,0014 \cdot P_O + 0,609$	$0,075 \cdot \ln(P_O) + 0,561$
$P_O > 49,0 \text{ W}$	0,880	0,880	0,870	0,860

2. Information requirements

- (a) From **1 April 2020**, instruction manuals for end-users (where applicable), and free access websites of manufacturers, their authorised representatives and importers shall include the following information, in the order as set out below:

Information published	Description

Nameplate output power (W)	Declared by the manufacturer
Root mean square (Rms) input voltage (V)	Declared by the manufacturer. Could be a value or a range
Input AC frequency	Specified by the manufacturer. Could be a value or a range
Rms output voltage (V)	Declared by the manufacturer for load condition 1. In case of multiple values the pairs of possible combinations Rms output voltage – Rms output current shall be provided
Rms output current (mA)	Declared by the manufacturer for load condition 1. In case of multiple values the pairs of possible combinations Rms output voltage – Rms output current shall be provided
Average active efficiency	Arithmetic average of efficiency calculated at load conditions 1–4
Efficiency at low load (10%)	Calculated at load condition 5
No-load power consumption (W)	Declared by the manufacturer for load condition 6

The relevant load conditions are as follows:

Percentage of nameplate output current	
Load condition 1	100 % ± 2 %
Load condition 2	75 % ± 2 %
Load condition 3	50 % ± 2 %
Load condition 4	25 % ± 2 %
Load condition 5	10 % ± 1 %
Load condition 6	0 % (no-load condition)

- (b) From **1 April 2020**, the technical documentation for the purposes of conformity assessment pursuant to Article 4 shall contain the following elements:

Reported Quantity	Description
Root mean square (Rms) output	Measured at load conditions 1–5

current (mA)	
Rms output voltage (V)	
Active output power (W)	
Rms input voltage (V)	Measured at load conditions 1–6
Rms Input Power (W)	
Total harmonic distortion (THD)	
True power factor	
Power consumed (W)	Calculated at load conditions 1–5, measured at load condition 6
Efficiency	Calculated at load conditions 1–5
Average active efficiency	Arithmetic average of efficiency at load conditions 1–4

The relevant load conditions are set out at point 2 (a).

ANNEX II

Measurements 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 other reliable, accurate and reproducible methods, which take into account the generally recognised state-of-the-art.

ANNEX III

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 or importer 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.

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 single unit of the model
2. The model shall be considered to comply with the applicable requirements if
 - (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 or importer 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 or importer does not contain values that are more favourable for the manufacturer or importer than the declared values; and
 - (c) 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 the table below.
3. If the results referred to in point 2(a) or (b) are not achieved, the model shall be considered not to comply with this Regulation
4. If the result referred to in point 2(c) is not achieved, the Member State authorities shall select three additional units of the same model for testing.
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 the table below.
6. If the result referred to in point 5 is not achieved, the model shall be considered not to comply with this Regulation.
7. The Member State authorities shall provide all relevant information to the authorities of the other Member States and to the Commission without delay after a decision being taken on the non-compliance of the model according to points 3 and 6.

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

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

Verification tolerances	
<i>Parameters</i>	<i>Verification tolerances</i>
No-load condition	The determined value shall not exceed the declared value by more than 0,10 W.
Arithmetical mean of efficiency at load conditions 1-4 as defined in Annex I	The determined value shall not be lower than the declared value by more than 5 %.

ANNEX IV
Benchmarks

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.

At the time of entry into force of this Regulation, the best available technology on the market for external power supplies in terms of their no-load energy consumption and average active efficiency was identified as follows.

(a) No-load condition

The lowest available no-load condition energy consumption of external power supplies can be approximated by:

- 0,002 Watt, for $P_O \leq 49,0$ Watts;
- 0,010 Watt, for $P_O > 49,0$ Watts.

(b) Average active efficiency

The best available active average efficiency of external power supplies according to most recent available data (status March 2015) can be approximated by:

- 0,767, for $P_O \leq 1,0$ Watt;
- 0,905, for $1,0 \text{ Watt} < P_O \leq 49,0$ Watts;
- 0,962, for $P_O > 49,0$ Watts.