FREQUENTLY ASKED QUESTIONS

TO

COMMISSION REGULATION (EU) No 327/2011

of 30 March 2011

implementing Directive 2009/125/EC of the European Parliament and of the Council with regard to ecodesign requirements for fans driven by motors with an electric input power between 125W and 500kW

INTRODUCTION

In March 2011 Regulation 327/2011[1] establishing Ecodesing requirements for fans was published in the Official Journal of the European Union (OJEU). This Regulation was the result of several years of work and negotiations involving different stakeholders and Member States.

Due to the highly technical nature of the product group and, in consequence, due to the high level of complexity of the Regulation it is deemed necessary to publish a list of "frequently asked questions" for helping all relevant parties transferring the Regulation and the requirements into practice and avoiding open issues in order to facilitate its correct implementation and the achievement of the foreseen energy savings.

The document aims at giving assistance to all actors, including fan industry, installers, original equipment manufacturers (OEMs) and public authorities, for transferring the Regulation and requirements into practice

The answers provided are not legally binding. A binding interpretation of Community law is the sole competence of the European Court of Justice.

[1] OJ L 90, 6.4.2011, p.8.

These FAQ cannot go beyond or substitute for the requirements of the Ecodesign Directive or its implementing Regulations. The Ecodesign Directive is addressed to the Member States and must be transposed into national law according to Article 23. The Ecodesign Regulations (implementing measures) are binding in their entirety and directly applicable in all Member States.

TABLE OF CONTENTS

1. ARTICLE 1. SUBJECT AND MATTER OF SCOPE

1.1. Placing on the market or putting into service of fans, including those integrated in other energy related products.

According to Directive 2009/125[2], 'placing on the market' means making a product available for the first time on the Community market with a view to its distribution or use within the Community, whether for reward or for free of charge and irrespective of the selling technique. In addition, 'putting into service' means the first use of a product for its intended purpose by an end-user in the Community.

Further explanations can be found on the Guide to the Implementation of Directives based on the New Approach and the Global Approach [Blue Guide][3]. According to section 2.3 of this document, a product is placed on the Community market when it is made available for the first time. This is considered to take place when a product is transferred from the stage of manufacture with the intention of distribution or use on the Community market.

According to this several situations might arise:

- The case of a manufacturer or an importer directly placing on the market European Economic Area (EEA) a fan is simple; it has to comply with Regulation 327/2011.

- Considering the case of an EEA based manufacturer of an energy-related product containing a fan. That manufacturer would purchase from a fan supplier from inside or outside the EEA a fan. The act of purchase is not deemed to have the intention of distribution or use on the EEA market. The requirements of the ecodesign fan regulations are the responsibility of the manufacturer integrating the fan into another energy-related product.

- Considering the case of an energy-related product containing a fan where the product has been produced outside of the EEA and is imported into the EEA. In this case the first time the fan is placed on the market is at the same time as the energy related product containing it is imported and placed into the EEA market. The requirements of the ecodesign fan regulations are the responsibility of the energy-related product containing a fan.

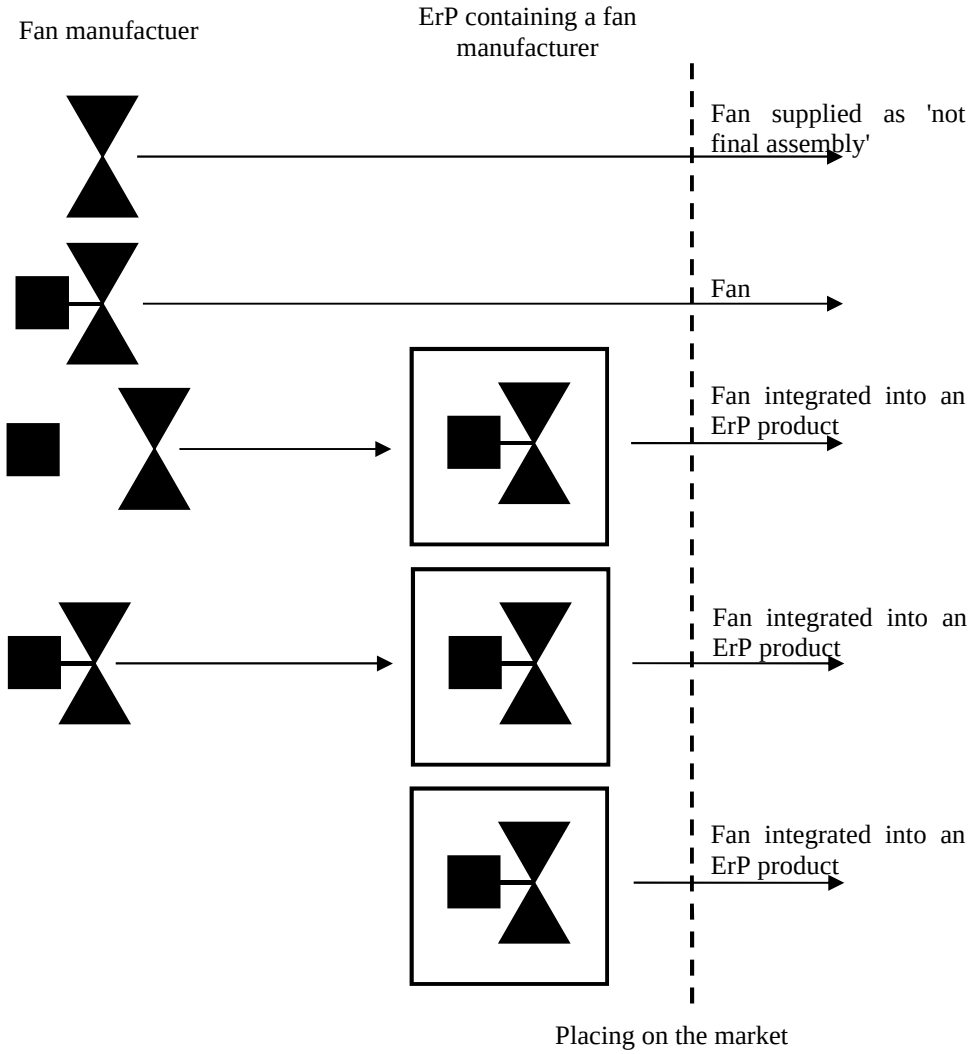
- Considering the case of an EEA based manufacturer of an energy-related product containing a fan. The fan itself is produced by the energy-related product manufacturer, so that the fan has not previously been separately placed on the market. In this case the first time the fan is placed on the market is at the same time as the energy related product containing it is placed into the market. In this instance the requirements of the ecodesign

[2] OJ L 285, 31.10.2009, p. 10.

[3] http://europa.eu.int/comm/enterprise/newapproach/newapproach.htm

fan regulations are the responsibility of the manufacturer of an energy-related product containing a fan.

In all cases, if a manufacturer of an energy-related product integrates a fan into its product; it is responsible for the compliance of the fan. According to the Blue Guide a manufacturer also means his appointed distributor or agent.



1.2. Putting into service of products not placed on the market

Concerning the putting into service, the Guide to the Implementation of Directives based on the New Approach and the Global Approach indicates that the compliance of products which can only be used after an assembly, an installation or other manipulation has been carried out can be verified in the framework of market surveillance.

In addition, the FAQs document on the Ecodesing Directive, developed by the Administrative Cooperation Group (ADCO) indicates that:

The term "putting into service" is used, as the EU legislation also needs to cover products, which are "physically" never placed on the market, but installed directly at the end-user's place. The sentence "be placed on the market and/or put into service", creates the impression that placing on the

market and putting into service are cumulative, i.e. that there are two different moments from when on a product has to comply, which is wrong.

The way the concepts should be understood is that "placing on the market" (making a product available for the first time on the EU market) and "putting into service" (first use of a product for its intended purpose by an end-user in the EU) refer to two different 'moments' in the process of bringing a product to the market; compliance for the 'entry' into the market is required only once based either on the moment when the product is placed on the market or when it is put into service. Accordingly, the Article 3 of the Ecodesign Directive should be understood as "products covered by implementing measures may be placed on the market or put into service, or both, only if they comply with those measures and bear the CE marking in accordance with Article 5."

A product has to comply with the requirements for CE marking from the moment that it is placed on the market. Only where a product is "not placed on the market" in the literal meaning, the moment of compliance is the putting into service.

An example where a product is put into service without being placed on the market is that of a manufacturer producing a fan or integrating a fan into an energy-related product, for instance, Heating, Ventilation and Air Conditioning (HVAC) equipment, containing fans, for own use on its factory. The products will not be placed on the market, but will be put into service and in consequence has to comply with the Regulation.

1.3. Manufacturer assembling impeller and motor

If a manufacturer assembles a fan from an impeller and a motor it is responsible for compliance with Regulation 327/2011.

The fact of using a motor complying with Regulation 640/2009[4], with the relevant CE marking and Declaration of Conformity (DoC) and an impeller complying with Regulation 327/2011 with the relevant CE marking and DoC does not exempt the fan assembler of providing the relevant CE marking and Declaration of Conformity (DoC) under Regulation 327/2011 if the fan is being placed on the market or put into service.

1.4. Products with a sole electric motor of 3 kW or less

According to article 1, 2(i) of the regulation it does not apply to fans integrated in appliances with a sole electric motor of 3 kW or less where the fan is fixed on the same shaft used for driving the main functionality;

This exemption applies only to products where the main functionality is other than ventilation and where the fan is normally used for cooling the motor.

Recital (12) provides further explanations on the topic:

[4] OJ L 191, 23.7.2009, p. 26.

Small fans (indirectly) driven by an electric motor between 125 W and 3 kW which primarily serves other functionalities are not within the scope. For illustration a small fan to cool the electric motor in a chain saw is not within the scope, even if the motor of the chain saw itself (which is also driving the fan) is above 125 W.

1.5. Kitchen hoods

According to article 1, 2(iii) of the Regulation, kitchen hoods < 280 W total maximum electrical input power attributable to the fan(s) are not covered by the Regulation.

A specific case can be found where the total maximum electrical power attributable to the fan is above 280 W but the input power in the optimum efficiency point is below. In this case, as the exclusion is made based on total maximum electrical input power, the fan must comply with the Regulation.

1.6. Fans used for cooling combustion engines

No exclusion for fans used in combustion motor cooling systems is foreseen on the Regulation.

Nevertheless, according to Directive 125/2009, article 1(3), the Directive, and in consequence the derived Regulation, shall not apply to means of transport for person of goods.

If the fan is used for cooling a combustion motor used in mean of transport, the Regulation shall not apply, if the combustion motor is used for other purposes, the Regulation applies.

Nevertheless, the calculation method of the overall efficiency described in Annex II indicates that the overall efficiency is to be calculated taking into account the power measured at the mains input terminals to the variable speed drive of the fan when the fan is operating at its optimal energy efficiency point.

In consequence, this calculation method cannot be applied to fans equipped with a combustion engine and they are considered not to be covered by the Regulation.

1.7. Operating temperatures

Article 1, 3(c) indicates that the Regulation shall not apply to fans which are specifically designed to operate:

- Where operating temperatures of the gas being moved exceed 100 ºC.
- Where operating ambient temperature for the motor, if located outside the gas stream, driving the fan exceeds 65 ºC.
- Where the annual average temperature of the gas being moved and/or the operating ambient temperature for the motor, if located outside the gas stream, are lower than – 40 ºC.

These exemptions are made for allowing fans designed for special purposes to be placed on the market or put into service. Fan operation within the conditions indicated above cannot always meet the requirements set by the Regulation as specific designs are needed in order to allow them operating under stringent conditions.

Nevertheless, it cannot be claimed that a fan is designed to operate under such conditions if the real life conditions are not going to be such. In that case, the fan will be considered not complying with the Regulation. For instance, if a fan is dimensioned for operating at – 41 ºC but the operational temperature is – 35 ºC the fan is within the scope of the Regulation.

1.8. Toxic, highly corrosive or flammable environments or in environments with abrasive substances

According to Article 1 of Regulation 327/2011, it shall not apply to fans designed specifically to operate in toxic, highly corrosive or flammable environments or in environments with abrasive substances.

The Regulation does not provide a definition of such environments. The only available approach is to refer to processes where in the industry is widely recognised that abrasive substance occur which causes accelerated wear on the fan / impeller blades or that highly corrosive or flammable environments exist. This has also to be combined with the fact that special designs of fans are used to withstand such environments.

Abrasion is the process of wearing away a surface by friction. If a particle can cause wear on a surface, depends on the hardness of the particle and of the surface material. Based on this approach, a stream of air contains abrasive particles, if the transported particles are harder than the typical materials the fans are made of.

An abrasive application requires special solutions for fans like special linings for reducing the abrasion of the impeller material. This is generally necessary for more than 100 milligrams of dust with large particles of minimum 5 Mohs per cubic meter of air.

The following are examples of applications where abrasive substances are present:

- Cement industry
- Asphalt industry
- Ceramic industry
- Cereal milling sector (pneumatic transport in mills)
- Glass sector
- Steel sector (air supply for burners and extraction of fumes)
- Brick products sector (air supply for burners' circulation' extraction of fumes)

- Woodworking sector (filtration' dust removal)
- Suction of material by leaf vacuums.

1.9. Fans not destined to be placed on the market or put into service in the European Economic Area (EEA)

Fans manufactured within the EEA and then exported outside are not placed on the market or put into service within the EEA and do not need to meet the requirements.

Fans that are manufactured and then transferred to another manufacturer to be integrated within another energy related product that is then exported outside of Europe are not covered by the Regulation.

1.10. Fans designed for use with or equipped with a battery driven electrical motor.

The Regulation does not indicate that fans designed for use with or equipped with a battery driven electrical motor are outside its scope.

Nevertheless, the calculation method of the overall efficiency described in Annex II indicates that the overall efficiency is to be calculated taking into account the power measured at the mains input terminals to the variable speed drive of the fan when the fan is operating at its optimal energy efficiency point.

In consequence, this calculation method cannot be applied to fans designed for use with or equipped with a battery driven electrical motor and they are considered not to be covered by the Regulation.

1.11. Suction units

Suction units are covered by the Regulation as it covers fans integrated in other energy-related products and no specific exceptions are made for these products.

2. ARTICLE 2. DEFINITIONS

2.1. Jet fans

The definition of fan is provided on Article 2 of the Regulation, according to this article 'fan' means a rotary bladed machine that is used to maintain a continuous flow of gas, typically air, passing through it and whose work per unit mass does not exceed 25 kJ/kg, and which:

- Is designed for use with or equipped with an electrical motor with an electric input power between 125 W and 500 kW (• 125 W and • 500 kW) to drive the impeller at its optimum energy efficiency point,
- Is an axial fan, cross flow fan or mixed flow fan.
- May or may not be equipped with a motor when placed on the market or put into service.

In addition 'axial fan' means a fan that propels gas in the direction axial to the rotational axis of one or more impeller(s) with a swirling tangential motion created by the rotating impeller(s). The axial fan may or may not be equipped with a cylindrical housing, inlet or outlet guide vanes or an orifice panel or orifice ring.

A jet fan complies with this definition and is in consequence, covered by Regulation 327/2011.

In addition, no exclusion was made on the impact assessment accompanying the Regulation, where on the section referring to problem definition it is indicated that as the technical scope of a fan cannot be limited to a given application or an end-use sector, the impact assessment is based on fans full-filling the technical criteria for axial, centrifugal, cross-flow, box and roof fans in the power range of 125 W – 500 kW.

Jet Fans are used for the longitudinal ventilation of tunnels, car parks, horticulture and de-stratification (tunnel); where the provision of conventional duct runs is impractical. In order to provide space for a supply duct and an extract duct, the tunnel cross section would have to be significantly increased, which in turn would lead to a significant increase in environmental cost when constructing the tunnel.

Instead of having separate air ducts, the tunnel itself is used as the conduit for transferring the polluted air or, in the case of a fire, hot gases and smoke. To enable this, specially designed Jet Fans are installed along the length of the tunnel, usually in the roof.

These fans work by producing a high velocity jet which entrains movement of the surrounding air, creating an overall air flow through the tunnel. The performance is determined by the thrust developed by the fans.

As such, these fans do not produce any pressure as defined by the Fan Regulations and the ISO 12759 standard. Therefore the efficiency of a Jet Fan would be calculated as zero and would fail to meet the minimum efficiency criteria as they currently stand.

In consequence, jet fans cannot be addressed with the available standards and cannot comply with the requirements set in Regulation 327/2011.

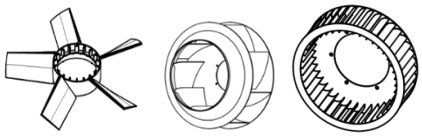
The performance of Jet Fans is determined using ISO 13350, where the parameters are defined as thrust, volume flow rate and power. It contains an informative annex which derives the efficiency from the thrust and the motor power input. Works are being carried out at international level in order to modify the standard ISO 13350 and allow measuring the efficiency of these fans.

Only the relevant information requirements can be required to these fans. The minimum energy efficiency requirements cannot be enforced.

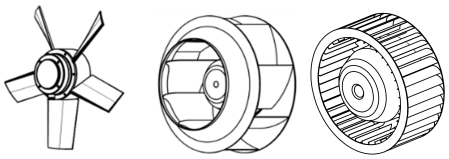
2.2. Types of fans included within the scope of the regulation

There are a number of diverse types of fan that differ to provide a variety of attributes.

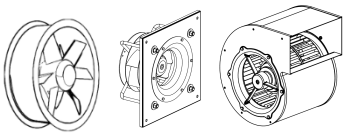
Impellers are within the scope of the Regulation, as it is clearly indicated that a fan may or may not be equipped with a motor when placed on the market or put into service. In addition, Annex II, 1 (6), defines 'not final assembly' as an assembly of fan parts, consisting of at least the impeller, which needs one or more externally supplied components in order to be able to convert electric energy into fan gas power. Different impellers are shown below.



Fans without housing are also included. If ancillaries are required to meet the declared energy efficiency, then these must be declared within the CE documentation and installation instructions. Different fans without housing are shown below.



Fans with housing are also included. If ancillaries are required to meet the declared energy efficiency, then these must be declared within the CE documentation and installation instructions. Different fans with housing are shown below.



Fans integrated in energy related products are also covered, including those integrated in box fans and roof fans.

Ancillaries may be housing, wall plate, wall ring, inlet ring, guide vanes, diffusers, and scroll.

2.3. Air conditioning products

According to Article 2, 17 of Regulation 327/2011, a ventilation fan is a fan that is not used on indoor units of household air-conditioning products and indoor household air-conditioners, • 12 kW maximum airco output power.

This exclusion is to be read in line with Regulation 206/2012[5], which in Article 1 indicates that the Regulation establishes eco-design requirements for the placing on the market and putting into service of electric mains-operated air-conditioning appliances with a design load of • 12 kW for cooling – or heating, if the product has no cooling function.

The products referred to by both paragraphs are the same.

[5] OJ L 72, 10.3.2012, p. 7.

2.4. Information technology products

The ecodesign requirements exclude fans used in 'information technology product' until 2015.

According to Regulation 1275/2008[6] with regard to ecodesign requirements for standby and off mode electric power consumption of electrical and electronic household and office equipment, 'information technology equipment' means any equipment which has a primary function of either entry, storage, display, retrieval, transmission, processing, switching, or control, of data and of telecommunication messages or a combination of these functions and may be equipped with one or more terminal ports typically operated for information transfer.

Information Technology Products are known in different types of products, differing widely in size and application. Fans in scope of the regulation are found in the more professional types of information technology equipment such as servers, data centres and highly productive office printers and industrial printers. According to articles 2 and 3, for such products, the energy efficiency requirements shall become effective in 2015.

2.5. Specific ratio

The term Specific Ration is also found in Article 3.4(b) where the regulation states; energy efficiency requirements shall not apply to fans in applications in which the 'specific ration' is over 1.11.

The term and value of 1.11 originates from the American Society of Mechanical Engineers (ASME). The term refers to the ratio of the discharge pressure to the suction pressure of the fan. They use it to define the difference between a fan, a blower and a compressor.

The value of 1.11 is the upper pressure development limit of a fan. ASME advises this pressure rise is equivalent to 11145 Pa. This upper limit is derived from the pressure rise from standard atmospheric pressure multiplied by 1.11; 101325 Pa x 1.11 = 112470 Pa, therefore the pressure rise is 112470 – 101325 = 11145 Pa.

A fan with a pressure development of < 11145 Pa is within the scope, one above is outside of the scope.

Product	Specific ratio	Pressure rise [Pa]
Fan	Up to 1.11	11145

2.6. Mixed flow fan

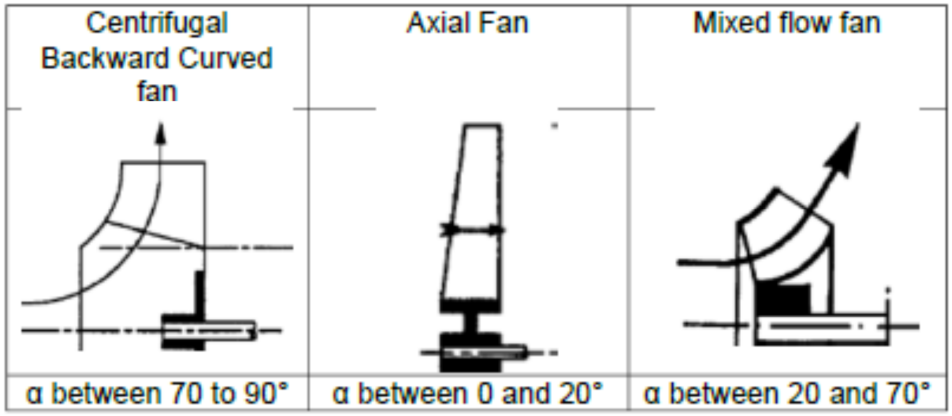
Mixed flow fans are defined as a fan in which the gas path through the impeller is intermediate between the gas path of centrifugal and axial types.

The definition and characteristic of a mixed flow fan is the angle of air direction • which is given by the blade's inclination angle to the impeller

[6] OJ L 339, 18.12.2008, p. 45.

axis of rotation. A mixed flow fan is one where angle • is between 20° and 70°.

For a centrifugal and mixed flow fan the angle • is taken as the angle from the axis of rotation to the mean valve between the angle of the shroud and of the hub. With an axial it is the angle of the tip of the blade in relation to the axis of rotation.



3. ARTICLE 3. ECODESIGN REQUIREMENTS

3.1. Non-gaseous substances

Non-gaseous substances are considered to be air containing particles of non-gaseous nature exceeding the concentration as specified below:

Dry air		Humid air (>70%)	
Max. dimension of suspended particles [mm]	**Max concentration of particles [g/m^3]**	**Max. dimension of suspended particles [mm]**	**Max concentration of particles [g/m^3]**
<1	<0.2	<0.05	<0.05

Note 1: Clean air is not a non-gaseous substance.

3.2. Garden blowers or vacuums

Questions have been raised concerning fans used in garden blowers or vacuums regarding the minimum energy efficiency requirements and the information requirements.

These products might differ on their characteristics.

The case of combustion powered or battery powered garden blowers or vacuums is clear, they are not covered as the calculation method for the overall efficiency described in Annex II cannot be applied to fans designed for use or equipped with a battery driven electrical motor or a combustion motor.

According to Article 1 (c) (iv), mains powered multifunctional fans in garden vacuums and blower vacuums are not covered by the Regulation. These fans are designed for multiple functions, including suction of gas

containing abrasive particles and transporting solid matter entrained in the gas stream and the mechanical shredding and mulching of such transported matter.

Mains powered single purpose blowers are in the scope of the Regulation, according to Article 3, if the fan is designed to operate with an optimum energy efficiency at 8 000 rotations per minute or more only information requirements shall apply, if the fan is designed to operate with an optimum energy efficiency below 8 000 rotations per minute, both energy efficiency and information requirements apply.

Nevertheless, the calculation method described on Annex II cannot be applied to this products, their objective is producing a high velocity jet, not a fan gas power as described in point 3.3 of the Regulation. These products cannot be considered to be covered.

To sum up, fans used in garden blowers or vacuums are not covered by Regulation 327/2011.

4. ARTICLE 4. CONFORMITY ASSESSMENT

4.1. Responsibility for conformity assessment

A doubt concerning who is responsible for conformity assessment might arise in case a fan covered by the Regulation is integrated in another energy-related product.

According to articles 3 and 4 of Directive 2009/125, the legal person who places the product on the market is responsible. In case the fan is produced outside the EEA the responsible is the importer of the fan.

As indicated in points 1.1, 1.2, 1.3, the actor placing the fan on the market and in very specific cases putting it into service is responsible for complying with the Regulation and, in consequence, for the conformity assessment.

5. ARTICLE 5. VERIFICATION PROCEDURE FOR MARKET SURVEILLANCE PURPOSES

No questions have arisen concerning this specific article.

6. ARTICLE 6. INDICATIVE BENCHMARKS

No questions have arisen concerning this specific article.

7. ARTICLE 7. REVISION

7.1. Review of the Regulation

Recital (14) indicates that a review of this Regulation is foreseen no later than four years after its entry into force. The review process may be initiated earlier if evidence reaches the Commission that warrants this. The review should in particular assess the setting of technology independent requirements, the potential of the use of variable speed drives (VSD) and the necessity of the number and scope of exemptions as well as the inclusion of fans below 125 W electric input power.

The options for the review are described in the recital and article 7 and they include:

- Eliminating exemptions.
- Extending the scope to fans with input power < 125 W.
- Reducing the number of fan types in order to reinforce competition on grounds of energy efficiency for fans which can fulfil a comparable function.

8. ARTICLE 8. ENTRY INTO FORCE

No questions have arisen concerning this specific article.

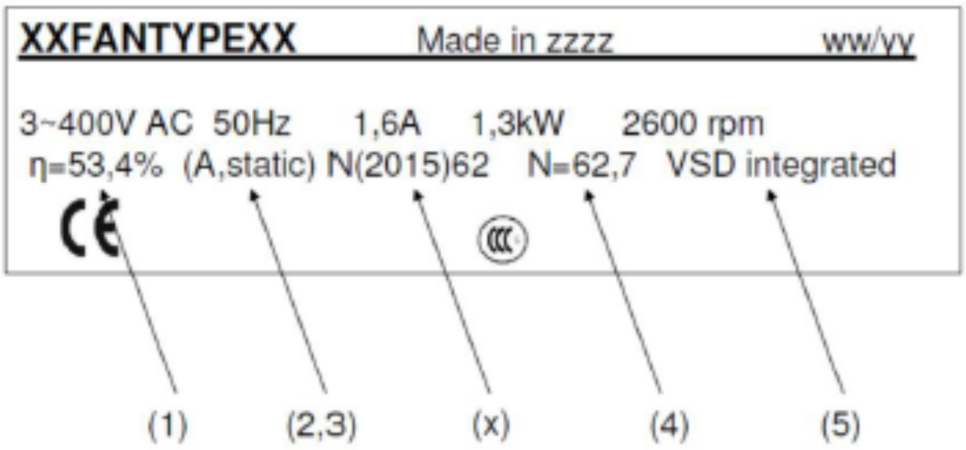
9. ANNEX I. ·ECODESIGN REQUIREMENTS FOR FANS

9.1. Data on the rating plate of the fan

According to Annex I, point 3, product information requirements on fans, the data to be show on the rating plate is:

- Overall efficiency (η) rounded to one decimal place.
- Measurement category used to determine the energy efficiency (A – D).
- Efficiency category (static or total).
- Efficiency grade at optimum efficiency point.
- Whether the calculation of fan efficiency assumed use of a VSD and if so, whether the VSD is integrated within the fan or the VSD must be installed with the fan.

An example is shown below:



Where;

1. Fan overall efficiency rounded to one decimal place.
2. Measurement category A, B, C or D
3. Efficiency category - static or total

4. Efficiency grade at optimum efficiency point related to the fan (not the target efficiency)
5. A statement where a VSD (variable speed drive) is integrated or whether it must be fitted to achieve the grade claimed (4)

x. optional – the target efficiency grade for this product and used as comparison to (4)

The term rating plate can also mean rating label or product label.

10. ANNEX I. ECODESIGN REQUIREMENTS FOR FANS

10.1. Fans with multiple operating points

If a fan has multiple operating points, the point providing the 'optimal energy efficiency point' shall be used as point for evaluation of compliance with the Regulation.

10.2. Optimal energy efficiency point

Fans can have adjustable pitch angles, in this case, a question arises as to which angle should be used for determining if the fan complies with the Regulation.

The actor placing the fan in the market shall evaluate the compliance of the fan with the Regulation using the pitch angle that leads to the optimal energy efficiency point.

10.3. Information requirements

According to the text of the Regulation, the product information requirements indicated in Annex I, section 3 also apply to fans integrated in other energy-related products.

The objective of these information requirements is facilitating compliance checks and providing information to consumers on the energy efficiency and other relevant parameters of the fan.

11. ANNEX II. MEASUREMENTS AND CALCULATIONS

11.1. Optimum efficiency. Best efficiency point. Peak efficiency

Optimum efficiency is defined within international standard ISO12759:2010 – fans – efficiency classification for fans section 3.4.7; the maximum efficiency achieved on the fan air characteristic with all operating parameters, except the air system resistance, being fixed.

It is the maximum efficiency achieved at a point on its operating characteristic.

Best efficiency point and peak efficiency are different words meaning the same term – optimum efficiency.

11.2. Fans supplied as 'not final assembly'

For fans which are not supplied as final assembly Annex II 3.2 provides a methodology for calculating the fan overall efficiency at the impeller's optimum energy efficiency point.

This methodology takes into account the efficiency of the fan impeller, the efficiency of the motor, in accordance with Regulation 640/2009, the efficiency of the drive arrangement and two compensation factors, one for taking into account the matching of components and an additional one for part load.

The values used for the default efficiencies and compensation factors are conservative, in order to assure the foreseen energy savings achieved by the Regulation.

11.3. Test standards

The European Commission issued a mandate M/500 for standardisation in the field of fans driven by motors with an electric input power between 125 W and 500 kW which was accepted by the European Standardisation Organisations (ESOs) in March 2012.

The standards requests ESOs to elaborate reliable, accurate and reproducible measurement methods in the form on a European standard, which take into account the generally recognised state of the art, and/or adapt or adopt existing European and International standards for fans.

Standards in response to this mandate should be proposed as harmonised standards 20 months for the first phase or 36 months after the acceptance for the second phase.

If scaling of results in accordance with state of the art methods is contemplated in the relevant standards it should be allowed to be used.

12. ANNEX III. VERIFICATION PROCEDURE FOR MARKET SURVEILLANCE PURPOSES

No questions have arisen concerning this specific annex.

13. ANNEX IV. INDICATIVE BENCHMARKS REFERRED TO IN ARTICLE 6

No questions have arisen concerning this specific annex.