



Market surveillance of eco-design regulation – assistance from the fan industry

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Market surveillance of eco-design regulation – assistance from the fan industry

Why a guidance document?

- Market surveillance is expensive, cheating is easy, and the environment is the loser.
- Misunderstanding the requirements, or deliberately avoiding them.

Market Surveillance Guidance Document
Eco-design Regulations for Fans – Regulation (EU) 327/2011
Produced by EVIA to assist Market Surveillance Authorities

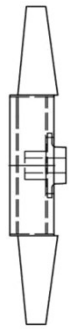
Introduction:
This document has been produced by the European fan industry to assist manufacturers, importers, distributors, retailers, end-users, and market surveillance authorities. It could be used to monitor and enforce eco-design requirements for fans. The requirements are detailed in European Commission Regulation 327/2011 (DG Energy, 2011) and is supported by the Commission's FAQ document (DG



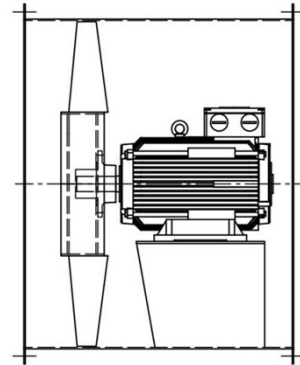


Regulation 327/2011

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 125 W and 500 kW



Impeller



Driven fan



Article 5 - Verification procedure for market surveillance purposes

Article 5

Verification procedure for market surveillance purposes

When performing the market surveillance checks referred to in Article 3(2) of Directive 2009/125/EC, the authorities of the Member States shall apply the verification procedure set out in Annex III to this Regulation.

ANNEX III



VERIFICATION PROCEDURE FOR MARKET SURVEILLANCE PURPOSES

When performing the market surveillance checks referred to in Article 3(2) of Directive 2009/125/EC, the authorities of the Member States shall apply the following verification procedure for the requirements set out in Annex I.

1. The authorities of the Member State shall test one single unit.



FAQ – frequently asked questions

Frequently Asked Questions (FAQ) on the Ecodesign Directive 2009/125/EC establishing a framework for the setting of ecodesign requirements for energy-related products and its Implementing Regulations

https://ec.europa.eu/info/sites/default/files/energy_climate_change_environment/frequently_asked_questions_on_the_ecodesign_measures.pdf

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.

https://ec.europa.eu/energy/sites/ener/files/documents/faq-ecodesign-requirements_fans.pdf



INTAS

Effective market surveillance for ecodesign: Focus on large* industrial products

Co-funded project by the Horizon 2020 programme of the European Union

<https://intas-testing.eu/>

- Deliverable 4.1: Final Methodology on market surveillance of large fans

https://intas-testing.eu/storage/app/media/INTAS_D4.1_Final.pdf

- Check rating plate
- Check documentation
- Check with physical measurements
- A tiered approach to verification



large* - with > 10kW motor



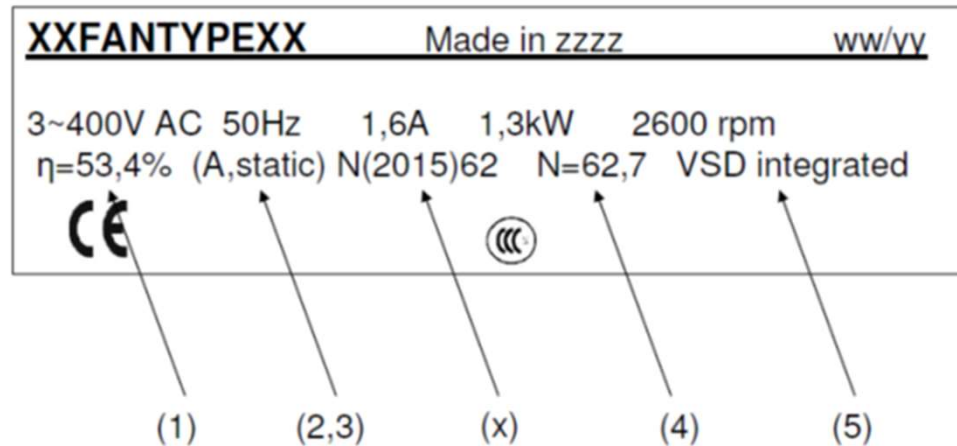
Market surveillance guidance document

Expanding the tiered approach proposed by the INTAS project

1. Review the product rating plate
2. An inspection of the manufacturer's ecodesign documentation
3. A Plausibility check
4. Third party certified quality management system
5. A review of the product testing documentation and type testing results
6. A physical verification by Factory Acceptance Testing (FAT) at the manufacturer's facility
7. Purchase a product and third part test



Product rating plate



- (1) Fan overall efficiency rounded to one decimal point
- (2) Measurement category
- (3) Efficiency category – static or total
- (4) Efficiency grade at optimum efficiency point
- (5) A statement if VSD is integrated, or must be used to achieve the claimed efficiency grade



Technical documentation

The regulation defines 14 pieces of information that must be provided on free access websites

1. Overall efficiency (η). Rounded to 1 decimal point
2. Measurement category used to determine the energy efficiency (A-D)
3. Efficiency category (static or total)
4. Efficiency grade at optimum efficiency point
5. Whether the calculation of the 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
6. Year of manufacture
7. Manufacturer's name or trademark, commercial registration number and place of manufacture
8. Products model number



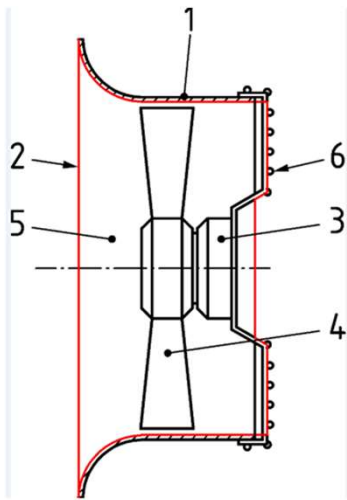
Technical documentation

The regulation defines 14 pieces of information that must be provided on free access websites

9. The rated motor power inputs(s) (kW), flow rate(s) and pressure(s) at optimum energy efficiency
10. Rotations per minute at the optimum energy efficiency point
11. The 'specific ratio'
12. Information relevant to for facilitating disassembly, recycling, or disposal at end-of-life
13. Information relevant to minimise impact on the environment and ensure optimal life expectancy as regards to installation, use and maintenance of the fan
14. Description of additional items used when determining the fan energy efficiency, such as ducts, that are not described in the measurement category and not supplied with the fan

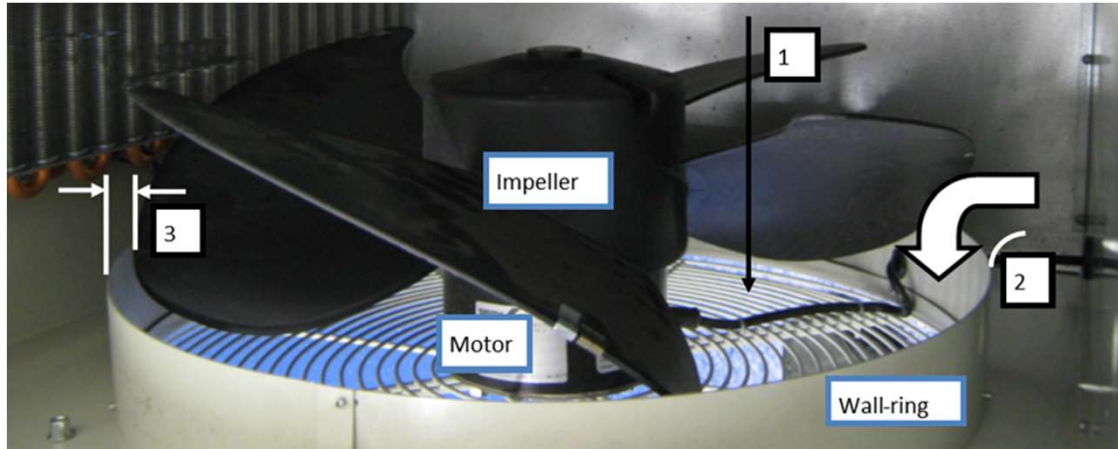


The scope of the fan – the boundary of the fan



Fan Impeller, motor and stator	Incomplete fan Impeller and motor only	Stator	Names of stators
			Inlet cone Venturi inlet Inlet bell
			Wall plate Wall ring Orifice plate
			Scroll Housing

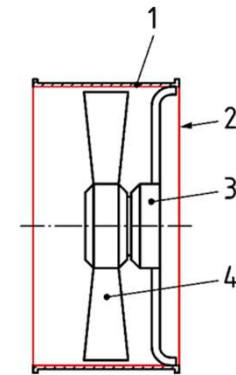
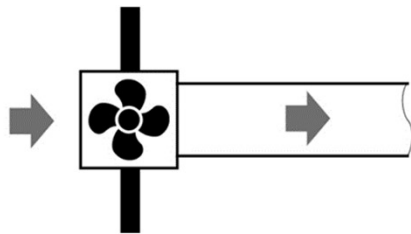
Plausibility check – does it look like it will perform?



1. Airflow direction
2. Poor entry condition, no radius – was the fan measured with this wall-ring?
3. Large gap between impeller and wall-ring (stationary element)



Types of fan





Plausibility check – the check test tool

Product information Reg 327/2011 Annex I.3.2	data
(1) overall efficiency (η)	29.5
(2) measurement category	A
(3) efficiency category	static
(4) efficiency grade	40.45
(5) calculation of efficiency assumed use of VSD	no
(6) year of manufacture	2019
(7) manufacturer name or trademark	Fan manufacturing Co.
(8) product's model number	An axial fan
(9) the rated motor power inputs(s) (kW), flow rate(s) and pressures(s) at optimum energy efficiency	0.165 kW
	3,000 m ³ /h
	60 Pa
(10) rotations per minute at the optimum energy efficiency	910 rpm
(11) the specific ratio	1.00
(12) recycling/disposal	see instructions
(13) Maintenance	see instructions
(14) additional components	none

	Volume Flow		Fan Pressure	RPM	Voltage	Current	Power	Efficiency
	m ³ /h	l/s	Static (Pa)		V	A	W	%
1	4880	1355.7	0	942	232	0.72	158.5	-0.3
2	4695	1304.1	7	937	231	0.74	163.1	5.4
3	4474	1242.7	14	935	232	0.76	168.4	10.1
4	4241	1178.0	21	931	232	0.77	171.8	14.2
5	4000	1111.2	30	929	231	0.78	174.9	18.9
6	3738	1038.2	39	922	231	0.80	178.4	22.6
7	3469	963.5	48	919	232	0.82	185.3	24.8
8	3247	901.8	54	913	232	0.84	189.1	25.7
9	3008	835.5	60	910	231	0.85	193.0	25.9
10	2748	763.3	65	904	231	0.87	196.8	25.2
11	2460	683.4	68	900	231	0.88	200.5	23.1
12	2012	559.0	68	896	231	0.88	200.8	18.9
13	1745	484.8	79	885	231	0.93	212.8	18.0
14	1239	344.1	102	860	231	1.02	234.2	15.0
15	150	41.7	135	810	232	1.19	273.5	2.1



Plausibility check – the check test tool

	A	B	C	D	E	F	G	H	I	J
1	Fan assembled?			Complete Fan						
2	Product info	Variable	Symbol	Value	Target value	Unit	Comment	Evaluation		
3	1	Overall efficiency	eta	29.5	28.7	%	Check if $\eta = qv \cdot p / P \cdot C_c$ (Tolerance 1%)	30.3		
4	2	Measurement category		A						
5	3	efficiency category		static			if 2 is A or C then static if 2 B or D then total			
6	4	efficiency grade at optimum	N	40.45	40.0					
7	5	VSD		No						
8	6	Year of manufacture		2019			Needs to be between 2015 and 2021			
9	7	Commercial registration umber					Not relevant for technical consistency check			
10	8	Products model number					Not relevant for technical consistency check			
11	9.1	rated power input at optimum	Pe	0.165		kW	Basis for calculation of line 1			
12	9.2	flow rate at optimum	qv	3000		m ³ /h	Basis for calculation of line 1			
13	9.3	pressure at optimum	psf	60		Pa	Basis for calculation of line 1			
14	10	rotations per minute	N	910		1/min	below 8000 1/min			
15	11	specific ratio		1		-	Check if smaller 1,11			
16	12	Recycling					Not relevant for technical consistency check			
17	13	life expectancy					Not relevant for technical consistency check			
18	14	additional items					Not relevant for technical consistency check			
19	additional	Fan Type		Axial fan			Specifies type of fan			
20	additional	compressibility factor	kps	1						
21										
22	assembled fan									

Product information Reg 327/2011 Annex I.3.2	data
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(10) rotations per minute at the optimum energy efficiency	910 rpm
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(12) recycling/disposal	see instructions
(13) Maintenance	see instructions
(14) additional components	none



Plausibility check – the check test tool

Example of data shown in manufactures datasheet

Product information Reg 327/2011 Annex I.3.2	data
(1) overall efficiency (η)	29.0
(2) measurement category	A
(3) efficiency category	static
(4) efficiency grade	40
(5) calculation of efficiency assumed use of VSD	no
(6) year of manufacture	2019
(7) manufacturer name or trademark	Co.
(8) product's model number	An axial fan
(9) the rated motor power inputs(s) (kW), flow rate(s) and pressures(s) at optimum energy efficiency	0.173 kW 3,000 m ³ /h 60 Pa
(10) rotations per minute at the optimum energy efficiency	910 rpm
(11) the specific ratio	1.00
(12) recycling/disposal	see instructions
(13) Maintenance	see instructions
(14) additional components	none

Comment: comparing the Product Information declaration to the actual fan test report shows the Product Information has not been reported correctly. Entering the input power at the recorded peak efficiency shows that the Target Value is 29.2%, but the fan only achieves 26.0%

Example of data shown on the test report

	Volume Flow		Fan Pressure	RPM	Voltage	Current	Power	Efficiency
	m ³ /h	l/s	Static (Pa)					
1	4880	1356	0	942	232	0.72	158.5	0.0
2	4695	1304	7	937	231	0.74	163.1	5.6
3	4474	1243	14	935	232	0.76	168.4	10.3
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6	3738	1038	39	922	231	0.8	178.4	22.7
7	3469	964	48	919	232	0.82	185.3	25.0
8	3247	902	54	913	232	0.84	189.1	25.8
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13	1745	485	79	885	231	0.93	212.6	18.0
14	1239	344	102	860	231	1.02	234.2	15.0
15 Fan	150	42	135	810	232	1.19	273.5	2.1

Product Information	Variable	Symbol	Value	Target value	Unit	Comment	Evaluation
1	Overall efficiency	eta	29	29.2	%	Check if $\eta = q_v \cdot p / P \cdot C_o$ (Tolerance 1%)	25.9
2	Measurement category		A				
3	efficiency category		static			if 2 is A or C then static if 2 B or D then total	
4	efficiency grade at optimum	N	40	40.0			
5	VSD		No				
6	Year of manufacture		2019			Needs to be between 2015 and 2021	
7	Commercial registration number					Not relevant for technical consistency check	
8	Products model number					Not relevant for technical consistency check	
3.1	rated power input at optimum	P _e	0.193		kW	Basis for calculation of line 1	
3.2	flow rate at optimum	q _v	3000		m ³ /h	Basis for calculation of line 1	



Fans integrated in imported product

What is this imported product?

What fan is inside?

Does the fan comply with the regulation?

What surveillance is applied and where is it applied?





summary

Why a guidance document?

- Market surveillance is expensive and to assist the industry provides guidance proposing simpler checks can be applied before the expense of taking a fan off the market
- Market surveillance authorities manage a wide portfolio. To assist them the guidance -
 - Explains the types of fans
 - What information should be on rating plates, publicly available documentation and test reports
 - How to check that information and provides a tool to assist
- Companies that deliberately avoid the regulations can only be made to comply by market surveillance authorities. The rest of the industry should help them enforce the regulations.
- Fans integrated in product imported into Europe – how can market surveillance monitor and enforce in this area?



Thank you

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<https://www.evia.eu/>