

## Accelerated Capital Allowances Eligibility Criteria

**Category: Process and Heating, Ventilation and Air-conditioning (HVAC) Control Systems****Technology: Fans**

*A fan is defined as a rotary bladed machine designed for the energy-efficient on-site transfer of gas, which works by receiving mechanical energy and utilising it by means of one or more impeller(s) fitted with blades to maintain a continuous flow of air or other gas passing through it and whose work per unit mass does not normally exceed 25 kJ/kg.*

**Fan equipment is considered to include the following:**

Axial flow fan: A fan having a static pressure development with in-line entry and exit of the air.

Centrifugal fan: A radial flow fan comprising an impeller where the direction of the entry air flow is vertical to the direction of the exit air flow

Cross flow fan: A forward curved centrifugal fan with impeller of an increased axial length. The air entry to the casing is positioned on the scroll such that the air traverses the impeller

**Fan Eligibility Criteria**

In order to be included on the ACA Specified List, a Fan must meet *all* of the requirements set out below

**Note:** *Supporting documentation that clearly demonstrates ACA compliance according to the conditions below will be required as part of the ACA checking process. Detailed information on the types of documents accepted can be found in the separate Supporting Documentation guidelines.*

No.	Condition
1.	Have a power rating greater than 1.1kW.
2.	Must fall under one of the fan type categories and minimum energy performance requirements as outlined in Table 1., and comply with ISO 5801 "Industrial fans - Performance testing using standardized airways", or scientific equivalent.
3.	All equipment and/or components must be CE marked as required by the specific EU directive(s).
4.	Fan curve plots, operating & maintenance manual must be available as part of the contract of sale in order to optimise the achievement of any potential energy savings.

**Table 1.: Minimum overall fan energy performance requirements**

Type	Characteristics	Min Efficiency (%)
		Power rating: 1.1-500 kW
Axial flow fan	In line air flow.	$3.9 * \ln(P_{el}) + 41.1$
Centrifugal fan	Forward with housing	$3.9 * \ln(P_{el}) + 46.1$
	Backward Curved Bladed Fan with and without housing	$5.25 * \ln(P_{el}) + 52.9$

**Where:**P<sub>el</sub> = Electrical Power (kW)

ln = Natural Log

----- End of ACA eligibility criteria -----  
 Please see next section for technical detail submission and supporting documentation guidance

***The following information is not part of the official criteria document published within the relevant statutory Instrument; it has been added here for guidance purposes only in order to provide assistance with the submission of product details and the provision of the required supporting documentation.***

**Note:** All information contained within this guidance document is subject to change without notice.

## Guidance on understanding the criteria and how to obtain values

### Fan efficiency guidance

The efficiency table denotes the minimum “overall” efficiency requirements for a fan which differ according to the fan type, size and configuration. To overcome difficulties where fans can be sold as “bare fan”, “directly coupled”, “belted”, with or without motors...etc., the levels denoted are overall efficiency values. These values also change according to the size of fan and thus some require calculations to derive the actual minimum efficiency. Where specific values are not available for a specific fan or fan configuration, (e.g. motor not supplied with fan, belt driven), default values are assumed to derive the overall efficiency of the arrangement which is then compared with the table shown to derive acceptability or otherwise.

### Measurement method:

Efficiency of the fan is measured in accordance with ISO 5801 (currently under revision). Where the level of uncertainty for the motor is not supplied, an assumed uncertainty level of 4 % must be used, except if the revised standard sets this level specifically. All tolerances in accordance with ISO 13348:2006 standard.

### Fans sold with/ without motors:

When a fan product includes the fan, transmission and motor, the product shall be measured taking into account the overall static efficiency of the actual product.

When a fan is sold alone (without the motor), product efficiency must be calculated with default values as follows:

### Motor:

Motor efficiency  $\eta_m$  to be assumed when the motor is not included in the fan product:

- Motor efficiency  $\eta_m$  as required to achieve EFF2 rating. The rating to be replaced by IE1 after the new IEC 60034-30 Ed. 1 efficiency classes have come into force.

### Transmission:

If the fan has a direct drive, transmission efficiency  $\eta_T$  of 100 % is to be assumed,

If the fan has a belt drive:

- For  $1.1 \text{ kW} < P_{el} < 5 \text{ kW}$ : assumed transmission efficiency  $\eta_T$  of 83 %;
- For  $P_{el} > 5 \text{ kW}$ : assumed transmission efficiency  $\eta_T$  of 90 %.

### Controls:

- For  $1.1 \text{ kW} < P_{el} < 5 \text{ kW}$ : assumed control compensation factor  $C_c$  of 1.11;
- For  $P_{el} > 5 \text{ kW}$ : assumed control compensation factor  $C_c$  of 1.04.

### Losses:

Assumed compensation factor for losses is ( $C_m = 0.9$ ).

## Technical information required in product submission

The following are the specific technical values required as part of the product submission for this technology:

### Fan type

As part of the product submission you must first select which type of fan your product is. Only one type can be chosen per product.

### Input power rating

The input power rating in kW of the fan required as a value for the product submission. It must be entered as whole number only (do not include kW symbol). There should also be no spaces or full stops after the number submitted. The figure must comply with the criteria requirements for minimum power rating values.

### Efficiency

The efficiency (%) of the fan product required as a value for the product submission. It must be entered as number only (do not include units). There should also be no spaces or full stops after the number submitted. The figure must comply with the criteria requirements for minimum efficiency values.

## Supporting documentation required

Described below is the list of documents that are accepted as proof of compliance for the specific fan conditions.

**Note: This information will only be requested AFTER you submit your product's basic details online**

### Important Notes to Product Providers

**Please ensure that you read the "Important Notes to Product Providers" section at the end of this document prior to submitting documentation.**

No.	Condition	Supporting Documentation Requirement
1.	Have a power rating greater than 1.1kW.	Official and published manufacturer's technical data sheet or brochure that demonstrates the requirements of the condition.
2.	Must fall under one of the fan type categories and minimum energy performance requirements as outlined in Table 1., and comply with ISO 5801 "Industrial fans - Performance testing using standardized airways", or scientific equivalent.	<p>Official and published manufacturer's technical data sheet or brochure that demonstrates the requirements of the condition</p> <p>The product provider should include a product provider note stating the page number on the document supplied where compliance with the condition is demonstrated.</p> <p><b><u>AND</u></b></p> <p>Accredited certification that the equipment complies with the named standard.</p> <p><b><u>OR</u></b></p> <p>Evidence of official testing by manufacturer or independent test lab carried out according to the principles outlined in the named performance standard. Test reports should be of the format described in the 'Important Notes to Product Providers' section of this document.</p> <p>Accepted Standard: ISO 5801 "Industrial fans - Performance testing using standardized airways".</p> <p>See note on 'Scientific Equivalence' in 'Important Notes to Product Providers' section at end of this document.</p>
3.	All equipment and/or components must be CE marked as required by the specific EU directive(s).	<p>Official and published manufacturer's technical data sheet or brochure that demonstrates CE marking compliance.</p> <p><b><u>OR</u></b></p> <p>A copy of an official signed declaration on headed paper which confirms CE marking compliance.</p> <p>Official declarations should explicitly state the product for which CE marking is being confirmed (i.e. do not provide a letter simply stating general compliance with the relevant ACA Condition).</p> <p>Where a document is used to demonstrate conformance for a number of products or range of products it should clearly specify each individual product covered by that document.</p>

No.	Condition	Supporting Documentation Requirement
4.	Fan curve plots, operating & maintenance manual must be available as part of the contract of sale in order to optimise the achievement of any potential energy savings.	<p>A copy of an official signed statement on headed paper which confirms that fan curve plots and operating and maintenance manuals are provided as part of the contract of sale. Where applicable, information on the availability of technical documentation to download online should be given.</p> <p><b>NB:</b> A signed declaration is required to comply with this condition in all cases. Submitting copies of user manuals is not sufficient and not required by this condition.</p>

## Important Notes to Product Providers

### General

There should be a clear link between all supporting documentation supplied and the product being submitted. This will typically take the form of a product code or product name that can be cross referenced between the submitted product and relevant supporting documentation. If product codes / names have been changed since publication of the supporting documentation, then official evidence of this must be provided with the supporting documentation supplied.

Any deviation from these requirements will result in the supporting documentation not being considered adequate for the purposes of demonstrating compliance with the criteria conditions. This will in turn delay the submission and/or result in the product not being considered eligible.

Where the ACA criteria or help documentation reference compliance to appropriate rather than specific standards, the onus is on the product provider to ensure that supporting documentation supplied references recognised standards that apply to the submitted product, i.e. the product must be covered under the scope of a recognised standard.

If any product submitted is later found not to meet the performance or specification criteria, then this product will cease to be considered eligible for the ACA.

**Note:** When supplying the supporting documentation through the online process you must ensure that the correct page number(s) of the document is referenced when compliance with the relevant condition is being demonstrated. An explanatory note should also be given where more than one page number is referenced.

### Test Report

A test report must comprise of the following elements:

An outline of the complete test including introduction, details on test conditions, the specific model details of the product tested, the steps taken in the test, the results, graphical representations, and a conclusion. All documents should be on headed paper and the document should be officially signed off. **All documentation must be in English**, or include adequate translation.

### Certification

Where certificates are provided, all tests must be carried out by an organisation that is accredited by a national accreditation body recognised via the European Cooperation for Accreditation (preferred) or the International Accreditation Forum. **All documentation must be in English**, or include adequate translation.

### Scientific Equivalence

Some ACA criteria conditions allow for scientifically equivalent tests and/or standards to be used. In the event that a product has not been designed, manufactured or tested to the specific standard named, then documentation

relating to an equivalent internationally recognised standard may be used (where the phrase 'Or scientific equivalent' is included in the ACA condition or help documentation). In such applications, the onus will be on the product submitter to demonstrate satisfactory equivalence of the standards. However, submissions which reference such supporting documentation may take longer to process, and if the product provider does not provide satisfactory evidence of equivalence, then the product will not be considered eligible for the ACA. **All documentation must be in English**, or include adequate translation.

**Note:** Where specific standards are cited in a condition or in the ACA help documentation, then documentation demonstrating that the relevant products have been designed, manufactured or tested to these specific standards is preferred. Scientific equivalence is considered the exception rather than the norm.