SLOVENSKI STANDARD
oSIST prEN 17166:2017

01-november-2017

Ventilatorji - Postopki in metode za ugotavljanje energijske učinkovitosti za električno vhodno moč v območju od 125 W do vključno 500 kW

Fans - Procedures and methods to determine the energy efficiency for the electrical input power range of 125 W up to 500 kW

Ventilatoren - Verfahren und Methoden zur Ermittlung der Energieeffizienz für die elektrische Eingangsleistung im Bereich von 125 W bis 500 kW

Ventilateurs - Procédures et méthodes pour déterminer et évaluer l`efficacité énergétique pour la gamme de puissance d`entrée électrique de 125 W jusqu´à 500 kW

Ta slovenski standard je istoveten z: **prEN 17166**

ICS:

23.120	Zračniki. Vetrniki. Klimatske naprave	Ventilators. Fans. Air-conditioners

oSIST prEN 17166:2017 **en,fr,de**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

DRAFT
prEN 17166

September 2017

ICS 23.120

English Version

Fans - Procedures and methods to determine the energy efficiency for the electrical input power range of 125 W up to 500 kW

Ventilateurs - Procédures et méthodes pour déterminer et évaluer l`efficacité énergétique pour la gamme de puissance d`entrée électrique de 125 W jusqu´à 500 kW

Ventilatoren - Verfahren und Methoden zur Ermittlung der Energieeffizienz für die elektrische Eingangsleistung im Bereich von 125 W bis 500 kW

This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 156.

If this draft becomes a European Standard, CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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European foreword

This document (prEN 17166:2017) has been prepared by Technical Committee CEN/TC 156 “Ventilation for buildings”, the secretariat of which is held by BSI.

This document is currently submitted to the CEN Enquiry.

1 Scope

This harmonized European Standard provides procedures and methods for measuring and/or calculating the energy efficiency and associated characteristics of fans when driven by electric motors.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN ISO 5801:2017, *Fans — Performance testing using standardized airways (ISO 5801:2017)*

EN ISO 5802, *Industrial fans — Performance testing in situ (ISO 5802)*

EN ISO 12759:2015, *Fans — Efficiency classification for fans (ISO 12759:2010 + A1:2013)*

EN ISO 13349:2010, *Fans — Vocabulary and definitions of categories (ISO 13349:2010)*

EN ISO 13350, *Fans - Performance testing of jet fans (ISO 13350)*

ISO 13348, *Industrial fans — Tolerances, methods of conversion and technical data presentation*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1
fan
rotary-bladed machine that receives mechanical energy and utilizes it by means of one or more impellers 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

[SOURCE: EN ISO 13349:2010, definition 3.1.1]

3.2
fans driven by motors
fan driven by an electrical motor (included all transmissions and drives)

Note 1 to entry: One or more impellers fitted to or connected to a motor, with or without a drive mechanism, a housing and a means of variable speed drive.

Note 2 to entry: See Figure 10.

Note 3 to entry: Adapted from ISO 13349:2010, definition 3.1.3.

[SOURCE: EN ISO 12759:2015, definition 3.1.5]

3.3
impeller
rotating part of the fan that is imparting energy into the gas flow and is also known as the fan wheel

3.4
fan type
fan of specific and typical design primarily distinguished by the geometry of its impeller and the gas path through the fan

3.4.1
axial, mixed flow and centrifugal fan
fan types are identified by the angles α_1 and α_2 (see figures)

Note 1 to entry: The angle α_1 is the angle of the tangent at the hub at the intersection of the blade trailing edge with the hub. The angle α_2 is the angle of the tangent at the shroud or at the outer diameter of the blade at the intersection of the blade trailing edge with the shroud or with the outer diameter of the blade. The fan types are defined as in Table 1:

Table 1 — Fan type defined by the relationship of the blade and the shroud/hub

Fan type	Angle α [a]
Axial fan	$\alpha < 20°$
Mixed flow fan	$20° \leq \alpha < 70°$
Centrifugal fan	$70° \leq \alpha$
[a] Where $\alpha = (\alpha 1 + \alpha 2)/2$.	

Note 2 to entry: Centrifugal fans contain the types „centrifugal radial bladed fan“ (including radial tip), „centrifugal forward curved fan“ and „centrifugal backward curved fan“ (including also backward inclined and backward curved aerofoil bladed fans).

Note 3 to entry: If the hub and/or shroud are not axisymmetric, angles α_1 and α_2 are the mean values in circumferential direction.

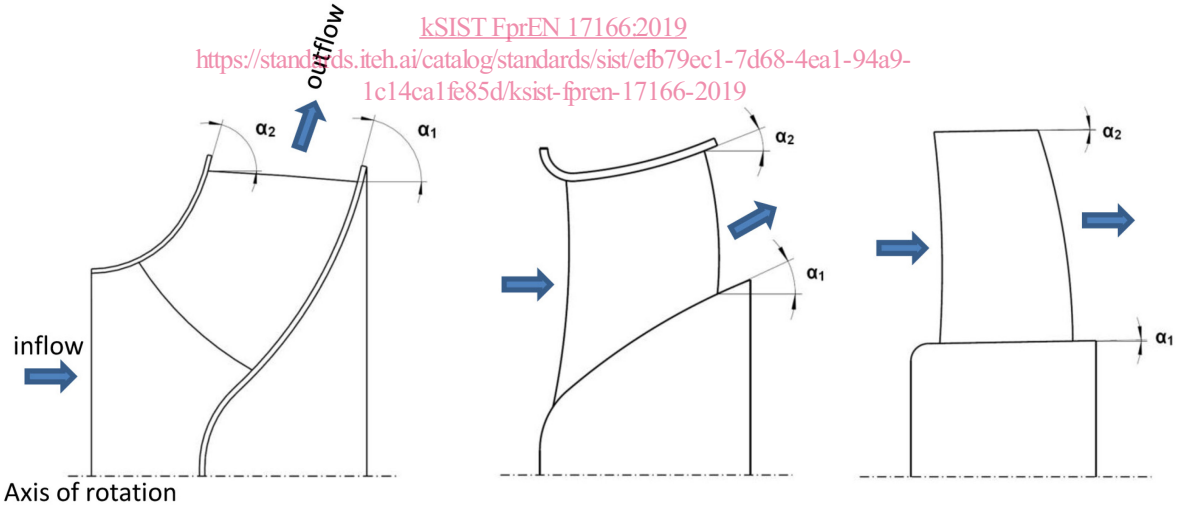

Figure 1 — Differentiation by angles

3.4.2
axial fan
axial-flow fan in which the air enters and leaves the impeller along essentially cylindrical surfaces coaxial with the fan

[SOURCE: EN ISO 13349:2010, definition 3.1.1]

3.4.3
mixed-flow fan
fan in which the fluid path through the impeller is intermediate between the centrifugal and axial-flow types

Note 1 to entry: See to 3.4.1.

[SOURCE: EC 327/2011, definition 15]

3.4.4
centrifugal fan
fan in which the air enters the impeller with an essentially axial direction and leaves it in a direction perpendicular, or near perpendicular to this axis (see Table 1 and Figure 1)

Note 1 to entry: For further details see 3.5.

3.4.5
cross flow fan (tangential fan)
fan in which the fluid path through the impeller is in a direction essentially at right angles to its axis both entering and leaving the impeller at its periphery

[SOURCE: EN ISO 13349:2010, definition 3.6.4]

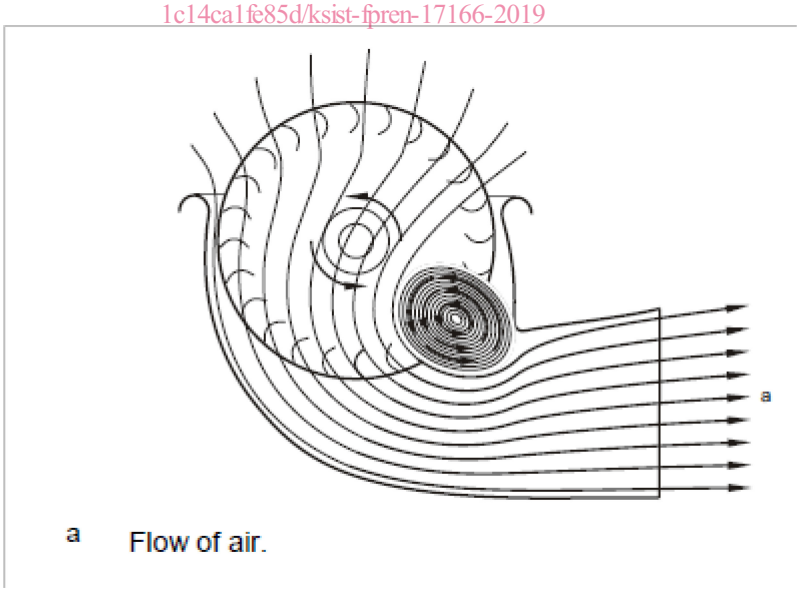

Figure 2 — Cross flow fan

3.4.6
jet fan (impulse fan)
fan used for producing a jet of air in a space and unconnected to any ducting

Note 1 to entry: The air jet can be used, for example, for adding momentum to the air within a tunnel or other space (e.g. enclosed car park), or for intensifying the heat transfer in a determined zone.

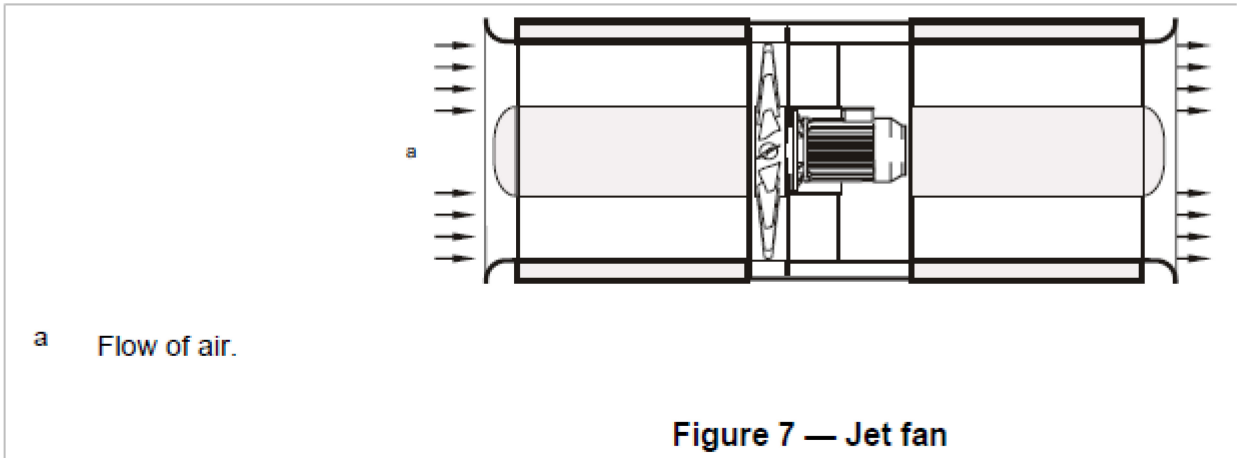

Figure 7 — Jet fan

Figure 3 — Jet fan

Figure 4 — Centrifugal jet fan

3.5
Detailed specification of centrifugal fan types
3.5.1
centrifugal forward curved fan
centrifugal fan with curved blades, where the outward direction of the blades at the periphery is forward relative to the direction of rotation

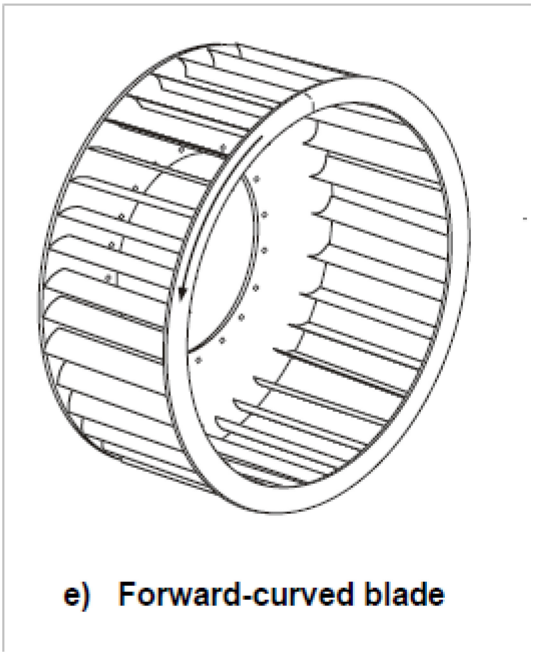

Figure 5 — Centrifugal forward curved fan

3.5.2
centrifugal backward curved fan
centrifugal fan with curved blades, where the outward direction of the blades at the periphery is backward relative to the direction of rotation

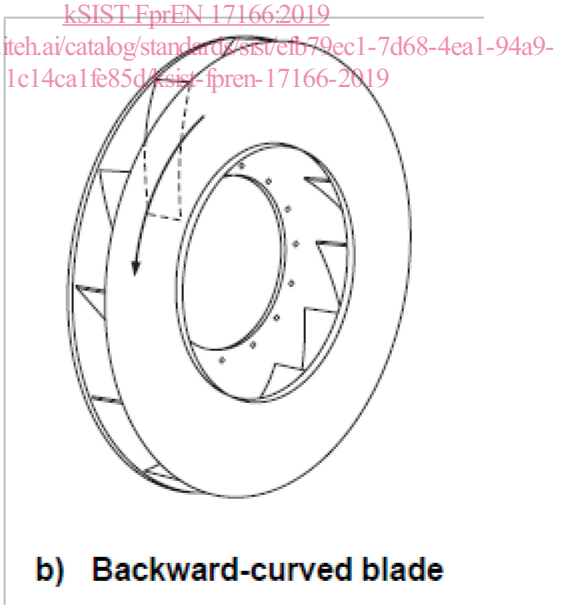

Figure 6 — Centrifugal backward curved fan

3.5.3
centrifugal backward inclined fans
centrifugal fan with flat blades, where the outward direction of the blades at the periphery is backward relative to the direction of rotation

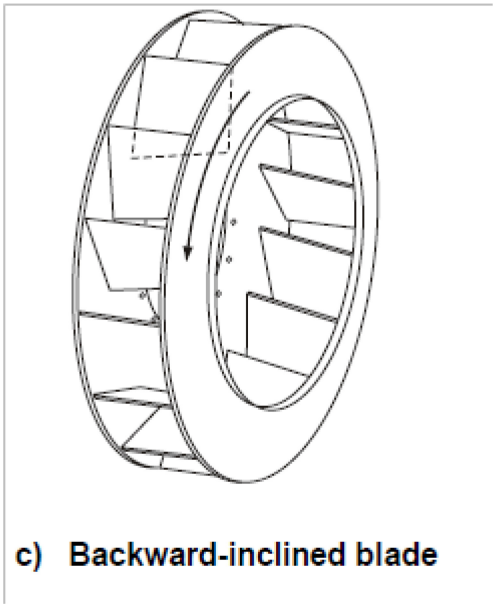

Figure 7 — Centrifugal backward inclined fan

3.5.4
centrifugal backward aerofoil fan
centrifugal fan with aerofoil blades (where the thickness of the blade is not constant throughout its length), where the outward direction of the blades at the periphery is backward relative to the direction of rotation

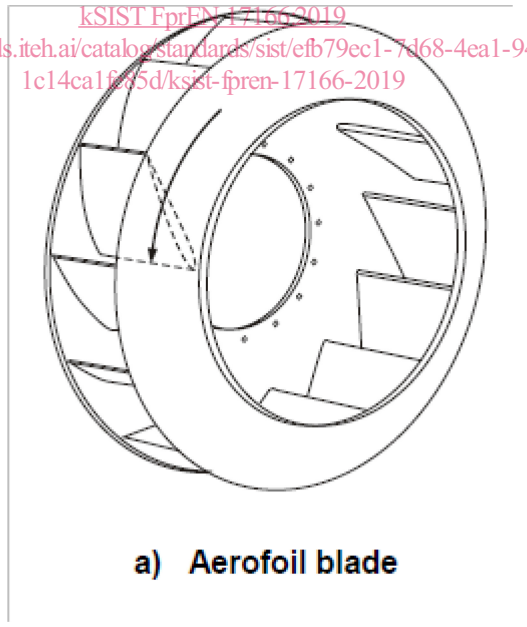

Figure 8 — Centrifugal backward aerofoil fan

3.5.5
centrifugal radial tip fan
centrifugal fan with flat or curved blades, where the outward direction of the blades at the periphery is radial

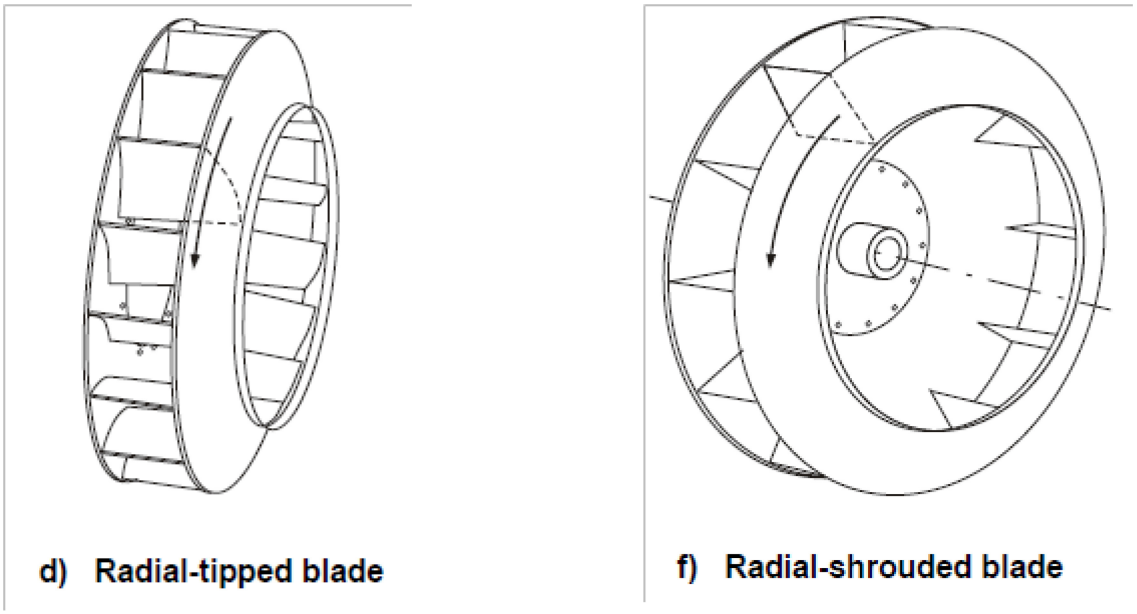

Figure 9 — Centrifugal radial tip fan

3.6
housing
stationary part which interacts with the air stream passing through the impeller

Note 1 to entry: A housing could be a device around the impeller which guides the gas steam towards, through and from the impeller.

Note 2 to entry: A housing may have additional parts included within the housing or attached to the housing to affect the performance of the fan. Such as:

— inlet bell, also known as venturi inlet, inlet cone, inlet radius;

— inlet guide vane;

— outlet guide vane;

— outlet diffuser.

Note 3 to entry: Additional parts are devices not listed above that provide an impact of the air power of the fan.

Note 4 to entry: Housing also called stator.

3.6.1
orifice ring
ring with an opening in which the fan sits and which allows the fan to be fixed to other structures

3.6.2
inlet guide vanes
vanes positioned before the impeller to guide the gas stream towards the impeller and which may or may not be adjustable

3.6.3
outlet guide vanes
vanes positioned after the impeller to guide the gas stream from the impeller and which may or may not be adjustable

3.6.4
orifice panel
panel with an opening in which the fan sits and which allows the fan to be fixed to other structures

3.6.5
diffuser
device that improves the fan performance thorough static recovery

3.6.6
inlet cone (also known as venturi inlet, inlet bell, inlet radius)
device that steers the air into the housing and reduces the vena contracta and turbulence that would occur at a sharp edge of the housing

3.6.7
fan without housing
fan designed not to rely upon a housing for its correct operation

3.6.8
fan with housing
fan designed to rely upon a housing for its correct operation

3.7
specific ratio
stagnation pressure measured at the fan outlet divided by the stagnation pressure at the fan inlet at the optimal energy efficiency point of the fan, also known as compression ratio

[SOURCE: Regulation EC 327/2011, definition 18]

3.8
measurement category
fan test configuration according to the arrangement of standardised test airways; also known as installation category according to EN ISO 5801 and EN ISO 13349

3.8.1
measurement category A
test configuration composed of the fan under test without any inlet or outlet duct fitted, optionally tested with the ancillaries supplied with the fan, i.e. protection grid, inlet bell, etc.

Note 1 to entry: Also known as test configuration category A (see EN ISO 5801:2017, 6.2).

3.8.2
measurement category B
test configuration composed of the fan under test with an outlet duct fitted, simulating ducted conditions, optionally tested with the ancillaries supplied with the fan

Note 1 to entry: Also known as test configuration category B (see EN ISO 5801:2017, 6.3).