International Standard

ISO 5801

# Fans — Performance testing using standardized airways

## AMENDMENT 1

*Ventilateurs — Essais aérauliques sur circuits normalisés*

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ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Email: copyright@iso.org
Website: www.iso.org

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# Fans — Performance testing using standardized airways

## AMENDMENT 1

*Clause 3*

Replace definitions 3.8, 3.9 and 3.15 with the following.

**3.8**

**hydraulic diameter**

$D_h$

four times the *cross-sectional area* (*3.5*) divided by the perimeter (*E)* which encloses the area

$$D_h = \frac{4A}{E}$$

**3.9**

**hydraulic mean depth**

$H_h$

*cross-sectional area* (*3.5*) divided by the perimeter (*E)* which encloses the area

$$H_h = \frac{A}{E}$$



**3.15**

**isentropic exponent**

$\kappa$

ratio of the *specific heat at constant pressure* (3.13) to the *specific heat at constant volume* (3.14)

$$\kappa = \frac{c_p}{c_V}$$

*4.1 Symbols and abbreviated terms*

Replace the symbol $P_{\square}$ with the following

| | | | |
|---|---|---|---|
| $E$ | Perimeter | 3.8 and 3.9 | m |

Change the definition reference for Polytropic exponent to 15.1.9.2

| | | | |
|---|---|---|---|
| $n_n$ | Polytropic exponent | 15.1.9.2 | — |

Delete the Perimeter P with missing subscript (Line after Fan air power)

*9.3.3 Blow through verification test*

Add quotation marks for "Blow through" in the subclause title and replace the content of 9.3.3. with the following.

**9.3.3 "Blow through" verification test**

This test evaluates the ability of the airflow settling means to provide a substantially uniform airflow ahead of a measurement plane. For this test, equally spaced measurement points are located in a plane $0{,}1D_h$ downstream of the settling means. The number of measurement points shall be in accordance with ISO 5802.

a) Nozzle wall: for tests of settling means upstream of the nozzle wall, the auxiliary fan should be set at its maximum flow rate, the entire nozzle array that induces the most distorted flow shall be open and the inlet shall be unrestricted so that the inlet area shall be equal to the largest area allowed by the cross-sectional area.

b) Test fan: for tests of settling means upstream of the test fan, the auxiliary fan shall be set at its maximum flow rate, half of the nozzle array that induces the most distorted flow shall be open and the outlet shall be open so that the outlet area shall be equal to the largest area allowed by the cross-sectional area.

The flow velocities shall be measured and the average determined. If the maximum velocity is less than 2 m/s or if the maximum velocity value does not exceed 125 % of the average, the settling screens are acceptable.

*15.1.5 Simplified sets of formulae, which can be used for $v_{2\cdot ref} \leq 65$ m/s*

Replace the first sentence with the following

As for reference air velocities $v_{2.\mathrm{ref}}$ not greater than 65 m/s, the temperature ratio $\theta_{sgx} / \theta_x$ does not exceed 1,008 and the Mach factor $f_{Mx}$ does not exceed 1,010 (see Annex P), simplified formulae can be used.



*15.1.9.1 General*

Replace the content of 15.1.9.1 with the following.



The fan air power can be written as Formula (47):

$$P_u = q_m \cdot y_f \tag{47}$$

There are two methods to calculate the air power:

— the first (15.1.9.2) derived from polytropic change of state to take into account the influence of air compressibility;

— the other one (15.1.9.3) for the simplified sets of formulae ($v_{2.\mathrm{ref}} \leq 65$ m/s).

If fan impeller power, $P_r$, is not measured and cannot be determined from known component efficiencies such as a calibrated motor, the method in 15.1.9.3 shall be used.

NOTE In instances where there exists a strongly non-adiabatic machine, such as high-pressure fans and blowers (where the fan pressure $p_f$ exceeds 10 000 Pa), or systems with a notable temperature disparity between the machine and the surrounding environment $(\Delta\theta > 50\,\mathrm{K})$, the exergetic computation of the fan air power is outlined in Annex O

*15.1.9.2*

Replace the title and content of 15.1.9.2 with the following.

**15.1.9.2 Calculation of fan air power from the polytropic change of state**