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Template for comments and secretariat observations

Date: xx/xx/20xx	Document: ISO/DIS xxxx
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1	2	(3)	4	5	(6)	7
MB	Clause No./ Subclause No./Annex (e.g. 3.1)	Paragraph/ Figure/Table/Note	Type of comment	Comment (justification for change) by the MB	Proposed change by the MB	Secretariat observations on each comment submitted
	3.1	Definition 1	ed	Definition is ambiguous and needs clarifying.	Amend to read '...so that the mains connector to which no connection...'	
	6.4	Paragraph 2	te	The use of the UV photometer as an alternative cannot be supported as serious problems have been encountered in its use in the UK.	Delete reference to UV photometer.	



DRAFT International Standard

ISO/DIS 27327-1

Fans — Air curtain units — Part 1: Laboratory methods of testing for aerodynamic performance rating

Ventilateurs — Rideaux d'air —

*Partie 1: Méthodes d'essai en laboratoire des caractéristiques de
performance aérodynamique*

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Contents

	Page
1 Scope	1
2 Normative references	1
3 Terms, definitions, and symbols	1
3.1 Terms and definitions	1
3.2 Symbols	9
4 Air curtain airflow rate test	10
4.1 Apparatus and instruments	10
4.1.1 General	10
4.1.2 Power	10
4.2 Preparation of air curtain airflow rate test	10
4.3 Test procedure	11
4.3.1 Initial conditions	11
4.3.2 Data to be recorded	11
4.3.3 Airflow rate determination	12
4.4 Calculation	12
4.4.1 General	12
4.4.2 Static pressure as a function of airflow rate	12
4.4.3 ACU Average outlet air velocity	13
4.4.4 ACU input power	13
4.5 Test report	13
5 ACU outlet air velocity uniformity test	14
5.1 Apparatus and instruments	14
5.1.1 General	14
5.1.2 Instrumentation	14
5.1.3 Air curtain core velocity measurement	14
5.2 ACU outlet air velocity uniformity test	14
5.3 Test procedure	14
5.3.1 Initial conditions	14
5.3.2 Data to be recorded	14
5.3.3 ACU outlet air velocity uniformity test	15
5.3.4 Air curtain core velocity	15
5.4 Calculation	15
5.4.1 General	15
5.4.2 Standard deviation	15
5.4.3 Average air curtain core velocity	16
5.4.4 ACU outlet air velocity uniformity	16
5.5 Test report	16
6 Air curtain velocity projection test	16
6.1 Apparatus and instruments	16
6.1.1 Air curtain core velocity measurement	17
6.2 Equipment and organization	17
6.3 Test procedure	17
6.3.1 Initial conditions	17
6.3.2 Data to be recorded	17
6.3.3 Air curtain velocity projection test	18
6.4 Calculation	19
6.4.1 General	19
6.4.2 Air curtain core velocity	19
6.4.3 Air curtain average core velocity	19
6.4.4 Air curtain velocity projection	19
6.5 Test report	19
7 Illustration of tests	19
Annex A (Informative) Air curtain discharge area	31

Annex B (Informative) Air curtain depth and width	32
Annex C (Informative) Air curtain active and inactive depth and width.....	33
Bibliography.....	34

Fans — Air curtain units —

Part 1: Laboratory methods of testing for aerodynamic performance rating

1 Scope

This part of ISO 27327 establishes uniform methods for laboratory testing of air curtain units to determine aerodynamic performance in terms of airflow rate, outlet air velocity uniformity, power consumption and air velocity projection, for rating or guarantee purposes.

This part of ISO 27327 is not applicable to the specification of test procedures to be used for design, production or field testing.

2 Normative references

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

ISO 5801, *Fans — Performance testing using standardized airways*

3 Terms, definitions, and symbols

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

3.1 Terms and definitions

3.1.1

absolute pressure

p

value of a pressure when the datum pressure is absolute zero.

Note 1 to entry: This is always positive.

3.1.2

ACU

abbreviation for an air curtain unit.

Note 1 to entry: See air curtain unit.

3.1.3

ACU airflow rate

q

airflow volume which leaves the discharge nozzle, at standard air conditions, as measured in accordance with ISO 5801

Note 1 to entry: This is given by [Equation \(1\)](#):

$$q = q_{Vsg1} \quad (1)$$

Note 2 to entry: This rate is expressed in cubic metres per hour.

3.1.4

ACU average outlet air velocity

v_a
airflow rate produced by the ACU divided by the cross-sectional area of the air curtain on the air curtain normal discharge plane at free-air delivery.

Note 1 to entry: See [4.4.3](#) for calculation of the value.

Note 2 to entry: Velocity is expressed in meters per second.

3.1.5

ACU discharge nozzle

component or an assembly in the ACU which directs and controls the airstream.

Note 1 to entry: May include decorative (inactive) sections.

Note 2 to entry: May include adjustable vanes.

Note 3 to entry: Leading edge shall be the first point or edge where the airstream leaves the discharge nozzle.

Note 4 to entry: Trailing edge shall be the last point or edge where the airstream leaves the discharge nozzle.

Note 5 to entry: If only one discharge nozzle is present, it is the primary discharge nozzle.

Note 6 to entry: Discharge nozzles are considered “multiple” when they do not share a common airflow discharge plane and are spaced more than two times the ACU discharge nozzle depth apart. The primary discharge nozzle on a system with multiple discharge nozzles is that which is closest to the plane of the protected opening.

3.1.6

ACU discharge nozzle depth

h_n
inside short dimension of the ACU discharge nozzle perpendicular to the airflow plane

Note 1 to entry: If a decorative (inactive) section exists between two active sections, it shall be considered active and included in the dimension.

Note 2 to entry: If the discharge nozzle is not rectangular, it shall be the largest measurement of the short dimension,

Note 3 to entry: Depth is expressed in millimetres.

Note 4 to entry: Refer to [Annex B](#) and [C](#) for examples.

3.1.7

ACU discharge nozzle width

b_n
inside long dimension of the ACU discharge nozzle parallel to the airflow plane

Note 1 to entry: If decorative (inactive) section exists between two active sections, it shall be considered active and included in the dimension.

Note 2 to entry: If the discharge nozzle is not rectangular, it shall be the largest measurement of the long side.

Note 3 to entry: Width is expressed in millimetres.

Note 4 to entry: Refer to [Annex B](#) and [C](#) for examples.

3.1.8

ACU energy effectiveness

E_{ACU}
ratio described by the difference in energy loss through an opening without and with the use of an air curtain divided by the energy loss without the air curtain.

Note 1 to entry: The energy loss with the use of the air curtain includes the energy consumption of the air curtain.

3.1.9**ACU inlet area**

total inside net area of all surfaces where entering airflow first meets the ACU cabinet

3.1.10**ACU normal**

vector declared by the sponsor that identifies the ACU cabinet orientation when the air curtain discharge angle is 0° and parallel to the plane of the opening it is protecting.

3.1.11**ACU outlet air velocity uniformity**
 u_{ACU}

indicator of the consistency of air velocities across the air curtain width

Note 1 to entry: The outlet air velocity uniformity is expressed as a percentage.

Note 2 to entry: See [5.4.4](#) for calculation of the value. See [Figure 7](#).

3.1.12**ACU input power**

power rating

 P_e

electrical power supplied at the terminals of the ACU.

Note 1 to entry: Includes electric motor(s) and drive(s).

Note 2 to entry: Input power is expressed in watts.

3.1.13**ACU pressure**
 p_{ACU}

difference between the stagnation pressure at the ACU outlet and the stagnation pressure at the ACU inlet

Note 1 to entry: This is determined using [Equation \(2\)](#):

$$p_{ACU} = p_{sg2} - p_{sg1} \quad (2)$$

Note 2 to entry: When the Mach number is less than 0,15, it is possible to use the relationship given in [Equation \(3\)](#):

$$p_{ACU} = p_{t2} - p_{t1} \quad (3)$$

Note 3 to entry: ACU pressure is expressed in pascals.

3.1.14**ACU static pressure**
 p_{sACU}

conventional quantity defined as the ACU pressure minus the ACU dynamic pressure corrected by the Mach factor.

Note 1 to entry: This is determined using [Equation \(4\)](#):

$$p_{sACU} = -p_{sg1} \quad (4)$$

Note 2 to entry: Static pressure is expressed in pascals.

3.1.15**ACU target distance** l_t

distance perpendicular to the air curtain normal discharge plane specified by the sponsor of the test to terminate a ACU velocity projection test.

Note 1 to entry: See 6.3.2.5 for definition of distances.

Note 2 to entry: Target distance is expressed in meters.

3.1.16**ACU velocity projection**

set of average air curtain core velocities measured along the air curtain width at specified distances from the air curtain normal discharge plane.

Note 1 to entry: See 6.3.2.5 for definition of distances.

Note 2 to entry: Velocity is expressed in metres per second.

3.1.17**air curtain**

directionally controlled airstream with a minimum width to depth ratio of 5:1

Note 1 to entry: When applied across the entire height and width of an opening, can reduce the infiltration or transfer of air from one side of the opening to the other and/or inhibit the passage of moisture, insects, dust and debris.

3.1.18**air curtain average core velocity** v_{ca}

average of air curtain core velocities measured along the air curtain width at specified distances from the air curtain normal discharge plane.

Note 1 to entry: See 6.3.2.5 for definition of distances.

Note 2 to entry: See [6.4.3](#) for determination.

Note 3 to entry: Velocity is expressed in metres per second.

3.1.19**air curtain core velocity** v_{cx}

maximum air velocity of the air curtain at point x as measured across both the air curtain depth and width at specified distances from the air curtain normal discharge plane.

Note 1 to entry: See [5.3.4](#) and 6.3.4 for determinations.

Note 2 to entry: See 6.3.2.5 for definition of distances.

Note 3 to entry: Velocity is expressed in metres per second.

3.1.20**air curtain discharge angle** θ

angle between the ACU normal or plane of the protected opening and the direction in which the air curtain leaves the discharge nozzle.

3.1.21**air curtain discharge area** A_{ac}

The true cross-sectional area of the air curtain on the air curtain normal discharge plane. Rectangular area is obtained by using the air curtain width and depth.

Note 1 to entry: This is determined using [Equation \(5\)](#).

$$A_{ac} = \frac{(b_{ac} \times h_{ac})}{1 \times 10^6} \quad (5)$$

Note 2 to entry: Discharge area is expressed in meters squared.

Note 3 to entry: See [Annex A](#) for examples.

3.1.22

air curtain depth

h_{ac}

the short dimension of the air curtain measured on the air curtain normal discharge plane.

Note 1 to entry: If the ACU discharge nozzle's entire depth is actively directing the airstream and is coplanar with the air curtain normal discharge plane, it shall be equal to the ACU discharge nozzle depth.

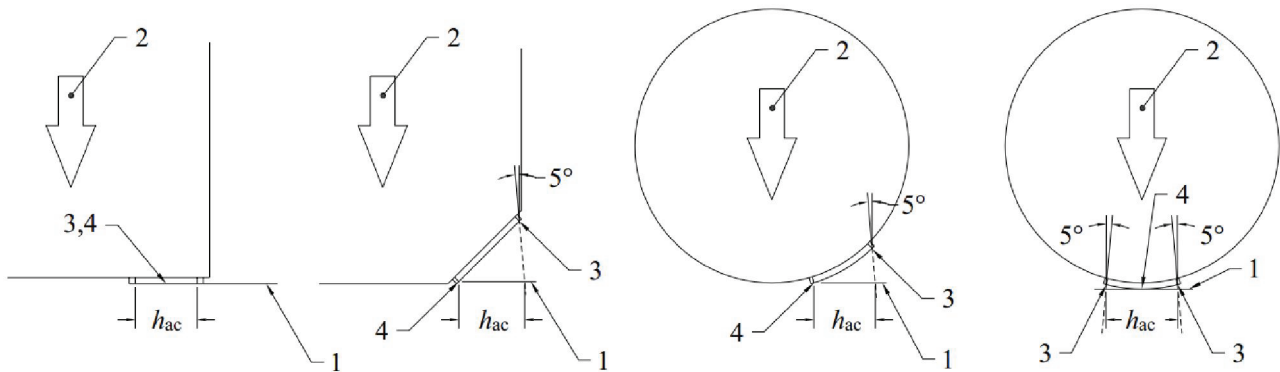
Note 2 to entry: If the ACU discharge nozzle depth has decorative (inactive) sections and is coplanar with the air curtain normal discharge plane, it shall be equal to the largest measurement of the short dimension of the active section declared and located by the sponsor.

Note 3 to entry: If the ACU discharge nozzle's entire depth is actively directing the airstream and is not coplanar with the air curtain normal discharge plane, it shall be the largest short measurement from trailing edge of the ACU discharge nozzle to the intersection of a line projected 5° from the leading edge of the ACU discharge nozzle and the air curtain normal discharge plane.

Note 4 to entry: If the ACU discharge nozzle depth has decorative (inactive) sections and is not coplanar with the air curtain normal discharge plane it shall be the largest short measurement from trailing edge of the ACU discharge nozzle to the intersection of a line projected 5° from the leading edge of the active ACU discharge nozzle declared by the sponsor and the air curtain normal discharge plane.

Note 5 to entry: Depth is expressed in millimetres.

Note 6 to entry: See [Annex C](#) for examples.



Key

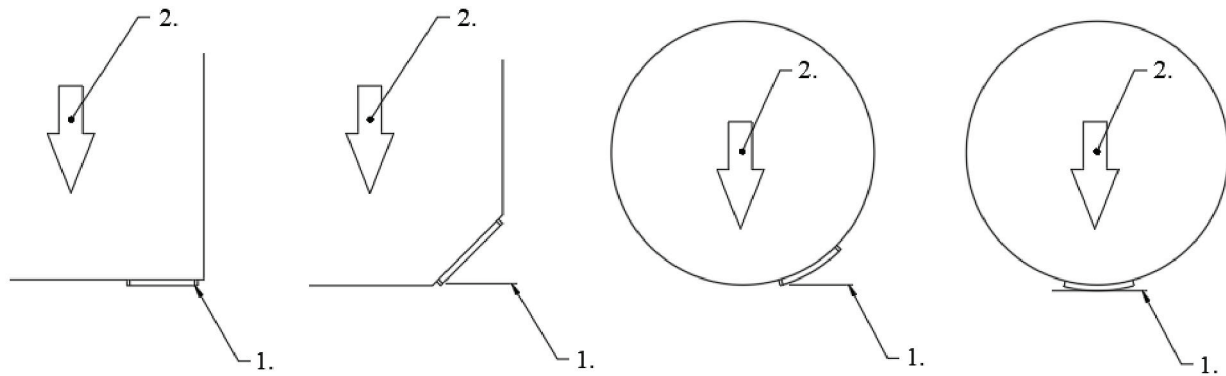
- 1 air curtain normal discharge plane
- 2 airflow normal
- 3 leading edge of the active nozzle
- 4 trailing edge of the active nozzle

Figure 1 — Air Curtain Depth

3.1.23

air curtain normal discharge plane

The plane perpendicular to the airflow normal (0° discharge angle) created by the cross section of the air curtain. It is located at the trailing edge of the active ACU discharge nozzle.



Key

- 1 air curtain normal discharge plane
- 2 airflow normal

Figure 2 — Air Curtain Normal Discharge Plane

3.1.24

air curtain unit

air-moving device which produces an air curtain.

3.1.25

air curtain width

b_{ac}

the long dimension of the air curtain measured on the air curtain normal discharge plane.

Note 1 to entry: If the ACU discharge nozzle's entire width is actively directing the airstream and is coplanar with the air curtain normal discharge plane, it shall be equal to the ACU discharge nozzle width.

Note 2 to entry: If the ACU discharge nozzle width has decorative (inactive) sections and is coplanar with the air curtain normal discharge plane, it shall be equal to the largest measurement of the long dimension of the active section declared and located by the sponsor.

Note 3 to entry: If the ACU discharge nozzle's entire width is actively directing the airstream and is not coplanar with the air curtain normal discharge plane, it shall be the largest long measurement from trailing edge of the ACU discharge nozzle to the intersection of a line projected 5° from the leading edge of the ACU discharge nozzle and the air curtain normal discharge plane.

Note 4 to entry: If the ACU discharge nozzle width has decorative (inactive) sections and is not coplanar with the air curtain normal discharge plane it shall be the largest long measurement from trailing edge of the ACU discharge nozzle to the intersection of a line projected 5° from the leading edge of the active ACU discharge nozzle declared by the sponsor and the air curtain normal discharge plane.

Note 5 to entry: Width is expressed in millimetres.

Note 6 to entry: See [Annex C](#) for examples.

3.1.26

air density

ρ_a

mass per unit volume of air

Note 1 to entry: Air density is expressed in kilograms per cubic metre.

3.1.27

Airflow rate

flow of air or an air current, specifically one that passes through a dimensionally defined plane.