INTERNATIONAL STANDARD

ISO 13351

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Fans — Dimensions

Ventilateurs — Dimensions

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 13351 was prepared by Technical Committee ISO/TC 117, *Fans*.

This second edition cancels and replaces the first edition (ISO 13351:1996), of which it constitutes a minor revision. It also incorporates the content of ISO 6580:2005, which will be withdrawn following its publication.

Introduction

This International Standard gives dimensional details of circular and rectangular flanges of fans in addition to specifying the fan size designation. For circular flanges, the values specified in ISO 6580 have been retained for light-duty fans, in parallel with those values given in Tables 3 and 4 for medium- and heavy-duty fans.

While it does not constrain the manufacturer's choice of flange details, this International Standard facilitates interchangeability, thereby helping to reduce technical barriers to trade.

Throughout this International Standard, the principal dimensions are based on the rounded values of preferred numbers given in ISO 497.

Fans — Dimensions

1 Scope

This International Standard specifies the dimensions of the circular and rectangular flanges of general-purpose fans, as well as the fan size designations. It is not applicable to cross-flow fans or to fan appliances used for individual household or similar applications.

For circular flanges, it provides for three different flange series: one for light-duty casing thicknesses, another for medium-duty fans and the third for heavy-duty fans as used on sea-going vessels or in heavy industry.

In order not to restrict fan design unduly, only the pitch diameter, hole numbers and hole diameters are specified. Flange thickness, as well as internal and external flange diameters, may be chosen freely within the limits of good engineering practice.

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 3, *Preferred numbers — Series of preferred numbers*

ISO 13349, *Industrial fans — Vocabulary and definitions of categories*

3 Terms, definitions and symbols

For the purposes of this document, the terms and definitions given in ISO 13349 and the following terms, definitions and symbols apply.

3.1
light-duty fan
fan suitable for air that is non-toxic, not saturated, non-corrosive, non-flammable, free from abrasive particles, and not exceeding a temperature of 80 °C, or 40 °C if the motor or the fan bearings are in the air stream, and for pressures up to 2 kPa

NOTE See Table 1.

3.2
medium-duty fan
fan with flange dimensions as specified in Figure 4 and Table 2 and suitable for pressures up to 10 kPa

3.3
heavy-duty fan
fan with larger flange dimensions as specified in Figure 4 and Table 3 and suitable for pressures up to 40 kPa

3.4
nominal impeller tip diameter
D
diameter of the impeller tip on which the design of the fan is based

NOTE See Figures 1 to 3.

D nominal impeller tip diameter, in millimetres (see Figures 1 to 3)

D_R actual impeller tip diameter, in millimetres (see Figures 1 to 3)

d_1 pitch circle diameter, in millimetres

d_2 hole diameter, in millimetres

d_3 bolt diameter, in millimetres

d_4 washer diameter, in millimetres

e casing thickness, in millimetres

g hole offset, in millimetres

l arc length between bolt holes, in millimetres

N number of holes

P pitch

α angle between bolt holes, in degrees

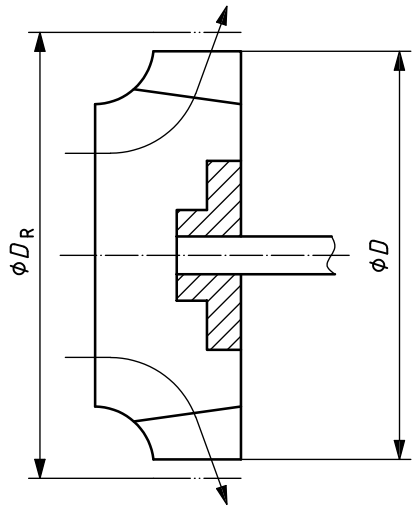


Figure 1 — Impeller — Centrifugal fan

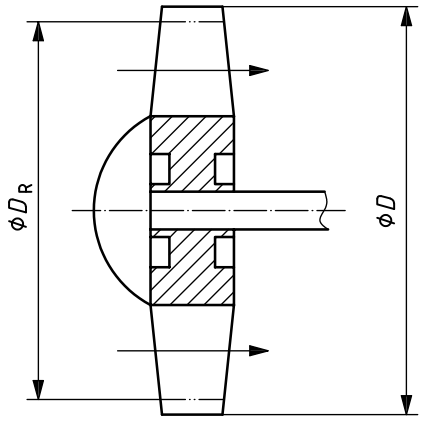
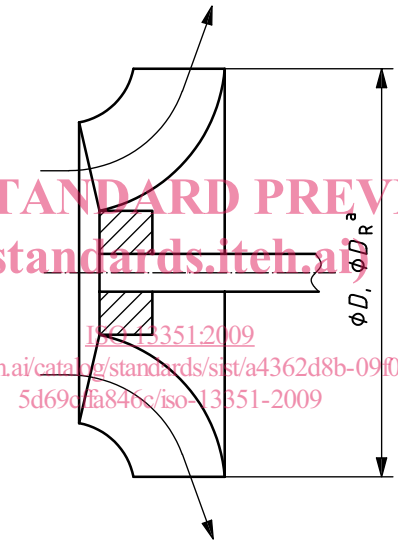


Figure 2 — Impeller — Axial-flow fan



[a] Usually, $D = D_R$

Figure 3 — Impeller — Mixed-flow fan

4 Requirements

4.1 General

This International Standard adopts the Renard R 20 series according to ISO 497 as the nominal dimensions for impeller tip diameters, the inside diameters of circular flanges and the inside lengths of the sides of rectangular flanges. It takes into account the maximum casing thicknesses likely to be used for general-purpose fans, as well as typical manufacturing tolerances representative of engineering “good practice”.

The smallest practical pitch circle diameter can be related to the inside diameter of the casing, the casing thickness, the size of the weld fillet or bend radius at the junction of the flange and the casing, and the normal washer diameter. Light-duty circular flanges might not be suitable for the use of open-ended spanners in all cases.

This International Standard accepts that the number and diameter of bolts or screws cannot be established on a theoretical basis. Practical experience of satisfactory service, optimum cost of installation and manufacture, as well as dimensional tolerances of production are the most important considerations.

The dimensions of circular and rectangular flanges are given in sizes corresponding to nominal diameters from 100 mm to 2 000 mm. In the smaller sizes (below about 200 mm) flange details may be determined by the customer's specification. However, where this is not the case, then the specifications of this International Standard are to be applied.

4.2 Circular flanges

The number of flange holes is divisible by four to permit the orientation of cylindrical cased fans at positions of 90°. The holes are disposed equally on each side of the centrelines of the fan. This permits a flange to be divided in half if a split casing is required. It also allows better access to the fixings on the remote side of a fan in a confined installation.

When an intermediate fan size is required, the R 40 series in accordance with ISO 3 shall be used to obtain the nominal inside diameter. The flange details shall be interpreted from the next larger R 20 size.

In exceptional circumstances, when even smaller increments of fan size are required, it is recommended that the R 80 series be used.

See Figure 4.

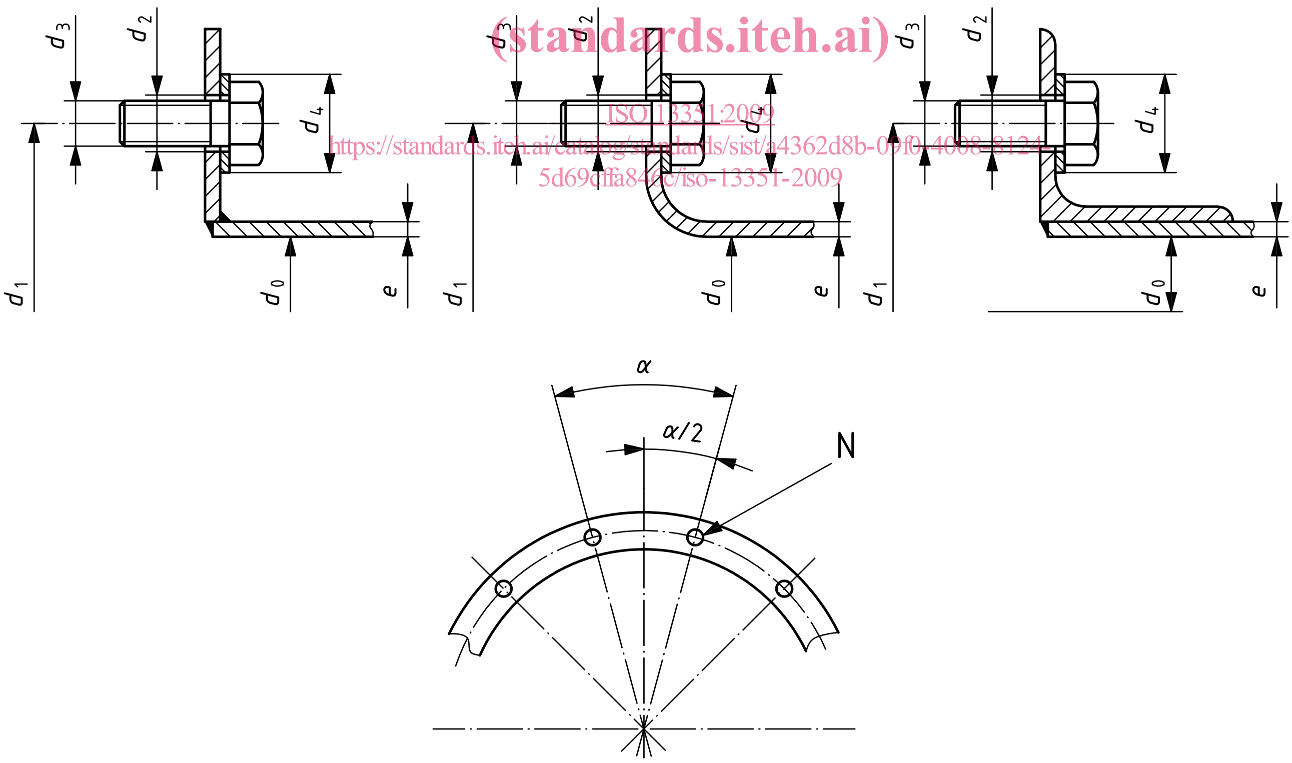


Figure 4 — Dimensions — Circular flanges

Table 1 — Dimensions — Circular flanges — Light-duty fans

Dimensions in millimetres

d_0	d_1	$\frac{d_1 - d_0}{2}$	N	α	d_2	d_3	d_4	$e_{max.}$
100	120	10	4	90	7	M6	12,5	1,6
112	137	12,5	4	90	7	M6	12,5	2
125	150	12,5	4	90	7	M6	12,5	2
140	165	12,5	4	90	7	M6	12,5	2
160	185	12,5	4	90	7	M6	12,5	2
180	205	12,5	4	90	7	M6	12,5	2
200	225	12,5	4	90	7	M6	12,5	2
224	254	15	4	90	7	M6	12,5	2
250	280	15	4	90	10	M8	17	2,5
280	320	20	4	90	10	M8	17	2,5
315	355	20	8	45	10	M8	17	3
355	395	20	8	45	10	M8	17	3
400	450	25	8	45	12	M10	21	3
450	500	25	8	45	12	M10	21	3
500	560	30	12	30	12	M10	21	3,5
560	620	30	12	30	12	M10	21	3,5
630	690	30	12	30	12	M10	21	5
710	770	30	16	22,5	12	M10	21	5
800	860	30	16	22,5	12	M10	21	5
900	970	35	16	22,5	15	M12	24	6
1 000	1 070	35	16	22,5	15	M12	24	6
1 120	1 190	35	20	18	15	M12	24	6
1 250	1 320	35	20	18	15	M12	24	6
1 400	1 470	35	20	18	15	M12	24	6
1 600	1 680	40	24	15	19	M16	30	8
1 800	1 880	40	24	15	19	M16	30	8
2 000	2 080	40	24	15	19	M16	30	8