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**SPECIFICATION FOR BLOWER
AND EXHAUSTER FOR FIRE FIGHTING**

(Second Revision)

(Incorporating Amendment Nos. 1 & 2)

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BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

Price Group 3

Indian Standard

**SPECIFICATION FOR BLOWER
AND EXHAUSTER FOR FIRE FIGHTING**

(Second Revision)

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(*Continued on page 2*)

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IS : 941 - 1985

(Continued from page 1)

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(Continued on page 9)

Indian Standard
SPECIFICATION FOR BLOWER
AND EXHAUSTER FOR FIRE FIGHTING
(*Second Revision*)

0. FOREWORD

0.1 This Indian Standard (Second Revision) was adopted by the Indian Standards Institution on 29 June 1985, after the draft finalized by the Fire Fighting Sectional Committee had been approved by the Civil Engineering Division Council.

0.2 The purpose of blower and exhauster is to provide the supply of fresh clean air to firemen who may be working in unventilated places or to exhaust accumulation of foul air, fumes and smoke from storage tanks, ships' holds, godowns, living rooms and the like.

0.3 This standard was first published in 1958 based on the type of equipment being imported from other countries. The first revision had been prepared to have the requirements based on the experience gained in the manufacture of this equipment in the country. This revision has been prepared so as to keep the design based on performance.

0.4 This edition 3.2 incorporates Amendment No. 1 (May 1989) and Amendment No. 2 (March 1993). Side bar indicates modification of the text as the result of incorporation of the amendments.

0.5 For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS : 2-1960*. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

1. SCOPE

1.1 This standard lays down the requirements regarding material, construction and performance of blower and exhauster used for fire fighting.

2. DESCRIPTION

2.1 The blower and exhauster shall consist of the following parts:

- a) Impeller,
- b) Casing,

*Rules for rounding off numerical values (*revised*).

IS : 941 - 1985

- c) Suction mouth with wire fabric,
- d) Exhaust pipe,
- e) Engine, and
- f) Frame with lifting handles.

Aluminium castings shall have a minimum thickness of 4 mm and aluminium sheet wherever used shall have a minimum thickness of 2.5 mm.

3. MATERIAL

3.1 The material used for the various parts shall be as given in Table 1.

TABLE 1 REQUIREMENTS OF THE MATERIALS OF COMPONENTS

| SL NO. | NAME OF PARTS | NAME OF MATERIAL | CONFORMING TO |
|--------|--|------------------|------------------------------|
| (1) | (2) | (3) | (4) |
| i) | Impeller | Aluminium | Grade 4423 of IS : 617-1975* |
| ii) | Casing | Aluminium | Grade 4423 of IS : 617-1975* |
| iii) | Suction mouth | Aluminium | Grade 4423 of IS : 617-1975* |
| iv) | Exhaust pipe | Canvas | IS : 1424-1977† |
| v) | a) Petrol engine of capacity 2.5 kW with 3 litre petrol tank; or b) Lightweight diesel engine of capacity 3.23 kW | — | IS : 7347-1974‡ |
| vi) | Frame with lifting handles | MS pipe | IS : 1239 (Part 1)-1979§ |
| vii) | Wire fabric steel | Steel | IS : 4948-1974 |

NOTE — Where it is possible to have electric supply, in place of petrol engine given at Sl No. (v) 3-phase induction motor according to IS : 325 - 1978 'Specification for three-phase inductor motors (*fourth revision*)' of capacity 2.2 kW with or without flameproof enclosures [see IS : 2148-1981 'Specification for flameproof enclosures of electrical apparatus (*second revision*)'] shall be used.

*Specification for aluminium and aluminium alloy ingots and castings for general engineering purposes (*second revision*).

†Specification for cotton canvas (*second revision*).

‡Specification for performance of small size spark ignition engines.

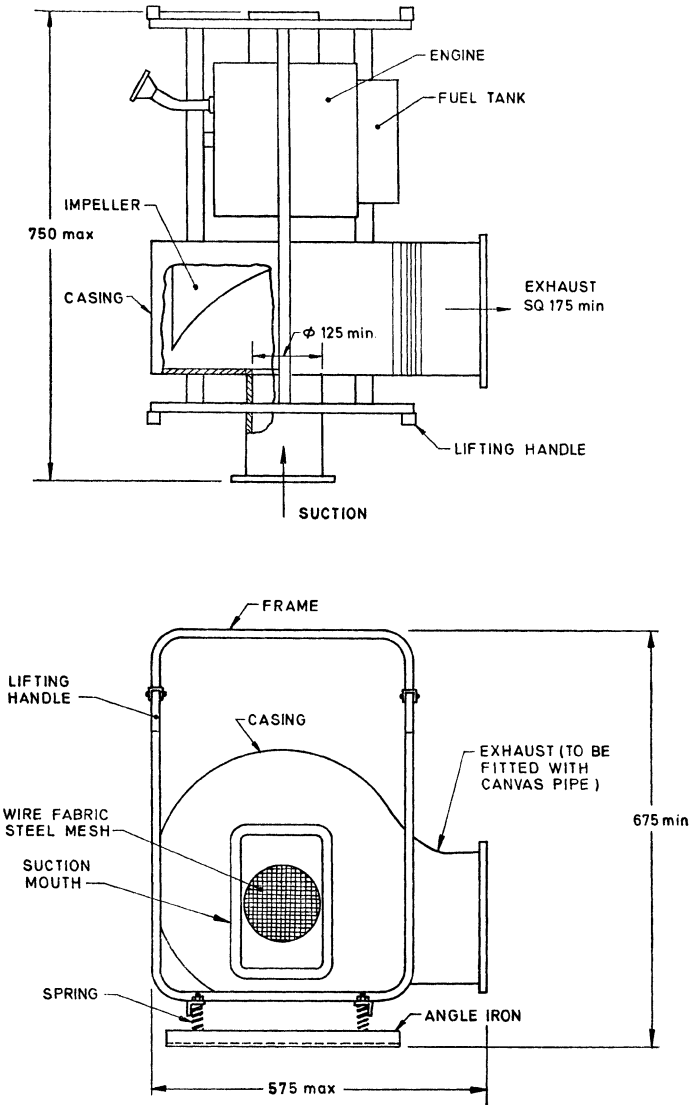
¶Performance requirements for constant speed compression ignition (diesel) engine for general purposes (up to 20 kW).

§Specification for mild steel tubes, tubulars, and other wrought steel fittings: Part 1 Mild steel tubes (*fourth revision*).

||Specification for welded steel wire fabric for general use (*first revision*).

4. CONSTRUCTION

4.1 Impeller and engine shall be mounted together and the total weight of the unit with fuel shall not exceed 60 kg. Runner shall be of the overhung type to mount correctly and securely on the extension of the engine shaft. The details shall be as given in Fig. 1.



All dimensions in millimetres.

FIG. 1 DETAILS OF BLOWER AND EXHAUSTER

5. PERFORMANCE REQUIREMENT

5.1 The blower shall be tested accordingly to method given in **5.1.1** to **5.1.3**, after removing the guard. The blower shall be capable of discharging safely and continuously 30 m³/minute of free air.

5.1.1 To the inlet side of the blower attach a cylindrical airway of diameter D not less than $1.5d$ where d is the diameter of orifice in which the impeller rotates (see Fig. 2A). To the inlet side of the airway shall be fitted a conical mouthpiece of length $D/4$ having an included angle of 60 degrees converging towards the blower, and a radial flange at its inlet end of width $D/25$. The total length of the test duct including the conical mouth-piece shall not be less than $2D$.

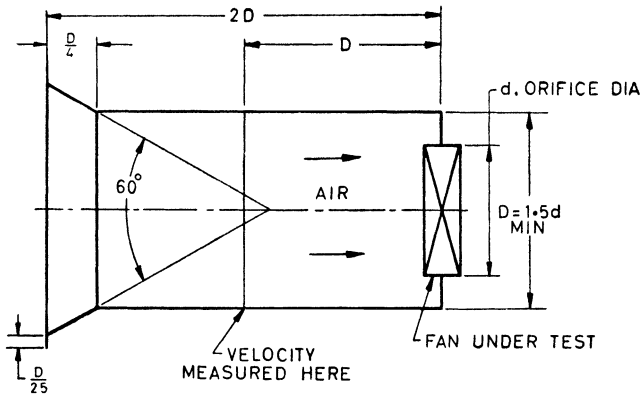


FIG. 2A ROUND TESTING DUCT FOR PROPELLER FANS

5.1.2 The average air velocity shall be determined by readings of a vane anemometer from measurements across a section D from the fan end of the cylindrical airway.

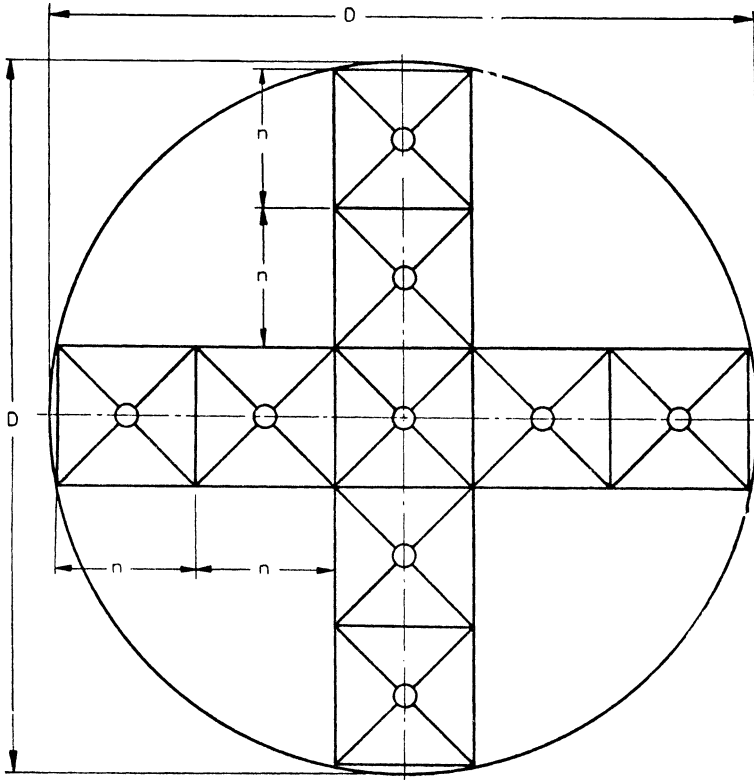
5.1.3 For the air delivery test, the cylindrical airway shall be considered to be divided into a number of equal square areas by lines parallel to the diameter D as shown in Fig. 2B. Measurements shall be taken with the centre of the anemometer vane wheel at the centre of each area, as shown in the Fig. 2B. The number of areas shall be determined by the ratio of D to the diameter of the ring surrounding the anemometer vanes, the relationship being shown in the table under Fig. 2B.

6. OPERATIONAL TEST

6.1 Blower and exhauster shall be run continuously for 2 hours. It shall remain stable and shall not move from its place by more than 30 cm. All the components shall be checked and there shall not be any looseness.

7. FINISH

7.1 All parts shall be of good finish, clear of burrs and sharp edges. All casting shall be clean and sound and shall be free from plugging, welding or repair of any defects.



| Diameter of Airway <i>D</i> | Subdivision of Each Diameter <i>n</i> | Number of Readings |
|------------------------------------|---|-----------------------|
| ϕ = Diameter of anemometer | | |
| 4 and above but less than 5ϕ | 3 | 5 |
| 5 and above but less than 8ϕ | 5 | 9 |
| 8 and above but less than 15ϕ | 7 | 13 |
| 15ϕ or greater | 9 | 17 |

FIG. 2B METHODS OF DIVIDING THE AREA OF AIRWAY

IS : 941 - 1985

8. PAINTING

8.1 Blower and exhauster except engine shall have two coats of paint after one coat of red oxide primer. The shade of paint for stand shall be black for body, fire red conforming to Shade No. 536 of IS : 5 - 1978*. Paint used shall be in accordance with IS : 2932-1974†.

9. MARKING

9.1 Each blower and exhauster shall be clearly and permanently marked with the following information:

- a) Manufacturer's name or trade-mark, and
- b) Year of manufacture.

9.1.1 The equipment may also be marked with ISI Certification Mark.

NOTE — The use of the ISI Certification Mark is governed by the provisions of the Indian Standards Institution (Certification Marks) Act and the Rules and Regulations made thereunder. The ISI Mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard under a well-defined system of inspection, testing and quality control which is devised and supervised by ISI and operated by the producer. ISI marked products are also continuously checked by ISI for conformity to that standard as a further safeguard. Details of conditions, under which a licence for the use of the ISI Certification Mark may be granted to manufacturers or processors may be obtained from the Indian Standards Institution.

10. CRITERIA FOR CONFORMITY

10.1 Each equipment shall be checked for the requirements given in this standard.

*Specification for colours for ready mixed paints and enamels (*third revision*).

†Specification for enamel, synthetic exterior (a) under coating, (b) finishing (*first revision*).

(Continued from page 2)

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Bombay

SHRI V. H. MADKAIKAR (*Alternate*)

Panel for Blowers and Exhauster, BDC 22 : 3/P-1

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Industrial Safety Engineers, New Delhi

INTERNATIONAL SYSTEM OF UNITS (SI UNITS)

Base Units

| <i>Quantity</i> | <i>Unit</i> | <i>Symbol</i> |
|---------------------------|-------------|---------------|
| Length | metre | m |
| Mass | kilogram | kg |
| Time | second | s |
| Electric current | ampere | A |
| Thermodynamic temperature | kelvin | K |
| Luminous intensity | candela | cd |
| Amount of substance | mole | mol |

Supplementary Units

| <i>Quantity</i> | <i>Unit</i> | <i>Symbol</i> |
|-----------------|-------------|---------------|
| Plane angle | radian | rad |
| Solid angle | steradian | sr |

Derived Units

| <i>Quantity</i> | <i>Unit</i> | <i>Symbol</i> | <i>Definition</i> |
|----------------------|-------------|---------------|---------------------------------|
| Force | newton | N | 1 N = 1 kg.m/s ² |
| Energy | joule | J | 1 J = 1 N.m |
| Power | watt | W | 1 W = 1 J/s |
| Flux | weber | Wb | 1 Wb = 1 V.s |
| Flux density | tesla | T | 1 T = 1 Wb/m ² |
| Frequency | hertz | Hz | 1 Hz = 1 c/s (s ⁻¹) |
| Electric conductance | siemens | S | 1 S = 1 A/V |
| Electromotive force | volts | V | 1 V = 1 W/A |
| Pressure, stress | pascal | Pa | 1 Pa = 1 N/m ² |

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Amendments Issued Since Publication

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BUREAU OF INDIAN STANDARDS

Headquarters:

Manak Bhavan, 9 Bahadur Shah Zafar Marg, New Delhi 110002.
Telephones: 323 01 31, 323 33 75, 323 94 02

Telegrams: Manaksanstha
(Common to all offices)

Regional Offices:

| | Telephone |
|---|--|
| Central : Manak Bhavan, 9 Bahadur Shah Zafar Marg NEW DELHI 110002 | { 323 76 17 323 38 41 |
| Eastern : 1/14 C. I. T. Scheme VII M, V. I. P. Road, Kankurgachi KOLKATA 700054 | { 337 84 99, 337 85 61 337 86 26, 337 91 20 |
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