

**BUREAU OF INDIAN STANDARDS****DRAFT FOR COMMENTS ONLY**

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**भारतीय मानक मसौदा**

**मैन्युअल रूप से संचालित उर्वरक प्रसारणकर्ता — विशिष्टता**

**(आइ एस 12337 का पहला पुनरीक्षण)**

*Draft Indian Standard*

**MANUALLY OPERATED FERTILIZER BROADCASTER — SPECIFICATION**

*(First Revision of IS 12337)*

**ICS 65.060.01**

Agricultural Machinery and Equipment  
Sectional Committee, FAD 11

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**FOREWORD**

*(Formal clause will be added later)*

Fertilizers are broadcasted in the field mostly by hand. But hand broadcasting is a time-consuming operation and also the distribution is not uniform. To overcome this issue, simple hand-operated fertilizer broadcasters were developed. As demand of these broadcasters increased among the farmers, a need was felt to develop a standard for the manufacturers to produce and users to select good quality fertilizer broadcasters. The standard was published in 1988 deriving assistance from technical information provided by Punjab Agricultural University, Ludhiana.

The first revision of the standard has been brought out to incorporate necessary editorial corrections and to bring it in the latest style and format of Indian Standards. One amendment issued to the earlier version has also been included. Reference to Indian Standards wherever applicable have also been updated.

The figure given in the standard is meant only for illustration of components. This should not be considered as suggestive of any standard design.

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 : 2022 'Rules for rounding off numerical values (*second revision*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

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**MANUALLY OPERATED FERTILIZER BROADCASTER — SPECIFICATION**  
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## 1 SCOPE

This standard prescribes the material, constructional and other requirements of manually operated fertilizer broadcaster.

## 2 REFERENCES

The following standards contain provisions which, through reference in this text, constitute provisions of this standard. At the time of publication, the edition indicated was valid. All standards are subject to revision, and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent edition of the standards indicated below:

<i>IS No.</i>	<i>Title</i>
IS 2062 : 2011	Hot rolled medium and high tensile structural steel — Specification ( <i>seventh revision</i> )
IS 277 : 2018	Galvanized steel strips and sheets (plain and corrugated) — Specification ( <i>seventh revision</i> )
IS 617 : 1994	Cast aluminium and its alloys — Ingots and castings for general engineering purposes — Specification ( <i>third revision</i> )
IS 620 : 1985	Specification for wooden tool handles general requirements ( <i>fourth revision</i> )
IS 2062 : 2011	Hot rolled medium and high tensile structural steel — Specification ( <i>seventh revision</i> )
IS 4454 (Part 2) : 2001	Steel wire for mechanical springs — Specification: Part 2 Oil hardened and tempered steel wire ( <i>second revision</i> )
5517 : 1993	Steels for hardening and tempering — Specification ( <i>second revision</i> )
IS 7201 (Part 1) : 1987	Methods of sampling for agricultural machinery and equipment: Part 1 Hand-tools and hand-operated/animal drawn equipment ( <i>first revision</i> )

## 3 TERMINOLOGY

For the purpose of this standard, the following definitions shall apply (*see also Fig. 1*).

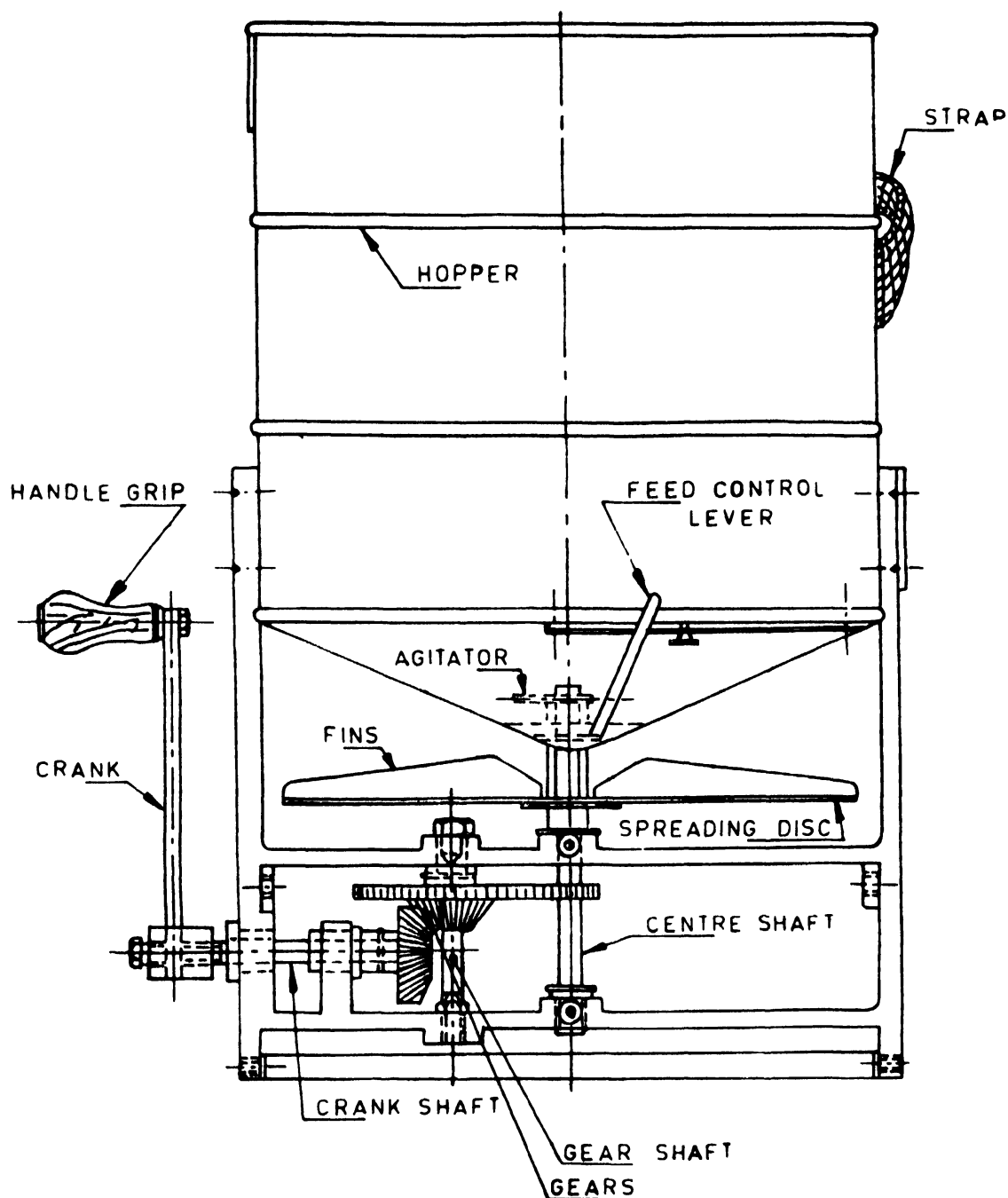


FIG. 1 NOMENCLATURE OF A MANUALLY OPERATED FERTILIZER BROADCASTER

**3.1 Agitator** — A device which mechanically initiates the movement of the fertilizer within the hopper (*see* Fig. 1).

**3.2 Broadcasting** — The process of scattering of agricultural inputs, such as seed, fertilizer and manure on the surface of the soil.

**3.3 Crank** — A component to help in rotating the gear train.

**3.4 Feed Control** — A device to control the feed of the fertilizer.

**3.5 Fertilizer Broadcaster** — A fertilizer distributor with a spreading width substantially greater than the width of the machine.

**3.6 Hopper** — A container for holding the fertilizer.

**3.7 Spreading Disc** — A circular disc having equally spaced fins for spreading the material falling on the disc by centrifugal force.

**3.8 Total Mass** — The mass of the broadcaster with all its mountings and attachments but without any fertilizer in the hopper.

## 4 MATERIAL

**4.1** The materials for construction of various components of manually operated fertilizer broadcasters are given in Table 1 for guidance.

**4.2** The material used for different components shall be declared by the manufacturer in the parts catalogue (*see 5.10*).

## 5 CONSTRUCTIONAL REQUIREMENTS

### 5.1 Hopper

The hopper shall have a concave shaped or conical bottom with a slope of 30 to 50° so that the fertilizer contained in it easily moves towards the feeding aperture. The hopper bottom shall have a circular hole for metering the fertilizer. The ratio between the diameter and the height of the hopper shall be in the range of 0.8 to 1.25. The hopper should be covered with a lid. The lid if provided, should have a peeping hole of at least 75 mm in diameter for observing the quantity of fertilizer left in the hopper during operation. The hopper should be sufficiently strong and should not buckle when fully filled with fertilizer.

The thickness of the mild steel and galvanized steel sheet for hopper shall be not less than 0.63 mm and 0.56 mm respectively.

### 5.2 Spreading Disc

The spreading disc mounted at the bottom of the hopper shall have 6 or 8 equally spaced fins. The spreading disc shall have a vertical clearance of at least 30 mm from the hopper bottom.

**Table 1 Material for construction of different components**

Sl. No.	Name of Component	Material	Applicable Standard
(1)	(2)	(3)	(4)
(i)	Hopper	Mild steel	IS 2062
		Galvanized steel sheet	IS 277
		Aluminium	IS 617
		Fibre glass reinforcement plastics	-
		Plastics	-

(ii)	Spreading disc		
(iii)	Lid		
(iv)	Handle grip	Seasoned wood	IS 620
		Plastics	-
(v)	Gears	Mild steel	IS 2062
		Nylon	-
(vi)	Agitators	Mild steel	IS 2062
		Spring steel	IS 4454 ( Part 2 )
(vii)	Gear shaft	Mild steel	IS 2062
		Carbon steel	IS 5517
(viii)	Centre shaft	Carbon steel	IS 5517
(ix)	Crank shaft	Mild steel	IS 2062
(x)	Feed control mechanism	Mild steel	IS 2062
		Galvanized steel sheet	IS 277
		Nylon	
(xi)	Strap	Woven web cotton	-
		Synthetic yarn	-

### 5.3 Feed Control Mechanism

A suitable feed control mechanism with locking device shall be provided to control the flow of fertilizer through the aperture. The mechanism shall be controlled by 8 levers from outside of the hopper and shall not require any tool for the operation. Provision of an Index pointer with marking for the aperture opening of hopper at positions closed 1/4, 1/2, 3/4 and full shall be provided. Provision of a scale indicating the discharge rate in kg/ha at different settings of the aperture opening is preferred.

### 5.4 Agitator

A suitable agitator shall be provided near the orifice of the hopper to avoid the clogging of the aperture and for feeding the fertilizer to the aperture. The agitator shall be kept at a vertical clearance of at least 3 mm above the aperture.

### 5.5 Gear Box and Gears

A suitable gear arrangement shall be provided for giving a peripheral speed of  $500 \pm 50$  cm/s to the spreading disc. The gear box shall be so designed as to allow easy access to gears for lubricating and inspection. Suitable provision for lubrication shall be provided. The gears shall mate correctly and shall move smoothly.

### 5.6 Crank

A crank shall be fitted with the crank shaft which should function in a clockwise motion. The crank shall be fitted with a handle of sufficient size. The handle shall be in easy reach of the operator.

## **5.7 Straps**

**5.7.1** Two straps of suitable length shall be provided in order to help easy carriage of the broadcaster. The provision for easy adjustment of the length of the straps shall be provided. At the option of the purchaser, a cushion of minimum 40 mm width and 20 mm thickness shall be provided with the straps at least on that portion which rests on the shoulder of the operator. The cushion, if provided shall be covered with cotton, canvas, rexin, PVC or plastic-coated fabrics. The straps and their assembly shall withstand the test prescribed in **5.7.2**.

**5.7.2** The hopper shall be filled with granular fertilizer to its total capacity. The broadcaster shall be hung from a solid support by its straps, simulating its carriage by the operator. It shall be lifted to a height of 30 cm and allowed to drop and hang by straps 25 times. The straps and their assembly shall be deemed to have passed this test, if no breakage, deformation, etc. are found during the test.

## **5.8 Bearings**

The crank shaft, gear shaft and the centre shaft shall be provided with bearings. The bearings shall be dust proof.

## **5.9 Total Mass**

The total mass of the broadcaster shall not exceed 5 kg (*see 3.8*).

## **5.10 Other Requirements**

**5.10.1** Operational and maintenance manual and parts catalogue shall be provided with each broadcaster. The manual should also contain the safety precautions, recommended forward speed, handle speed, effective width of spread, calibration chart indicating the discharge rate in kg/ha at different settings of the aperture opening, etc.

**5.10.2** Each broadcaster shall also be supplied with necessary tools.

## **6 CAPACITY**

The total capacity of the hopper shall be 12 to 15 litres. The capacity shall be declared by the manufacturer. The tolerance on the declared capacity shall be  $\pm 5$  percent.

## **7 WORKMANSHIP AND FINISH**

**7.1** The components of the broadcaster shall have a smooth finish and shall be free from pits, burrs. Sharp edges and other defects that may be detrimental for their use.

**7.2** The exposed metallic parts shall have a protective coating to prevent surface deterioration in transit and storage.

## **8 MARKING AND PACKING**

### **8.1 Marking**

Each broadcaster shall be marked with the following particulars:

- a) Manufacturer's name or recognized trademark, if any;
- b) Batch or code number; and
- c) Hopper capacity.

## **8.2 BIS Certification Marking**

The products conforming to the requirements of this standard may be certified as per the conformity assessment schemes under the provisions of the *Bureau of Indian Standards Act, 2016* and the Rules and Regulations framed thereunder, and the products may be marked with the Standard Mark.

## **8.3 Packing**

Each broadcaster shall be packed, as agreed to between the purchaser and the supplier, for safe handling in transit.

## **9 SAMPLING FOR LOT ACCEPTANCE**

Unless otherwise agreed to between the purchaser and the supplier. Sampling of the broadcaster for lot acceptance shall be done in accordance with **3** of IS 7201 (Part 1). The classification of different requirements of this specification for the purpose of lot acceptance is given below for guidance:

- a) Dimensional and visual requirements — *see 5* (except **5.7.2** and **5.9**).
- b) Other than visual and dimensional requirements — *see 5.7.2, 5.9* and **6**.