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IS 11459 (1985): Power-operated Chaff Cutter [FAD 20: Agriculture and Food Processing Equipments]



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Bhartrhari—Nitiśatakam

“Knowledge is such a treasure which cannot be stolen”

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Indian Standard

SPECIFICATION FOR
POWER-OPERATED CHAFF CUTTER

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Indian Standard

SPECIFICATION FOR POWER-OPERATED CHAFF CUTTER

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(*Continued on page 2*)

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Indian Standard

SPECIFICATION FOR POWER-OPERATED CHAFF CUTTER

0. FOREWORD

0.1 This Indian Standard was adopted by the Indian Standards Institution on 30 September 1985, after the draft finalized by the Agricultural Produce Processing Equipment Sectional Committee had been approved by the Agricultural and Food Products Division Council.

0.2 Power-operated chaff cutters are now extensively used for cutting the fodder. A need was felt to prepare an Indian Standard on the subject to help manufactures to produce quality chaff cutters.

0.3 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 specifies material performance, constructional and other requirements of power-operated chaff cutter.

2. TERMINOLOGY

2.0 For the purpose of this standard following definitions shall apply.

2.1 Chute-Fed Chaff Cutter — A chaff cutter in which the feeding of the fodder crop is done through a chute.

2.2 Conveyor Fed Chaff Cutter — A chaff cutter in which the feeding of the fodder crop is done through a conveyor.

2.3 Let-Fall Type — A chaff cutter in which the cut fodder is dropped down to the bottom of the chaff cutter.

2.4 Throw Away Type — A chaff cutter in which the cut fodder is thrown away to the front ward of the chaff cutter.

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

2.5 Blow-Up Type — A chaff cutter in which the cut fodder is blown up through the blow-up pipe.

2.6 Fly Wheel Type — A chaff cutter having rotating fly wheel with blades.

2.7 Cylinder Type — A chaff cutter the cutting mechanism which consists of a rotating cutting cylinder.

2.8 Feed Interference — The obstruction in advancing the fodder against the back of the blades. This occurs if the blade is not properly inclined to the plane of rotation.

3. TYPES

3.1 On the basis of cutting mechanism, the chaff cutter shall be of following types:

- a) Fly wheel type, and
- b) Cylinder type.

3.2 On the basis of cut-chaff dropping position, the chaff cutter shall be of following types:

- a) Let-fall type,
- b) Throw-away type, and
- c) Blow-up type.

3.3 On the basis of feeding system, the chaff cutter shall be of following types:

- a) Chute-fed (*see* Fig. 1), and
- b) Conveyor-fed (*see* Fig. 2).

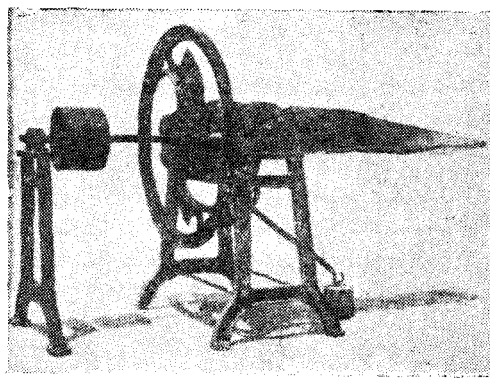


FIG. 1 CHUTE-FED CHAFF CUTTER

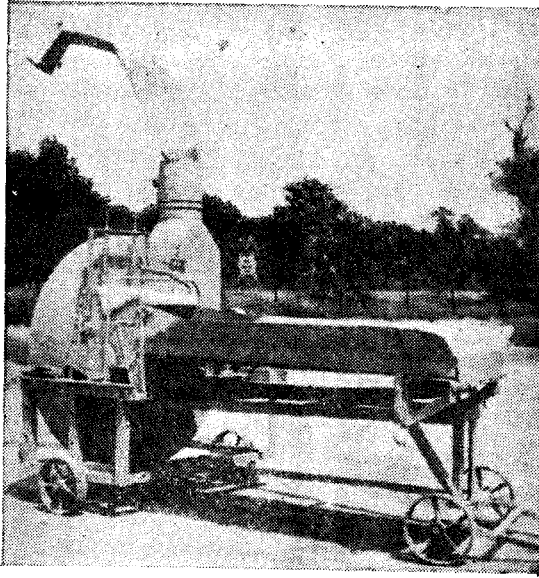


FIG. 2 CONVEYOR-FED CHAFF CUTTER

4. MATERIAL

4.1 The material for blade in case of fly wheel type and cylinder in case of cylinder type shall be as given in 2 of IS : 1511-1979*.

4.2 The material for other components shall be as given in col 3 of Table 1. The material may conform to the relevant Indian Standard given in col 4 of Table 1. Material for the component not listed shall be declared by the manufacturer.

5. HARDNESS

5.1 All cast iron components shall have a hardness of 160 to 220 HB.

5.2 The hardness of the blade shall be as given in 3 of IS : 1511-1979*.

6. PERFORMANCE REQUIREMENTS

6.1 The chaff cutter shall be operated at no load in accordance with 8.1 of IS : 7897-1975†. During the no-load run, the visual observation shall not indicate the following:

- a) Presence of any marked oscillation during operation;

*Specification for blades for manually-operated chaff cutter (second revision).

†Test code for chaff cutter.

- b) Presence of knocking or rattling sound;
- c) Frequent slippage of belts;
- d) Non-smooth running of shafts in respective bearings;
- e) Any unusual wear or slackness in any components; and
- f) Any marked rise in bearing temperature.

TABLE 1 MATERIAL OF CONSTRUCTION

(Clause 4.2)

SL No.	COMPONENTS	MATERIAL	RELEVANT IS:
(1)	(2)	(3)	(4)
i)	Frame	Cast iron	IS : 210-1978*
		Mild steel	IS : 226-1975†
ii)	Cover plate	do	do
iii)	Shear plate	do	do
iv)	Feed roll	do	do
v)	Feed roll shaft	do	do
vi)	Tie rod	do	do
vii)	Spring	Spring steel	IS : 4454 (Part 1)-1975‡
viii)	Gears	Cast iron	IS : 210-1978*
ix)	Fly wheel	do	do
x)	Pulley	do	do
xi)	Legs	Mild steel	IS : 226-1975†
xii)	Leg support	do	do
xiii)	Discharge box	do	do
xiv)	Feeding chute	do	do
xv)	Blower	do	do
xvi)	Blade cover	Mild steel	IS : 226-1975†
		Plastic	—

*Specification for grey iron castings (*third revision*).†Specification for structural steel (standard quality) (*fifth revision*).

‡Specification for steel wires for cold formed springs : Part 1 Patented and cold drawn.

6.2 When tested in accordance with the method given in 9.1 of IS : 7897-1975*, the chaff cutter shall meet the following requirements:

- a) The variation in length of cut shall be not more than 10 percent; and
- b) The blowing efficiency (if applicable) shall be not less than 99 percent.

*Test code for chaff cutter.

6.2.1 During and after the test for **6.2**, the visual observation shall not indicate the following:

- a) Observation given under **6.1** (a) to (f);
- b) Non-smooth flow of the material through different components;
- c) Frequent clogging of throat and feed rolls; and
- d) Frequent loosening of the fasteners.

6.3 When tested in accordance with **9.2** of IS : 7897-1975*, no breakdown shall occur in any unit of the chaff cutter.

7. CONSTRUCTIONAL REQUIREMENT

7.1 Cutter Head — It shall consist of fly wheel and blade in case of fly wheel type and cylinder in case of cylinder type.

7.1.1 In case of cylinder types, the cutting reel may be spring-mounted. Provision for adjusting height of reel in contact with throat shall be provided. Provision shall also be made for lubricating bearings at each end of the reel shaft.

7.2 Feed Rolls — There shall be two feed rolls. The roll shaft shall be mounted on ball bearings at either ends and aligned parallel to one another.

7.3 Feeding System — The feeding system in the chaff cutter shall be of chute or conveyor. The minimum length of chute and conveyor shall be 900 mm and 1 200 mm respectively. The chute or conveyor shall be covered up to a minimum of 300 mm near feed roll side. In case of chaff cutter with conveyor feeding, a feed reversing device in accordance with **6.4** of IS : 9129-1979† may be provided.

7.4 Stand/Wheels — Stand or wheels shall be provided. The minimum diameter of the wheel shall be 350 mm and its minimum width shall be 60 mm.

7.5 Blower — Blower, if provided, shall be centrifugal type with the suitable arrangement for controlling air blast.

7.6 Transmission System — The gears shall properly mesh and shall be suitably covered. Provision shall be made for lubrication. A suitable arrangement shall be provided for clutching or declutching of drive.

8. OTHER REQUIREMENTS

*Test code for chaff cutter.

†Technical requirements for safe feeding system for power threshers.

8.1 Provision shall be made to change the inclination of the plane of the cutting knives to the plane of rotation of fly wheel to avoid feed interference.

8.2 Provision for adjustment of the following shall be made:

- a) Feed rate;
- b) Length of cut;
- c) Feed roll clearance;
- d) Space between fixed and rotating blades;
- e) Air displacement (if applicable); and
- f) Direction of rotation of feed rolls.

8.3 If the cutter head is open, arrangement shall be made for locking it with the stand and the cutting edge of the blade shall be covered.

8.4 Various controls shall be easily accessible and capable of being locked in a choosen position.

8.5 Suitable guards shall be provided on the transmission system of the chaff cutter.

8.6 The chaff cutter shall be provided with the operator's manual (*see 4.2 of IS : 8132-1983**). Manual shall also contain the information given in Appendix A of IS : 7897-1975†.

9. WORKMANSHIP AND FINISH

9.1 Welding used for joining different components shall not be porous; it shall be smooth (*see also IS : 816-1969‡*).

9.2 All sharp corner and protruding fasteners shall be avoided.

9.3 The chaff cutter shall be suitably painted.

10. MARKING AND PACKING

10.1 Marking — Each chaff cutter shall be marked with the following particulars:

- a) Manufacturer's name and recognized trade-mark;
- b) Model number;
- c) Type;
- d) Batch, code or serial number;

*Guidelines for presentation of operator manuals and technical publications for agricultural tractors and machinery (*first revision*).

†Test code for chaff cutter.

‡Code of practice for use of metal arc welding for general construction in mild steel (*first revision*).

- e) Power rating, kW;
- f) Rated input capacity; and
- g) Recommended r/min of fly wheel or cylinder.

10.1.1 A minimum cautionary notice worded as follows shall be written in vernacular language legibly and prominently on the main body of the chaff cutter:

- a) DO NOT WEAR LOOSE DRESS, BANGLES, WATCH, ETC, WHILE WORKING;
- b) DO NOT WORK UNDER THE INFLUENCE OF INTOXICANTS LIKE LIQUOR, OPIUM, ETC;
- c) CHILDREN AND AGED PERSONS SHOULD BE DISCOURAGED FOR WORKING ON CHAFF CUTTER;
- d) DO NOT CROSS OVER MOVING BELTS;
- e) DO NOT OPERATE CHAFF CUTTER WITHOUT GUARDS AND SAFETY PROVISIONS;
- f) DO NOT PUSH SMALL FODDER BY HAND, USE PUSHING DEVICE;
- g) DO NOT MAKE ADJUSTMENTS WHILE THE MACHINE IS RUNNING;
- h) NEVER BRING HAND NEAR FEED ROLLS AND OPEN CUTTER HEAD;
- j) PUT THE COVER ON BLADE AND LOCK THE FLY WHEEL AFTER THE WORK; and
- k) DO NOT PUT OR TAKE-OFF BELT WHILE PULLEY IS RUNNING.

10.1.2 Each chaff cutter may also be marked with the 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.

10.2 Packing — The chaff cutter or its components shall be packed as agreed to between the purchaser and the supplier.

11. SAMPLING AND TESTS

11.1 At least one chaff cutter of a production model shall be tested under type testing for all the requirement of this specification.

11.2 Each chaff cutter shall be tested under routine testing for the following:

- a) Requirements given under **6.1, 8, 9, 10.1** and **10.1.1** and
- b) Dimensional requirement of the characteristics given in Appendix A of IS : 7897-1975* and comparing the values with those which was obtained for the cutter type tested.

11.3 For lot acceptance, the method of sampling and criteria of conformity shall be as agreed to between the purchaser and the supplier (*see* IS : 7201-1974†).

*Test code for chaff cutter.

†Method of sampling of agricultural machinery and tractors.

AMENDMENT NO. 1 DECEMBER 1995
TO
IS 11459 : 1985 SPECIFICATION FOR
POWER-OPERATED CHAFF CUTTER

(Page 6, Table 1) — Substitute the following for the existing table:

TABLE 1 MATERIAL OF CONSTRUCTION

		(Clause 4.2)	
Sl No.	COMPONENTS	MATERIAL	RELEVANT IS
(1)	(2)	(3)	(4)
i)	Frame	Cast iron	210 : 1993*
		Mild steel	2062 : 1992†
ii)	Cover plate	do	do
iii)	Shear plate	do	do
iv)	Feed roll	do	do
v)	Feed roll shaft	do	do
vi)	Tie rod	do	do
vii)	Spring	Spring steel	4454 (Part 1) : 1981‡
viii)	Gears	Cast iron	210 : 1993*
ix)	Fly wheel	do	do
x)	Pulley	do	do
xi)	Legs	Mild steel	2062 : 1992†
xii)	Leg support	do	do
xiii)	Discharge box	do	do
xiv)	Feeding chute	do	do
xv)	Blower	do	do
xvi)	Blade cover	Mild steel	do
		plastic	—

*Specification for grey iron castings (*fourth revision*).

†Steel for general structural purpose (*fourth revision*).

‡Specification for steel wires for cold formed springs : Part 1 Patented and cold drawn (*second revision*).

(Page 10, clause 11.3) — Substitute 'IS 7201 (Part 1) : 1987' for 'IS 7201 : 1974' and corresponding title in foot-note as '*Method of sampling of agricultural machinery and equipment : Part 1 Hand tools and hand operated/animal drawn equipment (*first revision*)' for the existing title.