भारतीय मानक

Indian Standard

IS 12792 : 2024

कृषि उत्पाद प्रेषण मशीनादि — चावल की लघु मिल — विशिष्टि

(पहला पुनरीक्षण)

Agricultural Produce Milling Machinery — Mini Rice Mill — Specification

(First Revision)

ICS 67.020

भारतीय मानक ब्यूरो
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January 2024 **Price Group 6**

Agriculture and Food Processing Equipment Sectional Committee, FAD 20

FOREWORD

This Indian Standard (First Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Agriculture and Food Processing Equipment Sectional Committee had been approved by the Food and Agriculture Division Council.

With the ongoing rapid mechanization of rice milling process, significance of mini rice mill is highly prominent, specifically in case of micro, small and medium scale industries. Therefore, manufacturing of mini rice mills has also been increasing in the country. A need was felt to prepare this standard to guide the manufacturer and the user.

This standard was originally published in 1989. In this revision, following modifications have been incorporated keeping in view the technological advancements in the field and the standard has been brought out in the latest style and format of the Indian Standards:

a) Processing capacity of the mini rice mill has been updated as per current industrial practice;

b) Broken rice percentage has been specified separately for raw and parboiled rice;

c) Requirement related to efficiency of electric motors has been incorporated;

d) Provision for a suitable mechanism for quick release of paddy grain in case of choking and for emergency stop/alarm have been incorporated;

e) Requirement related to maximum allowable noise level has been incorporated;

f) Marking clause has been updated considering the current industrial requirements;

g) The material specifications for individual components of the equipment have been added and the referred standards have been updated;

h) The minimum thickness of metal sheet used in construction of various components has been increased to 1.0 mm; and

j) The minimum load that guards shall withstand without any permanent set has been decreased from 1200 N/0.1 m^2 to 600 N/0.1 m^2.

The composition of the Committee responsible for the formulation of this standard is given in Annex B.

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.

Indian Standard

AGRICULTURAL PRODUCE MILLING MACHINERY — MINI RICE MILL — SPECIFICATION

(First Revision)

1 SCOPE

This standard covers raw material requirements, performance and other requirements for mini rice mill.

2 REFERENCES

The standards listed in Annex A contain provisions which through reference in this text, constitute provision of this standard. At the time of publication, the editions indicated were 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 these standards.

3 TERMINOLOGY

For the purpose of this standard, the following definition shall apply.

3.1 Mini Rice Mill — A single/two-unit machine with without bucket elevator comprising of paddy cleaner (with/without air blowing/aspirating system), rubber-roll/centrifugal dehusker, husk separation system, rice whitening mechanism (friction/abrasive type) and paddy separation system along with proper feeding/discharge mechanism for raw material/products/by-products/rejects, etc (*see* Fig.1 and Fig 2).

4 MATERIAL OF CONSTRUCTION

4.1 The material of construction for various components of the mini rice mill shall be as given in col (3) of Table 1. The materials shall conform to relevant Indian Standards as given in col (4) of Table 1.

4.2 The wire cloth sieve and perforated type sieve should conform to IS 2405 (Part 1) and IS 2405 (Part 2) respectively.

5 CAPACITY

The mini rice mill shall be capable of processing 1 tonne of paddy per hour, minimum. The manufacturer shall declare the capacity. The declared capacity shall not vary by ± 5 percent.

NOTE — There are mainly three types of paddy in India coarse, medium and fine grains. The capacity may be different for different type of paddy.

6 PERFORMANCE REQUIREMENTS

6.1 Cleaning unit should clean stock in such a way that the cleaned product shall not contain impurities more than 1 percent.

6.2 Dehusking unit shall be capable of shelling/dehulling 85 percent grains in case of raw paddy and 90 percent grains in case of parboiled paddy with maximum of 10 percent and 5 percent broken for raw and parboiled paddy, respectively.

6.3 Husk aspiration unit shall remove minimum of 95 percent husk present and no brokens and rice should go along with husk.

6.4 Whitener shall remove bran uniformly from the rice at 3 percent to 5 percent polish on single pass basis. The finished product shall not contain brokens more than 20 percent in case of raw rice and 15 percent in the case of parboiled rice.

6.5 Elevator unit shall be capable of lifting paddy at the rate of 15 percent above the rated capacity without causing any damage to grains.

6.6 Specific energy consumption shall not exceed 20 kWh/t of paddy.

6.7 Electric motors used in the system shall have efficiency not less than 80 percent.

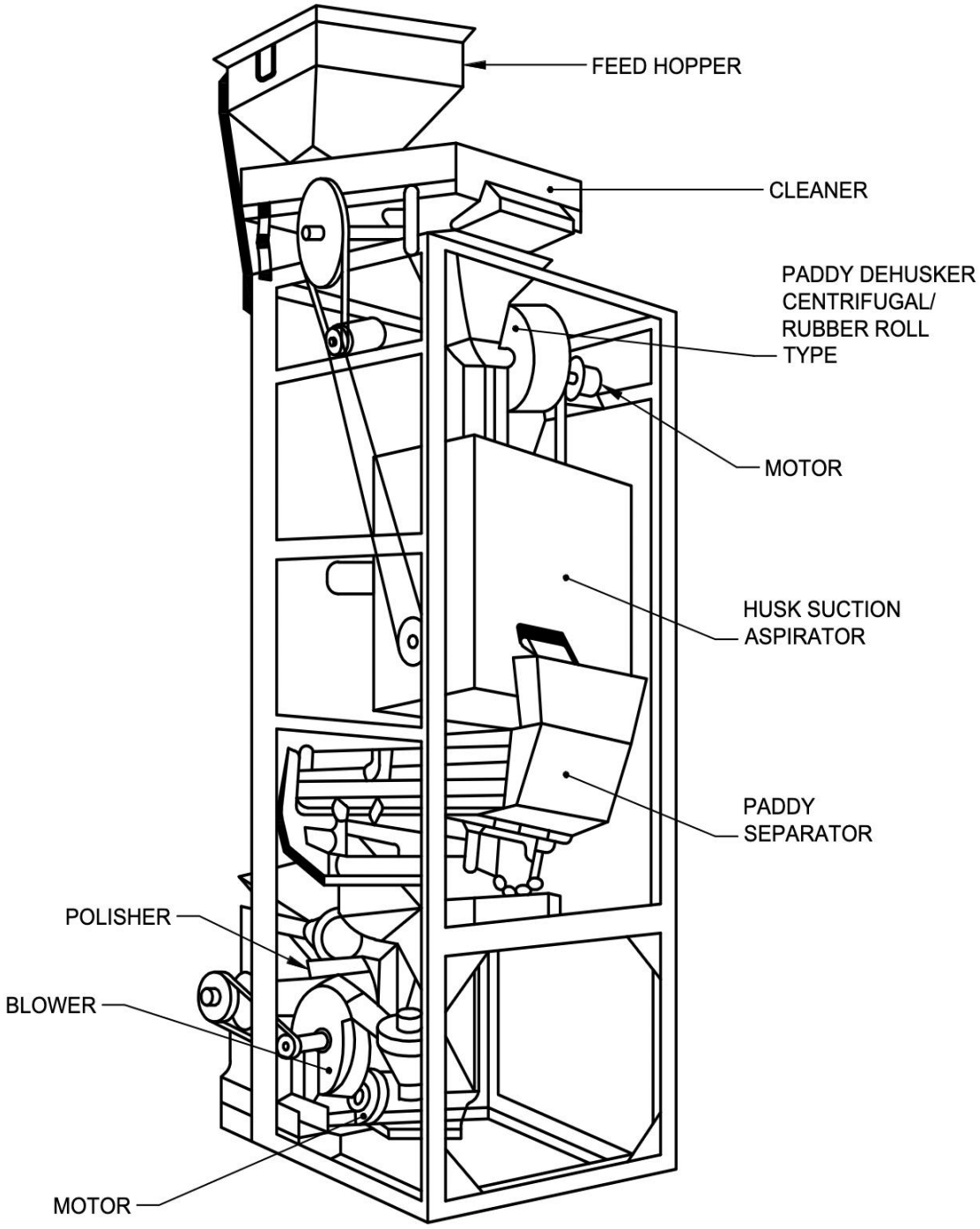

FIG. 1 SINGLE PASS MINI RICE MILL

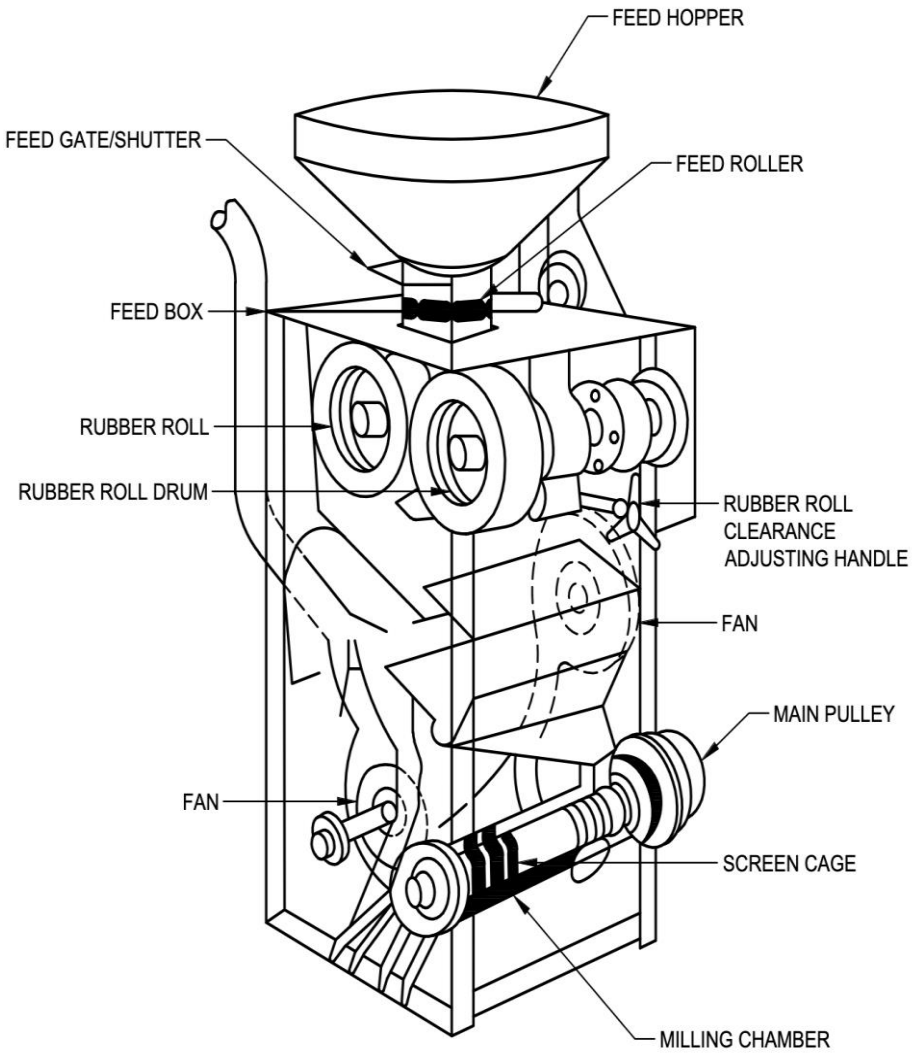

FIG. 2 A TYPICAL MINI RICE MILL WITH RUBBER ROLL DEHUSKER

Table 1 Material of Construction

(*Clause* 4.1)

Sl No.	Component	Material	Reference to IS
(1)	(2)	(3)	(4)
i)	Feed hopper	Mild steel	IS 2062
		Galvanized iron	IS 277
		Stainless steel	IS 6911
ii)	Feed roll	Cast iron	IS 210
		Mild steel	IS 2062
		Stainless steel	IS 6911
iii)	Feed box	Cast iron	IS 210
		Mild steel	IS 2062
		Stainless steel	IS 6911

Table 1 (*Continued*)

Sl No.	Component	Material	Reference to IS
(1)	(2)	(3)	(4)
iv)	Feed rate/distribution plates	Mild steel	IS 2062
		Galvenized iron	IS 277
		Stainless steel	IS 6911
v)	Dehusker body (rubber roll type)	Cast iron	IS 210
		Mild steel	IS 2062
vi)	Rubber roll drum	Cast iron	IS 210
		Mild steel	IS 2062
		Stainless steel	IS 6911
vii)	Dehusker chamber (centrifugal type)	Stainless steel (SS 304/ 314/430)	IS 6911
viii)	Feed screw (centrifugal type)	Stainless steel (SS 304/ 316)	IS 6911
ix)	Collar (centrifugal type)	Cast iron	IS 210
		Mild steel	IS 2062
x)	Impeller (centrifugal type)	Cast iron	IS 210
		Mild steel	IS 2062
		Stainless steel	IS 6911
xii)	Blower casing	Cast iron	IS 2062
		Mild steel	IS 2062
xii)	Blower impeller (blade holder)	Cast iron	IS 210
xiii)	Screens/sieves	Stainless Steel (SS 201/304/430)	IS 6911
xiv)	Polisher roller (friction type)	Stainless steel	IS 6911
xv)	Screen cage (friction type)	Galvenized iron	IS 277
		Stainless steel	IS 6911
		Cast iron	IS 210
xvi)	Disc (disc polisher)	Stainless steel (SS 304/316)	IS 6911
xvii)	Shafts	Mild steel	IS 2062
xviii)	Frame and body	Mild steel	IS 2062
		Galvenized iron	IS 277
		Stainless steel	IS 6911
xix)	Pulley	Cast iron	IS 210
		Mild steel	IS 2062
xx)	Plumber block	Cast iron	IS 210

Table 1 (*Concluded*)

Sl No.	Component	Material	Reference to IS
(1)	(2)	(3)	(4)
xxi)	Elevator body/frame	Mild steel	IS 2062
xxii)	Bucket	Mild steel	IS 2062
		Food grade plastic	—
xxiii)	Bottom and top drum of elevator	Cast iron	IS 210
xxiv)	Hand wheel	Cast iron	IS 210
xxv)	Rice outlets	Stainless steel	IS 6911
xxvi)	Husk and bran outlet	Mild steel	IS 2062
		Galvanized iron	IS 277

7 OTHER REQUIREMENTS

7.1 The metal sheet used in the construction of various parts shall be a minimum 1.0 mm thickness.

7.2 The axle shaft shall be finished to close tolerances at the bearing and shall be properly aligned.

7.3 Provision shall be made for lubrication of bearings and they shall be dust proof.

7.4 A feed regulating and spreading system shall be provided for the rubber roll sheller.

7.5 Adequate arrangements for cooling of rubber rolls during operation shall be provided so that the rubber roll housing temperature shall not exceed 60 °C.

NOTE — This requirement may be tested during long-run-test by putting the thermometer on the outside surface of the housing.

7.6 Various controls shall be easily accessible and capable of being locked in a chosen position.

7.7 In the case of belt drive, the provision shall be made for belt-tightening.

7.8 Provision for inspection window/cover may be made.

7.9 Transmission guards shall be provided to prevent accidental contact of persons or parts of clothing being caught in the transmission system. Design of the machine should be strictly as per the ergonomical consideration for worker's safety and comfort.

7.9.1 The (safety) guards shall be so designed as not to hinder in easy adjustment, servicing and operation of the mini rice mill.

7.9.2 It is preferable that all guards shall be either permanently attached or firmly secured to prevent their removal without the aid of the tools. The servicing and adjustments should be possible without complete removal of the guards.

7.9.3 The guards shall have sufficient strength to support load of 600 N applied at any point over an area of 0.1 m^2 without a permanent set.

NOTE — Depending upon space available, area and load may be correspondingly increased or decreased for testing purpose.

7.10 Provision for the adjustment of roller gap shall be made.

7.11 The rubber rolls shall conform to the requirements given in IS 8427. The manufacturer shall declare the type and size code. The arrangement shall be made for easy replacement as well as locking of the rolls.

7.12 In a rubber roll sheller, mechanism for quick release of paddy grains should be provided to clear the jam in case of choking.

7.13 In case of centrifugal dehusker, provision to rotate the dehusking drum/chamber lined with rubber pads for uniform wear of the rubber pad.

7.14 Emergency stop/alarm should may be included in the electric circuit.

7.15 The mini rice mill shall be provided with the operator's manual (*see* **4.2** of IS 8132). Manual shall also contain the information given in Annex A of IS 9049.

7.16 Performance evaluation of mini rice mill for different paddy varieties shall be provided.

7.17 Maximum allowable noise level shall not be more than 75 dB and adequate sound proof enclosures shall be provided.

8 WORKMANSHIP AND FINISH

8.1 Welding used for joining different components shall not be porous and shall be smooth (*see* IS 816).

8.2 Any sharp corner and protruding fastener shall be avoided.

8.3 Components of the mini rice mill shall be finished smooth and properly painted.

9 MARKING AND PACKING

9.1 Marking

Each mini rice mill shall be marked with the following particulars:

a) Manufacturer's name and recognized trade mark, if any;
b) Model number;
c) Batch, code or serial number;
d) Year of manufacture;
e) Power rating, KW;
f) Rated input capacity; and
g) Specific energy consumption of the system (on full load).

9.1.1 A minimum cautionary notice worded as follows shall be written in vernacular language legibly and prominently on the main body of the rice mill:

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 rice mill;
d) Do not cross over moving belts;
e) Do not operate rice mill without guards and safety devices; and
f) Do not put or take-off belt while pulley is running.

9.2 Packing

The mini rice mill or its components shall be packed as agreed to between the purchaser and the supplier for safe handling in transit and storage.

9.3 BIS Certification Marking

The product(s) 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.

ANNEX A

(*Clause 2*)

LIST OF REFERRED STANDARDS

IS No.	*Title*	*IS No.*	*Title*
IS 210 : 2009	Grey iron castings — Specification (*fifth revision*)	IS 6911 : 2017	Stainless steel plate, sheet and strip — Specification (*second revision*)
IS 277 : 2018	Galvanized steel strips and sheets (plain and corrugated) — Specifications (*seventh revision*)	IS 8132 : 2023/ ISO 3600 : 2022	Tractors machinery for agriculture and forestry powered lawn and garden equipment — Operators manuals — Content and format (*third revision*)
IS 816 : 1969	Code of practice for use of metal arc welding for general construction in mild steel (*first revision*)	IS 8427 : 2023	Agricultural produce milling machinery — Rubber roll for paddy dehusker — Specification (*second revision*)
IS 2062 : 2011	Hot rolled medium and high tensile structural steel — Specification (*seventh revision*)	IS 9049 : 2023	Agricultural produce milling machinery — Paddy dehusker rubber roll type — Test code (*second revision*)
IS 2405	Industrial sieves — Specification:		
(Part 1) : 2023	Wire cloth sieves (*second revision*)		
(Part 2) : 2023	Wire sieves (*second revision*)		

ANNEX B

(*Foreword*)

COMMITTEE COMPOSITION

Agriculture and Food Processing Equipment Sectional Committee, FAD 20

Organization	*Representative(s)*
Indian Council of Agricultural Research, New Delhi	DR SHYAM NARAYAN JHA **(*Chairperson*)**
Agriculture Machinery Manufacturers Association, Pune	DR SURENDRA SINGH SHRI MITUL PANCHAL (*Alternate*)
CCS Haryana Agricultural University, Hisar	DR RAVI GUPTA
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Indosaw Industrial Products Private Limited, Ambala Cantt.	DR VINOD H. KALBANDE
Mahatma Phule Krishi Vidyapeeth, Rahuri	DR VIKRAM PARASHARAM KAD
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National Committee on Precision Agriculture and Horticulture, New Delhi	SHRI ANAND ZAMBRE SHRI KRISHNA KUMAR KAUSHAL (*Alternate*)
National Institute of Food Technology, Entrepreneurship and Management, Thanjavur	DR S. BHUVANA
North Eastern Region Farm Machinery Training and Testing Institute, Biswanath Chariali	DR P. P. RAO SHRI S. G. PAWAR (*Alternate*)
Northern Region Farm Machinery Training and Testing Institute, Hisar	DR MUKESH JAIN SHRI SANJAY KUMAR (*Alternate*)

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Tamil Nadu Agricultural University, Coimbatore	DR V. THIRUPATHI DR P. RAJKUMAR (*Alternate*) DR P. SUDHA (*Alternate*)
In Personal Capacity (*CD 223, Ansal Golf Link 1, Greater Noida - 201315*)	DR PITAM CHANDRA
In Personal Capacity (*MIG - 154, E-7 Sector Aerea Colony, Bhopal - 462061*)	DR S. D. DESHPANDE
In Personal Capacity (*12/36 Sowbhagya Nagar A Block Civil Aerodrome Post, Coimbatore - 641014*)	DR R. VISVANATHAN
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Member Secretary
SHRI PRADEEP SHARMA
SCIENTIST 'B'/ASSISTANT DIRECTOR
(FOOD AND AGRICULTURE), BIS

To Update Raw Material Specification of Rice Milling Equipment Panel, FAD 20/P17

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Indosaw Industrial Products Private Limited, Ambala Cantt.	DR VINOD H. KALBANDE
Indian Stainless Steel Development Association, Gurugram	SHRI ROHIT KUMAR

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Amend No.	Date of Issue	Text Affected

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