Indian Standard

AGRICULTURAL PRODUCE MILLING MACHINERY — RUBBER ROLL FOR PADDY DEHUSKER — SPECIFICATION

(First Revision)

भारतीय मानक

कृषि उत्पाद प्रेषण मशीनरी — धान के छिलके उतारने के रबर रोल — विशिष्टि

(पहला पुनरीक्षण)

UDC 678·4·06 - 434·1 : 664·782·44

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Price Group 2

Agricultural Produce Milling Machinery Sectional Committee, AFDC 63

FOREWORD

This Indian Standard (First Revision) was adopted by the Bureau of Indian Standards on 31 July 1989, after the draft finalized by the Agricultural Produce Milling Machinery Sectional Committee had been approved by the Agricultural and Food Products Division Council.

Rubber rolls are fast-wearing components of paddy dehusker and have to be replaced very often. The dimensions and other characteristics of rubber rolls differ with different manufacturers. Consequently, the users experience difficulty in replacing the rubber rolls. This standard was first issued in 1977 to regulate the uniformity and the quality of the rubber rolls.

The standard has now been revised to make it up-to-date and *inter alia* includes the following additions/ changes:

a) Provision of tapper key has been made,

b) Limit for hardness value has been narrowed,

c) Temperature for hardness reduction test has been increased, and

d) Abrasion resistance and bond test between rubber and metal has been added to generate data.

For the purpose of deciding whether a particular requirements 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 'Rules for rounding off numerical values (*revised*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

IS 8427 : 1989

Indian Standard

AGRICULTURAL PRODUCE MILLING MACHINERY — RUBBER ROLL FOR PADDY DEHUSKER — SPECIFICATION

(First Revision)

1 SCOPE

This standard specifies material, dimensions and other requirements for rubber rolls used in paddy dehusker.

2 REFERENCES

2.1 The following Indian Standards are necessary adjuncts to this standard.

IS No.	*Title*
IS 210 : 1978	Specification for grey iron castings (*third revision*)
IS 513 : 1986	Specification for cold rolled low carbon steel sheets and strips (*third revision*)
IS 3400 (Part 1) : 1987	Method of test for vulcanized rubbers: Part 1 Tensile stress-strain properties (*second revision*)
(Part 2) : 1980	Method of test for vulcanized rubbers: Part 2 Hardness (*first revision*)
(Part 3) : 1987	Method of test for vulcanized rubbers : Part 3 Abrasion resistance using a rotating cylindrical drum device (*first revision*)
(Part 14) : 1984	Method of test for vulcanized rubbers : Part 14 Adhesion of rubber to metal (*first revision*)
IS 7201 (Part 1) : 1987	Method of sampling of agricultural machinery and equipment: Part 1 Hand-tools and hand operated/animal equipment (*first revision*)

3 TYPES

3.1 The rubber rolls shall be of the following two types:

a) Type *A* — Rolls of black colour, and

b) Type *B* — Rolls of white or any colour other than black.

3.2 Both types mentioned under 3 shall be either key type (*see* Fig. 1) or slip-on type (*see* Fig. 2). The keys may be rectangular or tapper.

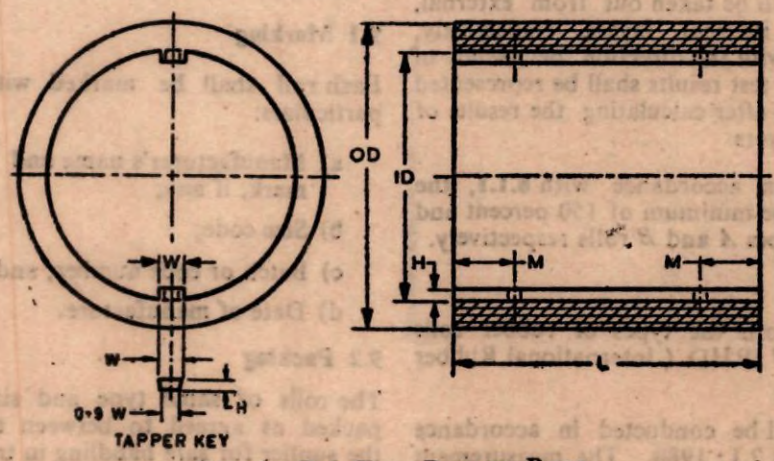

FIG. 1 KEY TYPE RUBBER ROLL

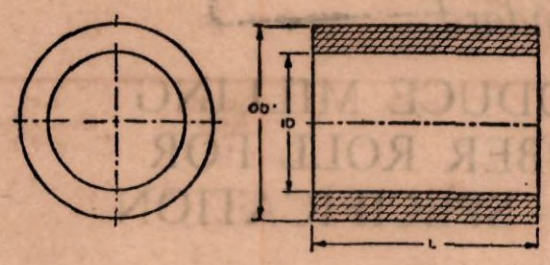

FIG. 2 SLIP-ON TYPE RUBBER ROLL

4 MATERIAL

4.1 The rubber roll shall be made from natural or synthetic rubber or a blend of both. It shall not contain scrap or reclaimed rubber.

4.2 The metal part of the roll shall be made of cast iron (*see* IS 210 : 1978) or plain or perforated sheet (*see* IS 513 : 1986) or wire mesh.

5 DIMENSIONS

5.1 The dimensions of the key type rubber rolls, when read in conjunction with Fig. 1 shall be as given in Table 1.

5.2 The dimensions of slip-on type rubber rolls, when read in conjunction with Fig. 2 shall be as given in Table 2.

6 PHYSICAL PROPERTIES

6.1 The tensile strength shall be minimum of 11·8 MPa and 8·8 MPa for Types *A* and *B* rolls respectively.

6.1.1 The tests for tensile strength rolls shall be carried out in accordance with the method stipulated in IS 3400 (Part 1) : 1987 by using dumb-bell shaped test pieces, but the test pieces shall be sampled from three layers of rubber blankets, which shall be taken out from external, intermediate and internal layers, respectively, lengthwise in line with the direction of grains of roll surface. The test results shall be represented by the lowest value after calculating the results of testing for three layers.

6.2 When tested in accordance with **6.1.1**, the elongation shall be minimum of 150 percent and 130 percent for Types *A* and *B* rolls respectively.

6.3 Hardness

The hardness for both the types of rubber rolls shall be 85 to 97 IRHD (International Rubber Hardness Degree).

6.3.1 This test shall be conducted in accordance with IS 3400 (Part 2) : 1980. The measurement shall be taken at five points selected optionally on the side of the rubber roll. The test values of the points checked for hardness should be within the limits specified under **6.3**.

6.4 The decrease in hardness after the test given in **6.4.1** shall be not more than 10 IRHD.

6.4.1 The test pieces shall be taken out from the rubber roll on test in suitable size and the hardness shall be measured in accordance with IS 3400 (Part 2) : 1980. The test pieces, shall then be put in the air thermostat for 2 hours at 90 ± 2°C and the hardness shall be taken again immediately after taking out the test pieces from thermostat.

6.5 Abrasion resistance and adhesion of rubber to metal characteristics shall be measured in accordance with the IS 3400 (Part 3) : 1987 and Method A of IS 3400 (Part 14) : 1984 respectively and the value reported.

7 OTHER REQUIREMENTS

7.1 The rubber rolls shall be uniform in construction.

7.2 The rubber surface shall be free from bloom sulphur.

7.3 The key type rubber rolls may be provided with one or two tapped holes for 8 mm size bolt. The distance from centre of the hole to the outer surface of the roll (*see M* in Fig. 1) shall be 50 mm.

8 WORKMANSHIP AND FINISH

8.1 The rolls shall be free from blisters, pin holes, cracks, embedded foreign matter, air bubbles and other defects which may impair their serviceability.

9 MARKING AND PACKING

9.1 Marking

Each roll shall be marked with the following particulars:

a) Manufacturer's name and registered trademark, if any;

b) Size code;

c) Batch or code number; and

d) Date of manufacture.

9.2 Packing

The rolls of same type and size code shall be packed as agreed to between the purchaser and the suplier for safe handling in transit.

Table 1 Dimensions of Key Type Rubber Rolls

(*Clause* 5.1)

Sl No.	Size Code	Outer Diameter (*OD*) $^{+2}_{-1}$	Inner Diameter (*ID*) $^{+0}_{-1}$	Length (*L*) ± 1	No. of Keys	Key Dimensions ± 0·5
(1)	(2)	(3)	(4)	(5)	(6)	(7)
		mm	mm	mm		mm
i)	*AK*	254	204	254	2	21 × 9·5
ii)	*BK*	254	202	254	2	21 × 9·5
iii)	*CK*	223	184	203	1	9·5 × 6·5
iv)	*DK*	223	184	152	1	15·5 × 5·5
v)	*EK*	223	184	100	1	9·5 × 6·5

Table 2 Dimensions on Slip-on Type Rubber Rolls

(*Clause* 5.2)

Sl No.	Size Code	Outer Diameter (*OD*) $^{+2}_{-1}$	Inner Diameter (*ID*) $^{+0}_{-0·5}$	Length (*L*) ± 1
(1)	(2)	(3)	(4)	(5)
		mm	mm	mm
i)	*AS*	223	159	260
ii)	*BS*	223	159	154
iii)	*CS*	223	159	125
iv)	*DS*	223	159	100
v)	*ES*	223	157	260
vi)	*FS*	150	100	82

10 SAMPLING FOR LOT ACCEPTANCE

10.1 Unless otherwise agreed to between the purchaser and the supplier, the sampling of rolls for lot acceptance shall be done in accordance with 3 of IS 7201 (Part 1) : 1987. 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**, **7** and **8**.

b) *Requirements Other Than Visual and Dimensional — See* **6**.

10.2 For routine tests, the test for the various physical properties (*see* **6**) shall be carried out on press-cured slabs made from the same mix and vulcanized as closely as possible in the same degree as used for rubber rolls.