
Agroprocessing machines — Specification

Part 2:

Power operated maize Sheller

ICS 65.060.01

Reference number

DRS 268-2: 2020

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Foreword

Rwanda Standards are prepared by Technical Committees and approved by Rwanda Standards Board (RSB) Board of Directors in accordance with the procedures of RSB, in compliance with Annex 3 of the WTO/TBT agreement on the preparation, adoption and application of standards.

The main task of technical committees is to prepare national standards. Final Draft Rwanda Standards adopted by Technical committees are ratified by members of RSB Board of Directors for publication and gazettment as Rwanda Standards.

DRS 268-2 was prepared by Technical Committee RSB/TC 023, *Mechanical engineering and metallurgy*.

This second edition cancels and replaces the first edition (RS 268-2: 2015) which has been technically revised.

DRS 268 consists of the following parts, under the general title *Agroprocessing machine— Specification*:

- *Part 1: Rice thresher*
- *Part 3: Rice mill*
- *Part 4 Heated air mechanical grain dryer*
- *Part 5: Maize mill*

Committee membership

The following organizations were represented on the Technical Committee on Mechanical engineering and metallurgy (RSB/TC 023) in the preparation of this standard.

University of Rwanda/college of science and technology

University of Rwanda/College of agriculture animal science and veterinary medicine

Kabizu business group

Rwanda Polytechnic/IPRC Kigali

Rwanda Polytechnic/IPRC Ngoma

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RWANTECH Boilers

Rwanda Inspectorate and competition authority

Rwanda Institute for Conservation Agriculture

ACER Ltd

Rwanda Standards Board (RSB) – Secretariat

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Agricultural machinery — Specification — Part 2: Power operated maize sheller

1 Scope

This Draft Rwanda Standard specifies the classification, performance requirements and methods of test for power operated maize sheller.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

DRS 269-2, *Agroprocessing machines — Test methods — Part 2: Power operated maize sheller*

RS 241, *Agriculture machinery — Methods of sampling*

RS 236, *Acoustics — Noise pollution — Tolerance limit*

RS 340, *Food processing machines — Specifications*

3 Terms and definitions

For the purposes of this standard, the following terms and definitions apply.

3.1

blower loss

ratio of the weight of maize kennels blown by the Sheller fan, to the weight of the total maize kernel input of the Sheller, expressed in percent

3.2

closed-frame cylinder

type of shelling cylinder formed by a rolled metal sheet/plate (Figure 1a) or formed by longitudinal bars adjacently arranged forming a continuous cylinder (Figure 1b)

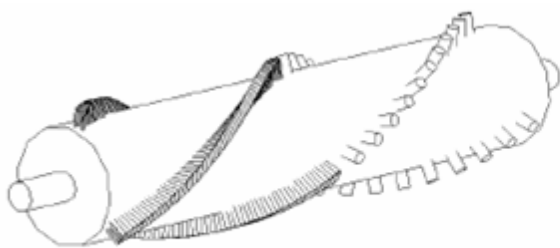


Figure 1a: Closed-frame type cylinder

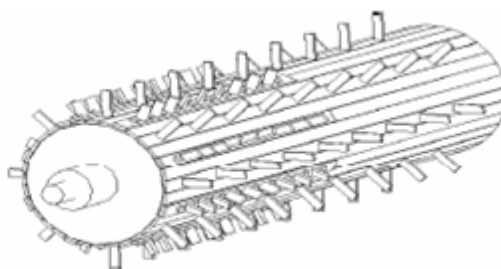


Figure 1b: Continuous cylinder with longitudinal bars

Figure 1 — Types of cylinders used in maize sheller

NOTE The shelling elements are either attached around the periphery of a cylinder or at the longitudinal bars.

3.3

maize husker-sheller

machine used to remove the husk of maize ear, detach, separate and clean the maize kernels from the cobs in one operation

3.4

maize sheller

machine used to detach, separate and clean the maize kernels from the cobs

3.5

ear maize (Syn., dehusked maize, maize-in-cob)

unshelled fruit of the maize plant where the husk has been removed mechanically or manually

3.6

hopper-fed type

type of maizesheller wherein the ear maize are fed into shelling chamber by gravity

3.7

kernel-ear maize ratio

ratio of the weight of the maize kernel present in the ear maize to the weight of the ear maize

3.8

mechanically damaged kernels

kernels that were broken and/or scratched as a result of shelling operation

3.9**net cracked kernel**

difference between the percent cracked sample taken before and after the shelling operation

3.10**open-frame cylinder**

type of shelling cylinder where the shelling elements are attached to the equally spaced longitudinal bars arranged cylindrically (Figure 2)

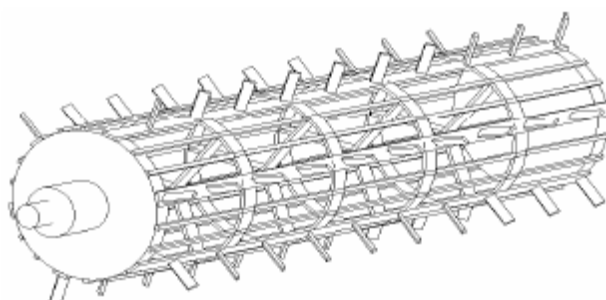


Figure 2 — An open-frame type cylinder

3.11**scattering loss**

ratio of the weight of maize kernels that fell out from the machine during shelling operation to the weight of the total maize kernel input of the sheller, expressed in percent

3.12**separation loss**

ratio of the weight of maize kernels that come out of the shelling chamber with the cobs at the cob outlet, to the weight of the total maize kernel input of the sheller, expressed in percent

3.13**unshelled loss**

ratio of the weight of maize kernels that remained in the cobs of the maize fed into the shelling chamber, to the weight of the total maize kernel input of the sheller, expressed in percent

4 Classification

The classification of maize sheller shall be based on the following:

- a) application

- i) maize husker-sheller; and
 - ii) maize sheller
- b) method of feeding
- i) hopper-fed type; and
 - ii) table-fed type
- c) shelling unit; and
- i) cylinder-type; and
 - I) number of cylinder
 - 1. single cylinder
 - 2. multi-cylinder
 - II) type of cylinder
 - ii) closed-frame cylinder
 - I) open-frame cylinder
 - II) disc-type

5 Materials and construction

5.1 Food zone area shall be made from food grade materials.

5.2 Non-food zone area may be made from carbon steel that has been rendered corrosion resistant

5.3 Construction of rice threshing machine shall be done in accordance with RS 340.

6 Performance and other requirements

6.1 The performance criteria for maize sheller shall be as specified in Table 1.

Table 1 — Performance criteria for mechanical maize sheller

S/N	Criteria	Performance data
i.	Shelling recovery, %, min.	97.0
ii.	Shelling efficiency, %, min.	99.5
Losses, %, max.		
iii.	a) Blower	1.0
	b) Separation	1.0
	c) Unshelled	0.5
	d) Scattering	0.5
iv.	Purity, %, min.	98.0
v.	Mechanically damaged kernel, %, max.	3.0
vi.	Net cracked kernel, %, max.	5.0

6.2 Sealed type bearings shall be used as protection against dust.

6.3 Lubrication shall be provided for non-sealed type bearings and bushings.

6.4 Belt guard or cover and provisions for belt tightening and adjustments shall be provided

6.5 The maximum level for Noise Level, [db] (A) for threshing machine shall be as specified in RS 236.

7 Workmanship and finish

7.1 Maize sheller shall be free from manufacturing defects that may be detrimental to its operation. The welding shall be satisfactory in all aspects and should not be brittle and porous.

7.2 Any uncoated metallic surfaces susceptible to corrosion shall be painted properly.

7.3 Maize sheller shall be free from sharp edges and surfaces that may hurt the operator.

7.4 Rotating parts should be dynamically balanced.

7.5 Maize sheller shall be constructed to ease to operation and cleaning.

8 Maintenance and operation

8.1 Each power operated maize sheller shall be provided with a set of relevant mechanic tool kit.

8.2 An instruction manual (User's manual, parts catalogue and service manual) shall be provided.

8.3 All components that require regular maintenance, servicing and adjustment should be easily accessible.

9 Sampling and testing

9.1 The power operated maize sheller shall be sampled for testing in accordance with RS 241.

9.2 The sampled maize sheller shall be tested in accordance with RS 269-2.

10 Marking

Each maize sheller shall be marked at prominent place with the following information in one of three official languages used in Rwanda:

- a) Name or registered trademark of the manufacturer;
- b) brand;
- c) model;
- d) serial number;
- e) country of manufacture;
- f) rating power, kW;
- g) frequency, Hz;
- h) recommended shelling cylinder speed, rpm;

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