

Foreword

The formulation of this national standard was initiated by the Agricultural Machinery Testing and Evaluation Center (AMTEC) with funding from the Department of Agriculture.

This standard has been technically prepared in accordance with BPS Directives Part 3:2003 – Rules for the Structure and Drafting of International Standards.

The word “shall” is used to indicate mandatory requirements to conform to the standard.

The word “should” is used to indicate that among several possibilities one is recommended as particularly suitable without mentioning or excluding others.

In the preparation of this standard, the following documents/publications were considered:

Regional Network for Agricultural Machinery (RNAM) Test Codes and Procedures for Farm Machinery, Technical Series No. 12:1983.

Specification for Knife Sections for Grain Harvesting Machines. Indian Standards Institution, India.

Agricultural Machinery – Rice Reaper – Specifications

1 Scope

This standard specifies the requirements for the construction and performance of rice reaper.

2 References

The following normative documents contain provisions, which, through reference in this text, constitute provisions of this National Standard:

PAES 102: 2000	Agricultural Machinery – Operator’s Manual – Content and Presentation
PAES 103:2000	Agricultural Machinery – Method of Sampling
PAES 213:2004	Agricultural Machinery – Rice Reaper – Methods of Test
PAES 311:2001	Engineering Materials – Bolts and Nuts for Agricultural Machines – Specifications and Applications
PAES 313:2001	Engineering Materials – Screws for Agricultural Machines – Specifications and Applications

3 Definitions

For the purpose of this standard the following definitions shall apply:

3.1**actual field capacity**

actual rate of being able to reap palay in a given area per unit of time

NOTE The time pertains to the actual time which includes the time spent for turning at the headland, adjustment of machine and machine trouble.

3.2**conveying loss**

free grains that fall with the cut stalks during delivery and release at the side of the reaper during operation

3.3**field efficiency**

ratio of the actual field capacity and theoretical field capacity, expressed in percent

3.4**header loss**

grains that have fallen to the ground due to the machine's cutting operation

3.5**reciprocating cutter knife**

cutting mechanism consists of fixed lower knife and reciprocating upper knife wherein its movement is controlled by the crank connected to the gear box or belt drive

3.6**rice reaper**

machine that cuts and lays stalks of planted rice crop (see Figure 1)

3.7**rotary knife**

cutting mechanism consists of planetary type circular saw-toothed blade which rotates at the same time with the pick-up triangular frame

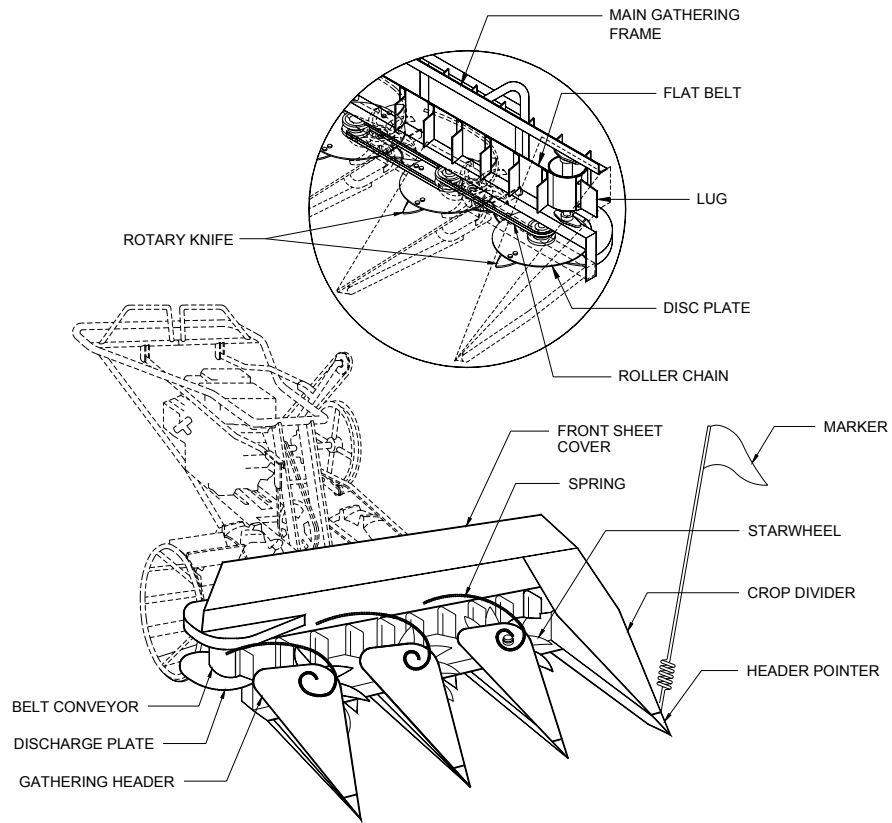
3.8**theoretical field capacity**

computed rate of being able to reap palay in a given area per unit of time

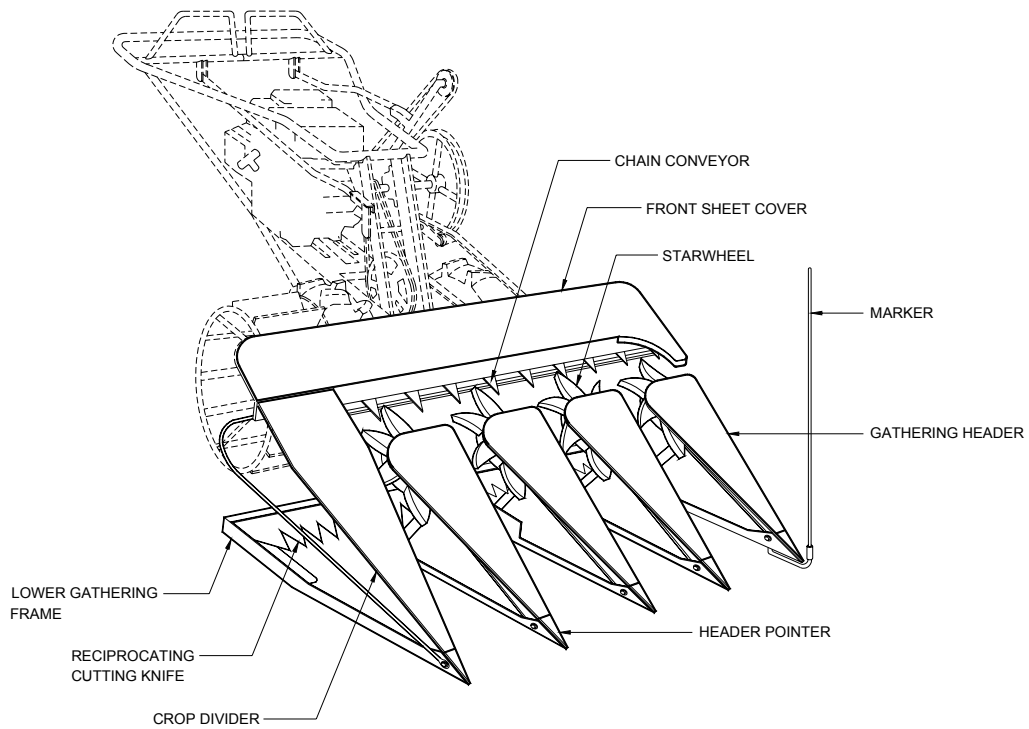
4 Classification

The classification of reaper shall be based on the inspection of the machine according to the following:

4.1 Cutting mechanism**4.1.1 Rotary knife****4.1.2 Reciprocating cutter knife****4.2 Transmission system****4.2.1 Belt drive****4.2.2 Gear drive**



a. Cutting Mechanism - Rotary knife



b. Cutting Mechanism – Reciprocating cutter knife

Figure 1 – Typical design of rice reaper

5 Materials of Construction

5.1 Steel bars and metal sheet shall be generally used for the manufacture of the different components of the reaper.

5.2 Starwheels shall be made of materials that can withstand sudden loading caused by conveyor belt lugs.

5.3 Cutting elements should be made of either AISI 1080 to AISI 1085 or its ISO equivalent.

5.4 The serrated portion of the cutting elements should be case hardened at RC 46 to RC 52 (see Figure 2). The non-hardened portion of the cutting section shall have hardness within the range of RC 25 to RC 27.

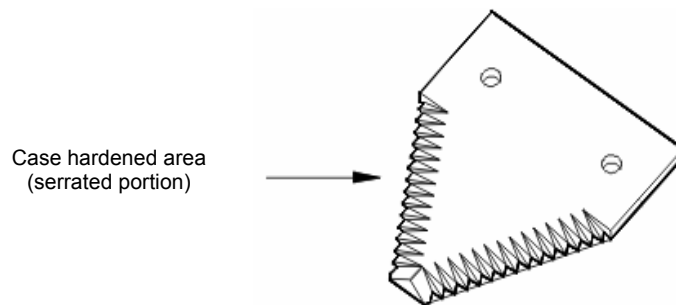


Figure 2 - Cutting knife

5.5 Bolts and screws to be used shall conform with the requirements of PAES 311 and PAES 313.

6 Performance Requirements

The reaper when tested in accordance with PAES 213 shall conform to the following requirements:

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

Table 1 - Performance criteria for reaper

Criteria	Performance Data
Field efficiency (%), minimum	65
Header loss (%), maximum	0.5
Conveying loss (%), maximum	1.0
Total machine loss (%), maximum	1.5
Noise level, db(A), maximum	92*

* Allowable noise level for six (6) hours of continuous exposure based on Occupational Safety and Health Standards, Ministry of Labor, Philippines. 1983.

6.2 Sealed type bearings should be used as protection against dust. There shall be provision for lubrication of non-sealed type bearings and bushings.

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

7 Other Requirements

7.1 Mechanism for cutter bar height adjustment shall be provided.

7.2 Mechanism for easy disengagement of power transmission shall be provided.

7.3 The reaper shall be operated at the speed of 3 kph to 5 kph. Mechanism for reverse speed should be provided for easy maneuverability.

7.4 Control levers shall be easily accessible to the operator.

8 Workmanship and Finish

8.1 The reaper shall be free from manufacturing defects that may be detrimental to its operation.

8.2 Any uncoated metallic surfaces shall be free from rust and shall be painted properly. Cutting section shall be coated with anti-corrosive varnish.

8.3 The reaper shall be free from sharp edges and surfaces, except for cutting blades that may injure the operator.

9 Warranty for Construction and Durability

9.1 Warranty against defective materials and workmanship shall be provided for parts and services except for normal wear and tear of consumable maintenance parts such as belts within six months from the purchase of the reaper.

9.2 The construction shall be rigid and durable without breakdown of its major components (i.e. transmission systems, cutting and gathering mechanism, etc) within six months from purchase by the first buyer.

10 Maintenance and Operation

10.1 Each reaper unit shall be provided with a set of manufacturer's standard tools required for maintenance.

10.2 An operator's manual, which conforms to PAES 102, shall be provided.

11 Sampling

The reaper shall be sampled for testing in accordance with PAES 103.

12 Testing

Sampled reaper shall be tested in accordance with PAES 213.

13 Marking and Labeling

13.1 Each rice reaper shall be marked in English with the following information using a stencil or by directly punching it in a plate and shall be positioned at the most conspicuous place:

13.1.1 Registered trademark of the manufacturer

13.1.2 Brand

13.1.3 Model

13.1.4 Serial number

13.1.5 Rated capacity, ha/h

13.1.6 Power requirement, kW

13.1.7 Name and address of the manufacturer

13.1.8 Name and address of the importer, if imported

13.1.9 Country of manufacture (if imported) / “Made in the Philippines” (if manufactured in the Philippines)

13.2 Safety/precautionary markings shall be provided when appropriate. Marking shall be stated in English and Filipino and shall be printed in red color with a white background.

13.3 The markings shall have a durable bond with the base surface material.

13.4 The markings shall be weather resistant and under normal cleaning procedures, it shall not fade, discolor, crack or blister and shall remain legible.