

## **Foreword**

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

This standard has been technically prepared in accordance with PNS 01-4: 1998 (ISO/IEC Directives Part 3:1997) - Rules for Structure and Drafting of International Standards.

The word “shall” is used to indicate requirements strictly to be followed in order to conform to the standard and from which no deviation is permitted.

The word “should” is used to indicate that among several possibilities one is recommended as particularly suitable, without mentioning or excluding others, or that certain course of action is preferred but not necessarily required.

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

AMTEC Test Data Bulletin for Rice Mills

PAES 206:2000 Agricultural Machinery – Rice Mill – Specifications

PAES 207:2000 Agricultural Machinery – Rice Mill – Methods of Test

Part 18 of the Regional Network for Agricultural Machinery Test Codes and Procedures for Rice Mill.

Philrice Micromill by the Philippine Rice Research Institute

Primer on Philippine Grains Standardization Program of the National Food Authority.

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**Agricultural Machinery – Micromill – Specifications**

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**1 Scope**

This standard specifies the construction and performance requirements for micromill.

**2 Reference**

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

PAES 102:2000 Agricultural Machinery – Operator’s Manual – Content and Presentation

PAES 103:2000 Agricultural Machinery – Method of Sampling

PAES 227:2005 Agricultural Machinery: Micromill – Methods of Test

**3 Definitions**

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

**3.1****bran**

outer layer of the brown rice consisting of the aleurone cells covering the endosperm of the rice grain

**3.2****brewer’s rice**

“binlid”

small pieces or particles of grains that pass through a sieve with round perforations of 1.4 mm in diameter

**3.3****broken grains**

grains that break in the process of milling which have a size of less than eight-tenth (8/10) of the average length of whole grain

**3.4****head rice**

grain or fraction of grain with its length equal to or greater than eight-tenth (8/10) of the average length of the whole grain

**3.5****household model**

type of micromill with milling capacity of 50 kg/h to less than 100 kg/h

**3.6****input capacity**

weight of palay per unit loading time into the hopper, kg/h

**3.7****micromill**

friction type rice mill performing simultaneous hulling and whitening operations and having a milling capacity of 50-250 kg/h

**3.8****milled rice**

grains obtained after the removal of hull and bran

**3.9****milling capacity**

quantity of palay that the micromill can process per total milling time, kg/h

**3.10****milling degree**

extent or degree by which the bran layer and germ have been removed

**3.11****milling recovery**

ratio of the weight of milled rice to the total weight of palay, percent

**3.12****paddy**

palay

rough rice

unhulled grain of *Oryza sativa* L., that is, grain with the hull/husk enclosing the grain

**3.13****percent head rice**

ratio of the weight of grains that do not break in the process of milling and with a size of eight-tenth (8/10) or more of the whole grain to the total weight of milled rice, percent

**3.14****rice hull**

outermost rough covering of the palay grain (palea and lemma) consisting of the empty glumes, floral glumes and awn

**3.15****village model**

type of micromill with input capacity of 100-250 kg/h

### **3.16**

#### **well-milled rice**

rice grain from which the hull, the germ, the outer bran layers, and the greater part of the inner bran layer have been removed, but part of the lengthwise streaks of the bran layers may still be present on less than 15% of the sample grains

## **4 Classification**

The classification of micromill based on input capacity shall be the following:

**4.1** Household model

**4.2** Village model

## **5 Physical Description and Basic Construction**

A micromill (Figure 1) is a single-pass rice mill which consists of the following components: hopper, milling unit, and an aspirating fan. The hopper which is located on top of the milling unit holds the paddy for milling. The rate of feeding is controlled by a sliding feed gate. From the hopper, the grains pass through the milling unit. The milling unit (Figure 2) is a steel huller-friction whitener (“kiskisan”) type where the hulling and whitening process are combined in one operation. It consists of a solid steel cylinder with a screwed portion which serves as feeder to the milling chamber. The portion of the solid steel cylinder at the milling chamber is provided with rectangular protrusions and screen housing. Two blades are provided positioned parallel at each side of the steel cylinder. The hull and subsequently the bran of the paddy fed between the concentric cylinders are removed through the abrasive action among the paddy grains and the friction action between the rotating cylinder and the grains. The bran is discharged from the milling chamber through the slots in the mill screen while milled rice is discharged through an outlet chute with screen for removing brewer’s rice.

## **6 Material of construction**

**6.1** Steel, cast iron or any other suitable materials shall be generally used for the manufacture of the different components of the micromill.

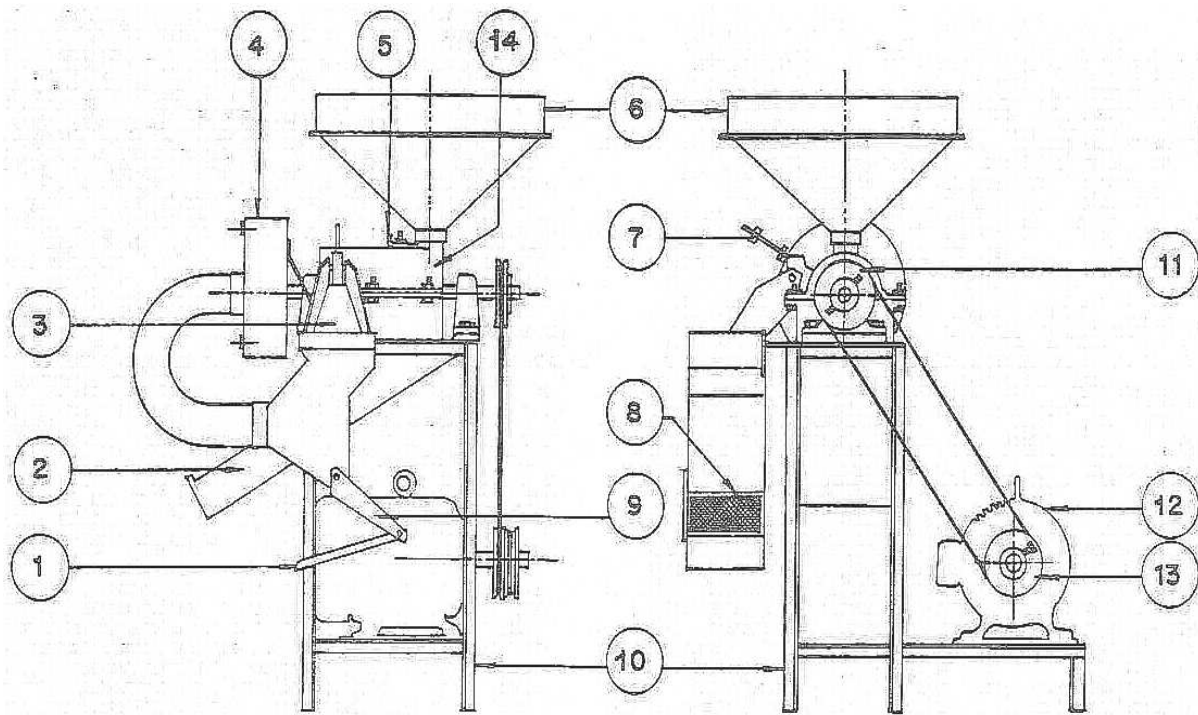
## **7 Performance and other requirements**

**7.1** The performance criteria for micromill shall be as specified in Table 1.

**7.2** The milling capacity should be specified by the manufacturer.

**7.4** There shall be provisions for lubrication of non-sealed type bearings and belt tightening.

**7.5** Provisions for safety of the operator from all moving components of the micromill such as belt guard or cover.



**Figure 1 - Typical Design of a Micromill**

REF	NAME
1	Brewer's rice outlet
2	Bran outlet
3	Outlet spout from huller
4	Aspirating fan
5	Feed regulator
6	Intake hopper
7	Adjustable grain discharge valve
8	Screen
9	Milled rice outlet
10	Main frame
11	Steel huller pulley
12	Electric motor
13	Electric motor pulley
14	Steel huller assembly

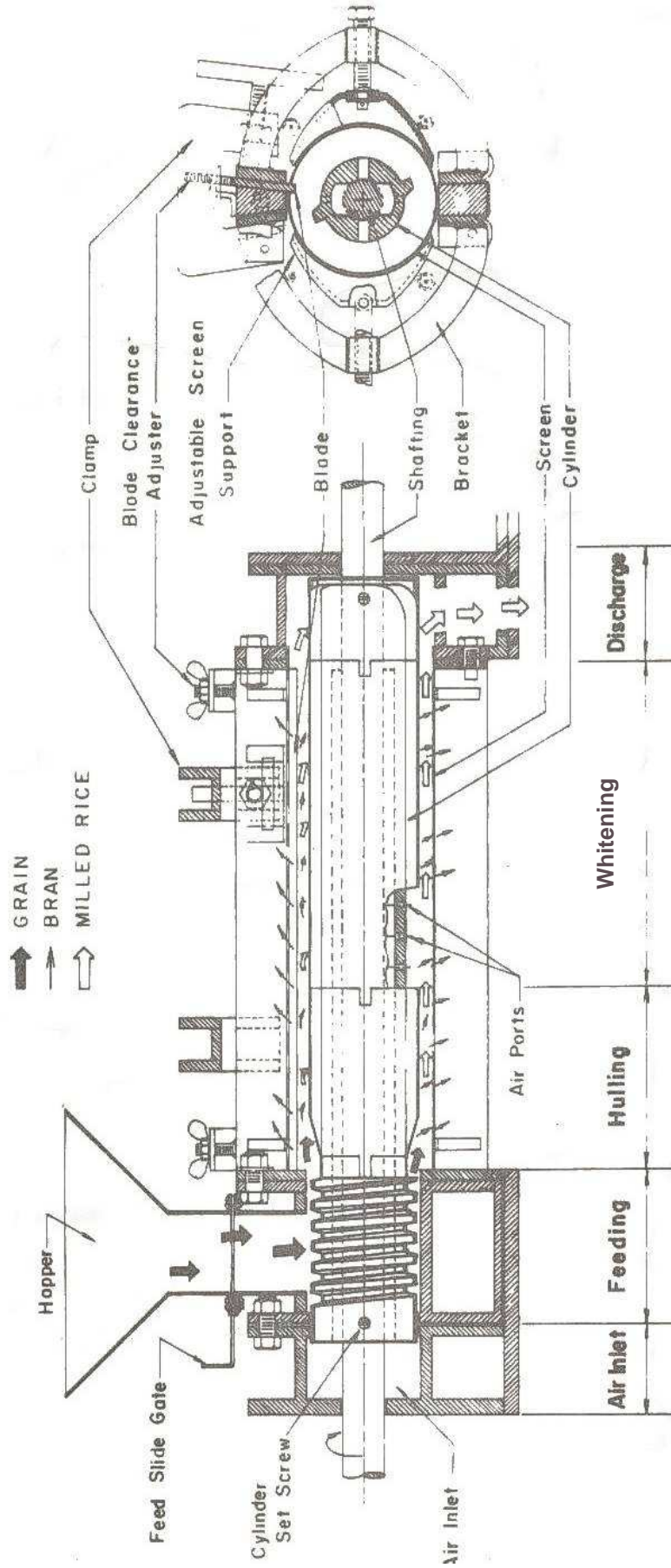


Figure 2 – Steel Huller Mill (kiskisan)

**Table 1 - Performance Criteria for Micromill**

<b>Criteria</b>	<b>Performance</b>
Milling Recovery, percent, minimum	62
Head Rice, percent, minimum	50
Broken Grains, percent, maximum	50
Bran, percent, maximum	10
Noise Level, db(A), maximum	92*
Milling Degree	Well-milled

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

## **8 Workmanship and finish**

**8.1** Micromill 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.

**8.3** Micromill shall be free from sharp edges and surfaces that may injure the operator.

## **9 Warranty for construction and durability**

**9.1** The construction of the micromill shall be rigid and durable without major breakdown of the milling component and aspirating mechanism within six months from original purchase.

**9.2** Warranty shall be provided for parts and services within six (6) months after the installation and acceptance by the user, except on easy to wear parts such as belts and screens.

## **10 Maintenance and operation**

**10.1** Each micromill shall be provided with dust mask and the following basic hand tools: three (3) pieces open/box wrenches; one (1) piece each Philips and flat screw driver; and one piece adjustable wrench. The micro mill shall also be provided with one piece of a spare milling screen.

**10.2** An instruction manual which conforms to PAES 102:2000 shall be provided.

## **11 Sampling**

The micromill shall be sampled for testing in accordance with PAES 103:2000 - Agricultural Machinery – Method of Sampling.

## **12 Testing**

The sampled micromill shall be tested in accordance with PAES 227: 2005 – Agricultural Machinery: Micromill – Methods of Test

## **13 Marking and labeling**

**13.1** Each unit of micromill shall be marked at a prominent place with the following information:

**13.1.1** Registered trademark of the manufacturer

**13.1.2** Brand

**13.1.3** Model

**13.1.4** Serial number

**13.1.5** Name and address of the manufacturer

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

**13.1.7** Input capacity, kg/h

**13.1.8** Power requirement, kW

**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.

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