

PHILIPPINE NATIONAL STANDARD

PNS/PAES 254:2011
(PAES published 2011)
ICS 65.060.01

Agricultural machinery – Abaca Stripper – Specifications



BUREAU OF PRODUCT STANDARDS

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National Foreword

This Philippine Agricultural Engineering Standards PAES 254:2011, Agricultural machinery – Abaca Stripper – Specifications was approved for adoption as Philippine National Standard by the Bureau of Product Standards upon the recommendation of the Agricultural Machinery Testing and Evaluation Center (AMTEC) and the Philippine Council for Agriculture, Forestry and Natural Resources Research and Development of the Department of Science and Technology (PCARRD-DOST).

Foreword

The formulation of this national standard was initiated by the Agricultural Machinery Testing and Evaluation Center (AMTEC) through the project “Development of Standards for Agricultural Production and Postharvest Machinery” funded by the Philippine Council for Agriculture, Forestry and Natural Resources Research and Development – Department of Science and Technology (PCARRD – DOST)

This standard has been technically prepared in accordance with PAES 010-2 – 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:

Official Standards for Hand and Spindle Stripped Abaca Fiber. Fiber Industry Development Authority.

PAES 228:2005 Agricultural Machinery – Fiber Decorticator – Specifications

A Miniature Specimen of Philippine Commercial Grades of Abaca. Fiber Industry Development Authority.

Sudaria, E.E., Vinh, T.N., de Ramos, J.D. Design and Development of a Low Cost Abaca Stripper. Agricultural Machinery Testing and Evaluation Center, University of the Philippines Los Baños. March 1986

Design and Development of an Improved Manual Extraction Process of Abaca Fiber in Northern Samar. Fiber Industry Development Authority (FIDA), Agricultural Machinery Testing and Evaluation Center (AMTEC) and Northern Samar Integrated Rural Development Project (NSIRDP)

Valenzuela, Adriano C., Catbagan, Warrior D., Jabay, Petronilo B., De Vera, Romeo P., Josol, Fidel S., Abriol, Edgar A. Mobile Abaca Spindle Stripping Machine. Patent No. 2-2006-00034. Fiber Technology and Utilization Division. Fiber Industry Development Authority. 2008

Abgona, Remedios V., Hilario, Celerina T., Abriol, Edgar A., Josol, Fidel S., Barcelona, Ramil B., De Vera, Romeo P. Improved Handstripping (Hagotan) Device. Patent No. 2-2008-000293Fiber Technology and Utilization Division. Fiber Industry Development Authority. 2008

PHILIPPINE AGRICULTURAL ENGINEERING STANDARD PAES 254:2011
Agricultural Machinery – Abaca Stripper – Specifications

1 Scope

This standard specifies the manufacturing and performance requirements for abaca stripper.

2 References

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

AWS D1.1:2000	Structural Welding Code - Steel
PAES 102:2000	Agricultural Machinery – Operator’s Manual – Content and Presentation
PAES 103:2000	Agricultural Machinery – Method of Sampling
PAES 311:2001	Engineering Materials - Screws for Agricultural Machines – Specifications and Applications
PAES 313:2001	Engineering Materials – Bolts and Nuts for Agricultural Machines – Specifications and Applications
PAES 255:2010	Agricultural Machinery – Abaca Stripper – Methods of Test

3 Definitions

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

3.1

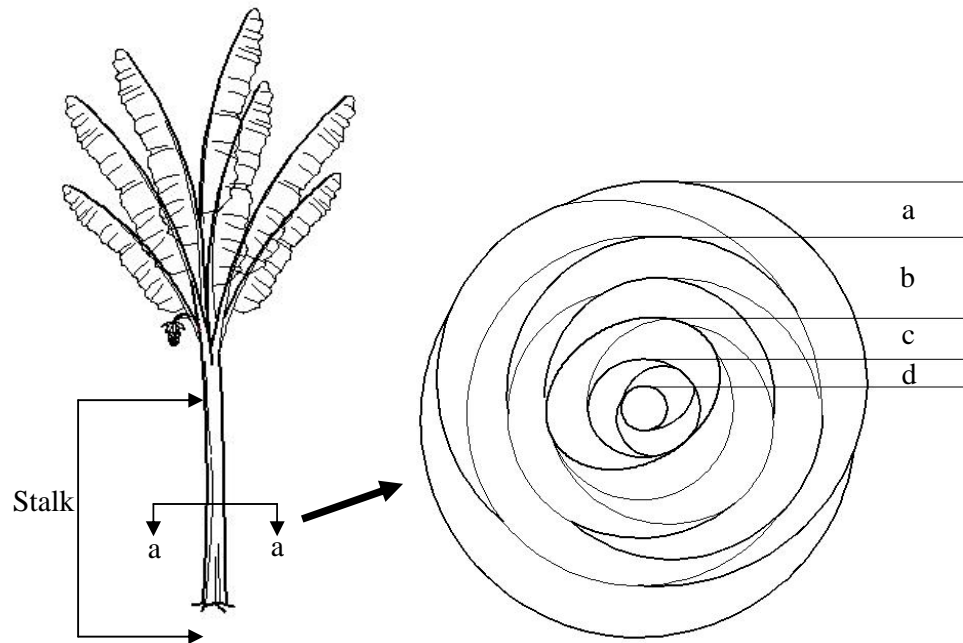
abaca fiber

long and slender natural filament of abaca plant

3.2

abaca stalk (Fig. 1)

part of abaca plant which consist of several layers of leaf sheath



- a – Outer leaf sheaths (1-6)
- b – Next to outer leaf sheaths (7-12)
- c – Middle leaf sheaths (13-15)
- d – Inner leaf sheaths (16-18)

Figure 1. Abaca stalk

3.3

abaca stripper

mechanical device used for extracting primary fibers by scraping action from blade and stripping block

3.4

bacnis method (Fig. 2)

method that uses bolo to partially cut (leaving the upper layer 1 mm to 2 mm thick uncut) crosswise the middle of the inner portion of the leaf sheath to be able to extract the tuxies

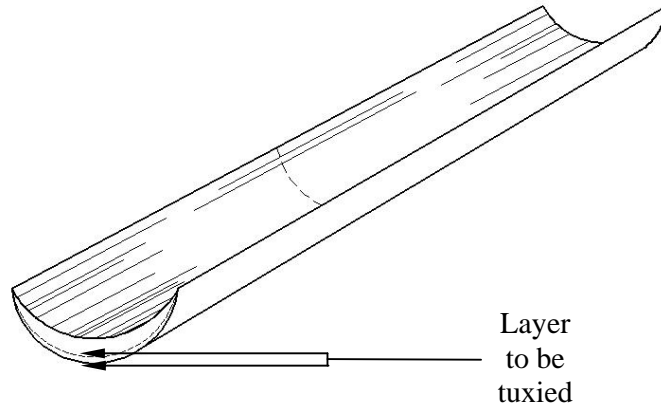


Figure 2. Single layer of abaca leaf sheath for bacnis method

3.5

fiber quality

refers to the physical properties such as tensile strength, length, color and texture (fineness and coarseness) of fibers extracted

3.6

locnit method (Fig. 3)

method that uses tuxying knife to thrust one side of the leaf sheath and make a cut between the upper and the inner portions of the material to be able to extract the tuxies

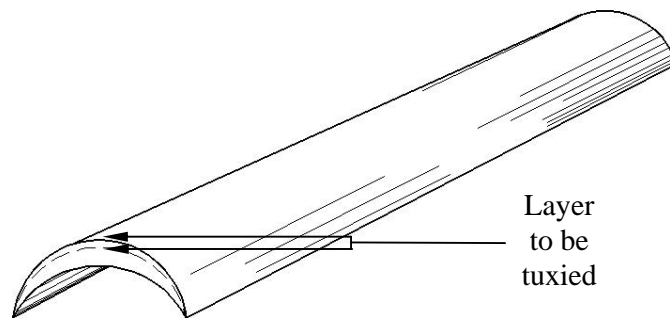


Figure 3. Single layer of abaca leaf sheath (locnit method)

3.9

output capacity

weight of the output fiber extracted from the abaca stripper per unit time, kg/h

3.10

parenchymatous material

soft tissue or non-fibrous material attached to the fiber

3.11

potential fiber content

summation of the dry weight (moisture content of 14%) of extracted fiber using manual or mechanical abaca stripper and unextracted fiber manually obtained

3.12

potential fiber recovery

ratio of fresh weight of fiber extracted and the total fresh weight of input abaca tuxies to the abaca stripper, expressed in percent

3.13

stripping

extracting the fiber from abaca tuxies using abaca stripper

3.14

stripping block

part of the abaca stripper that provides friction and where raw materials are being locked in position during fiber extraction

3.15

stripping efficiency

ratio of the total dry (moisture content of 14%) weight of the fiber extracted to the potential fiber content of abaca tuxies, expressed in percent

3.16

stripping knife

metal plate, non-serrated or serrated, that provides stripping action

3.17

tuxy

the outer layer of abaca leaf sheath which contains the primary fiber

3.18

tuxying

separating the outer layer from inner layer of leaf sheath which is at most 1.8 mm of abaca leaf sheath either by locnit method (using tuxying knife) or bacnis method (using bolo)

4 Classification

The classification of abaca stripper shall be based according to the following:

4.1 Methods of stripping

4.1.1 Traditional Stripping (Fig. 4)

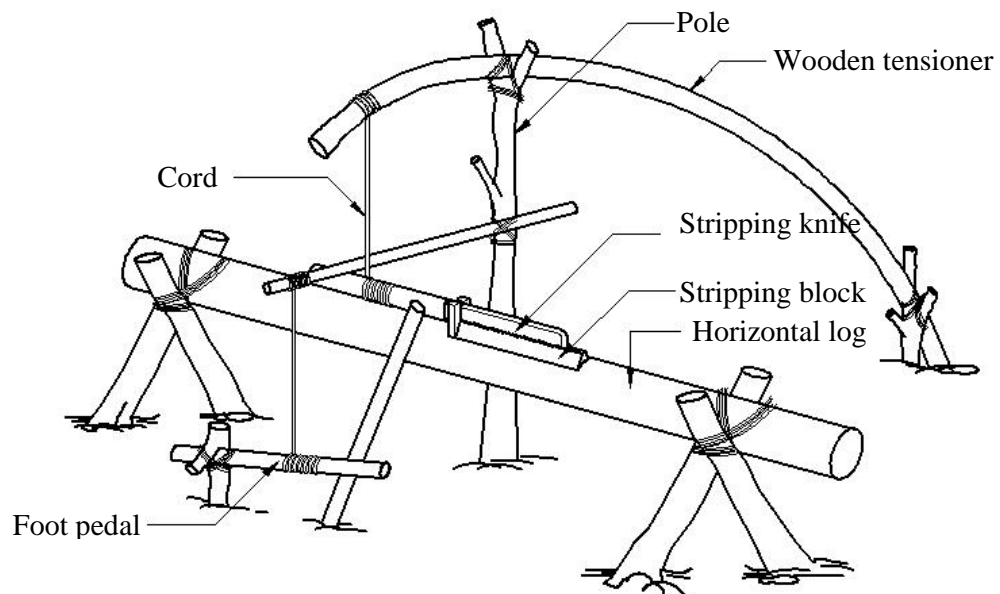


Figure 4. Traditional abaca stripper

4.1.2 Improved manual stripping device “Hagotan”

Type of abaca stripper that uses serrated blade and stripping block to be able to extract abaca fiber (Fig. 5)

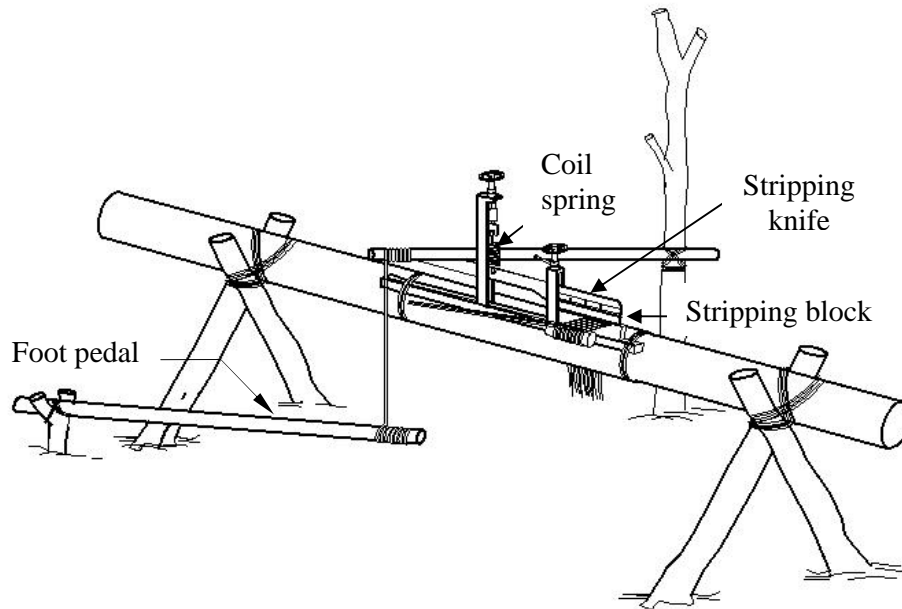


Figure 5. Improved hand-stripping (Hagotan) device (FIDA design)

4.1.3 Spindle type mechanical stripping

Operating by rotating the flywheel and spindle using a prime mover.

Spindle type mechanical stripping shall be classified as:

4.1.3.1 Mobile

Abaca stripper with pneumatic tires. (Fig. 6)

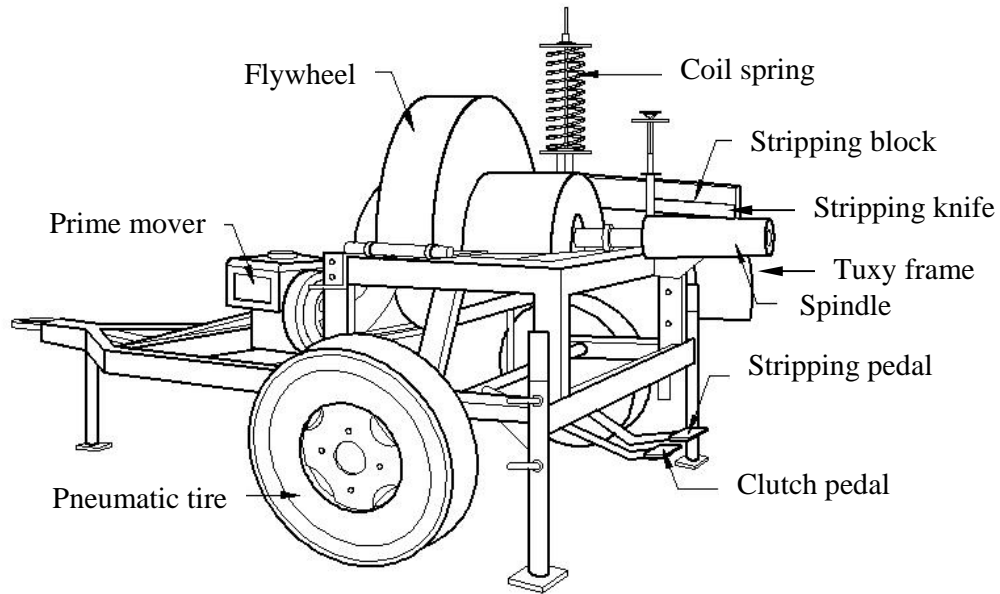


Figure 6. Mobile spindle stripping machine (FIDA Design)

4.1.3.2 Stationary (Fig. 7a and 7b)

Abaca stripper without transport mechanism (e.g. pneumatic tires)

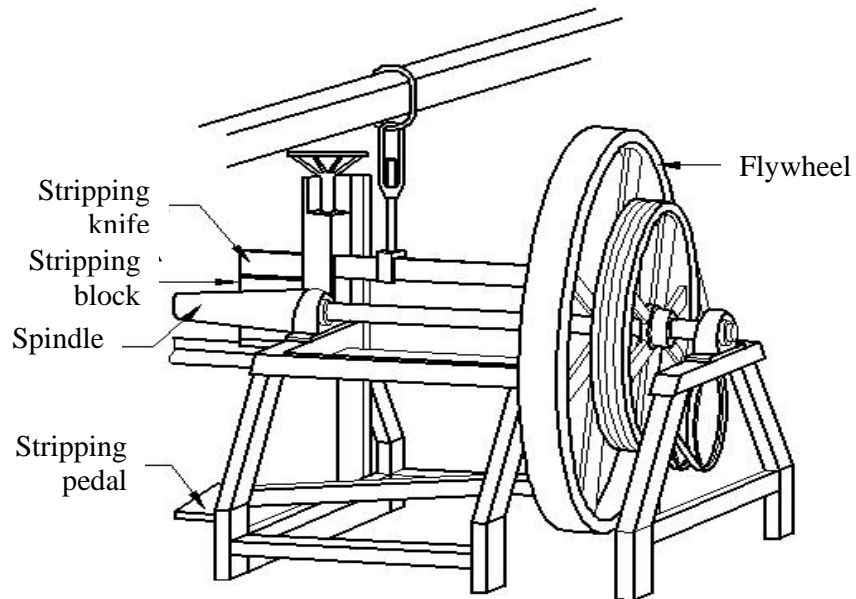


Figure 7a. Stationary single pedal spindle type abaca stripper (stationary)

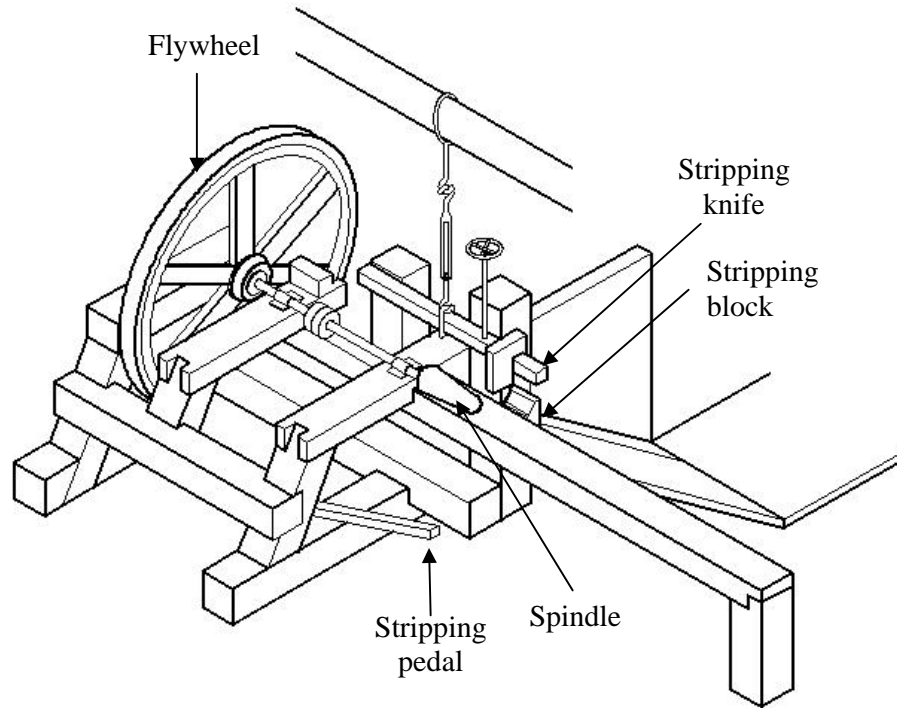


Figure 7b. Stationary single pedal spindle type abaca stripper (stationary)

5 Manufacturing Requirements

- 5.1 Abaca stripping machine or device shall be composed of knife/blade (zero and serrated for “*hagotan*” and zero serration for spindle type), stripping block, pedal(s) and spindle (spindle type)
- 5.2 Steel bars (angle bars, flat bars and round bars), metal sheet or plate and heavy-duty mild steel shall be generally used for the manufacture of the different components of the abaca stripper.
- 5.3 Knife or blade shall be corrosion resistant (e.g. stainless steel 304) and shall not affect the color of the abaca fiber.
- 5.4 For spindle type, knife shall be made of stainless steel 304, mild steel (machinable) or carbon steel. Tip shall be hardened either through heat treatment or welding process using manganese welding rod. It shall have zero serration.
- 5.5 For “*hagotan*”, knife shall be made of mild steel and the tip of the serration shall be hardened using heat treatment. There shall be three types of knife with the following serrations: 17 or 18 teeth per inch, 24 teeth per inch and zero serration. Serration of the knife shall be uniform.

- 5.6 For “*hagotan*”, stripping block shall be made of mild steel. It shall not affect the color of the fiber extracted.
- 5.7 For spindle type, stripping block shall be made of mild steel or engineering plastic. It shall not affect the color of the fiber extracted.
- 5.8 Flywheel with sufficient weight of the spindle type shall be made of cast iron. Its linear speed should range from 10.2 m/s to 20.4 m/s.
- 5.9 Spindle shall be made of hard wood or its equivalent and shall not have any effect on the color of the abaca fiber extracted.
- 5.10 Bolts and screws to be used shall conform to the requirements of PAES 311 and 313.
- 5.11 Coil spring shall be made of high carbon steel.
- 5.12 Sizes of the parts of the abaca stripper shall conform to the specifications of the manufacturer.

6 Performance Requirements

The abaca stripper when tested in accordance with PAES 255 shall conform to the following requirements:

- 6.1 The noise emitted by the abaca stripper shall not be more than 96 dB(A)*.

NOTE: *Allowable noise level for four hours of continuous exposure based on Occupational Safety and Health Standards, Ministry of Labor, Philippines. 1983.

- 6.2 Mobile spindle stripping machine designed by Fiber Industry Development Authority (FIDA) shall be able to extract abaca fiber from a minimum of 5 tuxies per one stripping process. Prime mover shall be 3.73 kW to 5.22 kW diesel engine.
- 6.3 For manually operated stripping machine or “*Hagotan*”, minimum potential fiber recovery shall be 12% of the weight of fresh tuxy.
- 6.4 For spindle type stripping machine, minimum potential fiber recovery shall be 10.5% of the weight of fresh tuxy.
- 6.5 Stripping efficiency of the mechanized stripping machine shall be at least 80%. Maximum stripping loss shall be 20%.
- 6.6 Fiber quality extracted by the manually operated abaca stripper shall depend on the serration of the stripping knife. (Table 1) Fiber grading shall depend on the Standards for abaca fiber of Fiber Industry Development Authority (FIDA).

Table 1. Abaca fiber grades in relation to the type of stripping knife used

Serration of Stripping Knife (teeth per inch)	Type of Cleaning	Leaf Sheath Position			
		Inner	Middle	Next to Outer	Outer
0	Excellent	AD*	EF*	S2*	S3*
24	Good	I*		G*	H*
17/18	Fair	JK*			M1*

*FIDA Standards for hand-stripped abaca fiber extracted in hand-stripped abaca stripper

- 6.7** Minimum fiber quality extracted by the spindle type abaca stripper shall be *S-AD, *S-EF, *S-S2 and *S-S3. Fiber grading shall depend on the Standards for abaca fiber of Fiber Industry Development Authority (FIDA).

NOTE: *FIDA Standards for abaca fiber extracted in spindle type abaca stripper

7 Safety, Workmanship and Finish

- 7.1** The base of abaca stripper shall be rigid and its rotating components shall be statically and dynamically balanced.
- 7.2** The abaca stripper shall be free from manufacturing defects.
- 7.3** Stripping knife/blade shall be accessible, adjustable and replaceable.
- 7.4** There shall be provision for easy removal and replacement of the stripping block
- 7.5** There should be provision for easy lifting of the stripping knife from the stripping block.
- 7.6** All surfaces shall be free from rust and shall be coated with a suitable paint material.
- 7.7** The abaca stripper shall be free from sharp edges and rough surfaces.
- 7.8** Cover or guard shall be provided for belt and all moving parts.
- 7.9** There shall be provision for belt tightening and adjustments.
- 7.10** Safety mechanism should be included by providing clutch mechanism which cause immediate load disengagement between prime mover and abaca stripper.

- 7.11 All welded parts shall be water-tight and smoothly polished and it shall pass visual inspection criteria (AWS D1.1:2000) for discontinuity of materials.
- 7.12 Welded joints shall not be less than 4 mm (1/8 inch) side fillet welded. Undercut shall not exceed 2 mm (1/16 inch) for any length of weld.

8 Warranty for Manufacture and Durability

- 8.1 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 one year from the date of purchase.
- 8.2 The construction shall be rigid and durable without breakdown of its major components for at least one year from the date of purchase.

9 Maintenance and Operation

- 9.1 Each abaca stripper unit shall be provided with a set of standard tools prescribed by the manufacturer.
- 9.2 An operator's manual which conform to PAES 102, shall be provided.
- 9.3 The abaca stripper shall be easy to clean and operate.

10 Testing

Abaca stripper shall be tested in accordance with PAES 255.

11 Marking

- 11.1 Each abaca stripper shall be marked in English with the following information using a stencil or by directly punching it on a plate and shall be positioned at a most conspicuous place:
 - 11.1.1 Registered trademark of the manufacturer
 - 11.1.2 Brand
 - 11.1.3 Model
 - 11.1.4 Serial number (punched)
 - 11.1.5 Output capacity, kg/h (punched)
 - 11.1.6 Recommended spindle speed, rpm (punched)

- 11.1.7** Power requirement, kW (punched)
- 11.1.8** Name and address of the supplier
- 11.1.9** Name and address of the importer, if imported
- 11.1.10** Country of manufacture (if imported) / “Made in the Philippines” (if manufactured in the Philippines)
- 11.2** Appropriate safety precautions shall be provided. Marking shall be stated in English and/or Filipino and shall be printed in red color with a white background.
- 11.3** The markings shall have a durable bond with the base surface material.
- 11.4** The markings shall be water resistant and under normal cleaning procedures, it shall not fade, discolor, crack or blister and shall remain legible.

Philippine Agricultural Engineering Standards

AMTEC-UPLB – PCARRD Project: “Development of Standards for Agricultural Production and Postharvest Machinery”

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