

# PHILIPPINE NATIONAL STANDARD

PNS/PAES 167:2015  
(PAES published 2015)  
ICS 65.060.10

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**Agricultural machinery – Disc plow for walking type  
agricultural tractor – Specifications**



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**National Foreword**

The Philippine Agricultural Engineering Standards PAES 167:2015, Agricultural machinery – Disc plow for walking type agricultural tractor – Specifications was approved for adoption as Philippine National Standard by the Bureau of Philippine Standards upon the recommendation of the Agricultural Machinery Testing and Evaluation Center (AMTEC) and the Philippine Council for Agriculture, Aquatic and Natural Resources Research and Development of the Department of Science and Technology (PCAARRD-DOST).

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**Agricultural Machinery – Disc Plow for Walking Type Agricultural Tractor –**  
**Specifications**

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**Foreword**

The formulation of this national standard was initiated by the Agricultural Machinery Testing and Evaluation Center (AMTEC) under the project entitled “Development of Standards for Rice Production and Postproduction Machinery” which was funded by the Philippine Council for Agriculture, Aquatic and Natural Resources Research and Development (PCAARRD) of the Department of Science and Technology (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 preparation of this standard, the following documents/publications were considered:

American Society of Agricultural Engineers (ASAE) EP 399.1:1985 – Preferred Metric Dimensions for Agricultural Implement Disk Blades.

A web page document on *Disc Plough* by Albert Boers. Last updated: July 4, 2001. Wageningen University.

Stevens G.N. *Equipment Testing and Evaluation*. Overall Division, National Institute of Agricultural Engineering (NIAE), Wrest Park, Silsoe Bedford England. 1982.

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

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## **1 Scope**

This standard specifies the requirements for the manufacture and performance of a disc plow hitched to a walking type agricultural tractor.

## **2 References**

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

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

**PNS/PAES 106:2000** Agricultural Machinery – Soil Tillage and Equipment – Terminology

**PNS/PAES 168:2015** Agricultural Machinery – Disc Plow for Walking Type Agricultural Tractor – Methods of Test

## **3 Definitions**

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

### **3.1**

#### **concave disc**

circular concave steel plate used for cutting and inverting the soil (Figure 1)

### **3.2**

#### **concavity**

vertical distance measured from the lowest point to the center of the disc when its concave side is placed on a flat surface

### **3.3**

#### **disc plow**

implement with individually mounted concave disc blades which cut, partially or completely invert soil slices to bury surface material, and pulverize the soil

**NOTE** Blades are attached to the frame in a tilted position relative to the frame and to the direction of travel for proper penetration and soil displacement.

### **3.4**

#### **frame**

structure on which the standards are fitted (Figure 1)

**3.5  
hitch**

portion of an implement designed to connect the implement to a power source

**3.7  
side angle**

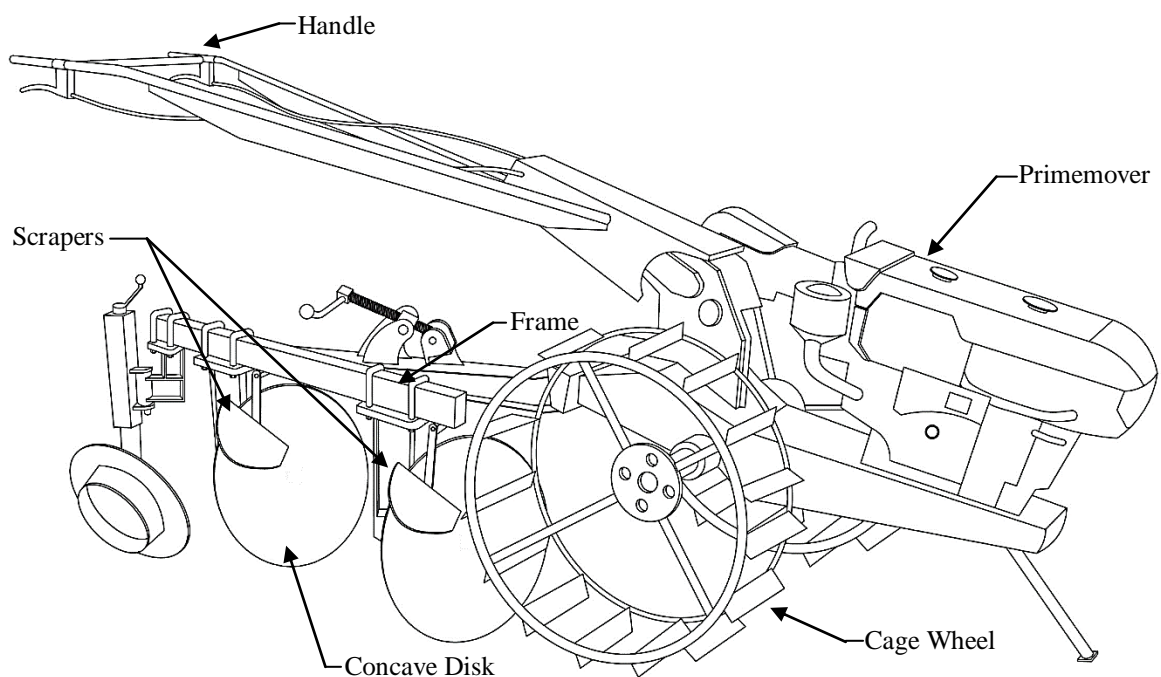
disc angle

horizontal angle made by the disc with the direction of travel (Figure 2a)

**3.8  
standard**

beam

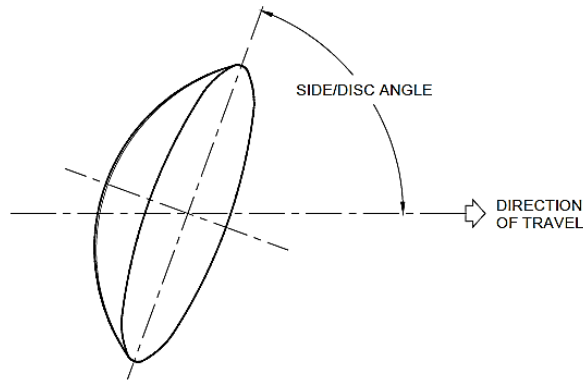
upright support which connects the shank to tillage implement frame (Figure 1)



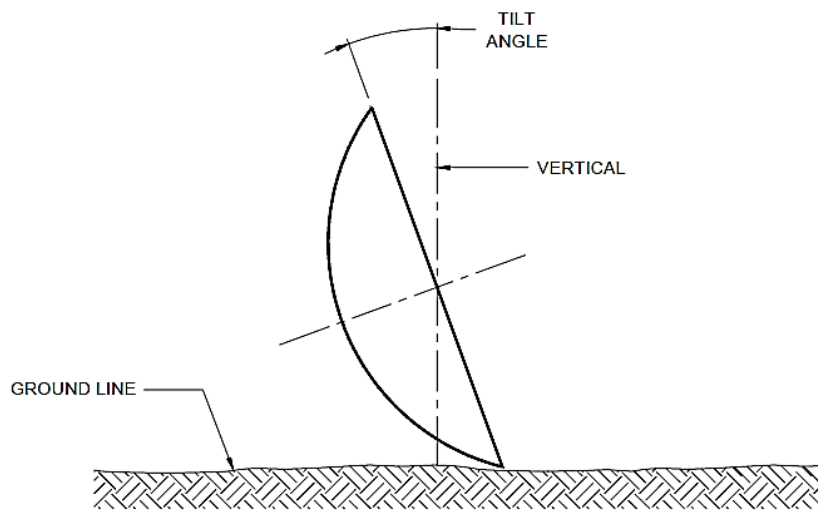
**Figure1 - Two-bottom disc plow hitched to a walking type agricultural tractor**

**3.9  
tilt angle**

angle made by the disc with the vertical line (Figure 2b)



**Figure 2a - Top View**



**Figure 2b - Side View**

**Figure 2 - Side and Tilt Angle**

### 3.10

#### **width of cut**

transverse distance between either the top or bottom cutting edges of the end discs

**NOTE** For measuring the width of cut, the tilt angle shall be set at 15 to 25°. For non-adjustable plow disc blades, the tilt angle shall be set at 18° to 20°.

## 4 Size

The size of the plow shall be determined by the number and diameter of the discs and the width of cut.

## **5 Materials of Construction**

**5.1** Mild steel shall be used in the manufacture of the frame, thrust wheel and hitch.

**5.2** Cold rolled steel shall be used in the manufacture of hitch pin.

**5.3** Carbon steel with at least 0.80% carbon content (e.g. AISI 1080) with trace amount of boron or equivalent alloy steel shall be used in the manufacture of the disc blades.

## **6 Construction Requirements**

The disc plow should conform to the following minimum requirements:

**Table 1 – Construction Requirements for Disc Plow**

<b>ITEM</b>	<b>REQUIREMENT</b>
Type of disc	Plain
Number of discs	2
Diameter of discs, mm	410
Thickness, mm	4
Concavity, mm	25
Frame height, mm	650
Disc spacing, mm	500

## **7 Performance Requirements**

During operation, the plow shall produce good quality of work such as the uniformity of soil clods, especially between successive passes.

## **8 Other Requirements**

**8.1** The frame shall be rigid and durable.

**8.2** The plow shall be easy to operate such as:

**8.2.1** Hitching to and unhitching from tractor

**8.2.2** Adjusting the depth of cut

**8.2.3** Maneuverability during operation

**8.2.4** Clearing blockages

## **9 Workmanship and Finish**

**9.1** The disc plow shall be free from manufacturing defects that may be detrimental to its operation.

**9.2** Except for disc blades, other uncoated metallic surfaces shall be free from rust and shall be painted properly.

**9.3** The disc plow, except for disc blades, shall be free from sharp edges and surfaces that may injure the operator.

## **10 Warranty for Construction and Services**

**10.1** One (1) year warranty on parts and services, in accordance to the manufacturer's warranty policy, shall be provided. This shall start upon the acceptance of the disc plow by the end user.

**10.2** There shall be no breakdown of its major components under normal use within one (1) year from acceptance of the disc plow by the end-user, in accordance to the manufacturer's warranty policy.

## **11 Testing**

Disc plow for walking type agricultural tractor shall be tested in accordance with PNS/PAES 168:2015 - Agricultural Machinery - Disc Plow for Walking Type Agricultural Tractor – Methods of Test.

## **12 Marking and Labeling**

**12.1** The disc plow shall be marked in English with the following information using a plate, stencil or by directly punching it at the most conspicuous place:

**12.1.1** Brand name or Registered trademark of the manufacturer

**12.2** The markings shall have a durable bond with the base surface material. The markings shall be water and heat resistant under normal cleaning procedures, it shall not fade, discolor, crack or peel and shall remain legible.



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