

PHILIPPINE NATIONAL STANDARD

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Agricultural machinery – Soil Auger – Specifications



BUREAU OF PRODUCT STANDARDS

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National Foreword

This Philippine Agricultural Engineering Standards PAES 161:2011, Agricultural machinery – Soil Auger – 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) under the project entitled “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 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:

European Patent Office EP0334934B1.

Slatter, J.W., J.P. Seidel and W. Kingwell. A proposed model for soil/auger interaction during installation of screw piling augers.

United States Patent US3760893. Cylinder Type Soil-sampling Auger.

United States Patent US4653336. Combination Soil Auger and Soil Core Sampler with Sample Retaining Capacity.

United States Patent US4779689. Soil Auger.

United States Patent US5133269. Plant Hole Digger with Cylindrical Cutter.

United States Patent US572249. Soil Displacement Auger Head for Installing Piles in the Soil.

<http://www.accurate.net.nz/soil/auger.html>

<http://www.eijkelkamp.com>

<http://www.johnsonsoilauger.co.za/types.aspx>

Agricultural Machinery – Soil Auger – Specifications

1 Scope

This standard specifies the manufacturing and performance requirements for a soil auger used for agricultural purposes such as sampling, planting and fencing.

2 References

The following normative documents contain provisions, which, through the 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 311:2001 | Engineering Materials – Bolts and Nuts for Agricultural Machines – Specifications and Applications |
| PAES 162:2011 | Agricultural Machinery – Soil Auger – Methods of Test |

3 Definitions

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

3.1

auger head

drill bit

boring part of the soil auger (Fig.1)



Figure 1a. Spiral or screw type

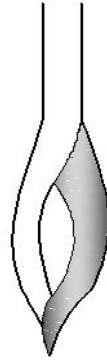


Figure 1b. Dutch type

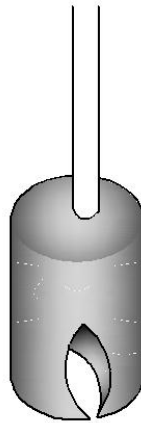


Figure 1c. Posthole type

3.2

extension rod

accessory part of the soil auger to lengthen the reach of the tool

3.3

soil auger

tool used for displacing soil at various depths for soil research and analysis or for digging post holes by means of a rotating helical flighting (Fig.2)

4 Classification

The soil auger shall be classified according to:

4.1 Purpose

4.1.1 Soil sampling auger

Type of soil auger with a diameter of at least 50 mm with provision for obtaining soil samples in the auger head through different soil types

4.1.2 Soil boring auger

Type of soil auger designed for drilling holes in the soil

4.2 Power source

4.2.1 Hand-operated type

Type of soil auger that makes use of human force to drill the soil (Fig.2).

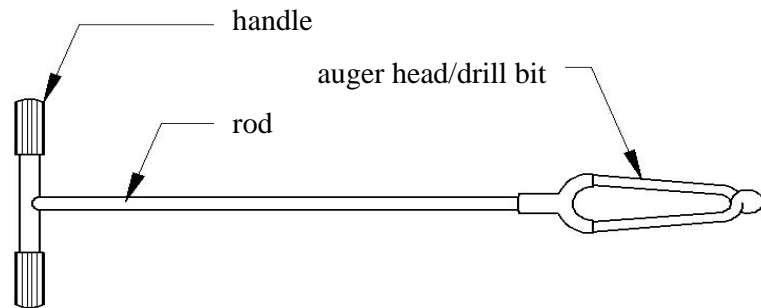


Figure 2. Hand-operated soil auger

4.2.2 Power-operated type

4.2.2.1 Motor-powered

Type of soil auger that is powered by an electric motor or an engine to drill the soil (Fig.3).

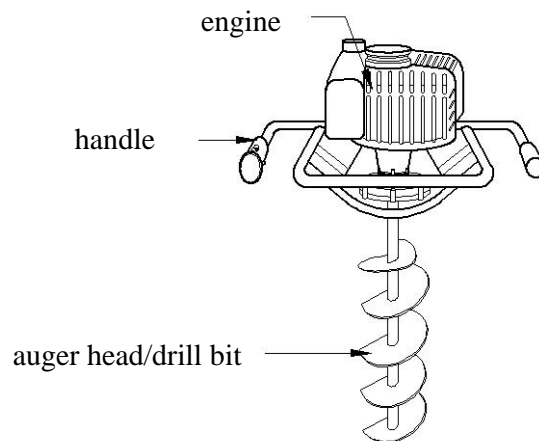


Figure 3. Motor-powered type

4.2.2.2 Fluid-powered

Type of soil auger that is powered by either pneumatic or hydraulic pump to drill the soil (Fig.4).

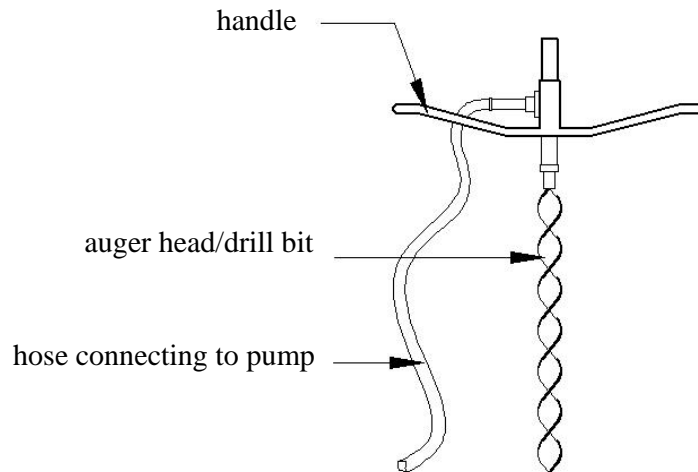


Figure 4. Fluid-powered type

5 Principle of Operation

The area where the soil auger shall be used shall be cleaned first. A small hole about 100 mm deep shall be dug to ease the penetration of the soil auger. The soil auger shall be turned either by hand or by power to dig deeper. Upon reaching the desired depth, the soil auger shall then be withdrawn. For soil sampling type, the auger shall be able to contain the desired soil sample in the auger head.

6 Manufacturing Requirements

All specifications indicated below are minimum requirements.

- 6.1 The auger head shall be made of heat-treated carbon steel (e.g. AISI 1080) or better material. It shall have a diameter of 50 mm.
- 6.2 The screw length shall be at least 200 mm.
- 6.3 For hand-operated type, the rod shall have a length of at least 500 mm, with a diameter of at least 13 mm.
- 6.4 Extension rods of hand-operated type shall be made of mild steel or better material. It shall have a diameter of at least 13 mm diameter.
- 6.5 The handle of hand-operated type shall be made of mild steel or better material with a diameter of at least 13 mm. It shall be covered with non-slip material (e.g. rubber).

- 6.6 For power-operated type, the handle shall be made of mild steel or better material with a diameter of at least 13 mm.
- 6.7 All welded parts shall be in accordance with the criteria set in AWS D1.1:2000.
 - 6.7.1 There shall be no crack on welded area.
 - 6.7.2 There shall be fusion between adjacent layers of weld metal and base metal.
 - 6.7.3 Welded joints shall not be less than 4 mm size fillet weld.
 - 6.7.4 Undercut shall not exceed 2 mm for any length of weld.

7 Performance Requirements

- 7.1 The soil auger shall penetrate the soil within the manufacturer's specified depth.
- 7.2 The soil auger shall have an efficiency of at least 80%.
- 7.3 For soil sampling type, samples shall be obtained once the auger is withdrawn from the soil.
- 7.4 The soil auger shall be able to displace stones under the soil surface.
- 7.5 The operating speed of the soil auger shall conform with the manufacturer's specification.
- 7.6 The power-operated soil auger shall not produce noise higher than 92 db(A) measured 50 mm away from the operator's ear level.

8 Safety, Workmanship and Finish

- 8.1 The soil auger shall have a rust-free finish.
- 8.2 All bolts shall conform with PAES 311:2001 for strength application and shall be made of hot-galvanized steel for corrosion resistance.

9 Warranty of Construction

- 9.1 The soil auger's construction shall be rigid and durable without breakdown of its major components within one (1) year from the date of original purchase.
- 9.2 Prime mover shall be covered by a separate warranty.

10 Maintenance and Operation

10.1 An operator's manual which conforms to PAES 102:2000, shall be provided.

10.2 Tools for adjustment and/or removal of extension rods shall be provided.

11 Testing

Testing of the soil auger shall be conducted on-site. The soil auger shall be tested for performance in accordance with PAES 162:2011.

12 Marking and Labeling

12.1 The soil auger 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 (optional)

12.1.2 Model and/or Serial number

12.1.3 Country of manufacture (if imported)/ "Made in the Philippines" (if manufactured in the Philippines)

12.2 Safety/ precautionary markings shall be provided. Markings shall be stated in English and shall be printed in red color with a white background.

12.3 The markings shall have a durable bond with the base surface material and shall be water and heat resistant 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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