

## **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 Slaughterhouse Equipment for Large Ruminants” which was funded by the Department of Agriculture- National Meat Inspection Service (DA-NMIS).

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:

Baumeister, T., E.A. Avallone and T. Baumeister III. 1978. Marks’ Standard Handbook for Mechanical Engineers. 8<sup>th</sup> ed. McGraw- Hill, Inc.

Cook, F.M. 1976. Hide Pulling Method and Apparatus. United States Patent. Patent No. US3936908. 6pp.

Grandin, T. G., 2005. Recommended Animal Handling Guidelines and Audit Guide for Cattle, Pigs, and Sheep (2005 Edition). American Meat Institute Foundation. 2005. pp. 25-27, 29-36, 42-43, 52-55.

Karubian, R. and E.D. Quintana. 1974. Dehiding Apparatus. United States Patent. Patent No. US3857177. 7pp.

Ministry of Agriculture, Fisheries and Food.2000. Captive Bolt Stunning Equipment and the Law – How it Applies to You. The National Assembly for Wales. Cathays Park. 6pp.

PAES 411: 2000      Agricultural Structures – Slaughterhouse for Swine, Small and Large Animals – General Requirement

Palmer, J. 1994. Brazing and Welding 304L Stainless Steel. Brewing Techniques.

Rietveld, G. 2003. On-farm Euthanasia of Cattle and Calves.

Stainless Steel – Martensitic. <http://www.alleghenyludlum.com>. <accessed April 9, 2008>.

**Slaughterhouse Equipment– Dehider – Specifications**

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**1 Scope**

This standard specifies the construction and performance requirements for a dehider for large ruminants such as cattle and carabao

**2 References**

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

- |                       |  |
|-----------------------|--|
| <b>PAES 102: 2000</b> | Agricultural Machinery – Operator’s Manual – Content and Presentation          |
| <b>PAES 319: 2002</b> | Engineering Materials – Engineering Plastics – Specifications and Applications |
| <b>PAES 517: 2008</b> | Slaughterhouse Equipment – Overhead Rail System – Specifications               |
| <b>PAES 520: 2008</b> | Slaughterhouse Equipment – Dehider – Methods of Test                           |

**3 Definitions**

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

**3.1****air motor assembly**

part of the handheld flayer that contains the air motor which actuates the movement of the blades by allowing air flow supplied by an air compressor (Fig.1)

**3.2****blade assembly**

part of the handheld flayer that is composed mainly by two blades that move in countermotion (Fig.1)

**3.3****dehider**

slaughterhouse equipment used to remove the skin from the body of the animal

### 3.4

#### **hide**

skin separated from the animal's body

### 3.5

#### **hide clamp**

part of the roller drum in vertical puller to which the hide is hooked prior to pulling (Fig.2b)

### 3.6

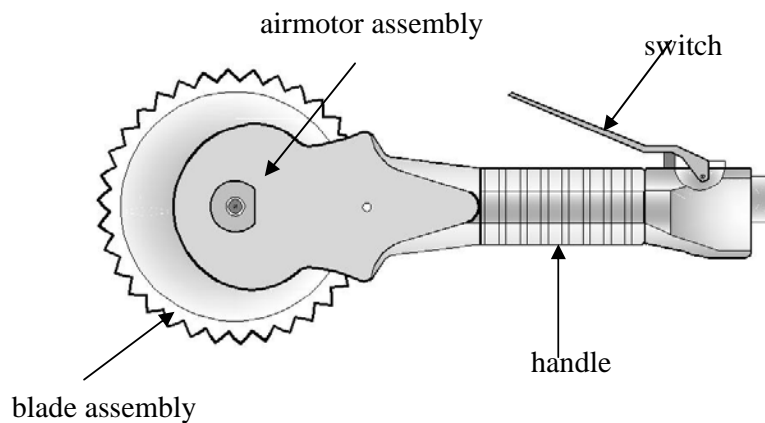
#### **roller drum**

part of the vertical puller which rolls and pulls the hide to separate it from the carcass (Fig.2b)

## 4 Classification

### 4.1 Handheld flayer

Type of dehider that is equipped with cutting blades attached to the air motor assembly aided by an air compressor (Fig.1).



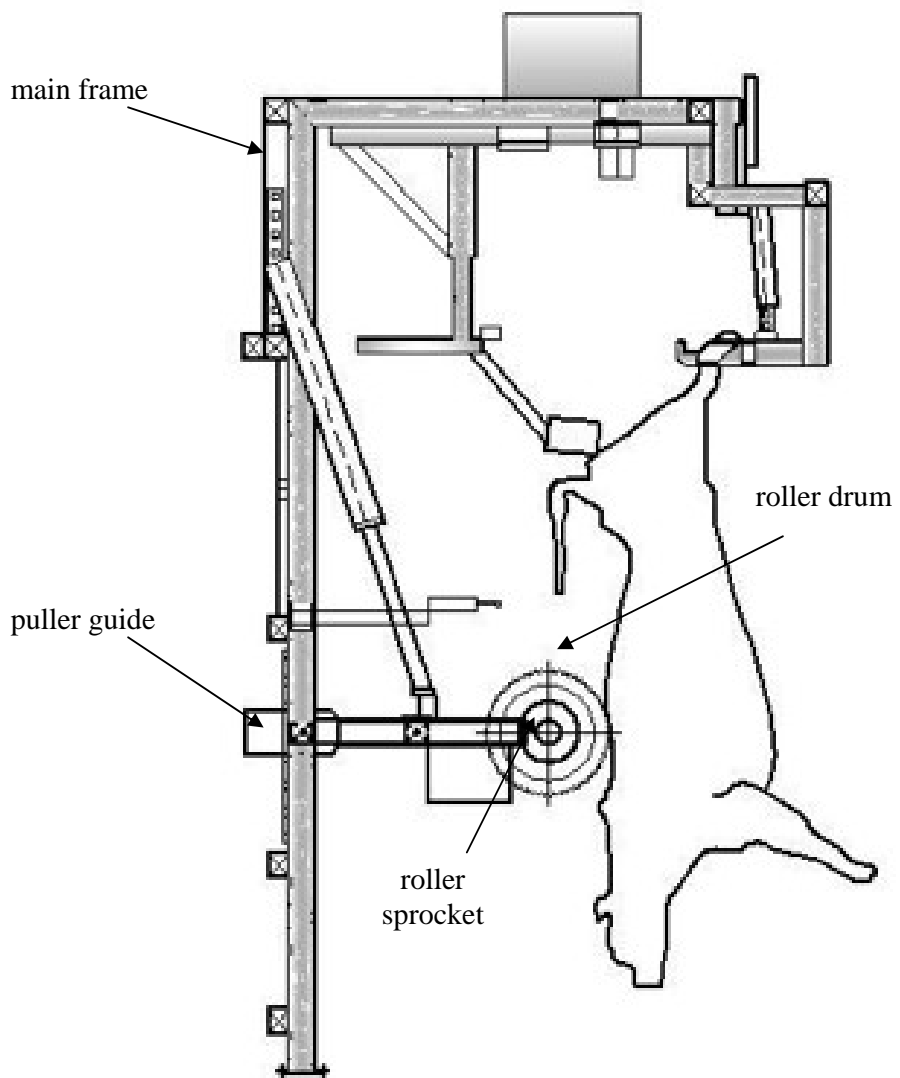
**Figure 1. Handheld flayer**

### 4.2 Hide puller

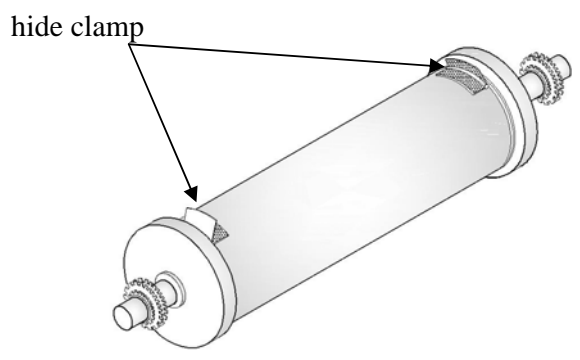
Type of dehider that makes use of roller drum and/or cylinders to pull the hide of the animal away from the body.

#### 4.2.1 Vertical puller

Type of hide puller that uses roller drum, which is connected to an electric motor, to pull the hide away from the animal's body (Fig.2).



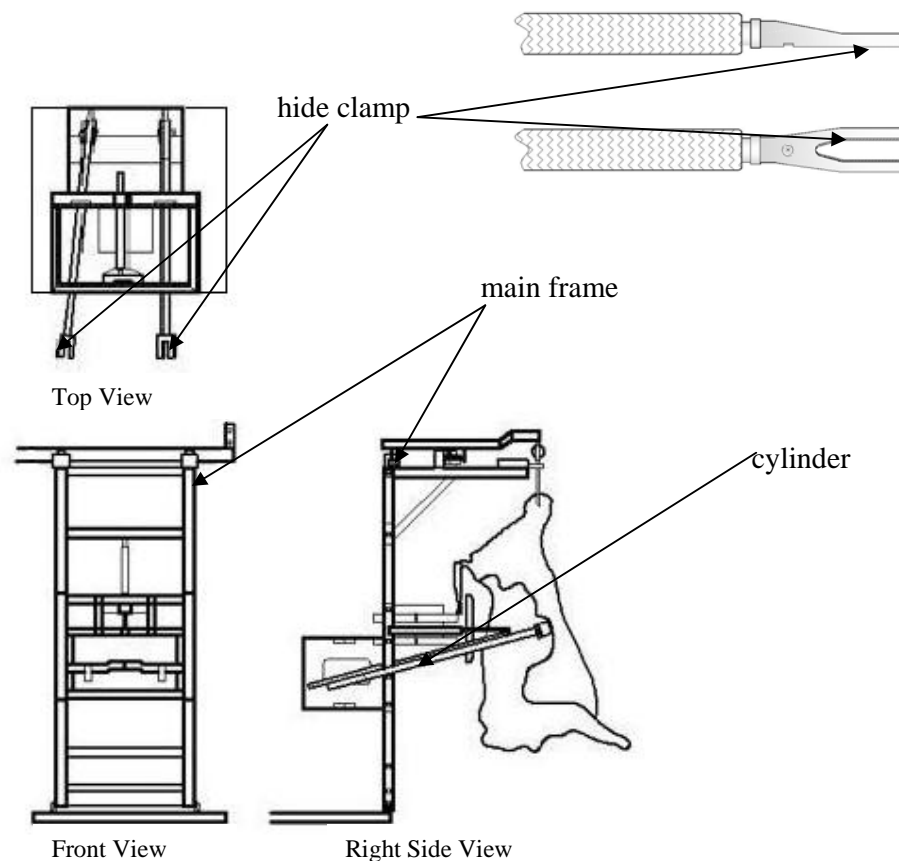
**Figure 2a. Vertical puller**



**Figure 2b. Drum roller with hide clamp**

## 4.2.2 Side puller

Type of hide puller that makes use of actuating cylinders, either pneumatic or hydraulic, to facilitate the pulling of hide away from the animal's body (Fig.3).



**Figure 3. Side puller**

## 5 Principle of Operation

The animal shall be suspended from its hind legs on the overhead rails as specified in PAES 517 after the bleeding process. Through the use of the dehider, the hide shall be separated from the carcass, either manually or mechanically.

### 5.1 Handheld flayer

With the carcass suspended on the overhead rail system, the operator shall start by making a midline incision along the skin. The skin shall then be separated from the

carcass. The operator shall proceed until the hide is totally separated from the animal's body.

## **5.2 Hide puller**

The same procedure shall be done for the removal of hide as that of handheld flayer. However, the removal of the hide shall be facilitated by roller drum and/or actuating cylinders instead of the blades. The operator shall start by making a midline incision along the skin of the animal. The flaps of the hide shall be hooked on the hide clamps. After securing the hide, the hide puller shall be activated to pull the hide from the animal's body.

## **6 Fabrication Requirements**

Generally, the dehider shall be made of non-corrosive materials (e.g. stainless steel 304 or higher) or any material appropriate for food plant operation.

### **6.1 Handheld flayer**

**6.1.1** The handheld flayer shall generally consist of circular blades, handle, switch, air motor assembly and blade assembly.

**6.1.2** The circular blades shall be constructed from food grade and non-corrosive steel (e.g. stainless steel 410 or higher). The two circular blades shall be identical but shall be installed in such a way that the two blades will operate in countermotion, either oscillating or circular (e.g. 100 mm diameter)

**6.1.3** The circular blades shall be designed to provide a finer cut.

**6.1.4** The blade assembly shall be constructed from non-corrosive steel (e.g. stainless steel 304 or higher). It shall be designed such that it can be disassembled for blade replacement, sharpening and cleaning.

**6.1.5** The handheld flayer shall be connected to an external pneumatic source such as air compressor.

**6.1.6** The air motor shall be properly sealed.

**6.1.7** Pressure gauge shall have a diameter of at least 70 mm with a range of 0 to 10 bars.

**6.1.8** The switch shall be located at the handle of the handheld flayer for the convenience of the operator.

**6.1.9** The handle shall be made of high impact non-slip material.

**6.1.10** Parts shall be readily serviceable.

### **6.2 Hide puller**

**6.2.1** The hide puller shall generally consist of main frame, cylinders and/or roller and hide clamps.

**6.2.2** The main frame of the hide puller shall be made of non-corrosive material (e.g. 6 mm thick stainless steel plate 304 or higher).

**6.2.2.1** Pressure gauge shall have a diameter of at least 70 mm with a range 0 to 10 bars.

### **6.2.3 Vertical puller**

**6.2.3.1** Vertical puller should generally consist of main frame, roller drum, roller sprockets, chain, puller guide and chain guard.

**6.2.3.2** The hide clamps shall be constructed from food grade and non-corrosive steel (e.g. stainless steel 304 or higher) and shall be attached on the hide roller.

**6.2.3.3** Chains shall be covered with chain guard for safety. Chain guard shall be made of non-corrosive material (e.g. stainless steel 304 Gauge 26).

**6.2.3.4** Roller drum shall be made of non-corrosive material (e.g. stainless steel 304 or higher) and shall have smooth surface to avoid damaging the hide.

### **6.2.4 Side puller**

**6.2.4.1** Side puller should generally consist of main frame, hide clamp handles and cylinders that actuate the pulling mechanism.

**6.2.4.2** Hide clamp handles shall be constructed from non-corrosive material (e.g. stainless steel 304 or higher).

**6.2.4.3** Hide clamps shall be attached on the hide clamp handles and shall be made of non-corrosive steel (e.g. stainless steel 304 or higher).

**6.3** All welded parts shall be water-tight and smoothly polished and it shall pass the visual inspection criteria (AWS D1.1:2000) for discontinuity of material.

**6.3.1** There shall be no crack on the welded area.

**6.3.2** There shall be fusion between adjacent layers of weld metal and between weld metal and intermittent fillet welds outside of their effective length.

**6.3.3** Weld profiles shall be in its acceptable form.

**6.3.4** Welded joints shall not be less than 4mm site fillet weld.

**6.3.5** Undercut shall not exceed 2mm (1/16 inch) for any length of weld.

- 6.4 Parts shall be readily serviceable and consumable parts shall be readily available. Manufacturer/dealer shall show proof of capability or commitment to supply replacement parts and services

## **7 Performance Requirements**

- 7.1 The dehider shall be able to separate the hide from the animal without ripping the hide.

- 7.2 The dehider shall not damage the carcass.

### **7.3 Handheld flayer**

- 7.3.1 The operating pressure shall commensurate with the operating pressure specified by the manufacturer (e.g. 3.1 bars).

- 7.3.2 The blades shall run at the speed specified by the manufacturer.

### **7.4 Hide puller**

- 7.4.1 The dehider shall reset to its initial position after dehiding to accommodate the next animal.

- 7.4.2 Hide removed from the animal shall be automatically released from the roller.

- 7.4.3 The hide shall not slip from the hide clamps during operation.

## **8 Safety, Workmanship and Finish**

- 8.1 The dehider shall have a rust-free finish and shall be free from sharp edges or surfaces. It shall be free from manufacturers defects.

- 8.2 The surfaces of the dehider shall not be painted.

- 8.3 Handle of the handheld flayer shall be non-slip.

- 8.4 Chains in hide puller shall be covered with a chain guard.

## **9 Warranty of Construction**

- 9.1 The dehider's construction shall be rigid and durable without breakdown of its major components within six (6) months from the date of original purchase.

- 9.2 Warranty shall be provided for parts and services within six (6) months after installation and acceptance by the consumer.



## **10 Maintenance and Operation**

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

**10.2** Grease points for lubrication of mechanical parts shall be provided.

**10.3** Food-grade grease and oil shall be initially included.

## **11 Testing**

Testing of the dehider shall be conducted on-site during commissioning. The dehider shall be tested for performance in accordance with PAES 520.

## **12 Marking and Labeling**

**12.1** The dehider 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** Name, address and contact number of the manufacturer

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

**12.1.5** Other additional markings shall be provided and shall include the name and address of the importer, if imported (optional).

**12.2** Safety/ precautionary markings shall be provided. Markings shall be stated in English or Filipino 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.