

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:

AWS D1.1:2008 Structural Welding Code – Steel

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

Department of Trade and Industry. The Cattle Industry of the Region. http://home.websprinter.net/~dti10/products/cattle_ind1.htm. <accessed March 28, 2008>.

Grandin, T. 1993. Teaching Principles of Behavior and Equipment Design for Handling Livestock. *Journal of Animal Science*. 71: 1065- 1070.

Grandin, T.G. 2005. Recommended Animal Handling Guidelines and Audit Guide for Cattle, Pigs and Sheep (2005 Edition). American Meat Institute Foundation. 2005.

Regenstein, J.M. 2004. Kosher and Halal: Animal Welfare Issues. 6th Annual Animal Care and Handling Conference. Kansas City, MO: February 19, 2004.

CONTENTS		Page
1	Scope	12
2	References	12
3	Definitions	12
4	General Conditions for Test and Inspection	13
4.1	Role of the manufacturer/dealer	13
4.2	Role of the operator	13
4.3	Test site conditions	13
4.4	Test instruments	13
4.5	Test material	13
4.6	Termination of test for stunning box	14
5	Test and Inspection	14
5.1	Verification of the manufacturer's technical data and information	14
5.2	Performance test	14
5.3	Performance after test	15
5.4	Test trial	16
6	Test Report	16
 <i>ANNEXES</i>		
A	Suggested List of Minimum Test Instruments	17
B	Specifications of Stunning Box	18
C	Performance Test Data Sheet	20
D	Performance After Test Data Sheet	21

Slaughterhouse Equipment – Stunning Box/ Knocking Pen – Methods of Test

1 Scope

This standard specifies the methods of test and inspection for stunning box/knocking pen for large ruminants. Specifically, it shall be used to:

- 1.1** verify the mechanism, dimensions, materials, accessories of the stunning box and the list of specifications submitted by the manufacturer;
- 1.2** determine the performance of the equipment;
- 1.3** evaluate the safety features;
- 1.4** report the results of the tests.

2 References

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

- | | |
|---------------|--|
| PAES 411:2000 | Agricultural Structures – Slaughterhouse for Swine, Small and Large Animals – General Requirements |
| PAES 513:2008 | Slaughterhouse Equipment – Stunning Box/ Knocking Pen - Specifications |

3 Definitions

For the purpose of this standard, the definitions given in PAES 513 and the following shall apply:

3.1**live weight**

weight of animal prior to slaughter

3.2**overall height**

measurement from the highest point of the stunning box to its base

3.3**overall length**

measurement from the entrance gate of the stunning box to the opposite end of the equipment including all the protruding parts (e.g. chin lift)

3.4

overall width

measurement between the outer side of the walls of the stunning box

3.5

rotating angle

angle measured from the restraint's initial upright position to inverted position

3.6

rotating time

total time spent to rotate the restraint from its upright position to inverted position

3.7

vocalization

animal sound such as bellowing in cattle

4 General Conditions for Test and Inspection

4.1 Role of manufacturer/dealer

The manufacturer shall submit the operator's manual for stunning box and shall abide with the terms and conditions set forth by the official testing agency.

4.2 Role of the operator

An officially designated operator shall be skilled and shall be able to demonstrate, operate, adjust and repair matters related to the operation of the equipment.

4.3 Test site conditions

The stunning box shall be tested as installed in the slaughterhouse. The site should have ample provisions for material handling, temporary storage and workspace conforming to PAES 411.

4.4 Test instruments

The suggested list of minimum test instruments needed to carry out the stunning box test is shown in Annex A.

4.5 Test material

The animal to be used for testing shall be at least three (3) heads with a live weight of at least 500 kg each, depending on the capacity of the stunning box as specified by the manufacturer.

4.6 Termination of test for stunning box

If during the test, the stunning box encounters major component breakdown or malfunction, the test engineer shall terminate the test.

5 Test and Inspection

5.1 Verification of the manufacturer's technical data and information

This inspection is carried out to verify the mechanism, dimensions, materials and accessories of the stunning box in comparison with the list of manufacturer's technical data and information. Safety features of the stunning box shall be noted. All data shall be recorded in Annex B.

5.2 Performance test

This is carried out to obtain actual data on overall performance of the equipment.

5.2.1 Measurement of initial data

Initial data, such as weight of the test animal, shall be obtained and recorded in Annex C before the test operation.

5.2.2 Operation of the stunning box

The stunning box shall be tested by performing actual restraining and stunning of the animal. Inspection of the carcass after deheading shall be conducted. This procedure shall be repeated for the succeeding trial(s).

5.2.2.1 Upright type

5.2.2.1.1 The animal shall be allowed to enter the stunning box one at a time through the entrance gate.

5.2.2.1.2 The head of the animal shall be secured in the head gate and shall be released after stunning.

5.2.2.1.3 The stunned animal shall be removed from the stunning box through the discharge gate.

5.2.2.1.4 Vocalization of the animal in relation to restraint stress shall be noted.

5.2.2.1.5 Presence of neck or head injuries shall be noted.

5.2.2.1.6 All observations shall be recorded in Annex C.

5.2.2.1.7 The same procedure shall be conducted for the next animal.

5.2.2.2 Rotating type

5.2.2.2.1 The stunning box shall be pre-tested before loading animal.

5.2.2.2.2 The initial data of the stunning box without load such as rotating time, noise level and pressure required to rotate the restraint shall be obtained.

5.2.2.2.3 The animal shall be allowed to enter the stunning box one at a time through the entrance gate.

5.2.2.2.4 The animal's head shall be secured in the head gate and shall be released after stunning.

5.2.2.2.5 Stunned animal shall be removed from the stunning box through the opened top or through the side wall.

5.2.2.2.6 The actual pressure reading on the gauge, rotating time and the noise level with load shall be noted. The actual pressure reading shall be compared with the operating pressure specified by the manufacturer.

5.2.2.2.7 Presence of neck or head injuries shall be noted.

5.2.2.2.8 All data shall be recorded in Annex C.

5.2.2.2.9 The same procedure shall be done for the next animal.

5.3 Performance after test

The equipment shall be tested for performance after the slaughtering process. All data shall be recorded in Annex D.

5.3.1 Upright type

5.3.1.1 Welded parts/joints shall be observed for detachments.

5.3.1.2 Bolted joints and parts shall be observed.

5.3.1.3 Moving parts shall be observed for malfunctions.

5.3.2 Rotating type

5.3.2.1 The new rotating angle, rotating time and noise level without load shall be obtained and shall be compared with the initial data without load.

5.3.2.2 The new operating pressure shall be recorded.

5.3.2.3 Welded parts/joints shall be observed for detachments.

5.3.2.4 Bolted joints and parts shall be observed.

5.3.2.5 Moving parts shall be observed for malfunctions.

5.4 Test trial

There shall be at least three (3) trials with one (1) animal per trial.

6 Test Report

The test report shall include the following information in the order given:

6.1 Title

6.2 Summary

6.3 Purpose and Scope of Test

6.4 Methods of Test

6.5 Description of the Machine

Table 1 – Machine Specifications

6.6 Results and Discussions

6.7 Observations (include pictures)

Table 2 –Performance test data

6.8 Name(s), signature(s) and designation(s) of test engineer(s)

Annex A

Suggested List of Minimum Test Instruments

Items	Quantity
A.1 Test animal characteristics	
A.1.1 weighing scale, capacity: 1000 kg	1
A.1.2 tape measure, capacity: 5 m	1
A.2 Dimensions	
A.2.1 steel tape, capacity: 5m	1
A.2.2 Vernier caliper: 0.05 mm accuracy, 200mm length	1
A.3 Rotating time	
digital timer	1
A.4 Rotating angle	
protractor	1
steel tape, capacity: 5m	1
A.5 Calculations	
scientific calculator	1
A.6 Noise level	
noise level meter	1
A.7 Pressure	
Pressure gauge: 0-10 bars	1

Annex B
(informative)

Specifications of Stunning Box

Name of Applicant/ Distributor: _____
 Address: _____
 Tel No: _____
 Name of Manufacturer: _____
 Address: _____
 Tel No: _____

GENERAL INFORMATION

Classification: _____ Maximum Weight Capacity: _____
 Serial No: _____ Brand/Model: _____
 Production Date of Stunning Box to be Tested: _____
 Testing Agency: _____ Test Engineer: _____
 Date of Test: _____ Location of Test: _____

Items to be inspected

ITEMS	Manufacturer's Specification	Verification by the Testing agency
B.1 Type		
B.2. Main frame		
B.2.1 overall dimensions		
B.2.1.1 length, mm		
B.2.1.2 width, mm		
B.2.1.3 height, mm		
B.2.2 material		
B.2.2.1 type		
B.2.2.2 thickness. mm		
B.3 Entrance gate		
B.3.1 dimensions		
B.3.1.1 height, mm		
B.3.1.2 width, mm		
B.3.2 material		
B.4 Counterweight		
B.4.1 mass, kg		
B.4.2 material		
B.4.2.1 type		
B.4.2.2 thickness. mm		
B.5 Head gate		
B.5.1 material		
B.5.1.1 type		
B.5.1.2 thickness. mm		
B.5.2 chin lift		

ITEMS	Manufacturer's Specification	Verification by the Testing agency
B.5.2.1 material		
B.5.2.2 thickness. mm		
B.6 Discharge gate		
B.6.1 dimensions		
B.6.1.1 length, mm		
B.6.1.2 height, mm		
B.7 Welding points		
B.7.1 texture/finish		
B.7.2 type		
B.8. Cylinder (for rotating type)		
B.8.1 type		
B.8.2 bore, mm		
B.8.3 stroke, mm		
B.8.4 operating pressure range, bar		

ANNEX D

Performance After Test Data Sheet

Items to be Measured and Inspected:

ITEMS	REMARKS
D.1 Upright type	
D.1.1 condition of welded joints/parts	
D.1.2 condition of bolted joints/parts	
D.1.3 condition of moving parts	
D.2 Rotating type	
D.2.1 new rotating angle, deg	
D.2.2 new rotating time, sec	
D.2.3 new operating pressure, bar	
D.2.4 condition of welded joints/parts	
D.2.5 condition of bolted joints/parts	
D.2.6 condition of moving parts	
D.3 Other comments:	REMARKS