

Foreword

The pursuance 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 Services (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:

Marks’ Standard Handbook for Mechanical Engineers. 8th ed. 1978. McGraw-Hill Book Company. New York.

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

The Cattle Industry of the Region. http://home.websprinter.net/~dti10/products/cattle_ind1.htm. March 2008

Tordillo Jose Arvin S. *Mechanical Engineering Formulas*. 2002. DMC Busa Printers.

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1 Scope

This standard specifies the requirements for methods of test and inspection for platform. Specifically, it shall be used to:

- 1.1** verify the mechanism, dimensions, materials, accessories of the platform and the list of specifications submitted by the fabricator;
- 1.2** determine the performance of the equipment;
- 1.3** determine 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 523:2008** Agricultural Machinery – Platform – Specifications

3 Definitions

For the purpose of this standard, the definitions given in PAES 523 and the following shall apply:

3.1

bearing stress

force per unit area in contact like compressive and tensile stress

3.2

bending

flexural stress

stress that is caused by the bending moment at a given point in the beam supporting the platform

3.3

compressive stress

force per unit area, that tends to compress or shorten the material

3.4

dehiding time

time required to remove the skin of one (1) carcass, expressed in seconds

3.5

fracture

defect caused by the bending moment at a given point in the material under stress

3.6

leveling bubble

instrument used for checking whether a plane structure is flat and horizontally leveled

3.7

splitting time

time required to split one (1) carcass expressed in seconds

3.8

tensile stress

force per unit area that tends to elongate or create tension on the material submitted to it.

4 General Conditions for Test and Inspection

4.1 Role of fabricator

The fabricator shall submit the operator's manual, specifications and other relevant information about the platform 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 of the fabricator/dealer shall operate, adjust, repair, and shall decide on matters related to the operation of the machine as the case may be related to the operation of the equipment.

4.3 Test site conditions

The platform shall be tested on site for normal operation in a slaughterhouse. The site should have ample provisions for material handling and workspace and suitable for normal working condition conforming to PAES 411.

4.4 Test instruments

The instruments to be used shall have been calibrated and checked by the testing agency prior to the measurements. The suggested list of minimum test instrument and materials needed to carry out the platform test is shown in Annex A.

4.5 Test materials

4.5.1 Stationary Platform

4.5.1.1 Test weights

4.5.1.1.1 Test weight material characteristics

Test weights or fabricated weight materials such as solid metals; bagged sands, stones or gravels, etc.; or its combination, may be used during the performance test of the platform.

4.5.1.1.2 Quantity to be supplied

Fourteen (14) pieces of test weights or fabricated weight materials of at least 25 kg (55 lbs.) each shall be used.

4.5.2 Mechanized Platform

4.5.2.1 Test weights

4.5.2.1.1 Test weight materials characteristics

Test weights or fabricated weight materials such as solid metals; bagged sands, stones or gravels, etc.; or its combination, may be used during the performance test of the platform.

4.5.2.1.2 Quantity to be supplied

Fifteen (15) pieces of test weights or fabricated weight materials of at least 25 kg (55 lbs.) each shall be used.

4.6 Termination of test

If during the test run, the platform fails due to major component breakdown or malfunctions, the test engineer shall terminate the test.

5 Test and Inspection

5.1 Verification of the fabricator's technical data and information

5.1.1 This inspection is carried out to verify the mechanism, dimensions, materials and accessories of the platform in comparison with the list of fabricator's technical data and information.

5.1.2 The items to be inspected and verified shall be recorded in Annex B.

5.2 Performance test

5.2.1 This is carried out to obtain actual data on overall machine performance.

- 5.2.2** Initial data of the test weights shall be recorded.
- 5.2.3** Evaluation on the capacity of the platform statically and dynamically shall be verified.
- 5.2.4** Stationary Platform
 - 5.2.4.1** Maximum Load Test
 - 5.2.4.1.1** Fourteen (14) test weights shall be placed or equally distributed on the floor plate of the platform for the maximum load test.
 - 5.2.4.1.2** After setting up the test weights on the platform, manual application of slight vibration to the platform shall be done.
 - 5.2.4.1.3** Observations for any signs of failure in any part of the platform shall be recorded in Annex C.
 - 5.2.4.1.4** Visual inspection test shall be made on welded parts of the platform and shall be recorded in Annex C.2.1.1
 - 5.2.4.1.5** Checking whether the platform floor plate is flat and horizontally leveled shall be done using leveling bubble. Data gathered shall be recorded in Annex C.

5.2.4.2 Balance Test (for stationary platform)

An expert operator shall stand on the top of the platform and shall lean on the guard rail to test the dynamical balance of the platform. Observations shall be recorded to Annex C.

5.2.5 Mechanized Platform

- 5.2.5.1** Maximum Load Test
 - 5.2.5.1.1** Fifteen (15) test weights shall be placed on the floor plate of the platform for the maximum load test.
 - 5.2.5.1.2** After setting up the test weights, the platform shall be operated using the platform control valve or switch.
 - 5.2.5.1.3** The platform shall be made to move horizontally using the side travel switch.
 - 5.2.5.1.4** Observations for any signs of jerking when in motion and failure in any parts of the platform shall be recorded in Annex C.
 - 5.2.5.1.5** Visual inspection acceptance test shall be made on welded parts of the platform and shall be recorded in Annex C.2.2.4

5.2.5.1.6 Checking whether the platform floor plate is flat and horizontally leveled shall be done using leveling bubble. Data gathered shall be recorded in Annex C.

5.2.5.2 Speed Test

5.2.5.2.1 Platform Without Load

Platform shall be operated to move vertically and horizontally. The total vertical and horizontal length and time traveled by the platform shall be recorded and shall be used to obtain the vertical and horizontal speed of the platform without load.

5.2.5.2.2 Platform With Load

Fifteen (15) test weight of 25 kg (55 lbs.) each shall be loaded to the platform. The platform shall be operated to move vertically and horizontally. The total vertical and horizontal length and time traveled by the platform shall be recorded and shall be used to obtain the vertical and horizontal speed of the platform with load.

5.2.5.2.3 Percent Speed Reduction

The final percent speed reduction shall be obtained using the average percent speed reduction of vertical and horizontal movement of the platform.

5.2.6 Test trials

A minimum of three (3) test trials shall be adopted for the maximum load test and speed test.

5.2.7 Data collection

5.2.7.1 Power consumption

Supply power for electric and pneumatic type of mechanized platform shall be maintained and sustained for the entire operation.

Power consumption for oscillating platform is measured using a power meter.

5.2.7.2 Data recording and observations

Record sheet for all data and information during the test is given in Annex C.

6 Formula

The formulas to be used during calculations and testing are given in Annex D.

7 Test Report

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

7.1 Title

7.2 Summary

7.3 Purpose and Scope of Test

7.4 Methods of Test

7.5 Description of the Machine

Table 1 – Machine Specifications

7.6 Results and Discussions

7.7 Observations (include pictures)

Table 2 –Performance test data

7.8 Names, signatures and designation of test engineers

Annex A
(informative)

**Suggested Minimum List of
Test Instruments and Materials**

A.1	Instruments	Quantity
A.1.1	Tachometer (contact type or photo electric type) Range: 0 rpm to 5,000 rpm	1
A.1.2	Digital timers (range: 60 minutes) Accuracy: 0.1 sec	2
A.1.3	Tape measure (with maximum length of 5m)	1
A.1.5	Weighing scale (capacity: 1000 kg) Scale divisions: 500 g	1
	Weighing scale (capacity: 1000g) Scale divisions: 0.1 g	1
A.1.6	Power meter (for electric motors) 60 Hz, 220 V or Pressure gauge (for pneumatic)	1
A.1.7	Leveling bubble	1
A.1.8	Camera	1
A.2	Materials	
A.2.1	Labeling tags which include	20
A.2.2	Date of test	
A.2.3	Platform test	
A.2.4	Test weights	
A.2.5	Trial number	
A.2.6	Carcass	2
A.2.7	Labeling tags which include:	
A.2.7.1	Date of test	
A.2.7.2	Mechanized Platform test	
A.2.7.3	Sample source	
A.2.7.4	Breed	
A.2.7.5	Size	
A.2.7.6	Trial number	
A.2.7.7	Water bath	
A.2.6	Permanent pentel pen	1

Annex B
(informative)

Specifications of Platform

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

GENERAL INFORMATION

Make: _____ Type: _____
 Serial No: _____ Brand/Model: _____
 Production date of splitting saw 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 Stationary		
B.1.1 Maximum Load Capacity, kg		
B.1.2 Main structure		
B.1.2.1 Material		
B.1.2.2 Overall dimensions, mm		
B.1.2.2.1 length		
B.1.2.2.2 width		
B.1.2.2.3 height		
B.1.3 Floor Plate		
B.1.3.1 Material		
B.1.3.2 Height from floor line, mm		
B.1.3.3 Dimensions, mm		
B.1.3.3.1 Length		
B.1.3.3.2 Width		
B.1.3.3.3 thickness		
B.1.4 Guard Rail		
B.1.4.1 Material		
B.1.4.2 Diameter, mm		
B.1.5 Hand Rail		
B.1.5.1 Material		
B.1.5.2 Diameter, mm		
B.2 Mechanized		
B.2.1 Maximum Load Capacity		
B.2.2 Main structure		
B.2.2.1 Material		

ITEMS	Manufacturer's Specification	Verification by the Testing agency
B.2.2.2 Overall dimensions, mm		
B.2.2.2.1 length		
B.2.2.2.2 width		
B.2.2.2.3 height		
B.2.3 Floor Plate		
B.2.3.1 Material		
B.2.3.2 Maximum height from floor line, mm		
B.2.3.3 Vibration, Hz		
B.2.3.3 Dimensions, mm		
B.2.3.3.1 Length		
B.2.3.3.2 Width		
B.2.3.3.3 thickness		
B.2.4 Stairs		
B.2.4.1 Material		
B.2.4.2 Dimensions, mm		
B.2.4.2.1 Length		
B.2.4.2.2 Width		
B.2.4.2.3 Thickness		
B.2.5 Guard Rail		
B.2.5.1 Material		
B.2.5.2 Diameter, mm		
B.2.6 Hand Rail		
B.2.6.1 Material		
B.2.6.2 Diameter, mm		
B.2.7 Driving Mechanism		
B.2.7.1 Mechanical motor		
B.2.7.1.1 Brand		
B.2.7.1.2 Make or manufacturer		
B.2.7.1.3 Serial No.		
B.2.7.1.4 Type		
B.2.7.1.5 Rated Power, kW		
B.2.7.1.6 Rated Speed, rpm		
B.2.7.1.7 Frequency, Hz		
B.2.7.1.8 Voltage		
B.2.7.2 Pneumatic motor		
B.2.7.2.1 Brand		
B.2.7.2.2 Make or manufacturer		
B.2.7.2.3 Serial No.		
B.2.7.2.4 Type		
B.2.7.2.5 Rated Power, kW		
B.2.7.2.6 Rated Speed, rpm		
B.2.7.2.7 Working Pressure, psi		
B.2.7.3 Hydraulic motor		
B.2.7.3.1 Brand		
B.2.7.3.2 Make or manufacturer		
B.2.7.3.3 Serial No.		

ITEMS	Manufacturer's Specification	Verification by the Testing agency
B.2.7.3.4 Type		
B.2.7.3.5 Rated Power, kW		
B.2.7.3.6 Rated Speed, rpm		
B.2.7.3.7 Working Pressure, Pa		

Annex C
(informative)

Performance Test Data Sheet

Test Trial No. _____ Date: _____
 Test Engineer: _____ Location: _____
 Assistants: _____ Test Specimen: _____
 Test Requested by: _____ Manufacturer: _____

C.1 Information on the Test Materials (Maximum Load Test)	
C.1.1 Weight, kg	
C.1.2 Material	
C.1.3 Quantity	
C.1.3 Dimensions, mm	
C.1.3.1 Length	
C.1.3.2 Width	
C.1.3.3 Thickness	
C.1.3.4 Diameter (if tubular)	
C.2 Result of the Performance Test	
C.2.1 Stationary Platform	
C.2.1.1 Welding Acceptance test	
C.2.1.1.1 Crack prohibition	
C.2.1.2.2 Weld/base-metal fusion	
C.2.1.2.3 Crater cross section	
C.2.1.2.4 Weld profile	
C.2.1.2.5 Time of inspection	
C.2.1.2.6 Undersize welds (if any)	
C.2.1.2.7 Undercut	
C.2.1.2.8 Porosity	
C.2.2 Mechanized Platform	
C.2.2.1 Platform vertical speed, m/s	
C.2.2.1.1 Without load	
C.2.2.1.2 With load	
C.2.2.2 Platform horizontal speed, m/s	
C.2.2.2.1 Without Load	
C.2.2.2.2 With Load	
C.2.2.3 Noise Level, dB(A)	
C.2.2.3.1 Without load	
C.2.2.3.2 With load	
C.2.2.4 Power Consumption	
C.2.2.4.1 Power, kW	
C.2.2.4.1.1 Without load	
C.2.2.4.1.2 With load	
C.2.2.4.2 Voltage, V	

C.2.2.4.2.1	Without load	
C.2.2.4.2.2	With load	
C.2.2.4.3 Current, A		
C.2.2.4.3.1	Without load	
C.2.2.4.3.1	With load	
C.2.2.5 Welding Acceptance test		
C.2.2.5.1	Crack prohibition	
C.2.2.5.2	Weld/base-metal fusion	
C.2.2.5.3	Crater cross section	
C.2.2.5.4	Weld profile	
C.2.2.5.5	Time of inspection	
C.2.2.5.6	Undersize welds (if any)	
C.2.2.5.7	Undercut	
C.2.2.5.8	Porosity	

C.3 Platform performance

	Static	Dynamic
C.3.1 Stationary		
C.3.1.1	Load Capacity, kg	
C.3.1.2	Tensile Stress, kPa	
C.3.1.3	Flexural Stress, kPa	
C.3.1.4	Bearing Stress, kPa	
C.3.1.5 Floor plate is flat and leveled horizontally*		
C.3.1.6 Dynamically balanced*		
C.3.2 Mechanized		
C.3.2.1	Load Capacity, kg	
C.3.2.2	Vibration, Hz	
C.3.2.3	Electrical Energy Consumption, kW-h	
C.3.2.4	Tensile Stress, kPa	
C.3.2.5	Flexural Stress, kPa	
C.3.2.6	Bearing Stress, kPa	
C.3.2.7	Percent Speed Reduction	
C.3.2.8 Capable to maintain height when stationary*		
C.3.2.9 Floor plate is flat and leveled horizontally*		
C.3.2.10 Easily stops at any height*		
C.3.2.11 Smoothly descend and ascend*		
C.3.3 Failure		
C.3.3.1 Sagging*		
C.3.3.2 Fracture*		

* Yes or No

C.4 Rate the following observations:

Items	Rating*				
	1	2	3	4	5
C.4.1 Ease of cleaning parts					
C.4.2 Ease of adjusting and repair of parts					
C.4.3 Ease of operating					
C.4.4 Safety					
C.4.5 Vibration					
C.4.6 Accessibility of the switches/valves					
C.4.7 Accessibility of grease points					

- *1 – Very good
- 2 - Good
- 3 - Satisfactory
- 4 - Poor
- 5 – Very poor

C.5 Other Observations:

Annex D
(informative)

Formula Used During Calculations and Testing

D.1 Percent Speed Reduction

$$R_S = \left(1 - \frac{S_2}{S_1} \right) \times 100$$

where:

R_S = Percent speed reduction, %

S_1 = Speed of the mechanized platform without load, m/s

S_2 = Speed of the mechanized platform with load, m/s

D.2 Electrical energy consumption

$$E_c = P_c T_o$$

where:

E_c = Electrical energy consumption, kW-h

P_c = Power consumed, kW

T_o = Time of operation, h

D.3 Compressive Stress

$$\sigma = \frac{P}{A}$$

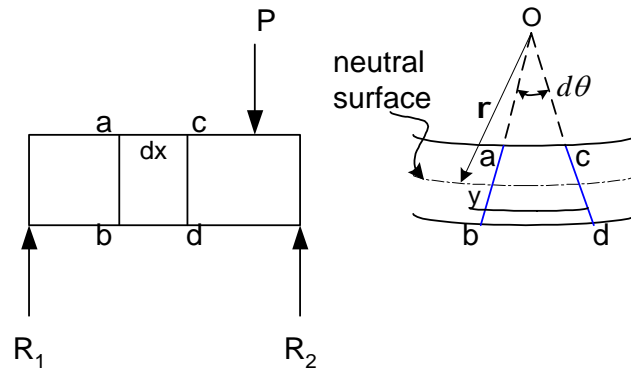
where:

σ = Average normal stress at any point on the cross-sectional area

P = Internal resultant normal force, which is applied through the centroid of the cross-sectional area

A = Cross-sectional area of the bar

D.4 Bending/Flexural Stress



$$\sigma = \frac{My}{I}$$
 the Flexure formula that relates the flexure stress with the bending moment

where:

σ = Bending/Flexural stress

M = Bending moment at a given point in the beam

y = Distance of fiber from the neutral axis

I = Moment of inertia of the cross-sectional area of the beam with respect to the neutral axis

$$\max \sigma = \frac{Mc}{I} \quad \text{or} \quad \max \sigma = \frac{M}{S} \quad S = \frac{I}{c}$$

where:

c = distance of the far most fiber from the neutral axis

S = section modulus of the cross-section

D.5 Bearing Stress

$$\sigma = \frac{P}{A}$$

where:

σ = Bearing stress

P = Internal resultant normal force, which is applied through the centroid of the cross-sectional area

A = Cross-sectional area in contact

