PHILIPPINE NATIONAL STANDARD

PNS/BAFS 310:2021
ICS 65.040.20

Slaughterhouse Equipment – Large Ruminant Restrainer – Specifications

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Foreword

In 2017, the Bureau of Agriculture and Fisheries Standards (BAFS) initiated the amendment of the Philippine Agricultural Engineering Standard (PAES) on Slaughterhouse Equipment – Stunning Box/Knocking Pen – Specifications (PAES 513:2008) upon the endorsement of the PAES Task Force. A Technical Working Group (TWG) was created through Special Order (SO) No. 487, series of 2017 (Creation of the TWG for the development of PNS for Cattle Restrainer and for the revision of PAES for Slaughterhouse and Lairage), SO No. 322, series of 2019 (Creation of Technical Committee [TC] and TWG for Agriculture and Fishery Products and Machinery, Tools, and Equipment), and SO No. 280, series of 2021 (Creation of TWG for the Development of Philippine National Standards [PNS] For Agriculture And Fishery Products, Machinery, and Equipment). This TWG was composed of representatives from the government agencies, academe, and private sector. The revised PAES, which is now a BAFS PNS, aimed to provide guidance to national and local authorities, engineers, technical personnel, traders, manufacturers, processors, and other relevant stakeholders on the restrainer design for the slaughterhouse of large ruminants intended for human consumption. The final draft standard was reviewed and finalized through a series of stakeholder consultations and TWG meetings conducted via online platforms.

This PNS/BAFS includes the following significant changes compared to the previous PAES:

1. Modification of format in accordance with ISO/IEC Directives Part 2 eighth edition;
2. Change of name of the slaughterhouse equipment from “Stunning Box/Knocking Pen” to “Large Ruminant Restrainer”;
3. Revision of the scope to include only general restrainers installed in slaughterhouses and limit the large ruminants to carabao and cattle only;
4. Modify classification of restrainer;
5. Inclusion of these references: “PAES 192:2016 Agricultural Machinery – Guidelines of After-Sales Service” and “Republic Act (RA) 8485 as amended by RA 10631”
6. Revision and deletion of some terms and definitions under Clause 3 and use the term “restrainer” throughout the document;
7. Addition of figures for different classifications of restrainer;
8. Deletion of the sketch illustrations for restrainer parts;
9. Deletion of the provision for the rotating-type cattle restrainer;
10. Inclusion of the butcher’s platform/flooring and discharge landing platform as integral component of the cattle restrainer;
11. Addition of the provision for emergency stop;
12. Addition of noise level for ruminant and operator’s safety;
13. Deletion of the provision for the prohibition of paint; and
14. Inclusion of Occupational Safety and Health Standard (OSHS) Rule 1074.01-1074.03 requirements attached as Annex A.

This standard cancels and replaces the PAES 513:2008 Slaughterhouse Equipment – Stunning Box/ Knocking Pen – Specifications.

This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2.

Content

1 Scope

This standard specifies the fabrication and performance requirements for restrainer intended for large ruminants such as cattle and carabao.

2 Normative References

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

Agricultural Machinery Testing and Evaluation Center – University of the Philippines Los Baños (AMTEC-UPLB). (2000). Agricultural machinery – Operator's manual – Content and presentation (PAES 102: 2000)
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Republic of the Philippines. (2013). An act amending certain sections of Republic Act No. 8485, otherwise known as "The Animal Welfare Act of 1998" (Republic Act No. 10631).
https://www.officialgazette.gov.ph/downloads/2013/10oct/20131003-RA-10631-BSA.pdf

3 Terms and Definitions

For the purpose of this standard, the following terms and definitions shall apply.

3.1
large ruminant
refers to cattle and carabao or water buffalo

3.2
restrainer
stunning box
knocking pen
slaughterhouse equipment used to immobilize or limit the movement of the large ruminant to facilitate stunning

3.2.1
discharge gate
part of the restrainer which opens to release the ruminant after stunning

3.2.2
entrance gate
part of the restrainer where the ruminant enters

3.2.3
head gate
part of the restrainer which secures the head of the ruminant during restraining

3.2.4
rump pusher
part of the restrainer which pushes the ruminant forward towards the head gate

3.2.5
chin lift
part of the head gate which positions the head of the ruminant to facilitate stunning

3.3
stunning
procedure for rendering the ruminant unconscious and insensible to pain

4 Classification

Restrainers can be classified as follows:

4.1 Simple box

A simple box restrainer should have a discharge gate that either slide vertically upwards or pivot round to eject the ruminant once it has been stunned.

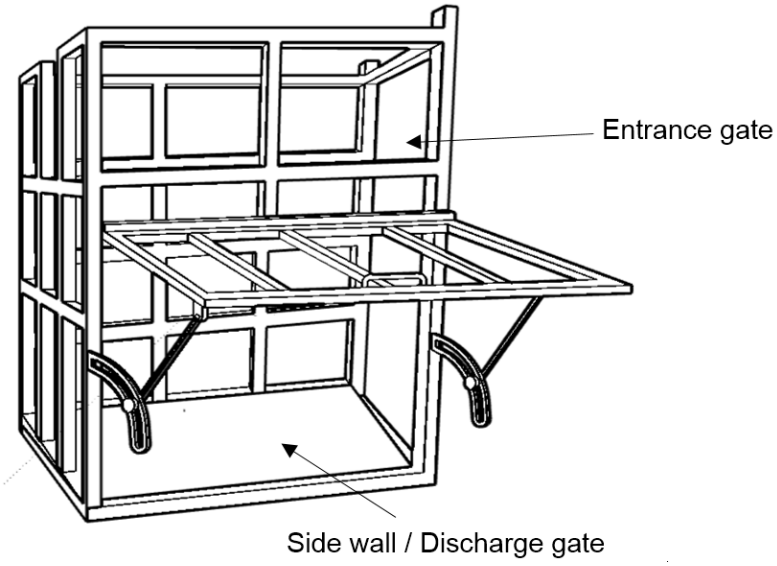

Figure 1 - Simple box large ruminant restrainer

4.2 Simple box with passive restraint (semi-mechanized)

A simple box with passive restraint should be a combination of moving and/or non-moving parts to facilitate the placement of the ruminant's head to a position accessible to the stunning operator.

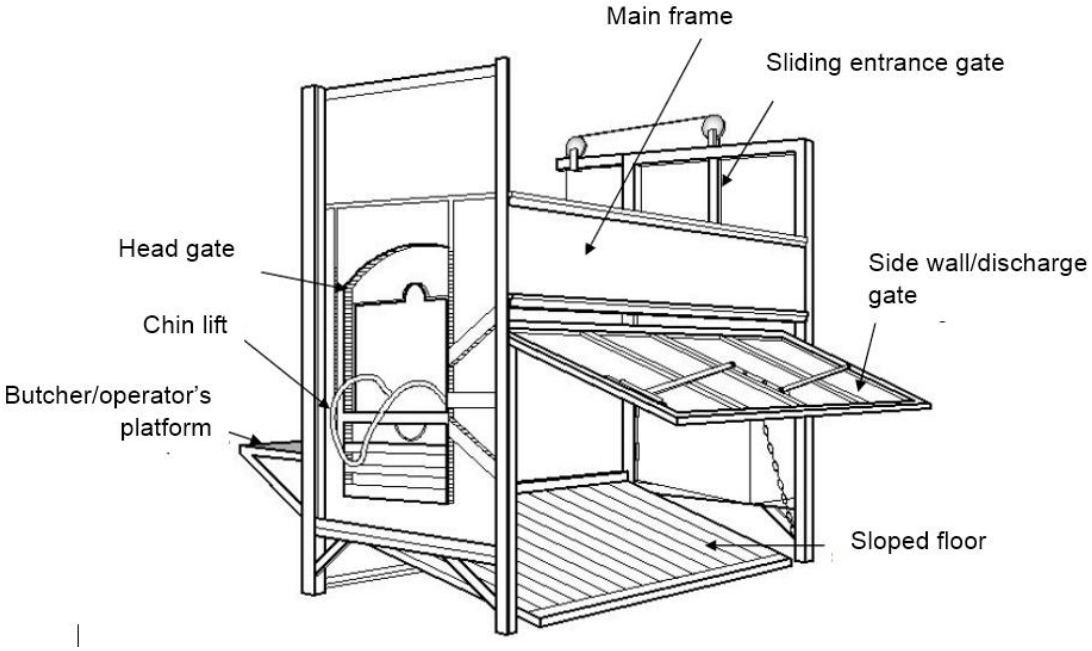

Figure 2 - Simple box with passive restraint

4.3 Simple box with active restraint (fully mechanized)

A simple box with pneumatic- or hydraulic-driven active restraints should have a yoke that catches the neck, a chin lift that raises the ruminant's head and jaw upwards and/or with the body of the ruminant, and a rump pusher to stabilize the ruminant during stunning.

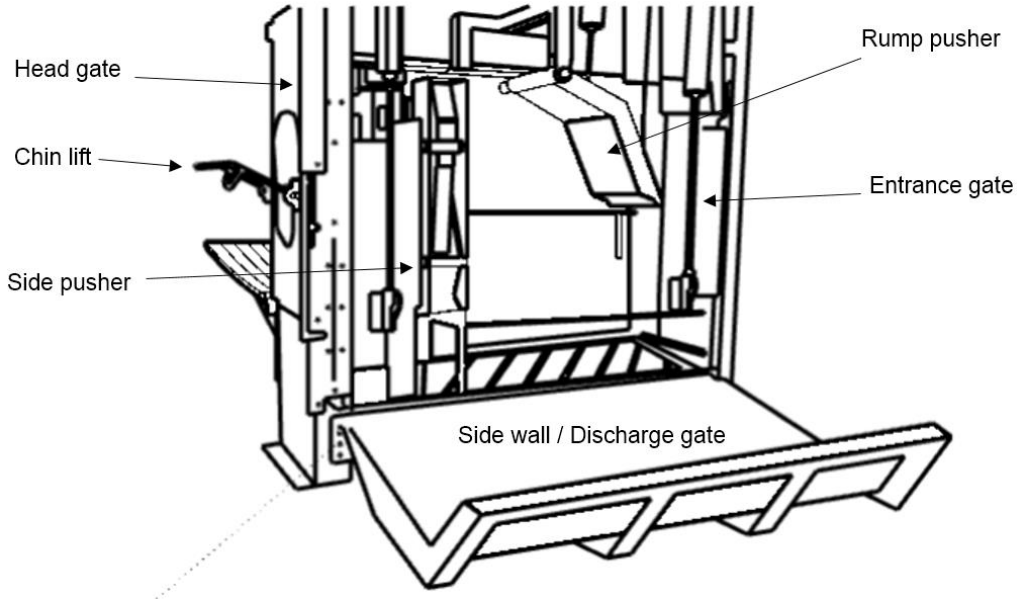

Figure 3 - Simple box with active restraint

5 Principle of Operation

5.1 Simple Box

The ruminant shall be allowed to enter the restrainer through the entrance gate. The highly skilled operator shall proceed with the stunning procedure. The stunned ruminant shall be removed from the restrainer through the discharge gate. The operators should be highly skilled to stun the ruminant consistently and accurately, as the ruminant's head is free and fully mobile.

5.2 Simple Box with passive or active restraint

The ruminant shall be allowed to enter the restrainer through the entrance gate. As the entrance gate is closed, the rump pusher shall push the ruminant into the head gate. The chin lift of the head gate shall then be raised. Afterwards, the operator shall then proceed with the stunning procedure. Finally, the stunned ruminant shall be removed from the restrainer through the discharge gate.

Long-horned ruminants that cannot enter the restrainer shall be treated separately with special consideration in accordance with Republic Act No. 8485 (Animal Welfare Act of the Philippines of 1998), amended as Republic Act No. 10631.

6 Fabrication Requirement

6.1 General Requirement

6.1.1 Generally, the restrainer should be made of corrosion-resistant materials. It shall be of the same floor elevation with the entrance chute.

6.1.2 The restrainer, regardless of the type, shall be humanely constructed in accordance with Republic Act No. 10631.

6.1.3 The flooring material from the chute to the restrainer box shall be of similar color or material to prevent balking. Non-slip flooring shall be provided so that the ruminant can stand without losing its footing. It can be made of stamped pattern of raised expanded metal into the wet concrete or rubber /flat steel mats.

6.1.4 The restrainer shall consist of entrance gate, flooring, side wall, counterweight, and discharge gate. For semi- and fully-mechanized types, there shall be rump pushers and head gate.

6.1.5 For simple box and semi-mechanized types, the vertical entrance gates shall be counterweighted to prevent back bruises. The bottom of this gate should be padded with rubber or conveyor belting to prevent back bruises to the ruminant.

6.1.6 For simple box and semi-mechanized types, the counterweight shall be made of corrosion-resistant material. It shall be connected to the entrance gate or the side wall through corrosion-resistant chains or cable.

6.1.7 The restrainer shall be designed in such a way that it can hold the ruminant in upright position before and during stunning.

6.1.8 The simple box restrainer shall have a concrete or metal inclined slider, which shall ease the discharge of the stunned ruminant.

6.1.9 The main frame for the discharge gate shall be constructed from a channel bar (minimum of 6 mm thickness) and shall be made of corrosion-resistant material.

6.1.10 The restrainer shall have a side wall that will serve as a discharge gate. The discharge gate shall be reinforced with steel support frames for added strength.

6.1.11 The inner side walls, head gate, rump pusher, and other parts of the restrainer that are in contact with the ruminant shall have smooth surfaces and round edges.

6.1.12 For a restrainer with active restraint, a pressure gauge within a range of 0 bar to 10 bars and of at least 70 mm diameter shall be installed within the view of the operator.

6.1.13 For simple box with pneumatic-driven active restraint, silencers shall be installed to reduce the noise produced by a pneumatic cylinder.

6.2 Welding requirements

6.2.1 All welded parts shall be fully welded and smoothly polished. It shall pass the visual inspection criteria (AWS D1.1:2000 - Structural welding code – Steel) for discontinuity of the material.

6.2.2 There shall be no crack or gap on the welded area. There shall be fusion between adjacent layers of the weld metal and between the weld metal and intermittent fillet welds outside of their effective length.

6.2.3 The weld profiles should be in its acceptable form.

6.2.4 The welded joints shall not be less than 4mm site fillet weld.

6.2.5 The undercut shall not exceed 2 mm (1/16 in) for any length of weld.

7 Installation Requirements

7.1 The vertical entrance gate of the restrainer shall be rigidly attached to the wall of the slaughterhouse.

7.2 The base of the restrainer should be mounted or bolted on the flooring or provided with foundation, as applicable.

7.3 There shall be a butcher's platform or flooring installed at the fixed side of the restrainer for safety and ease of operation.

7.4 There shall be a provision for a discharge landing platform for the stunned ruminant.

8 Performance Requirements

8.1 Generally, the restrainer shall be able to secure the ruminant without giving unnecessary stress to it.

8.2 The ruminant shall be able to stand inside the restrainer without losing its footing.

8.3 The head gate shall not cause neck or head injuries to the ruminant during the restraining and stunning processes.

8.4 For simple box with passive and active restraint, the ruminant shall not be able to move its head once secured in the head gate.

8.5 For simple box with active restraint, the pressure from the pump or compressor shall be sufficient to restrain the large ruminant. The operating pressure shall comply with the specifications of the manufacturer.

8.6 The discharge landing platform shall have a maximum of gap spacing of 76.2 mm that is enough to prevent the hoof of the ruminant to pass through between the grates.

8.7 The maximum permissible noise level of the restrainer shall be less than 90 dB(A) to avoid shock and/or stress to the ruminant before and during restraining and stunning process.

8.8 The maximum weight capacity designed by the manufacturer shall be attained.

9 Safety, Workmanship and Finish

9.1 The large ruminant restrainer shall have a rust-free finish. It shall be free from sharp edges, and manufacturing defects.

9.2 The safety locks, as applicable, should be present to avoid accidents.

9.3 For simple box with passive or active restraint, there shall be a provision for emergency stop.

9.4 For the operator's safety, the noise level of the restrainer should conform with the provision given in Annex A (Occupational Safety and Health Standard (Rule 1074.01 – 1074.03)

10 Warranty of Construction

Warranty shall be provided for parts and services except for normal wear and tear of expendable or consumable maintenance parts for at least one (1) year upon the acceptance of the procuring entity of the equipment. General requirements of the warranty and other after-sales service shall conform to PNS/BAFS 192:2016 (Agricultural machinery – Guidelines on After-Sales Services).

11 Maintenance and Operation

11.1 The operator's manual based on the PAES 102:2000 (Agricultural Machinery – Operator's Manual – Content and Presentation), maintenance schedule, and a list of warrantable parts of the large ruminant restrainer shall be provided.

11.2 The grease points for lubrication of mechanical parts shall be provided.

11.3 Food grade grease and oil shall be used, as applicable.

11.4 The restrainer made with materials other than corrosion-resistant materials shall be provided with strict maintenance provision set by the manufacturer.

12 Testing

The testing of the restrainer shall be conducted as installed in the slaughterhouse during commission. The restrainer shall be tested for performance in accordance with PNS/BAFS XXX:2021 Large Ruminant Restrainer – Methods of Test.

13 Marking and Labeling

13.1 The large ruminant restrainer shall be marked at the most visible place with the following information using a plate, stencil, or by directly punching it:

13.1.1 Brand name or registered trademark of the manufacturer;

13.1.2 Model and/or serial number;

13.1.3 Year of manufacture/fabricated;

13.1.4 Maximum weight capacity (kg);

13.1.5 Maximum working pressure, if applicable;

13.1.6 Name, address, and contact number of the manufacturer/importer/distributor; and

13.1.7 Country of manufacture (if imported)/ “Made in the Philippines” (if manufactured in the Philippines).

13.2 The safety or precautionary markings shall be provided. The markings shall be stated in English or Filipino and shall be printed in black color (lettering) with a yellow background.

13.3 The markings shall be durably bonded to the base surface material. The markings shall be all weather resistant and under normal cleaning procedures. It shall not fade, discolor, peel, crack or blister, and shall remain legible.

Annex A
(informative)

Occupational Safety and Health Standard (Rule 1074.01 – 1074.03)

A.1 Threshold Limit Values for Noise

The threshold limit values refer to sound pressure that represents conditions under which it is believed that nearly all workers may be repeatedly exposed without adverse effect on their ability to hear and understand normal speech.

Feasible administrative or engineering controls shall be utilized when workers are exposed to sound levels exceeding those specified in Table 2 hereof when measured on a scale of a standard sound level meter at slow response. If such controls fail to reduce sound within the specified levels, ear protective devices capable of bringing the sound level to permissible noise exposure shall be provided by the employer and used by the worker.

A.2 Permissible Noise Exposure

A.2.1 The values specified in Table 2 apply to total time of exposure per working day regardless of whether this is one continuous exposure or a number of short-term exposures but does not apply to impact or impulsive type of noise.

Table 2 - Permissible Noise Exposure

Duration per day, hours	Sound Levels [dB(A)], slow response
8	90
6	92
4	95
3	97
2	100
1½	102
1	105
½	110
¼	115

A.2.2 If the variation in noise level involves maximum intervals of one (1) second or less, it shall be considered as continuous. If the interval is over one (1) second, it becomes impulse or impact noise.

A.2.3 When the daily noise exposure is composed of two or more periods noise exposure of different levels, their combined effect should be considered rather than the effect of each.

If the sum of Equation A exceeds one (1), then the mixed exposure should be considered to exceed the threshold limit value. However, the permissible levels found in the table shall not be exceeded for the corresponding number of hours per day allowed. Noise exposures of less than 90 dBA are not covered by Equation A.

$$X = \frac{C_1}{T_1} + \frac{C_2}{T_2} + \frac{C_3}{T_3} \qquad (Equation\ A)$$

where: X is the sum of the ratios of C and T
C is the total time of exposure at a specified noise level
T is the total time of exposure permitted at the level

A.2.4 Exposures to impulsive or impact noise shall not exceed 140 dB (A) peak sound pressures level (ceiling value).

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