

PHILIPPINE NATIONAL STANDARD

PNS/BAFS PAES 252:2018
ICS 65.060.99

Agricultural Machinery – Corn Mill – Methods of Test



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Foreword

The Philippine National Standard (PNS) for Agricultural Machinery – Corn Mill – Specifications (PNS/BAFS PAES 252:2018) has been prepared by the Technical Working Group (TWG) for Silo and Corn Mill as per approved Department of Agriculture Special Order (SO) No. 238 Series of 2017 and SO No. 554 Series of 2018.

This Standard cancels and replaces the provisions recommended by PAES 211:2000 Agricultural Machinery – Corn Mill – Methods of Test.

This edition includes the following significant changes compared to the previous edition:

- Revision of terms “requesting party” and “manufacturer/distributor/dealer to “test applicant”;
- Addition of “test applicant” in the terms and definition;
- Addition of provision on termination of test;
- Addition of provision on the duration of loading, operating, and output time;
- Addition of Clause 9 Presentation of Results;
- Deletion of Annex B Test Materials for Corn Mill and incorporation of its contents to Clause 5.3;
- Modification of the variety of required test material from “hybrid” to “white flint corn”;
- Modification of the amount of required test materials, number of test trials, and duration of each test trial;
- Deletion of analysis of by-product in Annex E Laboratory Analysis;
- Revision of method of determination and formula of main product and by-product recovery.

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

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.

1 Scope

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

- 1.1 verify the mechanism, main dimensions, materials, accessories of the corn mill and the list of specifications submitted by the manufacturer;
- 1.2 determine the performance of the machine;
- 1.3 evaluate the ease of handling and safety features;
- 1.4 analyze the main product and by-products of corn milling through laboratory analysis; and
- 1.5 report the results of the tests.

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.

PNS/BAFS PAES 251:2018, *Agricultural Machinery – Corn Mill – Specifications*

PAES 103:2000, *Agricultural Machinery – Methods of Sampling*

ISO 6540:1980, *Maize – Determination of moisture content (on milled kernels and whole kernels)*

3 Terms and Definitions

For the purpose of this standard, the definitions given in PNS/BAFS PAES 251:2018 and the following shall apply.

3.1

aspirator

blower

cleaner that uses air to separate lower density material from the corn kernels/corn grits such as floured corn, germ, bran, and other foreign matters

3.2

bulk density

ratio of the weight (kg) of the corn kernels to its volume (m³)

3.3

degermed corn kernels

shelled corn kernels where the germ, tip cap, and pericarp have been removed

3.4

foreign matter

impurity

any matter which is not corn kernels/corn grits or fragment of corn kernels/corn grits such as corn cobs, sand, gravel, dirt, pebbles, stones, lumps of earth, clay, mud, weeds and other crop seeds

3.5

input capacity

weight of shelled corn kernels loaded from the hopper/intake pit per unit time, expressed in kilogram per hour (kg/h)

3.6

laboratory sieve shaker

equipment with shaking motion used to sort the size of the milled materials using standard screen sieves

3.7

moisture content (wet basis)

amount of moisture in the corn kernels expressed as percent of the total weight of the sample

3.8

output capacity

total weight of the main products collected per unit of time, expressed in kilograms per hour (kg/h)

3.9

overall height

distance between the horizontal supporting plane surface and the horizontal plane touching the uppermost part of the corn mill

3.10

overall length

distance between the vertical planes at the right angles to the median plane of the corn mill and touching its front and rear extremities

3.11

overall width

distance between the vertical planes parallel to the median plane of the machine, each plane touching the outermost point of the corn mill on its respective side

3.12

precleaner

auxiliary device of the corn mill that removes foreign matter

3.13

prime mover

electric motor or fuel engine used to run the corn mill

3.14

purity

ratio of the weight of clean corn kernels, to the total weight of unclean corn kernels, expressed in percent (%)

3.15

test applicant

manufacturer, direct importer, or any legitimate distributor, dealer, or end-user of the machine

4 General Conditions for Test

4.1 Selection of corn mill to be tested

Corn mill submitted for testing shall be sampled in accordance to PAES 103:2000 or any other suitable method of selection.

4.2 Role of the test applicant

The test applicant shall submit specifications and other relevant information about the corn mill. They shall abide with the terms and conditions set forth by the official testing agency, provide testing materials and shoulder other variable costs to carry out the test.

4.3 Role of the representative of the test applicant

An officially designated representative of the test applicant shall operate, demonstrate, adjust, repair as the case maybe and decide on matters related to the operation of the machine.

4.4 Test site conditions

The corn mill shall be tested and installed for normal operation. The site should have ample provisions for material handling, temporary storage, workspace and suitable for normal working condition. Adequate ventilation and lighting shall be provided in the area.

4.5 Suspension/Termination of test

If during the test run, the machine stops due to breakdown or malfunction so as to affect the machine's performance, the test may be suspended. If the machine will not be able to continue operation, the test shall be terminated.

5 Test Preparation

5.1 Preparation of the corn mill for testing

The representative of the test applicant and testing agency shall check the corn mill so as to ensure that the machine has been assembled and installed in accordance

with the instruction of the manufacturer. The official testing agency will test the corn mill according to the desired output of the manufacturer.

5.2 Test instruments and other materials

The suggested list of minimum field and laboratory test equipment and materials needed to carry out the corn mill test is shown in Annex A. These instruments shall be calibrated regularly. Before and after each test, these instruments shall be physically checked for operation and shall be cleaned, respectively. A checklist of instruments and materials to be used before departure to and from the testing area shall be prepared.

5.3 Test materials

The corn kernels to be used shall be from commonly or locally grown white corn flint variety with at most 14% uniform moisture content (wet basis) and at least 95% purity. The amount of test material to be supplied shall be sufficient for at least one hour of milling operation. The excess amount shall be used for laboratory tests and running-in prior to the actual conduct of test trials. Prepare the sample in such a way that test sample to be used for the running-in and in each test trial shall have identical characteristics in terms of moisture content, purity and variety. However, if the test materials are not conforming to the recommended quantity and characteristics, the test engineer shall not pursue the test.

5.4 Running-in and preliminary adjustments

The corn mill shall have undergone a running-in period before starting the test. During the running-in period, the various adjustments of the machine shall be made according to the recommendation of the manufacturer.

6 Pre-test observation

6.1 Verification of specifications

The specifications claimed by the manufacturer and the physical details given in Annex B shall be verified by the testing agency. A stable and level surface shall be used as reference plane for verification of dimensional machine specifications.

6.2 Test samples

Representative test samples shall be collected by the testing agency from the test material for analysis. Sampling procedure is shown in Annex C.

7 Performance test

7.1 Operation of the corn mill

The corn mill shall be operated for sufficient duration with load at the test site by the official representative of the test applicant using the manufacturer's recommended setting. The testing agency shall make all measurements, which form part of the test

and take the prescribed samples. After the test run, the area shall be cleaned and then prepared for the next test trial. This procedure shall be repeated for the succeeding test trials.

NOTE No other adjustments shall be permitted during the test.

7.2 Test Trials

A minimum of three (3) test trials, with duration of at least fifteen (15) minutes per trial, shall be adopted.

7.3 Sampling

Samples shall be collected at different outlets during each test trial. Sampling procedure is shown in Annex C.

7.4 Data collection

7.4.1 Duration of test

The loading time shall start at the feeding of the corn kernels from the intake hopper/intake pit and ends when there is no more corn kernel in the hopper.

The operating time shall start at the feeding of the corn kernels from the intake hopper/intake pit and ends after the last discharge of the main products at the product outlet.

The output time shall start from the first discharge of the corn grits at the product outlet and shall end after the last discharge of corn grits.

7.4.2 Noise level

7.4.2.1 The sound emitted by the machine, with and without load, shall be measured using a sound level meter at the location of the operator/s. The noise level, expressed in decibel [dB (A)], shall be measured 50 mm away from the ear level of the operator/s.

7.4.2.2 For each data to be taken, there shall be a minimum of five (5) observations. Before taking data, it should be ensured that the feed rate, speed, and other functional characteristics have stabilized. The time of recording shall be properly spaced during the whole duration of the test trial.

7.4.3 Power requirement/Fuel consumption

7.4.3.1 Using electric motor as prime mover

Use a power meter to measure the voltage, current, and the total electric power requirement of the corn mill. There shall be three (3) sets of data with a minimum of five (5) observations per set taken with and without load.

7.4.3.2 Using engine as prime mover

To get the amount of fuel consumed, the tank shall be filled to full capacity before the test. After the test, fill the tank with measured fuel to the same level before the test. When filling up the tank, careful attention shall be paid to keep the tank horizontal and not to leave empty space in the tank.

7.4.4 Speed of components

The speed of the rotating shafts of the major components of the corn mill shall be taken using a tachometer with and without load. For each data to be collected, there shall be a minimum of five (5) observations.

Requirements for each data to be taken shall conform to Clause 7.4.2.2.

7.4.5 Data recording and observations

Record sheet for all data and information during the test is given in Annex D. Observations to be taken during the performance test should be recorded in this sheet.

8 Laboratory Analysis

This is carried out to analyze the kernel samples taken during the performance test.

8.1 Laboratory analysis shall be made to determine the degermer efficiency, losses and percentage of corn grits of other sizes from each outlet. The laboratory procedures to be followed in the analysis are given in Annex E and the data sheet to be used is given in Annex F.

8.2 The percentage of corn grits of other sizes from each outlet shall be determined using a laboratory sieve shaker with sieves of the same sizes as in the corn mill.

9 Presentation of Results

Machine specifications and the results of the test shall be presented in tabular form in which data shall be taken from Annexes B and D. A schematic diagram of the power transmission system shall also be included. Observations made on the machine while in operation shall be supported with photographs.

10 Formula

The formula to be used during calculations and testing are given in Annex G.

11 Test Report

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

11.1 Name of testing agency

11.2 Test report number

- 11.3** Title
- 11.4** Summary of Results
- 11.5** Purpose and Scope of Test
- 11.6** Methods of Test
- 11.7** Conditions of the Machine
- 11.8** Description of the Machine
- 11.9** Results and Discussions
- 11.10** Observations (include pictures)
- 11.11** Names, Signatures, and Designation of Test Engineers

Annex A
(informative)

**Minimum List of Field and Laboratory
Test Equipment and Materials**

A.1	Equipment	Quantity
A.1.1	Performance Test	
A.1.1.1	Grain Moisture Meter (duly calibrated using the standard method)	1
A.1.1.2	Tachometer (contact type or photo electric type)	1
A.1.1.3	Timers Maximum Resolution: 0.1 sec	2
A.1.1.4	Measuring Tape (minimum: 5m)	1
A.1.1.5	Sound Level Meter Range: 30 to 130 dB(A)	1
A.1.1.6	Weighing Scale Minimum Capacity: 100 kg; Maximum Scale divisions: 0.2 kg	1
A.1.1.7	Graduated Cylinder (for engines) (500- mL capacity) or Clamp-on type Power Meter (for electric motors)	1
A.1.1.8	Digital Camera	1
A.1.2	Laboratory Test	1
A.1.2.1	Analytical balance (Sensitivity: 0.1 g)	1
A.1.2.2	Magnifying Lens	1
A.1.2.3	Grain Sampler/Divider	1
A.1.2.4	US Standard Sieves (no. 10, 12, 14, 16, 18, 20, 25)	
A.2	Materials	
A.2.1	Sample Bags	
A.2.2	Labeling Tags which include:	
A.2.2.1	Date of test	
A.2.2.2	Machine on test	
A.2.2.3	Sample source	
A.2.2.4	Variety	
A.2.2.5	Trial number	

Annex B
(informative)

Specifications of Corn Mill

Name of Applicant : _____
 Address : _____
 Tel. No. : _____

Name of Manufacturer : _____
 Address : _____
 Tel. No. : _____

GENERAL INFORMATION

Make : _____ Type : _____
 Serial No. : _____ Brand/Model : _____
 Date of Manufacture : _____
 Testing Agency : _____ Test Engineer : _____
 Location of Test : _____ Date of Test : _____

Items to be inspected*

No.	ITEMS	Manufacturer's Specification	Verification by the Testing agency
B.1	Main Structure		
B.1.1	Overall dimensions (mm)		
B.1.1.1	Length		
B.1.1.2	Width		
B.1.1.3	Height		
B.1.2	Weight, without engine (kg), if applicable		
B.2	Prime mover		
B.2.1	Electric motor		
B.2.1.1	Brand		
B.2.1.2	Type		
B.2.1.3	Make or manufacturer		
B.2.1.4	Serial number		
B.2.1.5	Rated power (kW)		
B.2.1.6	Rated speed (rpm)		
B.2.1.7	Phase		
B.2.1.8	Voltage (V)		
B.2.1.9	Current (A)		
B.2.1.10	Frequency (Hz)		
B.2.2	Engine		
B.2.2.1	Brand		
B.2.2.2	Model		
B.2.2.3	Make or manufacturer		
B.2.2.4	Type		
B.2.2.5	Serial number		

No.	ITEMS	Manufacturer's Specification	Verification by the Testing agency
B.2.2.6	Rated power (kW)		
B.2.2.7	Rated speed (rpm)		
B.2.2.8	Displacement (cm ³)		
B.2.2.9	Cooling system		
B.2.2.10	Starting system		
B.2.2.11	Power transmission system		
B.3	Intake Hopper/Loading Pit		
B.3.1	Holding capacity (kg)		
B.3.2	Materials of construction		
B.3.3	Features		
B.4	Pre-cleaner		
B.4.1	Size (L x D), mm		
B.4.2	Materials of construction		
B.5	Degermer		
B.5.1	Type		
B.5.2	Size (L x D), mm		
B.5.3	Materials of construction		
B.6	Elevator(s)		
B.6.1	Type		
B.6.2	No. of units		
B.6.3	Size of buckets		
B.7	Grinder		
B.7.1	Type		
B.7.2	Dimensions, mm		
B.7.3	No. of units		
B.7.4	Materials of construction		
B.7.5	Other features		
B.8	Sifter		
B.8.1	Type		
B.8.2	Dimensions, mm		
B.8.3	No. of screens		
B.8.4	Size of perforations, mm		
B.8.5	Length of stroke per RPM, mm/RPM		
B.8.6	Materials of construction		
B.9	Type of cleaning device		
B.10	Safety devices		
B.11	Special features		

*if applicable

B.12 Corn milling process flow diagram

Annex C
(normative)

Sampling Procedures

C.1 Sampling procedures for corn kernels

The crop conditions such as purity, bulk density and moisture content of kernel to be used in each test trial shall be taken using “representative samples”, each weighing one (1) kilogram. This is done by taking samples, each at the top, middle, and bottom of the pile. Samples representing the materials for each test trial shall be placed in appropriate containers for laboratory analysis.

C.2 Sampling from different outlets

During each test trial, three samples each shall be collected from the outlets of the different components (degermer, grinder, sifter outlets, aspirator etc.) of the corn mill to be analyzed in the laboratory. The minimum amount of sample to be taken shall be twice as much as what is needed for a particular analysis. The excess sample shall be used for reference purposes or for an eventual second check in case of review.

C.3 Handling of Samples

All samples to be taken to the laboratory shall be placed in appropriate containers and properly labeled. If the sample is to be used for determining moisture content, it must be kept in dry and airtight containers. Care should be taken so as to prevent alterations of the conditions of the test samples.

Annex D
(informative)

Performance Test Data Sheet

Test Trial No. : _____ Date : _____
 Test Engineers : _____ Location : _____
 Assistants : _____ Machine : _____
 Test Applicant : _____ Manufacturer : _____

No.	ITEMS	Trial 1	Trial 2	Trial 3	AVE.
D.1	Conditions of Test Sample				
D.1.1	Variety				
D.1.2	Source				
D.1.3	Moisture content (%)				
D.1.4	Bulk density (kg/m ³)				
D.2	Weight of input (kg)				
D.3	Weight of main products (kg)				
D.3.1	Grit #10				
D.3.2	Grit #12				
D.3.3	Grit #14				
D.3.4	Grit #16				
D.3.5	Grit #18				
D.4	Weight of by-products (kg)				
D.4.1	Floured corn ("tiktik") and fine grits (grit 20 and 24)				
D.4.2	Bran ("tahop")				
D.5	Loading time (h)				
D.6	Input capacity (kg/h)				
D.7	Output capacity (kg/h)				
D.8	Total operating time (h)				
D.9	Milling capacity (kg/h)				
D.10	Total milling recovery				
D.10.1	Main product recovery (%)				
D.10.2	By-product recovery (%)				
D.11	Speed of components (rpm)				
D.11.1	Prime mover				
D.11.1.1	Without load				
D.11.1.2	With load				
D.11.2	Degermer shaft				
D.11.2.1	Without load				
D.11.2.2	With load				
D.11.3	Aspirator/blower shaft				
D.11.3.1	Without load				
D.11.3.2	With load				
D.11.4	Grinder shaft(s)				

No.	ITEMS	Trial 1	Trial 2	Trial 3	AVE.
D.11.4.1	Without load				
D.11.4.2	With load				
D.11.5	Oscillating/rotary screen shaft				
D.11.5.1	Without load				
D.11.5.2	With load				
D.12	Noise level [db(A)]				
D.12.1	Without load				
D.12.2	With load				
D.13	Power consumption				
D.13.1	Power (kW)				
D.13.1.1	Without load				
D.13.1.2	With load				
D.13.2	Current (A)				
D.13.2.1	Without load				
D.13.2.2	With load				
D.13.3	Voltage (V)				
D.13.3.1	Without load				
D.13.3.2	With load				
D.14	Fuel consumed (L)				
D.15	Fuel consumption rate (L/h)				
D.16	Specific Energy Consumption (kg/kW-h or kg/L)				

D.16 Observations:

D.16.1Ease of loading

D.16.2Ease of cleaning parts

D.16.3Ease of adjustments

D.16.4Ease of collecting output

D.16.5Safety

D.16.6 Labor requirements

D.16.7Failure or abnormalities that may be observed on the corn mill or its component parts during and after the milling operation.

D.16.8Others

Annex E
(normative)

Laboratory Analysis

E.1 Purity determination

Take three 500 g samples from the “representative samples” of the input. Clean the corn kernels to remove the impurities. The clean corn kernel shall be weighed and recorded.

E.2 Moisture content

This shall be taken using a calibrated meter or by oven method. Five samples shall be taken for moisture content determination using a calibrated moisture meter. Using oven method based on ISO 6540:1980, three samples of not less than 100 g each is drawn from the bulk corn kernel sample. The mean value determined from the 100 g samples shall be taken as the moisture content of the corn kernels.

E.3 Analysis of output to determine the degermer efficiency

Three 100 g samples shall be taken after the corn kernels passed through the degermer. These samples shall be analyzed to determine the percent degermed, undegermed and impurities.

E.4 Analysis of main products

In each test trial, take three 100 g samples from each main product outlet. Using laboratory sieve shaker with sieves of the same size with the main product to be analyzed, determine the percent of actual corn grit sizes and by-products present in the output from different main product outlets. The main product recovery shall be adjusted using the obtained percent of by-products in the output of the main product outlets.

E.5 Analysis of output from grinder to compare laboratory result with machine’s output

In each test trial, take three 100 g samples from the grinder output. Using laboratory sieve shaker with sieves of the same sizes (for the main product) with the corn mill, get the weight of the samples that remained on each sieve and determine the percentages of corn grits (main products). Compare the result with the output (main product) of the corn mill.

Annex F
(informative)

Laboratory Analysis Data Sheet

Machine Tested : _____ Date Tested : _____
 Analyzed by : _____ Date Analyzed : _____

F.1 Moisture Content Determination

F.1.1 Using calibrated moisture meter

Reading 1	Reading 2	Reading 3	Reading 4	Reading 5	Average

F.1.2 Oven Method (100g sample)

	Trial 1	Trial 2	Trial 3	Average
A. Final weight (g)				
B. Moisture Content (%)				

F.2 Purity Determination (500g sample)

	Trial 1	Trial 2	Trial 3	Average
A. Final weight (g)				
B. Purity (%)				

F.3 Analysis of output from degermer

	Trial 1	Trial 2	Trial 3	Ave
A. Initial weight of sample (g)				
B. Weight of degermed corn kernels (g)				
C. Weight of undegermed corn kernels (g)				
D. Weight of impurities (g)				

F.4 Analysis of main products (using laboratory sieve shaker)

	Weight (g)				Percentage Weight (%)
	Trial 1	Trial 2	Trial 3	Average	
A. Grit no. 10 outlet					
A.1 corn grits no. 10					
A.2 corn grits no. 12					
A.3 corn grits no. 14					
A.4 corn grits no. 16					
A.5 corn grits no. 18					
A.6 by-products					
B. Grit no. 12 outlet					
B.1 corn grits no. 10					
B.2 corn grits no. 12					

	Weight (g)				Percentage Weight (%)
	Trial 1	Trial 2	Trial 3	Average	
B.3 corn grits no. 14					
B.4 corn grits no. 16					
B.5 corn grits no. 18					
B.6 by-products					
C. Grit no. 14 outlet					
C.1 corn grits no. 10					
C.2 corn grits no. 12					
C.3 corn grits no. 14					
C.4 corn grits no. 16					
C.5 corn grits no. 18					
C.6 by-products					
D. Grits no. 16 outlet					
D.1 corn grits no. 10					
D.2 corn grits no. 12					
D.3 corn grits no. 14					
D.4 corn grits no. 16					
D.5 corn grits no. 18					
D.6 by-products					
E. Grits no. 18 outlet					
E.1 corn grits no. 10					
E.2 corn grits no. 12					
E.3 corn grits no. 14					
E.4 corn grits no. 16					
E.5 corn grits no. 18					
E.6 by-products					

F.5 Analysis of output from grinder (using Laboratory Sieve Shaker)

	Weight (g)				Percentage weight (%)
	Trial 1	Trial 2	Trial 3	Average	
A. Grit no. 10 outlet					
B. Grit no. 12 outlet					
C. Grit no. 14 outlet					
D. Grit no. 16 outlet					
E. Grit no. 18 outlet					

Annex G
(normative)

Formulas Used During Calculations and Testing

G.1 Moisture Content

$$MC, \%w.b. = \frac{M_o - M_1}{M_o} \times 100$$

where:

MC is the moisture content of sample (%)
 M_o is the initial weight of the sample (g)
 M_1 is the weight of the dried sample (g)

G.2 Input capacity

$$C_i = \frac{W_i}{T_l}$$

where:

C_i is the input capacity (kg/h)
 W_i is the weight of clean corn kernel input (kg)
 T_l is the loading time (h)

G.3 Output capacity

$$C_o = \frac{W_o}{T_o}$$

where:

C_o is the output capacity (kg/h)
 W_o is the weight of main product (kg)
 T_o is the output time (h)

G.4 Milling capacity

$$C_m = \frac{W_i}{T}$$

where:

C_m is the milling capacity (kg/h)
 W_i is the weight of input corn kernels (kg)
 T is the total operating time (h)

G.5 Main product recovery

$$R_m = \frac{W_o \times (1 - k)}{W_i} \times 100$$

where:

- R_m is the main product recovery (%)
- W_o is the weight of main product (kg)
- k is the percentage of by-products present in the output from main product outlets (in decimal form)
- W_i is the weight of input corn kernels (kg)

G.6 By-product recovery

$$R_b = \frac{W_b}{W_i} \times 100$$

where:

- R_b is the by-product recovery (%)
- W_b is the weight of by-product (kg)
- W_i is the weight of input corn kernels (kg)

G.7 Degermer Efficiency

$$E_d = \frac{W_d}{W_i} \times 100$$

where:

- E_d is degermer efficiency (%)
- W_d is the weight of degermed corn kernels (kg)
- W_i is the weight of input corn kernels (kg)

G.8 Losses

$$L = 100\% - (R_m + R_b)$$

where:

- L is the losses (%)
- R_m is main product recovery (%)
- R_b is by-product recovery (%)

G.9 Fuel or Electric energy consumption

G.9.1 Fuel consumption rate

$$F_{cr} = \frac{F_v}{T}$$

where:

F_{cr}	is the fuel consumption rate (L/h)
F_v	is the volume of fuel consumed (L)
T	is the total operating time (h)

G.9.2 Electric energy consumption

$$E_c = P_c \times T$$

where:

E_c	is the electric energy consumption (kW-h)
P_c	is the amount of power consumed (kW)
T	is the total operating time (h)

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**Department of Agriculture
Bureau of Agriculture and Fisheries Standards**

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