

PINEAPPLE FIBER - PRODUCT STANDARD - GRADING AND CLASSIFICATION

PNS/BAFS 318:2021

ILLUSTRATIVE GUIDE



Pineapple Fiber - Product Standard - Grading and Classification (PNS/BAFS 318:2021)

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Introductory Note

This Illustrative Guide (IG) supplements the Philippine National Standard (PNS) Pineapple Fiber - Product Standard - Grading and Classification (PNS/BAFS 31:/2021). The PNS establishes a system for grading and classifying commercial grades of pineapple fiber that is extracted from the leaves of the pineapple plant (*Ananas comosus* L. Merr.). In addition to the text-based provisions, this Guide also includes graphical presentations that further explain the grading and classification system for pineapple fiber.

The Technical Working Group (TWG) responsible for creating this Guide is composed of representatives from the Philippine Fiber Industry Development Authority (PhilFIDA), private sector organizations namely, T'Boli Farm Growers Multi-purpose Cooperative (TFGMPC) and Polo Samahang Nayon MPC, as well as civil society organizations. This TWG was officially created through two Special Orders (SO): SO No. 81, series of 2021 (Creation of TWG for the Development of PNS for Agriculture and Fishery Products, Machinery, and Equipment) and SO No. 817, series of 2021 (Addendum to Special Order 81, series of 2021 entitled, "Creation of TWG for the Development of PNS for Agriculture and Fishery Products, Machinery and Equipment").

This IG is designed to help readers further understand the PNS provisions, regardless of whether they are regulatory personnel, industry professionals, or individuals interested in pineapple fiber. Furthermore, it aims to provide further clarity, insights, and inspiration for the regulatory agency and the target industry to adopt and implement the PNS requirements.

Foreword

The DA-BAFS Technical Services Division (TSD) generated a Priority List for PNS Promotion for 2023 based on established prioritization criteria, which included the PNS Pineapple Fiber - Product Standard - Grading and Classification (PNS/BAFS 318/2021). This Standard establishes the requirements for grading and classifying commercial grades of pineapple fiber extracted from the leaves of the pineapple plant (*Ananas comosus* L. Merr.).

To assist regulatory officers of the PhilFIDA and other relevant stakeholders, an IG was developed to provide supplementary material to the standard, further clarify the text of the standard, and provide more specific details on the grading and classification system through visual representations. The TWG, created specifically for the purpose, assisted in completing the IG in 2023, given the expressed urgency for this supplementary material to facilitate trade.

To create this IG, a series of field data gathering (FDG) activities were conducted in Alfonso in Cavite, Balete in Aklan, T'boli and Polomolok in South Cotabato, and Labo in Camarines Norte. The photographs and other relevant information gathered during these FDG activities were incorporated into the supplementary material. The TWG discussed and finalized the draft through a series of meetings and writeshops over a period of 7 months (April to October 2023).

The IG serves as a reference material and practical guide for regulatory personnel and other interested stakeholders in navigating the challenges of grading and classifying pineapple fiber.

Director's Message



I am pleased to present the Illustrative Guide for the Philippine National Standard (PNS) Pineapple Fiber - Product Standard - Grading and Classification (PNS/BAFS 318/2021). Consistent with our desire to be more and more customer-oriented, this Guide is specifically designed to help you understand the PNS better and implement the specific provisions more clearly.

After conducting Focus Group Discussions (FGD) with regulatory agencies, we realized the need to improve and ensure a consistent understanding of the PNS. Technical terms can be difficult to interpret and the way the PNS texts on grading and classification are presented can vary, making it challenging to use. Therefore, we have created this Guide to make the PNS simpler to use and understand.

The Philippine Fiber Industry Development Authority (PhilFIDA) provided significant recommendations that led to the development of this Illustrative Guide. Our aim is to make it practical and meaningful, serving as a helpful resource for fiber inspectors in their regulatory activities. Our ultimate goal is to transform the PNS document into an empowering tool for all relevant stakeholders. By addressing challenges in implementing our PNS, we hope to create an environment where the PNS is understood, embraced, and effectively adopted.

I extend my sincere gratitude to the Technical Working Group (TWG) for their invaluable contributions to the development of this Illustrative Guide. Together, we strive for a future where the PNS is uniformly adopted and effectively implemented.

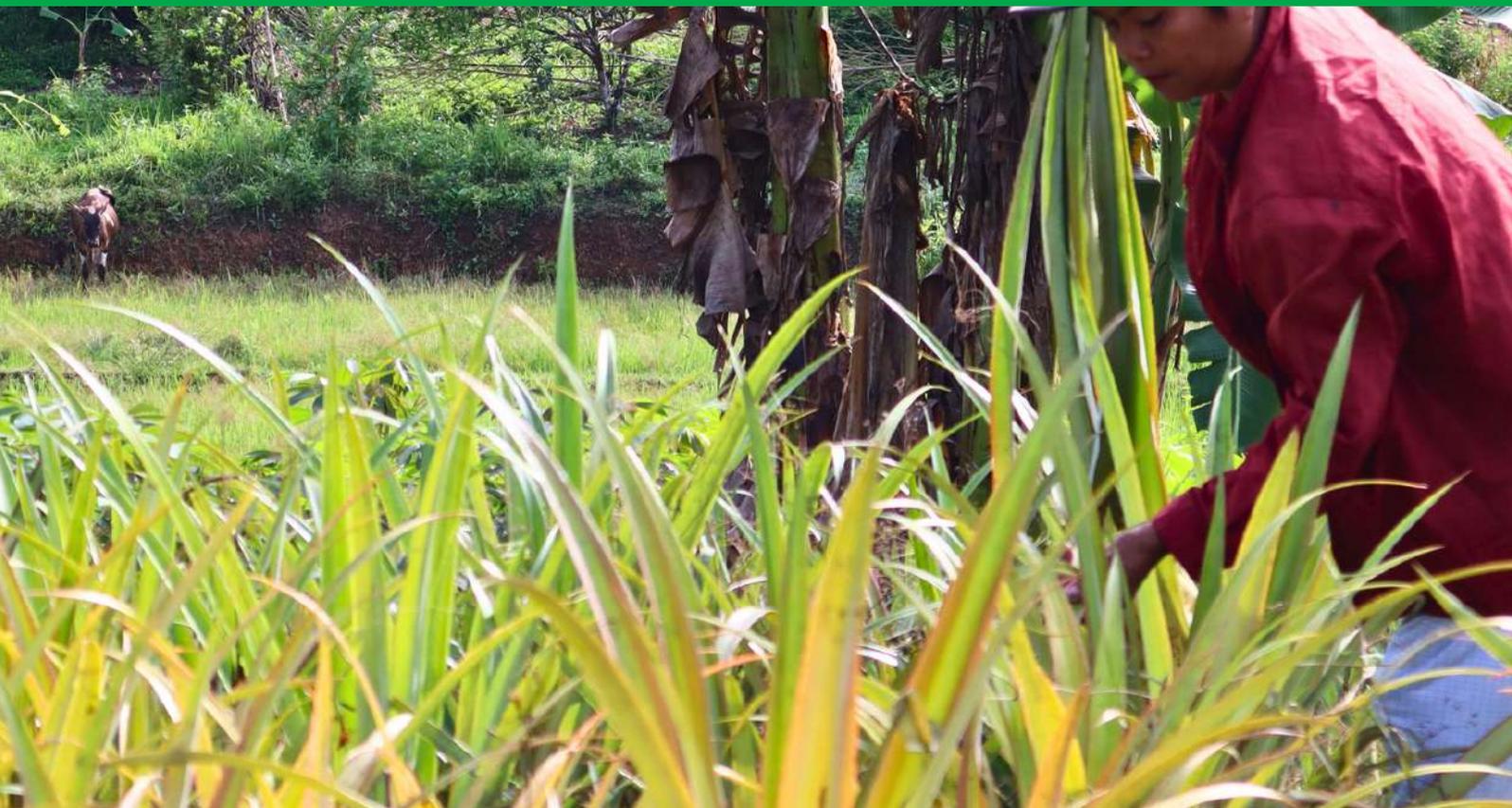
KAREN KRISTINE A. ROSCOM, PFT, PhD
Director IV

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Section 1

Scope



Scope

This Standard specifies requirements and establishes a system of grading and classification of commercial grades of pineapple fiber extracted from the leaves of pineapple plant (*Ananas comosus* L. Merr.). The pineapple varieties covered under this standard and their corresponding intended use/s are specified in Annex A (Pineapple varieties utilized for fiber production and their intended use/s).

Section 2

Normative References



Normative References

The following document is referred to in the text in such a way that some of its contents constitute the requirements of this document. For dated reference, only the latest edition applies. For updated reference, the latest edition of the referenced document (including any amendments) applies.

Department of Agriculture (DA) – Philippine Fiber Industry Development Authority (PhilFIDA). (2020). Rules and regulations to govern licensing, baling, tagging, marking, inspection, certification, and shipment of Philippine commercial fibers (DA – PhilFIDA Administrative Circular No. 12, series of 2020).

http://www.philfida.da.gov.ph/images/Issuances/administrative_circular/ac-no-12-s-2020-rules-and-regulations.pdf

Section 3

Terms and Definitions

Additional photographs/images or illustrations are included to assist the user in understanding the requirements of this standard. Section numbers of the Illustrative Guide mirror the content of the PNS.



For the purpose of this document, the following Terms and Definitions apply:

3.1 color

ranges from light ivory to dull brown and is influenced by the extraction method, oxidation, washing, drying, post-extraction management, and duration of storage

3.2 fiber

natural filament extracted from plants

3.3 grade

fiber quality designated according to standards by an alpha-numeric code which is generally described as normal and residual

3.4 Grading Baling Establishments (GBE)

firm engaged in buying, grading, baling, and selling commercial fibers for domestic and/or foreign consumption fully equipped with the required equipment, facilities, and manpower

3.5 length

unit of measure to describe the extent from end to end of pineapple fiber

3.6 pineapple fiber

fiber extracted from the leaf of the pineapple plant

3.6.1 hand-scraped pineapple fiber

fiber manually extracted by scraping the leaves of the pineapple plant



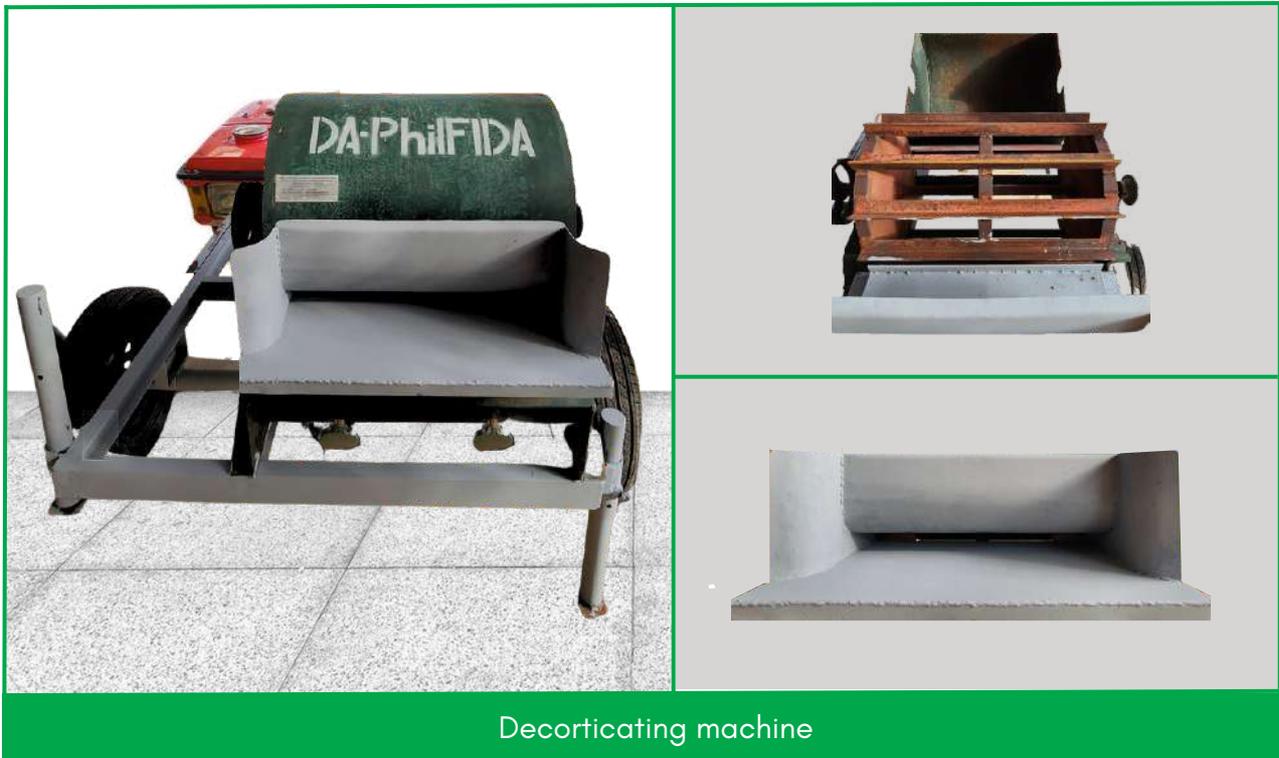
Hand-scraping of leaves with the use of porcelain ceramics



Porcelain ceramic and coconut shell used for handscraping

3.6.2 decorticated pineapple fiber

fiber extracted using a decorticating machine



3.6.2.1 brushed pineapple fiber

fiber subjected to mechanical brusher to disintegrate the fiber resulting in soft, cleaned, and lustrous fiber

Note:

To disintegrate the fiber means to thoroughly clean and untangle the filaments.





3.6.2.2 Unbrushed pineapple fiber

fiber not subjected to mechanical brusher



Cleaning Classification

Additional photographs/images or illustrations are included to assist the user in understanding the requirements of this standard. Section numbers of the Illustrative Guide mirror the content of the PNS.



Excellent



Pineapple fiber is of excellent cleaning when extraction, washing, and brushing process are thoroughly done. The fiber is free from the presence of epidermal tissues attached to it (less than 5%).



Pineapple fiber is of good cleaning when extraction, washing, and brushing processes are not sufficiently done. The fiber has minimal amounts of epidermal tissues attached to it.

Good



Fair



Pineapple fiber is of fair cleaning when the extraction process and washing have not been sufficiently carried out and brushing is not done. The fiber has minimal amounts of epidermal tissues attached to it.



Section 5

Minimum Requirements

Additional photographs/images or illustrations are included to assist the user in understanding the requirements of this standard. Section numbers of the Illustrative Guide mirror the content of the PNS.



In all normal grades subject to the special provisions for each grade under Section 6 and the tolerances allowed, pineapple fiber shall meet the following requirements:

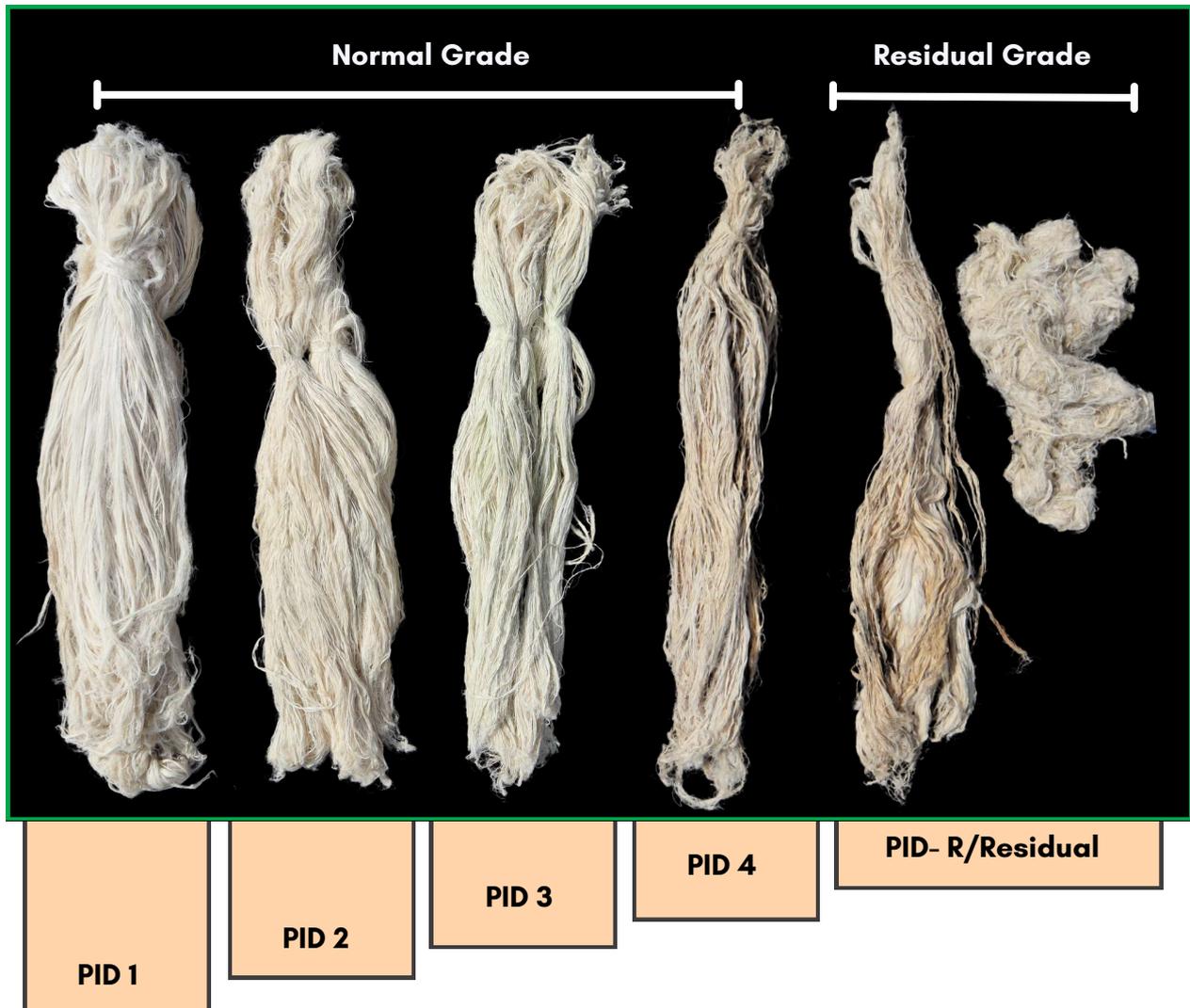
- 5.1 The pineapple fiber length shall not be less than 40 cm (15.748 inches).
- 5.2 The pineapple fiber shall have undergone the same kind of extraction process.
- 5.3 The pineapple fiber of a certain grade shall not be mixed with other grades.
- 5.4 The pineapple fiber shall not be damped, soiled, stained or discolored, and shall be free from foreign matter.



Note:

Pineapple fiber is considered damp when moisture content exceeds 14%.

- 5.5 The color of pineapple fiber shall be uniform that ranges from light ivory to dull brown, depending upon the cleaning and drying processes.



5.6 The texture of pineapple fiber shall be uniform, which ranges from soft to medium-coarse, depending upon the extraction process and the extent of its cleaning



Section 6

Grading

Additional photographs/images or illustrations are included to assist the user in understanding the requirements of this standard. Section numbers of the Illustrative Guide mirror the content of the PNS.



Grading

6.1 Hand-scraped pineapple fiber

Hand-scraped pineapple fiber shall be classified into various grades according to the epidermal layer of leaf it is extracted from, cleaning, texture, tensile strength, and elongation. Table 1 shows the characteristics of hand-scraped pineapple fiber based on the epidermal layer of leaf it is extracted from, texture, and degree of cleaning.

Table 1. Characteristics of hand-scraped pineapple fiber

Grade		Characteristics		
Name	Alpha-numeric code	Extracted from	Texture	Cleaning
Pineapple hand scraped one (Liniwan)	PIH-1	Lower epidermal layer of the pineapple leaf	Soft	Excellent
Pineapple hand scraped two (Bastos)	PIH-2	Upper epidermal layer of the pineapple leaf	Medium	Good
Pineapple hand scraped residual	PIH-R	Moldy, partly soiled, or stained fibers; irregularly cleaned fibers; discolored		

**Normal Grade
Pineapple handscraped one (PIH-1)
(Liniwan)**



Source: Eliserio C., 2023

*(Designated space for placing
the actual sample)*

Actual sample

Source: Eliserio C., 2023

**Normal Grade
Pineapple handscraped two (PIH-2)
(Bastos)**



Table 2. Tensile strength and elongation of hand-scraped pineapple fiber

Grade		Characteristics	
Name	Alpha-numeric code	Tensile strength (kgf/g.m.)	Elongation (%)
Normal grade			
Pineapple hand scraped one (<i>Liniwan</i>)	PIH-1	35.25-36.40	2.93-3.05
Pineapple hand scraped two (<i>Bastos</i>)	PIH-2	33.40-36.03	2.66-2.97
Pineapple hand scraped residual	PIH-R	Weak tensile strength	

Decorticated pineapple fiber

Decorticated pineapple fiber shall be classified into various grades according to cleaning, color, texture, tensile strength, and elongation. Table 3 shows the characteristics of decorticated pineapple fiber based on whether they are brushed/unbrushed, texture, color, and quality of cleaning.

Table 3. Characteristics of decorticated pineapple fiber

Grade		Characteristics			
Name	Alpha-numeric code	Brushed/unbrushed	Texture	Color	Cleaning
Normal Grade					
Pineapple decorticated one	PID-1	Brushed	Soft	Light ivory to almost white	Excellent
Pineapple decorticated two	PID-2	Brushed	Medium soft	Light ivory to light ochre	Good
Pineapple decorticated three	PID-3	Unbrushed	Medium -coarse	Light ochre to light brown	Fair
Pineapple decorticated four	PID-4	Unbrushed	Medium -coarse	Light brown to dull brown	Fair
Pineapple decorticated residual	PID-R	Moldy, partly soiled, or stained fibers; irregularly cleaned fibers; discolored			

Pineapple decorticated one (PID-1)
(Normal grade)



Pineapple decorticated two (PID-2)
(Normal grade)



*(Designated space for placing
the actual sample)*

Actual sample

Pineapple decorticated three (PID-3)
(Normal grade)



*(Designated space for placing
the actual sample)*

Actual sample

Pineapple decorticated four (PID-4)
(Normal grade)



Pineapple decorticated residual - PID-R
(Residual grade)



Table 4 shows the classification of decorticated pineapple fiber based on tensile strength and elongation. The detailed data of tensile strength and elongation are found in Annex C (Tensile strength and elongation of decorticated pineapple fiber)

Table 4. Tensile strength and elongation of decorticated pineapple fiber

Grade		Characteristics	
Name	Alpha-numeric code	Tensile strength (kgf/g.m.)	Elongation (%)
Pineapple decorticated one	PID-1	18.78-19.73	3.38-3.51
Pineapple decorticated two	PID-2	22.19 - 26.66	2.61 - 3.44
Pineapple decorticated three	PID-3	18.85-24.14	2.77-3.43
Pineapple decorticated four	PID-4	27.14-29.34	3.21-3.49
Pineapple decorticated residual	PID-R	Weak tensile strength	

Universal Testing Machine (UTM)



Residual

The grade is designated by either PIH-R or PID-R alpha-numeric code and residual consists of any or a combination of the following:

- moldy, partly soiled, or stained fibers;
- irregularly cleaned fibers
- discolored
- length with less than the minimum requirement of 40 cm; and/or
- weak tensile strength (below the average tensile strength)

Residual



- ✓ Irregularly cleaned fibers
- ✓ Length with less than the minimum requirement of 40 cm
- ✓ Weak tensile strength (below the average tensile strength)

- ✓ Moldy, partly soiled, or stained fibers
- ✓ Discolored

Section 7

Length Classification

Additional photographs/images or illustrations are included to assist the user in understanding the requirements of this standard. Section numbers of the Illustrative Guide mirror the content of the PNS.



The length of pineapple fiber is classified according to the specifications indicated in Table 5.

Table 5. Length classification of pineapple fiber

Description	Length (cm)
Long	more than or equal to 100
Normal	more than 60 to less than 100
Short	40 to less than 60
Very short	Less than 40

Long



113 cm

Normal



89 cm



Section 8

Tolerances

Additional photographs/images or illustrations are included to assist the user in understanding the requirements of this standard. Section numbers of the Illustrative Guide mirror the content of the PNS.



Tolerances

In all grades, a 5% tolerance level for the cleaning process and length shall be allowed whenever applicable.

Section 9

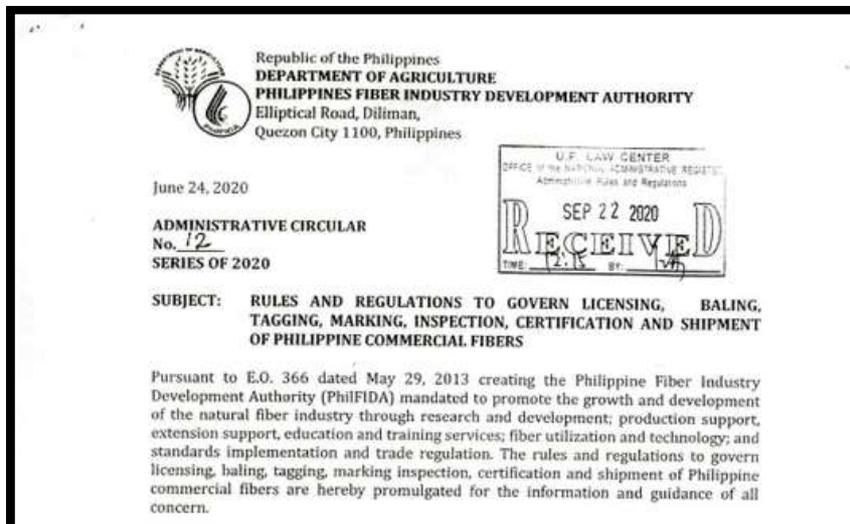
Baling for Decorticated Fiber

Additional photographs/images or illustrations are included to assist the user in understanding the requirements of this standard. Section numbers of the Illustrative Guide mirror the content of the PNS.



Baling for Decorticated Fiber

The baling of the pineapple fiber shall follow the specifications stated in DA PhilFIDA Administrative Circular No. 12, series of 2020 (Rules and regulations to govern licensing, baling, tagging, marking, inspection, certification, and shipment of Philippine commercial fibers).



Note:

According to Section 4 of the Administrative Circular No. 12 series of 2020 baling of fibers particularly to Piña Fiber, "Piña fiber shall be tied hank of not less than five (5) centimeters nor more than ten (10) centimeters. The fiber of the same grade shall be baled at 125 kilograms and should not exceed the standard size for long fiber which is 100 cm x 55 cm x 60 cm. The bale shall be tied with not less than seven (7) crosswise bands."

Section 10

Labeling

Additional photographs/images or illustrations are included to assist the user in understanding the requirements of this standard. Section numbers of the Illustrative Guide mirror the content of the PNS.



Labeling

The tagging and marking of bales shall be as follows:

- 10.1 Each bale shall bear a tag known as the long unstarched cotton cloth tag with a measurement of not less than 58 cm long and 10 cm wide. The one end of which shall be securely tied to the hank inside the bale and the other end shall project out from the bale about 25 cm.



Source: PhilFIDA RSO 12, (2023)

- 10.2 The following data indicated in the order below shall be stamped, one below the other, on the long unstarched cotton cloth tag placed inside the bale:
- 10.2.1 The full or abbreviated name of the Grading Baling Establishment (GBE);
 - 10.2.2 The name of the municipality or city where the establishment is located;
 - 10.2.3 The establishment and lot number are separated by a dash;
 - 10.2.4 The full or abbreviated name of the province of origin;
 - 10.2.5 The date of pressing or baling; and
 - 10.2.6 The initial of the station, the registered mark of the establishment, and the letter designation of the grade, the three forming one line separated from one another by bars.
- 10.3 The classifier's license number shall be indicated on the upper portion of the long unstarched cotton cloth tag tied inside the bale.

For local trade



Classifier's license number

Name of Grading Baling Establishment

Name of Municipality

Establishment and lot number (separated by dash)

Full/abbreviated name of the province of origin

Date of pressing or baling

Initial station, registered mark, government grade (the three forming one line separated from one another by bars)

Alpha-numeric code (Official government grade)

Inspector's Control Number (ICN)

Source: PhilFIDA RSO 12, (2023)

For export trade

PRODUCT OF THE PHILIPPINES
**JUAN DE LA CRUZ
CORPORATION**
TABACO, ALBAY
B/JDC/ JK

Note:

It is important to note that for export, unstarched cotton long cloth and a square tag are required. As of now, there is no report of exportation of pineapple fiber. An official sample of the square tag will be released once there is a report for the exportation of pineapple fibers.

10.4 The other end of the long unstarched cotton long cloth tag projecting out of the bale shall be divided into two sections. The one adjacent to the bale shall bear the same data stamped in the upper end of the tag in the same order, except the classifier's license number, and the rest of the long tag shall be reserved for the official stamps of the competent authority. The rest of the long tag shall be reserved for the official stamp of government grades and fiber Inspector's Identifiers Control Number (ICN).

Unstarched cotton long cloth tag



Stamps

Data stamp



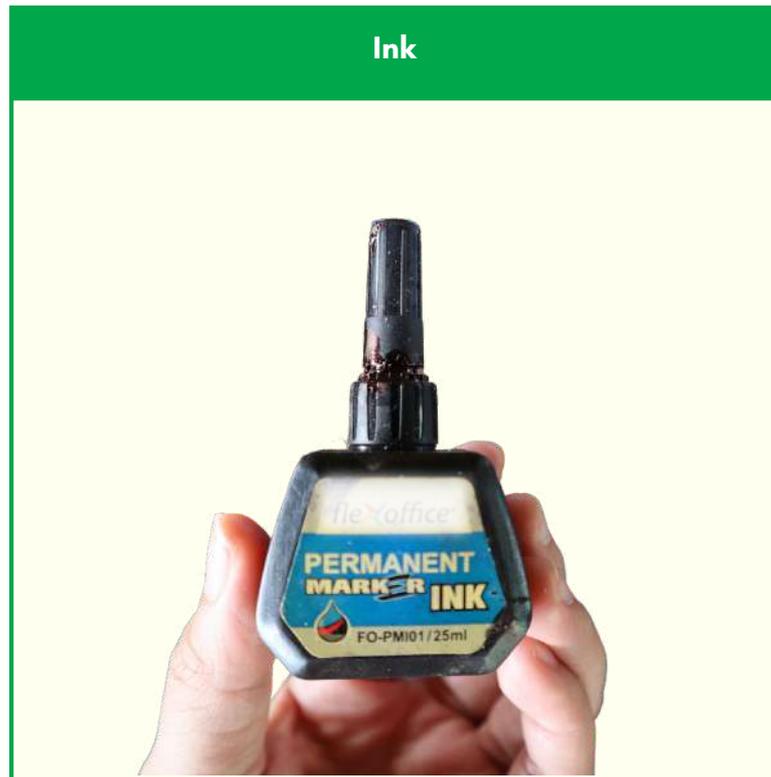
Identifier's Control Number stamp



Alpha-numeric code (Government Grade)



- 10.5 All markings on the unstarched cotton long cloth tag, whether letters or numerals, shall be stamped with clear indelible stamping ink and shall not be less than 2 cm in height except the name of the municipality/city where the establishment is located and the date of pressing which shall not be less than 8 mm.
- 10.6 Data/marks required herein to be placed upon the cloth tags shall be stamped or stenciled in black paint, printer's ink, Chinese or Indian ink. Freehand marking shall not be accepted.



Section 11

Sampling

Additional photographs/images or illustrations are included to assist the user in understanding the requirements of this standard. Section numbers of the Illustrative Guide mirror the content of the PNS.



Sampling

The sampling method to be used for ascertaining conformance to the requirements of this specification shall be in accordance with the established procedures used by the competent authority.



Note:

For sampling, 10% of the sample bales presented for inspection are opened using a random sampling method.

In case of a dispute, the owner or baler of the fiber may request additional samples to resolve the issue.

Annex



Annex A
Normative

Common pineapple varieties utilized for fiber production and intended use

Table A. 1 Common pineapple varieties utilized for fiber production and their intended use

Pineapple variety	Intended use	Image
Red spanish	handwoven fabric	 <p>Source: Habi the Philippine Textile Inc., (n.d)</p>
Hawaiian (F200)	Textile, paper and other handicrafts	 <p>Source: PhilFIDA RSO 12, (2023)</p>

(continuation)

Pineapple variety	Intended use	Image
<p>Hawaiian (MG3)</p>	<p>Textile and paper</p>	 <p>Source: PhilFIDA RSO 12, (2023)</p>
<p>Formosa (Queen)</p>	<p>Textile and paper</p>	 <p>Source: PhilFIDA RSO 5, (2023)</p>

Annex B
(Normative)

Table B. 1 Tensile strength and elongation of PIH-1 pineapple fiber (Red Spanish variety from Antique)

Replication	Fiber Sample	Tensile strength (kgf/g.m)	Elongation (%)
A	PIH-1	33.84	2.66
B	PIH-1	36.03	2.78
C	PIH-1	33.70	2.97
Average		34.52	2.80

Table B. 2 Tensile strength and elongation of PIH-2 pineapple fiber (Red Spanish variety from Aklan)

Replication	Fiber Sample	Tensile strength (kgf/g.m)	Elongation (%)
A	PIH-2	36.40	2.93
B	PIH-2	37.32	3.03
C	PIH-2	35.25	3.05
Average		36.32	3.00

Annex C
(Normative)

Tensile strength and elongation of decorticated pineapple fiber

Table C.1 Tensile strength and elongation of PID-1 pineapple fiber (Formosa Variety from Labo, Camarines Norte)

Replication	Fiber Sample (3 replicates)	Tensile strength (kgf/g.m)	Elongation (%)
A	PID-1	19.73	3.45
B	PID-1	23.01	3.38
C	PID-1	18.78	3.51
Average		20.51	3.45

Table C.2 Tensile strength and elongation of PID-2 pineapple fiber (Formosa Variety from Labo, Camarines Norte)

Replication	Fiber Sample	Tensile strength (kgf/g.m)	Elongation (%)
A	PID-2	26.66	3.44
B	PID-2	23.52	2.61
C	PID-2	22.19	2.85
Average		24.12	2.97

Table C.3 Tensile strength and elongation of PID-3 pineapple fiber (Formosa variety from Daet, Camarines Norte)

Replication	Fiber Sample	Tensile strength (kgf/g.m)	Elongation (%)
A	PID-3	18.85	2.77
B	PID-3	19.98	3.43
C	PID-3	24.14	3.30
Average		20.99	3.17

Table C.4 Tensile strength and elongation of PID-4 pineapple fiber (Formosa Variety from Daet, Camarines Norte)

Replication	Fiber Sample (3 replicates)	Tensile strength (kgf/g.m)	Elongation (%)
A	PID-4	27.41	3.49
B	PID-4	29.34	3.27
C	PID-4	27.14	3.21
Average		27.96	3.32

Table D. Summary of Grade and characteristics of fibers

Grade		Characteristics						
Name	Alpha-numeric code	Brushed/Unbrushed	Texture	Color	Cleaning	Tensile strength (kgf/g.m)	Elongation (%)	
Pineapple decorticated one	PID-1	Brushed	Soft	Light ivory to almost white	Excellent	18.78-19.73	3.38-3.51	
Pineapple decorticated two	PID-2	Brushed	Medium soft	Light ivory to light ochre	Good	22.19 - 26.66	2.61 - 3.44	
Pineapple decorticated three	PID-3	Unbrushed	Medium coarse	Light ochre to light brown	Fair	18.85-24.14	2.77-3.43	
Pineapple decorticated four	PID-4	Unbrushed	Medium coarse	Light brown to dull brown	Fair	27.14-29.34	3.21-3.49	
Pineapple decorticated residual	PID-R	a) moldy, partly soiled, or stained fibers; b) irregularly cleaned fibers; c) discolored; d) length with less than the minimum requirement of 40 cm; and/or e) weak tensile strength (below the average tensile strength)						

References



DOCUMENT REFERENCES

Bureau of Agriculture and Fisheries Standards (2014). PNS/BAFS 318:2021-
Pineapple Fiber - Grading and Classification

PHOTO REFERENCES

Cover photo (bottom right).

BAFS and Habi the Philippine Textile Inc. (n.d)

Page 18.

Eliserio C. 2023. Liniwan

Page 19.

Eliserio C. 2023. Bastos

Page 41.

PhilFIDA RSO 12. 2023. Unstarched cotton cloth tag (for local trade)

Page 45.

PhilFIDA RSO 12. 2023. Sampling

Page 47.

Habi the Philippine Textile Inc.(n.d). Red spanish
PhilFIDA RSO 12. 2023. Hawaiian (F200)

Page 48.

PhilFIDA RSO 12. 2023. Hawaiian (MG3)
PhilFIDA RSO 5. 2023. Formosa (Queen)

Technical Working Group



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Illustrative Guide for Pineapple fiber - Grading and Classification

DA Special Order No. 272 series 2023

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Illustrative Guide (IG) serves as a supplementary Philippine National Standards (PNS) learning material to aid regulatory officers and other interested stakeholders in having a uniform understanding and interpretation of the PNS for its efficient adoption and implementation.



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