GOOD PRACTICES FOR
THAI SILK YARN PRODUCTION

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Published in the Royal Gazette Vol.125 Section 15D,
dated 22 January B.E. 2550 (2007)
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The Ministry of Agriculture and Cooperatives of Thailand once notified Thai Silk Yarn Standards (TAS 8000) in 2005 to be used as basic criteria for Thai silk yarn quality. This provides confidence and acceptance among silk producers and buyers. Since the Thai silk yarn producers are mostly small farmers living all over the country with different processes of production control, thus the product quality is diversified in a wide range. Therefore it is deemed necessary to develop good practices for Thai silk yarn production to be the guidelines for the Thai silk yarn producers to efficiently and uniformly produce good silk yarn guidances. This effort will also promote the production of Thai silk yarn to meet the standards.

The establishment of this standard is based on the information of the following documents:


**Remark:**

The standard title has been revised from “Thai Agricultural Commodity and Food Standard (TACFS)” to “Thai Agricultural Standard (TAS)” in accordance with the enforcement of the Agricultural Standards Act B.E. 2551 (2008).
NOTIFICATION OF THE NATIONAL COMMITTEE ON AGRICULTURAL COMMODITY AND FOOD STANDARDS
SUBJECT: THAI AGRICULTURAL COMMODITY AND FOOD STANDARD: GOOD PRACTICES FOR THAI SILK YARN PRODUCTION
B.E. 2550 (2007)

The resolution of the 2/2550 session of the National Committee on Agricultural Commodity and Food Standards dated 28 August B.E. 2550 (2007) endorsed the Thai Agricultural Commodity and Food Standard entitled Good Practices for Thai Silk Yarn Production. This standard would be of benefits for quality improvement, facilitating trade and protecting consumers.

By virtue of the Cabinet Resolution on Appointment and Authorization of the National Committee on Agricultural Commodity and Food Standards dated 3 April B.E. 2550 (2007), the Notification on Thai Agricultural Commodity and Food Standard entitled Good Practices for Thai Silk Yarn Production is hereby issued as voluntary standard, the details of which are attached herewith.

Notified on 26 September B.E. 2550 (2007)

Prof. Theera Sutabutr
Minister of Agriculture and Cooperatives
Chairperson of the National Committee on Agricultural Commodity and Food Standards
THAI AGRICULTURAL STANDARD
GOOD PRACTICES FOR THAI SILK YARN PRODUCTION

1 SCOPE

This standard defines major components for Thai silk yarn production which includes silk yarn reeling house, reeling machines, tools and equipments, cocoon quality inspection, cocoon cooking, reeling techniques, silk yarn quality inspection, silk yarn re-reeling for skein production, silk yarn storage packaging and data recording. This is to ensure that the production of Thai silk yarn meets the requirements of Thai silk yarn standard (TAS 8000-2005).

2 DEFINITIONS

For the purpose of this standard:

2.1 Thai Silk Yarn means the handicraft silk yarn derived from the hand-reeled raw silk of the yellow Thai silk varieties, or the handicraft-industrial silk yarn derived from the machine-reeled raw silk of the yellow Thai silk varieties. The reeling machine shall not exceed five HP in total capacity.

2.2 Skein means the silk yarn derived from the re-reeling process as a single thread in a diamond cross form with the circumference of 135 cm to 155 cm and the weight of 80 to 100 g/unit.

2.3 Plying means a step of making silk skein. While in a re-reeling apparatus, silk skeins are divided by at least 6 intervals. A thread is inserted between two intervals of skeins through the diamond cross. The end of this thread measured across the width of skeins shall not be less than 8 cm. The end of the thread is tied with silk yarn thread (figure B.15).

2.4 A good cocoon means a cocoon that has characteristics of its variety. For example, oval-shaped, peanut-shaped, oval-shaped with long head and sharp end, etc. Moreover, the cocoon shall have alive pupa, be free of stain, no rough cocoon shell and the silk fibre is formed tightly and firmly.

2.5 An eliminated cocoon means a cocoon that contains malformed characteristics, or deviates from its variety. For example, double cocoon, pierced cocoon, inside soiled cocoon, outside soiled cocoon, thin cocoon, loose shell cocoon, thin-end cocoon, malformed cocoon, cocoon with prints of cocoon frame, crushed cocoon, and musty cocoon.

2.6 Cocoon Cooking Pot means a container used to boil cocoons for a traditional reeling method or an improved one (figure B.3).

2.7 Hand Reeling Apparatus means a piece of hand-reeling equipment which consists of a frame and a pulley made of wood or other materials. The equipment is attached to the top of cocoon cooking pot (figure B.4).
2.8 **Developed hand reeling apparatus** means a developed form of traditional silk yarn reeling apparatus where a piece of small reel and re-reeling apparatus are assembled to store the silk yarn during the reeling process (figure B.5).

2.9 **Small reel** means a piece of equipment that stores the silk yarn being drawn from the cocoons in a cooking pot for traditional, or improved reeling methods or cooking containers for a small community reeling machine (figure B.10).

2.10 **Re-reeling apparatus** means a piece of equipment used for re-reeling the silk yarn to make skein before marketing or being used (figure B.6).

2.11 **Small reeling machine** means a silk yarn reeling machine which contains about two to six heads, driven by not more than 5 HP. The machine is controlled by man with denieral device to control the size of silk thread (figure B.9).

2.12 **Visual inspection** means an inspection of any external physical appearances of an item, for example; produce, product, or apparent environmental conditions. This is basically examined by eyes. Any other sensory evaluation may be applied depending on quality factors in question, and additional tools may be applied such as magnifying lens as necessary. Subsequently, physical appearances and environmental conditions shall be assessed so as to see if the criteria are fully met. The processes and working procedures are also necessary to be inspected visually.

3. **PROVISIONS CONCERNING REQUIREMENTS AND INSPECTIONS**

3.1 Provisions concerning requirements and inspections for good practices for Thai silk yarn production are according to Table 1.

Table 1 Control points, requirements and inspections for good practices for Thai silk yarn production.

<table>
<thead>
<tr>
<th>Control Points</th>
<th>Requirements</th>
<th>Inspections</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Reeling site</td>
<td>Located in an appropriate environment and does not create any negative effect to the environment. The area shall be spacious with good ventilation.</td>
<td>Visual inspection</td>
</tr>
<tr>
<td>2. Machines, equipments and tools</td>
<td>- Maintenance on machines, equipments and tools shall be done regularly.</td>
<td>Visual inspection of the machines equipments, tools and their working, both before and after use.</td>
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<tr>
<td></td>
<td>- Machines, equipments and tools shall be cleaned before and after each use.</td>
<td></td>
</tr>
<tr>
<td>3. Cocoon quality inspection</td>
<td>Inspect and culling between good and eliminated cocoons to match with each type of silk yarn to be produced.</td>
<td>- Visual inspection for good and eliminated cocoons</td>
</tr>
<tr>
<td>Control Points</td>
<td>Requirements</td>
<td>Inspections</td>
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<td>---------------</td>
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<tr>
<td>4. Cocoon cooking</td>
<td>- Cocoon cooking pot shall be clean.</td>
<td>- Visual inspection on equipment.</td>
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<td></td>
<td>- Water at the beginning of cooking shall be clear, neutral, and clean and shall be refilled when gets darker or dirty.</td>
<td>- Visual inspection of the actual work implementation.</td>
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<td></td>
<td>- Cook the cocoons based on their types; fresh or dried cocoons.</td>
<td>- Visual inspection of the actual work implementation.</td>
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<tr>
<td></td>
<td>- All cocoons shall be properly cooked.</td>
<td>- Visual inspection of the cooked cocoons, i.e. the whole cocoons shall be soaked thoroughly.</td>
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<tr>
<td>5. Reeling technique</td>
<td>- Control the water temperature in the cocoon cooking pot at an appropriate level according to the types of cocoon and silk yarn to be produced.</td>
<td>- Measure the water temperature.</td>
</tr>
<tr>
<td>5.1 Hand reeling apparatus or developed hand reeling apparatus</td>
<td>- Control the size of silk yarn by keeping the number of cocoons and the pulling tension appropriately.</td>
<td>Counting the number of cocoons at the start of the reeling and visually inspect the silk yarn characteristics.</td>
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<td></td>
<td>- Changing the water regularly when it gets darker or becomes dirty to keep the control of colour quality of silk thread.</td>
<td>- Visual inspection of the actual work implementation and the silk yarn colour.</td>
</tr>
<tr>
<td>5.2 Small reeling machine</td>
<td>- Control the water temperature in the cocoon cooking pot at an appropriate level according to the types of cocoon and silk yarn to be produced.</td>
<td>- Measure the water temperature.</td>
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<td></td>
<td>- Use an appropriate device to control the desired size of silk yarn.</td>
<td>- Inspection of the denieral device.</td>
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<td></td>
<td>- Observe the movement of equipment, number of cocoon in cooking pot, and clean the equipment regularly to get rid of sericin.</td>
<td>- Visual inspection of the operation of workers</td>
</tr>
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<td></td>
<td>- Change the water regularly when it gets darker or becomes dirty to keep the control of yarn colour.</td>
<td>- Visual inspection of the actual work implementation and the silk yarn colour.</td>
</tr>
<tr>
<td>Control Points</td>
<td>Requirements</td>
<td>Inspections</td>
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<tr>
<td>---------------------------------------------------</td>
<td>-----------------------------------------------------------------------------</td>
<td>----------------------------------------------------------------------------</td>
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<tr>
<td>6. Silk yarn quality inspection</td>
<td>- Inspect / test the size of silk yarn and / or the characteristics</td>
<td>- Visual inspection of silk yarn and inspection of data recording.</td>
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<tr>
<td></td>
<td>of the yarn during the production process</td>
<td></td>
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<tr>
<td>7. Re-reeling of silk yarn for skein making process</td>
<td>Diamond cross of silk skein, that has a diameter of 135 cm to 155 cm, and</td>
<td>Visual inspection of silk skeins, measure the skein size and weight of the</td>
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<td>weight of 80 g to 100 g per skein, and with at least 6 plies intervals</td>
<td>silk skein.</td>
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<td>8. Silk yarn storage</td>
<td>Provide a storage area of silk yarn</td>
<td>Visual inspection</td>
</tr>
<tr>
<td>9. Packaging</td>
<td>- The packaging is moisture and insect proof, free of odour and contaminants</td>
<td>Visual inspection</td>
</tr>
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<td>which will affect on the quality of silk yarn.</td>
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<td>- The packaging can prevent damage during transportation</td>
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<tr>
<td>10. Record keeping</td>
<td>- The following data shall be recorded at each batch of reeling;</td>
<td>Inspection of data recording, see example in Annex C.</td>
</tr>
<tr>
<td></td>
<td>- Date of cocoon purchasing and reeling</td>
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<tr>
<td></td>
<td>- Silkworm variety or source</td>
<td></td>
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<tr>
<td></td>
<td>- Name of buyer</td>
<td></td>
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<td></td>
<td>- Percentage of good and an eliminated cocoons</td>
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<tr>
<td></td>
<td>- Number of cocoons for each size of yarn reeled</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Type, size and weight of silk yarn produced</td>
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</tr>
<tr>
<td></td>
<td>- Results of silk yarn quality test</td>
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<td></td>
<td>- Silk yarn and cocoon ratio (percentage)</td>
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</tbody>
</table>

3.2 The recommendations on Good Practices for Thai Silk Yarn Production are provided as the guidances for producers to meet the Thai Silk Yarn standards (TAS 8000-2005), the details of which are in Annex A.
ANNEX A

Recommendations on Good Practices for Thai Silk Yarn Production

A. 1 Reeling site

The reeling site shall not be too far from the community and shall be surrounded by appropriate environmental settings;

(1) Open space with good ventilation.
(2) Separated area for each silk yarn production process.
(3) Provide sufficient light.
(4) Sufficient clean water for operation.
(5) Provide a good sewage management system.

A. 2 Machines, tools and equipments

(1) Machines, tools and equipments shall be adequate for operation.
(2) Machines, tools and equipments shall be kept orderly for convenient use.
(3) Machines, tools and equipments shall be cleaned before and after each operation.
(4) Do not use reeling tools and equipments for degumming and dyeing as stains left on the equipment may deform silk yarn colour.
(5) Maintain the machines, tools and equipments in good function.

A. 3 Cocoon quality testing

The cocoons collected from the production process, or from the purchase shall be the same variety, or uniform in sizes and colours. The cocoon quality testing focuses on the cocoon shell percentage and eliminated cocoons (details in Annex E).

(1) Cocoon culling
- Cocoons are culled for good and eliminated cocoons to be used appropriately for each type of yarn. Cocoon culling is based on 11 types of eliminated cocoons (details in Annex D).
- Good and eliminated cocoons shall be stored separately in different containers.

(2) Cocoon storage
- If cocoons are to be stored for the next reeling, the followings shall be practiced:
  - Keep the cocoons in refrigerator to slow down the development of pupa into moth, or
  - Get the cocoons dried completely so that when they are cooked, the fibre is released neatly through the whole cocoons. This will help increasing reeling efficiency. Dried cocoons shall be stored in containers with humidity below 70% and able to prevent damages from insects or rats.

A. 4 Cocoon cooking

(1) Water quality
- Use fresh, clear and clean water, e.g. distilled water and rainwater.
- pH of the water is between 6 – 7.
- Change the water when it turns darker or becomes dirty. This is to control the quality of silk yarn colour.

(2) Cocoon cooking for hand reeling and developed hand reeling apparatus
- Cook the cocoons in the cocoon cooking pot. Separate the fresh and dried cocoons.
- Over-turn the cocoons so that they are thoroughly cooked.
- If the cocoons are properly cooked, the cocoon shell shall appear soaked all over.
- After cooked, reduce the water temperature to around 60°C to 70°C to reel the silk yarn.

(3) Cocoon cooking for small reeling machine
- Cook the cocoons in the cocoon cooking pot. Separate the fresh and dried cocoons.
- Keep all cocoons under the water in the cooking pot using a pressing device or meshed wire to cover the pot.
- If the cocoons are properly cooked, the cocoon shell shall appear thoroughly soaked all over.
- After cooked, transfer them to a basin waiting for a reeling process.

A. 5 Reeling Techniques

(1) Hand reeling or developed hand reeling apparatus
- Control the water temperature in the cocoon cooking pot at around 60°C to 70°C. Higher temperatures will lead to knots on the silk yarn, while lower temperatures will cause difficulties in reeling. This depends very much on the types of cocoons; fresh or dried.
- Refill the cocoons in order to keep an approximate number at the beginning.
- Keep pulling tension at one level while reeling the silk yarn.
- Refill the water if the level drops from the top of the pot.
- Change the water when it turns darker or becomes dirty, to control the quality of silk yarn colour.

(2) Small reeling machine
- Control the water temperature in the cocoon cooking pot at around 35°C to 40°C, depending on the types of cocoons; fresh or dried.
- Set the number of cocoons per head according to the size of silk yarn to be produced.
- Refill the cocoons in order to keep an approximate number at the beginning.
- Set up a deneiral device to keep control of the silk yarn size. Observe the operations of all equipments if they are functioning properly.
- Regularly clean the deneiral device with soap water or warm water to get rid of silk gum.
- Refill the water if the level drops from the top of the cooking pot.
- Change the water when it turns darker or becomes dirty, to control the quality of silk yarn colour.

A. 6 Silk Yarn Quality Testing

During the production process, samples of silk yarn shall be drawn for quality check. The samples are weighed, measured for an average size, using a standard equipments, while visual inspection is also important. The practices are controlling the uniformity of silk yarn quality.
A. 7 Silk Yarn Re-reeling

(1) Re-reel the silk yarn to become silk skeins of a circumference 135 cm to 155 cm with the weight of 80 g to 100 g per skein.
(2) If kept in small reels and the yarn gets dry, soak it in warm water to soften the silk gum before re-reeling.
(3) Re-reel the yarn to a diamond cross pattern.
(4) Prepare silk plies for at least six intervals to prevent the silk yarn clots when degumming or dyeing.
(5) After plying, allow the silk skeins to air-dry before storage.

A. 8 Silk Yarn Storage

(1) Storage rooms shall be dry and clean.
(2) Storage rooms shall be kept free of insects, rats, as well as the control of environment, e.g. sunlight, temperature, humidity in order to prevent the silk yarn getting deteriorated.
(3) Silk yarn is kept by type and sizes.

A. 9 Packaging

(1) Packaging materials shall be of good quality, able to prevent moisture and damages from insects, durable for transportation, free of odours and other contaminants which will affect the quality of silk yarn.
(2) Be able to prevent any damages which may occur during transportation.

A. 10 Record keeping

(1) Keep records for easy retrieval.
(2) The following types of data shall be kept properly;
  - Date of cocoon purchasing and reeling
  - Silkworm variety or source
  - Name of buyer
  - Percentage of good and an eliminated cocoons
  - Number of cocoons for each size of yarn reeled
  - Type, size and weight of silk yarn produced
  - Results of silk yarn quality test
  - Silk yarn percentage which can be calculated from the following formula;

  \[
  \text{silk yarn percentage} = \frac{\text{the quantity of reeled silk yarn (kg)} \times 100}{\text{the quantity of cocoons used (kg)}}
  \]

  Or keep record in forms as shown in Annex C.
Diagram on good practices for each step of Thai silk yarn production

- **Cocoon quality test**
  - Cocoon culling
  - Cocoon weighing
  - An eliminated cocoon percentage
  - Cocoon shell percentage
  - Control of water quality and temperature

- **Cocoon cooking**
  - Control of water quality and temperature

- **Silk yarn reeling**
  - Control of water quality and temperature
  - Control of silk yarn size
  - Measure silk yarn size

- **Silk yarn quality test**
  - Inspect the characteristics of silk yarn

- **Re-reeling and making skein**
  - Control of re-reeling apparatus
  - Diamond cross re-reeling
  - Plying of six intervals
  - Control of silk yarn weight per skein

- **Silk yarn storage and packaging**

- **Record keeping**

- **Machines, tools and equipments**
ANNEX B

Figure B.1  Cocoon culling

Figure B.2  Cocoon quality test
Silk yarn reeling by hand reeling and developed hand reeling apparatus

Figure B.3 Cocoon cooking pot
Figure B.4 Hand reeling apparatus

Figure B.5 Developed hand reeling apparatus
Figure B.6 Re-reeling apparatus
Silk yarn reeling by a small reeling machine

Figure B.7  Cocoon cooking pot

Figure B.8  Cooked cocoons

Figure B.9  A small reeling machine

Figure B.10  Small reels
Figure B.11  Silk yarn size measurement and test

Figure B.12  Visual inspection of silk yarn characteristics
Figure B.13  Silk yarn ready for making skein

Figure B.14 Diamond cross pattern

Figure B.15  Plying

Figure B.16  Silk yarn being air-dry in shade

Figure B.17 Silk skeins prepared in bulk getting ready for market or storage
## ANNEX C

**Example of Record Keeping for Thai Silk Yarn Production**

<table>
<thead>
<tr>
<th>1. Name / group ......................................... No. ................. Road............................... Sub-district.............................. District............................... Province .................................. Tel............................ Fax................................... E-mail ........................................</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>2. Cocoon collection Date........ month........ year ............</td>
<td>7. Silk yarn produced Date (d/m/y) ........... Total weight......kgs.</td>
</tr>
<tr>
<td>3. Sources of cocoons □ own produce □ purchased from.................................................. Type of cocoon □ Fresh cocoons □ Dried cocoons</td>
<td>8. Type of cocoon used for reeling □ Fresh cocoons □ Dried cocoons</td>
</tr>
<tr>
<td>□ Nangnoi Srisaket 5. Total cocoons..............kgs Average price .............Bht/kg</td>
<td>9. Reeled silk yarn percentage.........................%</td>
</tr>
<tr>
<td>□ Nangnuan 6. Results of cocoon quality test □ Nangluang - Cocoon culling □ Nanglai Weight of good cocoons.........kgs □ Chaiyabhumе % of good cocoons.................% □ Paengpuay □ Nangmai □ Samrong □ Nonrasi □ Kiosakol □ Others .......................</td>
<td>10. Type of silk yarn produced: □ Grade 1 □ Grade 2 □ Grade 3 Quality class: □ Premium □ First class □ Second class</td>
</tr>
<tr>
<td>□ Nangmai Average size........ Denier. Weight per skein........g / skein</td>
<td>11. Results of silk yarn quality test Size (denier) □ O ≤ 120 □ O 121 – 150 □ O 151 – 200 O 151 – 200 □ O 201 - 250 □ O 201 - 250 □ O ≥ 251 □ O ≥ 301 □ Others .......................</td>
</tr>
<tr>
<td>□ Others ....................... 12. Name of Purchaser................ Contact address........................ Tel. .................. Date ........../....../.........</td>
<td>13. Data recorder......................................... Date ....../....../.........</td>
</tr>
</tbody>
</table>

**TAS 5900-2007**
ANNEX D

Characteristics of Eliminated Cocoons

D.1 **Double cocoon** means a cocoon made by two silkworms together. The silk yarn from this type of cocoon tends to break easily during a reeling process because there are more than one silk threads twisted. Thus, the silk yarn reeling ability and efficiency is low. The derived silk yarn is uneven. Double cocoon is caused by different reasons such as varieties, too many silkworms per frame, cocoon frame is not proper and appropriate for silkworms.

D.2 **Pierced cocoon** means a cocoon pierced out by a maggot of Uzi fly leaving a hole on the cocoon causing silk yarn filament breaks. Thus, the silk yarn reeling ability and efficiency is low.

D.3 **Inside soiled cocoon** means a cocoon which contains dead pupa inside or that made by an infected silkworm but still on cocoon development stages. The dead pupa causes stains inside the cocoon which yields low quality silk yarn.

D.4 **Outside soiled cocoon** means cocoon derived from silkworms urinate before cocooning or infected silkworm contaminate the cocoon in the same frame. This is called ‘outside soiled cocoon’, which is difficult to reel, or the cocoons become soggy before reeling.

D.5 **Thin shell cocoon** means a cocoon not fully developed which is caused by infected silkworm. The silkworms have only short time to spin the cocoon before they die. In other case, the mature silkworms are harvested too late and thus they spin cocoon on the side of rearing trays or tables, leaving little fibre when they are placed on a cocoon frame. It is not possible to reel this type of cocoons as they become too soggy.

D.6 **Loose shell cocoon** means a cocoon produced under an improper environmental condition. The fibre from this type of cocoon tends to break easily when reeled. The yarn is of poor quality.

D.7 **Thin-end cocoon** means a cocoon of a variety or caused by high temperature during egg incubation period. Sometimes this occurs because it is too cold during cocooning period. The cocoon is unusually thin at both ends, and when cooked thinner part becomes soggy leading to several filament breaks during reeling process. Thus, the silk yarn reeling ability and efficiency is low.

D.8 **Malformed cocoon** means a cocoon made from silkworms in an improper cocoon frame, or from weak silkworms. This prevents the silkworms from completing the cocooning process and the cocoons are distorted and irregular. When cooked with normal cocoons, they are either soggy easier or hard depending on the condition of each malformed cocoon.

D.9 **Cocoon with prints of cocoon frame** means a cocoon made by a silkworm on the edge of a cocoon frame or on the lining paper. The cocoon is too flat with some thicker parts. This is due to too many silkworms per a cocoonframe, leaving little space for cocooning. Sometimes it occurs because the cocoon frame is improper.
D.10 **Crushed cocoon** means a cocoon caused by poor handling during transportation. The cocoons are crashed to one another. The filament from these cocoons break easily especially at the crushed spots.

D.11 **Musty cocoon** means a cocoon caused by an incomplete cocoon drying process and improper moisture control in a cocoon storage room. This condition allows fungus to grow in the cocoon shell. It is not advised to reel this type of cocoons as the filament gets deteriorated.
ANNEX E

Calculation of Cocoon Shell Percentage and An Eliminated Cocoon

E.1 Equipments

(1) Knife for cocoon shell cutting.
(2) Weighing machine with fine measurement of at least 2 decimal points.
(3) Working table for culling.

E.2 Procedure

(1) Weigh the cocoons and record the total weight and silkworm variety of each farmer.
(2) Take a sample of 1.5 kg for every 50 kg of cocoons.
(3) Divide the sample into two parts, with the first part for 2/3 of the total sample weight for measuring an eliminated cocoons. Of the remaining 1/3, take 20 cocoons for measuring cocoon shell percentage.
(4) Cut the 20 cocoons selected in (3), divide them into two parts;
   First part : to measure cocoon shell weight
   Second part : to measure the weight of pupa and other silkworm parts.
(5) Take the first part of sample to sort out for good and eliminated cocoons, then weight both sorted parts to calculate for percentage of eliminated cocoons.
(6) Calculate the percentage of good and eliminated cocoons as follows;
   - Calculation of cocoon shell percentage using the following formula;
     \[
     \text{Cocoon shell percentage} = \frac{\text{cocoon shell weight}}{\text{total cocoon weight}} \times 100
     \]
   - Calculation of an eliminated cocoon percentage using the following formula;
     \[
     \text{An eliminated cocoon percentage} = \frac{\text{total an eliminated cocoon weight}}{\text{total cocoon weight}} \times 100
     \]
(7) Cocoon pricing is based on the data collected: cocoon shell percentage, eliminated cocoon percentage. Compare the data against the cocoon pricing table currently in use.
ANNEX F

Unit

The units and symbols used in this standard and the units of SI (International System of units or *Le Système International d’Unités*) recognized to be used are as follows:

<table>
<thead>
<tr>
<th>Quantity</th>
<th>Name of Units</th>
<th>Symbols</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mass</td>
<td>gram</td>
<td>g</td>
</tr>
<tr>
<td>Mass</td>
<td>kilogram</td>
<td>kg</td>
</tr>
<tr>
<td>Length</td>
<td>centimetre</td>
<td>cm</td>
</tr>
<tr>
<td>Temperature</td>
<td>degree Celsius</td>
<td>°C</td>
</tr>
</tbody>
</table>