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Textile Industry Standard of the People's Republic of China

FZ/T 73013—2017

Replace FZ/T 73013-2010

Knitted swimming suits

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(English Translation)

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Foreword

SAC/TC 209/SC6 is in charge of this English translation. In case of any doubt about the contents of English translation, the Chinese original shall be considered authoritative.

This standard is drafted in accordance with the rules given in the GB/T 1.1—2009.

This standard replaces the FZ/T 73013—2010 *Knitted swimming suits* in whole. The following deviations have been made with respect to the FZ/T 73013—2010:

- Revised the scope of application (see chapter 1, chapter 1 in 2010 edition);
- Revised the normative references (see chapter 2, the chapter 2 in 2010 edition);
- The assessment standard of fiber content was changed from FZ/T01053 to GB/T29862 (see 4.2.1, 4.2.1 in 2010 edition);
- Revised the assessment index of color fastness to light; increased the fluorescence color: Superior and first-class products should meet the criteria of level 3, The qualified products are not required to be assessed (see 4.2.1);
- Added “swimsuits for infants and children should meet the requirements of GB31701” (see 4.2.4);
- Added “lining materials should meet the requirements of GB 18401” (see 4.2.5);
- Added the description of defect level (see 4.3.1);
- Revised the schematic diagram of the measurements (see 5.2.2, 4.3.3 in 2010 edition);
- Deleted the requirements of stitch density(see 4.3.6 in 2010 edition);
- Deleted the Annex A, the color transfer in joints should be tested according to the method A in GB/T 31127—2014 (see 5.1.2.15, Annex A in 2010 edition);

This standard was proposed by China National Textile and Apparel Council.

This standard was prepared by Subcommittee 6 on Knitting Products of National Technical Committee 209 on Textiles of Standardization Administration of China (SAC/TC 209/SC 6).

The previous editions of this standard are as follows:

- FZ/T 73013-1998, FZ/T 73013-2004, FZ/T 73013-2010.

Knitted swimming suits

1 Scope

This standard specifies product classifications, size designation, requirements, test methods, inspection rules and instructions for use, packaging, transporting and storage for knitted swimming suits.

This standard is applicable to the identification of knitted swimming suits made of knitted fabrics. Knitted swimming suits made of other fibers may refer to this standard.

2 Normative references

The following referenced documents are indispensable for the application 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.

GB/T 250, *Textiles—Tests for color fastness—Grey scale for assessing change in color*

GB/T 2910 (All parts), *Textiles—Quantitative chemical analysis*

GB/T 2912.1, *Textiles—Tear properties of formaldehyde—Part 1: Free and hydrolyzed formaldehyde (water extraction method)*

GB/T 3920, *Textiles—Tests for color fastness—Color fastness to rubbing*

GB/T 3921-2008, *Textiles—Tests for color fastness—Color fastness to washing with soap or soap and soda*

GB/T 3922, *Textiles—Tests for color fastness—Color fastness to perspiration*

GB/T 4856, *Package of cotton goods and knitwear*

GB/T 5713, *Textiles—Tests for color fastness—Color fastness to water*

GB/T 5714, *Textiles—Tests for color fastness—Color fastness to sea water*

GB/T 5926.4, *Instructions for use of consumer goods—Part 4: Textiles and apparel*

GB/T 6529, *Textiles—Standard atmospheres for conditioning and testing*

GB/T 7573, *Textiles—Determination of pH of the aqueous extract*

GB/T 8427-2008, *Textiles—Tests for color fastness—color fastness to artificial light: Xenon arc fading lamp test*

GB/T 8433, *Textiles—Tests for color fastness—color fastness to chlorinated water (swimming-pool water)*

GB/T 8878, *cotton knitted underwear*

GB/T 14801, *Test method for skewness and bow in woven and knitted fabrics*

GB/T 17952, *Textiles—Determination of the banned azo colourants*

GB 18401, *National general safety technical code for textile products*

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GB/T 31127, *Textiles—Tests for color fastness—Color fastness to transfer in joints*

GB 31701, *Safety technical code for infants and children textile products*

GB/T 29862, *Textiles—Identification of fiber content*

FZ/T 01057, *Test method for identification of textile fibers*

FZ/T 01095, *Textiles—Test method of elastane fiber content*

FZ/T 70006, *stretch and recovery testing method for knits*

FZ/T 73012, *Brassiere*

GSB 16-2159, *Color cards of standard depths for knitted products (1/12)*

GSB 16-2500, *Defect appearance replicas of knitted fabric*

3 Product classification and size designation

3.1 Knitted swimming suits shall be classified into three types: one-piece swimming suits, two-piece swimming suits and swimming trunks.

3.2 The size designation of one-piece swimming suits: applicable wearer's net height and net chest, labeled by centimeter.

3.3 The size designation of two-piece swimming suits include: applicable wearer's net height, net chest and net hip shall be labeled by centimeter. The top of two-piece swimming suits with brassiere cups shall comply with FZ/T 73012.

3.4 The size designation of swimming trunks include: applicable wearer's net height and net hip shall be labeled by centimeter.

4 Requirements

The requirements include intrinsic quality and appearance quality. The intrinsic quality includes fiber content, formaldehyde content, pH value, odor, decomposable carcinogenic aromatic amine dyes, elastic elongation, elastic recovery to chlorinated water (swimming pool water), color fastness to washing with soap, color fastness to perspiration, color fastness to water, color fastness to sea water, color fastness to rubbing, color fastness to chlorinated water (swimming pool water), color fastness to light, color transfer in joints, etc. The appearance quality includes appearance defects, dimensional deviation of specifications, dimensional differences of symmetrical parts, sewing requirements, etc.

4.1 Grading criteria

4.1.1 The quality classification includes superior grade, first grade, and qualified grade.

4.1.2 The intrinsic quality is classified by batch, and the appearance quality is classified by piece. The grade of the product shall be determined by the lower grade of the two.

4.1.3 For intrinsic quality, take the inferior one as the final grade for the batch.

4.1.4 The grade of appearance quality is determined by the rating of appearance defects, size deviation, size deviation of symmetrical parts and sewing requirements. If appearance defects with different grades are found in the same product, take the inferior one as the final grade of the piece.

4.1.5 Only two worst appearance defects of the same grade are allowed in one piece of the product, otherwise lower a level if more appearance defects exist.

4.2 Intrinsic quality requirements

4.2.1 Intrinsic quality requirements are shown in Table 1.

Table1 Intrinsic quality requirements

Item		Superior grade	First grade	Qualified grade	
Fiber content (%)		In accordance with GB/T 29862			
Content of formaldehyde (mg/kg)		In accordance with GB 18401			
pH value					
Odor					
Decomposable carcinogenic aromatic amine dyes (mg/kg)					
Elastic elongation (%) ≥	Lengthwise	120	100	80	
	Widthwise	100	80	70	
Elasticity recovery to chlorinated water (swimming pool water) (%) ≥	Lengthwise	70	65	60	
	Widthwise	70	65	60	
Color fastness /Grade ≥	Color fastness to washing with soap	Change in color	3		
		Staining	3 (dark 2-3)		
	Color fastness to perspiration	Change in color	4	3 (3-4 for infants and children)	
		Staining	3-4	3(3-4 for infants and children)	
	Color fastness to water	Change in color	3-4	3(3-4 for infants and children)	
		Staining	3-4	3(3-4 for infants and children)	
	Color fastness to sea water	Change in color	4	3-4	3
		Staining	3	3	
	Color fastness to rubbing	Dry	4	3 (4 for infants and children)	
		Wet	4	3 (dark 2-3)	
	Color fastness to chlorinated water (swimming pool water)	Change in color	4	3	2~3
	Color fastness to light	Change in color	4	3	
		Fluorescence color	3		No assessment
	Color transfer in joints	Staining	3-4	3	2-3

The color depth is determined according to GSB 16-2159. The color darker than 1/12 standard depth is regarded as dark color, and the other color is regarded as light colour.

4.2.2 Color transfer in joints is only applicable to the products with dark and light pieces stitched together. Color transfer in joints is not applicable to light decorative strips.

4.2.3 The elastic elongation and elastic recovery to chlorinated water (swimming pool water) for lengthwise are not required for two-piece swimming suits.

4.2.4 Infants and children's swimming suits shall meet the relevant requirements of GB 31701.

4.2.5 The lining materials shall comply with the provisions of GB18401.

4.3 Appearance quality requirements

4.3.1 Assessment of appearance quality

Rating rules for surface defects are shown in Table 2.

Table 2 Rating rules for appearance defects

Classification of the defects	Defects	Superior grade	First grade	Qualified grade
Yarn defects	Soiled yarn, dyed yarn	Not allowed	Slight defects are permitted	Slight defects are permitted

Weaving defects	Long miss tuck	Not allowed		Allow one, within length of 3 cm
	Mending mark	Not allowed		Not allowed
	Tight yarn	Not allowed		The rest of continuous yarn draw back into the fabric, under 3
	Fragmentary tuck, needle line, course mark	Not allowed		Slight defects are permitted.
Dyeing defects	Color difference (Grade)	4	3-4	3
	Straying end	≤3%		≤5%
	Bright specks, crease mark, mottled appearance	Not allowed		Slight defects are permitted.
	Rusty spot	Not allowed		Not allowed
Sewing defects	Soiled sewing thread	For light color, 3 places with length of 1 cm or 1 place with length of 2 cm.		For light color, the length shall not be more than 10 cm. For dark color, the length shall not be more than 5 cm
	Pin marks	Not allowed		Not allowed
	Overlap stitches	Joints are not allowed in the middle (except reasonable joints).		1 place with length of 4 cm is permitted, except reasonable joints.
Print defects	Missing print	Not allowed		Slight defects are permitted.
	Misplaced printing	Not allowed		0.3 cm
	Printing overlap	Not allowed	5 places with length of 0.5 cm are permitted, or not affecting the appearance.	Slight defects are permitted.
	Interpenetration printing	Width of thin lines: not more than doubled; Width of thick lines: not more than 0.2 cm.		Unobvious defects are permitted.
	After stretching pigment printing fabrics, slight cracks on its gummed surface are allowed.			
	The defects that are not listed in Table 2 shall be assessed according to GB/T 8878. The appearance defects shall be assessed according to GSB 16-2500.			

4.3.2 Size deviation

Size deviation is shown in Table 3.

Table 3 Size deviation

Unit: cm

Items	Height ≤160 cm			Height >160 cm		
	Superior grade	First grade	Qualified grade	Superior grade	First grade	Qualified grade
length	-1.0		-1.5	-1.0	-1.5	-2.0
1/2 Chest (hip, waist) girth	-1.0		-1.5	-1.5	-1.5	-2.0
Side length (briefs)	-0.3		-0.5	-0.5	-0.8	-1.0
Side length (boxers)	-0.5		-0.8	-0.5	-0.8	-1.0
Leg opening width	-1.0		-1.5	-1.0	-1.5	-2.0
Crotch width	-0.5		-0.5	-0.5	-0.5	-0.5

4.3.3 Symmetrical part size difference

Size difference of symmetrical parts is shown in Table 4.

Table 4 Size difference of Symmetrical part Unit: cm

Item	Superior grade ≤	First grade ≤	Qualified grade ≤
<5 cm	0.3	0.4	0.5
5 cm~30 cm	0.6	0.8	1.0
>30 cm	0.8	1.0	1.2

4.3.4 Sewing requirements

4.3.4.1 The product shall be firmly sewed, and sewing stitches should be straight, smooth and of suitable elasticity.

4.3.4.2 At joint seam, it shall be sewed with four-thread or five-thread overlock stitch.

4.3.4.3 Backstitch is required at the seam edge of flat sewing stitch.

4.3.4.4 Double crotch should be used in crotch. Chest interlining (or pad) should be used at the chest part. The accessories and interlining shall be selected according to the requirements of the product.

4.3.4.5 The product shall be sewed with high elastic sewing thread. Do not break the line, and the reverse stitch can't prick the hand.

5 Test

5.1 Internal quality inspection

5.1.1 Preparation and test conditions

5.1.1.1 The sample taken should not have defects affecting the test.

5.1.1.2 Before testing the size change after washing, the humidity should be pre-adjusted according to the atmosphere prescribed by GB/T 6529. Once the humidity meets the requirements, the experiment can be carried out.

5.1.2 Test methods

5.1.2.1 Fiber content

Fiber content shall be tested in accordance with GB/T 2910 (All parts), FZ/T 01057 (All parts), and FZ/T 01095.

5.1.2.2 Formaldehyde content

Formaldehyde content shall be tested in accordance with GB/T 2912.1.

5.1.2.3 pH value

pH value shall be tested in accordance with GB/T 7573.

5.1.2.4 Odors

Odors shall be tested in accordance with GB 18401.

5.1.2.5 Decomposable carcinogenic aromatic amine dyes

Decomposable carcinogenic aromatic amine dyes shall be tested in accordance with GB/T 17592.

5.1.2.6 Elastic elongation rate

Elastic elongation shall be tested in accordance with FZ/T 70006 "Elongation testing under constant load". The tensile speed is 300 mm/min. The constant load is 15 N, and the adding force is 0.1 N. Three lengthwise and widthwise testing samples are randomly selected, respectively. The effective size of samples shall be 10 cm×5 cm. The first stretch is used for breaking the finishing agent of fabric. The second stretch is the elongation under constant load as the test value. Only the fabrics are tested.

5.1.2.7 Elastic recovery to chlorinated water (swimming pool water)

5.1.2.7.1 Sample treatment

Three lengthwise and three widthwise testing samples are randomly selected, respectively. The effective size of samples shall be 10 cm×5 cm. Elastic recovery to chlorinated water shall be tested in accordance with GB/T 8433. Stir 4 h in a container, in which the concentration of available chlorine is 50 mg/L.

5.1.2.7.2 Test for elastic recovery to chlorinated water (swimming pool water)

The prepared samples after treatment shall be tested in accordance with FZ/T 70006 "elastic recovery and plastic deformation after repeated stretch under constant load". The speed is 300 mm/min. Constant load is 15 N. Adding force is 0.1 N. Repeated stretching cycles are 3. Only the fabrics are tested.

5.1.2.8 Color fastness to washing

Color fastness to washing shall be tested in accordance with GB/T 3921-2008 (in accordance with the requirements of testing condition A(1)).

5.1.2.9 Color fastness to perspiration

Color fastness to perspiration shall be tested in accordance with GB/T 3922.

5.1.2.10 Color fastness to water

Color fastness to water shall be tested in accordance with GB/T 5713.

5.1.2.11 Color fastness to sea water

Color fastness to sea water shall be tested in accordance with GB/T 5714.

5.1.2.12 Color fastness to rubbing

Colorfastness to rubbing shall be tested in accordance with GB/T 3920. Only lengthwise testing is required.

5.1.2.13 Color fastness to chlorinated water (swimming pool water)

Color fastness to chlorinated water (swimming pool water) shall be tested in accordance with GB/T 8433. The concentration of available chlorine is 50 mg/L.

5.1.2.14 Color fastness to light

Color fastness to light shall be tested in accordance with GB/T 8427-2008 (method 3).

5.1.2.15 Color transfer in joints

Color transfer in joints shall be tested in accordance with method A of GB/T 31127-2014.

5.2 Appearance quality inspection

5.2.1 Inspection conditions of appearance quality

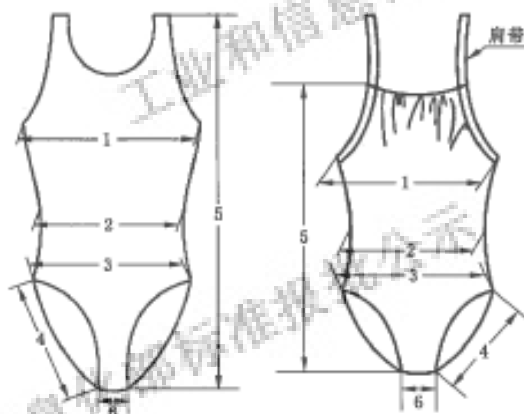
5.2.1.1 Generally, the artificial light is used to examine. A 40 W white fluorescent lamp with a lampshade is used. The vertical distance between the lampshade and the center of inspection table is (80±5) cm.

5.2.1.2 If natural light is used indoors, the light source is emitted in the direction of north to top left (or right), sunlight is not allowed to direct on the samples.

5.2.1.3 The samples should be spread on the inspection table and covered with white cloth for testing. The sight of inspector should face up to the surface of the flat samples. The distance between eyes and sample is over 35 cm.

5.2.2 Position and method of measurement

5.2.2.1 Measuring positions for one-piece swimming suits are shown in Figure 1.



Instructions:

1-1/2 Chest girth

2-1/2 Waist girth

3-1/2 Hip girth

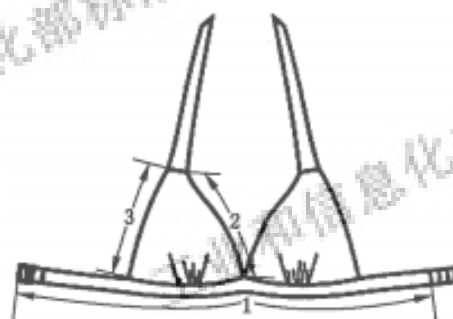
4-Width of leg opening

5-Garment length

6-Crotch width

Figure 1 Measuring positions for one-piece swimming suits

5.2.2.2 Measuring positions for split swimsuit tops are shown in Figure 2.



Instructions:

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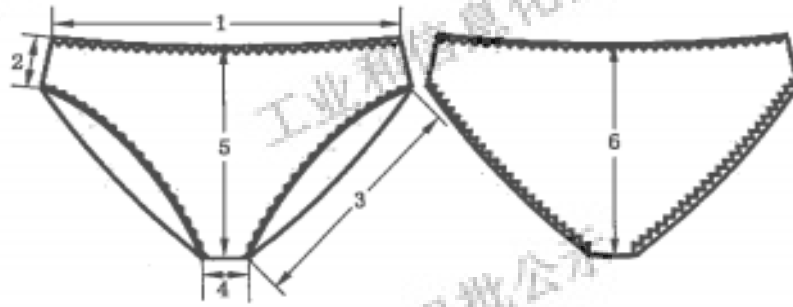
1-1/2 Chest girth

2- Medial length of cup

3- Lateral length of cup

Figure 2 Measuring positions for two-piece swimsuit tops

5.2.2.3 Measuring positions for **two-piece** swimsuit briefs are shown in Figure 3.



Instructions:

1-1/2 Waist girth

2-Side length

3-Width of leg opening

4-Crotch width

5-Front crotch length

6-Back crotch length

Figure 3 Measuring positions for two-piece swimsuit briefs

5.2.2.4 Measuring positions for split swimsuit skirt are shown in Figure 4.



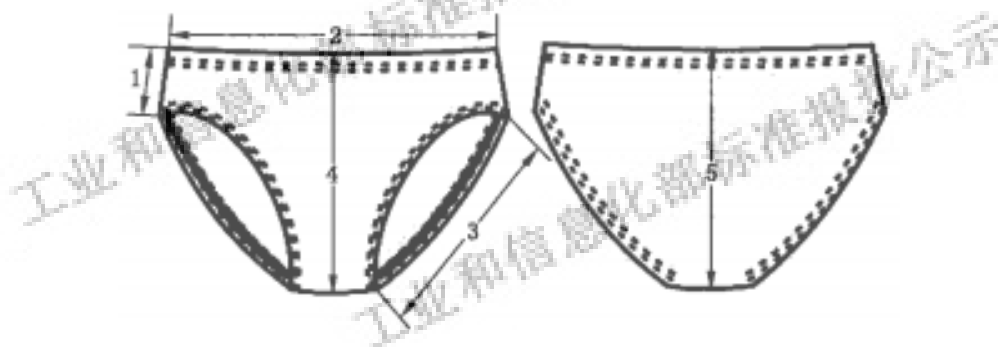
Instructions:

1-Skirt side length

2-1/2 Waist girth

Figure 4 Measuring positions for two-piece swimsuit skirt

5.2.2.5 Measuring positions for men's swimsuit brief are shown in Figure 5.

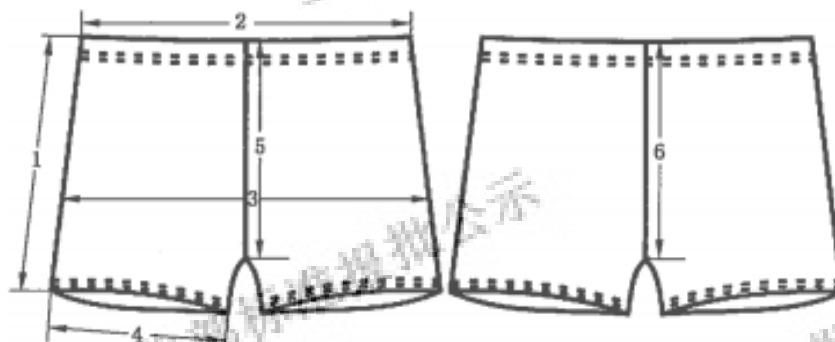


Instructions:

- 1-Side length
- 2-1/2 Waist girth
- 3-Width of leg opening
- 4-Front crotch length
- 5-Back crotch Length

Figure 5 Measuring positions for men's swimsuit brief

5.2.2.6 Measuring positions for swimsuit boxer are shown in Figure 6.



Instructions:

- 1-Side length
- 2-1/2 Waist girth
- 3-1/2 Hip girth
- 4-Width of leg opening
- 5-Front crotch length
- 6-Back crotch Length

Figure 6 Measuring positions for swimsuit boxer

5.2.2.7 Requirements for measuring positions are specified in Table 5.

Table 5 Requirements for measuring positions

NO.	Position	Measuring requirement
1	Length	Measure perpendicularly from the highest point of the front shoulder straps to the bottom line. For swimming suits with set-in shoulder straps, measure from the highest point of the front perpendicularly to the bottom line.
2	1/2 Chest girth	Measure horizontally at the widest position of chest.
3	Medial length of cup	The arc measurement from shoulder point to center point
4	Lateral length of cup	The arc measurement from shoulder point to side seam point of cup
5	1/2 Hip girth	Measure horizontally at the widest position of hip.
6	Crotch width	Measure horizontally at the narrowest position of crotch.
7	Bottom width	Fold the pants, and measure the width along the bottom hem.
8	1/2 Waist girth	Measure horizontally at the top of waist.
9	Side length	From the waist joint along the side seam to the foot edge.
10	Skirt side length	From the waist joint along the side seam to the skirt bottom side
11	Front crotch length	Arc measurement from waist to the bottom of the crotch
12	Back crotch length	From the waist to the bottom of the crotch
<p>Note: The measured value in each part is accurate to 0.1 cm. For swimming suits with different styles, other positions shall be measured according to the mutual agreements of both parties.</p>		

5.2.3 Test methods

5.2.3.1 Colour difference

The color difference shall be tested in accordance with GB/T 250.

5.2.3.2 Stragglng end test

Stragglng end shall be tested in accordance with GB/T 14801.

6 Rules of inspection

6.1 The Number of sampling

6.1.1 The appearance quality is measured by randomly selecting 1%~3% among the batches according to types and colors. But no less than 20 pieces are selected.

6.1.2 The intrinsic quality is measured by randomly selecting 4 pieces according to types and colors. Number of items can be increased if insufficient samples.

6.2 The intrinsic quality

The intrinsic quality requirements shall comply with 4.2 of this standard. If any one of the required items is disqualified, this batch of product shall be assessed as disqualified. If the products do not meet the requirements of color fastness items, then the products are not qualified by color requirements.

6.3 Appearance quality

Calculate the proportion of disqualified product in each batch according to the variety and color. If the proportion of disqualified samples is $\leq 5\%$, the batch is determined to be qualified in appearance quality, otherwise, this batch of product is determined to be disqualified in appearance quality.

6.4 Re-inspection

6.4.1 If either party has any objection to result, re-inspection is allowed to be requested.

6.4.2 Re-inspection shall comply with 6.1, 6.2 of this standard. The assessment is subject to the re-inspection.

7 Instructions for use, packaging, transporting and storage

7.1 Instructions for use shall be in accordance with GB/T 5296.4. Infants and children's products are according to GB/T 5296.4 and GB 31701.

7.2 Packaging shall be in accordance with GB/T 4856 or the mutual agreements of both parties.

7.3 Products have to be protected from moisture, fire and pollution during the transporting.

7.4 Products shall be stored in the storehouses which are cool, ventilate, dry and clean. Besides, products should be protected from worms and -moulds.