

stipulation. The latter contains formaldehyde content, pH value, peculiar smell, decomposable carcinogenic aromatic amine dye, fiber content, color fastness to water, color fastness to perspiration, color fastness to rubbing, color fastness to soaping, horizontal extension value, straight extension value, etc.

5.2 Grading criteria

5.2.1 Using pair (strip) as a unit, the quality of hosiery are divided into first-class and qualified.

5.2.2 The quality of hosiery shall be graded according to the minimum of inner quality grade and appearance quality grade; the inner qualities are graded as batch and the appearance quality are graded as pair (strip).

5.3 Appearance requirement

5.3.1 Specifications and tolerance

5.3.1.1 The names of each part of hosiery are as shown in Figure 1 to figure 4.

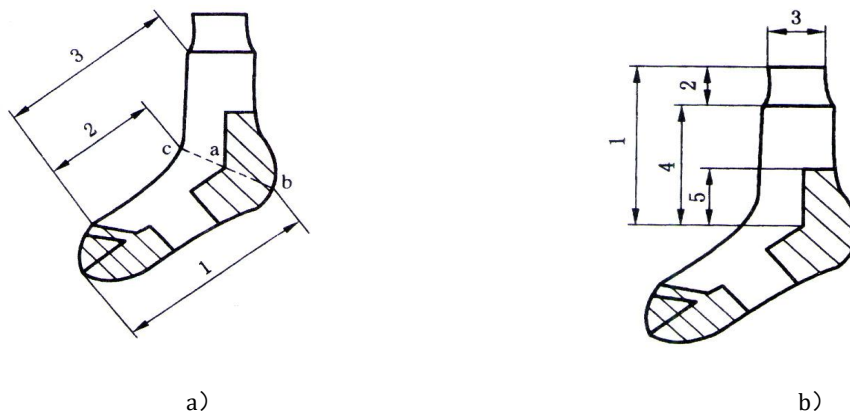


Illustration:

1—socks sole (the length of socks sole) ;

2—foot instep;

3—hoseiry instep;

a—starting point of woven heel;

b—contact point of woven heel (it is the intersection of socks heel arc fold line with the socks heel arc).

c—the intersection of the extended line of starting point of woven heel with the socks instep.

Note: The section line in the figure is the position of the loading point.

1—overall length of socks;

2—the height of socks welt;

3—the width of socks welt;

4—the length of socks leg;

5—the height of socks heel.

Figure 1 Hosiery with heel

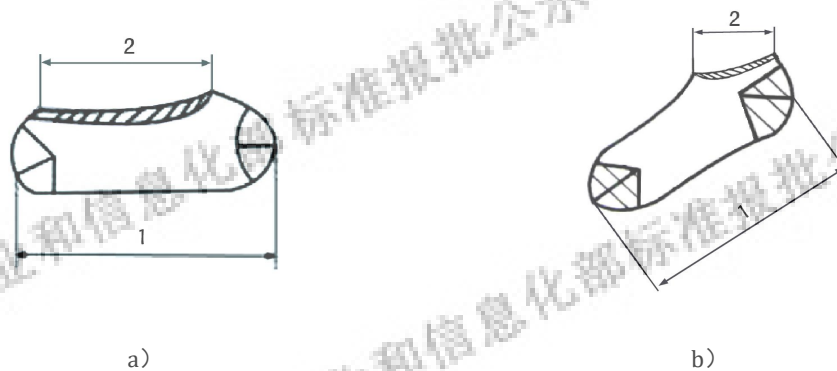


Illustration:

- 1—liner socks sole (the length of liner socks sole);
- 2—the width of liner socks welt.

Figure 2 Low cut ped socks (ship socks)

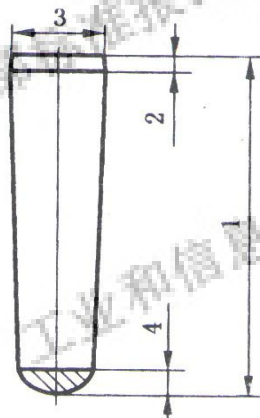


Illustration:

- 1—overall length of stocking;
- 2—the height of stocking welt;
- 3—the width of stocking welt;
- 4—stocking toe.

Figure 3 Anklet socks, knee-high socks and stockings

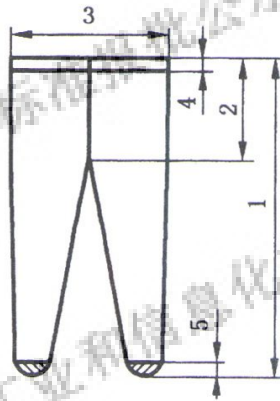


Illustration:

- 1—overall length of pantyhose;
- 2—crotch depth;
- 3—the width of waist welt;
- 4—the height of waist welt;
- 5—pantynose toe.

Figure 4 Pantyhose

5.3.1.2 Specifications and tolerance are as shown in Table 1 to Table 3.

Table 1 The specification and tolerance of inelastic hosiery with heel

Unit: cm

hosiery size	the length of hoseiry sole	tolerance of the length of hoseiry sole
12	12	
13	13	
14	14	
15	15	
16	16	
17	17	
18	18	
19	19	
20	20	
21	21	+0.5
22	22	-0.8
23	23	
24	24	
25	25	
26	26	
27	27	
28	28	
29	29	
30	30	

Table 2 The specification and tolerance of elastic hosiery with heel

Unit: cm

hosiery size	propositional hoseiry sole length	tolerance of the hoseiry sole length	hosiery size	propositional hoseiry sole length	tolerance of the hoseiry sole length
13~14	13	±1.0	12~14	9	±1.2
15~16	15		14~16	11	
17~18	17		16~18	13	
19~20	19		18~20	15	
21~22	21		20~22	17	
23~24	23	±1.2	22~24	19	±1.5
25~26	25		24~26	21	
27~28	27		26~28	23	
29~30	29		28~30	25	

Note: The index of hoseiry sole length and its tolerance in this table are both reference dimension, they are not suitable for judgement.

Table 3 The specification and tolerance of elastic hosiery without heel

Unit: cm

category	Overall length	Height of hoseiry welt≥	Width of hoseiry welt	Tolerance of hoseiry welt width	Waist welt height≥	Waist welt width≥	crotch depth≥
anklet socks	≥22 and <40	1.5	8.0	+2.0 -1.0	—	—	—
Knee-high socks	≥40 and <60		8.5				
Stocking	≥60		11.0				
pantyhose	—	—	—	—	2	18	20

Note 1: Hosiery without setting needn't assess overall length.

Note2: Hosiery with character instruction such as children in the lable or for the children styles hoseiry, the specification and tolerance needn't be assessed.

5.3.2 Appearance defects are as shown in Table 4.

Table 4 Appearance defects

category	Serial number	Appearance defects name	first-class	qualified
Inelastic hosiery with heel, elastic hosiery with heel	1	Thick filaments (thread)	Slight: foot instep is limited to 1 cm, other parts are limited to 0.5 circle accumulatively	Obvious: the cumulative limit of foot instep is 0.5 circle, and the limit of other parts is 3 within 0.5 circle
	2	Fine yarn	Not limited for hosiery welt, the force point is not allowed, other parts are limited to 0.5 circle	Slight: not allowed at the point of strength, not limited to other parts
	3	Broken yarn	Not allowed	Not allowed
	4	Needle-out	Slight: limited to 3 for foot instep; Obvious: not allowed for hosiery welt	Obvious: limited to 3 for hosiery instep
	5	Strained	Slight laddering is limited to 1 cm for 1 places on foot instep, other parts are limited to 1.5 cm for 2 places and slight needle-out structure and loose-tightening texture are allowed.	Slight laddering is limited to 2.5cm for 2 places and obvious needle-out structure and loose-tightening texture are allowed.

	6	Miss tuck	Nylon socks foot instep are not allowed, other parts are allowed for 3 places dispersedly.	foot instep are allowed for 3 places dispersedly, other parts are allowed.
	7	Floricome transformation	The defect which don't affect the beauty are allowed	
	8	Random pattern	Limited to 3 places in foot instep, slight for other parts.	Allowed
	9	Surface yarn breaking	Slight: limited to 0.3 cm for 1 places in hosiery instep, the force point is not allowed	Slight: the force point is not allowed limited to 0.5 cm for 2 places in other parts
	10	Grin	Slight: not allowed in hosiery instep, are limited to 0.3 cm for 1 place in hosiery toe and heel	Limited to 0.3 cm for 2 place in hosiery instep, toe and heel
	11	Elastic welt with different tension	Allowed for slight	Allowed for obvious
	12	Inaccurate toe closing	Allowed for slight	Allowed for slight
		Drop stitch, broken hole and incomplete sewing in seam allowance of hosiery toe, woven hole	Not allowed	Not allowed
	13	Stitch line out of straight in seam allowance of hosiery toe	Limited to 0.5 cm	Limited to 1.0 cm
	14	Uneven welt	Allowed for slight defect	Allowed
	15	skilteriness, oil stain, colour staining	Allowed for slight defect that no effect on apperance	Allowed for slight defect
	16	Chromatic aberration	Level 4-5 is allowed for a pair; the same is only allow level 3-4 , except for different color socks head and socks heel	Level 4 is allowed for a pair; the same is only allow level 3, except for different color socks head and socks heel
	17	Different length	Limited to 0.5 cm for a pair	Limited to 0.8 cm for a pair
	18	Height of hosiery welt, Width of hosiery welt	Limited to 0.5 cm for a pair	Limited to 0.5 cm for a pair
	19	Mending trace	Not allowed for foot instep, other parts are limited to 0.5 cm for 1 places.	Slight repair trace is allowed
	20	Mending scar	Not allowed	
elastic hosiery without heel	21	Poor quality filament	Not allowed	Allowed for slight
	22	Hairchested filament, filement with knot	Not Allowed for leg parts and foot instep	Allowed
	23	Core broken yarn	Not allowed	Not allowed
	24	Woven defect caused by damaged needle and missing stitch, seing needle hole	Not allowed	Not allowed
	25	Miss tuck	Discontinuity slight floricom is limited to 5 places for leg parts	Allowed
	26	Uneven crotch	The differnce between upper and lower stitches of waist elastic ribbon is limited within 0.5 cm.	The differnce between upper and lower stitches of waist elastic ribbon is limited within 0.7 cm.

27	Seam wrinkle	Not allowed for hosiery toe, other parts are allowed for slight defects	Allowed for slight defects
28	Different toes	Limited within 0.5 cm between each other	Limited within 0.8 cm between each other
29	Small toes	Not less than 1.5 cm	Not less than 1.5 cm
30	Incorrect sewing in crotch	The crotch is not sewn up or the seam is out of mesh in leg end part are not allowed	
31	Loss end crotch sewing	Sewing end of crotch depth must tie a knot	
32	skilteriness, oil stain, colour staining	Allowed for slight	Obvious is allowed except for foot instep
33	Chromatic aberration	Level 4-5 is allowed for a pair	Level 4 is allowed for a pair.
34	Laddering	Allowed for 0.5 cm dispersedly in 3 places or 1.0 cm in 1 place	Allowed for 0.5 cm dispersedly in 5 places or 1.0 cm in 2 places
35	Different length	Limited to 0.5 cm for a pair	Limited to 0.8 cm for a pair
36	Height of hosiery welt, Width of hosiery welt	Limited to 0.5 cm for a pair	Limited to 0.5 cm for a pair
37	Repair trace	Allowed for slight defects	
38	Repair scar	Not allowed	
39	Snagging	Not allowed	
40	Thread residue	Allowed within 0.5 cm to 1.5 cm	
41	unmatch	Not allowed to have different patterns on the surface of two pantyhose.	

Note1: The length of the appearance defects are measured with the maximum length (diameter) of the defects.
Note2: The appearance defects are assessed according to GSB 16-2610.
Note3: In case of any appearance defects which are not specified in the provisions, they shall be treated with the similar defects.
Note4: Description of defect degree:
Slight—The defects are not obvious in intuitively, but could be seen by careful identification;
Obvious—The defects don't affect the overall effect, but it can sense the defects;
Remarkable —The defects affect the overall effect obviously.

5.3.3 Sewing stipulate

5.3.3.1 The crotch of pantyhose shall be sewn with three-thread or four-thread overlock machine. The width of the seam shall be 0.3 cm ~ 0.4 cm, the stitch density shall be no less than 10 stitches /cm for three-thread overseam, and no less than 8 stitches /cm for four-thread overseam. The seam in straight direction shall not loosen by stretching. After sewing crotch, the height difference of the ladder-proof parts in pantyhose between two legs should be less than 1.5 cm. The length of the ladder-proof part should be sewed more than 1.5 cm.

5.3.3.2 For thin socks, the toe and heel parts should be reinforced (reinforcement method is not limited).

5.3.3.3 Elastic hosiery should be sewn with elastic sewing thread.

5.4 Inner quality requirement

5.4.1 The lengthwise and widthwise extension values and tolerance requirements are shown in table 5 ~ table 7

Table 5 Widthwise extension values and tolerance of inelastic hosiery with heel Unit: cm

Hosiery size	Hosiery welt	Hosiery leg	Tolerance for hosiery welt and leg
12	13.0	14.0	+1.0
13			-1.5

14	13.5	14.5	
15			
16	14.5	15.0	
17			
18	15.0	15.5	
19			
20	16.0	16.5	
21			
22	16.5	17.0	
23			
24			
25	17.5	18.0	
26			
27	18.5	19.0	
28			
29			
30	19.0	20.0	

Table 6 Lengthwise and widthwise extension values of elastic hosiery with heel Unit: cm

Hosiery size		Lengthwise extension values (length of hosiery sole) \geq	Widthwise extension values (hosiery welt, hosiery leg) \geq
13-14	12-14	21.0	16.0
15-16	14-16	25.0	
17-18	16-18	27.0	
19-20	18-20	29.0	17.0
21-22	20-22	31.0	
23-24	22-24	34.0	18.0
25-26	24-26	37.0	
27-28	26-28	40.0	
29-30	28-30	43.0	19.0

Note: Ankle socks (ship socks) do not assess the widthwise extension value, the straight extension value should be reduced by 1.0 cm when assessed.

Table 7 Lengthwise and widthwise extension values of elastic hosiery without heel Unit: cm

category	Widthwise extension				Lengthwise extension		
	Hosiery welt \geq	Up hosiery leg \geq	Down hosiery leg \geq	Waist welt width \geq	Hip width \geq	Crotch depth \geq	Leg length \geq
socks	21.0	—	22.0	—	—	—	—
Knee-high socks	26.0	26.0					
stocking	28.0	28.0					
pantyhose	—	32.0	22.0	40.0	50.0	32.0	130.0

Note1: Hosiery with character instruction such as children in the label or the children styles hosiery, the specification and tolerance needn't be assessed for lengthwise and widthwise extension values.

Note2: The lengthwise extension value for open-toe pantyhose leg should be decreased by 20.0 cm.

5.4.2 Other inner quality requirements and grading stipulation are shown in table 8.

Table 8 Inner quality requirements and grading stipulation

Items		First-class	qualified
formaldehyde content / (mg/kg)		According to GB 18401	
pH value			
peculiar smell			
decomposable carcinogenic aromatic amine dye/ (mg/kg)			
Fiber content/%		According to GB/T 29862	
Color fastness to water/grade	≥	Change in colour, staining	3
Colour fastness to perspiration/grade	≥	Change in colour, staining	3
Colour fastness to rubbing/grade	≥	dry rubbing	3
		wet rubbing	3 (dark 2-3)
Fastness to soap washing/grade	≥	Change in colour, staining	3
Widthwise extension value/cm	Hosiery welt, hosiery leg		
	Waist welt width, hip width	Comply with this standard	More than the first-class index by negative 5.0 cm
Lengthwise extension value/cm	Crotch depth		Comply with this standard
	Leg length		More than the first-class index by negative 4.0 cm
	Length of socks sole		More than the first-class index by negative 6.0 cm
Comply with this standard			
Note1: Children hosiery that specified in GB 31701 shall meet the relevant requirements of the mandatory standards.			
Note2: Colour depth is determined according to GSB 16-2159. The colour darker than 1/12 standard depth is regarded as dark colour, and the other colour is regarded as light colour.			

6 Test rules

6.1 Sampling amount

6.1.1 For the appearance quality, according to the delivery batch, random sample 2% ~ 3% on the basis of type, color and specification, but not less than 10 pairs (strip).

6.1.2 For the inner quality, according to the delivery batch, random sample more than 5 pairs (strip) on the basis of variety, color, specification.

6.2 Appearance quality inspection

6.2.1 Commonly use lamplight illum to examine, choosing a 40 W blue or white fluorescent lamp with lampshade above, the vertical distance between the lampshade and the center of the test table should be 50 cm ±5 cm or under the D65 light source.

6.2.2 If using indoor natural light, the light must proper, the direction of the light shoots should be in the angle of north to the left (or right), can't exposure directly to products.

6.2.3 During the inspection, the products should be spread out on the test table, the inspector should be in front of the product. In case of suspicious defects involving inner quality, both sides of the products should be inspected carefully, the assessment should be based on erthyphoria as products tiled (gloves are needed when test stockings) .

6.2.4 When testing the specification and dimension, it shall be measured without external tension.

Test tools: measuring stick, the length of which should be greater than the length of the sample, accurate to 0.1cm.

Test operation: when measuring the length of the hosiery sole, place the hosiery on a smooth plane, and measure the contact point of woven heel with the toe point with a measuring stick.

6.2.5 Color difference is assessed according to GB/T 250.

6.3 Sample preparation for inner quality test

6.3.1 Samples shall not have defects that affect the accuracy of the inner quality test.

6.3.2 Samples should be placed flatly at room temperature for 20 h first; then placed flatly in laboratory environment with temperature $20\text{ }^{\circ}\text{C}\pm 2\text{ }^{\circ}\text{C}$ and relative humidity of $65\%\pm 4\%$ for 4 h, and then under the same condition to test the extension values.

6.4 Test method for inner quality test

6.4.1 Lengthwise and widthwise extension values

6.4.1.1 Test instruments

a) Electric tensile instrument: the standard tension is $25\text{ N}\pm 0.50\text{ N}$, the extended standard tension is $33\text{ N}\pm 0.65\text{ N}$; The speed of the moving lever is $40\text{ mm/s}\pm 2\text{ mm/s}$.

b) Multifunctional tensile instrument: tensile force should be adjusted within the range of $0.1\text{ N}\sim 100\text{ N}$, length measurement should be range $(25\sim 300)\text{ cm}\pm 1\text{ cm}$, the speed of moving lever is $40\text{ mm/s}\pm 2\text{ mm/s}$, the standard tensile force is $25\text{ N}\pm 0.50\text{ N}$ and the extended standard tensile force is $33\text{ N}\pm 0.65\text{ N}$.

6.4.1.2 Test parts

6.4.1.2.1 Test parts for hosiery with heel

a) Widthwise extension of sock welt: in the middle of the sock welt

b) Widthwise extension of sock leg: for socks with reinforced sole, measure at 1.0 cm above the heel height; for socks with single layer sole, measure at the middle of the sock leg.

c) Lengthwise extension of sock sole: measure between two lines, one line is about 1.0 cm from the sock toe (fully clamped), the other line is 3.0 cm of the perpendicular line which is vertical with sock sole line passing contact point of woven heel. The clamping position is shown in figure 5.

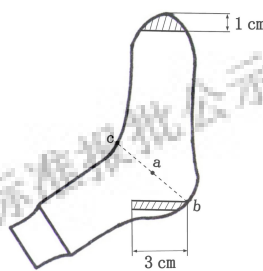


Figure 5 Schematic diagram of clamping position of socks sole

6.4.1.2.2 Test parts for socks without heel (anklet socks, knee-high socks, stocking)

a) Widthwise extension of sock welt: the middle of the sock welt

b) Widthwise extension of up sock leg: test at 5.0 cm below sock welt for knee-high socks and at 10.0 cm below sock welt for stockings.

c) Widthwise extension of down sock leg: test at 10.0 cm from sock toe.

6.4.1.2.3 Test parts for pantyhose

- a) Widthwise extension of waist welt width: the middle of the waist welt.
- b) Widthwise extension of hip width: 10.0 cm below waist welt.
- c) Widthwise extension of up pantyhose leg: 10.0 cm below crotch length.
- d) Widthwise extension of down pantyhose leg: 10.0 cm from pantyhose toe.

Note: For pantyhose with setting heel, test point of the widthwise extension of the down pantyhose leg is: 5.0 cm above the midpoint of the broken line of the heel arc; for pantyhose with woven heel, the test point of the widthwise extension of down pantyhose is: 5.0 cm above the starting point of woven heel; for pantyhose with open toe, test with similar pantyhose type for reference.

- e) Lengthwise extension of crotch: test between two lines, one is the middle of waist welt; the other is 1.5 cm above the extension line of crotch bottom.
- f) Lengthwise extension of pantyhose leg: test between two lines, one is the extension line of crotch bottom, the other is 1.5 cm from pantyhose toe.

Note: For the leg length of open-toe pantyhose, test between two lines, one is extension line from starting point of woven heel to hosiery instep, the other line is extension line of crotch bottom; if the pantyhose with no starting point, test with similar pantyhose type for reference.

6.4.1.3 Test operation and calculation

6.4.1.3.1 Testing elastic hosiery without heel by standard tension; Test other types of hosiery by extended standard tension. Standard tension is $25 \text{ N} \pm 0.50 \text{ N}$, extended standard tension is $33 \text{ N} \pm 0.65 \text{ N}$. The result should be kept to one decimal place.

6.4.1.3.2 Pantyhose extension test: the widthwise extension should be test first, then for lengthwise extension after placing 30 min.

6.4.1.3.3 The two leg lengths of pantyhose should be tested separately.

6.4.1.3.4 For the lengthwise extension of crotch, it should be test after folding relatively by left and right from the waist welt to the crotch bottom.

6.4.1.3.5 If the sample slippage on the retractor during testing, the sample shall be replaced and retested.

6.4.1.3.6 Calculation method (result is retained as integer) : the qualified rate is calculated according to formula (1).

$$A = \frac{n}{N} \times 100\% \dots\dots\dots (1)$$

In the formula:

A—pass rate, unit as %;

n—total number of qualified tested parts;

N—total number of tests parts.

6.4.2 Colorfastness test

6.4.2.1 Color fastness to soaping shall be test according to A (1) of GB/T 3921-2008.

6.4.2.2 Color fastness to perspiration shall be test according to GB/T 3922.

6.4.2.3 Color fastness to rubbing shall be tested according to GB/T 3920. Just test the straight of hosiery hole.

6.4.2.4 Color fastness to water shall be test according to GB/T 5713.

6.4.3 Fiber content test

According to GB/T 2910 (all parts), FZ/T 01057 (all parts), FZ/T 01095, FZ/T 01026, GB/T 16988, FZ/T 01101, FZ/T 30003.

Test parts: usually test the foot instep area or the hosiery sole area (except the hosiery toe and heel).

6.4.4 Formaldehyde content test

According to GB/T 2912.1.

6.4.5 pH value test

According to GB/T 7573.

6.4.6 Peculiar smell test

According to GB 18401.

6.4.7 Decomposable carcinogenic aromatic amine dye test

According to GB/T 17592.

7 Judgment rules

7.1 Appearance quality

With double (strip) as the unit, where the rate of non-conforming products exceeds 5.0% or above, or where holes or drop stitch are above 3.0%, the batch of products shall be judged as unqualified.

7.2 Inner quality

7.2.1 The lengthwise and widthwise extension value can be judged qualified when the qualified rate of them are above 80% or more by testing 5 pairs (pairs) of hosiery.

7.2.2 If test results of formaldehyde content, pH value, peculiar smell, decomposed carcinogenic aromatic amine dye, fiber content are qualified, the batch of products can be judged qualified, or judged unqualified as long as one item test result mentioned above unqualified.

7.2.3 If test results of color fastness to water, to perspiration, to rubbing and to soaping are qualified, the batch of products can be judged qualified; or judged unqualified on the basis of color classify as long as one item test result mentioned above unqualified.

7.3 Recheck

7.3.1 If any party has any objection to the test results, it may request a recheck.

7.3.2 The recheck results shall be judged according to 7.1 and 7.2, the judgment shall be subject to the recheck results.

8 Instructions for use, package, transportation and storage

8.1 Instructions for use shall be manufactured in accordance with GB 5296.4. Children hosiery's product instruction shall be manufactured in accordance with GB 5296.4 and GB 31701.

8.1.1 Fiber content is usually label the part of foot instep or hosiery sole (except toe and heel).

8.1.2 Specification label.

a) Inelastic hosiery with heel mark hosiery size in centimeters (cm), such as 23, 24, etc.

b) Elastic hosiery with heel mark hosiery size in centimeters (cm), such as 23-24, 22-24, etc.

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c) Elastic hosiery without hell (anklet socks, knee-high socks, stocking) mark the suitable height range for human dressing or mark hosiery size in centimeters (cm), such as 155-175、145-155 or 23-24、22-24.

d) Pantyhose mark the suitable height range and the suitable hipline range for human dressing in centimeters (cm), such as 155-175/75-105、145-155/70-90.

8.2 Package is according to GB/T 4856 or the related agreement.

8.3 When transportation, the product package should be protected from fire, moisture and pollution prevention.

8.4 Products should be stored in a cool, ventilated, dry and clean warehouse, meanwhile, protected from mildew and mothproof.

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