

ICS 59.090.30
W 63



ORGANIZATION STANDARD

T/ZZB XXXX—XXXX

Anti Cutting & Anti Slip External Wearing Sports Socks

XXXX-XX-XX

XXXX-XX-XX implementation

Published by Zhejiang Brand Building Federation

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PREFACE

This standard is drafted according to the rules given in GB/T 1.1-2009.

Some contents of this standard may involve patents, and the issuing organization of this standard shall not be responsible for identifying these patents.

This standard is proposed and managed by Zhejiang Brand Building Federation.

This standard is organized and formulated by Zhejiang Textile Testing Research Institute.

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Anti Cutting & Anti Slip External Wearing Sports Socks

1 range

This standard specifies the basic requirements, technical requirements, test methods, inspection rules, instructions for use, packaging, transportation, storage and quality commitment of anti-cutting and anti-skid wear sports socks.

This standard is applicable to cut-resistant and slip-resistant sports socks made from yarns containing high-performance fibers through weaving and dipping the sock bottom.

This standard does not apply to socks for infants aged 36 months or less.

This standard does not apply to professional athletic socks.

2 Normative references

The following documents are essential for the application of this document. For dated references, only dated versions are applicable to this document. For undated references, the latest version (including all amendments) is applicable to this document.

GB/T 250 Grey Sample Cards for Testing and Evaluating Colour Fastness of Textiles

GB/T 2910 (All Parts) Quantitative Chemical Analysis of Textiles

GB/T 2912.1 Determination of formaldehyde in textiles Part 1: Free and hydrolyzed formaldehyde (water extraction method)

GB/T 3903.6 Test Methods for Footwear

Textiles-tests for colour fastness-colour fastness to rubbing

Textiles-Tests for colour fastness-Colour fastness to soaping

Textiles-tests for colour fastness-colour fastness to perspiration

GB/T 4856 Needle Cotton Fabric Packaging

GB/T 5296.4 Instructions for Use of Consumer Goods Part 4: Textiles and Clothing

Textiles-tests for colour fastness-colour fastness to water

Determination of pH value of textile water extract

GB/T 16988 Determination of Mixture Content of Special Animal Fiber and Sheep Hair

Determination of banned azo dyes in textiles

GB 18401 national general safety technical code for textile products

GB/T 19976-2005 Textiles-Determination of bursting strength-Steel ball method

GB/T 21655.1 Evaluation of Moisture Absorption and Rapid Drying of Textiles Part 1: Single Combination Test Method

GB/T 24121 Testing Methods for Needle-Broken Residues in Textile Products

GB 24153—2009 Determination of N- Nitrosamine in Rubber and Elastomer Materials

GB 24541—2009 Hand Protection Mechanical Hazard Protective Gloves

GB/T 29554-2013 Ultra High Molecular Weight Polyethylene Fiber

Identification of textile fiber content

GB 31701 Technical Specification for Safety of Textile Products for Infants and Children

FZ/T 12040—2013 polyester (nylon)/spandex coated silk thread

FZ/T 73023—2006 antibacterial knitwear

FZ/T 01057 (All Parts) Textile Fiber Identification Test Method

FZ/T 01095 Test Method for Fiber Content of Textile Spandex Products

FZ/T 01026 quantitative chemical analysis of textiles multicomponent fiber mixtures

FZ/T 01101 Textiles-Determination of fibre content-Physical method

FZ/T 30003 method for quantitative analysis of hemp and cotton blended products
microscopic projection method

QB/T 4886 footwear sole low temperature folding performance requirements

3 basic requirements

3.1 Design and development

3.1.1 Design product styles according to different users, 3 to 6 years old for split toe socks, 7 years old and above for five toe socks.

3.1.2 According to ergonomic principles, the socks structure is designed in order to meet the requirements of socks foot wrap and protection.

3.1.3 According to the requirements of the product's protective properties, the product is configured with high-performance yarns in different stressed parts, and the height of the arch ring and ankle ring is designed.

3.1.4 According to different protection requirements, the area of the colloid (dip depth), pattern, etc. are calculated and designed.

3.2 Raw and auxiliary materials

3.2.1 Using high-performance yarn as raw material, the strength is not less than $4N / \text{tex}$, and the modulus is not less than $105N / \text{tex}$.

3.2.2 If ultra-high molecular weight polyethylene and nylon / ammonia-covered yarn are used as raw materials, the ultra-high molecular weight polyethylene should meet the requirements of gb / t 29554-2013 for superior products, and the nylon / ammonia-covered yarn should meet fz / t 12040-2013 for superior Product requirements.

3.2.3 Using high-quality natural latex, the latex content is not less than 95%.

3.3 Craft equipment

3.3.1 Five-toe socks machine is adopted. The five-toe socks machine has an automatic control system, a tension self-stop device, and a woven heel. The number of stitches can be selected between 72-176 stitches.

3.3.2 Special foot molds are used for production, and the finished product specifications meet the standards.

3.4 check

3.4.1 Testing equipment for raw material yarn strength, color difference and defect items should be available and tested.

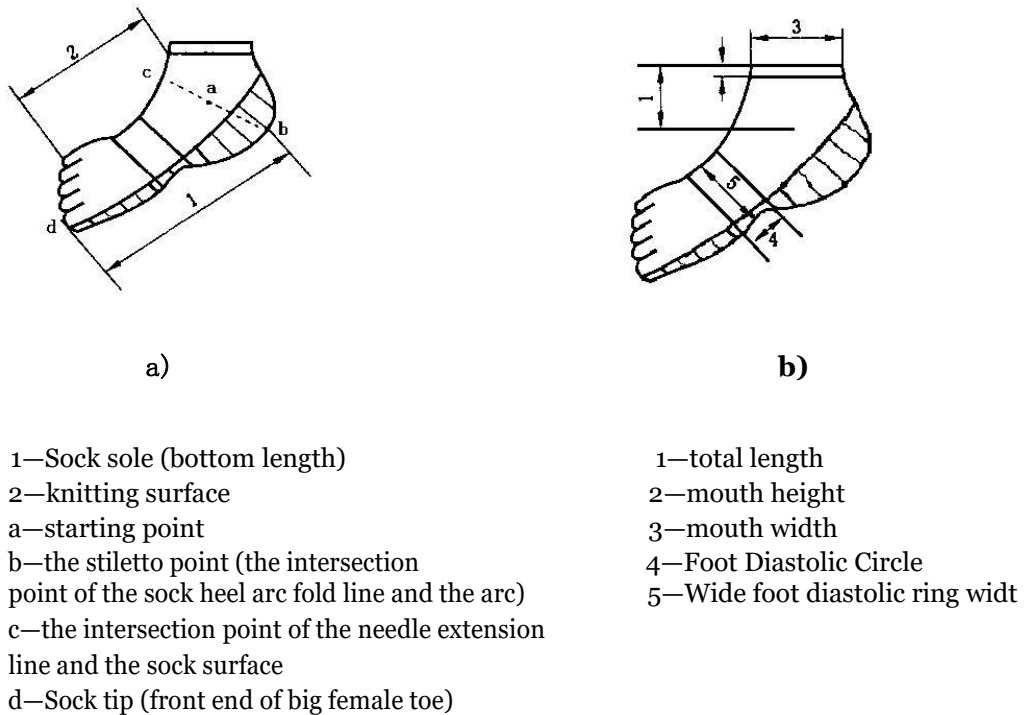
3.4.2 Testing equipment for transverse elongation, abrasion resistance, anti-aging (ultraviolet), and broken needle items of the finished product shall be provided and tested.

3.4.3 Infrared thermometer to measure the vulcanization temperature of latex.

4 skills requirement

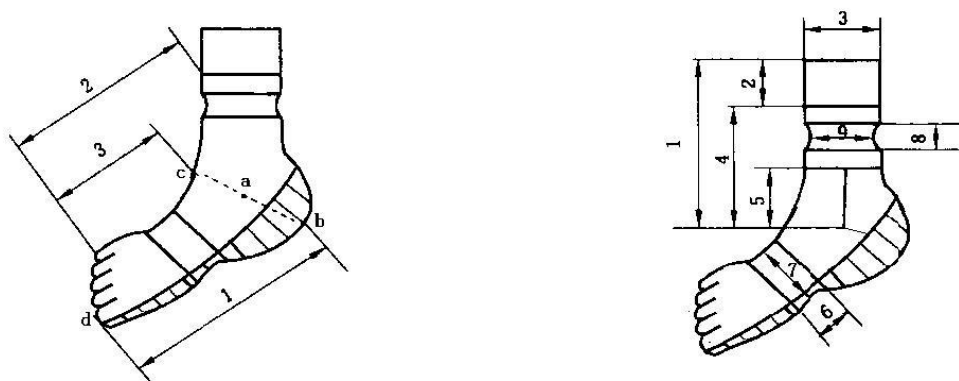
4.1 Appearance Quality

4.1.1 The specifications of the names of cut-resistant and slip-resistant outer socks for various specifications are shown in Figures 1 to 3.



Note: The section line in the figure is the point of impact and the glued part

Figure 1 Anti-cut and anti-skid outer wear socks under the ankle



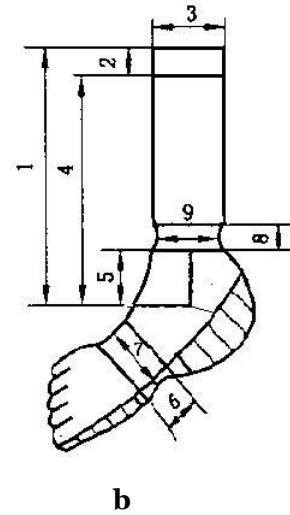
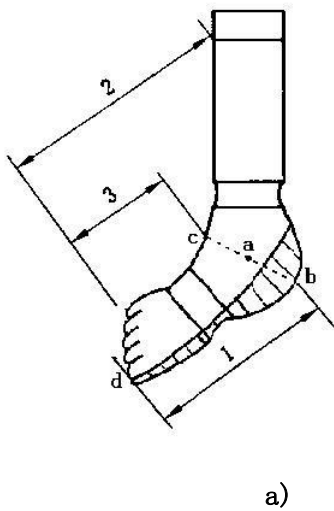
Explanation:

- 1—Sock sole (bottom length)
- 2—sock surface
- 3—foot surface a—starting point of needle
- b—the stiletto point (the intersection point of the sock heel arc fold line and the arc)
- c—the intersection point of the needle extension line and the sock surface
- d—Sock tip (front end of big female toe)

Note: The section line in the figure is the point of impact and the glued part

- 1—total length
- 2—mouth height
- 3—mouth width
- 4—tube length
- 5—follow
- 6—Foot diastolic ring height
- 7—Wide Diastolic Circle
- 8—high ankle diastole
- 9—Wide ankle diastole

Figure 2 Short-cut anti-skid outer wear socks



Explanation:

- 1—Sock sole (bottom length)
- 2—sock surface
- 3—foot surface a—starting point of needle
- b—the stiletto point (the intersection point of the sock heel arc fold line and the arc)
- c—the intersection point of the needle extension line and the sock surface
- d—Sock tip (front end of big female toe)

Note: The section line in the figure is the point of impact and the glued part

- 1—total length
- 2—mouth height
- 3—mouth width
- 4—tube length
- 5—follow
- 6—Foot diastolic ring height
- 7—Wide Diastolic Circle
- 8—high ankle diastole
- 9—Wide ankle diastole

Figure 3 Medium and long sleeve cut-proof non-slip outer wear sports socks

4.1.2 Specifications and tolerances are shown in Tables 1 and 2.

Table 1

Under ankle and short tube cut-resistant non-slip outer wear sports socks specifications and tolerances

In centimeters

Sock size	Recommended base length	Recommended Base length tolerance	Dimples and high ankle diastole \geq	Ankle diastolic loop is smaller than the width of the bottom of the sock
16~18	13	± 1.2	2	0.5 and up
18~20	15			
20~22	17			
22~24	19	± 1.5	3	
24~26	21			
26~28	23			
28~30	25			
30~32	27			
17~18	17	± 1.2	2	0.5 and up
19~20	19			
21~22	21			
23~24	23	± 1.5	3	
25~26	25			
27~28	27			
29~30	29			
31~32	31			

Table 2

Specifications and tolerances for tube and long socks

In centimeters

Sock size	Recommended base length	Recommended base length tolerance	Total length		Dimples and high ankle diastole \geq	Ankle diastolic loop is smaller than the width of the bottom of the sock
			Middle tube	Long tube		
16~18	14	± 1.2	26	40	2	0.5 and up
18~20	16					
20~22	18					
22~24	20	± 1.5	29	45	3	
24~26	22					
26~28	24					
28~30	26					
30~32	28					
17~18	15	± 1.2	32	45	2	0.5 and up
19~20	17					
21~22	19					
23~24	21	± 1.5	30	50	3	
25~26	23					
27~28	25		36	56		
29~30	27					
31~32	29					

4.1.3 The surface defect requirements are shown in Table 3.

table 3 Surface defect requirements

Serial numbe	Defect name	To begging
1	Thick wire (thread)	Not allowed, the foot area is limited to 1 cm, and the accumulative limit is 0.5 turn except for the foot area
2	Spun yarn	There is no limit to the area of the sock. It is not allowed at the point of focus.
3	Yarn break	Not allowed

4	Rare needle	Not allowed
5	Drawing, elastic	Not allowed
6	Flower needle	The foot area is not allowed, and the other parts are scattered and allowed to accumulate 6
7	Flower deformation	Does not affect aesthetics
8	Table yarn shreds	Not allowed
9	Inside yarn	Not allowed
10	Socks are uneven (bubbles, wrinkles)	Not allowed
11	Weaving holes and missing stitches	Not allowed
12	Color flowers, oil stains, stains	Not allowed
13	Chromatic aberration	Level 4-5 is allowed for the same pair; Level 3-4 is allowed for the heel and the body of the same pair, except for heterochromatic heads
14	Different lengths	0.5 cm limit (the difference between the two is less than 0.5 cm)

Table 3 Surface defect requirements (continued)

Serial number	Defect name	To begging
15	Repair scar	Not allowed
17	Repair	The foot surface is not allowed, and other parts are allowed to be scratched within 0.5 cm.
18	Rubber bottom color	4-5 grades allowed on the same pair, without dirt and stain
19	bubble	Less than 1.5mm in diameter without affecting the abrasion resistance, less than one medium bubble with a diameter greater than 1.5mm and less than 3mm, large bubbles greater than 3mm are not allowed
20	Rubber sole pattern	The density, shape, and block distribution of the rubber sole pattern of the left and right socks are basically the same, and the height difference between the dipping edges is controlled within 3mm
21	Hanging glue, bumping, no marks	Not allowed

Note 1: The length of the appearance defect is measured, measured by the longest length (diameter) of the defect. Note 2: The appearance of the surface defect is evaluated according to the color sample of the surface defect of the socks gsb 16-2610.

4.2 Intrinsic quality

4.2.1 The horizontal extension requirements of the product are shown in Table 4.

Table 4

Requirement for lateral extension of under ankle and short tube anti-cut non-slip outer wear sports socks

In centimeters

Sock size		Horizontal extension value		
		Socks, socks	Ankle diastole	Foot diastole
17~18	16~18	16	<Transverse value at the width of the sock	<The lateral extension value at the bottom of the socks
19~20	18~20	17		
21~22	20~22			
23~24	22~24	18		
25~26	24~26			
27~28	26~28	19		
29~30	28~30			
31~32	30~32	20		18

table 5

Requirement for lateral extension of cut-proof and slip-proof outer socks

In centimeters

Sock size		Horizontal extension value				Ankle diastole	Foot diastole
		Sock opening \geq		Socks \geq			
		Middle tube	Long tube	Middle tube	Long tube		
17~18	16~18	20	23	20	23	<Transverse value at the width of the sock	<The lateral extension value at the bottom of the socks
19~20	18~20	21	24	21	24		
21~22	20~22						
23~24	22~24	22	25	22	25		
25~26	24~26						
27~28	26~28	23	26	23	26		
29~30	28~30						
31~32	30~32	24	27	24	27		

4.2.2

Other requirements for intrinsic quality are shown in Table 4.

Table 6

Other requirements for intrinsic quality

item		Head	Means	Mark
Fiber content / %			Implementation according to gb / t 29862	
Formaldehyde content / (mg / kg)			Implemented according to GB 18401	
pH value				
Decomposable carcinogenic aromatic amine dye / (mg / kg)				
Peculiar smell				
Antibacterial effect ^a	Antibacterial rate / %	Staphylococcus aureus \geq	80	
		E.coli \geq	70	
		Candida albicans \geq	60	
Burst strength / n		\geq	320	
Friction resistance / cycle		\geq	8000	
Cut resistance / index		\geq	20	
Puncture resistance / n		\geq	100	
Dyeing fastness ^b / level \geq	Water fastness	Discoloration	4	
		Staining	4	
	Color fastness to acid and alkali sweat	Discoloration	4	
		Staining	4	
	Color fastness to rubbing	Ganmo	3-4	
		Wet friction	4 (dark 3)	
Color fastness to soaping	Discoloration	4		

	Staining	4
N-nitrosoamine / (mg / kg)	≤	Not checked out
Anti-slip performance (wet coefficient of dynamic friction)	≥	0.4
Water absorption rate /%	≥	200
Evaporation rate / (g / h)	≥	0.18
Low temperature resistance of socks		The length of the cut after the bottom of the socks is ≤20.0 mm, the number of new cracks is not more than 3, and the maximum length of the crack should not be greater than 5.0mm
Broken needle		Not checked out
^a Antibacterial grade aaa, antibacterial rate against S. aureus, E. coli and Candida albicans after 50 washings. ^b Color fastness is not tested for natural and bleached fabrics. ^c Fiber content, burst strength, moisture absorption and quick-drying test take only the fabric of the socks surface.		

4.2.2.1 Color classification according to gsb 16-2159 standard, > 1/12 standard depth is dark, ≤ 1 / 12 standard depth is light.

4.2.2.2 The antibacterial effect is only evaluated for products with clear antibacterial function. The safety performance of antibacterial substances is according to fz / t 73023-2006.

5.3 Or according to the relevant provisions in the explicit antibacterial performance standard number.

4.2.2.3 Children's sports socks should also meet the relevant requirements of GB 31701.

5 experiment method

5.1 Appearance Quality

5.1.1 Lighting inspection is generally used. Use a 40 W blue or white fluorescent lamp with a lamp cover on it. The vertical distance between the lamp cover and the center of the inspection table is 50 cm ± 5 cm or under a D65 light source. If indoor natural light is used, the light must be appropriate. The direction of light incidence is north to the left (or right) upper corner.

5.1.2 The product is evenly distributed on the inspection table during the inspection. Inspectors should face the product's surface squarely. In case of suspicious defects involving internal quality, they can carefully inspect or reverse the inspection, but the evaluation shall be regarded as flat.

5.1.3 When checking the size, it should be measured without being subject to external tension.

5.1.3.1 Test tool: a measuring ruler whose length must be greater than the sample length to the nearest 0.1 cm.

5.1.3.2 Test operation: lay the socks flat on a smooth surface and measure.

- a) Sock width: Measure the width of the bottom of the sock at a distance of 1 cm from the bottom of the starting point of the lifting needle. Sock Width: Measure the width of the sock from the bottom of the sock to the ankle relaxation circle of the sock.

- c) The other parts are measured as shown in Figure 1.

5.1.4 Color difference is evaluated according to gb / t 250.

5.2 Intrinsic quality

5.2.1 Sample preparation and test conditions

5.2.1.1 The intrinsic quality sample must not have defects that affect the accuracy of the test.

5.2.1.2 The sample shall be laid flat at room temperature for 20 h, then placed under the conditions of a test room temperature of $20\text{ }^{\circ}\text{C} \pm 2\text{ }^{\circ}\text{C}$ and a relative humidity of $65\% \pm 4\%$ for 4 h, and then tested under the same atmospheric conditions.

5.2.2 Horizontal extension value

5.2.2.1 Test Instruments

Test equipment includes:

- a) Electric transverse tension tester: the extension standard tension is $33\text{ N} \pm 0.65\text{ N}$, the adjustment tension is $10\text{ N} \pm 0.5\text{ N}$, and the moving speed of the moving lever is $40\text{ mm} / \text{s} \pm 2\text{ mm} / \text{s}$.
- d) Multifunctional tensile tester: Adjustable in the range of tensile force $0.1\text{ N} \sim 100\text{ N}$, length measurement range ($25\text{ cm} \pm 1\text{ cm}$) \sim ($300\text{ cm} \pm 1\text{ cm}$), travel speed of moving lever is $40\text{ mm} / \text{s} \pm 2\text{ mm} / \text{s}$, The standard extension force is $33\text{ N} \pm 0.65\text{ N}$, and the adjustment force is $10\text{ N} \pm 0.5\text{ N}$.

5.2.2.2 Test site

Test site: The lateral extension of the sock:
the middle of the sock. The lateral extension of the sock: The middle of the length of the sock.

Horizontal extension of ankle diastole: middle of ankle diastole. Horizontal extension of sock tube width: 1cm below ankle sock ankle diastole. Horizontal extension of ankle diastole: middle of ankle diastole. Wide bottom of sock Lateral extension: 1cm below the starting point of the lifting needle from the bottom of the socks.

5.2.2.3 Test operation and calculation

5.2.2.3.1 Test the lateral extension of the sock opening and the lateral extension of the sock with the standard extension of $33\text{ n} \pm 0.65\text{ n}$. Test the lateral extension of the sock with the $10\text{ n} \pm 0.5\text{ n}$, the lateral extension at the width of the sock, and the dimple with the foot Horizontal extension value, lateral extension value at the sole width. 5.2.2.3.2 If the sample slips off the pull hook during the test, the sample should be replaced and the test repeated.

5.2.2.3.3 Calculation method (the final result is rounded down to several digits according to gb / t 8170): the pass rate is calculated according to formula (1).

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

A-pass rate;

n-total number of tests passed;

N-total number of tests.

5.2.3 Fiber content

Press fz / t 01057 (all parts), gb / t 2910 (all parts), fz / t 01095, fz / t 01026, gb / t 16988, fz / t 01101, fz / t 30003.

Test site: The largest area of the foot structure is usually cut (except for the diastolic ring).

5.2.4 Formaldehyde content

Implemented according to gb / t 2912.1.

5.2.5 pH value

Implemented according to gb / t 7573.

5.2.6 Decomposable aromatic amine dyes

Implemented according to gb / t 17592.

5.2.7 Peculiar smell

Implemented according to GB 18401.

5.2.8 Burst strength

According to GB / T 19976-2005, the diameter of the steel ball is 20 mm ± 0.02 mm, and the hosiery surface is removed.

5.2.9 Antibacterial effect

According to fz / t 73023-2006 6.2.3 and 6.3 or the antibacterial performance standard number explicitly stated on the product, take the socks surface part.

5.2.10 Friction resistance

Perform according to 5.2 of GB 24541-2009, take the rubberized part of the bottom of the socks as the test sample.

5.2.11 Cut resistance

According to the provisions of 5.3 of GB 24541-2009, take the rubber part of the bottom of the socks as the test sample.

5.2.12 Puncture resistance

According to 5.5 in GB 24541-2009, take the rubber sampled part of the bottom of the socks as the test sample.

5.2.13 Dyeing fastness grade

5.2.13.1 Water fastness test shall be performed according to gb / t 5713;

5.2.13.2 The test method for color fastness to acid and alkali sweat stains is performed in accordance with the provisions of gb / t 3922. The bottom of the socks is taken as the test sample, and the front and back sides are tested;

5.2.13.3 The test method for color fastness to rubbing is performed in accordance with the provisions of gb / t 3920. The bottom of the socks is taken as the test sample, and the front and back sides are tested.

5.2.13.4 The test method for color fastness to soaping is performed in accordance with gb / t 3921-2008, and the test conditions are performed in accordance with a (1).

5.2.14 n-nitrosamine

According to the provisions of GB 24153-2009, take the rubber part of the bottom of the socks as the test sample.

5.2.15 Anti-slip performance

It is implemented according to gb / t 3903.6, the test interface is ceramic tiles, the test medium is third-grade water, and the dynamic friction coefficient of the sample is tested using the heel mode.

5.2.16 Water absorption and evaporation rate

According to gb / t 21655.1, take the same tissue structure part of the socks surface as the test

sample.

5.2.17 Low temperature folding resistance

Implemented according to qb / t 4886.

5.2.18 Broken needle

Executed according to gb / t 24121 and the detection limit is 1.0.

6 testing regulations

6.1 Inspection type

Inspection points are factory inspection and type inspection.

6.2 Factory inspection

The factory inspection items are the inspection stipulated in the 5.1 and 5.2 broken needle items of this standard. The factory inspection items are qualified and attached with a qualified mark (or inspection mark) before leaving the factory.

6.3 Type test

6.3.1 Type inspection items

Type inspection items are all items in Chapter 5. Type inspection should be performed when one of the following conditions exists: a) Trial production appraisal of new products or old products transferred to the factory;

b) After the official production, if there are major changes in structure, raw materials or processes, which may affect product performance; c) At 12 months of normal production;

d) When production is stopped for six months, when production resumes;

e) When the factory inspection results are significantly different from the last type inspection; f)

Quality supervision agency

6.3.2 Group approval

Products that are continuously produced according to the same order, same variety and same model of the delivery batch number are regarded as inspection batches.

6.3.3 Sampling number

6.3.3.1 Appearance quality is randomly sampled by variety, color, and specification from 2% to 3% according to the delivery batch, but not less than 10 pairs (articles).

6.3.3.2 The intrinsic quality is according to the delivery batch, random sampling of no less than 5 pairs (articles) by variety, color and specification.

6.3.4 Decision rules

6.3.4.1 Appearance quality batch determination is based on double unit.If the non-compliance rate exceeds 5.0%, the batch of products is judged as unqualified.

6.3.4.2 Batch determination of intrinsic quality

6.3.4.2.1 The horizontal elongation value is qualified when the total passing rate of the test 5 pairs of socks reaches 80% and above.

6.3.4.2.2 Fiber content, formaldehyde content, pH value, decomposable carcinogenic aromatic amine dye, odor, burst strength, antibacterial effect, friction resistance, cut resistance, puncture resistance, toluene, xylene content, slip resistance If the test results of water absorption and evaporation rate are qualified, the batch of products is qualified, and one of the unqualified ones is determined to be unqualified.

6.3.4.2.3 Those who pass the test results of water fastness, sweat fastness, rubbing fastness, and soaping fastness are judged to be qualified for the dyeing fastness of the batch; those who are unqualified are judged to be unqualified for color separation .

If all the items in 6.3 are qualified, the intrinsic quality of the batch of products is determined to be qualified; if one item is not qualified, the intrinsic quality of the batch of products is determined to be unqualified.

6.3.4.2.4 Comprehensive judgment

If all the items of internal quality and appearance quality are qualified, the batch of products is determined to be qualified; if one item is not qualified, the batch of products is determined to be unqualified.

7 Instructions for use, packaging, transportation, storage

7.1 Instructions for use

According to gb / t 5296.4, children's socks are subject to gb / t 5296.4 and gb 31701.

7.1.1 The fiber content is usually marked on the product with the largest structural area on the foot surface (except for the diastolic ring).

7.1.2 Specification marking: Sock size is marked in centimeters (cm), 23 ~ 24, 22 ~ 24 or 23 ~ 24cm, 22 ~ 24cm, etc.

7.1.3 Antibacterial effect labeling: According to 8.2.1 and 8.2.2 in fz / t 73023-2006, or the relevant provisions in the explicit antibacterial performance standard number.

7.2 Packaging

Implemented according to gb / t 4856 or agreement.

7.3 Transport

Product packing and transportation shall be fire-proof, direct-proof, moisture-proof, damage-proof and pollution-proof.

7.4 Storage

The product should be kept tightly closed, and should not be exposed to direct sunlight.It should be stored in a cool, ventilated, dry and clean place.

8 Quality Commitment

8.1 Provide more detailed instructions for use and maintenance in the product packaging and the company's network platform to guide customers in the correct use and maintenance of the product.

8.2 In the case of normal storage and transportation and use, within 7 days from the user's purchase, it can be returned unconditionally without affecting the secondary sales.

8.3 When users object to the quality of this product, the factory will respond within 24 hours to provide customers with services and solutions in a timely manner. When users raise objections to product quality, the manufacturer should respond within 24 hours and provide customers with timely Services and solutions.
