

Knitted casual wear

1 Scope

This standard specifies the terms and definitions, product size, requirements, testing methods, sampling rules, judgment rules, instructions for use, packaging, transportation and storage for knitted casual wear.

This standard is applicable to identify the quality of knitted casual wear made of knitted fabrics mainly.

This standard is not applicable to the clothing for infants at the age of 36 months or below.

2 Normative Reference

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 colour fastness—Grey scale for assessing change in colour*

GB/T 251, *Textiles—Tests for colour fastness—Grey scale for assessing staining*

GB/T 1335(all parts), *Standard sizing systems for garments*

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

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

GB/T 3920, *Textiles—Tests for colour fastness—Colour fastness to rubbing*

GB/T 3921, *Textiles—Tests for colour fastness—Colour fastness to washing with soap and soda*

GB/T 3922, *Textiles—Tests for colour fastness—Colour fastness to perspiration*

GB/T 4802.1-2008, *Textiles—Determination of fabric propensity to surface fuzzing and to pilling—Part 1: Circular locus method*

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

GB/T 5296.4, *Instruction for use of products of consumer interest—Part 1: Textiles and apparel*

GB/T 5711, *Textiles—Tests for colour fastness—Colour fastness to drycleaning using perchloroethylene solvent*

GB/T 5713, *Textiles—Tests for colour fastness—Colour fastness to water*

GB/T 6411, *A series of size of knitted underwear*

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

GB/T 8170, *Rules of rounding off for numerical values & expression and judgement of limiting values*

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

GB/T 8629-2017, *Textiles—Domestic washing and drying procedures for textile testing*

GB/T 8878, *Knitted cotton underwear*

FZ/T 73020—2019

GB/T 14576, *Textiles—Tests for colour fastness—Colour fastness to light of textiles wetted with artificial perspiration*

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

GB/T 15557-2008, *Standard terminology relating to apparel*

GB/T 17592, *Textiles-Determination of the banned azo colourants*

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

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

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

GB/T 31127-2014, *Textiles—Tests for colour fastness—Colour fastness to transfer in joints*

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

FZ/T 01026, *Textiles—Quantitative chemical analysis—Quaternary fibre mixtures*

FZ/T 01057(all parts), *Test method for identification of textile fibers*

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

FZ/T 01101, *Textile test method—Fiber content-Quantitative physical analysis*

FZ/T 80007.3-2006, *Dry wash resistance test method for garments used adhesive interlining*

GSB 16-1523, *Pilling standard of knitted fabric*

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

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

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1

mini shorts

A kind of shorts with the hem to the middle of the thigh or above.

[Definition 3.33 in GB/T 15557-2008]

3.2

fluorescence colour

The color that visible light excited by some substances when they absorb incident light of a certain wavelength range.

Note: The fluorescence color is irradiated by ultraviolet lamp.

4 Product size

The size of knitted casual wear shall be in accordance with GB/T 6411 or GB/T 1335(all parts). If the size beyond the standard range, it shall be marked increase or decrease in order according to the principle of classification in GB/T 6411 or GB/T 1335 (all parts).

5 Requirements

5.1 Required Contents

The requirements include inherent quality and appearance quality. The inherent quality includes fiber content, formaldehyde content, pH value, odor, decomposable carcinogenic aromatic amine dyes, bursting strength, pilling, dimensional stability to washing, dimensional stability to drycleaning, spirality after washing, color staining degree of washing solution, colour fastness to washing, colour fastness to water, colour fastness to perspiration, colour fastness to rubbing, colour fastness to light, colour fastness to drycleaning, colour fastness to transfer in joints, colour fastness to light of textiles wetted with artificial perspiration, appearance quality after washing(drycleaning), etc. The appearance quality includes appearance defects, dimensional deviation of specifications, dimensional differences of symmetrical parts, sewing requirements, etc.

5.2 Grading criteria

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

5.2.2 The inherent 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.

5.2.3 The lowest testing result in terms of inherent quality shall determine the final grade of inherent quality of the lot.

5.2.4 In case of appearance quality of different grades in one product, the grade classification shall be graded according to the lowest grade. Only two appearance defects with extreme in the same grade are allowed for one piece of sample, otherwise, the sample shall be degraded.

5.3 Inherent quality Requirements

5.3.1 The requirements of inherent quality are shown in Table 1.

Table 1 Requirements of inherent quality

Items		Superior grade	First grade	Qualified grade	
Fiber content /%		Conform to GB/T 29862			
Formaldehyde content / (mg/kg)		Conform to GB18401			
pH value					
Odor					
Decomposable carcinogenic aromatic amine dyes / (mg/kg)					
Bursting strength /N \geq		250			
Pilling/Grade \geq		3-4	3	3	
Dimensional stability to washing and drycleaning /%		Lengthwise, widthwise $-3.5 \sim +2.0$		$-6.5 \sim +2.0$	
spirality after washing / % \leq		Top	4.0	5.0	6.0
		Bottom	1.5	2.5	3.5
Color staining degree of washing solution \geq		3		2-3	
Shell fabric	Colour fastness to washing with soap or soap and soda /Grade \geq	Change in colour	4	3-4	3
		Staining	4	3-4	3
	Colour fastness to water/Grade \geq	Change in colour	4	3-4	3
		Staining	4	3	3
	Colour fastness to perspiration/Grade \geq	Change in colour	4	3-4	3
		Staining	4	3	3
	Colour fastness to rubbing/Grade \geq	Dry	4	3-4	3
		Wet	3-4	3(dark 2-3)	2-3(dark 2)
	Color fastness to light /Grade \geq	dark	4	4	3
		light	4	3	3
Color fastness to drycleaning /Grade \geq	Change in colour	4	4	3-4	
	Staining	4	4	3-4	
Colour fastness to transfer in	Staining	4-5	4	4	

	joins /Grade \geq			
	Colour fastness to light of textiles wetted with artificial perspiration (alkaline)/Grade \geq		4-5	3-4
Lining	Colour fastness to washing with soap or soap and soda /Grade \geq	Change in colour / Staining	3	
	Colour fastness to water/Grade \geq	Change in colour / Staining	3	
	Colour fastness to perspiration/Grade \geq	Change in colour / Staining	3	
	Colour fastness to rubbing/Grade \geq	Dry	3-4	
Wet		2-3 (dark 2)		
Appearance quality after washing(drycleaning)		No obvious color changes on the whole, no damage to the fabric, no sewing thread coming off. no cracking, blistering, peeling and falling off on the printed (iron) position. No serious wrinkling and deformation on embroidery position. No deformation, discoloration, damage, falling off and rusted on accessories. Other defects that seriously affect the appearance quality are not allowed. Except for special style design.		
Note: The 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.				

- 5.3.2 Bursting strength is not applicable to elastic fabric and products with hollow-out (grenadine, mesh, etc.), stripe, burn-out and other structural.
- 5.3.3 Pilling is only applicable to the face side of product and not applicable to product with face side sanded, fleeced and flocked.
- 5.3.4 The color staining degree of washing solution is only applicable to the dark fabric whose area accounts for 30% or more of the total clothing area
- 5.3.5 Dimensional stability to washing is not applicable to elastic fabric at widthwise, and not applicable to wrinkled product at the direction of wrinkle.
- 5.3.6 For the fluorescence color product, the index of color fastness to light for qualified grade could be a half grade lower than this standard.
- 5.3.7 The color fastness to drycleaning, dimensional stability to drycleaning and appearance quality after drycleaning are only applicable to the product marked with drycleaning in the instruction for use.
- 5.3.8 The color fastness to washing with soap or soap and soda, dimensional stability to washing, spirality after washing and appearance quality after washing are only applicable to the product marked with washable in the instruction for use.
- 5.3.9 The spirality after washing is not applicable to products with tight, mini-shorts, upper clothing with non-straight hem.
- 5.3.10 The colour fastness to transfer in joints is only applicable to the products splicing with dark and light colour.
- 5.3.11 the colour fastness to light of textiles wetted with artificial perspiration is only applicable to the single layer clothing in direct contact with skin.
- 5.3.12 The colour fastness to washing, water, perspiration, rubbing and drycleaning are not applicable to the natural colour and bleached products.
- 5.3.13 The clothing for children shall also conform to the requirements specified in GB 31701.

5.4 Appearance quality requirements

5.4.1 Classification requirements of appearance defect are shown in Table 2.

Table 2 Classification stipulations of appearance defect

Name of defect	Superior grade	First grade	Qualified grade
Colour different / Grade \geq	4-5 among main fabrics, 4 among main fabrics and accessories	4 among main fabrics, 3-4 among main fabrics and accessories	3-4 among main fabrics, 3 among main fabrics and accessories
Skewness (stripe and check products) /% \leq	3.5	4.5	6.0
Uneven stitch line \leq	0.2 cm for main parts and top stitching 0.5 cm for others		0.5 cm
Oiled stained sewing thread, oiled yarn, oiled cotton	light colour: two places are allowed for 1 cm or one place is allowed for 2 cm . Not allowed in collar, lapel or pocket		20 cm for deep colour 10 cm for deep colour
Facing leans out of front edge	Not allowed	Allowed for slight	
Yellowing , discoloration , bright water-based stains, deterioration caused by ironing	Not allowed		
Unsmooth stitching	Not allowed	Allowed for slight	Allowed for obvious, and not allowed for severe
Unsmooth and curved zipper	Not allowed	Allowed for slight	Allowed for obvious, and not allowed for severe
Missing of steps or errors in the manufacture procedure, components missed or damaged	Not allowed		
Note1: The defects not listed above shall be classified according to GB/T 8878. Note2: The appearance defects shall be classified according to GSB 16-2500. Note3: The main parts refer to the 2/3 front top part for upper clothing (including the exposed part of the back neck line) , while trousers have no specified main part. Note4: The description of defect degree: Slight: Not obvious but can be recognized with carefully observation. Obvious: Easy to be recognized, but not affecting the overall appearance. Severe: Easy to be recognized, while affecting the overall appearance.			

5.4.2 The dimensional deviations of specifications are shown in Table 3.

Table 3 Dimensional deviation of specifications

Unit: cm

Types	Superior grade	First grade	Qualified grade
Lengthwise (length of upper clothing, sleeves, or trousers)	60 or more	± 1.0	± 2.0
	Less than 60	± 1.0	± 1.5
Widthwise (1/2 chest girth, 1/2 waist girth)	± 1.0	± 1.5	± 2.0

5.4.3 Dimensional differences of symmetric positions are shown in Table 4.

Table 4 Dimensional differences of symmetric positions

Unit: cm

Item	Superior grade product	First grade product	Qualified grade product
	\leq	\leq	\leq
≤ 5	0.2	0.3	0.4
> 5 and ≤ 15	0.5	0.5	0.8
> 15 and ≤ 76	0.8	1.0	1.2

>76	1.0	1.2	1.5
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5.4.4 Sewing requirements

- 5.4.4.1 The joining shoulder seam, crotch seam joint of trousers and seam end shall be reinforced.
- 5.4.4.2 Sewing shall be firm, and the stitches shall be straight, smooth, and with proper tightness.
- 5.4.4.3 Sewing threads with strength, shrinkage, colour and luster matching the fabric shall be used, except for decoration yarns.
- 5.4.4.4 The collar type of the product shall be correct, the front fly shall be straight and flat, zipper shall be smooth, ironing shall be flat, and no sundries.

6 Test methods

6.1 Inherent quality inspection

6.1.1 Fiber content

It is tested according to GB/T 2910(all parts), FZ/T 01026, FZ/T 01057(all parts), FZ/T 01095, FZ/T 01101, and so on.

6.1.2 Formaldehyde content

It is tested according to GB/T 2912.1.

6.1.3 pH value

It is tested according to GB/T 7573.

6.1.4 Odor

It is tested according to GB18401.

6.1.5 Decomposable carcinogenic aromatic amine dye

It is tested according to GB/T 17592.

6.1.6 Bursting strength

It is tested according to GB/T 19976-2005, and the diameter of the steel ball is (38 ± 0.02) mm.

6.1.7 Pilling

It is tested according to GB/T 4802.1-2008, Method E, while the classification is assessed from the style of the fabrics and the shape of the naps in accordance with GSB 16-1523.

6.1.8 Dimensional stability to washing

6.1.8.1 Measured position

For upper clothing, the calculation basis of body length is the average of the four measured values includes left and right on both front side and back side, and the calculation basis of widthwise is the measured values of back cross. For trousers, the calculation basis of lengthwise is the measured values of length of trousers on the left leg and right leg, and the calculation basis of widthwise is the measured values of the mid-leg width of the left leg and right leg. Marking is made on the products when it is measured, so that it can be measured after washing. The measured positions of upper clothing are shown in figure 1, the measured positions of the trousers are shown in figure 2.

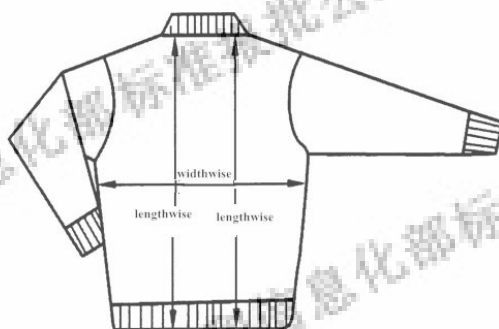


Figure 1 Measuring positions of upper clothing before and after washing

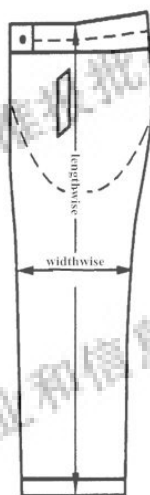


Figure 2 Measured positions of trousers before and after washing

6.1.8.2 Method to measure is specified in Table 5.

Table 5 Measuring position of the Dimensional stability to washing

Category	Positions	Method of measurement
Upper clothing	lengthwise	Measure body length, from the highest point on the shoulder seam to the hem vertically.
	widthwise	Measure back cross, horizontally at 5 cm down from the intersection point of the armhole seam and the side seam.
trousers	lengthwise	Measure trouser length, from the waist line vertically to the hem along the side seam.
	widthwise	Measure the mid-leg width, horizontally at midpoint of the line from the crotch to the hem

6.1.8.3 Washing procedure

According to GB/T 8629-2017, select washing program 4N of type A washing machine. However, if products with "hand wash only" indication, select washing program 4H of type A washing machine. Select "standard detergent 3" as detergent. The number of test pieces is three and the washing time is one.

6.1.8.4 Drying method

Line dry. For upper clothing, using the pole to cross the sleeves to keep the chest girth and armhole area straight, and straighten the front and back of the clothes with your hand from the bottom. Trousers is hung up in a folded state, and the crotch of trousers is placed on the air pole and kept it flat. Keep the dried samples on a platform for more than 4 hours in an environment with a temperature of $(20\pm 2)^{\circ}\text{C}$ and a relative humidity of $(65\pm 4)\%$, and then tap the crease gently and measure it.

6.1.8.5 Result calculation

Dimensional stability to washing in lengthwise or widthwise is calculated according to formula (1), negative sign (-) indicates a dimensional shrinkage, and the positive sign (+) indicates a dimensional elongation (increase). Take the arithmetic means of all the samples as the test result. If there are both shrinkage and elongation (increase) test results, take the arithmetic mean value of two samples of shrinkage (or elongation) as the test result, and the final result is retained one decimal place revised according to GB/T8170.

$$A = \frac{L_1 - L_0}{L_0} \times 100\% \quad (1)$$

Where:

A is dimensional stability to washing in lengthwise or widthwise, %;

L_1 is mean value of lengthwise or widthwise after washing; unit is centimeter (cm);

L_0 is mean value of lengthwise or widthwise before washing; unit is centimeter (cm).

6.1.9 Dimensional stability to drycleaning

It is tested according to FZ/T 80007.3-2006, and select conventional dry cleaning method. The number of test pieces is three. Measure according to the test method of dimensional stability to washing.

6.1.10 Spirality after washing

6.1.10.1 Washing procedure and drying method

Washing and drying are carried out according to test method of dimensional stability to washing.

6.1.10.2 Measuring method after washing

Spread out the washed specimen on a smooth countertop and gently pat it flat by hand. Measuring position shall be on the side with the greatest skewness of each specimen, see figure 3 and figure 4.



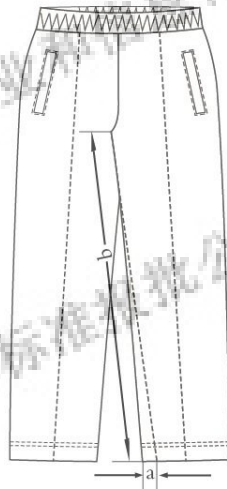
Instructions:

a is the distance between the two points, the one point is the vertical projection point of the intersection of side seam and armhole on the hem, and the another point is the intersection point of the side seam and the hem. The unit is centimeter (cm);

b is the vertical distance from the intersection of the side seam and the armhole to the hem. The unit is centimeter (cm);

Note: All data are calculated by the measured value after washing. If the product is distorted before washing, mark it and indicate it in the report.

Figure 3 Example of the measuring positions of the upper clothing



Instructions:

a is the distance between the two points, the one point is the intersection point of inside edge and the hem, and the another point is the intersection point of inseam and the hem. The unit is centimeter (cm);

b is the distance between the bottom point of the crotch and the hem along the inseam.

Note: All data are calculated by the measured value after washing. If the product is distorted before washing, mark it and indicate it in the report.

Figure 4 Example of the measuring positions of the trousers

6. 1. 10. 3 Result calculation

Spirality after washing is calculated according to formula (2), take the arithmetic mean value of three samples of the spirality after washing as the test result, and the final result is retained one decimal place revised according to GB/T 8170.

$$F = \frac{a}{b} \times 100 \% \dots\dots\dots (2)$$

Where:

F is spirality after washing;

a、 b is seen in Figure 3 and Figure 4.

6. 1. 11 Colour staining degree of washing solution

Sample preparation and washing are carried out according to method A (1) in GB / T 3921-2008, and then pour the residual liquid soap that is filtered to remove impurities to colorimetric tube. Finally, assess the staining of the washing solution with reference to the original soap solution with the same test temperature using grey scale for assessing staining (GB/T 251). It should be noted that the assessing should be completed within 15 minutes.

6.1.12 Colour fastness to washing with soap or soap and soda

It is tested according to GB/T 3921-2008, Method A(1).

6.1.13 Colour fastness to water

It is tested according to GB/T 5713.

6.1.14 Colour fastness to perspiration

It is tested according to GB/T 3922.

6.1.15 Colour fastness to rubbing

It is tested according to GB/T 3920, with only the vertical direction tested.

6.1.16 Colour fastness to artificial light

It is tested according to GB/T 8427-2008, Method 3.

6.1.17 Color fastness to drycleaning

It is tested according to GB/T 5711.

6.1.18 Colour fastness to transfer in joints

It is tested according to GB/T 31127-2014, Method A. For sample size less than $(100 \pm 2) \text{mm} \times (40 \pm 2) \text{mm}$ or denture products, take the maximum size of the sample, and sew the two samples together along the short edge.

6.1.19 Colour fastness to light of textiles wetted with artificial perspiration

It is tested according to GB/T 14576.

6.1.20 Appearance quality after washing(drycleaning)

Wash and dry the samples in accordance with test method of dimensional stability to washing and drycleaning in this standard, and assess the washed clothes one by one according to table 1.

6.2 Inspection for appearance quality

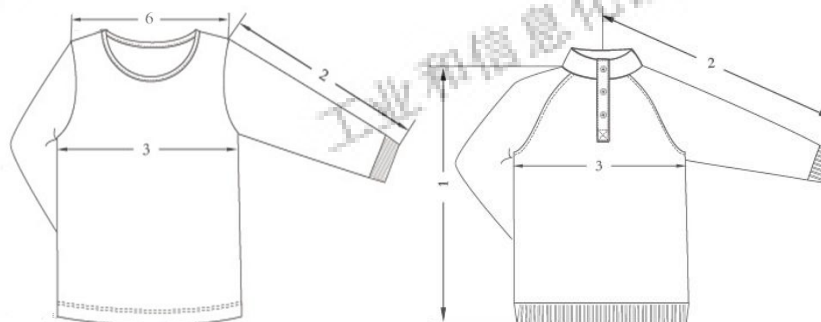
6.2.1 Test conditions of inspection for appearance quality

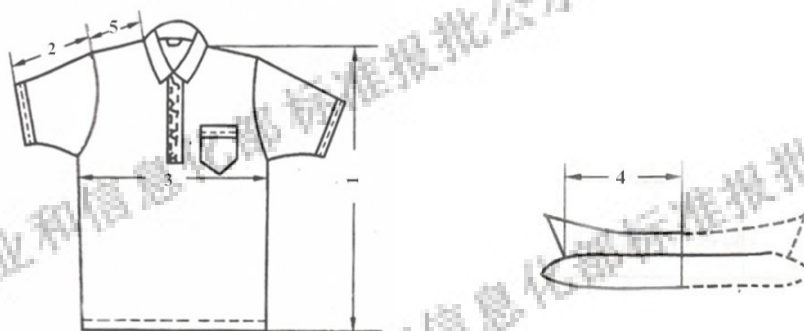
6.2.1.1 Lighting with illumination not less than 600lx is normally used in appearance evaluation. If use the natural light indoor, the north sky light shall prevail.

6.2.1.2 During the inspection, the products shall be spread on the inspection table with a layer of white cloth on the table. The inspector personnel shall look squarely at the surface of the products, and the distance from eyes to products shall be more than 35 cm.

6.2.2 Measuring position and method

6.2.2.1 Measuring positions of upper clothing are shown in Figure 5.



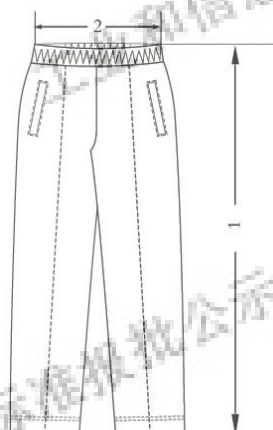


Instructions:

- 1—body length;
- 2—sleeve length;
- 3—1/2 chest girth;
- 4—1/2 collar length;
- 5—single shoulder width;
- 6—total shoulder width.

Figure 5 Example of the measuring positions of the upper clothing

6. 2. 2. 2 Measuring positions of trousers is shown are Figure 6.



Instructions:

- 1—trousers length;
- 2—1/2 waist girth.

Figure 6 Example of the measuring positions of the trousers

6. 2. 2. 3 The requirements of measuring position of garments.

Table 6 Stipulations of measuring position of garments

Type	Number	Position	Measurement stipulation
Upper	1	Body length	From the top point of shoulder seam to the hem vertically.

clothing	2	Sleeve length	Flat sleeve style: Measure from the intersection point of the shoulder seam and the armhole seam to the middle of the cuff edge. Raglan sleeve style: Measure from the middle of the back collar to the cuff edge
	3	1/2 chest girth	Horizontally measure at 2 cm down the intersection point of armhole seam and side seam
	4	1/2 collar length	Fold the collar in half and measure horizontally in the inside. For stand collar, measure the top of the collar.
	5	Single shoulder width	Measure from the top point of shoulder seam to the intersection point of the shoulder seam and the armhole seam
	6	Total shoulder width	Horizontally measure from the intersection point of the shoulder seams, after spread out.
Trousers	1	Trousers length	From the waist line to the hem vertically along the seam.
	2	1/2 waist girth	Horizontally measure at the middle of the waist band.

6.2.3 Colour difference

It is tested according to GB/T 250.

6.2.4 Skewness

It is tested according to GB/T 14801.

7 Sampling rules

7.1 For inherent quality, the sampling is randomly according to the batch type and color. For products with "washing only" indication, four samples are required. For products with "dry cleaning only" indication, two samples are required. For washable and dry-cleanable product, five samples are required. The number of samples can be increased when it is insufficient.

7.2 For the appearance quality, 1%- 3% from each batch of products are randomly taken according to variety and color, but not less than 20 pieces.

8 Judgment rules

8.1 Judgement for batch

8.1.1 Inherent quality

8.1.1.1 The inherent quality is judged according to Clause 5.3, with final of any item leading to the final judgment being unqualified. Among them, if the color fastness items do not meet the requirements, this batch of product is judged as unqualified according to colour.

8.1.1.2 For appearance quality after washing, this batch of products is judged as qualified if at least 2 samples meet the requirements, otherwise judged unqualified.

8.1.2 Appearance quality

The non-conformity rate of appearance quality is calculated according to the variety and color. If the rate of non-conformity is not more than 5%, this batch of products shall be judged as qualified. If the rate of non-compliance is above 5%, this batch of product is judged as unqualified.

8.1.3 Result judgment

This batch of products is judged as unqualified when the products meet all the requirements of Clause 8.1.1 and Clause 8.1.2.

8.2 Judgement for single piece

If the number of inspected products is less than the sampling number, only the tested samples are judged according to Clause 8.1.

8.3 Others

Products with defects that seriously affect the performance are not allowed.

8.4 Re-inspection

8.4.1 If either party has any objection to the result of the test, it may request the re-inspection.

8.4.2 The results of re-inspection shall be carried out in accordance with the provisions of Clause 8.1, Clause 8.2 and Clause 8.3 of this standard, and the judgment shall be subject to the re-inspection results.

9 Instructions for use, packaging, transportation and storage of product

9.1 Instructions for use shall comply with GB/T 5296.4, while those for children shall comply with GB/T 5296.4 and GB 31701.

9.2 The packaging shall comply with GB/T 4856 or the agreement.

9.3 Product transportation shall take measures to avoid humidity, fire and pollution.

9.4 Products should be stored in a cool, ventilated, dry and clean warehouse, and attention should be paid to mothproof and mould proof.