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Shanks for Footwear

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Foreword

The 5.1, 5.3.2, 5.4, 5.6 and 5.7 of this Standard are mandatory terms, and the rest are recommendatory terms.

This Standard is established on the basis of multiyear implementation of the original light industry professional standard QB/T 1917 - 2000 "shanks for leather shoes ".

This standard was drafted in accordance with regulations given in GB/T 1.1-2009.

This standard was proposed by the China National Light Industry Council.

This Standard is under the jurisdiction of National Technical Committee (SAC / TC 305) on shoemaking of Standardization Administration of China.

Drafting organizations of this Standard: Kunshan Longying Metal Products Company Limited, Xinbaili footwear (Shenzhen) Company Limited, Shandong Zaozhuang Tianzhu metal and footwear material limited company, Group Company Limited, China Leather & Footwear Industry Research Institute.

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Shanks for Footwear

1 Scope

This Standard specifies the product classification, technical requirements, testing methods, inspection rules and marking, packing, transportation and storage of the shanks of footwear (including boots).

This Standard is applicable to shanks made of metal materials used for footwear (including boots).

2 Normative Reference

The following documents are indispensable for the application of this standard. For dated references, only the dated edition is applicable to this document. For undated references, the latest editions of the normative documents (including all the amendments) are applicable to this document.

GB/T 191 Packaging-Pictorial marking for handling of goods

GB/T 230.1 Metallic materials - Rockwell hardness test - Part 1: Test method (scales A, B, C, D, E, F, G, H, K, N, T)

GB/T 2703 Footwear – Vocabulary

GB/T 3903.35 Footwear—Test methods for shanks—Fatigue resistance

QB/T 1813 Test methods for longitudinal rigidity of leather shoes shanks

3 Terms and Definitions

The Terms and Definitions defined in GB/T 2703 are applicable to this Document.

4 Product Classification

It can be classified according to using objects: male shoes shanks, female shoes shanks and children (older child) shoes shanks.

It can be classified according to the shapes of shanks: I-shaped shanks, L-shaped shanks and Y-shaped shanks.

5 Technical Requirements

5.1 Marking

The following contents shall be marked on shanks:

——Using objects: "1" refers to shanks used for male shoes, "2" refers to shanks used for female shoes and children shoes;

——For the applicable heel height or applicable heel height range, it is denoted by Arabic numerals, in mm.

Examples:

1 / 20 (shanks used for male shoes, the applicable heel height is 20mm)

2/ 30 ~ 35(shanks used for female shoes and children shoes, the applicable heel height is 30mm ~ 35mm)

5.2 Appearance

The shanks surface shall be free from burr and rusting erosion, the positions of the string, tack hole and prong shall be accurate.

5.3 Dimension

5.3.1 Dimension allowable error

For the same lot, the length allowable error is not larger than ± 2.0 mm, the width allowable error is not larger than ± 1.0 mm, the thickness allowable error is not larger than ± 0.2 mm.

5.3.2 The lower limit value of length

5.3.2.1 The lower limit value of shank length in male shoes is detailed in Table 1.

Table 1 The lower limit value of shank length in male shoes In: mm

Shoes Sizes	235~243	244~253	254~263	264~278	279~298	299 or above
Shanks length	105	110	115	120	125	130

5.3.2.2 The lower limit value of shank length in female shoes and children (older child) shoes is detailed in Table 2.

Table 2 The lower limit value of shank length in female shoes and children (older child) shoes In: mm

Shoes Sizes		200~213	214~223	224~233	234~243	244~258	259~278	279 or above
Heel height	<30	90	100	105	110	115	120	125
	≥30	95	105	110	115	120	125	130

5.3.2.3 For the L-shaped shanks (used for female high-heeled shoes, its rear bent down and form short side and embed the shanks at the molding bottom heel), its length lower limit value is allowed to be shorter 15 mm than that specified in Table 2. For the Y-shaped shanks, its length lower limit value is allowed to be shorter 25 mm than that specified in Table 1 or Table 2.

5.4 Longitudinal Rigidity

The requirements of shanks longitudinal rigidity are detailed in Table 3.

Table 3 Requirements of shanks longitudinal rigidity

Heel height mm	<50	50~74	>74~99	>99
Longitudinal rigidity kN·mm^2	≥400	≥800	≥1200	≥1600

5.5 Fatigue Resistance

The shanks shall undergo fatigue resistance test and reach the test times specified in Table 4. The sample shall not fracture, and fine cracks on the surface are allowed.

Table 4 the times requirements of shank fatigue resistance test

Heel height mm	<50	50~74	>74~99	>99
Test times Times	3000	8000	20000	60000

5.6 Hardness

The requirements of shanks hardness are detailed in Table 5.

Table 5 Requirements of shanks hardness

Heel height mm	<30	≥30

Hardness	HR15N	≥70.0	≥82.0
	HRA	≥61.5	≥72.5
	HRC	≥22.5	≥43.5
Note 1: the hardness requirements shall conform with one of the indexes of HR15N, HRA and HRC. Note 2: the HRA and HRC shall not be used when the sample thickness is less than 1 mm.			

5.7 Bending Property

The shanks shall undergo 180° bending test without fracture, fine cracks on the surface is allowed.

6 Sample Quantity

The shanks of the same materials, same specification and in the same continuous production lot shall be regarded as a sampling lot, take 6 pieces of shanks randomly as the sample, 2 of them shall be inspected for marking, appearance, dimension, longitudinal rigidity, hardness and bending property, the rest 4 shall undergo fatigue resistance inspection.

Note: the samples used for longitudinal rigidity inspection and fatigue resistance inspection shall not be shared.

7 Test Method

7.1 Marking and Esthetic Quality

Visual inspection shall be conducted under normal light.

7.2 Length Measurement of Shanks

7.2.1 Length measurement of I-shaped shanks

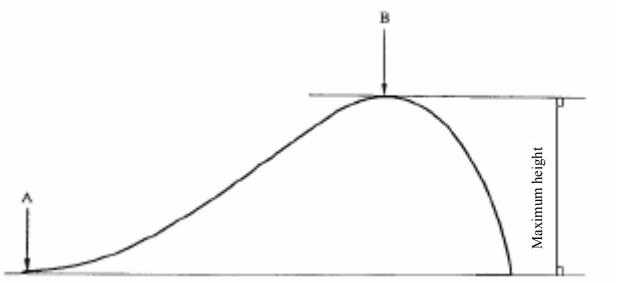
The measure tape used for shoes with the precision not less than 1 mm is adopted, measure the shank by adherence its top surface and the longest part is the shanks length, results keep integer bit. The length of each shank shall be denoted respectively, the length allowable error is the difference of the maximum value and the minimum value measured.

7.2.2 Length measurement of L-shaped shanks

Place the shank on platform as shown in Figure 1, measure with height gauge and mark the peak B of the shank, the measure tape used for shoes with the precision not less than 1 mm is adopted, measure the distance between the point and the head end point of the shank by adherence its top surface and distance is the shanks length, results keep integer bit. The length allowable error is the difference of the maximum value and the minimum value measured.

7.2.3 Length measurement of Y-shaped shanks

The measure tape used for shoes with the precision not less than 1 mm is adopted, measure the distance between the front end point and the center point of the lay groove at Y part of the shank by adherence its center line of top surface and distance is the shanks length, results keep integer bit. The length allowable error is the difference of the maximum value and the minimum value measured.



Explanation:

A——The head end point of shank;

B——The peak of shank.

Figure 1 Length measurement of L-shaped shank

7.3 The Width Measurement of Shank

The slide caliper with the precision not less than 0.05 mm is adopted, measure a point both at the head and trail where has no burr respectively, The calculation result is accurate to one decimal place. The width value of head and trail on each shank shall be denoted respectively. The width allowable error is the difference of the maximum value and minimum value measured at corresponding parts.

7.4 The Thickness Measurement of Shank

The slide caliper with the precision not less than 0.05 mm is adopted, measure a point both at the head and trail where has no burr respectively, the arithmetic mean value of head-trail thickness measured values is the thickness value. The calculation result is accurate to one decimal place. The thickness allowable error is the difference of the maximum value and minimum value measured at corresponding parts.

7.5 Longitudinal Rigidity

Carry out test in accordance with QB/T 1813, the test result of each shank shall be denoted respectively.

7.6 Fatigue Resistance

Carry out test in accordance with GB / T 3903.35, the test result of each shank shall be denoted respectively.

7.7 Hardness

Carry out test in accordance with GB / T 230.1, the hardness value of each shank shall be denoted respectively.

7.8 Bending Property

7.8.1 Test equipment

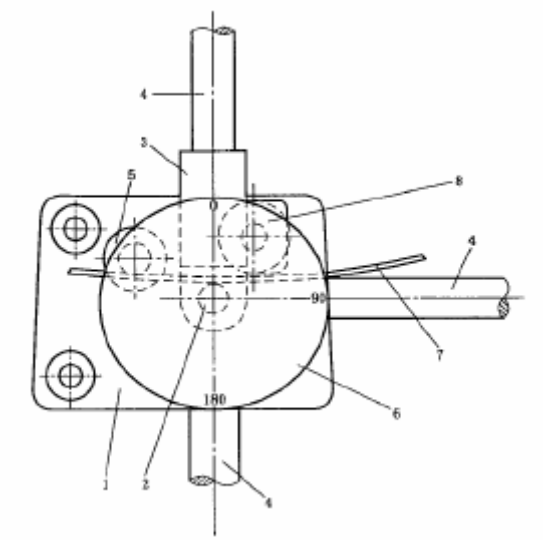
The bending property tester (see Figure 2) of shank covers fixed clamping tube and unfixed clamping tube, the unfixed clamping tube may rotate 180° around the center column with φ 10 mm in diameter.

7.8.2 Test temperature

Room temperature (20℃ ± 5℃).

7.8.3 Sample quantity

1 piece (the one with the maximal hardness value shall be selected).



Explanation:

1——Base;

2——Center column;

3——Loading head;

4——Loading rod;

5——Supporting Point;

6——Indexing plate;

7——Shank;

8——Rolling.

Figure 2 The bending property test of shank

7.8.4 Test procedures

The equipment schematic diagram is detailed in Figure. Carry out the bending property test in accordance with the following procedures:

a) Insert the shank into supporting point (see 5 in Figure 2), center column (see 2 in Figure 2) and rolling (see 8 in Figure 2);

b) Carry out the 180° bending test by close fitting the center column (φ 10 mm) as the supporting point with the top surface of shank center section (for L-shaped shank, test its long side part, is exclude the corner part);

c) Visual inspect whether the shank breaks, simultaneously observe the crack condition on its surface.

8 Inspection Rules

8.1 Shank Production Inspection

8.1.1 Batching

Acceptance inspection is conducted lot by lot. Productions with same type, same specification and continuously produced may be regarded as a inspection lot.

8.1.2 Inspection classification

Inspection of the products comes with delivery inspection and type inspection.

8.1.3 Delivery inspection

Full inspection shall be made for marking and appearance; random inspection shall be

made for length lower limit of dimension, longitudinal rigidity, hardness and bending property; selection inspection shall be made for dimension allowable error and fatigue resistance.

8.1.4 Type inspection

When testing for all the items, carry out the test for marking, esthetic quality, dimension, length lower limit value, longitudinal rigidity and hardness first, and then select the piece of shank with maximal hardness to undergo the bending property test, the rest 4 shanks undergo fatigue resistance test.

The type test shall be carried out if one of the following conditions is met.

a) There is significant change in product structure, technique and materials;

b) When reinstating the production after production halts for more than three months;

c) When the type inspection is required by the national quality supervision inspection organizations;

d) During the regular production, at least a type inspection is carried out once half a year.

8.2 The Shank Inspection in Footwear Production

When random inspection and submittal for inspection is carried out for footwear production and the sample quantity fails to meet the requirements of this Standard, 2 shanks taken from the same pair of shoes shall be regarded as samples which undergo shank inspections for all the items, 2 shanks undergo inspections for marking, appearance, dimension and hardness. 1 shank undergo fatigue resistance test and 1 shank undergo tests for other items.

8.3 Result Judgment

If in individual test, 1 piece of shank or above fail to meet the requirements of this Standard, this item shall be judged as unqualified; if in the test for all the items, one item or above are unqualified, this lot of products shall be judged as unqualified. Among which, the marking, length lower limit, longitudinal rigidity, hardness and bending property are mandatory terms, 1 item or above are unqualified, this lot of products shall be judged as unqualified and it is forbidden to reinspect; the appearance and fatigue resistance are recommendatory terms, 1 item or above are unqualified, sampling again from the original lot and double the sample quantity to reinspect for the unqualified items, judgment shall be made in accordance with the reinspection result.

9 Marking, Packing, Transportation and Storage

9.1 Marking

The following contents shall be marked on the product package:

Product name, using objects, specification (length, width, thickness), applicable heel height (also may be the applicable heel height range), quantity, name of manufacture, plant location, telephone, postal code, brand, production date, moistureproof marking, delivery inspection quality certificate and number of this Standard.

Country of origin, name of the domestic dealer, address and telephone shall be marked for imported product.

The pictorial marking for packing and handling shall comply with those specified in GB/T 191.

9.2 Packing

Antirust measure shall be adopted inside the packing, carton or wooden case may be adopted as the packing type or it may be concerted by the supplier and the demander.

9.3 Transportation and Storage

When in transportation and storage, it is forbidden to press, drench and contact with corrosives such as acid or alkali. Keep ventilation and dry inside the warehouses. The productions shall be away more than 0.2 m from the ground and wall to avoid rusting.