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**SPECIFICATION FOR
EVA SANDALS
(First Revision)**

SRI LANKA STANDARDS INSTITUTION

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SLS 1295 : 2011

Gr. 5

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FOREWORD

This standard was approved by the Sectoral Committee on Textiles, Clothing and Leather and was authorized for adoption and publication as a Sri Lanka Standard by the Council of the Sri Lanka Standards Institution on 2011-01-25.

This specification prescribes the requirements for sandals, which contains not less than 15 per cent Ethylene vinyl acetate(EVA) material in the bottom components. This specification also prescribes in detail the requirements of material components that go into production.

Guidelines for the determination of the compliance of a lot with the requirements of this specification based on statistical sampling and inspection are given in Appendix A.

For the purpose of deciding whether a particular requirement of this specification is complied with, the final value, observed or calculated, expressing the result of a test or an analysis, shall be rounded off in accordance with **SLS 102**. The number of significant places retained in the rounded off value shall be the same as that of the specified value in this specification.

In the preparation of this specification the valuable assistance derived from the following publication is gratefully acknowledged:

IS 6721: 1972 - Indian Standard Specification for PVC sandal

1 SCOPE

This specification prescribes the requirements, methods of sampling and tests for EVA sandals for men, ladies and children.

2 REFERENCES

ASTM D 395	Standard test methods for rubber property-Compression set
ISO 4648	Rubber, vulcanized or thermoplastic – Determination of dimensions of test pieces and products for test purposes
ISO 4649	Rubber, vulcanized or thermoplastic- Determination of abrasion resistance using a rotating cylindrical drum device
ISO 5423	Moulded plastics footwear – Lined or unlined polyurethane boots for general industrial use- Specification
ISO 7619	Rubber, vulcanized or thermoplastic-Determination of indentation hardness Part 1: Duro meter method (Shore hardness)
ISO 20344	Personal protective equipment- Test methods for footwear
SLS 102	Rules for rounding off numerical values
SLS 374	Standard atmospheric conditions for conditioning and testing

SLS	428	Random sampling methods
SLS	492	Foot wear sizes- Mondopoint system
SLS	1176	Leather military boots

3 DEFINITIONS

For the purpose of this specification the following definitions shall apply :

- 3.1 **EVA** : Ethylene Vinyl Acetate Copolymer.
- 3.2 **outer sole** : Outer layer of the sole or sole assembly (soles comprising more than one layer) while walking with or without the heel that comes in contact with ground.
- 3.3 **mid sole** : Layer between the insole and the outer sole.
- 3.4 **foot bed** : Soft removable or non removable bottom fastened on top of the insole.

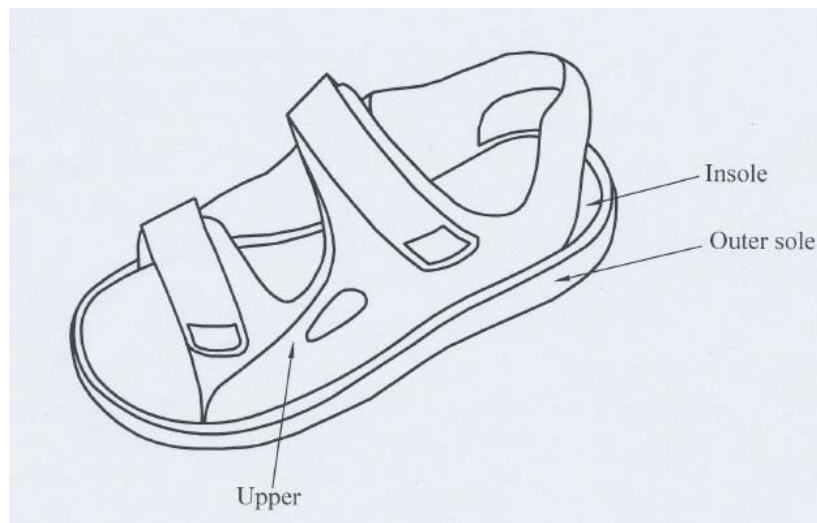


FIGURE 1 : Parts of a sandal

4 REQUIREMENTS

EVA sandals shall be free from visible distortion and defects.

4.1 Upper materials

4.1.1 *General requirements*

EVA sandals shall be made with upper components of leather or PVC or PU coated woven fabric or polyamide , polyester ribbon or braided fabric or PVC cord or EVA moulded sheet

with or without lining made from non woven material or combination of these material. It shall be flexible and shall not have an unpleasant odour during usage.

The colour and the finish of the material shall be as agreed between the purchaser and the supplier.

4.1.2 Requirements for EVA upper material

The EVA upper material of sandal shall comply with the requirements given in Table 1. Thickness shall be not less than 2 mm. Thickness shall be determined according to method A of ISO 4648.

TABLE 1 - Requirements for EVA upper material of sandal

Sl. No. (1)	Characteristic (2)	Requirement (3)	Method of Test (4)
i)	Hardness, Type AO, min.	45	ISO 7619-1

4.1.3 Requirements for PVC upper material of shoe

The PVC upper material of the shoe shall comply with the requirements given in Table 2.

TABLE 2 - Requirements for PVC upper material of sandal

Sl. No. (1)	Characteristic (2)	Requirement (3)	Method of Test (4)
i)	Flexing resistance, cycles, min.	150 000	ISO 5423 :1992 Annex B

NOTE : *This requirement may be considered only if test pieces of sufficient size may be extracted from the sandal, if not this requirement may be ignored.*

4.1.4 Trims

4.1.4.1 Metallic trims

Metallic trims shall be of an intrinsically corrosion – resistant metal or shall have been so treated as to render them resistant to corrosion.

4.1.4.2 Plastic trims

Plastic trims shall be properly fastened for their intended function and shall show no signs of cracks or pit marks.

4.1.4.3 Hook and loop

Hook and loop(Velcro) fastening system shall not disfunction during usage life cycle of the sandal.

4.1.4.4 Decorative layers and ornaments

Decorative layers and ornaments shall be securely fastened.

4.2 Bottom material

4.2.1 Foot bed

Foot bed shall be made from compression moulded, EVA of thickness not less than 1.5 mm. Foot bed shall also comply with the requirements given in Table 3. Thickness shall be determined according to method A of ISO 4648.

TABLE 3 - Requirements for EVA foot bed

Sl. No. (1)	Characteristic (2)	Requirement (3)	Method of Test (4)
i)	Hardness, Type AO	40-50	ISO 7619-1:2004

4.2.2 Mid sole

Mid sole shall be made from compression – moulded, injection moulding or fabricated (cut to shape).

4.2.3. Outer sole

Outer sole shall be of compression moulded, expanded EVA soling material or injection moulded expanded EVA soling material as required. It shall have a tread pattern to avoid slippage while walking. Thickness of the outer sole shall be not less than 6 mm. Outer soles shall comply with the requirements given in Table 4.

TABLE 4 - Requirements for EVA outer sole

Sl No. (1)	Characteristic (2)	Requirement (3)	Method of Test (4)
i)	Hardness, Type AO, min.	50	ISO 7619-1:2004
ii)	Compression set at 40° C, per cent, max.	25	ASTM D 395: 2003 Method B
iii)	Abrasion resistance, mm ³ , max.	450	ISO 4649

4.3 Peeling strength

Peeling strength shall be not less than 30 N/cm, when tested by the method prescribed in **SLS 1176**.

4.4 Whole sole flexing resistance

There shall be no cracking, no deformation, no visible damage to sole, insole, covered insole or delamination of sole components or bond failure in cemented construction before 100 000 flex cycles , when tested by the method prescribed in **ISO 20344**.

4.5 Sizing

Sizing and marking of the sandals shall conform to **SLS 492**.

5 PACKAGING AND MARKING

5.1 Packaging

Packaging shall be as agreed between the purchaser and the supplier. It shall not be damaged during normal transportation, storage and handling.

5.2 Marking

5.2.1 The sandals shall be legibly and indelibly marked on insole or tag with the following information:

- a) Size of the sandals;
- b) Manufacturer's name or trade mark; and
- c) Any other information required by the purchaser.

5.2.2 Each package shall be legibly and indelibly marked with the following information:

- a) Manufacturer's coding;
- b) Size of the sandals;
- c) Brand name and /or trade mark, if any;
- d) Batch number; and
- e) Any other information required by the purchaser.

6 METHODS OF TEST

6.1 Tests shall be carried out as prescribed in **ASTM D 395, ISO 4648, ISO 4649, ISO 5423, ISO 7619-1, ISO 20344** and **SLS 1176**.

6.2 The conditioning and testing atmosphere shall be the standard atmosphere for conditioning and testing as defined in **SLS 374** ,i.e relative humidity of 65 ± 5 per cent and temperature of 27 ± 2 ° C.

APPENDIX A COMPLIANCE OF A LOT

The sampling scheme given in this Appendix shall be applied where compliance of a lot to the requirements of this standard is to be assessed based on statistical sampling and inspection.

Where compliance with this standard is to be assessed based on manufacturer's control systems coupled with type, testing and check tests or any other procedure, an appropriate scheme of sampling and inspection shall be adopted.

A.1 LOT

In any consignment all pairs of EVA sandals of the same style belonging to one batch of manufacture or supply shall constitute a lot.

A.2 SCALE OF SAMPLING

A.2.1 Samples shall be tested from each lot for ascertaining the conformity of the product to the requirements of this specification.

A.2.2 Number of pairs of EVA sandals to be selected from the lot shall be in accordance with Columns 1 and 2 of Table 5.

TABLE 5 - Scale of sampling

Number of pairs of sandals in the lot (1)	Number of pairs of sandals to be selected (2)	Number of pairs of sandals in sub sample (3)
Up to 500	13	03
501 and 1200	20	05
1201 to 10 000	32	05

A.2.3 Pairs of sandals shall be drawn at random. In order to ensure randomness of selection random number tables as given in **SLS 428** shall be used.

A.3 NUMBER OF TESTS

A.3.1 Each package selected as in **A.2.2** shall be inspected for packaging and marking requirements specified in **5**.

A.3.2 Each pair of sandals selected as in **A.2.2** shall be inspected for packaging and marking requirements specified in **5**.

A.3.3 A sub sample of size as given in Column 3 of Table 5 shall be drawn from the sample selected as in **A.2.2** and examined for the requirements given in **4.1.1** and **4.1.4**.

A.3.4 Each item in the sub-sample examined as in **A.3.3** shall be tested for the requirements given in Table 1, Table 3 and hardness of outer sole as specified in Table 4.

A.3.5 A sub sample of size as given in Column 3 of Table 5 shall be drawn from the sample selected as in **A.2.2** and tested for thickness of upper material, thickness of foot bed and thickness of outer sole as given in **4.1.2, 4.2.1** and **4.2.3** respectively.

A.3.6 A sub-sample of size as given in Column 3 of Table 5 shall be drawn from the sample selected as in **A.2.2** and one sandal from each pair shall be tested for the requirements given under **4.1.3** and **4.4**.

A.3.7 A sub-sample of size as given in Column 3 of Table 5 shall be drawn from the sample selected as in **A.2.2** and tested for Compression set and abrasion resistance of outer sole as specified in Table 4.

A.3.8 A sub sample of size as given in Column 3 of Table 5 shall be drawn from the remaining sample selected as in **A.2.2** and tested for peeling as given in **4.3**.

A.4 CRITERIA FOR CONFORMITY

A lot shall be declared as conforming to the requirements of this specification if the following conditions are satisfied:

A.4.1 Each package inspected as in **A.3.1** satisfies the packaging and marking requirements.

A.4.2 Each pair of EVA sandals inspected as in **A.3.2** satisfies the packaging and marking requirements.

A.4.3 Each EVA sandal examined as in **A.3.3** satisfies the relevant requirements.

A.4.4 Each EVA sandal tested as in **A.3.4, A.3.5, A.3.6, A.3.7** and **A.3.8** satisfies the relevant requirements.

SLS CERTIFICATION MARK

The Sri Lanka Standards Institution is the owner of the registered certification mark shown below. Beneath the mark, the number of the Sri Lanka Standard relevant to the product is indicated. This mark may be used only by those who have obtained permits under the SLS certification marks scheme. The presence of this mark on or in relation to a product conveys the assurance that they have been produced to comply with the requirements of the relevant Sri Lanka Standard under a well designed system of quality control inspection and testing operated by the manufacturer and supervised by the SLSI which includes surveillance inspection of the factory, testing of both factory and market samples.

Further particulars of the terms and conditions of the permit may be obtained from the Sri Lanka Standards Institution, 17, Victoria Place, Elvitigala Mawatha, Colombo 08.



SRI LANKA STANDARDS INSTITUTION

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