SRI LANKA STANDARD 826:1988

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SPECIFICATION FOR

RUBBER WEATHERSTRIPS FOR AUTOMOBILES

SRI LANKA STANDARDS INSTITUTION

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SLS 826 : 1988

Gr. 6

SRI LANKA STANDARDS INSTITUTION
53, Dharmapala Mawatha,
Colombo 3,
Sri Lanka.

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This standard does not purport to include all the necessary provisions of a contract.

SRI LANKA STANDARD

SPECIFICATION FOR RUBBER WEATHERSTRIPS FOR AUTOMOBILES

FOREWORD

This Sri Lanka Standard was authorized for adoption and publication by the Council of the Sri Lanka Standards Institution on 1988-08-25, after the draft, finalized by the Drafting Committee on Rubber Components for Automobiles, had been approved by the Chemicals Divisional Committee.

Rubber weatherstrips are used to fix glasses and some metal components to the body of vehicles in the automobile industry. Rubber weatherseals, rubber glazingstrips, rubber beadings and rubber sealings are the other terms used to identify rubber weatherstrips. As some of these terms are used to identify rubber components intended for other purposes which do not require weather resistant characteristics, the terminology "rubber weatherstrips" is used in this specification.

The requirements given in **4.2** and **5.1** of this specification call for agreement between the purchaser and the supplier.

All standard values in this specification are given in SI units.

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 analysis shall be rounded off in accordance with CS 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 assistance obtained from the publications of the International Organisation for Standardization and the British Standards Institution is gratefully acknowledged.

1 SCOPE

This specification prescribes the requirements and methods of sampling and test for rubber weatherstrips for automobiles.

2 REFERENCES

ISO 815 Vulcanized rubbers - Determination of compression set under constant deflection at normal and high temperatures.

ISO 1431/1 Rubber vulcanized - Resistance to ozone cracking - static strain test.

ISO 2285 Rubber vulcanized - Determination of tension set at normal and high temperatures.

CS 102 Presentation of numerical values.

SLS 297 Methods of testing vulcanized rubber

Part 2 : Determination of tensile stress strain properties.

Part 4 : Determination of hardness.

Part 5 : Accelerated ageing test.

SLS 428 Random sampling methods.

3 TYPES

Rubber weatherstrips shall be of the following four types.

TYPE	HARDNESS, IRHD
A	75^{+5}_{-4}
B	65^{+5}_{-4}
C	55^{+5}_{-4}
D	45^{+5}_{-4}

4 REQUIREMENTS

4.1 Materials and workmanship

4.1.1 *Materials*

Weatherstrips shall be manufactured from a suitable compounded rubber to give weather resistant properties.

4.1.2 *Workmanship*

The finished product shall be free from porosity, significant surface defects and dimensional irregularities. Weatherstrips shall be black in colour, unless otherwise agreed to between the purchaser and the manufacturer.

NOTE - When colours other than black are required, lower tensile strength values may be anticipated.

4.2 Dimensions

Dimensions of weatherstrips shall be as agreed to between the purchaser and the manufacturer. Dimensional tolerances shall be as given in 4.2.1 and

Table 1 (see Note). A change of tolerance in either direction may be agreed between the interested parties, so that, for example, the permissible tolerance of $\pm$ 0.35 may also be stated as $^{+0.2}_{-0.5}$ or $^{+0.7}_{0}$ or $^{0}_{-0.7}$ etc.

Dimensions shall be determined as given in 7.1.

NOTE - The tolerance class required for different cross-sectional dimensions of a product should be specified by the purchaser. If the tolerance class is not specified the lowest tolerance class shall be considered to apply.

4.2.1 In case of rolls of weatherstrips (see 5.1) the length shall be as specified by the purchaser. A tolerance of -0.5 per cent shall be permitted on the specified length.

TABLE 1 - Tolerance on cross-sectional dimensions of weatherstrips

(Values in millimetres)

Nominal dimension		Tolerance class		
Above (1)	Up to (2)	E 1 $\pm$ (3)	E 2 $\pm$ (4)	E 3 $\pm$ (5)
0	2.5	0.20	0.35	0.50
2.5	4.0	0.25	0.40	0.70
4.0	6.3	0.35	0.50	0.80
6.3	10.0	0.40	0.70	1.00
10	16	0.50	0.80	1.30
16	25	0.70	1.00	1.60
25	40	0.80	1.30	2.00
40	63	*	1.60	2.50
63	100	*	2.00	3.20

* Tolerance shall be as agreed between the interested parties.

4.3 Ozone resistance

Rubber weatherstrips shall not show cracks when tested as given in 7.2.

NOTE - This parameter should be tested only when required by the purchaser.

4.4 Outdoor exposure resistance

Rubber weatherstrips shall not show cracks when tested as given in Appendix A.

4.5 Physical requirements

4.5.1 Rubber compounds used in the manufacture of weatherstrips shall conform to the physical requirements given in Table 2.

4.5.2 Test pieces required for determination of characteristics given in Table 2 shall be prepared from a sample drawn from the same batch of rubber compound used for extrusion of weatherstrips and vulcanized under identical conditions as the weatherstrips supplied by the manufacturer (see 6.3.4).

TABLE 2 - Physical requirements for rubber compounds used in the manufacture of weatherstrips

Sl. No.	Characteristic	Type				Method of test (Reference to relevant SLS and clauses)
		A	B	C	D	
(1)	(2)	(3)	(4)	(5)	(6)	(7)
i)	Hardness, IRHD	75^{+5}_{-4}	65^{+5}_{-4}	55^{+5}_{-4}	45^{+5}_{-4}	SLS 297:Part 4
ii)	Tensile strength, MPa, min.	10.0	10.0	10.0	10.0	SLS 297:Part 2
iii)	Elongation at break, %, min.	250	300	400	400	SLS 297:Part 2
iv)	Compression set, %, max.	40	40	35	35	7.3
v)	Tension set, %, max.	30	30	30	30	7.4
vi)	Hardness change after accelerated ageing at 70 °C for 7 days, IRHD, max.	± 5				SLS 297:Part 5

5 PACKAGING AND MARKING

5.1 Packaging

Rubber weatherstrips shall be dusted and shall be packed as agreed to between the purchaser and the supplier in the form of rolls or individual items.

5.2 Marking

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

a) Type of the weatherstrip;

b) Length of the weatherstrip in case of rolls, in metres;

c) Month and year of manufacture;

d) Name and address of the manufacturer and country of origin;

e) Registered trade mark, if any; and

f) Batch or code number.

6 SAMPLING

6.1 Lot

All packages of weatherstrips of one type submitted for inspection at one time shall constitute a lot.

6.2 General requirements for sampling

6.2.1 Unless otherwise specified, sampling and testing shall be carried out within 2 months from the date of receipt of product by the purchaser.

6.2.2 Samples shall be adequately protected to minimize any deterioration prior to testing.

6.3 Scale of sampling

6.3.1 Samples shall be tested from each lot to ascertain conformity of the product to the requirements of this specification.

6.3.2 Number of packages to be selected from a lot shall be in accordance with Table 3.

TABLE 3 - Scale of sampling

Number of packages in a lot (1)	Number of packages to be selected (2)
Up to 15	3
16 to 25	4
26 to 100	5
101 to 200	7
201 and above	10

6.3.3 The packages shall be selected at random. In order to ensure randomness of selection, random number tables given in **SLS 428** shall be used.

6.3.4 In order to test for physical requirements given in this specification extruded sample of the same composition and vulcanized under the same conditions as the weatherstrips of the lot shall be provided by the manufacturer with the lot. The length and the diameter of the extruded sample shall be 1.5 m and 29.0 ± 0.5 mm, respectively.

6.3.5 In order to test for ozone resistance (see Note), moulded test sheet of the same composition and vulcanized under the same conditions as the weatherstrips of the lot shall be provided by the manufacturer with the lot. The moulded test sheet shall have a length of 150 mm, a width of 100 mm and a thickness of 2.0 ± 0.2 mm.

NOTE - This parameter should be tested only when required by the purchaser.

6.4 Number of tests

6.4.1 Each package selected as in **6.3.2** shall be inspected for packaging and marking requirements.

6.4.2 In case of rolls, the length of each roll selected as in **6.3.2** shall be measured.

NOTE - The length may be measured at the place of inspection.

6.4.3 Sufficient length of material shall be cut from each package selected as in **6.3.2** and each length thus obtained shall be tested separately for workmanship **(4.1.2)**, dimensions **(4.2)** and outdoor exposure resistance **(4.4)**.

6.4.4 The extruded sample obtained as in 6.3.4 shall be tested for physical requirements **(4.5)**.

6.4.5 The moulded test sheet obtained as in **6.3.5** shall be tested for ozone resistance **(4.3)**.

7 METHODS OF TEST

Tests shall be carried out in accordance with **SLS 297:Part 2, Part 4** and **Part 5**, and with clauses 7.1, 7.2, 7.3, and 7.4 and Appendix A of this specification.

7.1 Determination of dimensions

7.1.1 *Cross-sectional dimensions*

Measure the cross-sectional dimensions of the weatherstrip with vernier calipers. Adjust the calipers so that the measuring faces contact the surfaces of the weatherstrip without compressing it. Take, at least, five measurements of each dimension to be determined to the nearest 0.01 mm and report the average of the results.

7.1.2 *Length*

Measure the length of the weatherstrip to the nearest millimetre.

7.2 Determination of ozone resistance

Determine the ozone resistance as given in Method A of **ISO 1431/1-1980** using test pieces from vulcanized sheet stipulated in **6.3.5**. Condition the test pieces at 27 ± 2 °C. Carry out the test at 40 ± 2 °C.

7.3 Determination of compression set

7.3.1 Determine the compression set as given in **ISO 815** using large type test pieces. Condition the test pieces at 27 ± 2 °C. Carry out the determination at 70 ± 1 °C. Compress the test pieces to 25 per cent of the original thickness for a duration of 24 hours. Measure the thickness of test pieces after a recovery period of 30 minutes.

7.3.2 Compression set, per cent $= \frac{t_0 - t_1}{t_0 - t_s} \times 100$

where,

t_0 = initial thickness of the test piece;

t_1 = thickness of the test piece after recovery; and

t_s = height of the spacer.

7.4 Determination of tension set

7.4.1 Determine the tension set as given in **ISO 2285** using strip test pieces with enlarged ends. Condition the test pieces at 27 ± 2 °C. Apply a strain

of 50 per cent of the specified minimum elongation at break (see Table 2) to the test pieces for a period of 10 minutes. Measure the reference length after recovery and after relaxation period of 10 minutes.

7.4.2 Tension set, per cent = $\frac{l_1 - l_0}{l_s - l_0} \times 100$

where,

l_0 = original unstrained reference length;

l_s = strained reference length; and

l_1 = reference length after recovery.

8 CONFORMITY TO STANDARD

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

8.1 Each roll or package inspected as in **4.1** satisfies the relevant packaging and marking requirements.

8.2 The length of each cut piece, tested as in **6.4.2** satisfies the relevant requirement.

8.3 The test results on cross-sectional dimensions satisfy the relevant requirements.

8.4 The samples tested for outdoor exposure resistance satisfy the relevant requirement.

8.5 The test results of physical requirements, when tested as in **6.4.4** satisfy the relevant requirements.

8.6 The moulded test sheet tested as in **6.4.5** satisfies the relevant requirement.

APPENDIX A

DETERMINATION OF OUTDOOR EXPOSURE RESISTANCE

A.1 APPARATUS

A.1.1 A flat wooden frame, mounted on a support with suitable grips or clamps made from inert material (see Note) to secure the test pieces vertically under strained condition. When installed, no portion of the test specimens shall be closer than 0.5 m to the ground or any other obstruction.

NOTE - Non corrosive aluminium alloy, stainless steel have been found suitable. Brass, steel or copper shall not be used.

A.2 TEST PIECES

Cut strips having approximately 115 mm in length and suitable thickness from the weatherstrip so as not to exclude the outer surface of the weatherstrip.

A.3 PROCEDURE

Mark 25 mm gauge-length lightly on the test pieces. Stretch the test pieces until the gauge-length has increased by 10 per cent and secure them on the frame (A.1.1) vertically, so that all surfaces of the test pieces are freely exposed to the atmosphere. Place the frame in a location free from shadows from surrounding structures such that the uncut surfaces of the test pieces face easterly direction.

Expose the test pieces for a period of 4 weeks (see Note) and examine the test pieces while they are on the frame for cracking by means of a lens of magnification about x 10.

NOTE - The results will not be valid, if there had been rain for a period more than 25 per cent of the test.

SRI LANKA STANDARDS INSTITUTION

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