

SRI LANKA STANDARD 321 : PART 1 : 2004
UDC 685.55 : 672.9

SPECIFICATION FOR
UMBRELLA RIBS
PART 1: NON-FOLDING TYPE UMBRELLA RIBS

SRI LANKA STANDARDS INSTITUTION

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SLS 321: PART 1 : 2004

Gr. 6

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**SPECIFICATION FOR UMBRELLA RIBS
PART 1: NON-FOLDING TYPE UMBRELLA RIBS
(FIRST REVISION)**

FOREWORD

This standard was approved by the Sectoral Committee on Engineering Materials, Mechanical systems and Manufacturing Engineering and was authorized for adoption and publication as a Sri Lanka Standard by the council of the SLSI on 2004-08-18.

This is the first revision of **SLS 321: 1974** Specification for umbrella ribs. In this edition, the requirements for finished umbrella ribs, namely the materials, shapes, dimensions and methods of test have been revised.

This standard is presented in two parts as follows:

- Part 1 : Non-folding type umbrella ribs
- Part 2 : Folding type umbrella ribs

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

All values given in this specification are in SI units.

For the purpose of deciding whether a particular requirement of this standard 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 **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 standard.

In the preparation of this specification valuable assistance derived from the **IS 2917** of the Indian Standards Institution is gratefully acknowledged.

1 SCOPE

This standard lays down the specifications for umbrella ribs and covers the requirements for finished umbrella ribs, both main and stretcher, for the non-folding type umbrellas.

2 REFERENCES

CS 102	Presentation of numerical values
SLS 428	Random sampling methods
SLS 978	Tensile testing of metallic materials

3 DEFINITIONS

For the purpose of this standard, the following definitions shall apply.

3.1 main rib : The long ribs, which stretch the cloth of the umbrella into the desired shape, when the umbrella is opened.

3.2 stretcher rib : The ribs that connect the main rib to the runner of the umbrella and help the main ribs to open or close and serve as strut to main rib to maintain the desired shape of the umbrella.

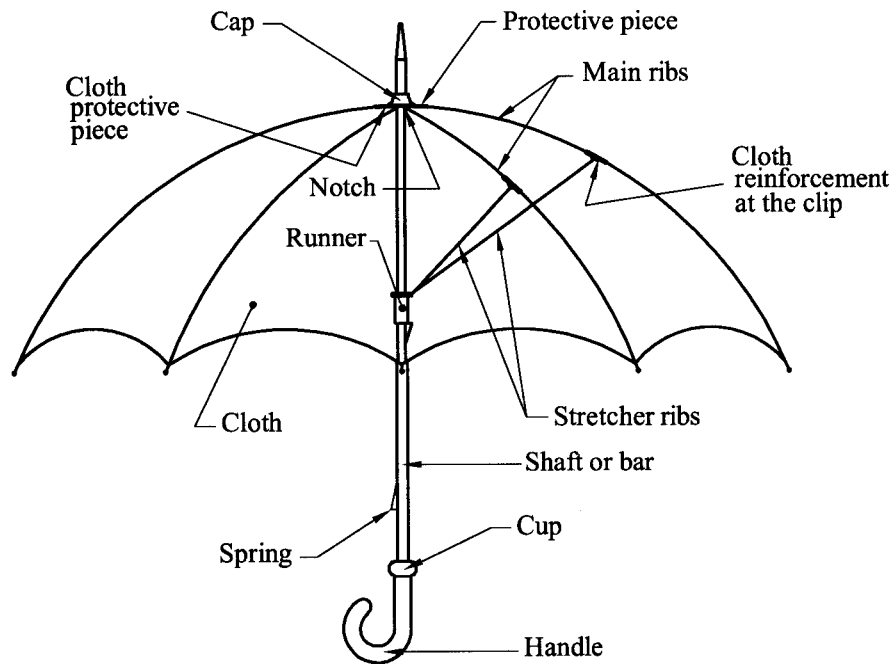


FIGURE 1 - Schematic diagram of complete umbrella (non-folding type)

4 TYPES

The umbrella ribs shall be one of the following two types :

- a) Solid ribs; or
- b) Fluted ribs

4.1 Solid ribs

The solid ribs shall be of round cross section.

4.2 Fluted ribs

The fluted ribs shall be of U-shaped cross section.

5 REQUIREMENTS

5.1 Materials

Umbrella ribs shall be made of carbon steel, conforming to physical requirements stated in 5.4. Alternatively they may be made of any other suitable material and if made out of such other material, they shall have equal or better performance to that stipulated for carbon steel ribs.

5.2 Chemical composition

The carbon steel used for umbrella ribs shall not have sulphur or phosphorous contents of more than 0.04 per cent.

5.3 Shapes and dimensions

5.3.1 Preferred shapes and dimensions of the ribs shall be as given in Figure 2 to Figure 4 and Table 1 and Table 2.

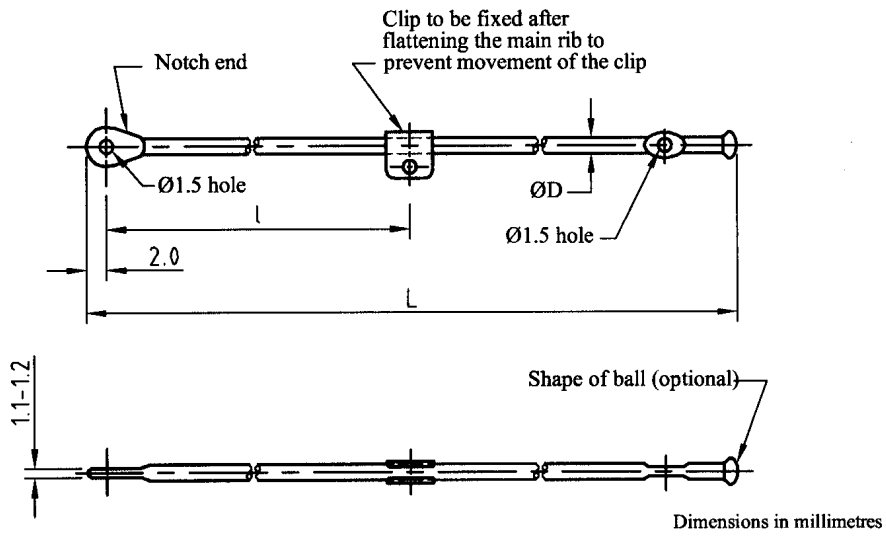


FIGURE 2 - Typical illustration of a main rib

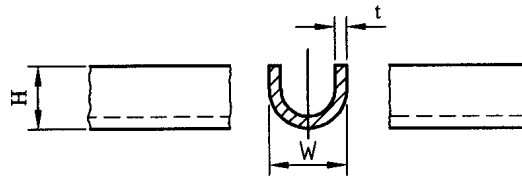


FIGURE 3 - Enlarged section of a fluted rib

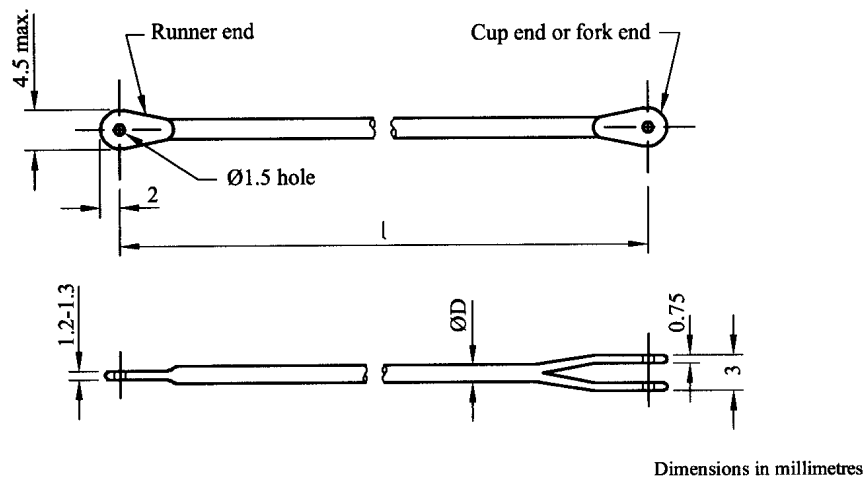


FIGURE 4 - Typical illustration of a stretcher rib (solid type)

TABLE 1- Dimensions of main ribs (Figure 2 and 4)*All values in millimeters*

Sl.No.	Nominal size (L) (1)	Tolerance on L (2)	Minimum values for fluted ribs			For solid ribs, Minimum D (6)
			W (3)	H (4)	t (5)	
1	750	± 5	3.50	2.40	0.45	3.00
2	685	± 5	3.50	2.40	0.45	3.00
3	665	± 5	3.45	2.35	0.40	2.00
4	600	± 5	3.45	2.35	0.40	2.00
5	585	± 5	3.45	2.35	0.40	2.00
6	535	± 5	3.45	2.35	0.40	2.00
7	405	± 5	3.45	2.35	0.40	2.00
8	385	± 5	3.45	2.35	0.40	2.00
9	205	± 5	--	--	--	1.70

TABLE 2 – Dimensions of stretcher ribs (Figure 3 and 4)*All values in millimeters*

Sl. No.	Nominal size (L) (1)	Tolerance On L (2)	Minimum values for fluted ribs			For solid ribs, Minimum D (6)
			W (3)	H (4)	t (5)	
1	315	± 5	3.50	2.40	0.45	3.00
2	290	± 5	3.50	2.40	0.45	3.00
3	280	± 5	3.45	2.35	0.35	2.50
4	260	± 5	3.45	2.35	0.35	2.50
5	250	± 5	3.45	2.35	0.35	2.50
6	240	± 5	3.45	2.35	0.35	2.50
7	220	± 5	3.45	2.35	0.35	2.50
8	190	± 5	3.45	2.35	0.35	2.50
9	160	± 5	3.45	2.35	0.35	2.50
10	80	± 5	--	--	--	1.80
11	65	± 5	--	--	--	1.80

5.4 Physical requirements of finished ribs

5.4.1 Tensile strength

Ribs of steel shall be heat-treated to have minimum tensile strength as stated in Table 3.

TABLE 3 – Tensile strength of ribs made of carbon steel

Type of ribs	Minimum Tensile Strength N/mm ²
Main ribs	
Fluted	1200
Solid	1400
Stretcher ribs	650

5.4.2. Resilience of ribs

The ribs when subject to the test described in 8.2, shall comply with the requirements specified therein.

5.5 Workmanship and finish

5.5.1 The riveting of the stretcher ribs at the joint with the main rib shall be such that its movement is free but without shake or play.

5.5.2 The ribs shall be suitably protected against corrosion by galvanizing, metal plating or painting.

6 MARKING

The brand name or the trademark of the manufacturer shall be suitably marked or shown by any other means on the ribs individually or on the pack.

NOTE: *Attention is drawn to the certification marking facilities offered by the Sri Lanka Standards Institution. See the inside back cover of this standard.*

7 PACKING

The ribs shall be packed as agreed between the purchaser and the supplier.

8 METHODS OF TEST

8.1 Tensile test

Tensile test shall be carried out in accordance with SLS 978.

8.2 Resilience test

8.2.1 On a suitable board, the notch end of the main rib shall be clamped on a fixed pin at point A as shown in Figure 5. The stretcher rib shall be so inclined as to make an angle of 60° with the main rib and the free end of the stretcher rib shall be clamped on another fixed pin at a point B. The ball end of the main rib shall be rotated so that the main rib is bent to a position as shown in Figure 5, and making an angle with its own original position as specified below and measured as indicated:

	Angle of Bend
Round main rib	110°
Fluted main rib	100°

When released the rib shall return to its original position.

A permanent set of 5° Max shall be permitted.

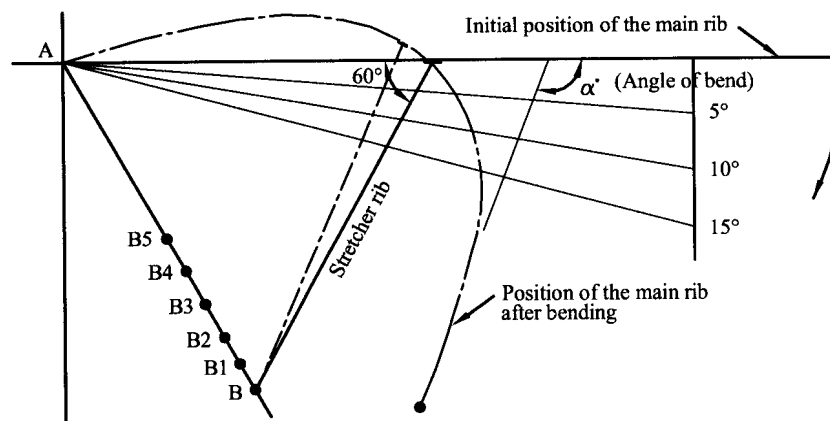


FIGURE 5 - Test for resilience of umbrella ribs

APPENDIX A

SAMPLING SCHEME AND CRITERIA FOR CONFORMITY FOR UMBRELLA RIBS

A.1.1 Lot

In any consignment, all the ribs of the same type, shape and dimension and belonging to the same batch of manufacture shall constitute a lot.

A.1.1.1 Every lot in a consignment shall be tested separately to ascertain its conformity to the requirements of this standard.

A.1.2 To ascertain the conformity of the lot to the requirements of this standard, the number of ribs to be selected at random from the lot shall be in accordance with column 2 and Column 3 of Table 4.

**TABLE 4- Sample size and criteria for conformity
(Clause A.1.2, A.2.2 and A.3.1)**

Sl. No (1)	Lot size (No. of ribs in the lot) (2)	Sample size (No. of ribs to be selected) (3)	Acceptance number (4)	Sub-sample size (5)
1	Up to 100	13	1	3
2	101 to 150	20	1	4
3	151 to 300	32	2	5
4	301 to 500	50	3	6
5	501 to 1 000	80	5	7
6	1 001 to 3 000	125	7	8
7	3 001 to 10 000	200	10	9
8	10 001 and above	315	14	10

A.1.3 The ribs shall be selected at random. In order to ensure randomness of selection random number tables as given in **SLS 428** shall be used.

A.2 Number of tests and criteria for conformity

A.2.1 The ribs selected according to A.1.2 shall be tested for

- (a) shape and dimensions (5.3)
- (b) resilience (5.4.2)
- (c) workmanship and finish (5.5)

A.2.2 For testing tensile strength the number of ribs to be selected from the ribs already tested under **A.2.1** and found satisfactory with respect to all the characteristics shall be in accordance with Column 2 and Column 5 of Table 4.

A.2.3 Criteria for conformity

The lot shall be declared as conforming to the requirements of this standard if the conditions given in **A.2.3.1** and **A.2.3.2** are satisfied.

A.2.3.1 The number of defective ribs with respect to any one or more of the characteristics tested for in A.2.1 shall not exceed the corresponding acceptance number given in Column 4 of Table 4.

A.2.3.2 From the test results for tensile strength the average \bar{X} (see Note 1) and the range R (see Note 2) are computed and the value of the expression $\bar{X} - 0.6 R$ shall not be less than the relevant specified minimum value.

NOTES

- 1. Average (\bar{x}) is the value obtained by dividing the sum of test results by the number of test results.*
- 2. Range(R) is the difference between the maximum and the minimum of the test results.*

SRI LANKA STANDARDS INSTITUTION

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