SRI LANKA STANDARD 269:1974
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SPECIFICATION FOR
SYNTHETIC PLASTIC SPECTACLE FRAMES (METRIC UNITS)

BUREAU OF CEYLON STANDARDS

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SLS 269 : 1974

Gr.5

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

SRI LANKA STANDARD

SPECIFICATION FOP SYNTHETIC PLASTIC SPECTACLE FRAMES (METRIC UNITS)

FOREWORD

This Sri Lanka Standard Specification has been prepared by the Drafting Committee on Spectacle Frames. It was approved by the Agricultural and Chemicals Divisional Committee of the Bureau of Ceylon Standards and was authorised for adoption and publication by the Council of the Bureau on 1974-05-21.

This standard is intended to serve as a guide for the manufacturers in their production and for the purchasers in selecting plastic spectacle frames.

Dimensions and other characteristics in this specification are given in metric 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, shall be rounded off in accordance with CS 102 Presentation of numerical values. The number of significant figures to be retained in the rounded off value shall be the same as that of the specified value of this standard.

In the preparation of this standard assistance has been derived from the publications of the British Standards Institution and the Indian Standards Institution.

1 SCOPE

This standard prescribes the requirements, methods of sampling and testing for plastic spectacle frames. This standard does not cover frames meant for spectacles or appliances worn before the eyes, designed for protection from injury caused by external agency.

2 TERMINOLOGY

For the purpose of this standard, the definitions given in SLS ...* and the following shall apply. Use Fig. 1 for guidance.

2.1 **bridge**: That part of the front which forms the main connection between the lenses or the rims. The bridge assembly is generally taken to include the pads, if any.

2.2 **datum centre (dat c)**: The mid-point of that part of the datum line which is bounded by the lens shape.

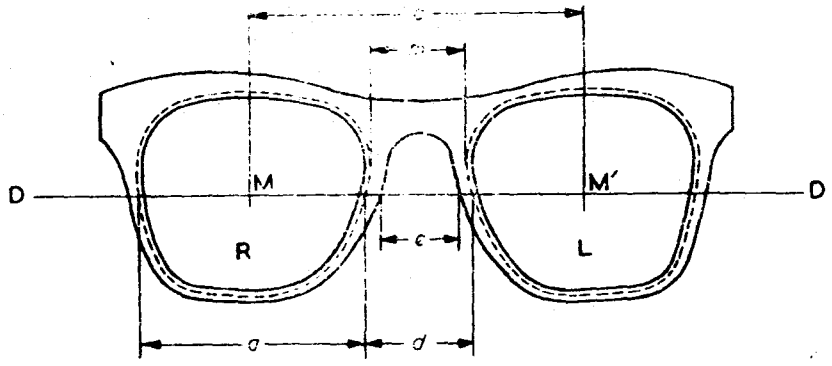
2.3 **datum line**: The line midway between, and parallel to, the horizontal tangents at the highest and the lowest points of the lens.

2.4 **distance between lenses**: The horizontal distance, measured along the datum line between the nasal edges of the lenses.

2.5 **front**: The part of the frame or mount comprising the bridge, rims, if any, joints and lugs.

2.6 **joint**: a) The hinge linking the side and the front.
b) That part of, or attachment to, the rim which provides the means of pivoting the side and closing the side upon the lens.

**Glossary of terms used in the plastic industry (under preparation).*



DD = Datum line of frame
M_1 = datum centre of right lens
M = datum centre of left lens
a = datum length of lens
c = datum centre distance
d = distance between lenses (DBL)
e = distance between rims (dat)

FIG. 1 - Front of plastic spectacle frames

NOTE - The dotted curves represent peak of bevel or bottom of groove.

2.7 lug: An extension at each end of the front to which the joint or side is attached.

2.8 pad: An extension of, or attachment to, the bridge or the rim to bear on the nose.

2.9 rim: That part of the frame or mount which partly or completely surrounds the lens.

2.10 side (temple): An extension of, or attachment to, the front passing towards or over the ear.

3 REQUIREMENTS

3.1 Material

The frames shall be made from cellulose nitrate or cellulose acetate sheets or similar plastic sheets of 3.5 mm to 8 mm thickness.

3.2 Freedom from defects

The frames shall be free from faults, blemishes and cracks.

3.3 Dimensions

The dimensions of the frames shall be as agreed to between the manufacturer and the consumer. The side length dimensions shall be subject to a tolerance of ± 1 mm and shall be measured from the joint up to the bend of the side. All other linear dimensions, excepting the thicknesses specified under 3.4 shall be subject to a tolerance of ± 0.5 mm.

3.4 Front

3.4.1 *Thickness of the front*

The thickness of the front (see Fig. 2) excluding the ends of the lugs, shall be no where less than 3.6 mm.

3.4.2 *Thickness of the bridge in the vertical plane*

The thickness of the bridge in the vertical plane of the frames (see Fig. 2) shall be in accordance with Table 1 unless otherwise agreed to between the purchaser and the supplier.

3.4.3 *Rims*

The rims shall match for shape and size.

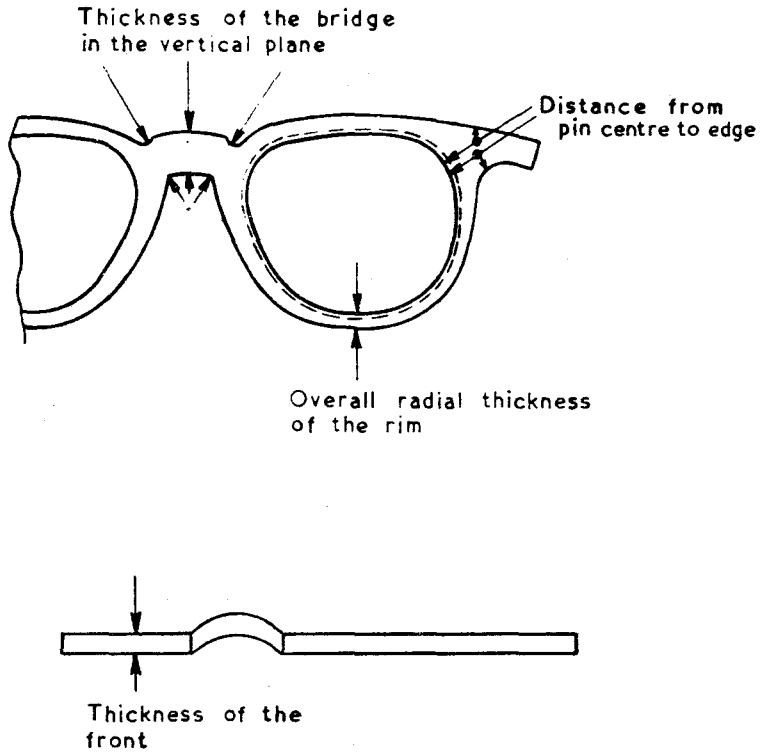


FIG. 2 Some dimensions of plastic spectacle frames

TABLE 1 - Thickness of the bridge in the vertical plane of spectacle frames

Datum length of lens mm	Thickness in the vertical plane of the bridge, min.		
	16 mm DBL*	18 and 20 mm DBL*	22 and 24 mm DBL*
Up to 38	5.0	5.25	5.5
38 to 42	5.5	5.75	6.0
over 42	6.0	6.25	6.5

**DBL - Distance between lenses (d in Fig. 1).*

3.4.4 *Overall radial thickness of the rims*

The overall radial thickness (see Fig. 2) of the rims of the finished frame shall comply with the requirements of Table 2.

TABLE 2 - Overall radial thickness of rims of spectacle frames

Lens size	Minimum overall radial thickness of rims of the finished frame
mm	mm
38 or less	2.0
Over 38 to 42	2.2
Over 42	2.4

3.4.5 *Grooves*

Grooves shall be v-shaped or u-shaped, suitably placed and symmetrically formed, and shall be of 0.6 ± 0.1 mm depth. The grooves and the inner surfaces of the rims shall be smoothly finished.

3.4.6 *Pads*

Pads shall be at the same height relative to the datum line of the frame. In case the pads are not integral with the front, they shall be neatly and firmly cemented to the frame.

3.5 Joints, rivets, reinforcing wires and screws

Joints, rivets, reinforcing wires and screws shall be made of nickel-silver alloy. The percentage of nickel present shall be as follows:

Component	Nickel content per cent by mass, min
Joints	14
Rivets and screws	10
Reinforcing wires	15

3.5.1 *Joints*

The joints shall be so designed and made as to ensure a smooth movement. Each side shall be able to move easily and not fall under its own weight.

3.5.2 *Rivets*

The rivets used for attaching the joint to the side shall pass through the flattened portion of the reinforcing wire.

3.5.3 *Reinforcing wires*

Reinforcing wires shall be not less than 1.3 mm in diameter.

3.5.4 *Screws*

The form and dimensions of the screws shall be suitable to the joints used. The length of the screws shall be such that, when fitted into the joint, they shall give full thread engagements without excessive protrusion from the joint surface

3.6 Finish

3.6.1 All sharp edges and corners, file marks and roughness shall be removed before polishing.

3.6.2 The joints shall be neatly and securely fitted and polished and shall show no signs of damage through filing or other causes.

3.6.3 The rivets shall be fixed in such a manner that neither the wire nor the surrounding material shall be split, cracked or damaged.

3.6.4 The screw heads shall be undamaged.

3.6.5 The front and the sides shall match neatly at the lug.

4 METHOD OF TEST

4.1 Determination of nickel

The determination of nickel shall be carried out in accordance with one of the methods prescribed in Appendix A.

5 SAMPLING

5.1 Lot

In any consignment all the frames of the same lens size and drawn from a single batch of manufacture shall be grouped together to constitute a lot.

5.1.1 The number of frames to be selected from the lot shall depend upon the size of the lot and shall be in accordance with Columns 1 and 2 of Table 3.

TABLE 3 - Scale of sampling and permissible number of defectives

Lot size N (1)	Number of samples to be selected n (2)	Permissible number of defectives (3)
Up to 100	5	0
101 to 150	8	1
151 to 300	13	1
301 to 500	20	2
501 to 1000	32	3
1001 to 3000	50	5
3001 and above	80	7

5.1.2 These frames shall be selected at random from the lot, and to ensure randomness of selection, random number table shall be used. In case such tables are not available the following procedure may be adopted.

Starting from any packet count all the packets in one order as 1,2,3....up to *r* and so on, where *r* is the integral part of *N/n*. Every *r*th packet thus counted shall be withdrawn to give a sample for purposes of test.

The number of packets equal to *n* as given in Column 2 of Table 3, shall first be chosen from the lot as given above and from each of the packet so chosen, one frame shall be selected at random.

5.2 Number of tests

All the frames selected as in Column 2 of Table 3 shall be inspected for all the requirements specified in this standard. A frame failing to satisfy any one or more of these requirements shall be regarded as defective.

5.3 Criterion for conformity

A lot shall be considered as conforming to the requirements of this specification if the total number of defective frames in the sample does not exceed the number given in Column 3 of Table 2, otherwise not.

6 PACKING

The spectacle frames shall be packed as agreed to between the purchaser and the supplier.

a) Manufacturer's name and/or registered trade mark, if any,

b) Datum length of lens to be fitted, and

c) Distance between lenses.

APPENDIX A

A.1 DETERMINATION OF NICKEL

Two methods are given for the determination of nickel. Suitable method shall be chosen depending on the availability of the equipment and the quantity of the sample available for test.

A.2 METHOD I

A.2.1 Procedure

Weigh about 0.1 g of the sample and transfer into a 250-ml volumetric flask, add 10 ml nitric acid (50:50) and heat to expel brown fumes. Allow to cool and dilute to volume with distilled water.

Determine the nickel using atomic absorption spectrophotometry using the nickel 341.4 nm resonance line, and a lean air-acetylene flame. The nickel standards should contain the same concentration nitric acid.

A.3 METHOD II

A.3.1 Principle

The sample is dissolved in nitric/phosphoric acid. The absorption peak is given by nickel at 395 nm measured against a solution of suitable accurately known nickel/copper/zinc ratio in the reference cell. Measurements for background correction are also made on the same solution at 490 nm where zinc, copper or nickel do not absorb.

The standard nickel reference solutions and test solutions are prescribed on the presumption, that 1 g sample is being used for the test. However if a lesser quantity of sample is to be used for test the preparation of the standard nickel reference solutions and test solution should be modified accordingly.

A.3.2 Reagents

a) Nickel - High purity.

b) Copper - High purity copper nominally free from nickel.

c) Zinc - High purity.

d) Nitric acid - 50:50 (v/v).

e) Phosphoric acid - specific gravity 1.75.

f) Hydrogen peroxide - 2 volumes. Dilute 10 ml of hydrogen peroxide 20 volumes with 90 ml of water.

g) Standard nickel reference solutions - These solutions contain a combined mass of 1 g of nickel plus copper plus zinc per 100 ml. The nickel/copper/zinc ratios are related to the range of nickel contents to be determined, for example, reference solutions for nickel in the range 10 per cent to 15 per cent should contain 0.1000 g of nickel plus 0.5800 g of copper plus 0.3200 g of zinc to make a total of 1 g per 100 ml of standard.

Transfer to a large beaker the calculated mass of nickel, copper and zinc to make 1 litre of solution. Dissolve it in 100 ml of nitric acid and add 300 ml of phosphoric acid sp.gr. 1.75. Evaporate to remove all nitrous fumes. Dilute to about 800 ml, add 20 ml of hydrogen peroxide 2 volumes, and boil for 5 minutes. Cool, transfer the solution to a 1-litre calibrated flask, dilute almost to the mark and place in a thermostatically controlled bath at 20 °C for 1 hour. Dilute to the calibration mark and mix well.

A.3.3 Method

Weigh 1 g of sample, dissolve in 10 ml of nitric acid 50:50, add 30 ml of phosphoric acid and evaporate to small volume to remove nitrous fumes.

Cool, dilute to a volume of about 85 ml, add 2 ml of hydrogen peroxide 2 volumes and boil gently for 5 minutes. Cool, transfer to a 100-ml calibrated flask and dilute to the mark at 20 °C. Measure the absorbance in a 40-mm cell at 395 nm and 490 nm, with the 10 per cent nickel reference solution in the reference cell (for other ranges of nickel contents the procedure is similar, measurements being made by using a reference solution appropriate to the range).

Calibration

As an example, the procedure is given for preparing the calibration graph for the range 10 per cent to 15 per cent nickel. Weigh accurately to the nearest mg 0.09, 0.10, 0.11, 0.12, 0.13, 0.14, 0.15 and 0.16 g portions of nickel, add copper and zinc in the same proportions of 50:27 to each, to make a total sample mass of 1.00 g. Dissolve the samples in 10 ml of nitric acid, add 30 ml of phosphoric acid and evaporate to small volume to remove nitrous fumes.

Cool, dilute to a volume of about 85 ml, add 2 ml of hydrogen peroxide 2 volumes and boil gently for 5

minutes. Cool, transfer to a 100-ml calibrated flask and dilute to the mark at 20 °C. Measure the absorbance of each solution in a 40-mm cell at 395 nm and 490 nm with respect to the 10 per cent reference solution and record the difference in absorbance at these two wavelengths. To form the calibration graph, plot absorbance difference against added nickel.

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