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Specification No. IND/GS/1786(a)

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भारत सरकार
रक्षा मंत्रालय

गुणता आश्वासन विभाग
GOVERNMENT OF INDIA
MINISTRY OF DEFENCE
(DQA ORGANISATION)

SPECIFICATION

FOR

GOGGLES GS MK - 2

D. S. Cat. No. 8465 - 888734

ISSUED BY

नियंत्रक
गुणता आश्वासन नियंत्रणालय (सामान्य वस्तु)
रक्षा उत्पादन तथा आपूर्ति विभाग
रक्षा मंत्रालय
(गुणता आश्वासन महानिदेशालय)
पोस्ट बॉक्स संख्या 127
कानपुर 208 004

CONTROLLER

CONTROLLERATE OF QUALITY ASSURANCE (GENERAL STORES)
DEPARTMENT OF DEFENCE PRODUCTION & SUPPLIES
MINISTRY OF DEFENCE (DQA)
POST BOX No. 127
KANPUR - 208 004

PRICE : Rs. 98/-

YEAR : 2002

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NEW CONTROLLER
DEPARTMENT OF QUALITY
ASSURANCE
MINISTRY OF DEFENCE
KANPUR

Specification No.IND/GS/1786(a)

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RECORD OF AMENDMENTS

Amendment Srl. No	Date : dd/mm/yy :	Details of Amendments	Amendment Carried out by & Date
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0.0 FOREWORD

0.1 This specification has been prepared by Controllerate of Quality Assurance (General Stores), Kanpur on behalf of the Director General Quality Assurance, Ministry of Defence, New Delhi.

0.2 This specification supersedes unsealed specification No. CGA(GS)/US/407(b).

0.3 This specification shall be used to guide procurement, manufacture & Quality Assurance of the store for which it is intended.

0.4 The Quality Assurance Authority for the store covered by this specification is the Controller, Controllerate of Quality Assurance (General Stores), P.B.No.127, Kanpur-208001. Enquiries regarding this specification related to technical or any other contractual conditions shall be referred to the Quality Assurance Authority named in the purchase document viz. tender or contract.

0.5 This Specification is a live document and is, therefore, likely to undergo changes. Any major change in design should have the approval of General Staff/Users, financial concurrence in the form of DGQA approval. Thus, it may involve some price difference. Therefore, a specification issued holds good only for the supply order for which it is issued.

0.6 Copies of any other reference documents such as specification/drawing/instructions/guides etc. can be obtained on payment from the addresses as shown below :-

Specification	Source
I.S. Series	Director General Bureau of Indian Standards, Manak Bhawan 9, Bahadur Shah Zafar Marg, NEW DELHI-110 002. Or its Regional Offices at Mumbai, Kolkata, Chennai and Kanpur
IND/GS/series JSS & Supple Schedule in CGA(GS)/SS series	The Controller, Controllerate of Quality Assurance (GS), PB No.127, KANPUR-208 001. Or their Regional Establishments 1. Sr. Quality Assurance officer S. G. A. Estt.(GS) Hastings, KOLKATA - 700 022.
IND/SL series	The Controller, Controllerate of Quality Assurance (Materials), PB.No.229,KANPUR- 208 001. 2. Sr. Quality Assurance officer S. G. A. Estt.(GS) DGQA Complex, LBS Marg Vikhroli, Mumbai - 400 083.
IND/TC series	The Controller, Controllerate of Quality Assurance (T&C), PB No 294, KANPUR-208 001. 3. Sr. Quality Assurance Officer S. G. A. Estt.(GS) P. B. No. 307, KANPUR-208 001.
IND/SL series for petroleum products (if required).	The Controller, Controllerate of Quality Assurance (petroleum produ- cts), P.B. No.244, 4. Sr. Quality Assurance Officer S. G. A. Estt.(GS), Shahjahanpur - 242 001. 5. Sr. Quality Assurance Officer S. G. A. Estt (GS) DGQA Complex, Pazhavanthangal, CHENNAI - 600 114.

DMSRDE'series The Director,
(if required) DMSRDE, GT Road,
KANPUR-208 013.

6. Sr. Quality Assurance Officer
S. G. A. Estt(GS), Anand Parbat
NEW DELHI-110 005.

1.0 SCOPE

1.1 This specification covers the requirements of Goggles GS MK-2 (DS Cat No.8465-000734) and provides guidance to contractors / suppliers, manufacturers, Quality Assurance Agencies, stockists/indentors etc.

2.0 RELATED SPECIFICATIONS AND DOCUMENTS

Srl.No.	Specification No.	Title / Subjects
(a)	IS:380-1978(2nd Rev.),Reaff-1992	French Chalk Technical.
(b)	IS:971-1983(1st Rev.), Amdt.1 Reaffirmed-1993	Method for determination of colour fastness of textile materials to perspiration.
(c)	IS:1398-1982(2nd Revision), Reaffirmed 1988	Paper Packing waterproof Bitumin Laminated.
(d)	IS:1720-1978(2nd Rev)Reaff-1991	Cotton Sewing Threads.
(e)	IS:1969-1985(2nd Rev)Reaff-1993	Method for determination of breaking load and elongation of woven textile fabrics.
(f)	IS:2102(Pt-1)-1993 (3rd Revision)	General tolerances for linear and angular dimensions.
(g)	IS:2500(Pt-1)-1992	Sampling Inspection Procedure.
(h)	IS:2771(Pt-1)-1990 Amdt.1 (2nd Revision)	Fibre Board Boxes. Corrugated Fibre Board Boxes.
(i)	IS:4185-1989 & CIGS/SS/185(b)	Adhesive Paper tapes.
(j)	IS:4356-1967 (Amdt.1) Jan 1970 (Withdrawn)	Paper cuttings.
(k)	IS:4439-1967(Amdt.1)Reaff-1988	Velvet Rayon.
(l)	IS:4741-1968(Amdt.1)Reaff-1991	Snap Fasteners(four piece).
(m)	IS:4905-1968(Amdt.1)Reaff-1991	Method of random Sampling.
(n)	IS:7888-1976, Reaffirmed-1991	Method of test for flexible Polyurethane foam.
(o)	IS:7933-1975, Reaffirmed-1991	Flexible Polyurethane for domestic mattresses.
(p)	IS:9686-1980(Amdt.1) Reaff-1992	Elastic Tape.
(q)	IND/GS/1683(a)	Polypropylene Strapping 12 mm wide x 0.55 mm thick.
(r)	IND/SL/B107	Adhesive.
(s)	IND/TC/8150	Flannel Piece.
(t)	JSS:8010-21	Paint RFU Enamel Stoving Black.
(u)	JSS:8115-1 with Amdt. List No.1 & SS No. CIGS/SS/27(e)	Boxes Rigid Collapsible Covered Type 'D'.
(v)	JSS:9330-2 and Supp. Sch. No. CIGS/SS/313(a)	Polythene Film.

3.0 STANDARD PATTERN

3.1 Standard pattern of Goggles GS MK-2 (DS Cat. No. 8465 - 000734) held by the Controllerate of Quality Assurance (General Stores), Post Box No. 127, Kanpur shall constitute the standard as regards any particulars or properties, not noted or defined in this specification.

3.2 General Description :- Goggles G S is used by Army in all types of Terrains. It consists of a rubber frame fitted with neutral tinted C A sheet. A rubber flap, tape elastic head band fitted with adjustable buckles. The frame is pasted with polyurethane foam bonded with a layer of velvet fabric as a lining material. One clear C A Sheet, one flannel piece to clean window and one rubber flap shall be supplied as spares. Goggles along with spars i.e. C A Sheet, flannel piece are kept in box rigid collapsible. spare rubber flap shall be fitted to the rubber frame by means of press button.

4.0 MATERIAL

4.1 The item shall be manufactured from the following materials :

Srl No.	Store/component	Material & Grade if any	Specification
(a)	Rubber Frame and Flap	Black Vulcanised Rubber	Conforming to the details given in Appx 'A' to this specification.
(b)	Windows	(i) Cellulose Acetate sheet neutral tinted. (ii) Cellulose Acetate sheet clear transparent.	The Thickness of the sheet shall be 0.75 + 0.05 mm. The sheet shall be free from scratches, streaks, cracks, bubbles and other imperfections. The transparency of sheet shall be as laid down in test methods clause 12.7 of this specn.
(c)	Head Band	Tape Elastic Black 19mm wide	Conforming to the detail given in Appx 'F' of this Specification. Test method and quality as per IS:9686-1980.
(d)	Lining on polyurethane foam	Velvet Fabric Black	Conforming to the detail given in Appx 'B'. Test methods and quality as per IS:4439-1967, IS:1969-1985 for determination of breaking load and IS:971-1983 for fastness of perspiration. Height of pile be checked by direct measurement.
(e)	Polyurethane Foam lining	Polyurethane Foam 5 mm thick (Black)	Conforming to the detail given in Appx 'C'. Test method and quality as per IS:7888-1976 and IS:7933-1975.
(f)	Adhesive	Neoprene based adhesive (S/758)	Conforming to specn. IND/SL/8107.
(g)	Press Button	Snap fastner M.S. Nickel plated having top & side black painted.	IS:4741-1968.
(h)	Buckle with Bar-3	Mild Steel 0.08 mm thick	-
(i)	Buckle toothed	Nickel plated	-
(j)	Eyelets for Window	Copper 0.355/5/0.315 mm thick	-

Srl No.	Store/component	Material & Grade if any	Specification
(k)	Paint RFU Enamel	-	ISS:8010-21.
	stoving Black	-	IS:1720-1978.
(l)	Thread cotton 16	-	IND/TC/8150.
	Text/6 Black	-	JSS:8115-1 with Amdt.
(m)	Flannel Piece	-	List No.1 & Supp.Sch.
(n)	Carton (Boxes	Straw Board Sheet 1.5 mm	No.CIGS/GS/27(e).
	Rigid collapsible	thick	
	Covered Type 'D'		

5.0 PROCESSING

5.1 Goggles GS MK-2 and the Carton shall be manufactured to the shape and design as shown in the relevant plate attached to this specification.

5.2 The goggles shall be fitted with neutral tinted window and two rubber flaps by means of press buttons. One transparent clear CA sheet and one flannel piece of size 20 x 20 cm in double fold to clean window shall be kept in the carton alongwith the goggles.

6.0 DIMENSIONS AND TOLERANCES

6.1 DIMENSIONS

6.1.1 The goggles and its Carton store shall conform to the dimensions shown in the plate attached to this specification.

6.2 Tolerances

6.2.1 Unless otherwise specified, general tolerances to IS:2102 (Pt-I)-1993 as given below shall apply, provided the fitting of the Window to the frame is not in any way adversely affected.

Tolerance	class
-----------	-------

Designation	Description	Applicable on Components/Parts
C	Coarse	Rubber frame, Flap, Windows, Head band, buckles, Flannel piece and Carton.

7.0 WORKMANSHIP AND FINISH

7.1 The Rubber frame shall be free from surface defects such as porosity, grit, blemishes, blisters, air pockets, cuts, pits, foreign matter embedded, any kind of damages and other irregularities.

7.1.1 The Cellulose acetate sheet windows shall be free from scratches, cracks, haziness and other defects.

7.1.2 The ventilation holes in the frame shall be circular with raised Periphery and equally spaced.

7.1.3 The elastic tape shall be free from kinks, broken rubber, treads, braiding, weaving and other defects. When laid on flat surface without any tension, the tape shall not assume a wobbled up or curved position.

7.1.4 Velvet fabric shall be bonded properly and evenly on the polyurethane foam (with the help of adhesive) already cut to shape of the rubber frame. The bonded piece shall then be pasted on the rubber frame by means of adhesive.

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7.2 The general workmanship and finish shall be of a high standard and similar to sealed pattern.

8.0 PRE-INSPECTION OF SUPPLIES BY THE PRODUCER

8.1 ADVANCE SAMPLE : If required the manufacturers shall submit (3) advance samples of acceptable quality fabricated from specified material for approval by CQA(GS) Kanpur prior to commencement of bulk production.

8.2 Manufacturers/contractors must satisfy themselves first that the store manufactured are in accordance with the contract and fully conform to the specification, by carrying out thorough pre-inspection of each lot/batch before actually tendering the same for inspection to the Quality Assurance Officer nominated under the terms of the contract.

8.3 A declaration by the Contractor that necessary pre-inspection tests have been carried out on the stores tendered and the same are fit for inspection and test, shall be rendered along with the challan. The declaration shall include the method followed in pre-inspection showing features checked/tested.

9.0 QUALITY ASSURANCE

9.1 Examination of samples taken from any portion of the consignment or during surveillance inspection, shall conform to the requirement when tested in accordance with the methods mentioned against each in this specification.

9.2 Control samples shall be forwarded to CQA(GS) Kanpur from bulk supplies to check/monitor the quality whenever required.

10.0 SAMPLING PROCEDURE

10.1 The suppliers shall arrange the units of the homogeneous lot in such a way that all the units are easily accessible to the Quality Assurance Officer to enable him to draw samples from any portion of the homogeneous lot.

10.2 Sampling of stores shall be done adopting appropriate sampling method as per IS: 4905-1968 so that samples drawn as per Table I and II given for assessing various quality requirements, are truly representative of the lot.

11.0 SCALE OF SAMPLING

11.1 The number of sample-units to be drawn for assessing the quality of the store, characteristic wise, should be in accordance with the Table I for dimensional/non destructive/visual inspection and Table II for detailed laboratory testing.

12.0 CRITERIA FOR CONFORMITY

12.1 All the sample units as specified in Table I and II are required to be tested / inspected irrespective of the rejection number ($= Ac+1$) being achieved earlier.

12.2 The Quality Assurance Officer shall draw samples as per Table I for dimensional/nondestructive/visual inspection to assess the quality of the lot. If the quality of the lot indicates conformity to the standard as laid down in Table I, sampling for laboratory testing will be done. Otherwise the lot shall be straightway rejected.

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12.3 Sampling for Laboratory Testing

12.3.1 If the lot is considered conforming to the quality standards as specified in Table I, sampling for laboratory tests shall be carried out as per Table II and the samples shall be subjected to the laboratory tests.

12.3.2 To avoid subjectivity and deshaping in the storage and transit, the samples when received in the laboratory, fitment/Interchangeability test should be done at first and if found satisfactory then dimensions should be checked in fitted conditions of CA sheet windows of correct size (Certified sample duly sealed & labelled) held by laboratory.

12.4 Bulk Sentencing

12.4.1 If the laboratory test report indicates that the lot does not conform to the standards as specified in Table II, the whole lot shall be rejected.

12.4.2 The lot shall be considered conforming to the specified quality if the number of defective units observed in the sample is not more than the respective acceptance number of each class of defects.

12.4.3 When the sample size equals to the lot size, do 100% Quality Assurance check.

12.4.4 The number of sample units to be sampled for laboratory testing should be a multiple of the number of Characteristics / tests which can not be carried out simultaneously on the same sample units.

12.5 Sampling and Formation of Lot

12.5.1 The delivery shall be visually inspected by the Quality Assurance Officer at the spot in the first instance to ascertain its homogeneity in respect of nature, size, shape, source and year of manufacture. If it is homogeneous, the delivery shall be treated as one lot. If not, it shall be segregated by the supplier into separate groups so that each group which is homogeneous within itself forms a lot.

12.6 Sampling Tables

Table I
Sampling plan for Visual Inspection
(Based on ADL 4% General Inspection Level II)

Lot Size	Sample Size (n)	Acceptance Number (Ac)
Up to 150	20	2
151 to 280	32	3
281 to 500	50	5
501 to 1200	80	7
1201 to 3200	125	10
3201 to 10000	200	14

Table II
Sampling plan for Laboratory Testing, AQL 4%

Lot Size	Chemical Test Level S-2		Physical Test Level S-3	
	Sample Size (n)	Acceptance Number (Ac)	Sample Size (n)	Acceptance Number (Ac)
Up to 150	3	0	5	0
151 to 280	5	0	8	1
281 to 500	5	0	8	1
501 to 1200	5	0	13	1
1201 to 3200	8	1	13	1
3201 to 10000	8	1	20	1

Note : i) When the sample size equals lot size, do 100 % inspection/non-destructive testing with zero acceptance number.
ii) The rejection number (Re) will always be one more than the acceptance number (Ac).

Source : IS:2500 (Pt-I) - 1992 : (Sampling Inspection Tables).

12.7 Test Methods

12.7.1 Physical Tests : Design, shape and dimensions.

12.7.2 Chemical Tests : Chemical analysis.

12.7.3 Performance Test

12.7.3.1 Light Transmission Test :- Cellulose acetate sheet window shall be tested for its transmission characteristics in the three regions as given in Appendix 'D' to this specification. The values of transmission factors shall not deviate from the following limits :-

(i) Neutral tinted C A Sheet	Region	Transmission Value
(a) Visible	(a) Visible	10 to 25 percent.
	(b) Ultraviolet	10 percent (Maximum).
	(c) Infra Red	50 percent (Maximum).
(ii) Clear Sheet	(a) Visible	93 percent (Minimum).

12.7.3.2 Adhesion Strength:- The goggles shall be tested for adhesion strength in between rubber frame and polyurethane foam, pasted with velvet fabric. The adhesion strength shall be as follow :-

Average Adhesive Strength - 5 N (Min) per 15 mm width. The method of testing is given in the Appendix 'E' to this specification.

12.7.3.3 Fitting / Inter-changeability Test :- The Cellulose acetate sheet window shall fit the respective frame and shall also be inter changeable with other frame supplied as well as with the standard pattern.

12.7.3.3.1 Set of parts for Goggles @ S MK-2 when supplied separately, shall fit satisfactorily with the window sheet of standard pattern.

13.0 MARKING

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13.1 Marking by the supplier

13.1.1 The store shall be legibly and indelibly marked with :-

- (a) Manufacturer's name, initials or recognised trade mark.
- (b) The year of manufacture.
- (c) D. S. Catalogue number of the store.

13.2 Marking by the Quality Assurance Officer

13.2.1 Each accepted store shall be legibly and indelibly marked using stencil plate or Rubber / Steel stamp of letter size 6 mm.

13.3 The final rejections may be marked by Quality Assurance Officer by stamping the letter 'X' on both sides of the manufacturer's marking thus :

8465-000734
X M-----CO X
2001

14. PACKAGING

14.1 Packing

14.1.1 Materials

Conforming to

- | | |
|---|--|
| (a) Boxes Rigid Collapsible Covered Type 'D' | JSS:8115-1 with Amdt List No.1 and S.S. No. CIGS/SS/27(e). |
| (b) Fibre Board boxes, Part-1, Corrugated Fibre Board Boxes (7 Ply) | IS:2771 (Pt-1) 1990 (Amdt.1) (Second Revision). |
| (c) Polythene Film, Bag | JSS:9330-2 and SS No.CIGS/SS/313(a). |
| (d) French Chalk | IS: 380-1978 (Second Revision) Reaffirmed-1992. |
| (e) Paper packing waterproof bitumin laminated | IS:1398-1982 (Second Revision) Reaffirmed-1988. |
| (f) Adhesive Paper Tapes | IS:4185-1989 & CIGS/SS/185(b). |
| (g) Paper cuttings | IS:4356-1967(Amdt.1) of Jan 1970 (withdrawn). |
| (h) Polypropylene strapping 12mm wide 0.55 mm thick. | IND/GS/1683(a). |

14.2 Method

14.2.1 Goggles GS shall be delivered in a new and clean condition.

14.2.2 The tinted cellulose acetate window shall be taken out from each goggles. The rubber frame with two rubber flaps shall be dusted with french chalk (atleast 5g) as preservative and then kept in a polythene bag made from polythene film 0.04 mm thick. One spare flap shall also be preserved and kept in the same bag. The open end shall be heat sealed.

14.2.3 The tinted & clear transparent cellulose acetate sheet and flannel piece to be kept in separate polythene bag made from polythene film 0.04 mm thick. The open end shall be heat sealed.

14.2.4 One set of polythene bags as made in clause 14.2.2 & 14.2.3 shall be housed in boxes rigid collapsible covered type "D". The Carton thus formed shall be wrapped with adhesive paper tape 25 mm (So as to provide a place for affixing acceptance mark by Q.A. Officer).

14.2.5 Sixty (5 x 4) such cartons shall be packed in corrugated fibre board box (7 ply) of appropriate size. All the inner faces of corrugated Fibre Board Box shall be lined with paper packing waterproof Bitumen laminated. The open flaps (Top and Bottom) of Fibre Board box shall be closed with adhesive paper tape 50 mm.

14.2.6 The empty spaces in the Boxes Rigid collapsible as well as fibre Board Box, if any, shall be filled with paper cutting to avoid movements of the contents during transit.

14.2.7 Each corrugated Fibre Board Box shall be strapped with polypropylene strapping 12 mm wide x 0.55mm thick at least at four places.

14.2.8 The gross mass of the package shall not exceed 25 Kg.

14.3 Marking on Package

14.3.1 Each final package shall be legibly and indelibly marked as under :

(A) Front and Top

- i) D.S. Cat. NO. and designation of the store.
- ii) QTY packed, preceded by the abbreviation 'QTY'.

(B) Back

- i) Name and address of the consignee as given in the contract.
- ii) Mass of the package in Kilogram preceded by the abbreviation 'Kg'.
- iii) Number of the individual package and total number of packages in the consignment i.e. 1 of 4, 2 of 4, 3 of 4 and 4 of 4 when the consignment consists of 4 packages.

(C) Left end

- i) Consignor's name, initials or recognised Trade Mark.
- ii) Month and year of packing.
- iii) A/T, S/O or Extract No. and Date.
- (iv) I/Note No. and Date.

15.0 TECHNICAL LITERATURE / DOCUMENTS

15.1 Illustrated spare parts list, History sheet/maintenance manual, shall be supplied with each store wherever required/demanded.

16.0 WARRANTY

16.1 Stores supplied against this specification shall be deemed to bear the warranty of the contractor against defective design material, workmanship and performance for a period of twenty four months from the date of receipt of store at consignee end, and if during the specified period, the store supplied are found to be defective, the same shall be replaced immediately with serviceable store by the contractor at site free of any charges as may be decided by the purchasing officer, on recommendation of consignee/Quality Assurance Authority.

17.0 SUGGESTION FOR IMPROVEMENT

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17.1 This specification is a live document and subject to change/ updating. Any suggestions for improvement of this document may be sent to the Controller, CQA(BS) Kanpur.

(Signature)
(Nusrat Ullah)
SSOI
Group Officer.

(Signature)
(Sukhinder Singh)
(~~Group Officer~~)
Lt. Col.
Dy. Controller

(Signature)
(A.K. Sandhu)
JAG(NFSG)

(Signature)
(D.R. Yadav)
JAG(NFSG)
Jt. Controller.

CONTROLLER

CONTROLLERATE OF QUALITY ASSURANCE (GS)

POST BOX NO.127.

KANPUR - 208 001

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Appendix 'A'
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- (i) Hardness - 60 ± 5
- (ii) Tensile Strength - 140
2
(Kg/cm minimum)
- (iii) Elongation at break - 350
percent minimum
- (iv) Compression set, percent maximum, under 25 %
deflection for 24 hours at 70 ± 1 deg Celcius - 35
with 10 minutes recovery. Set calculated as a
percentage of deflection.
- (v) Resistance to Ageing

Maximum change after accelerated ageing at 70 ± 1 deg Celcius for
168 hours in an air oven.

- | | | |
|---------------------------------|------|---|
| (a) Hardness IRHD | + 5 |] |
| | - 0 |] |
| (b) Tensile strength percentage | -20 |] |
| | |] |
| (c) Elongation at break | + 0 |] |
| percent | - 20 |] |
- of the observed values.

Note : (a) The above tests shall be carried out as per IS specifications
given below :-

Hardness - IS:3400 (Pt-II).

Tensile Strength and - IS:3400 (Pt -I).
Elongation at break.

Accelerated Ageing - IS:3400 (Pt-IV).

- (b) The Contractor shall supply 2 sheets of vulcanizate one in $30 \times 30 \times 0.25$ cm and other in $15 \times 15 \times 0.8$ to 1.0 cm size prepared from the same composition and vulcanised as early as possible to the same degree as the rubber compound used for gaskets.

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19.0

Appendix 'B'
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The velvet fabric shall conform to the following particulars:-

- | | | |
|--|---|------------------|
| (i) Weight/Sq.m (in gm.) | - | 160 + 5 |
| (ii) Breaking Strength (in Kg) - | | |
| (a) Warp | - | 20 + 2 |
| (b) Weft | - | 30 + 2 |
| (iii) Surface Abrasion | | |
| (No. of cycles to abrade per sq. inch) - 1500 Nos. | | |
| (iv) Height of the pile fabric | - | 1.0 mm (minimum) |
| (v) Fastness to perspiration | - | 3 or better. |

20.0

Appendix 'C'
=====

Polyurethane foam shall be uniform in thickness and shall be free from defects such as cuts, holes, stains etc.

Polyurethane foam shall conform to the following particulars:-

- | | | |
|-----------------------------------|---|--------------|
| (i) Thickness (mm) | - | 5 + 0.5 |
| (ii) Apparent Density (g/ml) | - | 0.02 + 0.001 |
| (iii) Tensile Strength (KN/m sq.) | - | 100 (Min) |
| (iv) Elongation percentage | - | 150 (Min) |
| (v) Compression set percent | - | 20 (max) |

21.0

Appendix 'D'
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(i) Percentage visible transmission - The radiations from a tungsten gas filled lamp, shall be allowed to fall on photo electric cell with viscor filter directly and then the tinted window intercepted between the cell and lamp. A micro ammeter shall be used in series with cell. The percentage transmission factor shall be calculated as given below :-

$100 \times \text{reading of micro ammeter when tinted window intercepted}$

Reading of micro ammeter without tinted window. A spectro-photometer may also be used for determining the visible transmission.

(ii) Percentage ultra - violet transmission:- Ultra violet radiation from a black glass covered mercury vapour discharge lamp of 125 watts shall be allowed to fall on a photo electric cell directly and then the tinted window intercepted between the lamp and the cell. A microammeter shall be used in series with the cell. The percentage transmission factor shall be calculated as given below:-

$150 \times \text{reading of Microammeter when tinted window intercepted}$

Reading of microammeter without tinted window.

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(iii) Percentage infra-red transmission:- The radiation from a 1000 CP tungston gas filled lamp, shall be allowed to fall on a thermopile directly and then a tinted window intercepted between the thermopile and lamp. A microammeter shall be used in series with the thermopile. The percentage transmission factor shall be calculated as given below:-

100 x reading of microammeter when tinted window is intercepted.

Reading of microammeter without tinted window.

22.0

Appendix 'E'
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A piece of rubber bonded with foam of 10 to 12 cm length, 15 mm width shall be cut from the top portion of the goggles frame. At one end of this piece, rubber and polyarethene foam bonded with velvet fabric shall be separated from each other by hand to such an extent that these two separated pieces shall be fitted to the grip/jaws of the adhesive strength tester. Then apply the required force at a speed of 50 mm per minute to make the bonded piece separated and record the load.

23.0

Appendix 'F'
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Tape elastic black 19 mm shall conform to the following particulars:-

- | | | |
|-------|---------------|-----------------|
| (i) | Width | 19 mm + 1 mm |
| (ii) | Thickness | 1.3 mm + 0.4 mm |
| (iii) | Stretch Tests | |

- (a) Extension - Load/19 mm width required to produce 50 percent extension in the tape shall be as follows:-

Original =====	After ageing =====
665 gms (min)	500 gms (min)
1330 gms (max)	1000 gms (max)

- (b) Limit of useful extension - Limit of useful extension shall not be less than 120 percent.

- (c) Tension decay under constant stretch:-

Original =====	After ageing =====
shall not exceed 5 %	shall not exceed 10 %

- (d) Fatigue test

Original =====	After Ageing =====
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The specimen shall not show sign of rupture of any of the rubber threads.