

S15-1-1



PRODUCT STANDARD

AME BHOPAL

AM 54016 REV 16

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SHAFT SEALS

ALL DIMENSIONS ARE IN mm.

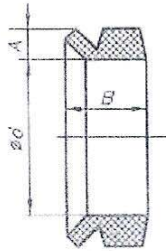
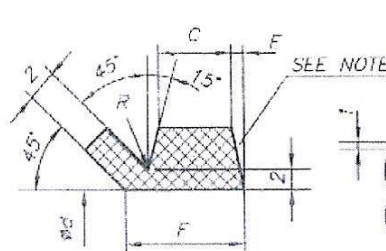
REF:-SN63256
MATL:- AA59804

FIG-1



ENLARGED VIEW

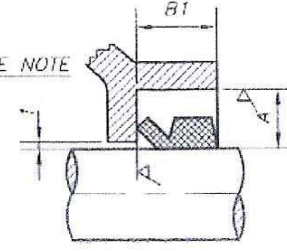
FIXING ARRGT.
OF SHAFT SEAL

TABLE OF DIMENSIONS

ITEM NO.	BRO. SIZE	SUITABLE FOR SHAFT FROM TO		d	A	B	C	E	F	R	DIM. ON ASSY.		Pm *	RPM **	STYLE NO.
											B1	a			
1	85	83	88	77	6	15.5	5	3.5	11.5	1.5	13.5	9	± 1.2	3150	BP9094321890
2	90	88	93	81										2970	-
3	95	93	98	85										2810	BP9094320592
4	100	98	105	90										2670	BP9094322684
5	110	105	115	99	7	18	6	4	13	1.5	15.5	10.5	± 1.5	2430	BP9094320061
6	120	115	125	108										2230	BP9094320606
7	130	125	135	117										2060	BP9094320053
8	140	135	145	126										1910	BP9094320614
9	150	145	155	135	8	20.5	6.5	4.5	14	1.5	18	12	± 1.8	1780	BP9094320622
10	160	155	165	144										1670	BP9094320630
11	170	165	175	153										1570	BP9094320620
12	180	175	185	162										1490	BP9094320638
13	190	185	195	171	8	20.5	6.5	4.5	14	1.5	18	12	± 1.8	1410	BP9094320606

NOTE:-

RING DESIGNATION TO BE EMBOSSED BY RAISED LETTER SIZE 2.5 TO AA0621403 SUCH THAT IT IS CLEARLY VISIBLE AND READABLE. DESIGNATION SHALL BE THE SIZE SPECIFIED IN COL.2 OF TABLE PREFIXED WITH LETTER 'V' eg; RING DESIGNATION FOR ITEM 01 SHALL BE "V85" AND FOR ITEM 09 SHALL BE "V150".

CONT.ON SH1-2

* PERMISSIBLE AXIAL
MOVEMENT OF SHAFT
** MAX. PERMISSIBLE SPEED

AM 54016

REVISIONS

REV.	DATE	DESCRIPTION	DISTRIBUTION NO.		NAME	SIGN	DATE
			AME	1			
16	27-10-06	STYLE NO. ADDED FOR IT. 18.	TEX (IMM)	1	PREPARED	J C GUPTA	15.1.84
15	21-12-04	REDRAWN AND REARRANGED.	PLM	3	CHECKED		
			TEX (PLM)	1	APPROVED	PB	15.1.84

CIRCLIP FOR SHAFT, NORMAL TYPE, STEEL

IT.NO.	SHAFT DIA NOM. SIZE	MATERIAL SPEC/CODE	CORE CODE	ST. NO. REMARK
1	28 X 1.5	AA 716 70 01 058		
2	70 X 2.5	AA 716 70 01 198		
3	75 X 2.5	AA 716 70 01 333		
4	80 X 2.5	AA 716 70 01		
5	85 X 3.0	AA 716 70 01 260		
6	90 X 3.0	AA 716 70 01 279		
7	95 X 3.0	AA 716 70 01 341		
8	100 X 3.0	AA 716 70 01		
9	110 X 4.0	AA 716 70 01 350	40588949	
10	120 X 4.0	AA 716 70 01 368		
11	130 X 4.0	AA 716 70 01 376		
12	140 X 4.0	AA 716 70 01 384		BP9013026303
13	150 X 4.0	AA 716 70 01 309		BP9013026311
14	160 X 4.0	AA 716 70 01 392		BP9013026320
15	170 X 4.0	AA 716 70 01 406		BP9013026338
16	180 X 4.0	AA 716 70 01		BP9013026346
17	240 X 5.0	IS : 3075 PART-1		BP9013035159
18	190 X 4.0	AA 716 70 01		BP9013026354
19	200 X 4.0	AA 716 70 01		BP9013026834
20	220 X 5.0	IS : 3075 PART-1		BP9013034942
21	260 X 5.0	IS : 3075 PART-1		BP9013035167

CAUTION:— THIS IS ONLY A DOCUMENT FOR CORE CODE DIRECTORY OF CIRCLIPS. THIS SHOULD NOT BE USED FOR ANY OTHER PURPOSE SUCH AS INDENTING ETC. BY IMM/LEM.

SIEMENS REF. DYN 78402 HGW 684											CIRCLIP FOR SHAFT				
REV	DATE	ALT	REV	DATE	ALT	REV	DATE	ALT.	TITLE						
		CHD.			CHD.			CHD.							
REVISIONS	REV	DATE	ALT	REV	DATE	ALT	REV	DATE	ALT.	DISTRIBUTION		NAME	SIGN	DATE	
			CHD.			CHD.	03	5.10.06	CHD.	AME-1		DRN.	PS	Sd-09.01.98	
							DRG. REDRAWN IT. 21 ADDED.				IMM-3 TEX(IMM)-1 PLM-3		CKD.	VRG	Sd-
													APPD.	VRG	Sd-14.01.98



CORPORATE PURCHASING SPECIFICATION

AA59804

Rev No. 04

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NITRILE RUBBER SHEETS, GASKETS AND MOULDINGS 60 IRHD

1 GENERAL

This specification governs the quality requirements of Nitrile Rubber Sheets, Gaskets and Mouldings having a hardness of 60 IRHD.

2 APPLICATION

Used as gaskets and mouldings in transformer, AC machines, traction machines, etc.

3 COMPLIANCES WITH NATIONAL STANDARDS

The material shall comply, in general, with the requirements of the following national standard and also meet the requirements of this specification.

BS 2751 : 2001, Gr.: BA 60 : General Purpose Nitrile-Butadiene Rubber Components.

And also shall meet the additional requirement of clause 10.5 of this specification.

4 DIMENSIONS AND TOLERANCES

4.1 Sizes

Length x Width x Thickness of the sheet shall be stated in BHEL order.

Gaskets and mouldings shall be supplied as per BHEL drawings.

Preferred thickness for sheets and gaskets are 2, 3, 4, 5, 6, 7, 10, 11, 12 and 16 mm.

4.2 Tolerances

Unless otherwise stated in the order / drawing, tolerances on length, width and thickness shall be as follows:

4.2.1 On Length and Width

± 3 mm

4.2.2 On Thickness

Nominal thickness, mm		Tolerance, ±mm
Over	upto & including	
--	2	0.25
2	8	0.4
8	12	0.6
12	16	0.8

Revisions:

As per clause 34.11.53 & 34.6 of MOM of MRC-CPO

APPROVED:

INTERPLANT MATERIAL RATIONALISATION
COMMITTEE – MRC(CPO+NM)

Rev No.04

Amd No.

Reaffirmed

Prepared
HEP, Bhopal

Issued
Corp.R&D

Dt. of 1st Issue
01-07-1980

Dt:15-11-2005

Dt:

Year:2021

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CORPORATE PURCHASING SPECIFICATION



5 FINISH

Material shall have a smooth finish.

6 FREEDOM FROM DEFECTS

All ingredients of the mix shall be free from grit and extraneous matter. The selection and processing of the ingredients shall be such that the vulcanizate is free from surface imperfections, blisters, porosity, voids, inclusions, flow marks, inadequate joint-formation and other defects, which would impair satisfactory performance.

The material shall not develop excessive bloom on storage under normal temperature conditions.

7 CHEMICAL COMPOSITION

Sheets, gaskets and moulding shall be made out of vulcanizates based on Butadiene acrylonitrile copolymer reinforced only carbon black, vulcanized with sulphur/organic accelerator activated with stearic acid and rubber containing at least 4 parts per hundred of zinc oxide and 2 parts per hundred of a suitable antioxidant.

No factice or other extender, reclaimed or ground vulcanized rubber shall be used.

8 IDENTIFICATION

The material, when identified by infra-red spectroscopy, or by any other convenient method shall be of butadiene acrylonitrile copolymer.

9 TEST SAMPLES

Three samples of sheets of the following sizes pre, 150 x 150 mm from the same batch and vulcanized to the same degree as the consignment concerned shall be submitted for testing.

- | | |
|-------------------------------------|--------------|
| 150 x 150 x 2 ± 0.15 mm thickness | : two sheets |
| 150 x 150 x 6.3 ± 0.15 mm thickness | : one sheet |

10 PROPERTIES

When tested in accordance with the Indian standards / British standards shown against each, the test samples shall show the following properties:

10.1 Hardness (BS 903: Part A26: Method N, 2 Files. Ball test 2mm with the thicker ply on top)

60 ± 5, IRHD

10.2 Tensile strength (IS 3400 : Part 1, Dumb-bell)

8.5 N/mm², minimum

10.3 Elongation at Break (IS 3400 : Part 1, Dumb-bell)

400%, minimum

10.4 Compression set at 70°C (IS 3400 : Part X)

For 72 hours + 0, - 2, hours: 20%, maximum.



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11 TYPE TESTS

Whenever specified, the following type tests shall be conducted as per the test method specified against each and the norms of acceptance shall be as specified below:

11.1 Volume Change (BS 903 : Part A16: Volumetric Method, Liquid B, 22 Hours at 40°C)

- 0, + 25%.

11.2 Adhesion to and corrosion of metals (BS 2751, Appendix A)

There shall be no corrosion or pitting of the metals and the material shall not adhere to the metal surface or show any sign of liquid exudation.

Discolouration of the metal surfaces shall not be considered to be objectionable.

11.3 Accelerated Ageing (IS 3400 : Part IV)

11.3.1 Ageing in Air

Four test specimens (where possible 25mm wide of suitable length) shall be cut from each sheet in the sample from widely separated positions. The specimens shall be aged in air for 168 hours at $110 \pm 5^\circ\text{C}$.

After ageing in air, when tested in accordance with the method specified at clause 10.1 above, the change in hardness shall not be more than 10 IRHD over the values obtained at clause 10.1.

11.3.2 Ageing in Oil

Two test specimens each of 25 mm wide and of suitable length shall be cut from each sheet in the sample from widely separated positions. The specimens shall be aged in insulating oil conforming to IS 335 for 168 hours at 100°C .

After the oil is wiped by bottling paper, the specimens shall show the following properties.

11.3.2.1 Change in Volume

10%, maximum

11.3.2.2 Oil Absorption (Calculated on the Original Weight of the Specimen)

15%, maximum

12 TEST CERTIFICATES

Unless otherwise stated, three copies of test certificates shall be supplied giving the following information:

In addition, the supplier shall ensure to enclose one copy of the test certificate along with their dispatch documents for quick clearance of the material.

AA59804, Rev.04: NITRILE RUBBER SHEETS, GASKETS AND MOULDINGS 60 IRHD

BHEL Order No.

Manufacture's/Supplier's Name and Trade mark, if any.


Batch/Lot No.

Date of manufacture

Test results of clauses 4, 8, 10 and 11

13 KEEPING PROPERTY

When stored under cover in a dry place under normal storage conditions, the material shall retain the properties prescribed in this specification for a period of not less than 24 months after the date of manufacture, which shall be subsequent to the date of placing the order.

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14 PACKING AND MARKING

Material shall be suitably packed to prevent damage from contamination and handling during transit.

Each package shall be legibly marked with the following information:

AA59804: NITRILE RUBBER SHEETS, GASKETS AND MOULDINGS 60 IRHD

BHEL Order No.

Supplier's/ Manufacturer's Name and Trade mark, if any

Batch No.

Drawing No. & Item No., if any

Size and Quantity

15 REFERRED STANDARDS (Latest Publications including Amendments)

- 1) IS 335
- 2) IS 3400
- 3) BS 903