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APPENDIX 'C' TO DOCUMENT NO.: DRDO ARDE DOA TOT 239-2017
QAP FOR TWO PIECE INSITU RUBBER SEAL
FOR SHOT 120MM FSAPDS MK-II ASSEMBLY (EMPTY)

Appendix 'C'

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GOVERNMENT OF INDIA
MINISTRY OF DEFENCE



Appendix 'C' to Document No: DRDO-ARDE-DOA-TOT-239-2017

**QAP FOR TWO PIECE INSITU RUBBER SEAL
FOR
SHOT 120mm FSAPDS MK-II ASSEMBLY (EMPTY)**

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Quality Matrix

VENDOR: CUSTOMER:							Responsibility		Remarks
SL NO	OPERATIONS	SAMPLING PLAN	ACCEPTANCE STANDARD	FORMAT	Vendor	ARDE			
1	Raw Material Chemical Composition	Supplier test report for Raw rubber will be verified	As per this QAP	Report	R	R		Bulk production clearance shall be accorded after fitment & functional trial of pilot batch	
2	Batch Qualification Report (i.e Tensile test, etc)	1 No/Lot	As per this QAP	Report	P	W			
3	Visual Inspection	5 No's or 10% samples	As per this QAP	Report	P	W			
4	Gauging (Ring Gauge)	100%	As per this QAP	Report	P	W			
5	Dimensional Inspection	5 No's or 10% samples	As per this QAP	Report	P	W			
6	Final Identification & Tagging	100%	As per this QAP	Tag/label	P	R			
7	Packing	100%	As per this QAP	Report	P	--			
8	Despatch	100%	As per this QAP	--	P	--			

Abbreviations:
 P- Performed By
 R- Review By
 W- Witness

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TWO PIECE INSITU RUBBER SEAL
FOR 120mm FSAPDS MK-II
(PROVISIONAL)

1.0 Scope:

This specification provides guidelines for manufacturing, selection of material, inspection and testing of TWO PIECE insitu moulding of rubber seal for 120mm FSAPDS MK-II Ammunition.

2.0 Introduction:

2.1 ARDE has developed 120 mm FSAPDS Mark-II ammunition to enhance the lethality of MBT Arjun. The insitu rubber seal will act as a barrier between shot and high temperature flame gas produced due to burning of propellant. It acts as front seal and helps in preventing gas leakage during shot travel in Barrel.

3.0 General :

- 3.1 This specification is the property of the Ministry of Defence and must be returned to the Department from which it is issued immediately after the tender has been declined or on completion of the contract or on demand.
- 3.2 This specification or any other information issued in connection therewith may only be issued for specific enquiries, tenders or orders placed by a competent authority on behalf of the Ministry of Defence. It is not to be used for any other purpose whatsoever without the express written sanction of the Director ARDE. Any enquiries regarding this specification should be addressed to the inspecting Authority named in the tender or contract.
- 3.3 Contractor before commencement of bulk production shall submit requisite number of samples, test pieces as directed by the inspector for qualifying material / process / component as the case may be.
- 3.4 All the tests including hardness check of components / assemblies shall be undertaken by the manufacturer in presence of the representative of inspection agency.
- 3.5 The firm shall fabricate initial one-sample (prototype), which shall be taken up for various qualification testing. Only on clearance of the same the bulk clearance shall be accorded.

4.0 Applicable Document

4.1 This specification should be read in conjunction with the

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- 1006 13 21 01 05 000 001A
- 1006 13 21 01 05 001 001A
- 1006 13 21 01 05 002 001A

5.0 RAW MATERIALS

- 5.1 All the raw materials must be procured from the reputed vendors as per the requirements given on the relevant drawings / specifications. The manufacturer shall undertake chemical and mechanical testing of raw material on accordance with the relevant specification quoted in the manufacturing drawing. Acceptance of raw materials shall be as per the material tests certificate produced by the reputed vendor. Tested quantity of material with lot homogeneity shall be procured in suitable batches and these shall be sealed by the inspecting agency after Inward goods inspection. Once the raw material has been accepted for the internal use for manufacture of components it shall not be changed, altered, modified during the process. No other material in lieu of already sealed one shall be permitted without the written approval.
- 5.2 Contractor is responsible for the procurement of raw material conforming to the specification in the requisite sizes.
- 5.3 Raw material lots that do not correspond to the specifications must be rejected. The supplier has the right to be convinced about the justification of the rejection. The results of the inward goods inspection shall be communicated in writing to the supplier (contractor).
- 5.4 If there is any dispute in acceptance of material on the suppliers test certificate, inspector reserves the right to get it tested from a neutral test agency and satisfy the requirements as per specification.
- 5.5 If the lot of raw material is rejected at the discretion of the inspection authority it should be discarded and care should be taken to avoid mixing of the rejected lot with accepted lots. A proper rejection control / system shall be adopted by the contractor.



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- 5.6 The raw materials procured should be stamped duly by the inspection agency. Inspection agency should also ensure that the same material is being processed for the subsequent cutting or machining operation. The trace ability of the material shall be ensured to the inspecting agency, whenever required.
- 5.7 Wherever the specification or drawing permits a choice of alternative material(s), the contractor must inform in writing to the Inspecting Authority, which of the permitted alternatives he chooses to produce and once the choice has been granted to the event of this choice requiring further amendment, the fabricator/contractor is bound to get the prior approval of inspecting agency & Inspection Authority for such a change over.

6.0 MANUFACTURE / FABRICATION

- 6.1 The contractor may subcontract the fabrication of sub -assembly or part thereof with prior permission and approval of inspection authority.
- 6.2 Wherever the specification or drawing permits a choice of alternative method(s) of manufacture, the contractor must Inform in writing to the Inspecting agency, which of the permitted alternatives he chooses to produce and once the choice has been granted to the contractor, he shall not devlate from this choice during course of manufacture. In the event of this choice requiring further amendment, the fabricator/ contractor is bound to get the prior approval of inspecting agency & Inspection Authority for such a change over.
- 6.3 The contractor shall submit the manufacturing / fabrication process with relevant control points for stage inspection and quality assurance plan to the inspecting authority for approval before starting any process. Once the process of manufacture/ fabrication has been documented, process sheets prepared and approval granted, no changes should be allowed without the written approval of the Inspecting Authority.

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- 6.4 All details of workmanship shall be consistent with the requirement. There shall be no cracks, burrs, dents, scratches, sharp edges, loose parts, foreign matter or any other evidence of poor workmanship that will render components/ subassemblies unsuitable for its internal use. Cleaning methods used shall not be injurious to any of the parts. No parts shall be contaminated by cleaning agent.
- 6.5 Components shall be manufactured as per the approved plan from the specified materials and should meet all physical, chemical, metallurgical and geometrical requirements as indicated by relevant document/ specification.
- 6.6 No mechanical work, heat treatment or any other operation, which may modify, alter the metallurgical or physical properties of the material will be carried out after it has been submitted for approval.
- 6.7 All tolerances specified are absolute with no allowance made for manufacturing process, machine inaccuracies (or measuring instruments inaccuracies). All components are to be manufactured within the tolerance limits specified.
- 7.0 **INSPECTION**
- 7.1 Unless otherwise stated in the contract or purchase order, supplier is responsible for the performance of inspection requirement as per relevant drawing / specification using his in-house facility or as per the directive issued by the Inspecting agency.
- 7.2 The right to perform any inspection, testing at any stage during course of production or at the completion of manufacture rests with the Inspecting Agency. Contractor shall inform Inspection Agency of his readiness to commence manufacture at his place or at the place where sub-contracting has been made and make available all facilities and access to all places of work to undertake inspection task.



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- 7.3 All the test fixture, tools, gauges, equipment, instrument etc., required to undertake inspection/ testing along with calibration certificate shall be made available by the supplier.
- 7.4 Any component, sub-assembly or assembly spent / damaged during the course of transit etc., shall be replaced free of cost by the supplier.
- 7.5 Contractor before commencement of bulk production shall submit requisite number of samples, test pieces as directed by the inspector for qualifying material/ process/ component as the case may be.
- 7.6 Inspection Agency representatives shall also draw samples of raw materials and carry out the chemical / mechanical testing independently. The representative is at his / her liberty to select more than one rod, plate etc. The manufacturer shall also provide the certificate of purchase of raw material with heat / lot number in order to ensure trace ability, where possible. The facilities for testing will be provided / arranged by the contractor.
- 7.7 Supplier (Manufacturer) and inspector shall mutually agree on the requirements of on-line inspection during the processing of the components and inspection criteria. Further, manufacturer shall submit only those components / parts, which meet all the requirements as stipulated on the drawings/ specifications.
- 7.8 Any component/ pattern sent to the supplier shall be used only as guide to manufacture and not for details.
- 7.9 All components / stores shall be manufactured using the same process, material, procedure and equipment approved prior to the start of manufacture.
- 7.10 Prior to submission, manufacturer in his own interest shall inspect all the components to the degree necessary to ensure that they confirm to the requirement and submit

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his documents/ records/ test results, along with the statement of finding, for material, test standards etc., to the inspector for his scrutiny / vetting.

- 7.11 All tests including hardness check of components / assemblies shall be undertaken by the manufacturer in presence of the representative of Inspection Agency.
- 7.12 Samples containing known defects shall not be submitted.
- 7.13 Fresh samples shall be submitted for inspection/testing whenever there is a change in material, specification, process, and drawings or if there is a lapse of more than one year in production. These repeat samples shall be subjected to the severity of test/ inspection criteria as in the case of original sample.
- 7.14 **During production, any major component, subassembly and final assembly not meeting the requirements stipulated in this specification or relevant drawings, shall be referred to the Inspecting authority, who in turn on the merits of deviations observed will seek the approval of waiver board or any such competent authority either for acceptance, rectification and resubmission or rejection as the case may be.**
- 7.15 All the rejected components / subassemblies / final assemblies shall be segregated and destroyed under instructions to Inspection Agency & Inspection Authority

8.0. DEFINITIONS

- 8.1 Lot/ Batch Formation: Unless otherwise specified, a lot is that quantity which is produced according to the same production basis and production process in an unbroken continuous sequence by the manufacturer and with the same lot/ batch of material received fulfilling the condition of homogeneity without exceeding the maximum quantity mentioned in the specification
- 8.2 Defect Classification - Critical, Major and Minor
- a) *Critical defect*
- A defect that would render the item totally unfit for use or could result in hazardous or unsafe conditions for individuals using or maintaining the item.

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b) *Major defect*

A defect, other than critical defect that could result in failure, or materially reduces the usability of the item or product for its intended purposes.

c) *Minor defect*

A defect other than critical and major defect that does not materially reduce the usability of the product for its intended purpose.

- 8.3 Lot size for components: Unless otherwise mentioned hereinafter, the lot size shall not be greater than 500 Nos. For lot size less than 16 nos., 100% inspection shall be carried out on all the dimensions.
- 8.4 Sampling: During production unless otherwise specified hereafter or by the inspecting authority, for a given lot/ batch size, sample size shall be as mentioned in the QAP.
- 8.5 **Acceptance Quality Levels:** during the Initial production inspection will be carried out as per the sample size given in QAPs. If any deviation occurred than 100% inspection will be carried out and accepted components will be taken for assembly. (Acceptance clause shall be decided at the discretion of Inspecting agency wherever applicable.)
- Note:** For lot size less than 16 no, all the dimensions shall be inspected 100% inspection.

9.0. **MARKING**

- 9.1 **Raw Materials:** All the raw material shall be identified suitably with the following information

Source of supply:

Order No.:

Batch No.:

Identification code:

- 9.2 **Components:** All the components from the acceptable batch shall be marked with a serial number/ lot number wherever it is mentioned in this specification. All the accepted components shall be grouped in suitable batches and shall be identified on their package with the following information. This information shall also be recorded on the inspection reports and be moved along with the batch.

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Quantity:

Lot no.:

Manufacturer's code:

Date / Year of manufacturing:

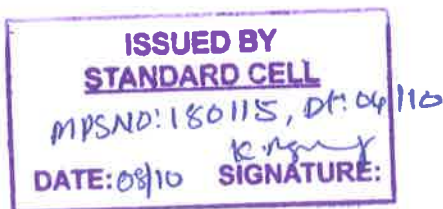
9.3 Marking can be either stenciled, inked, painted, etched unless otherwise mentioned, such that it does not vanish during handling, storage, transportation.

10.0 PACKING/ TRANSPORTATION & STORAGE

Unless otherwise specified herein or in relevant documents, between various works centers the manufacturer is responsible for transportation/ storage of components / empty sub-assemblies in suitable transit packages in such a way that the components are protected from abrasion, corrosion, mishandling and other environmental effects.

11.0 Detailed Sub Assembly / Component wise Inspection and Acceptance Criteria:

The quality assurance method for each component and sub-assembly is given as below:



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1. LOWER RUBBER SEAL

- 1.0 Drawing No : 1006 13 21 01 05 001 00TA ✓
- 2.0 Method of Manufacture : Compression Moulding
- 3.0 Raw Material : Silicon Rubber to DTD 818 Class I-3 or equivalent.

3.1 Inspection and Testing of Raw Material.

Sl. No.	Mechanical Properties	Acceptance Criteria
1	Tensile Strength (min)	4.80 MPa
2	Elongation at break (mln)	200%
3	Hardness Shore 'A'	60±5
4	Compression Set (max) (at 70°±5°C for 24 hrs)	25%

Note: Average of any three sample of the slab prepared for the testing purpose should be taken

4.0 In-process Inspection : ---NA---

5.0 Stage Inspection : Detailed mould report to be submitted before the commencement of the moulding process of every lot

Dimension to be checked on mould for data generation

Sl. No.	Details of Feature	Drawing Zone	Inspection Method
1	30-0.2	E-4	CMM
2	124±0.2	E-3	CMM
3	132±0.2	F-3	CMM
4	14°	E-2	CMM
5	66°	E-1	CMM
6	R8.5 & R5	E-4 & E-2	CMM

6.0 Final Inspection Report:

6.1 Visual Inspections.

Following Parameters to be checked

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Sl. No.	Details of Feature	Sample Size	Acceptance Criteria	Defect Class
1	Cracks, Lumps, Blow holes, uneven surfaces etc.	100% by factory QC &	Not Permitted	Major
2	Presence of 6 holes equi-spaced of diameter 7 mm on PCD 95 mm	10% by AHSP/SQAE	Presence	Major

6.2 Dimensional Inspection.

6.2.1 Critical Dimension : -NA-

6.2.2 Geometrical Dimension : -NA-

6.2.3 Major Dimension :

Sample Size: 100% by factory QC & 10% by AHSP/SQAE.

Sl. No.	Details of Feature	Drawing Zone	Inspection Method
1.	30±0.2	E-4	Height Vernier/ Gen. Engg Method
2.	14°	E-2	Template
3.	132±0.2	F-3	Gen. Engg Method
4.	1.5+0.3	E-2	Gen. Engg Method

6.2.4 Minor Dimensions : ---NA---

7.0 Test on Finished Items :

1. Fitment test

All the seal produced to be checked for fitment on the original shot or on the template

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2. INSITU RUBBER SEAL

- 1.0 Drawing No : 1006 13 21 01 05 002 001A
2.0 Method of Manufacture : Compression Moulding
3.0 Raw Material : Silicon Rubber to DTD 818 Class L-3 or equivalent.
3.1 Inspection and Testing of Raw Material.

Sl. No.	Mechanical Properties	Acceptance Criteria
1	Tensile Strength (min)	4.80 MPa
2	Elongation at break (min)	200%
3	Hardness Shore 'A'	60±5
4.	Compression Set (max) (at 70±5°C for 24 hrs)	25%

Note: Average of any three sample of the slab prepared for the testing purpose should be taken

4.0 In-process inspection : ----NA----

5.0 Stage Inspection : Detailed mould report to be submitted before the commencement of the moulding process of every lot.

5.1 Dimension to be checked on mould for data generation

Sl. No.	Details of Feature	Drawing Zone	Inspection Method
1.	6	D-5	CMM
2	∅ 24-0.2	C-5	CMM
3.	51.7	D-6	CMM

6.0 Final Inspection Report:

6.1 Visual Inspections.

6.2 Dimensional Inspection.

All dimensions in the drawing are shown for reference and mould creation

6.2.1 Critical Dimension : ----NA----

6.2.2 Geometrical Dimension : ----NA----

6.2.3 Major Dimension : ----NA----

6.2.4 Minor Dimensions : ----NA----

7.0 Test on Finished Items :

Procedure for Manufacture:

a) Take 120 mm FSAPDS MK-II shot and place it on the suitable fixture.

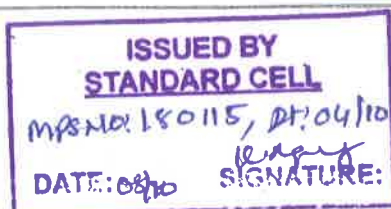
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- b) Mask the DB rear portion with adhesive tape and roughen the rear portion of sabot behind DB by hand grinder. Then clean the rear portion of the shot using toluene or suitable cleaning solution and allow it to get dry.
- c) Apply one coat Chemlock 607 manufactured by Lord on cleaned sabot portion. Apply another coat of Chemlock 607 after waiting for 15 minute
- d) Mix the composition of EE-529 as specified. (See Appendix attached). Apply one coat of the Silicon adhesive EE529 (Mfg from Elastomeric Engineers Salem Tamilnadu) on sabot portion over Chemlok 607 coat.
- e) Wait for 15 minutes and apply coat of the Silicon adhesive EE-529 on inner surface of the lower rubber seal.
- f) Insert the lower rubber seal from the rear portion of sabot and paste it over there confirming butting at rear portion of sabot and aligning the 6 holes.
- g) Apply the pressure by hand and try to spread the seal evenly on the surface of rear portion.
- h) Clean the traces of adhesive if any from all the surfaces of the shot using clean cloth.
- i) Keep this assembly in vertical position (tip up) under self-dead weight of shot for 12 hrs using suitable fixture for proper adhesion/curing.
- j) After curing clean the remaining surface of the penetrator and rear portion of sabot using clean cloth.
- k) Apply one coat of CHEMLOCK 607 Adhesive manufactured by M/s LORD on the required portion on the Sabot and penetrator. (Evenly on Sabot and penetrator portion at rear)
- l) Wait for 10 minutes and then apply one more coat of the CHEMLOCK 607 on the same surface again.
- m) Take this assembly for insitu rubber moulding.



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- n) Put predefined amount of rubber and do compression moulding on the rear part using suitable mould with predefined temperature and pressure.
- o) Keep the shot vertical (i.e. tip down) on suitable fixture for curing for min 5 hours.
- p) Ensure proper adhesion at the joint of insitu moulding with lower rubber seal.
- q) De-flashing of rubber to be carried out carefully.

NOTE:

Details of compression moulding for reference

Parameter	Reference
1. Press Details (Make of Machine)	1 Ton
2. Load/pressure	60kg/cm ²
3. Temperature	160°C-200°C
4. Fixture details.	To be provided by vendor
5. Dwell time (Insitu)	20-30 minutes
6. Curing time in mould (insitu)	Nil
7. Curing time after mould (insitu)	To be provided by vendor
8. Raw rubber Loaded	
1. Lower Rubber Seal	35 gms
2. Insitu Rubber Seal	35 gms
9. Type of moulding method	Compression moulding (Shot in horizontal position in the mould)

Compression moulding process & parameters are at the discretion of the vendor .However vendor to submit the details of the compression moulding process /parameters to the inspector.

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3. TWO PIECE INSITU MOULDING FOR 120mm FSAPDS MARK-II

1.0 Drawing No : 1006 13 21 01 05 000 00TA

One set of the this assembly consist of the following items

Sr. No.	Nomenclature	Drawing No:	Qty
1	Lower Rubber Seal	1006 13 21 01 05 001 00TA	1
2	Insitu Rubber Seal**	1006 13 21 01 05 002 00TA	1

** to be Insitu Moulded as per process.

2.0 Method of Manufacture : Compression Moulding, Pasting, Insitu Moulding,

3.0 Raw Material

3.1 Inspection and Testing of Raw Material : ----NA----

4.0 In-process inspection

: ----NA----

5.0 Stage Inspection

: Detailed mould report to be submitted before the

commencement of the moulding process.

6.0 Final Inspection Report:

6.1 Visual Inspections.

After completion of moulding process, store the shots in air conditioned room (below 25°C) for min 12 hrs, then carry out the inspection. Following Parameters are to be checked.

SL. No.	Details of Feature	Sample Size	Acceptance Criteria	Defect Class
1.	Cracks, Lumps, Blow holes, uneven surfaces etc.	100% by factory QC &	Not Permitted	Major
2.	Presence of 6 holes equi-spaced of diameter 7 mm on PCD 95 mm	10% by AHSP/SQAE	Presence	Major
3.	Loose Sticking of the lower rubber seal (done before insitu moulding)		Not permitted	Major

Note: Some overlap of rubber at the joint permitted provided the loose ends are not visible

6.2 Dimensional Inspection.

6.2.1 Critical Dimension

: ----NA----

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6.2.2 Geometrical Dimension : ---NA---

6.2.3 Major Dimension :

Sample Size: 10% of Sample or 5 Numbers whichever is higher.

Sl. No.	Details of Feature	Drawing Zone	Inspection Method
1	79.7+0.5	C-2	Height Vernier

6.2.4 Minor Dimensions : Nil

7.0 Test on Finished Items :

7.1 Inter-petal Gap between Sabots

Sample Size: 10% of the order or 5 No's whichever is higher.

Method:

Hold the shot suitably, take filler gauge of 100 micron and check the inter petal gaps.

Observation:

The filler gauge should not enter between the inter petal gap.

7.2 Gauging.

Sample Size: 100%

Method:

Hold the shot suitably, take a ring gauge of dimension 125.95+0.05 mm and check the shot for passing it through the ring gauge.(ARDE/HAPP will provide Ring Gauge)

Observation:

The shot should pass through the gauge.

ISSUED BY
STANDARD CELL
MPS NO: 180115, Dt: 04/10
DATE: 08/10 SIGNATURE: [Signature]

APPENDIX 'C' — TO DOCUMENT NO.: DRDO ARDE DOA TOT 239 2017
 QAP FOR TWO PIECE INSITU RUBBER SEAL
 FOR SHOT 120MM FSAPDS MK-II ASSEMBLY (EMPTY)

Annexure



ELASTOMERIC ENGINEERS,

(An AS 9100C Company)

NH-7, Bye Pass Road,
 Seelanaickenpatly,
 Salem - 636 201, (T.N)

AS 9100C
 DEKRA
 CERTIFIED TO THIS
 Ph: 0427 - 2422232
 0427 - 2422332
 Fax: 0427 - 2422432
 E-mail: elastomerz@litesalemantp.com
 elastomericeuropeus@gmail.com
 URL: www.litesalemantp.com

SILICONE ADHESIVE EE-529

SILICONE BASED ADHESIVE EE-529 is an pressure sensitive Type only. This silicone based pressure sensitive adhesive may be applied and heat cured or at Room temperature. Cure time can be shortened with elevated temperature upto 140° C (300°F).

Recommended Solvent : Toluene

Processing Instruction

1. Silicone Gum EE-529 : 100 parts by weight
2. Catalyst (Liquid Benzoyl Peroxide) : 3.0 Parts (max)
3. Solvent (or Dilution) Toluene : 30% (max)

Adhesion Application

SILICONE ADHESIVE EE-529 is supplied at a viscosity suitable for almost conventional coating operations. It may be thinned by adding toluene. To obtain maximum adhesive strength by heating (solvent free state) for 1.5 to 2 minute at 90° C (194° F)

Storage and Usage

Catalyst added adhesive should be stored in tightly closed containers and used within 24 hours. **AND IT SHOULD BE STORED IN COOL AND DRY PLACE.**

CATALYSED SILICONE EE-529 Adhesive can be applied with brush, roller or any draw down device. Thinning (if required) may be done with a solvent Toluene. Both surfaces to be bonded should be cleaned (with an alcohol) and coated in such a way that a smooth, solvent free film. Use adhesive in a well-ventilated area. Most of the solvent will evaporate from the applied film in a time of 20-30 minutes allowing for immediate positioning of lap joints. At this point the surfaces should be pressed firmly together if possible with steel roller. The adhesive will continue to harden noticeable for about three days.

For best result check after 72 hours.

Mfrs AERONAUTICAL RUBBER PRODUCTS

TIN No: 237127-1-14
 RC No: 2004

CSIR No: 190/00-1-3-6-85
 AREA CODE: 142

NEW ECC No: 1004/E/0594/10W/004
 RANGE: 1 SA PARTVISION

ISSUED BY
STANDARD CELL
 MFSNO: 180115, Dt: 04/10
 DATE: 08/10 SIGNATURE: *[Signature]*

Restricted

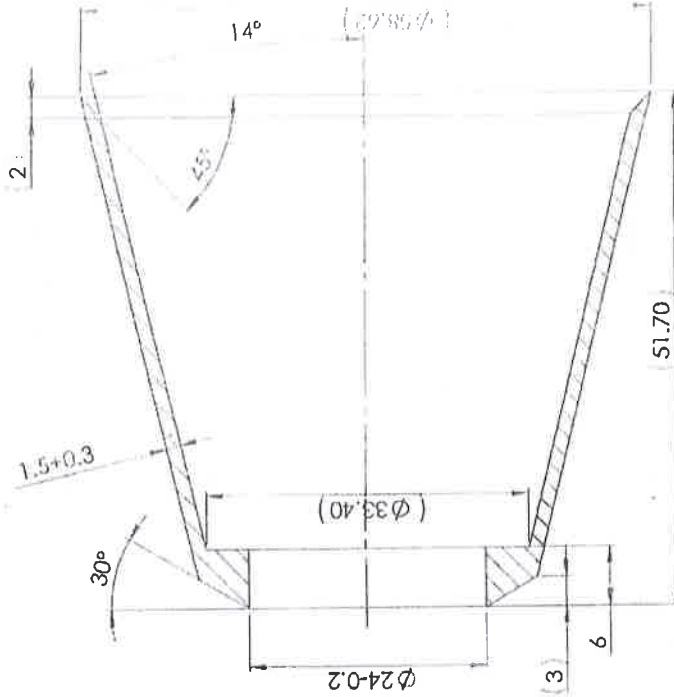
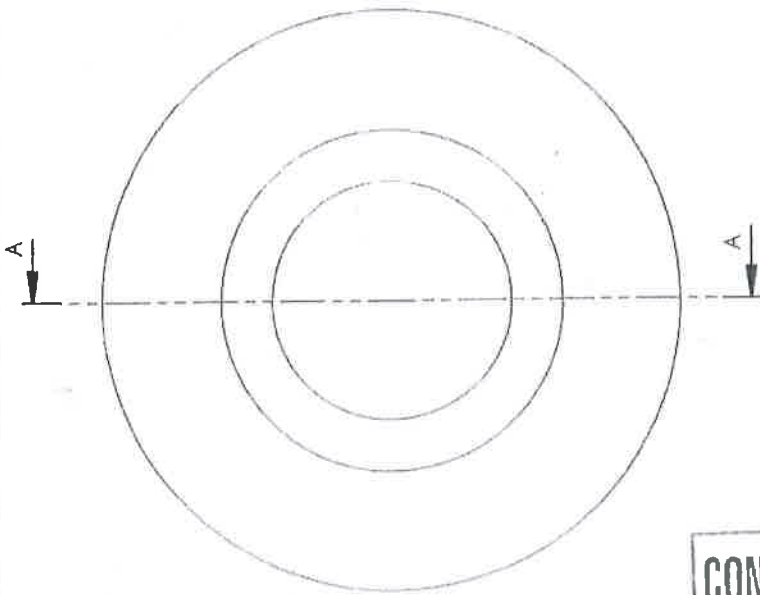
Page No 20

CONTROLLED COPY NO. 1

DRG No. 1006 13 21 01 05 002 001A

GEN TOL MEDIUM CLASS TO IS:2102

DRG CONVENTIONS CONFORM TO INDIAN STDS.
DIM IN mm UNLESS OTHERWISE STATED.



SECTION A-A
SCALE 2:1

NOTE:
1. DIMENSION MENTIONED ARE CREATION OF MOULD.
2. DIMENSION IN BRACKETS ARE FOR REFERENCE ONLY.

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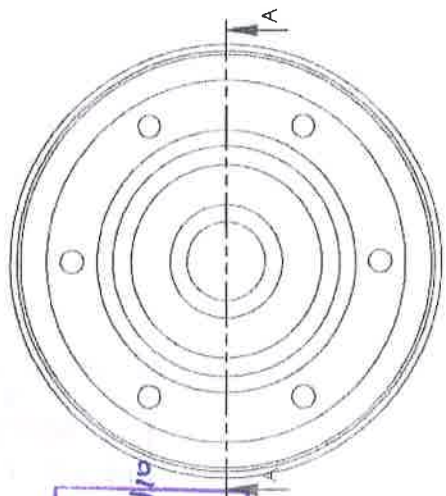
ISSUED BY
STANDARD CELL
MPSNO: 18015, dt 04/10
DATE: 04/10
SIGNATURE: [Signature]

R No	DATE	AUTHORITY	BRIEF RECORD	ZONE	CC	SIGN
DRN: PP	CHD: [Signature]	R.D. MISAL, Sc 'G'	MATERIAL: SILICON RUBBER TO DTD 818 CLASS L-3 OR EQUIVALENT			
P.S. P. [Signature]	R.D. MISAL, Sc 'G'	For Director	PROTECTIVE FINISH: ---NIL---			
APPD: 26/02/18	EST MASS: [Blank]	kg (Approx)	TITLE: INSITU RUBBER SEAL			
SEALED	DESIGN AUTHORITY: ARDE					
	DRG No: 1006 13 21 01 05 002 001A					
	PART No. [Blank]	DS CAT No. AHSP				

135

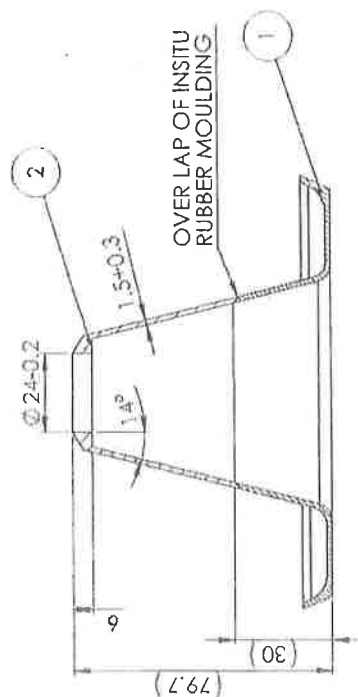
DRG NO. 1006 13 21 01 05 000 00TA

GEN TOL MEDIUM CLASS TO IS:2102
 DRG CONVENTIONS CONFORM TO INDIAN STDS.
 DIM IN mm UNLESS OTHERWISE STATED.



ISSUED BY
 STANDARD CELL
 M/S NO: 180115, Dt: 10/10/18
 DATE: 08/10 SIGNATURE: *[Signature]*

CONTROLLED COPY NO. 1



SECTION A-A
 SCALE 1 : 1.5

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	1006 13 21 01 05 001 00TA	LOWER RUBBER SEAL	1
2	1006 13 21 01 05 002 00TA	INSITU RUBBER SEAL	1

- PROCEDURE FOR INSITU RUBBER MOULDING**
- TAKE 120 MM FSAPDS MK-II SHOT AND PLACE IT ON THE SUITABLE FIXTURE.
 - MASK THE DB REAR PORTION WITH ADHESIVE TAPE AND ROUGHEN THE REAR PORTION OF SABOT BEHIND DB BY HAND GRINDER. THEN CLEAN THE REAR PORTION OF THE SHOT USING TOLUENE OR SUITABLE CLEANING SOLUTION AND ALLOW IT TO GET DRY.
 - APPLY ONE COAT CHEMLOCK 607 MANUFACTURED BY LORD ON CLEANED SABOT PORTION. APPLY ANOTHER COAT OF CHEMLOCK 607 AFTER WAITING FOR 15 MINUTE.
 - MIX THE COMPOSITION OF EE-529 AS SPECIFIED. (SEE APPENDIX ATTACHED). APPLY ONE COAT OF THE SILICON ADHESIVE EE529 (MFG FROM ELASTOMERIC ENGINEERS SALEM TAMILNADU) ON SABOT PORTION OVER CHEMLOCK 607 COAT.
 - WAIT FOR 15 MINUTES AND APPLY COAT OF THE SILICON ADHESIVE EE-529 ON INNER SURFACE OF THE LOWER RUBBER SEAL.
 - INSERT THE LOWER RUBBER SEAL FROM THE REAR PORTION OF SABOT AND PASTE IT OVER THERE CONFIRMING BUTTING AT REAR PORTION OF SABOT AND ALIGNING THE 6 HOLES.
 - APPLY THE PRESSURE BY HAND AND TRY TO SPREAD THE SEAL EVENLY ON THE SURFACE OF REAR PORTION.
 - CLEAN THE TRACES OF ADHESIVE IF ANY FROM ALL THE SURFACES OF THE SHOT USING CLEAN CLOTH.
 - KEEP THIS ASSEMBLY IN VERTICAL POSITION (TIP UP) UNDER SELF-DEAD WEIGHT OF SHOT FOR 12 HRS USING SUITABLE FIXTURE FOR PROPER ADHESION/CURING.
 - AFTER CURING CLEAN THE REMAINING SURFACE OF THE PENETRATOR AND REAR PORTION OF SABOT USING CLEAN CLOTH.
 - APPLY ONE COAT OF CHEMLOCK 607 ADHESIVE MANUFACTURED BY M/S LORD ON THE REQUIRED PORTION ON THE SABOT AND PENETRATOR (EVENLY ON SABOT AND PENETRATOR PORTION OF REAR).
 - WAIT FOR 10 MINUTES AND THEN APPLY ONE MORE COAT OF THE CHEMLOCK ON THE SAME SURFACE AGAIN.
 - TAKE THIS ASSEMBLY FOR INSITU RUBBER MOULDING.
 - PUT PREDEFINED AMOUNT OF RUBBER AND DC COMPRESSION MOULDING ON THE REAR PART USING SUITABLE MOULD WITH PREDEFINED TEMPERATURE AND PRESSURE.
 - KEEP THE SHOT VERTICAL (I.E. TIP DOWN) ON SUITABLE FIXTURE FOR CURING FOR MIN. 1 HRS.
 - ENSURE PROPER ADHESION AT THE JOINT OF INSITU MOULDING WITH LOWER RUBBER SEAL.
 - DE-FLASHING OF RUBBER TO BE CARRIED OUT CAREFULLY.

R No.	DATE	AUTHORITY	BRIEF RECORD	ZONE
DRN: P.S.Pall Sc'D	26/02/2018	CHD R.D. Meekar, Sc'E	---	---
APPD			MATERIAL: ---NIL---	
DATE: 26/02/2018		R.D. MISAL, Sc.'G' For Director	PROTECTIVE FINISH - ---NIL---	
SEALED				
SCALE: NTS	EST MASS kg (Approx)	TITLE		
		TWO PIECE INSITU MOULDING FOR 120 mm FSAPDS MK-II		
DESIGN AUTHORITY	ARDE			
DRG No.	1006 13 21 01 05 000 00TA			
PART No.	DS CAT No. 4-SP			

DRG No. **1006 13 21 01 05 001 00TA**

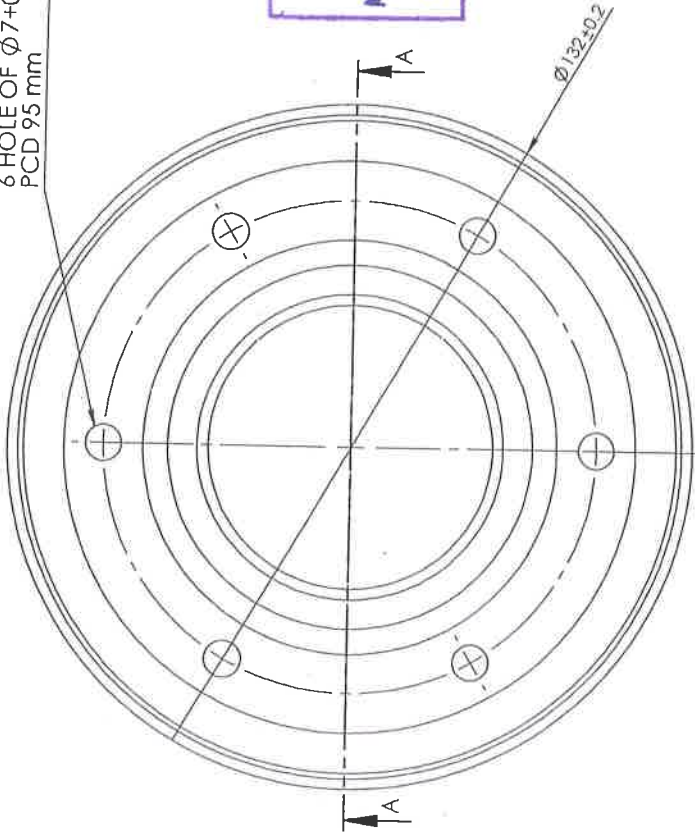
GEN TOL MEDIUM CLASS TO IS:2102

DRG CONVENTIONS CONFORM TO INDIAN STDS.
DIM IN mm UNLESS OTHERWISE STATED.

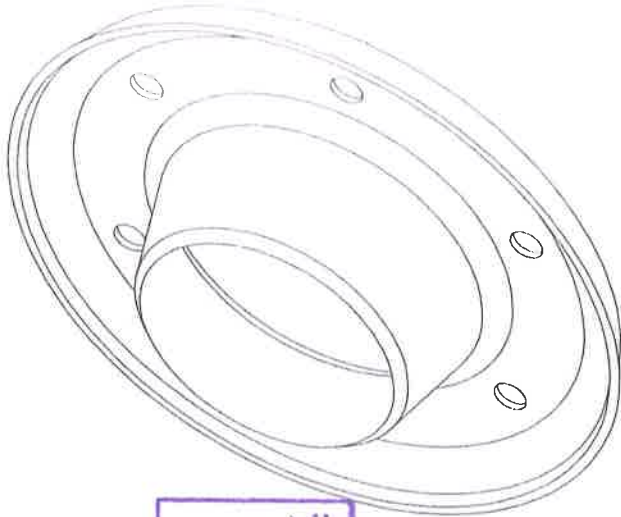
NOTE:

- REFERENCE ONLY
- MARKING TO BE MOULDED IN 3 X 0.3 mm
- DATE OF MANUFACTURE (MONTH-YEAR)
- CONTRACTORS INITIAL OR REGISTERED TRADE MARK
- LOT NO
- 1. NO BURR/FLASH MARKS
- 2. SHORE A HARDNESS 60 ± 5

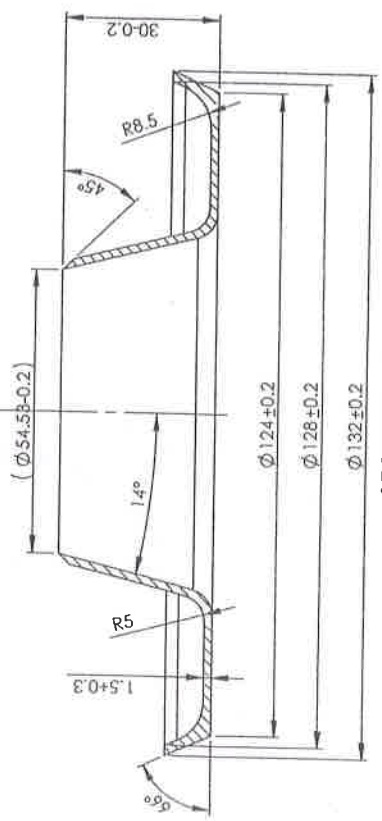
6 HOLE OF $\phi 7 \pm 0.5$ mm EQUISPACED
PCD 95 mm



ISSUED BY
STANDARD CELL
MYSNO: 180115 Df: D4/jd
K. N. Srinivas
DATE: 26/10 SIGNATURE:



CONTROLLED COPY NO.



SECTION A-A
SCALE 1:1

R No.	DATE	AUTHORITY	BRIEF RECORD	ZONE	CD
DRN	P. S. Parth Sc D	CHD R.D. Krieger, Sc E	MATERIAL:-		3.2A
APPD	DATE: 26/02/18	R. D. MISAL, Sc G For Director	SILICON RUBBER TO DTD 818 CLASS 'L-3' OR EQUIVALENT		
SEALED			PROTECTIVE FINISH:-		
SCALE: NTS	EST MASS	TITLE			
	kg (Approx)		---		
DESIGN AUTHORITY					
ARDE			LOWER RUBBER SEAL		
DRG No.	1006 13 21 01 05 001 00TA				
PART No.	DS CAT No				

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Received on
08/12/18
for
8/12