Specification No. RDEE/ENGR/SPCN/93680

FOR

ROD AVALANCHE

Research & Development Establishment (Engineers),
Dighi, Pune 411 015.
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RESTRICTED

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GOVERNMENT OF INDIA

MINISTRY OF DEFENCE

RESEARCH & DEVELOPMENT ESTABLISHMENT (ENGRS)
DIGHI, PUNE-411015

SPECIFICATION No. RDEE/ENGR/SPCN/93680

FOR

ROD AVALANCHE

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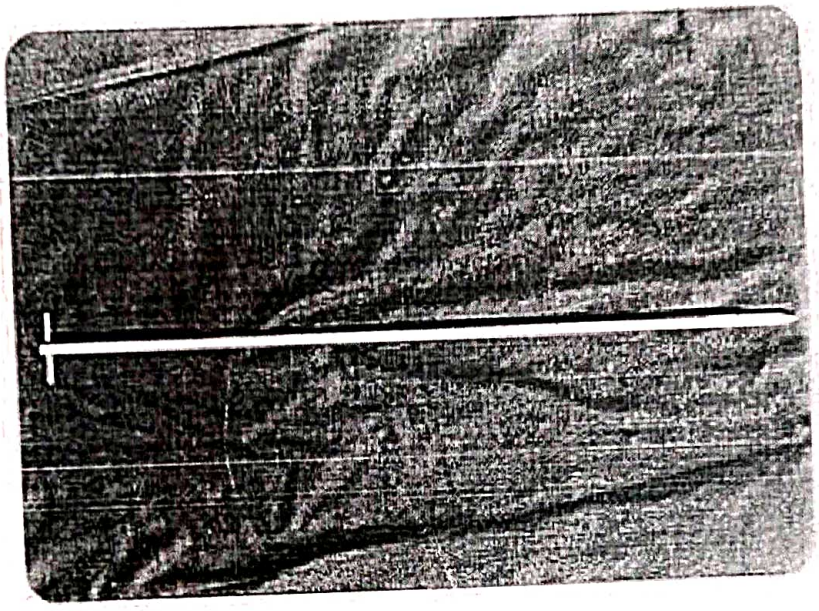


SPECIFICATION

FOR

ROD AVALANCHE

SECTION I – GENERAL

This specification and other information issued in connection therewith may be used for a particular order placed or to be placed by a competent authority. It is not to be used for any other purpose, whatsoever, without EXPRESS WRITTEN SANCTION OF THE DIRECTOR, R&DE (Engrs), Dighi, PUNE-411015.

This specification must be returned on submission of the tender/on completion of the order.

Any proposal for any change in this specification and manufacture, will be addressed to the Director, Research & Development Establishment (Engineers), Dighi, PUNE-411015. No request for any deviation will be entertained from the sub-contractor, if any, except through the main Contractor.

The inspecting authority, at his discretion check the test results obtained at manufacturer's work by independent test in the Govt. Test House or elsewhere.

SECTION SCOPE

This specification covers the materials, fabrication, manufacture, workmanship, quality control, inspection, testing and packing for Rod Avalanche.

SECTION III – DRAWINGS & SPECIFICATIONS

Drawing numbers given below pertaining to Rod Avalanche form a part of this specification. Any modifications suggested during the manufacture of pilot sample shall be incorported in base drawings with prior approval of Inspection Authority.

Drawing No.	Nomenclature
AVL-02-001	
AVL-04-002	– Top cap with handle
AVL-04-003	– Middle Tube
AVL-04-004	– Bottom cone
AVL-04-005	– Connector Male
AVL-04-006	– Connector Female
AVL-04-007	– Pin, Rivt.

2.2 Tolerances. Tolerances on dimensions of the components shall conform to medium class as per IS-2102.

2.3 All materials used in the manufacture of Avalanche Rod shall conform to the relevant Indian Standard specifications. Wherever these have not been specified relevant Defence or other specifications as mentioned shall be applicable.

2.4 The following specifications shall apply :

Indian Standards	Nomenclature
IS-733	: Specification for wrought aluminium & aluminium alloy bars, rods and section (for General Engineering Purpose)
ASTM Standard	
Vol. 3	: Stainless steel 304/316.

2.5 Copies of Indian Standard specifications referred to above may be obtained from Bureau of Indian Standards, Manek Bhavan, 9 Bahadur Shah Zafar Marg, NEW DELHI-110001.

SECTION IV - GENERAL DESCRIPTION

4.1 Rod Avalanche is used to locate victims burried under the debris of avalanche by proding. Each assembly of avalanche rod consists of six aluminium alloy tubes of 12.7 mm dia. Each assembly is 3000 mm long. The top most tube has a 'T' joint at one end for grip while the end of the last tube is of conical shape for easy penetration into snow/soft ice. The avalanche rod is supplied in dismantled condition packed in a nylon satchel. Each satchel is provided with two keys to facilitate assembly under field conditions. The maximum weight of the avalanche rod is 630 gms when packed in a satchel it weighs 665 gms.

SECTION V - MATERIALS

5.1 Componentwise the Rod Avalanche is made of the following materials :

(a) **Section Tube.** Tube in aluminium alloy 64430 as per IS-733/RDE-32/RDE-40.

(b) **Connectors Male & Female.** Round in aluminium alloy 24345/RDE-32/RDE-40 in WP condition.

(c) Handle 'T'. Round bar in aluminium alloy 24345/RDE-32/RDE-40 in WP condition.

(d) Bottom Cone. Round bar in aluminium alloy 24345/RDE-32/RDE-40 in WP condition.

(e) Keys. SS-304/316.

(f) Satchel, Nylon cloth & Velcro tape.

SECTION VI = MANUFACTURE, WORKMANSHIP & FINISH

6.1 Manufacture. Manufacture of Rod Avalanche mainly involve cutting of aluminium tubes, machining of aluminium rounds and assembling the components by rivetting. However, the contractor shall devise and adopt a suitable bulk production technique based on advanced production technology to impart better finish and cosmetic appeal to the equipment.

6.2 Toolings. The Contractor is responsible for developing and making all necessary toolings required for the manufacture of the equipment.

6.3 Workmanship & Finish. The Workmanship and finish of the equipment shall be of the highest order and at par with those of similar equipments available in the developed countries.

SECTION VII = QUALITY CONTROL

7.1 Quality control shall be exercised by adopting the procedure enumerated below :

(a) Visual Examination for Quality Finish. The surface finish vis-a-vis the cosmetic appearance shall be checked with aesthetic sense.

(b) Uniformity of Length. Use of proper jigs and fixtures ensure uniformity of lengths of the segments. Subsequent use of proper inspection gauges assure acceptance of correct segment.

(c) Joining of Segments. Straightness in tapping and proper centring for threading during machining operations only ensure perfect matching of male and female components at the joints. Any flow in this process will resultin misalignment of the complete assembly. Use of proper jigs and fixtures therefore shall be ensured at the time of manufacture.

(d) Test for Straightness of the assembly. All the section tubes/segments of the Rod Avalanche shall be joined and the straightness of the assembled length shall be checked by placing entire length on an even surface on the floor. This aspect may even be checked by placing the complete Rod Avalanche on the table of a planing machine if it is available in the Contractor's premises.

SECTION VIII = INSPECTION

8.1 It shall be open to the Government representative to inspect the components of Rod Avalanche at any stage of manufacture, namely :

(a) Pre-inspection stage

(b) Production stage

(c) Stage of preparations for delivery.

The manufacturer shall provide all facilities, free of charges, for carrying out inspection.

8.2 No part of the work shall be repaired or rectified without the approval of the Inspecting Authority.

8.3 The Contractor shall afford, at his own expenses, the Inspecting Officer of reasonable accommodation and inspection and testing facilities for satisfying himself that the stores are being or have been manufactured in accordance with the specification and for this purpose the Inspector shall have full and free access at any time during the contract to the Contractor's work and may require the Contractor to make arrangement for anything pertaining to this contract, to be inspected at his premises or any other connected place and the Contractor shall arrange similar facilities at his ownexpense as regard any sub-contract he may make.

8.4 The Contractor shall pay all the costs connected with such tests and any other tests covered under quality control provision and provide without any extra charges, all materials, tools, gauges, labour and assistance, other than special or independent tests which he shall require to be made on Contractor's premises and shall pay all costs attendant thereon, failing these facilities (in regard to which the inspector shall be sole judge) at his own premises for making the tests, the Contractor shall bear the cost of carrying out such tests elsewhere.

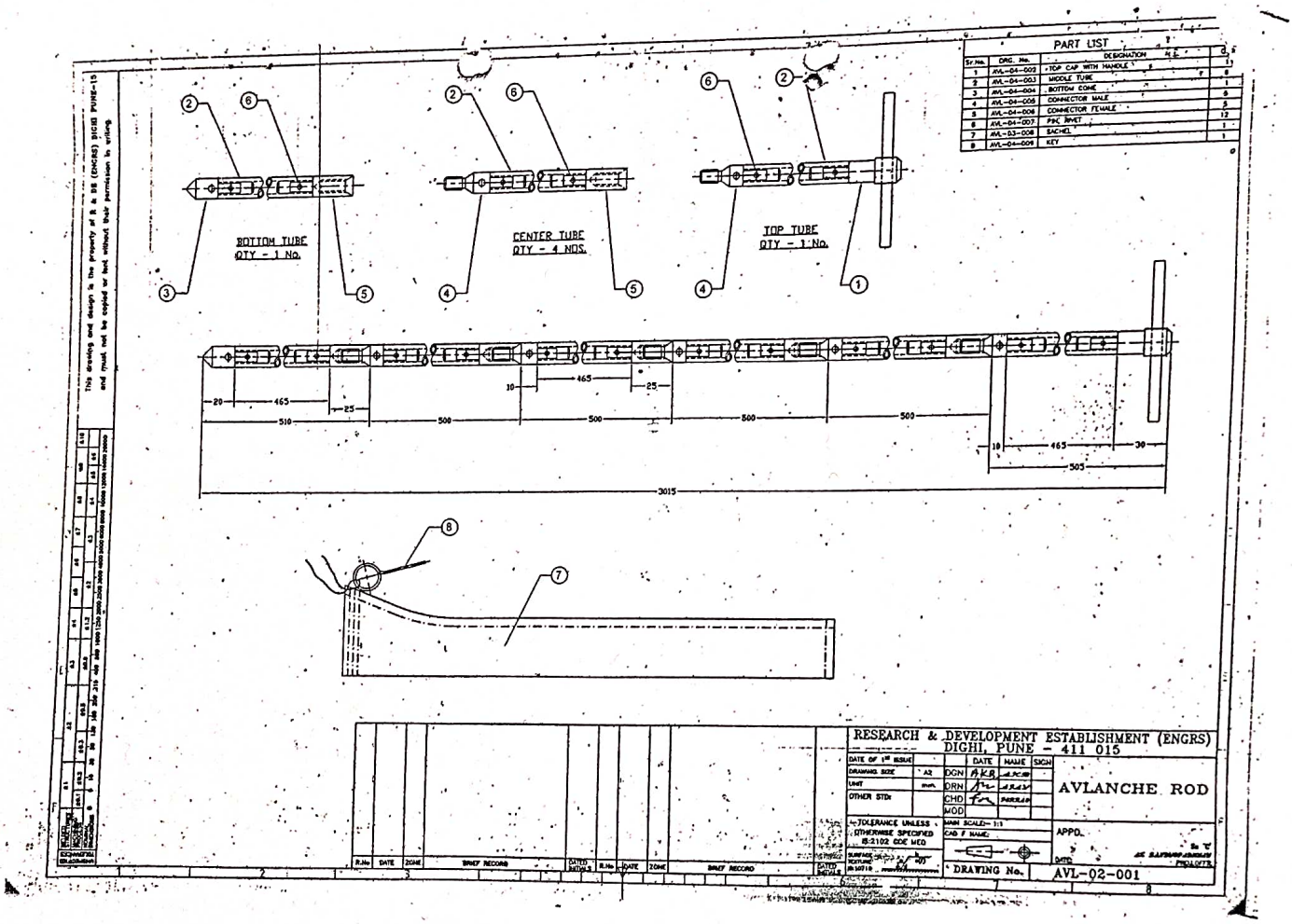
SECTION IX - PACKING & IDENTIFICATION

9.1 Identification. The satchel containing the Rod Avalanche shall be legibly and indelibly stamped/marked at a suitable place with the manufacturer's name, recognised trade mark and the year of manufacture.

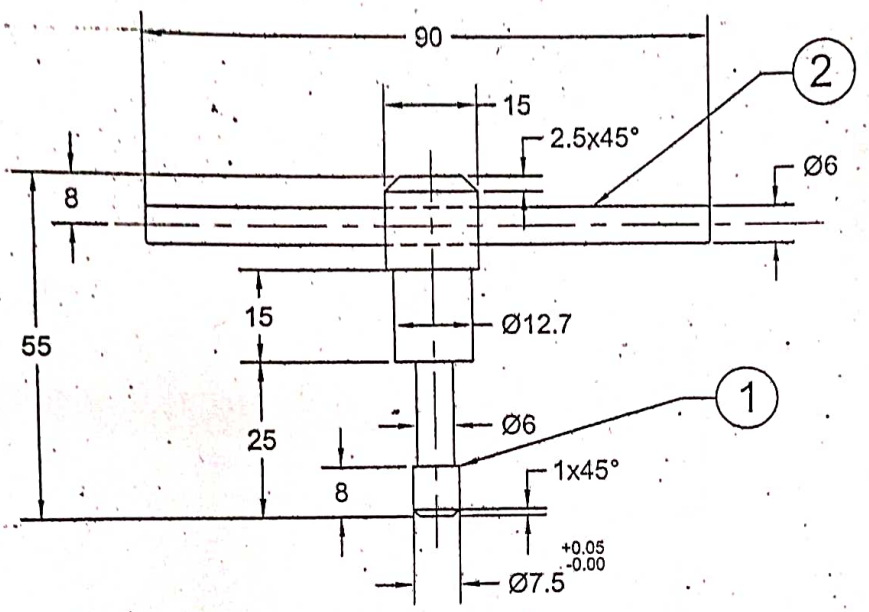
9.2 Packaging. Ten numbers of Rod Avalanche in their satchel shall be packed in a wooden case of suitable size. Suffic[illegible] thermocole may be used in the packing to prevent any damage to the Rod Avalanche in transportation.

9.3 Identification of Packages. Each wooden case shall have the reference of the contract particulars, date of manufacture, lot number and total weight painted /stamped legibly on it. Also each bulk package shall have the details giving the following information :

a) Manufacturer's Name
b) Description of material
c) Weight of consignment
d) Any other particulars required by the inspecting authority.


PART LIST
Sr.No. | DRG. No. | DESIGNATION | M.S. | Q.
1 | AVL-04-002 | TOP CAP WITH HANDLE | 1
2 | AVL-04-003 | MIDDLE TUBE | 1
3 | AVL-04-004 | BOTTOM CONE | 1
4 | AVL-04-005 | CONNECTOR MALE | 6
5 | AVL-04-006 | CONNECTOR FEMALE | 5
6 | AVL-04-007 | PRC RIVET | 12
7 | AVL-03-008 | SACHEL | 1
8 | AVL-04-009 | KEY | 1
BOTTOM TUBE QTY - 1 NO.
CENTER TUBE QTY - 4 NOS.
TOP TUBE QTY - 1 No.
20
465
25
510
500
10
465
25
500
500
500
10
465
30
505
3015
RESEARCH & DEVELOPMENT ESTABLISHMENT (ENGRS)
DIGHI, PUNE - 411 015
AVLANCHE ROD
DRAWING No. AVL-02-001

Sr.No.	DESIGNATION	SIZE
1	AL. ALLOY ROD ø15 24345 WP	55 Lg.
2	AL.ALLOY ROD ø6 24345 WP	90 Lg.



UNSPECIFIED TOLERANCES — WELDED STRUCTURES — MACHINING PROCESS — NOMINAL DIMENSIONS

RESEARCH & DEVELOPMENT ESTABLISHMENT (ENGRS) DIGHI, PUNE – 411 015

			DATE	NAME	SIGN
DATE OF 1ST ISSUE					
DRAWING SIZE	A4	DGN	AKB	AKB	
UNIT	mm.	DRN	AJAY	AJAY	
OTHER STD.		CHD	FERRAO	FERRAO	
		MOD			

TOP CAP WITH HANDLE

TOLERANCE UNLESS OTHERWISE SPECIFIED IS:2102 GDE MED

MAIN SCALE:– 1:1

CAD F NAME;

APPD.

Sc 'C'

AX BANDYOPADHYAY

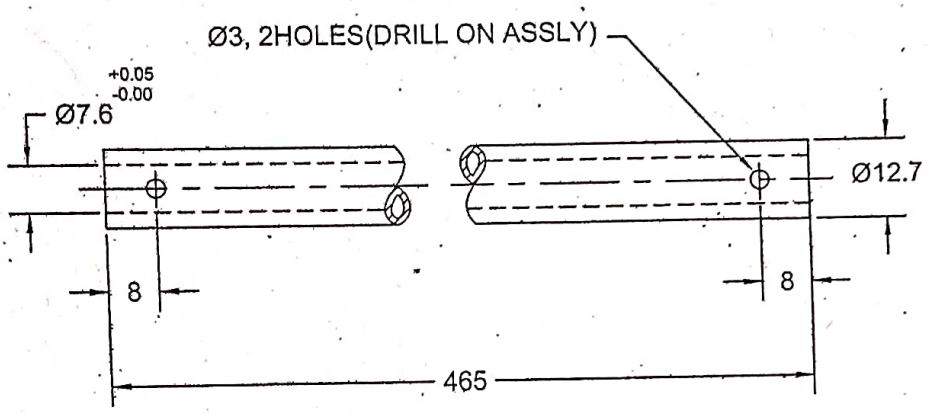
PROJ.OFFR

DATE:

SURFACE TEXTURE IS:10719

DRAWING No. AVL-04-002

Sr.No.	DESIGNATION	SIZE
1	AL. ALLOY TUBE ø12.7, 2.55 THK 64430 WP	470



UNSPECIFIED TOLERANCES
WELDED STRUCTURES
MACHINING PROCESS
NOMINAL DIMENSIONS

RESEARCH & DEVELOPMENT ESTABLISHMENT (ENGRS) DIGHI, PUNE – 411 015

			DATE	NAME	SIGN
DATE OF 1ST ISSUE					
DRAWING SIZE	A4	DGN	AKB	AKB	
UNIT	mm.	DRN		AJAY	
OTHER STD:		CHD		ISRRAO	
		MOD			

MIDDLE TUBE

TOLERANCE UNLESS OTHERWISE SPECIFIED IS:2102 GDE MED

MAIN SCALE:– 1:1

CAD-F NAME:

APPD.

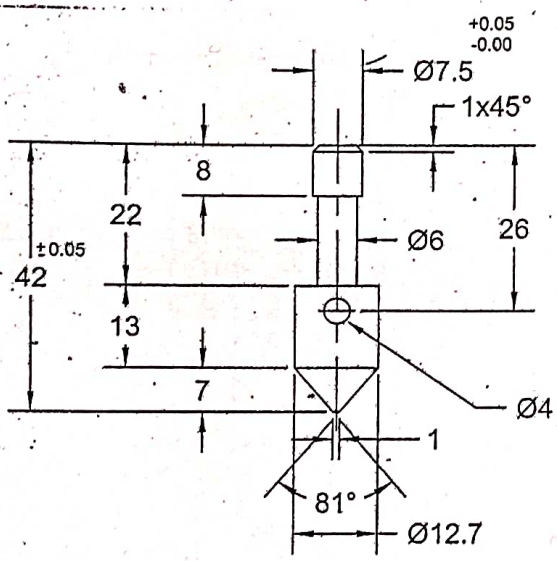
Sc 'C'
AK RANDYOPADHYAY
PROJ.OFFR

DATE:

SURFACE TEXTURE IS:10719

DRAWING No. AVL–04–003

Sr.No.	DESIGNATION	SIZE
1	AL. ALLOY ROD Ø15 24345 WP	45 Lg.



UNSPECIFIED TOLERANCES	WELDED STRUCTURES	MACHINING PROCESS	NOMINAL DIMENSIONS
±10			20000
±9		±6	16000
		±5	12000
±8		±4	10000
			8000
±7		±3	6000
			5000
±6			4000
		±2	3500
±5			2500
			2000
±4		±1.2	1250
			1000
±3		±0.8	500
			400
			315
		±0.5	250
			180
±2			120
		±0.3	50
			30
±1		±0.2	18
			6
		±0.1	0

RESEARCH & DEVELOPMENT ESTABLISHMENT (ENGRS) DIGHI, PUNE – 411 015

			DATE	NAME	SIGN
DATE OF 1ST ISSUE					
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UNIT	mm.	DRN	[illegible]	AJAY	
OTHER STD:		CHD	[illegible]	FERRAO	
		MOD			

BOTTOM CONE

TOLERANCE UNLESS OTHERWISE SPECIFIED IS:2102 CDE MED

MAIN SCALE:– 1:1

CAD F. NAME:

APPD.

Sc 'C'

AX BANDYOPADHYAY

PROJ.OFFR.

DATE:

SURFACE TEXTURE IS:10719

DRAWING No. AVL-04-004

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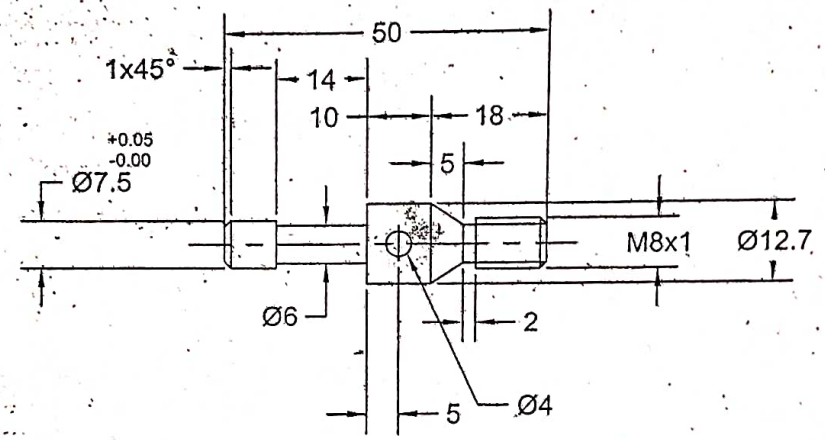


UNSPECIFIED TOLERANCES: WELDED STRUCTURES ±2, MACHINING PROGRESS ±0.3, NOMINAL DIMENSIONS ±0.2 ±0.1 ±1 ±0.5 ±0.8 ±1.2 ±4 ±2.5 ±3 ±6 ±7 ±4 ±5 ±6 ±9 ±10

RESEARCH & DEVELOPMENT ESTABLISHMENT (ENGRS) DIGHI, PUNE – 411 015

			DATE	NAME	SIGN
DATE OF 1ST ISSUE					
DRAWING SIZE	A4	DGN	A.K.B.	AKB	
UNIT	mm.	DRN	[illegible]	AJAY	
OTHER STD:		CHD	[illegible]	FERRAO	
		MOD			

CONNECTOR MALE

TOLERANCE UNLESS OTHERWISE SPECIFIED IS:2102-GDF-MED

MAIN SCALE:– 1:1

CAD F NAME:

APPD.

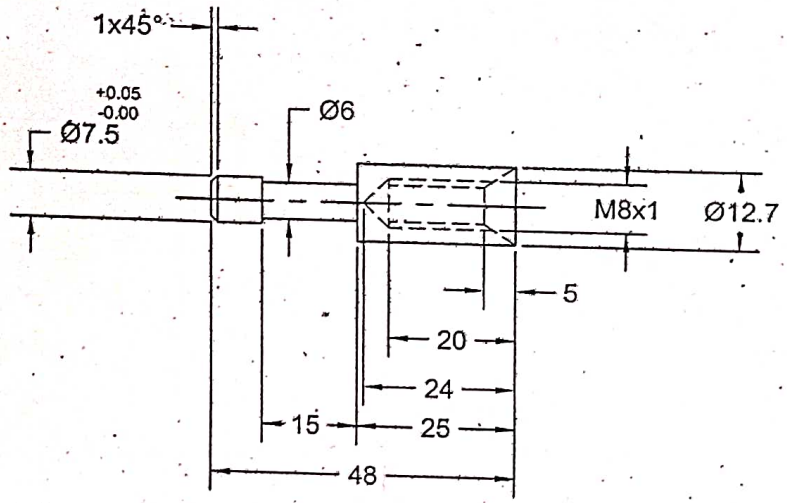
Sc 'C'
AK BANDYOPADHYAY
PROJ.OFFR.

DATE:

SURFACE TEXTURE IS:10719

DRAWING No. AVL-04-005

Sr.No.	DESIGNATION	SIZE
1	AL. ALLOY ROD ø15 24345 WP	50 Lg.



UNSPECIFIED TOLERANCES
WELDED STRUCTURES ±2
MACHINING PROCESS ±0.5
NOMINAL DIMENSIONS ±0.2

RESEARCH & DEVELOPMENT ESTABLISHMENT (ENGRS) DIGHI, PUNE – 411 015

			DATE	NAME	SIGN
DATE OF 1ST ISSUE					
DRAWING SIZE	A4	DGN	AKB	AKB	
UNIT	mm.	DRN	Ajay	AJAY	
OTHER STD:		CHD	Ferrao	FERRAO	
		MOD			

CONNECTOR FEMALE

TOLERANCE UNLESS OTHERWISE SPECIFIED IS:2102 GDE MED

MAIN SCALE:- 1:1

CAD F NAME:

APPD.

Sc 'C'
AK BANDYOPADHYAY
PROJ.OFFR

SURFACE TEXTURE IS:10719

DATE:

DRAWING No. AVL-04-006

Sr.No.	DESIGNATION	SIZE
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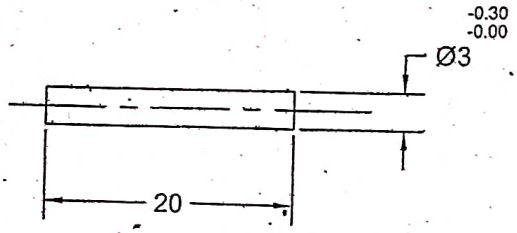


UNSPECIFIED TOLERANCES
WELDED STRUCTURES
MACHINING PROCESS
NOMINAL DIMENSIONS

RESEARCH & DEVELOPMENT ESTABLISHMENT (ENGRS)
DIGHI, PUNE – 411 015

			DATE	NAME	SIGN
DATE OF 1ST ISSUE					
DRAWING SIZE	A4	DGN	A.K.B	AKB	
UNIT	mm.	DRN	[illegible]	AJAY	
OTHER STD:		CHD	[illegible]	[illegible]	
		MOD			

PIN, RIVET

TOLERANCE UNLESS OTHERWISE SPECIFIED IS:2102 GDE MED

MAIN SCALE:– 1:1

CAD F NAME:

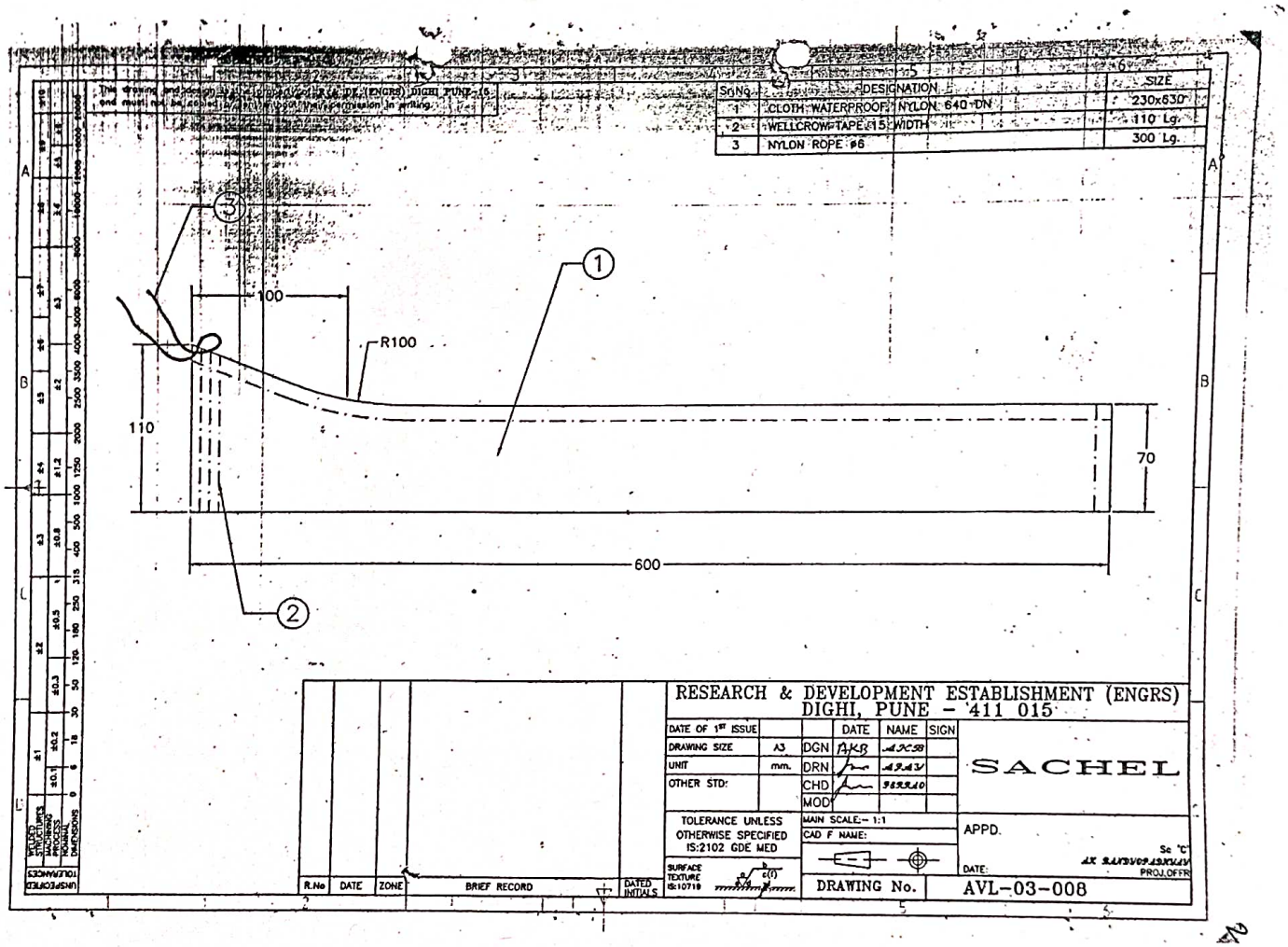
SURFACE TEXTURE IS:10719

APPD.

DATE:

Sc 'C'
AX RANDVOPADHYAY
PROJ.OFFR.

DRAWING No. AVL-04-007



Sr.No.	DESIGNATION	SIZE
1	CLOTH WATERPROOF NYLON 640 DN	230x630
2	WELLCROW TAPE @15 WIDTH	110 Lg.
3	NYLON ROPE Ø6	300 Lg.

RESEARCH & DEVELOPMENT ESTABLISHMENT (ENGRS)
DIGHI, PUNE - 411 015

DATE OF 1ST ISSUE			DATE	NAME	SIGN
DRAWING SIZE	A3	DGN	AKB	AKB	
UNIT	mm.	DRN		AKB	
OTHER STD:		CHD		BBBAD	
		MOD			

SACHEL

TOLERANCE UNLESS OTHERWISE SPECIFIED IS:2102 GDE MED

MAIN SCALE:- 1:1

CAD F NAME:

APPD.

DATE:

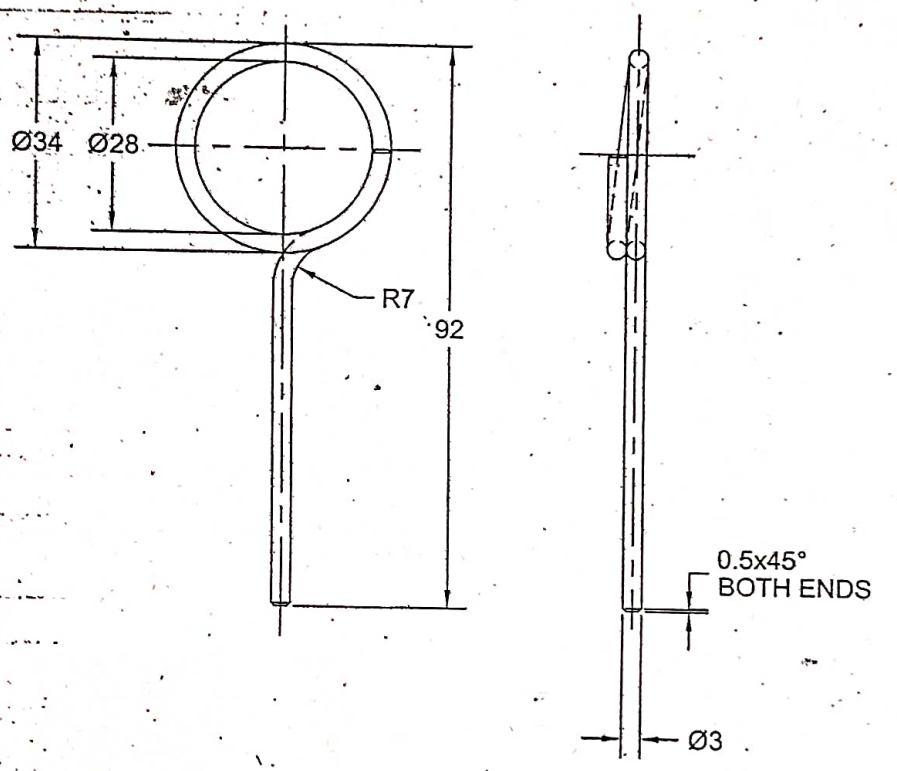
PROJ.OFFR

SURFACE TEXTURE IS:10719

DRAWING No. AVL-03-008

R.No	DATE	ZONE	BRIEF RECORD	DATED INITIALS

Sr.No.	DESIGNATION	SIZE
1	S.S. 304 ø3	195 Lg.



RESEARCH & DEVELOPMENT ESTABLISHMENT (ENGRS)
DIGHI, PUNE – 411 015

			DATE	NAME	SIGN
DATE OF 1ST ISSUE					
DRAWING SIZE	A4	DGN	AKB	AKB	
UNIT	mm.	DRN		AJAY	
OTHER STD:		CHD		GORRAO	
		MOD			

TOLERANCE UNLESS OTHERWISE SPECIFIED IS:2102-GDE-MED

SURFACE TEXTURE IS:10719

MAIN SCALE:– 1:1

CAD F NAME:

APPD.

Sc 'C'
AK RANDYOPADHYAY
PROJ.OFFR.

DATE:

DRAWING No. AVL-04-009