

Government of India
Bhabha Atomic Research Centre
Electromagnetic Applications & Instrumentations Division

Ref : EmA&ID/ERS/2021/ P-13897

Mod Labs., Trombay.

Date : 12 /11/2021

Sub : Minor Fabrication - Invitation of Quotation.

Item/ Works: Fabrication & Supply of all Mechanical subassemblies of He-MSLD (Helium Mass Spectrometer Leak Detector) as per the annexure-1 and the drawings attached.

Qty. - 4 sets.

Dear Sir,

1. Quotations are invited for the job as per the enclosed drawings and specifications.
2. Bidder shall quote for fabrication of these components with material and without material.
3. Taxes and excise duties shall be quoted separately. Form 'AF' shall be provided where necessary.
4. The quotations must reach **Head, EmA&ID** by **24/11/2021** and must be sent in a sealed envelope super-scribed with the above reference number and due date given above. (by speed post)
5. The address on the envelope should read : **The Head, EmA&ID , Physics Group, Mod Labs., Bhabha Atomic Research Centre, Trombay, Mumbai - 85, Attention: RAVISANKAR, SO/H, MDAS/ EmA&ID, BARC**
6. The bidder shall have to take an insurance policy against any material issued to him by the purchaser.
7. The fabrication work shall be subject to inspection by our engineers at bidder's works. Necessary inspection facilities should be provided to our engineers during fabrication at bidder's premises.
8. The bidder shall deliver the finished components after approval by our engineer within **16 weeks** from the date the firm work order is issued to the bidder. The finished components and the scrap from the free issue material shall be delivered by the bidder **G-86, EmA&ID, Mod Labs, B. A. R. C, Trombay, Mumbai - 85.**
9. Head, **EmA&ID**, PG, B A R C., reserves the right to accept /reject any or all quotations without assigning any reason.
10. GST and PAN numbers are compulsory.

Encl: ANNEXURE-1 & DRAWINGS covering technical specifications



RAVISANKAR.E , SO/H

HEAD, MDAS, EmA&ID

BARC

रविशंकर ई. / Ravisankar E.
अध्यक्ष, एम.ए.आइ.डी. / Head, MDAS
ई.एस.ए.ए.डी. / EmA & ID, BARC
भारत सरकार / Government of India
ट्रॉम्बे, मुंबई / Trombay, Mumbai - 400 085.

Annexure-1

Item/Works:-

Fabrication & Supply of all Mechanical subassemblies He-MSLD (Helium Mass Spectrometer Leak Detector) as per the annexure-1 and the drawings attached.

Qty: 4 Sets.

Technical Specifications:

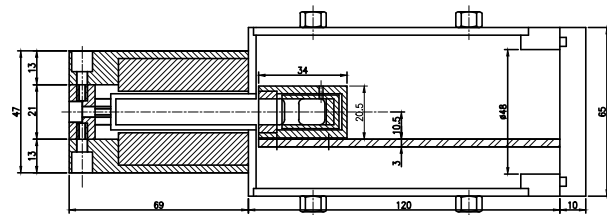
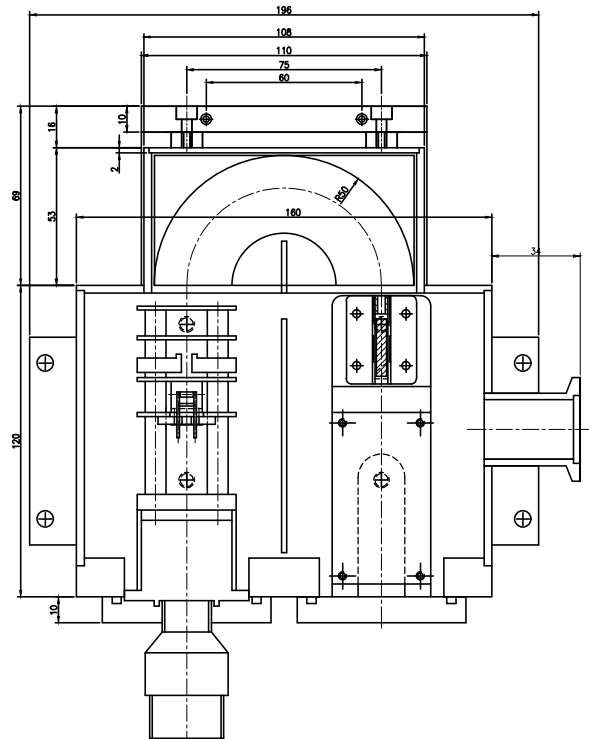
Each of the total assembly consists of the following items assembled and leak tested.

Scope of work include 5 meter length standard **sniffer probe** capable of a detection sensitivity of 1×10^{-7} Torr litter per second, one piece per set.

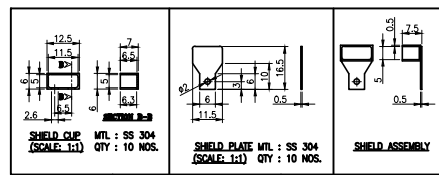
Scope of work also include total assembly, alignment and vacuum leak testing as per given specifications.

- Ion source assembly set (500 V) as per drawing No.LD-3/6/21(1of 4)
- 10 PIN Ceramic-Metal Seal (700V) with connectors (for ion source electric connections should be welded to source flange)
 - Current: 4.8 A or more
 - Conductor diameter: 0.062" (1.55mm)
 - Conductor Material: Alumal
 - Make: Solid seal technology , P/n: FA10656 (UK)
- Faraday cup collector/Chanel Electron Multiplier set/MCP (for taking out put signals, BNC/D-Type connector are welded to collector flange)
 - Weldable BNC CONNECTOR 500V, 3 A, Single pin
 - Conductor : stainless steel. (UHV compatible)
 - D – Connector, 500 V, 5A, 15 pin, gold flashed.
 - Weldable type, UHV compatible.
 - (All these connectors are welded and leak tested on flanges as per drawing)
- Vacuum envelops (UHV compatible) with integral flight tube
- Material S.S 304 L
- Ion optics with 180 degree deflection
- Miniaturized Electromagnetic Valves (6 nos. for each set)
- Analyzer magnet with holders
- Vacuum manifold should be Leak tested (UHV compatible)
- Leak rate better than 5×10^{-9} Torr litter per second
- Material body : Aluminum (for vacuum manifold)
- Vacuum manifold as per drawing LD-04/9/21
- Support systems for fixing manifold with studs.
- Solenoid Valves 24 V DC , 20 W, 0-16 bar Pressure/Vacuum
- Support systems as per drawing
- Powder coated heavy duty Trolley
- Spring loaded arrangement for Pump to make vibration free
- Trolley will be fixed on Rubber/Teflon coated heavy duty wheels 4nos. (2 with brakes, 3 inch dia and 1 inch width)

As per the attached drawings enclosed with this tender specifications.



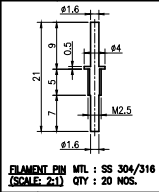
ASSEMBLY OF MAGNET & CUP



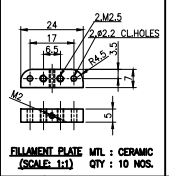
SHIELD CUP
MTL : SS 304
QTY : 10 NOS.

SHIELD PLATE
MTL : SS 304
QTY : 10 NOS.

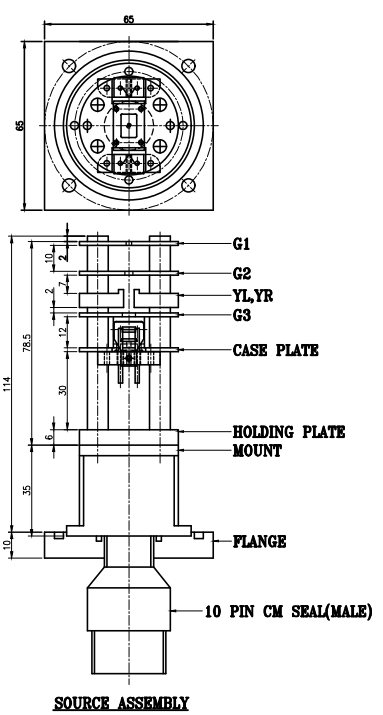
SHIELD ASSEMBLY



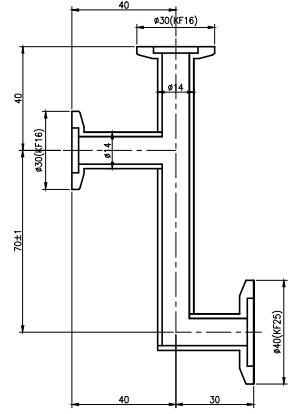
FILAMENT PIN
MTL : SS 304/316
(SCALE: 2:1) QTY : 20 NOS.



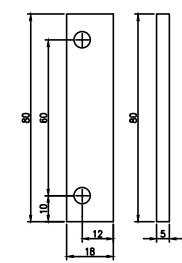
FILAMENT PLATE
MTL : CERAMIC
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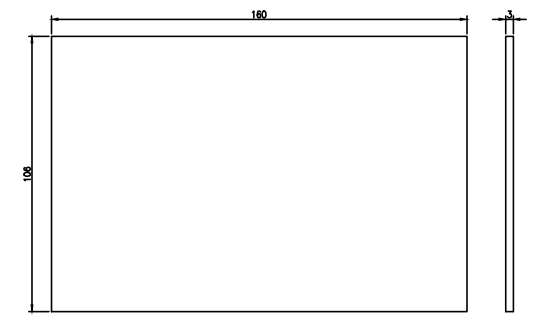
SOURCE ASSEMBLY



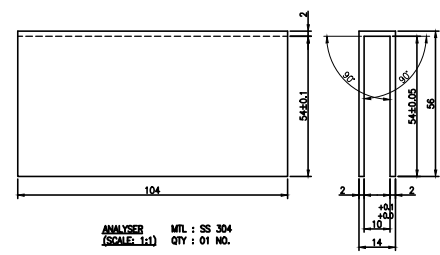
CAPLING
MTL : SS 304
(SCALE: 1:1) QTY : 01 NO.



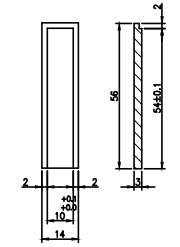
CLAMPING PLATE
MTL : SS 304
(SCALE: 1:1) QTY : 02 NOS.



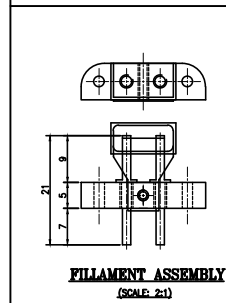
TOP & BOTTOM PLATE
MTL : SS 304
(SCALE: 1:1) QTY : 02 NOS.



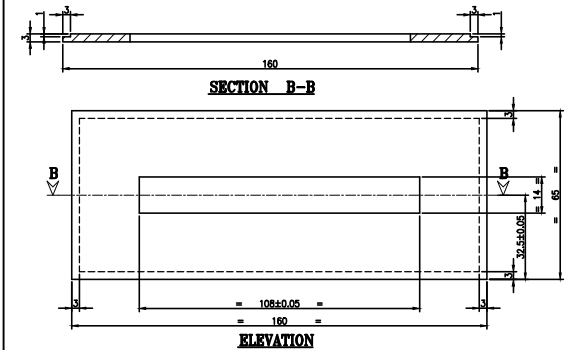
ANALYSER
MTL : SS 304
(SCALE: 1:1) QTY : 01 NO.



ANALYSER SIDE PLATE
MTL : SS 304
(SCALE: 1:1) QTY : 02 NOS.



FILAMENT ASSEMBLY
(SCALE: 2:1)



SECTION B-B

ELEVATION

BACK PLATE
MTL : SS 304
(SCALE: 1:1) QTY : 01 NO.

NOTES :-
01 ALL WELDED JOINTS ARE TO BE ARGON ARC (TIG TYPE) & SHOULD BE LEAK TIGHT BETTER THAN 10⁻⁴ STD. CC/SEC.
02 SEALING SURFACES OF CONFLAT FLANGES SHOULD BE PROTECTED FROM SCRATCHES.
03 THE ORIENTATION OF HOLES OF THE FLANGES SHOULD BE AS SHOWN IN ASSEMBLY.
04 ALL THE ABOVE PARTS SHOULD BE MADE BY EDM WIRE CUT METHOD ONLY.

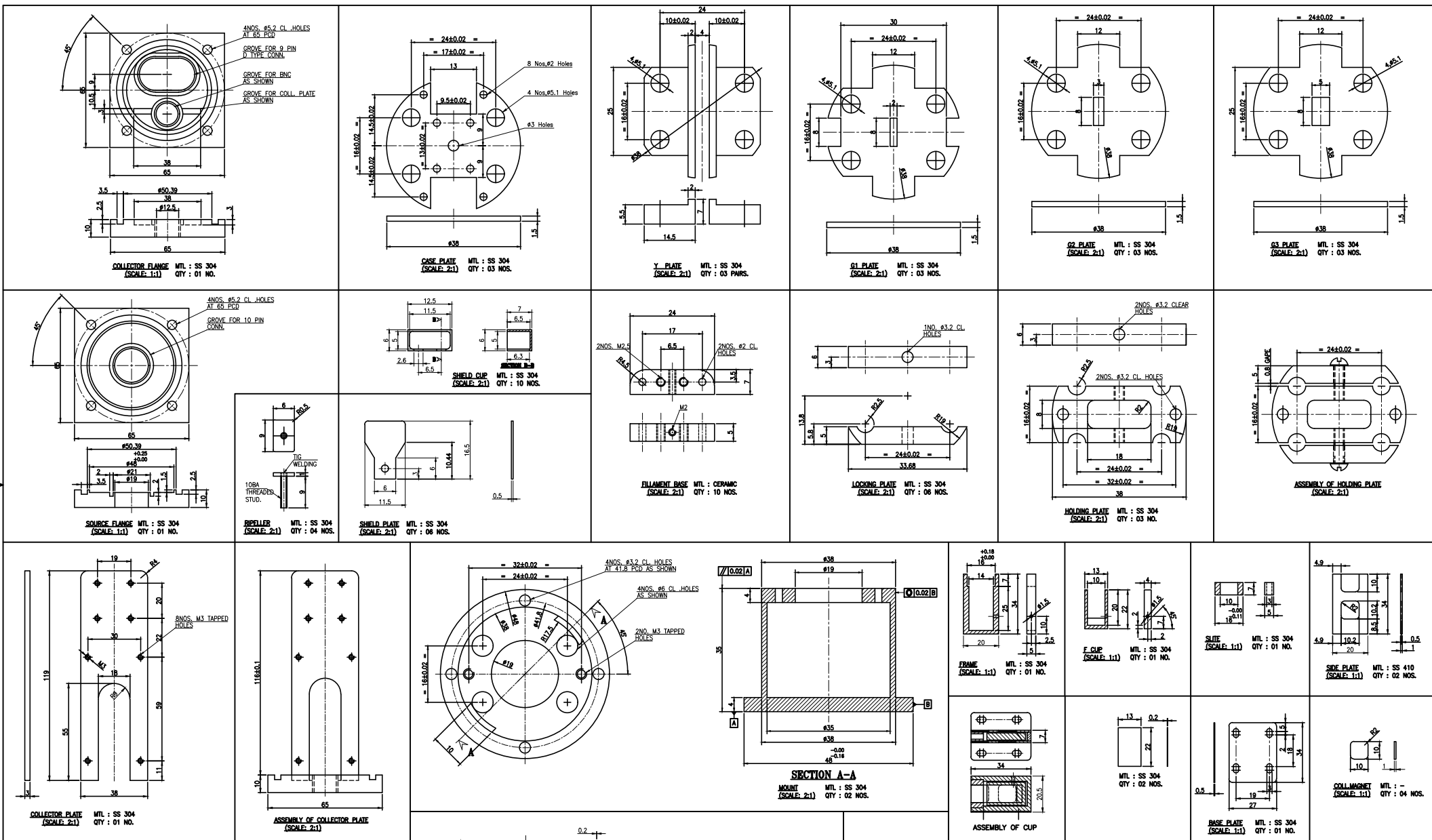
GENERAL TOLERANCE UNLESS OTHERWISE SPECIFIED SHOULD CONFORM TO IS 2102 VIZ: (MEDIUM CLASS)		
LINEAR DIMENSIONS	LENGTH OF SHORTER SIDE OF ANGLE	SURFACE FINISH IN MICRONS 3.15/CLA
UP TO 6 ±0.1	1 - 6 ± 1'	CHAMFER 1 x 45'
6 - 30 ±0.2	6 - 30 ± 0'-30'	
30 - 120 ±0.3	30 - 120 ± 0'-20'	
120 - 315 ±0.5	120 - 400 ± 0'-10'	
315 - 1000 ±0.8		
1000 - 2000 ±1.2		
2000 - 4000 ±2.0		
4000 & ABOVE ±3.0		

NOTES:-
1. IF IN DOUBT ASK.
2. ALL DIMENSIONS ARE IN MILLIMETRES.
3. REMOVE SHARP CORNERS AND BURRS.

PROJECT OR SECTION		TITLE:	
LD		INTERNAL ASSEMBLY & DETAILS OF LD	
DR'N : A.M.KORI	DATE : 18/06/2021	APP'D : R.K.BHATIA	
DRG. CHK'D : E.RAVISANKAR	DATE : 18/06/2021	SHEET No. : 01 OF 04 SHEETS	
DES'D : E.RAVISANKAR	DES CHK'D : R.K.BHATIA	SCALE : 1:1 & AS STATED	
GOVERNMENT OF INDIA		PROJECTION:	
BHABHA ATOMIC RESEARCH CENTRE		DRG. No.	
EnAMD		REV. 0	
		LD-03/06/21	

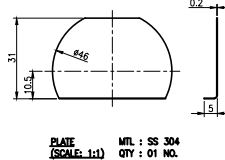
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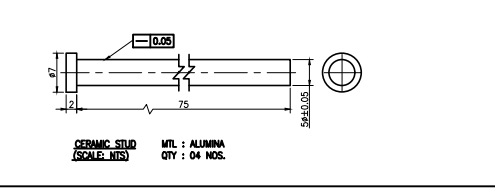
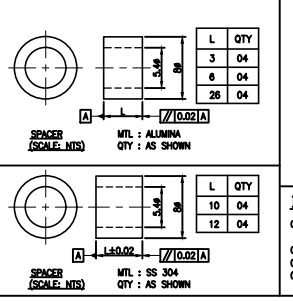
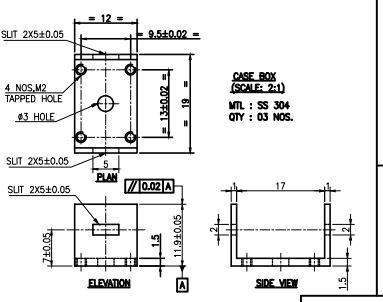
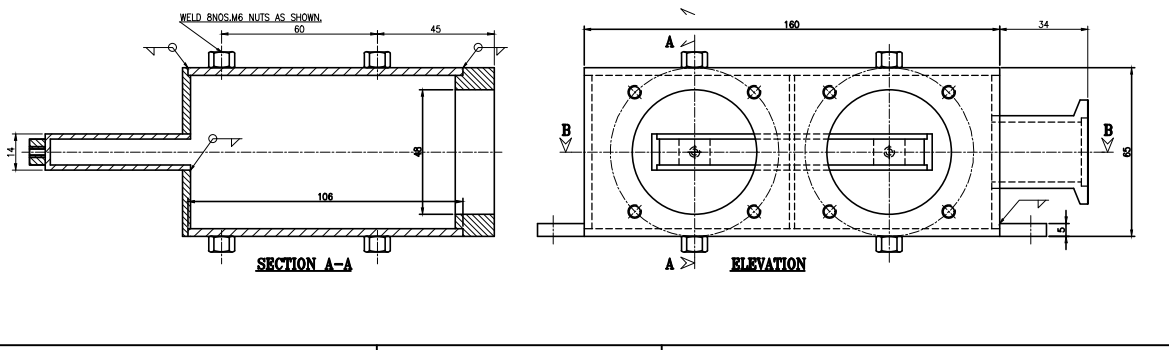
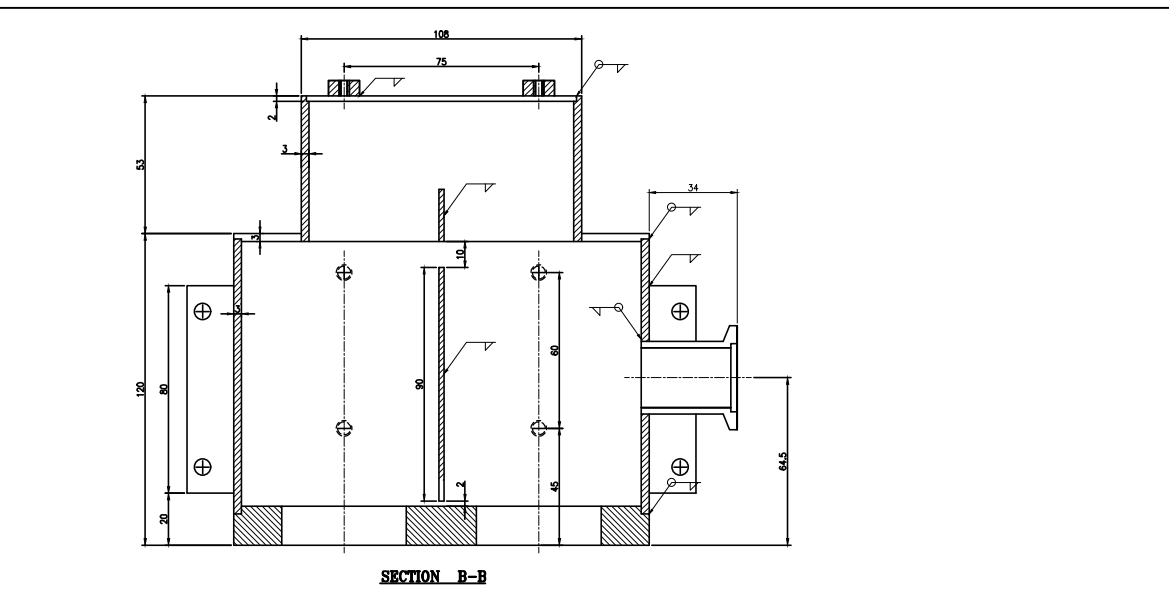
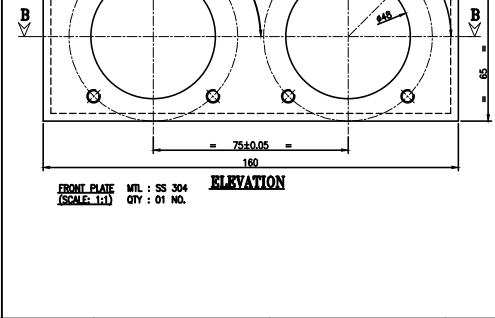
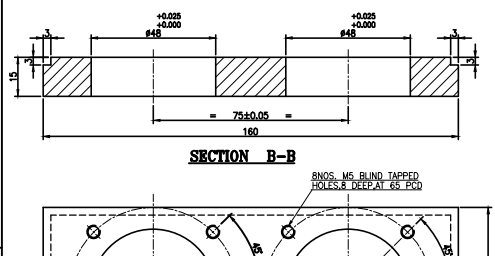
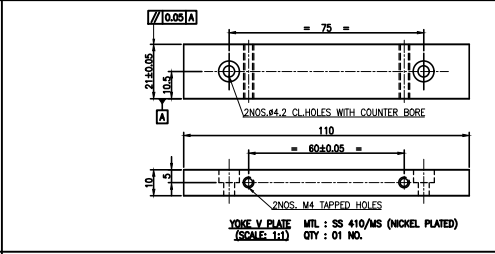
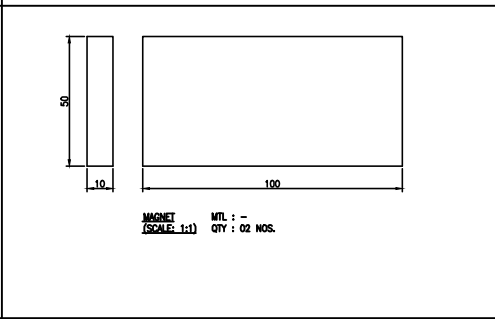
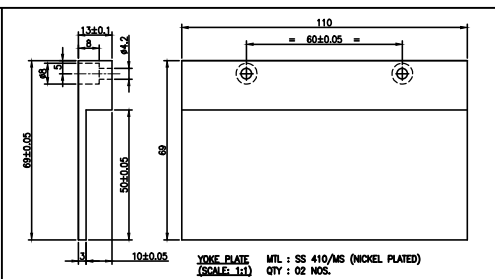
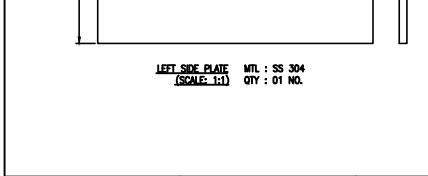
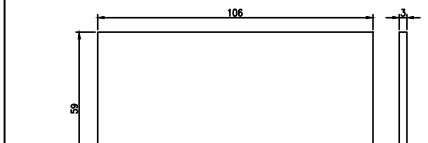
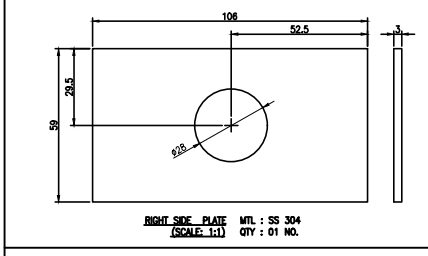
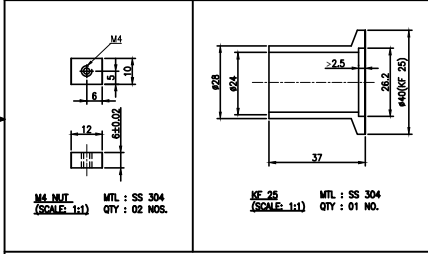
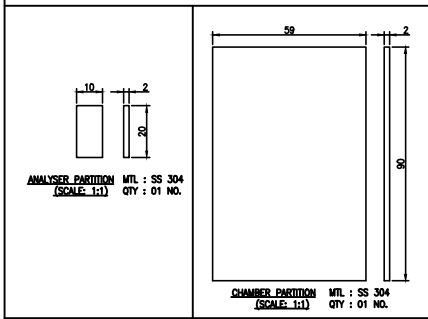
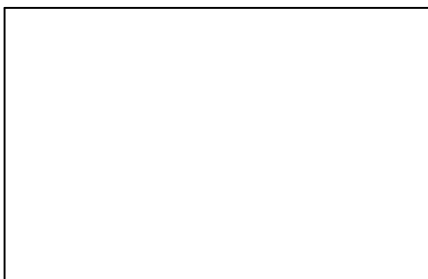
LINEAR DIMENSIONS	LENGTH OF SHORTER SIDE OF ANGLE	SURFACE FINISH IN MICRONS 3.15/CLA
UP TO 6 ±0.1	1 - 30	MTL : SS 304
6 - 30 ±0.2	30 - 120 ± 0'-20'	QTY : 01 NO.
30 - 120 ±0.3	120 - 400 ± 0'-10'	CHAMFER 1 x 45°
120 - 315 ±0.5		
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NOTES:-
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PROJECT OR SECTION		TITLE:	
LD		INTERNAL ASSEMBLY & DETAILS OF LD	
DR'N : A.M.KORI	DATE : 18/06/2021	APP'D : R.K.BHATIA	
DRG. CHK'D : E.RAVISANKAR	DATE : 18/06/2021	SHEET No. : 02 OF 04 SHEETS	
DES'D : E.RAVISANKAR	DES CHK'D : R.K.BHATIA	SCALE : 1:1 & AS STATED	
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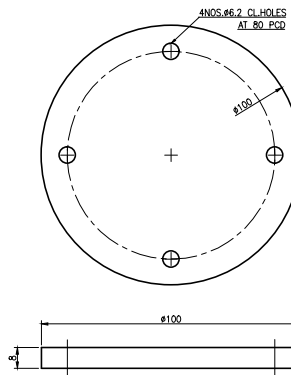
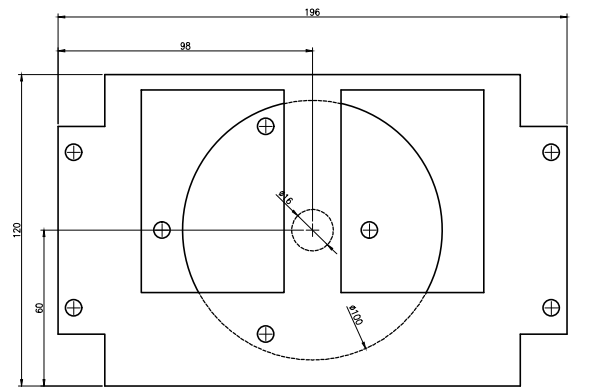
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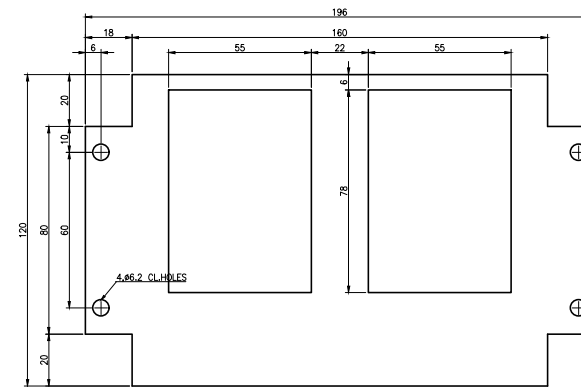
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03 THE ORIENTATION OF HOLES OF THE FLANGES SHOULD BE AS SHOWN IN ASSEMBLY.
04 ALL THE ABOVE PARTS SHOULD BE MADE BY EDM WIRE CUT METHOD ONLY.

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DR'N : A.M.KORI	DATE : 18/06/2021	APP'D : R.K.BHATA	
DRG. CHK'D : E.RAVISANKAR	DATE : 18/06/2021	SHEET No. : 03 OF 04 SHEETS	
DES'D : E.RAVISANKAR	DES CHK'D : R.K.BHATA	SCALE : 1:1 & AS STATED	
GOVERNMENT OF INDIA		PROJECTION:	
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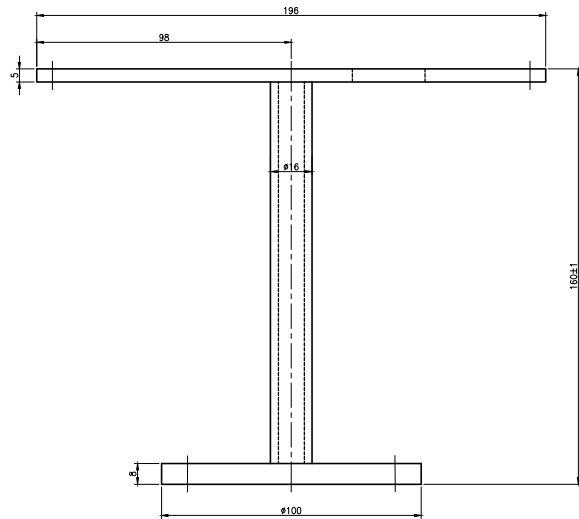
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BASE PLATE MTL : SS 304
 (SCALE: 1:1) QTY : 01 NO.



TOP PLATE MTL : SS 304
 (SCALE: 1:1) QTY : 01 NO.



SYSTEM SUPPORT
 (SCALE: 1:1)

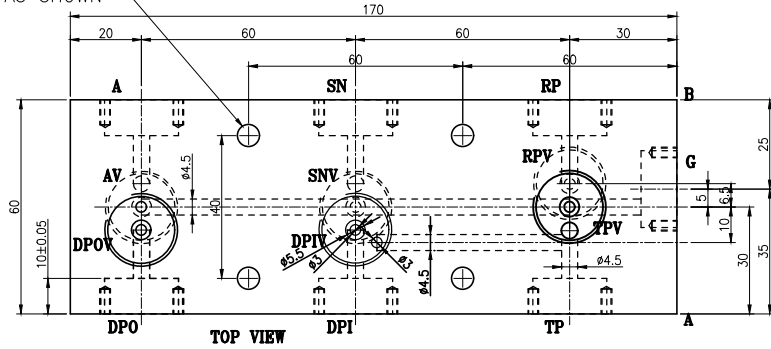
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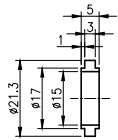
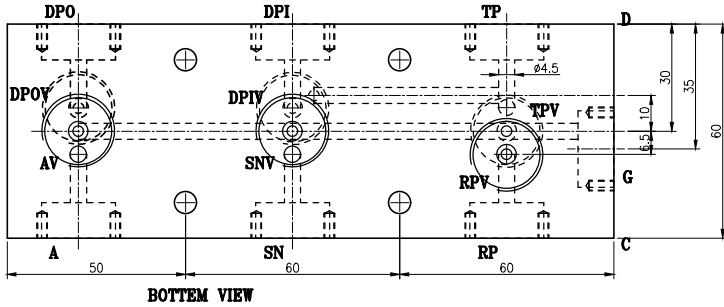
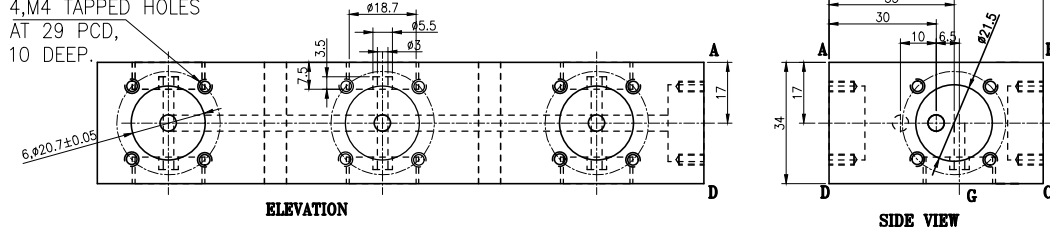
GENERAL TOLERANCE UNLESS OTHERWISE SPECIFIED SHOULD CONFORM TO IS 2102 VIZ: (MEDIUM CLASS)		PROJECT OR SECTION	TITLE:																									
		LD	INTERNAL ASSEMBLY & DETAILS OF LD																									
<table border="1"> <thead> <tr> <th>LINEAR DIMENSIONS</th> <th>LENGTH OF SHORTER SIDE OF ANGLE</th> <th>SURFACE FINISH IN MICRONS 3.15/CLA</th> </tr> </thead> <tbody> <tr> <td>UP TO 6 ±0.1</td> <td>1 - 6 ± 1'</td> <td rowspan="4">CHAMFER 1 x 45'</td> </tr> <tr> <td>6 - 30 ±0.2</td> <td>6 - 30 ± 0'-30'</td> </tr> <tr> <td>30 - 120 ±0.3</td> <td>30 - 120 ± 0'-20'</td> </tr> <tr> <td>120 - 315 ±0.5</td> <td>120 - 400 ± 0'-10'</td> </tr> <tr> <td>315 - 1000 ±0.8</td> <td></td> <td></td> </tr> <tr> <td>1000 - 2000 ±1.2</td> <td></td> <td></td> </tr> <tr> <td>2000 - 4000 ±2.0</td> <td></td> <td></td> </tr> <tr> <td>4000 & ABOVE ±3.0</td> <td></td> <td></td> </tr> </tbody> </table>		LINEAR DIMENSIONS	LENGTH OF SHORTER SIDE OF ANGLE	SURFACE FINISH IN MICRONS 3.15/CLA	UP TO 6 ±0.1	1 - 6 ± 1'	CHAMFER 1 x 45'	6 - 30 ±0.2	6 - 30 ± 0'-30'	30 - 120 ±0.3	30 - 120 ± 0'-20'	120 - 315 ±0.5	120 - 400 ± 0'-10'	315 - 1000 ±0.8			1000 - 2000 ±1.2			2000 - 4000 ±2.0			4000 & ABOVE ±3.0			DR'N : A.M.KORI	DATE : 18/06/2021	APP'D : R.K.BHATIA
LINEAR DIMENSIONS	LENGTH OF SHORTER SIDE OF ANGLE	SURFACE FINISH IN MICRONS 3.15/CLA																										
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		DES'D : E.RAVISANKAR	DES CHK'D : R.K.BHATIA	SCALE : 1:1 & AS STATED																								
		GOVERNMENT OF INDIA BHABHA ATOMIC RESEARCH CENTRE En&MD		PROJECTION: DRG. No. LD-03/06/21 REV. 0																								

A B C D E F G H I J K L

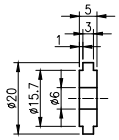
4, $\phi 6.2$ CL. HOLES
AS SHOWN



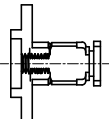
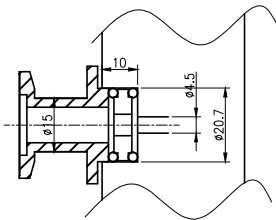
4, M4 TAPPED HOLES
AT 29 PCD,
10 DEEP.



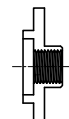
CENTER RING
MTL : TEFLON
QTY : 01 NO.
(SCALE: 1:1)



CENTER RING
MTL : TEFLON
QTY : 06 NOS.
(SCALE: 1:1)

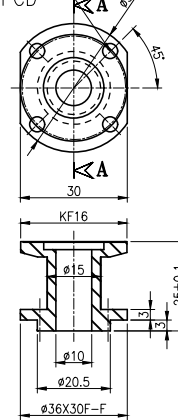


SNIFFER
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QTY : 01 NO.
(SCALE: 1:1)



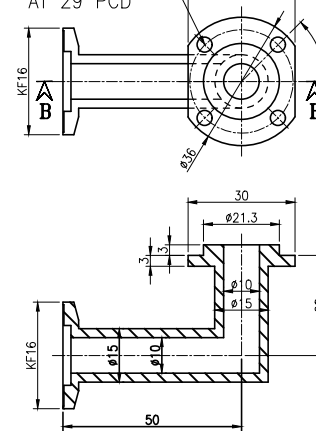
AIR INLET
MTL : SS 304
QTY : 01 NO.
(SCALE: 1:1)

4, $\phi 4.2$ CL. HOLES
AT 29 PCD



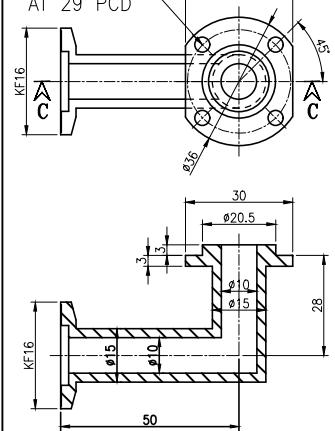
DETAIL A-A
KF16
MTL : SS 304
QTY : 02 NOS.
(SCALE: 1:1)

4, $\phi 4.2$ CL. HOLES
AT 29 PCD

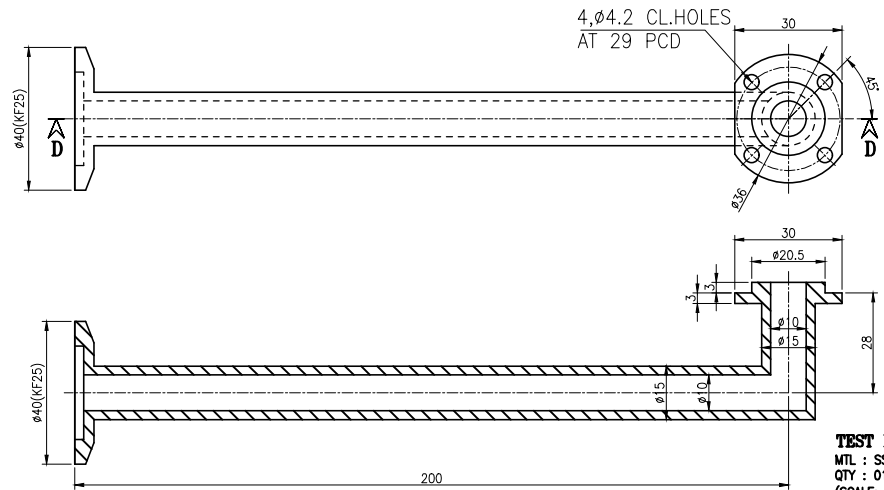


DETAIL B-B
G COUPLING
MTL : SS 304
QTY : 01 NO.
(SCALE: 1:1)

4, $\phi 4.2$ CL. HOLES
AT 29 PCD



DETAIL C-C
RP COUPLING
MTL : SS 304
QTY : 01 NO.
(SCALE: 1:1)



TEST POST
MTL : SS 304
QTY : 01 NO.
(SCALE: 1:1)

DETAIL D-D

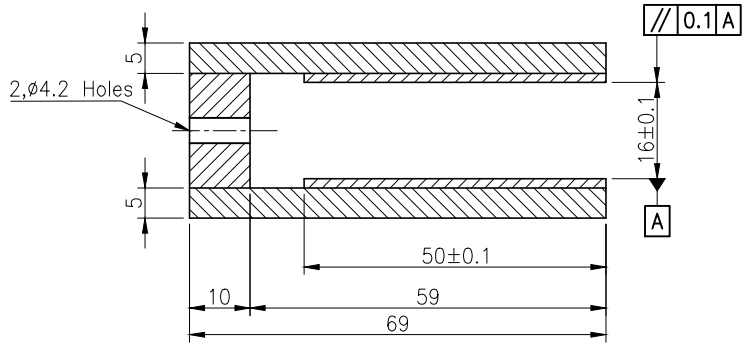
GENERAL TOLERANCE UNLESS OTHERWISE SPECIFIED SHOULD CONFORM TO IS 2102 VIZ: (MEDIUM CLASS)

LINEAR DIMENSIONS	LENGTH OF SHORTER SIDE OF ANGLE	SURFACE FINISH IN MICRONS 3.15/CLA
UP TO 6 ± 0.1	1 - 6 $\pm 1'$	CHAMFER 1 x 45'
6 - 30 ± 0.2	6 - 30 $\pm 0'-30'$	
30 - 120 ± 0.3	30 - 120 $\pm 0'-20'$	
120 - 315 ± 0.5	120 - 400 $\pm 0'-10'$	
315 - 1000 ± 0.8		
1000 - 2000 ± 1.2		
2000 - 4000 ± 2.0		
4000 & ABOVE ± 3.0		

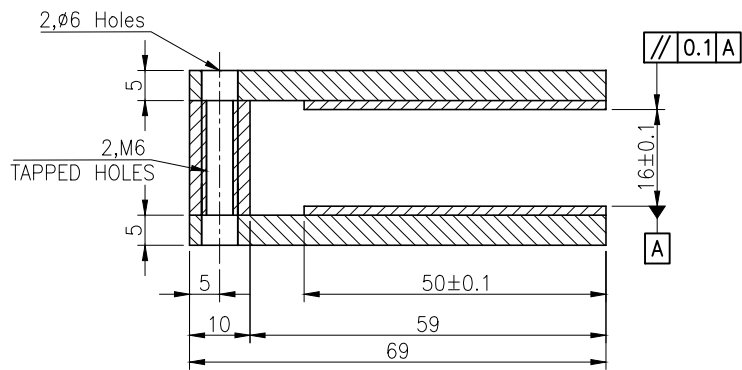
NOTES:-
1. IF IN DOUBT ASK.
2. ALL DIMENSIONS ARE IN MILLIMETRES.
3. REMOVE SHARP CORNERS AND BURRS.

PROJECT OR SECTION	TITLE:
LD	MANIFOLD ASSEMBLY & DETAILS FOR LD
DRN' : A.M.KORI	DATE : 09/09/2021
DRG. CHK'D : E.RAVISANKAR	DATE : 09/09/2021
DES'D : E.RAVISANKAR	DES CHK'D : R.K.BHATIA
GOVERNMENT OF INDIA BHABHA ATOMIC RESEARCH CENTRE EnABD	
APP'D : R.K.BHATIA	SHEET No. : 01 OF 03 SHEETS
SCALE : 1:1 & AS STATED	PROJECTION:
LD-04/9/21	REV. 0

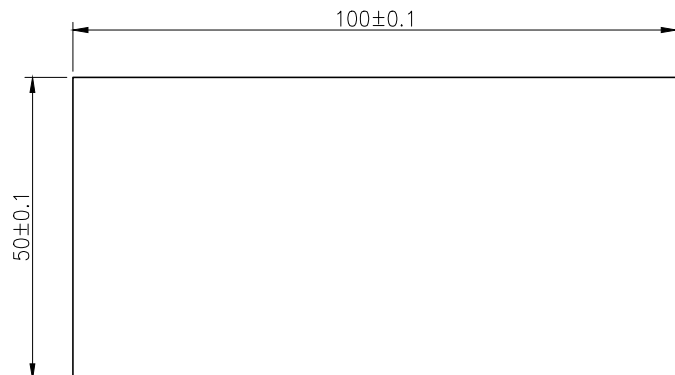
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SECTION A-A

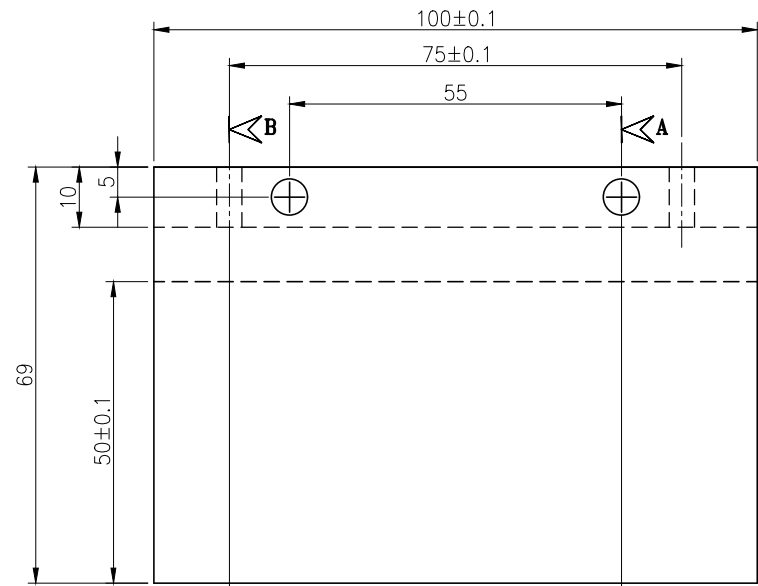


SECTION B-B

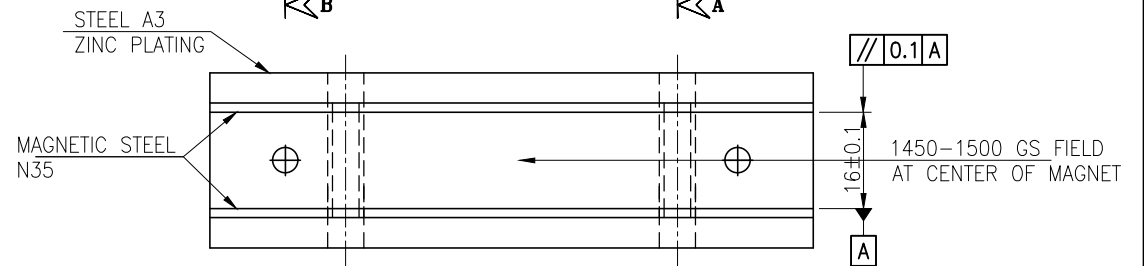


MAGNET

MTL : MAGNETIC STEEL N35
QTY : 02 NOS.



PLAN

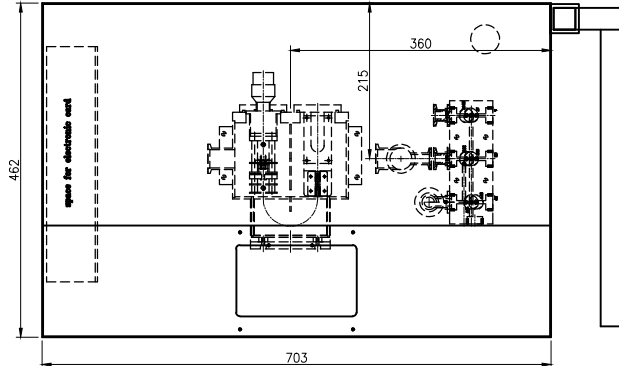


ELEVATION

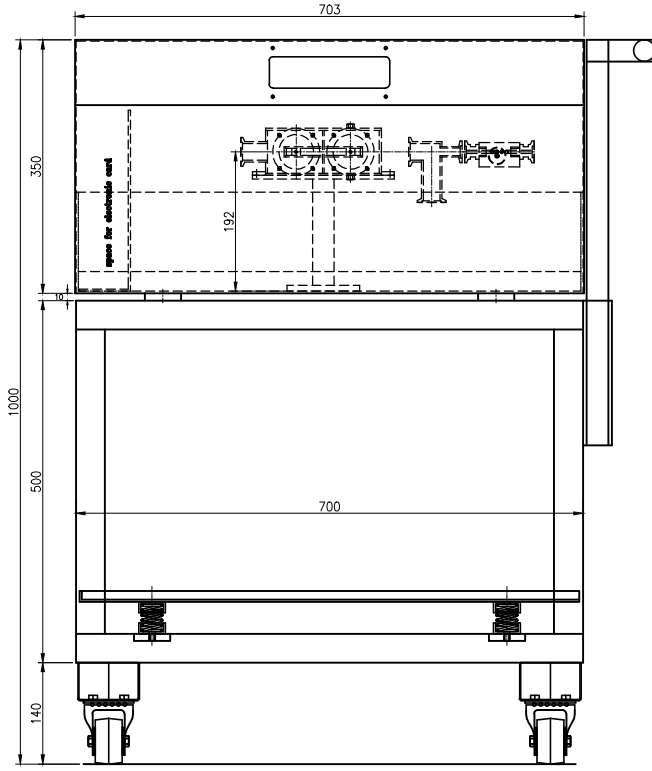
MTL : STEEL A3, Zn-PLATING

NOTE :- 1450 TO 1500 GAUSS

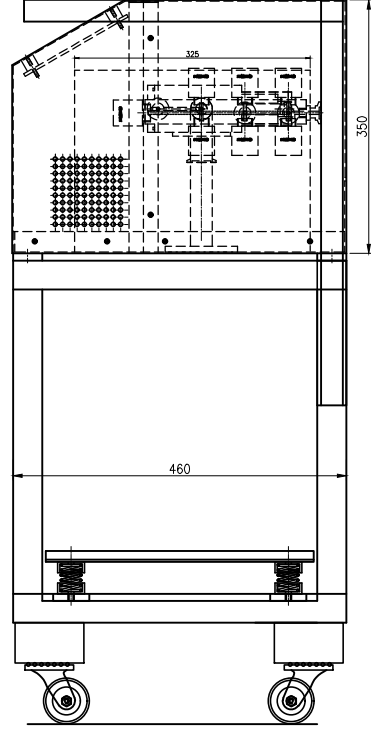
GENERAL TOLERANCE UNLESS OTHERWISE SPECIFIED SHOULD CONFORM TO IS 2102 VIZ: (MEDIUM CLASS)			PROJECT OR SECTION		TITLE	
			LD		PERMANENT MAGNET ASSEMBLY	
LINEAR DIMENSIONS			LENGTH OF SHORTER SIDE OF ANGLE		SURFACE FINISH IN MICRONS 3.15/CLA	
UP TO	6 ± 0.1	1 - 6 ± 1'			CHAMFER 1 x 45°	
6 -	30 ± 0.2	6 - 30 ± 0'-30'				
30 -	120 ± 0.3	30 - 120 ± 0'-20'				
120 -	315 ± 0.5	120 - 400 ± 0'-10'				
315 -	1000 ± 0.8					
1000 -	2000 ± 1.2					
2000 -	4000 ± 2.0					
4000 & ABOVE	± 3.0					
NOTES:-			GOVERNMENT OF INDIA			
1. IF IN DOUBT ASK.			BHABHA ATOMIC RESEARCH CENTRE			
2. ALL DIMENSIONS ARE IN MILLIMETRES.			EmA&ID			
3. REMOVE SHARP CORNERS AND BURRS.			PROJECTION:		DRG. No.	
			LD		LD-04/06/21	
			SCALE : 1:1		REV.	
			APP'D : R.K.BHATIA		0	
			SHEET No.: 01 OF 01			
			DATE : 22/06/2021			
			DRG. CHK'D : E.RAVISANKAR			
			DES'D : E.RAVISANKAR			
			DATE : 22/06/2021			
			DES' CHK'D : E.RAVISANKAR			



PLAN



ELEVATION

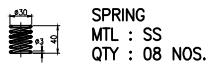
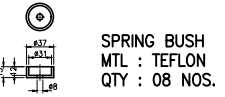
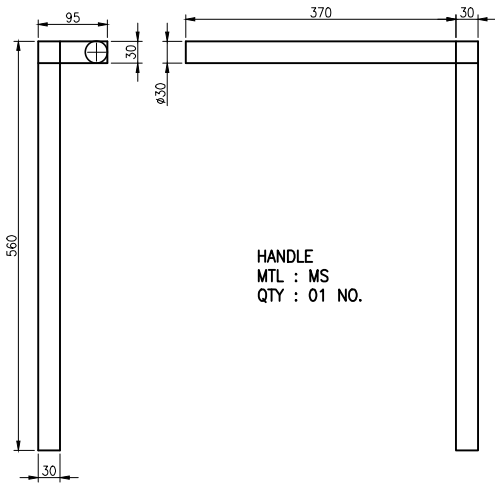
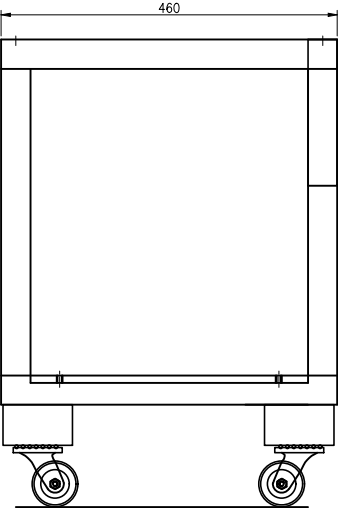
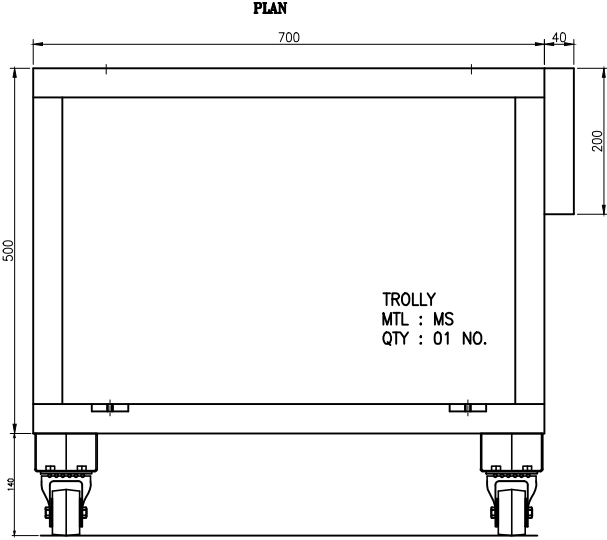
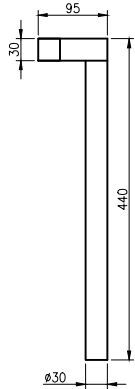
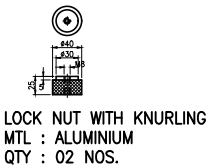
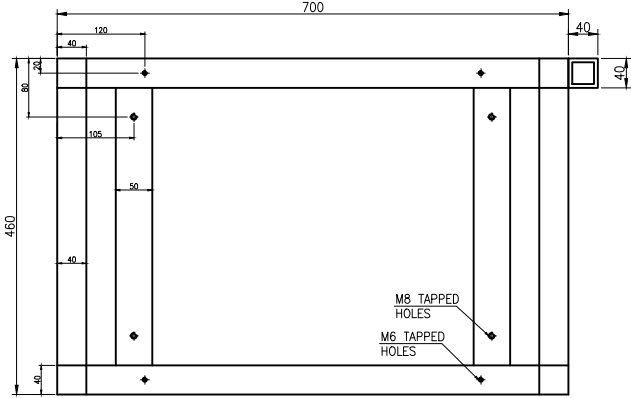
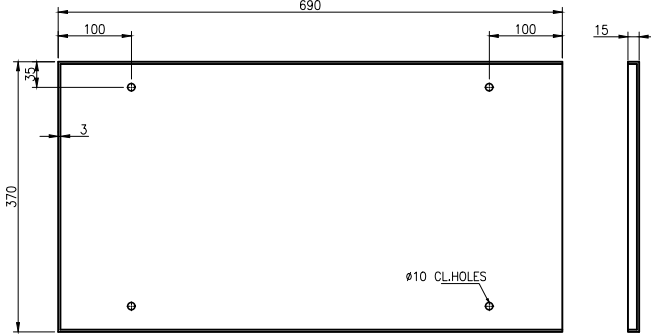
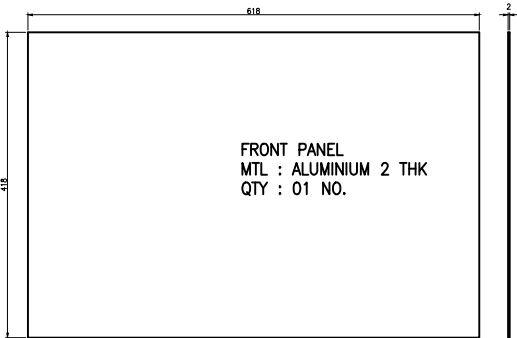


SIDE VIEW

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GENERAL TOLERANCE UNLESS OTHERWISE SPECIFIED SHOULD CONFORM TO IS 2102 VIZ: (MEDIUM CLASS)		
LINEAR DIMENSIONS	LENGTH OF SHORTER SIDE OF ANGLE	SURFACE FINISH IN MICRONS 3.18/CLA
UP TO 6 ±0.1	1 - 6 ± 1°	CHAMFER 1 x 45°
6 - 30 ±0.2	6 - 30 ± 0°-30'	
30 - 120 ±0.3	30 - 120 ± 0°-20'	
120 - 315 ±0.5	120 - 400 ± 0°-10'	
315 - 1000 ±0.8		
1000 - 2000 ±1.2	NOTES:-	
2000 - 4000 ±2.0	1. IF IN DOUBT ASK.	
4000 & ABOVE ±3.0	2. ALL DIMENSIONS ARE IN MILLIMETRES.	
	3. REMOVE SHARP CORNERS AND BURRS.	

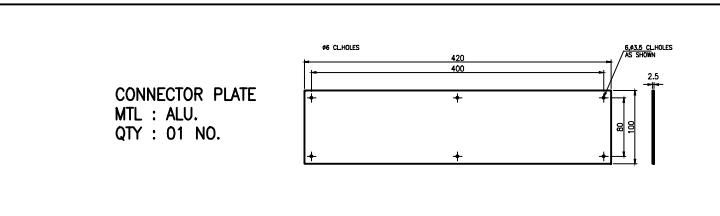
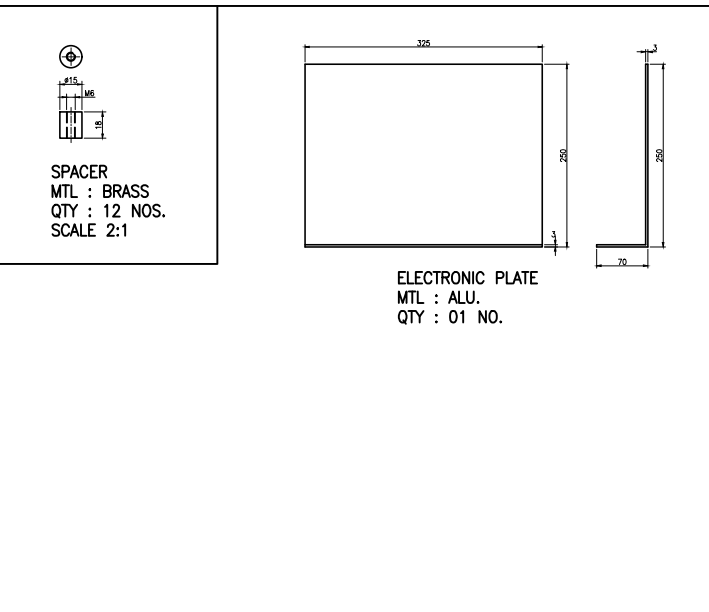
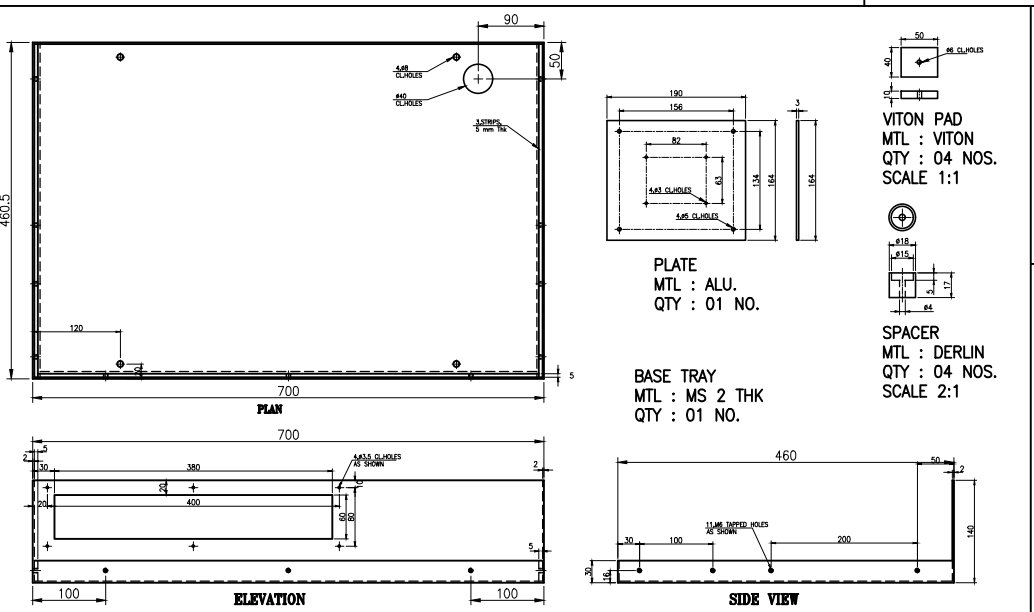
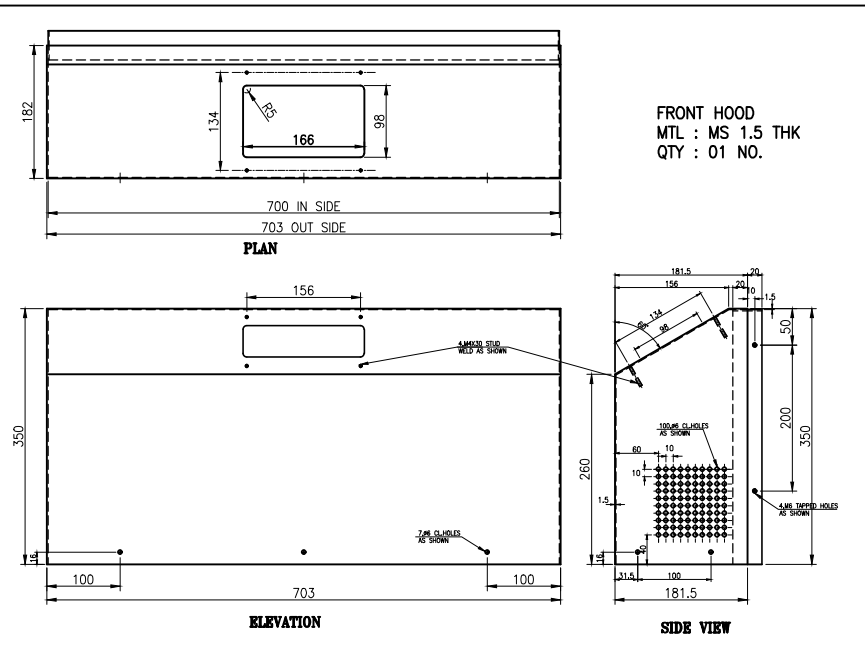
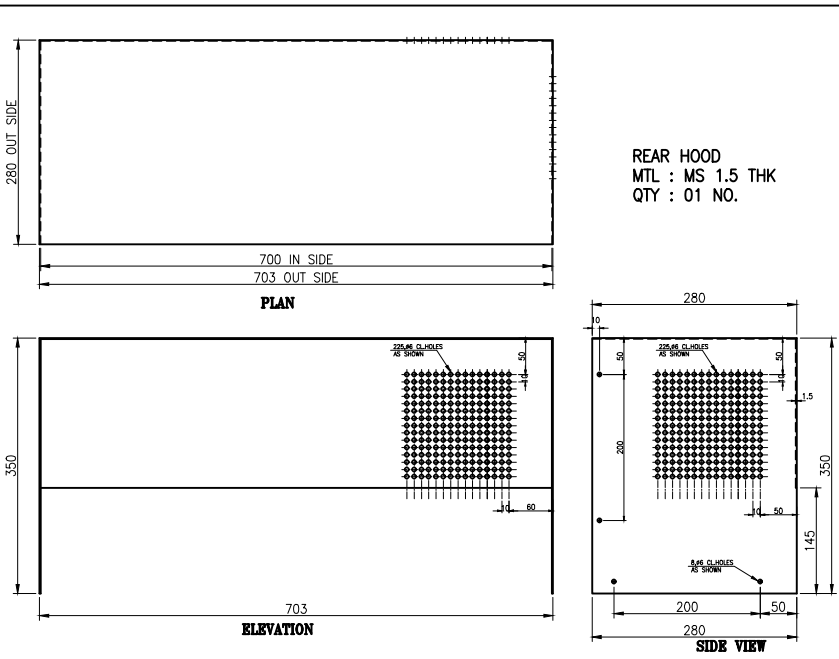
PROJECT OR SECTION	TITLE:	
LD	RACK FOR LD	
DR'N : A.M.KORI	DATE : 14/06/2021	APP'D : R.K.BHATA
DRG. CHK'D : E.RAVISANKAR	DATE : 14/06/2021	SHEET No.: 01 OF 03 SHEET
DES'D : E.RAVISANKAR	DES CHK'D : E.RAVISANKAR	SCALE : 1:1 & AS STATED
GOVERNMENT OF INDIA		PROJECTION:
BHABHA ATOMIC RESEARCH CENTRE		DRG. No.
EnABD		LD-01/06/21
	REV.	0



GENERAL TOLERANCE UNLESS OTHERWISE SPECIFIED SHOULD CONFORM TO IS 2102 VIZ: (MEDIUM CLASS)		
LINEAR DIMENSIONS	LENGTH OF SHORTER SIDE OF ANGLE	SURFACE FINISH IN MICRONS 3.15/CLA
UP TO 6 ±0.1	1 - 6 ± 1'	CHAMFER 1 x 45'
6 - 30 ±0.2	6 - 30 ± 0'-30'	
30 - 120 ±0.3	30 - 120 ± 0'-20'	
120 - 315 ±0.5	120 - 400 ± 0'-10'	
315 - 1000 ±0.8		
1000 - 2000 ±1.2		
2000 - 4000 ±2.0		
4000 & ABOVE ±3.0		
NOTES:- 1. IF IN DOUBT ASK. 2. ALL DIMENSIONS ARE IN MILLIMETRES. 3. REMOVE SHARP CORNERS AND BURRS.		

PROJECT OR SECTION		TITLE:	
LD		RACK OF LD	
DR'N : A.M.KORI	DATE : 14/06/2021	APP'D : R.K.BHATIA	
DRG. CHK'D : E.RAVISANKAR	DATE : 14/06/2021	SHEET No.: 02 OF 03 SHEET	
DES'D : E.RAVISANKAR	DES CHK'D : E.RAVISANKAR	SCALE : 1:1 & AS STATED	
GOVERNMENT OF INDIA		PROJECTION:	
BHABHA ATOMIC RESEARCH CENTRE		DRG. No.	
EnA&ID		LD-01/06/21	
		REV.	0

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GENERAL TOLERANCE UNLESS OTHERWISE SPECIFIED SHOULD CONFORM TO IS 2102 VIZ: (MEDIUM CLASS)

LINEAR DIMENSIONS	LENGTH OF SHORTER SIDE OF ANGLE	SURFACE FINISH IN MICRONS 3.15/CLA
UP TO 6 ±0.1	1 - 6 ± 1'	CHAMFER 1 x 45'
6 - 30 ±0.2	6 - 30 ± 0'-30'	
30 - 120 ±0.3	30 - 120 ± 0'-20'	
120 - 315 ±0.5	120 - 400 ± 0'-10'	
315 - 1000 ±0.8		
1000 - 2000 ±1.2		
2000 - 4000 ±2.0		
4000 & ABOVE ±3.0		

NOTES:-
1. IF IN DOUBT ASK.
2. ALL DIMENSIONS ARE IN MILLIMETRES.
3. REMOVE SHARP CORNERS AND BURRS.

PROJECT OR SECTION	TITLE:	
LD	RACK OF LD	
DR'N : A.M.KORI	DATE : 14/06/2021	APP'D : R.K.BHATIA
DRG. CHK'D : E.RAVISANKAR	DATE : 14/06/2021	SHEET No.: 03 OF 03 SHEET
DES'D : E.RAVISANKAR	DES CHK'D : E.RAVISANKAR	SCALE : 1:1 & AS STATED
GOVERNMENT OF INDIA BHABHA ATOMIC RESEARCH CENTRE Erv&ID		PROJECTION: REV. No. LD-01/06/21
		REV. 0

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