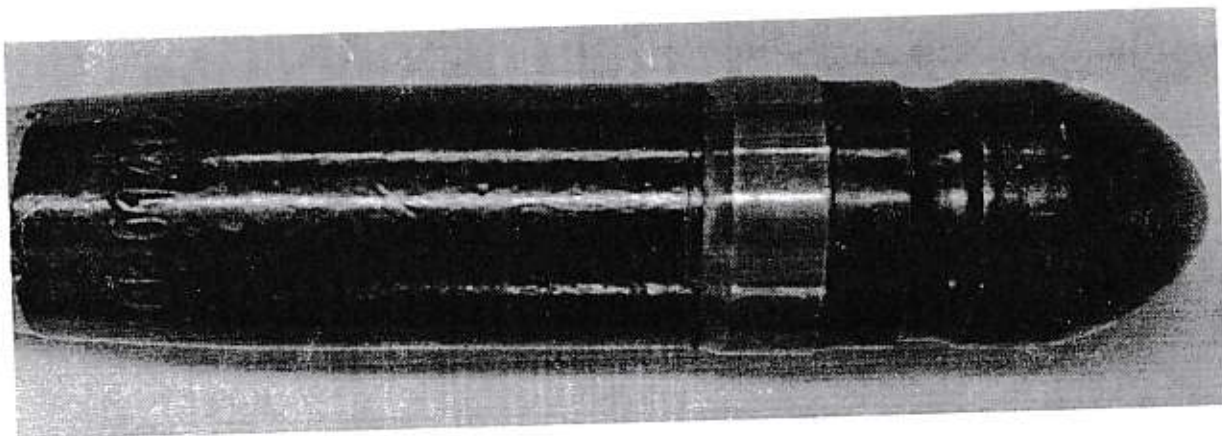
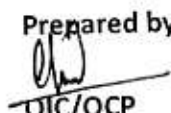


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QUALITY ASSURANCE PLAN **FOR** **30MM ADEN CARTG. SHELL** **BODY**

Drawing Number : **D6(L)1149/E**



Prepared by
 OIC/QCP
 OIC/A5

Checked by
 DO/IRB
 DO/VKS

 SM/AKS

Approved by
 AGM/PE

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INTODUCTION:- Shell is one of the important component of 30 mm ADEN Ammunition . The shell is manufactured from a steel Rod by the deep drawing process which includes 1st draw, 2nd draw & 3rd draw as well as trimming Grooving, Dovetailing and Knurling in white stage while in final stage by the process of hardening, Tempering, Grinding , Band swaging CDB Turning and Phosphating are performed by using CNC, Conventional Machine and Furnace . The final component should have smooth surface without any cracks and should have a Zinc Phosphate Class-II .

1. Drawing Number : D6(L)1149/E
2. Nature of Item : Critical
- 2.1 Method of Manufacture : Deep Drawing (1st draw, 2nd draw & 3rd draw)
- 2.2 (Special instructions for manufacturing/specification to be followed)
 - a) Process Schedule : 175/04
 - b) Flow Process Chart : 3A/175/04
3. Raw material : Steel Strip 101.6±0.5 wide X 3.56±0.05
4. Mat. Specification : BS1449 PT-I 1983, GRADE CS30

4.1 Tests/Checks and Acceptance Criteria for Raw Material :

S. No.	Test/Check	Parameter & Acc. Criteria
	CHEMICAL	
	Carbon	0.25-0.35%
	Mangnese	0.50-0.90%
	Phosphorus	0.045% MAX.
	Sulphur	0.045% MAX.
	Silicon	0.05-0.35%
	Any other single impurity	
	MECHANICAL	
	HARDNESS	140 HV MAX. TEMP 22°C
	TENSILE STRENGTH	380 N/MM ² MIN
	ELONGATION	20% MIN
	YIELD	230 N/MM ² MIN

5. Final inspection : Visual and dimensional
- 5.1 Mode of inspection : Normal Inspection
- 5.2 Sample size : As mentioned against each feature/parameter
- 5.3 Visual Inspection :

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S. No.	Detail of Feature	Sample Size		Accp Criteria
		MFR	QCP	
a)	Should be clean from both side	100%	100%	As per IS - 2500
b)	Visual defects (Cracks, Dent, Cut damage, Chattering, Scoring	100%	100%	
c)	Protective finish (Improper coating, scratch marks, Lining, any other Defects.	100%	100%	

5.4 Dimensional Inspection :

5.4.1 Geometrical Dimensions :

S. No.	Dimension/Feature	Sample Size		Inspection Method
		MFR	QCP	
1	EXT. DIA H29.870 L29.718	100%	As per IS 2500	CRITICAL EXAMINATION OF QTY.05 SAMPLES AND GAUGING INSPECTION OF BULK AS PER GAUGE SCHEDULE No. i) 175/4 ALT. ii) 175/4/1 ALT.
2	CANNULURE DIA ØH28.19, ØL27.89	100%		
3	DIST. FROM DRIVING BAND GROOVE TO BASE H27.508, L27.356	100%		
4	WIDTH OF DRIVING BAND H8.10, L7.80	100%		
5	DIST. (H80.01, L79.50) AT DIA 26.59 BASIC	100%		
6	OVER ALL LENGTH (H82.42, L82.17)	100%		
7	BORE DIA (H22.28, L22.23)	100%		
8	INT. SCREW 23.81 -.28	100%		
9	FORM OF OGIVE	100%		
10	CONC. OF THD. WITH INT. BOTTOM BORE	100%		
11	SQ OF FACE & CONC. WITH EXT. DIA	100%		
12	HEIGHT OF KNURLN MAX 0.2MM	100%		
13	GROOVE FOR DRIVING BAND FORM GO	100%		
14	FORM OF CANNULURE	100%		
15	POSITION OF CANNULURE H7.87 L7.67	100%		

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5.4.1.1 Final Stage Dimensions :

S. No.	Dimension/Feature	Sample Size		Inspection Method
		MFR	QCP	
1	Driving Band dia GO H31.19	100%	As per IS 2500	Gauge
	Driving Band dia NO GO H31.09			
2	Position of Copper Driving Band from Base H27.56, L27.31	100%		Gauge
3	Width of Copper Driving Band & Form of Angle H8.00 L7.49	100%		Gauge
4	Straightness of Body dia 29.97 and Concentricity of Driving Band Dia 31.29	100%		Concentricity Gauge
5	External dia Rear of Driving Band NOT GO L-29.64	100%		Gauge
	External dia (Over paint) GO DIA 29.92	100%		Gauge

5.4.2 Critical Features :

S. No.	Dimension/Feature	Inspection Method
1	R 0.38 MAX. (Both sides)	
2	Dovetail length 8.33mm to 8.754mm	
3	Dovetail thickness 2.790mm to 3.044mm	
4	Knurling depth 0.406mm	
5	Weight 126 gm.	
6	Thickness 1.65mm +0.381 (1.650 to 2.031) at the height of 16.51mm	
7	Wall thickness marked this must not be less than 1.722mm	
8	Diametrically opposed must not be less than 1.778mm	
9	HARDNESS	350-400 VPN at the load of 30 Kg. 1) Hardness taken at 3mm (from CDB groove to towards dome side) 2) Hardness taken at 3mm (from CDB groove to towards mouth of the shell)

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		the shell)
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5.4.3 Major Dimensions :

S. No.	Dimension/Feature	Inspection Method
	NIL	

5.4.4 Minor Dimensions :

S. No.	Dimension/Feature	Inspection Method
	NIL	

6. Tests on Finished Items :

6.1 Details of Test/Checks on finished Items and Acceptance Criteria:

S. No.	Test/Check	Acceptance Criteria
a)	PHOSPHATING	Should be as per specification (Pointage 25-40 Zinc Phosphate Class-II with at water Temp. 70%-80%)
b)	PAINTING OF EXTERNAL BODY AND DOME	Paint black stoving to SPECN-JSS 8010-12 SG 1994 REV NO. 1

6.2 Details of Tests and other Information : NIL

7. DETAILS OF PROOF SELECTION

- 7.1 Proof Schedule No. : II 827
- 7.2 Lot size : 10000 Nos.
- 7.3 Proof size : 150 + 05 (Pressure check)
- (A) Recovery – 150 Nos.
- (B) Check Pressure – 5 Nos.

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