SCOPE OF WORK FOR ZINC PLATING FOLLOWED BY CHROMATISING ON 30 MM CARTRIDGE CASE FOR **SDOTE** FOR PR. NO: 2131000321 Dt. 04.08.2021.

1. The firm shall collect the black cartridge cases from MSF and deliver back to MSF after the zinc electroplating followed by chromate passivation. Firm shall make his own arrangement for vehicle/transport and returnable packing boxes (Carton/ polypropylene) for collection and delivery of the stores.

2. Firm shall deliver the zinc plated and chromate passivated cartridge cases filled in VCI (Vapour corrosion inhibitor) packets in dry condition duly packed in returnable carton / polypropylene boxes. The packing boxes shall have separators for each cartridge case and each box may contain minimum 30-50 nos. of cartridge cases.

3. The firm shall follow the process cycle (for guidance purpose only) for electro chemical zinc plating followed by chromate passivation for cartridge cases as per Annexure "A" enclosed herewith.

4. Firm has to maintain Quality check report of the following tests against each batch of particular Lot at their end and the same to be produced along with the supply:-

   a. 100% visual inspection (The Cartg. Case must be free from pitting marks, white/Black spots, ring marks, die marks, blisters etc. also check the uniformity, smoothness and colour of zinc plated Cartg. Case)
   b. Coating thickness test (With Digital type Coating Thickness meter. The Coating thickness should not be less than 18 microns at any point of the outer surface and not less than 10 microns at any point of inner surface of the Cartg. Case. Also, thickness must not exceed 40 micron at any point of Cartg. Case.) :- 20 samples from each batch supply.
   c. Corrosion resistance Test (As per OST B 84 55381)- 01 sample from each batch supply.
   d. Adhesion test as per the testing norms (As per IS 1573 – 1986 / GOST 9.302-79)- 01 sample from each batch supply.

Note:- Firms must have to return all the samples of point 4(b), (c) &(d) after tests along with each batch supply.

5. On receipt of the zinc plated and chromate passivated cartridge cases, MSF or it's authorized inspectorate will cross verify all the submitted test reports by necessary inspection/ testing on sample basis. If everything found satisfactory, the Lot will be sentenced as accepted.

6. If any of the cartridge case fails in the above mentioned test, whole lot will be rejected & the firm will have to rectify the lot free of cost. No additional cost including transportation or handling will be borne by MSF for such rework. No white/black spots are acceptable after corrosion test. Ideally there should not be any rework.

7. The Firm should have spare capacity for Zinc Plating of MSF 30 mm Cartg. Cases at least 20,000 nos. on monthly basis including lifting of components (in black stage) from MSF.

Cont..... P/2

8. If rework of a Zinc Plated Lot (Size:-5000 Nos. for Navy version, & 10,000 Nos. for Army version) is found to be exceeded 2% of respective lot size, A Cost deduction will be carried out as per the following formula for each Lot:-

Cost deduction = 0.05 x Basic price x % of Rework

If rework is found excessively high in consistent manner, MSF may short close the placed S. O.

9. Firm will also do lacquer (Lacquer and Manpower to be provided by the firm) at MSF in the primer hole & base of each Cartg. Case as per grade PF-283 to GOST 5470-75 after passing in all the tests by MSF's authorized inspectorate.

10. Firm will submit Bank Guarantee @Rs. 100 per cartridge case for lifting of minimum 4000 nos of cartridge cases for the desired work and for maintaining the cycle .

11. MSF Representative/Authorised Inspectorate representative may visit Firm's premises for process inspection as per convenient. The firm has to carry out the inspection criteria as per Sl. No. 4 at their end. The same has to be produced / submitted whenever asked by MSF representative.

12. The Zinc Plated and Chromate passivated cartridge cases supplied by the firm shall be warranted / guaranteed for any visual /corrosion defect for 12 months from the date of final QC clearance/date of dispatch to consignee from MSF, whichever is later.

13. Firms must be equipped with the following minimum plants and machineries for executing supply order of Zinc plating followed by chromate passivation of 30 mm Cartg. cases :-

a) Rectifiers

b) Grinding/Polishing facility for outside and inside surface preparation of black Cartg cases.

c) Facility for Degreasing and Acid pickling .

d) Electrolytic cleaning set up (Anodic cleaning)

e) P.P. VATs for electrolysis process of Zinc plating

f) Facility for chromate passivation

g) Heat chamber of range 55 to 100 deg. Cel. and centrifugal air blower for drying

h) Corrosion resistance test set up and Digital Coating thickness gauge

i) Facility for storage of DM water as per requirement for the above processes

14. Firm should comply pollution control norms as per State Govt./ Central Govt.

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ANNEXURE "A"

The firm shall follow the following process cycle (for guidance purpose only) for electro chemical zinc plating with chromatizing for cartridge cases : -

1. PRE-CLEANING:

   Using 1,1,1 trichloro ethane

2. DEGREASING/ALKALINE SOAKING :

   Bath concentration : 30-120 gm/litre
   Temp : 80-90 degree C
   Duration : 3-15 minutes

3. RINSING/SWILLING :

   Continuous flow of water

4. DE-RUSTING/PICKLING :

   With HCl acid commercial grade at ambient temp.
   Acid concentration : 15%

5. RINSING/SWILLING:

   Continuous flow of water

6. ACIDIC ELECTROLYTIC CLEANING :

   At a temp. 75-90 degree C
   Timing : 2 -5 minutes

7. RINSING/SWILLING :
   Continuous flow of water

8. POLISHING :
   Mechanical through cloth with emery powder

9. SWILLING IN RUNNING WATER:

10. INSIDE CLEANING / POLISHING OF CARTRIDGE CASE:

Cont P/2

11. ZINC PLATING :

Anode : 99.99% pure zinc

Operation condition : Zinc : 30 – 35 gms/litre
Cyanide : 80 – 100 gms/litre
Caustic : 65- 75 gms/litre

Temp : Ambient

12. SWILLING IN RUNNING WATER :

13. NEUTRALIZATION :

Nitric acid concentration 0.5 - 1 %

Temp : Ambient

14. SWILLING IN RUNNING WATER :

15. CHROMATE PASSIVATION :

Iridescent yellow colored as per IS-1573 GRADE-C/OSTB-84-553-81.
Solution : Dichromate : 13-18 gm/lit
H2SO4 : 6 mls/litre
Temp : Ambient
Timing : 15-20 secs

16. SWILLING IN RUNNING WATER:

17. DRYING : In oven or Centrifugal drier

Temp : 55-60 degree C
Timing : 2-3 mins.

18. AIR DRYING FOR 24 HOURS :

19. LACQUERING :

In the primer hole & base of each component as per grade PF-283 TO GOST 5470-75, after final acceptance of the Lot at MSF premises, within 2 days after verbal intimation from CCS Section.

20. QUALITY CHECK: Firm has to maintain Quality check report as mention in SL. No.-4 against each lot at their end and the same to be produced along with supply of each batch .

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