(SECTION-III)

TECHNICAL SPECIFICATION FOR DOUBLE ANCHOR TAMPER EVIDENT POLYCARBONATE SEALS AGAINST TN-2364.

SCOPE:

The specification covers the design, manufacture, testing at manufacturers works, supply and delivery at destination stores of Double Anchor Tamper Evident Poly-carbonate Seals for sealing of Meter body and terminal covers of energy meters, Meter Box, CT-PT Units etc. with non-corrosive, non-magnetic stainless steel sealing wire. These seals shall also be used for sealing the meters, metering equipments and inspected materials.

The Double Anchor Tamper Evident Poly-carbonate Seals shall conform to the Nigam's specification as under:

1. Material of Double Anchor Tamper Evident Poly-carbonate Seals :

The raw material used for Double Anchor Tamper Evident Poly-carbonate Seals shall be of M/s. Dow Caliber Ltd., Switzerland (Grade-201- 15), M/s.GE Plastic, Singapore (Grade 143R), M/s. Dupont, Japan (Grade IV-20) or any other manufacturer having better properties as under :-

Sr.No.	Properties	Poly-carbonate
1.	Melting temperature	280^{o} C to 295^{oC}
2.	USE	Engineering
3.	Softness	Hard
4.	Durability	Weather effect resistance
5.	Transparency	Fully transparent (long time transparency)

2. Service Conditions (Climatic Conditions) :

The meters to be supplied against this specification should be capable of performing and maintaining required accuracy under extreme hot, cold, tropical and dusty climate and solar radiation typically existing in state of Rajasthan (India). The meter shall be required to operate satisfactorily and continuously under the following tropical climatic conditions.

1	Maximum ambient air temperature	55 deg.C.
2	Maximum ambient air temperature in shade.	45 deg.C
3	Maximum temperature attainable by the meter exposed to sun.	60 deg.C.
4	Minimum ambient temperature	(-) 5 deg.C.

5	Average daily ambient air temperature	40 deg.C.
6	Maximum relative humidity	95%
7	Number of months of tropical monsoon condition	4 months.
8	Maximum attitude above mean sea level	1000 meters.
9	Average annual rain fall	10-100 cm.
10	Maximum wind pressure.	200 kg/sq.m

3. Colour of Seal :

The female portion of the Polycarbonate Seal(s) shall be available in Clear /Red/Green colour and should be transparent (see through) type, which shall give complete visualization of its fixing mechanism and shall show clear indication if tampered.

4. Design and Construction of Seal :

a) **Design :** The seal shall be Double Anchor (Push Fit) type tamper evident with double locking. There shall not be any change in size, shape or design of the seal than the approved samples. If the seal is found different than the approved design / shape / size, the same shall be out rightly rejected. The double anchor should not be so soft that it can be easily pressed before sealing, so that after pressing the seal can not be opened.

b) **Thickness :** The wall thickness of seal should be minimum one (1)mm.

c) **Serial No. of the Seal :** Non repeat seven digits Serial numbers including Code number shall be laser etched/ embossed during moulding/ thermo engraved (It should not be Screen printed) in contrast colour on Front side of capsule body (female part).

d) **Monogram :** The seal shall have embossed/ laser etched printed of monogram of JVVNL on front side and month and year of manufacture in figure embossed on the backside. The laser etched printing should be through complete thickness of polycarbonate.

e) **Seal Wire :** The non-corrosive, non-magnetic stainless steel twisted wire (26 guage) confirming to IS : 280 shall be used . The seal wire shall not have affect of magnet i.e. it should not attract to magnet. The length of the sealing wire should be minimum 8" twisted two strand pull resistant stainless steel wire fixed to the seal. The diameter of each individual stand should be of 0.4 to 0.5 mm. dia and overall diameter of the seal wire shall be 0.8 to 1.0 mm. The No. of turns shall be minimum 20 per inch. The seal wire should be inserted at the female and male part during the process of moulding itself. It should be continuous and visible throughout the length of

the wire. The wire shall be intact such that it can not be pulled out after sealing.

The seal wire insert hole should be just sufficient for passing the seal wire and hole of larger dia is discouraged.

f) **Tolerance :-** Tolerance to the tune of +/- 10% is allowed in respect of number of turns per inch of seal wire.

5. General Construction :

The seal shall be capable to withstand temperature upto 147^{o} C without any damage / deformation.

The seal shall be designed for a single use only and if tampered with the help of plier, knife or any other sharp instruments, the seal shall be damaged and due to its transparent property, the sign of internal tampering shall be easily detected. Also once opened, it can not be re-used. The seal shall be made in such a way that, it can be easily locked with the help of finger and thumb pressing no tools shall be required to close the seal in the laboratory or at site. Both the parts shall be designed in such a way that they can not be separated and the attachment shall be flexible and shall not break. After inserting the seal wire through female part, the cap of the male part shall be fitted in the female part in such a way that it should not leave any space to avoid insertion of any sharp tools for opening of seal body of the female part in hot or cold condition. The seal shall have also the following features:-

a) Tamper resistance and reliable.
b) Environmentally safe as it does not contain any lead.
c) Withstand long-term exposure to direct sunlight.
d) Required no tools for installation.
e) Transparent.
f) Heat resistance.

6. Testing :

The seals shall be inspected / tested as a acceptance test at the manufacture's works before dispatch in presence of authorized representative of purchaser for the following tests:

i) **Physical Dimensional Check-up :** The seals shall be subjected to visual check-up for verification of workmanship and other features as mentioned above including shape / design / dimensions as per approved drawing / samples.

ii) **Boiling Water Test:** The seal when emerged in the boiling water for two hours there shall not be any affect on the seal and it shall remain intact condition i.e. the seal should not become soft, but instead should turn out to trail and easily break thus showing easily the tampering signs if it eventually happens. Even, with the help of any sharp instrument, pulling with plier i.e. by applying mechanical force, the male portion shall not come out from the female part (body seal). In case, it comes out, the same shall damage the seal, so that it can not be re-used.

iii) **Pull Out Test:** After locking the seal, if the male part / insert is pulled with mechanical force with the help of plier or any other instrument, sharp instrument etc. at normal condition, the seal should not get unlocked without any damage and when such condition occurs, it should leave traces of tampering.

iv) **Seal Wire :** In case, if someone tries to pull the seal wire and in any of the tests as mentioned above at (ii) & (iii) in that case the male / female portion of the seal should be damaged and the same can be seen visually being a transparent one.

v) **Chemical Test:** The seals shall be kept in the concentrated acid for minimum one hour in locked condition. The same shall remain in tact condition and if try to unlock the seal, the same shall be damaged.

vi) **Temperature withstand test:** The seal should be tested for 30 minutes at 147 degree C. temperature without damage/ deformation.

In short, if the seal is tested for any of the above tests, in no condition the male and female part shall be separated out without affecting / damaging the seal. In case, if they are separated, the seal shall have sufficient tamper evident. Also, if seal wire is pulled out from the seal in any of the above tests, it shall not come out from the seal without damaging seal.

7. Sampling Criteria :

For carrying out above acceptance tests at manufacturer's works shall be selected at the rate of 0.2% of the offered quantity with minimum 5 samples selected at random from the each lot offered for each circle.

The seals used in testing shall be destroyed in the presence of Nigam's Inspecting Officer.

8. Supply Schedule :

After placement of order the purchaser will intimate delivery schedule wing wise i.e. Green colour for I&S, Clear colour for M&P & Red for O&M with

Code No. and Sr.No. of the seals. The seals shall be manufactured only after receipt of the delivery schedule and as per the delivery schedule unless specifically instructed or otherwise.

9. Random Testing:

As per the sampling criteria the random testing of the material in MST,CPH, Jaipur Discom, Lab.,Jaipur after receipt in the stores irrespective of the fact whether or not it was inspected before dispatch will be carried out and in case of any failure, the entire lot shall be rejected at the risk & cost of the supplier.

10. Guarantee :

The seals shall be guaranteed for a minimum period of two years. In case, if any defect in design and manufacturing is noticed within the guarantee period, the seals shall be replaced within one month free of cost. The defective seal found in the field viz. STORES/FIELD OFFICERS shall be collected by the supplier at their risk and cost and shall be destroyed at their works in the presence of purchaser's representative. For the replacement of seals, revised Sr. No. shall be provided by the purchaser.

11. Replacement of rejected seals:

In case material are found not in accordance with the prescribed specification/approved drawings and/ or the approved samples the same will be rejected and supplier shall replace the rejected material free of cost within one month from the date of intimation. The lot(s) of replaced seals will also have to be got inspected from purchaser's representative.

12. Special feature:

A secret code shall be given to each bidder on whom the Nigam places the order and secret code shall be embossed / Laser Printed on the Double Anchor portion. There will not be any name of the bidder embossed/laser printed on the seals but only JVVNL logo, Sr.No., Month and Year of manufacture or any other symbol given by the Nigam shall be embossed/ laser printed. After completion of supply of order, the die of the secret code of the seals shall be surrendered to the Nigam by each bidder on whom the order is placed. Before commencing the supply 15 Nos. of sample seals shall have to be approved from the purchaser.

13. Patent :

Seals should be patented with patent office. Copy of valid PATENT CERTIFICATE /Patent License should be submitted along with the offer.

14. Test Certificate(s):

The bidder shall have to submit test certificates for the type of offered seals from NABL/Govt. approved Laboratory . The supplier shall not dispatch the materials unless and until test certificate(s) are approved by the purchaser.

15. Packing and Forwarding :

The bidder shall be responsible for suitable packing of seals, circle wise. The supplier shall have to supply each 100 seals in chronological order i.e. arranging in serially, tied with the steel wire forming a loop and the same shall be packed in polythene bag with labels furnishing Sr.No. of seals and name of the circle and further in cardboard boxes.

16. Tender Samples :

The samples of each item offered shall be submitted before the due date and time of submission of tender. The sample(s) submitted shall be strictly conforming to the specification and drawing of the material offered. If the sample is found to be not as per specification/drawing the offer will not be considered and no correspondence from the tenderer for accepting supplies to the Nigam's requirement will be entertained. The tenderer shall have to submit fifteen (15) Nos. of each type of offered seals. The tender without samples shall be rejected and not considered. The sample seals shall be tested as per specification/drawing/relevant standards.

17. Submission of drawing:

The tenderer shall submit their drawing for approval along with copy of tender document wherever the Nigam's drawing is not specified and attached with the specifications. The drawing submitted shall be strictly conforming to the sample and to the specifications.

18. Quality of Supplies :

All materials supplied shall be strictly as per specification laid down and in strict accordance with and as per the approved standard samples.

19. Sample before commencing bulk supplies :

a) Before taking up the manufacture of the bulk supply, the successful bidder(s) will have to submit samples for approval to the purchaser within 7 days from receipt of the detailed order.
b) No bulk supply should be made unless the sample is approved by the purchaser.

20. Form of undertaking :

On placement of order, bidders shall have to give undertaking as desired by the Jaipur Vidyut Vitran Nigam Limited.

SCHEDULE-'A'

GUARANTEED TECHNICAL PARTICULARS FOR DOUBLE ANCHOR TAMPER EVIDENT TRANSPARENT POLYCARBONATE SEALS AGAINST TN-2364

S. NO.	PARTICULARS	TO BE FURNISHED BY BIDDER
1	NAME & ADDRESS OF MANUFACTURER	
2	WORK'S ADDRESS	
3	RAW MATERIAL OF POLYCARBONATE SEALS	
4	PROPERTIES OF MATERIAL	
i)	USE	
ii)	SOFTNESS	
iii)	DURABILITY	
iv)	TRANSPARENCY	
5	COLOUR OF THE SEALS	
6	WHETHER DESIGN & CONSTRUCTION OF SEAL IS AS PER SPECIFICATION(GIVE DETAILS)	
7	THICKNESS OF SEAL	
8	WHETHER ETCHING/EMBOSSING OF SERIAL NO.IS AS PER SPECIFICATION (GIVE DETAILS)	
9	HETHER PRINTING OF MONOGRAM IS AS PER SPECIFICATION	
10	MAX. WITHSTAND TEMPERATURE (UPTO 147DEG.C.)	
11	WHETHER SEAL HAVE FOLLOWING PROVISIONS	
a)	TAMPER RESISTANT AND RELIABLE	
b)	ENVIRONMENTALLY SAFE AS IT DOES NOT CONTAIN ANY LEAD	
c)	WITHSTAND LONG TERM EXPOSURE TO DIRECT SUNLIGHT	
d)	REQUIRED NO TOOLS FOR INSTALLATION	
e)	TRANSPARENT	
f)	HEAT RESISTANCE	
12	GUARANTEE OF SEAL(MIN.2 YRS.)	
13	WHETHER SEAL IS PATENTED & COPY OF PATENT IS ENCLOSED.	
14	WHETHER SEAL WIRE IS PROVIDED IN THE SEALS AS PER SPECIFICATION.	