

TAMPER PROOF 2 PC QUAD LOCK

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## SPECIFICATIONS

### 1. SCOPE

The specification covers the design, manufacturing, testing at works, supply & delivery of Tamper Proof Poly Carbonate Plastic Seal for sealing electrical installations viz. meter body for energy meters, terminal cover of energy meters, Metal Box and for other metering purpose. The size of the seal shall be 33 x 23 x 5 ± 0.5 mm. These Seals shall be used for LT, HT Industrial Consumers and in theft prone areas. **Manufacture should also develop a seal tracking software.**

### 2. APPLICABLE STANDARDS

IS: 4905

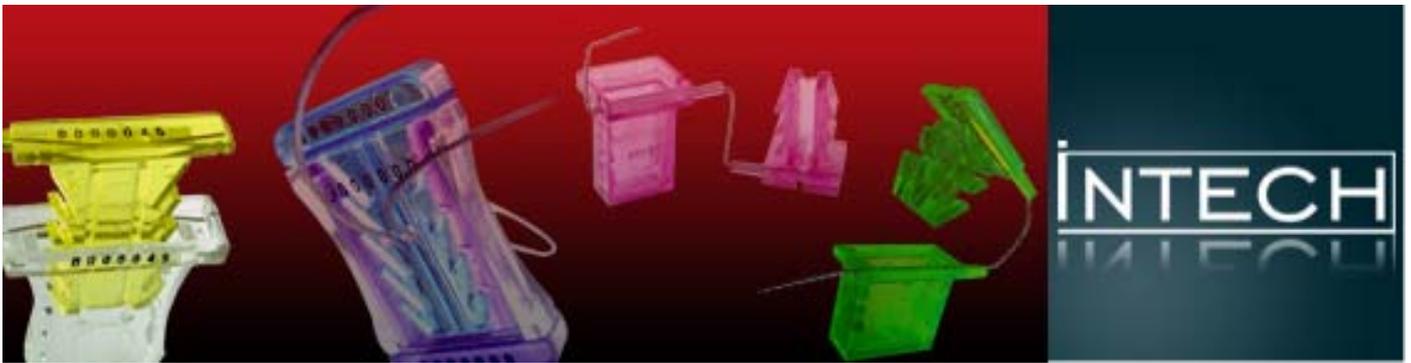
Poly Carbonate Plastic Seal, form ISO Certified manufacture (ISO 9000 and ISO 14000)

### 3. CLIMATIC CONDITIONS

The Poly Carbonate Plastic Seal shall be suitable for satisfactorily working under the following climatic conditions: -

Max. Ambient Temperature	60 <sup>0</sup> C
Min. Ambient Temperature	-5 <sup>0</sup> C
Max. Relative Humidity	100%
Min. Relative Humidity	23%
Altitude	Within 1000 meters above mean seal level.

266/3, Phase II, G.I.D.C., Wadhwan City-363035,  
 Dist. Surendranagar, (Gujrat) India.  
 Ph.: 02752 240070 | Fax. : 02752 243770  
 Mr. Atul Patel 09825223750 Email: Intech\_3@hotmail.com



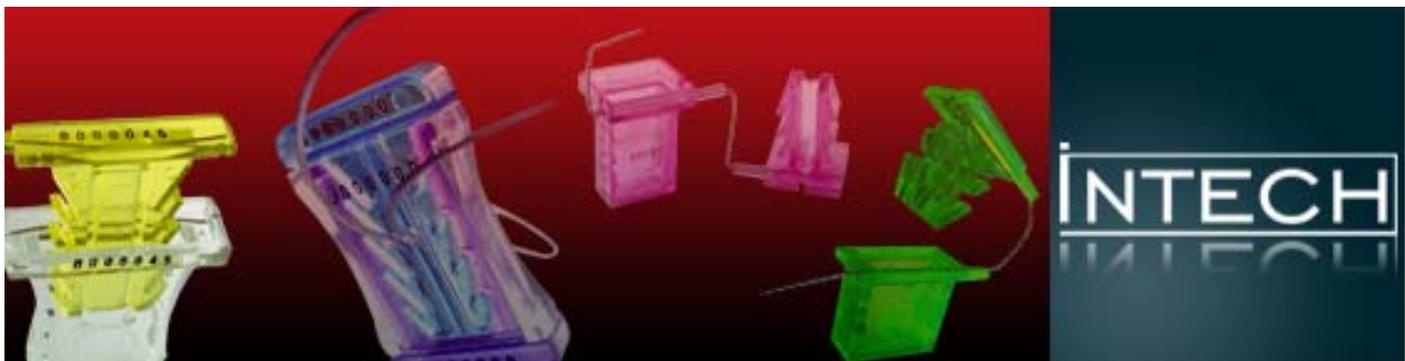
The Poly Carbonate Plastic Seal shall be suitably designed and treated for normal life and satisfactory operation under the hot and hazardous tropical climate conditions.

#### **4. DESIGN AND CONSTRUCTION OF SEAL**

##### **4.1 GENERAL CONSTRUCTION.**

The seal shall be designed for a single use only. The seal shall be damaged, due to its see through property, if tampered with the help of puller, knife or any other sharp instruments. The sign of internal tampering shall be easily detected; it should not be reused, once opened. The seal shall be made in such a way that it can be easily locked with the help of finger and thumb pressing and no tools shall be required to close the seal in the laboratory or at site. After inserting the seal wire through hole of 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 or the female part in hot or cold condition. The seal shall also have the following features: -

- 4.1.1 Tamper resistant and reliable.
- 4.1.2 Environmentally safe, should not contain any lead (pb).
- 4.1.3 Withstand long-term exposure to direct sunlight.(UV Resistance)
- 4.1.4 No tools required for installation.
- 4.1.5 Transparent and see through body reveals.
- 4.1.6 Heat resistant.
- 4.1.7 Chemical resistant.



## 4.2 MATERIAL OF PLATIC SEAL

The raw material used for polycarbonate plastic seals shall be M/s Dow Caller Ltd. Switzerland (Grade 201-15), M/s GE Plastic Singapore (Grade 143 R), M/s Bayer Plastic 2407 Grade (UV Stabilized) or any other equivalent manufacture having similar material properties as under:-

Sr.No.	Material Description	Particulars Polycarbonate
1	Melting temperature	280 <sup>0</sup> C to 295 <sup>0</sup> C
2	Specific gravity	1.20 at 27 <sup>0</sup> C
3	Use	Engineering
4	Size	33 x 23 x 5 ± 0.5 mm. tolerance
5	Softness	Hard
6	Durability	Weather effect resistant (UV Resistant)
7	Transparency	Fully transparent (for the life of the seal)

## 4.3 COLOR OF SEAL.

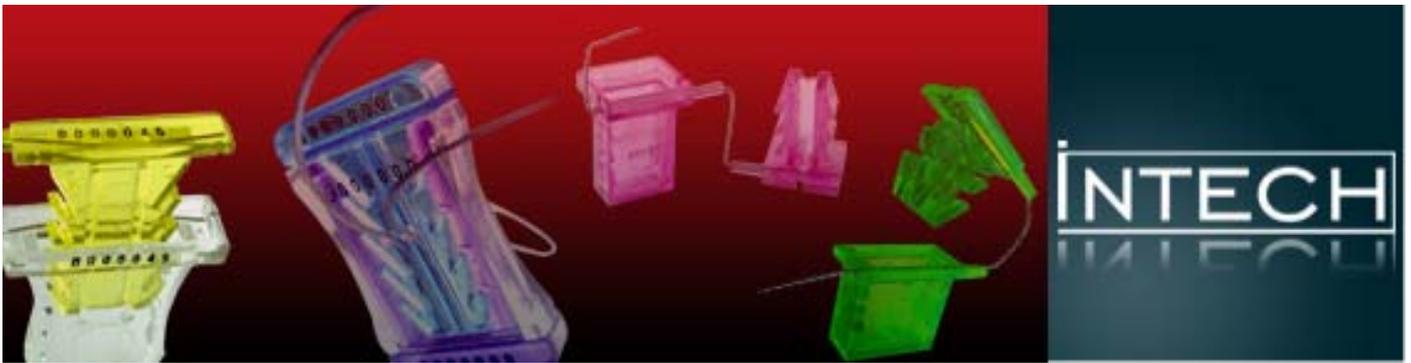
The seal body will be colorless, transparent (see through) type, which shall give complete visualization of its fixing mechanism and shall show clear indication if tampered with. Also seal's anchor can be of different colour like Red, Blue, Yellow, Green and Orange etc for necessary area wise applicable colour coding i.e. two different colours in same seal, which makes seal unique.

## 4.4 SPECIAL SIX LEVEL SECURITY FEATURES.

4.4.1 Quadra locking mechanism with 8 anchors.

4.4.2 **Micro text matter/symbol readable with magnifying lens at minimum four places.(neon text coding)**

4.4.3 Special colour codes (weather resistant)



4.4.4 Ultra violet numbering and logo thermo laser printing type (not screen printed) visible only by UV light torch i.e. UV readable number and logo inside of the anchor part of seal. The expected life of UV numbering is guaranteed for 10 years in any conditions.

4.4.5 Thermo engraved (itching type) with contrast colour serial no. at two points i.e. unique type numbering on anchor and female part positions with special Psychological effect (German technology)

4.4.6 Seven stand lace wire connected with male and female part of seal.(Inox 304 grade)

#### 4.5 DESIGN

The seal will be anchor type, tamper evident with eight locking system and shall be of different color codes (for e.g. one particular color shall be used by M&P Organization other by the (OP) Wring and 3<sup>rd</sup> by the purchasing/inspecting agency.

#### 4.6 SIZE OF THE SEAL

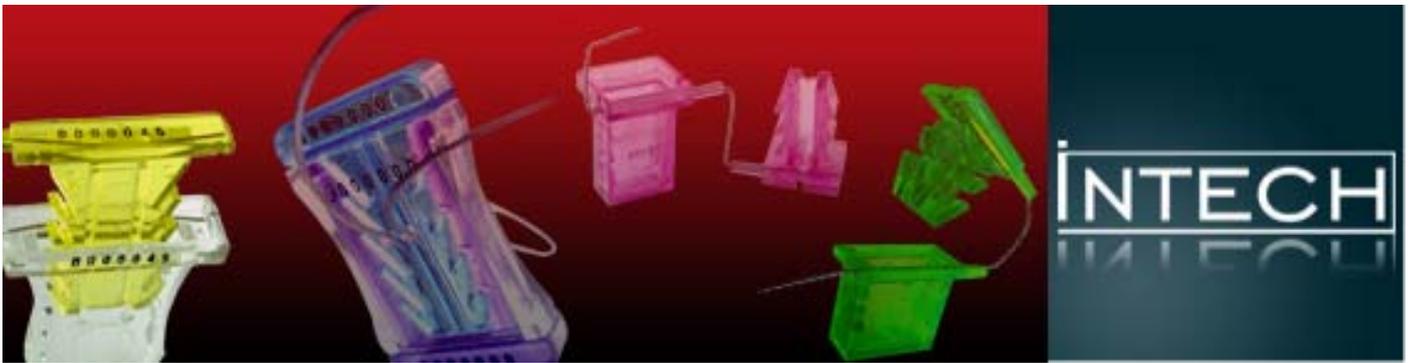
4.6.1 The size of the female part body of the seal shall be  $33 \times 23 \times 5 \pm 0.5$  mm.

4.6.2 The size of two wire hole should be sufficient to insert seal wire, but in case, more than 1.0 mm + 0.1 mm.

4.6.3 Wall thickness should not be less that 0.8 mm.

#### 4.7 SERIAL NO. OF THE SEAL

Non repeat seven digits numeric Sr.No, on the seal shall be itching type in contrast color. Its should be provided on anchor flap i.e. on the top of anchor part and on body on female part.



#### **4.8 MONOGRAM**

The seal shall have facility for embossed type monogram of COMPANY logo in 10 mm circle on front side and rear side of body of seal.

#### **4.9 SEAL WIRE**

Seal wire should be molded in seal in such way that it should be connecting male female part of the seal and remaining open wire will be used for sealing. The non corrosive non magnetic inox 304/316 grade, seven twisted wires, each of  $0.23 \pm 0.01$  mm dia with over all diameter of wire  $0.7 \pm 0.05$  mm (minimum shall be used. The diameter of each individual stand wire shall be  $0.23 \pm 0.01$  mm (approx) and over all diameters of seal wire shall be  $0.7 \text{ mm} \pm 0.05 \text{ mm}$  so that it can easily insert into the female portion where the diameter of two hole shall be  $1.00 \text{ mm} \pm 0.1 \text{ mm}$ . Total seal wire length should be of 300 mm.(open wire length)

#### **4.10 SEAL TRACKING SOFTWARE**

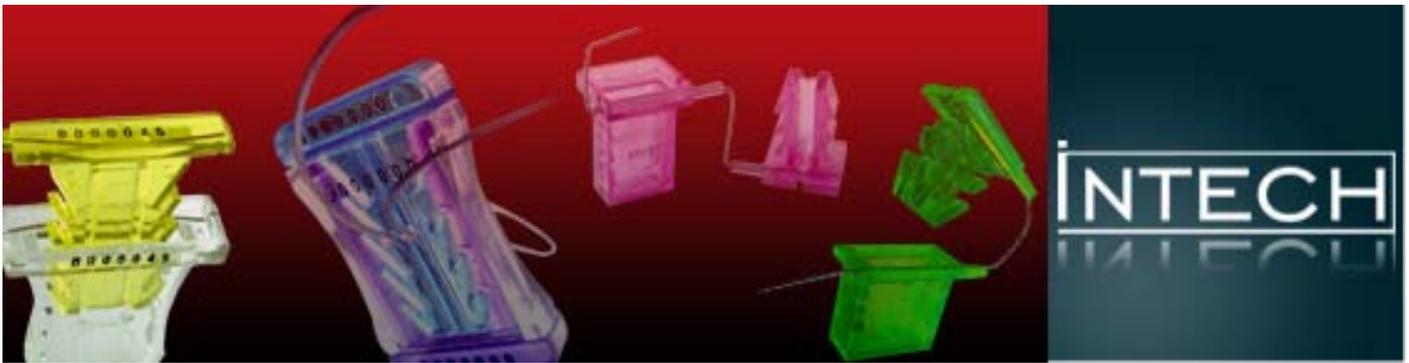
Seal tracking software should be developed by the contractors with the following specifications:

4.10.1 Software should be web based.

4.10.2 Software should be able to be integrated with the existing systems at company running on Microsoft SQL database server and ASP.NET as front end.

4.10.3 Software developed should be robust with significant security mechanism inbuilt into the software.

4.10.4 Software should help Nigam in end to end tracking of the seals provided.



## 5. TEST

The seal shall be subjected to following tests at the manufacture's works.

5.1 **VISUAL CHECK:** Workmanship and other feature as specification.

5.2 **DIMENSIONAL CHECK:** As per supplier drawing.

5.3 **BOILING WATER TEST:** The seal shall be dipped in the boiling water for more than one hour and there shall not be any effect of any type on the seal.

### 5.4 PULLED OUT TEST

5.4.1 **MALE PART:** The seal shall not get unlocked without any damage and remain intact even when male part of the seal is pulled with the help of any sharp instrument like pulling with puller or by applying mechanical force. The seal shall become defective in such a way that it can not be reused, in case seal gets unlocked when pulled.

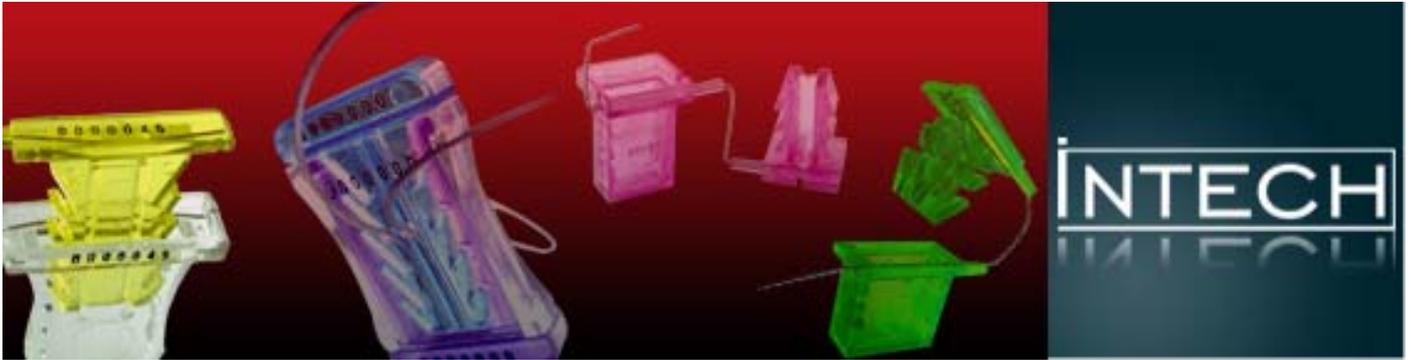
5.4.2 **FEMALE PART:** The seal shall not get unlocked without any damage and remain intact even when female part of the seal is pulled with the help of any sharp instrument like pulling with puller such a way that it can not be reused, in case seal gets unlocked when pulled.

5.4.3 **SEAL WIRE:** The seal shall not get unlocked without any damage and get damaged when seal wire is pulled with the help of puller i.e. by applying mechanical force. The seal shall become defective in such a way that it cannot be re-used in case the seal get unlocked i.e. seal wire shall not come out without damage the seal under test.

5.5 **CHEMICAL TEST:** The seal shall not get damaged/deformed when kept in the Hydrochloric Acid (34% concentrated) for one hour.

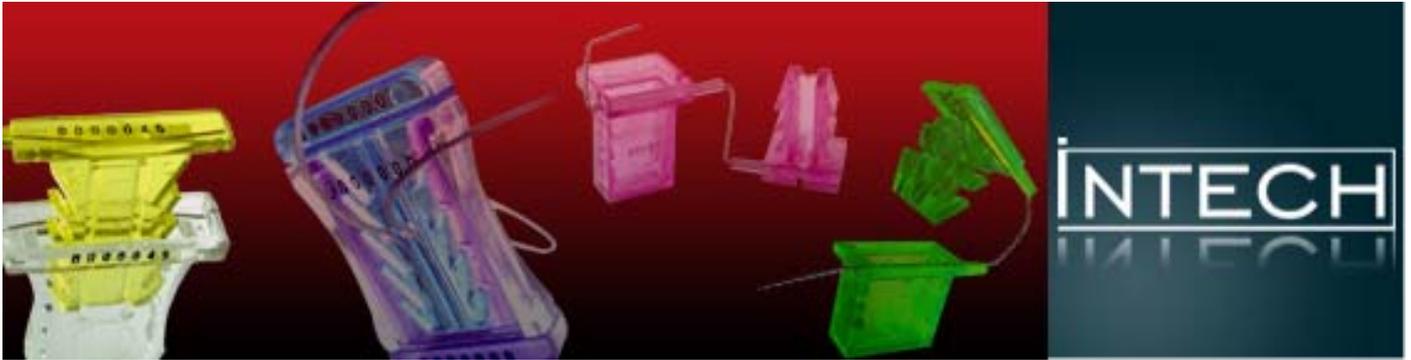
5.6 **TEMPERATURE WITHSTANDS TEST:** The seal shall be heated at 147<sup>0</sup> C (minimum) for one hour. The same shall not get damaged OR deform.

5.7 **SAMPLING CRITERIA:** As per IS 4905. The seals, used in testing, shall be destroyed in the presence of inspecting officer.



5.8 **GUARANTEE:** The designed life of the seal shall be 10 years. However, the seal shall be guaranteed for a period of 66 months from the date of supply. The seals, found defective, within guarantee period, shall be replaced within 45 days from the date receipt of intimation.

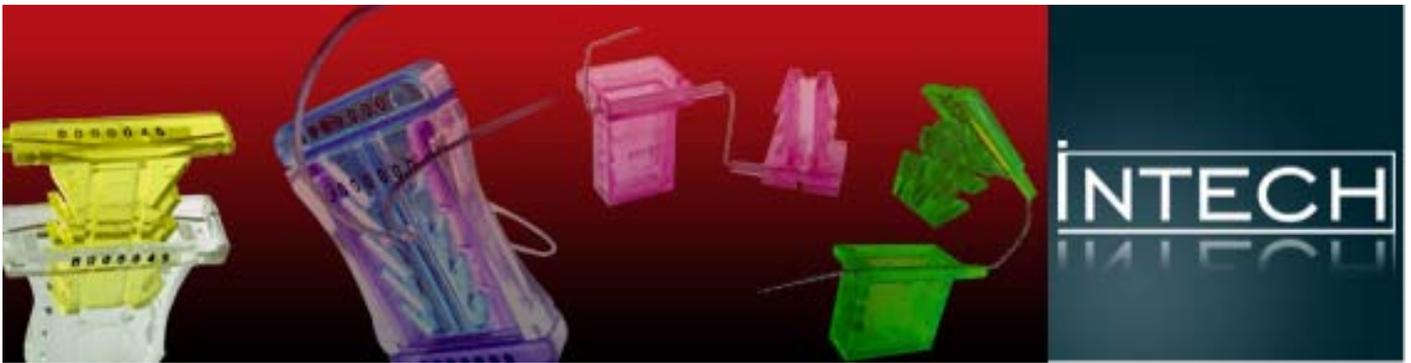
5.9 **TENDER SAMPLE:** The bidder shall have to submit 20 Nos. of samples along with the technical bid. Seals submitted as tender sample shall be identified with trademark or logo on female part of the seal. The seals shall also be serially numbered from 0000001 to 0000020 on top of the male part of the seal as well as on the female part of the seal, so as to be read sequentially while holding the seal. Tender submitted without samples shall be rejected outright and the offer will not be considered. The sample seals shall be tested as per specification if desired by company, third party Govt. laboratory. The tender sample seals not conforming to the specification shall be rejected and the bidders offer not be considered for further evaluation.



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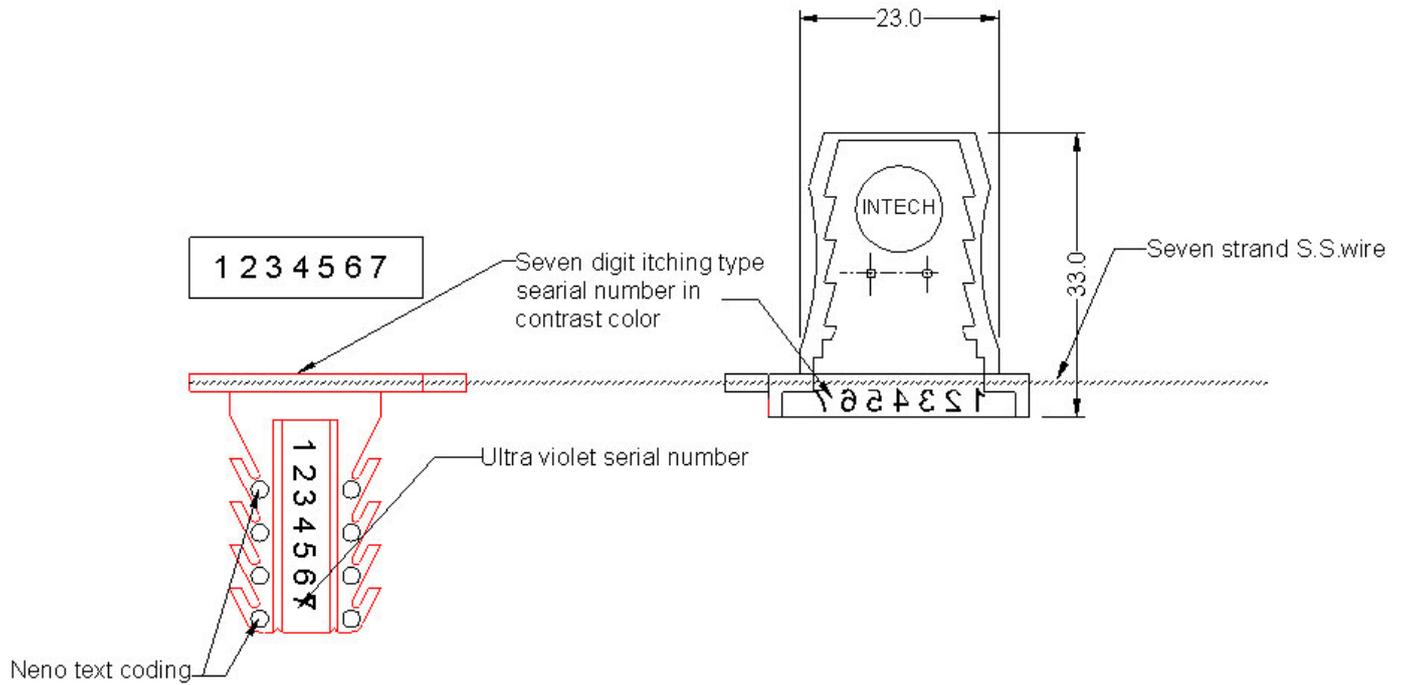
## SPECIAL FEATURES

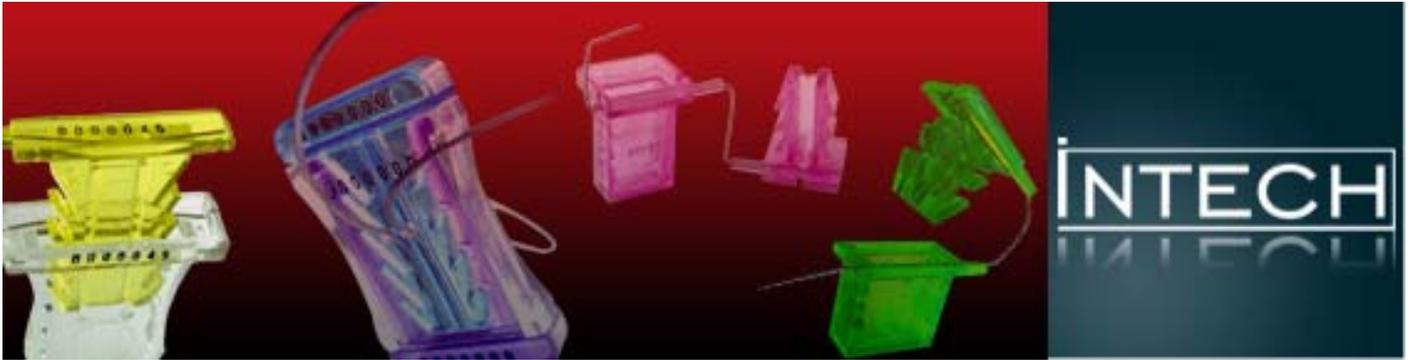
1. Quadra locking mechanism first time in India.
2. Neno text confidential coding on seals.
3. Special two colour code (weather resistance) in same seals.
4. Ultra violet numbering visible only by UV light torch.
5. Itching type unique numbering on two position of seals.
6. Special seven strand inox-304 sealing wire.
7. Seals serial number has psychological effect (German technology)
8. Bar Coding possibility.
9. Laser Numbering Possibility



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**DIAGRAM**



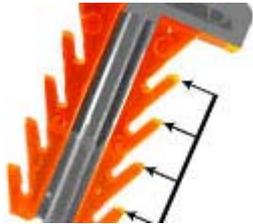


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## Benefits

### Benefits (With Figure as in Our Web Site)

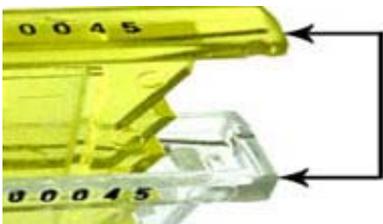
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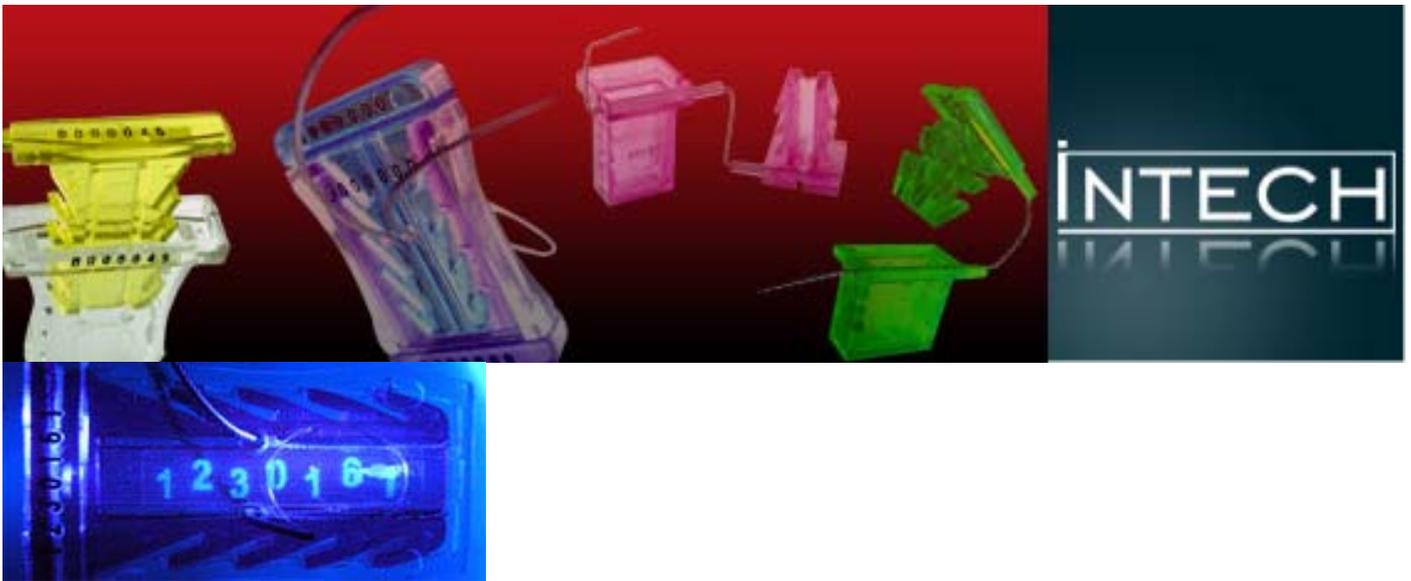
2. Nano text confidential coding on seals.



3. Special two colour code (weather resistance) in same seals.



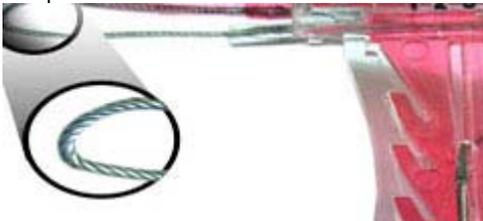
4. Possible Ultra violet numbering visible only by UV light torch.



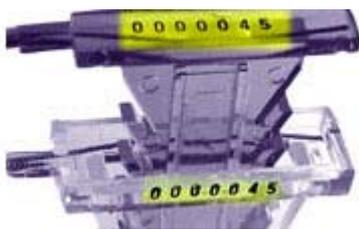
5. Itching type unique numbering on three position of seals.



6. Special seven strand inox-304 sealing wire.

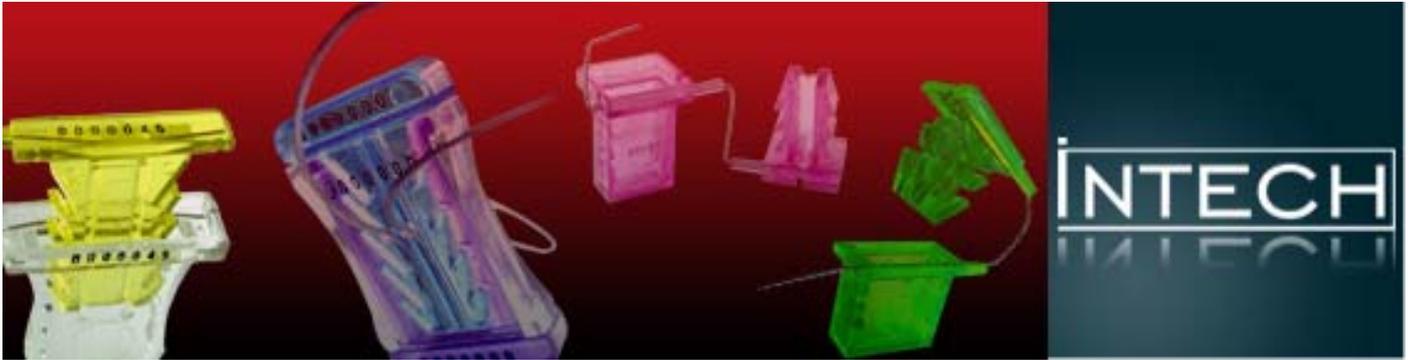


7. Seals serial number has psychological effect (German technology)



8. Original Company Logo And Company name in as small as 8 mm size possible.

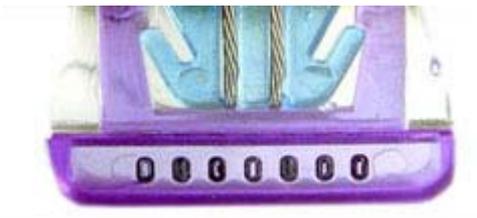


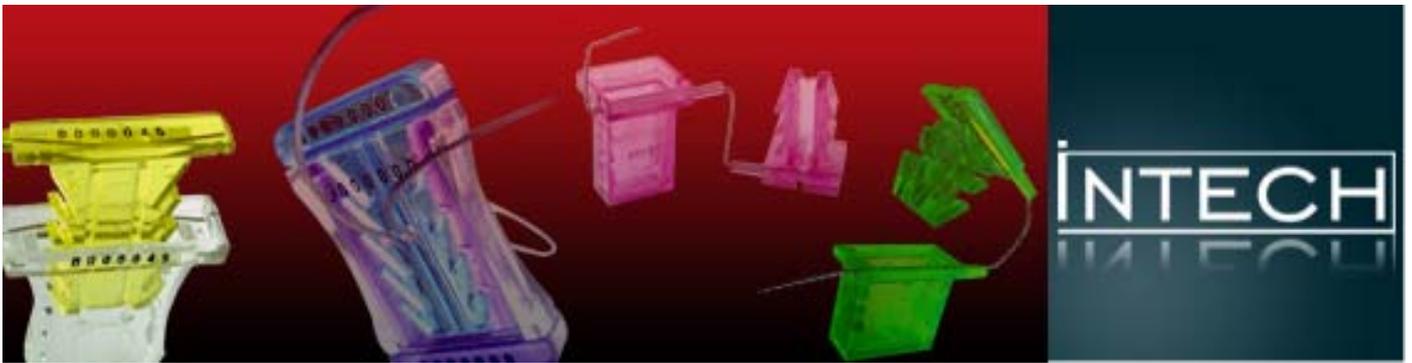


9. Wide Temperature range for using at high temperatures as well.



10. Transparent Material for Better verification

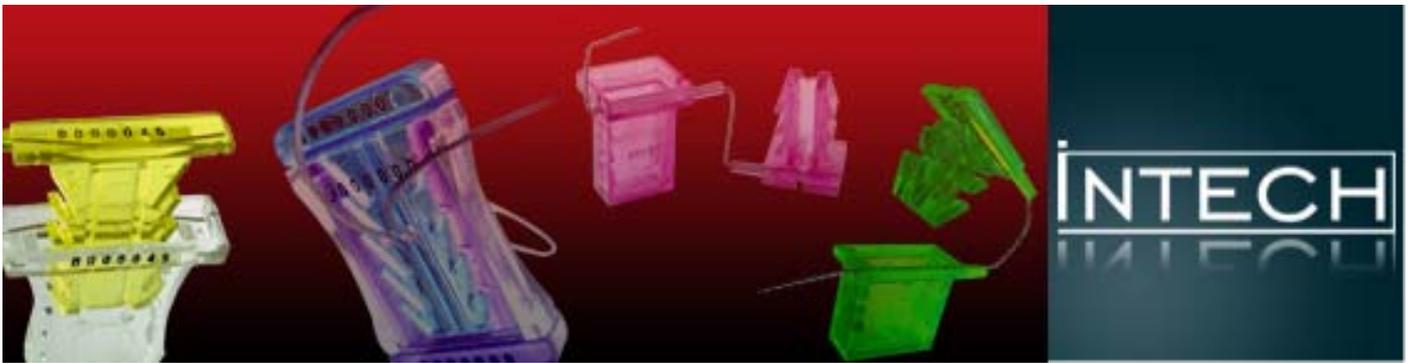




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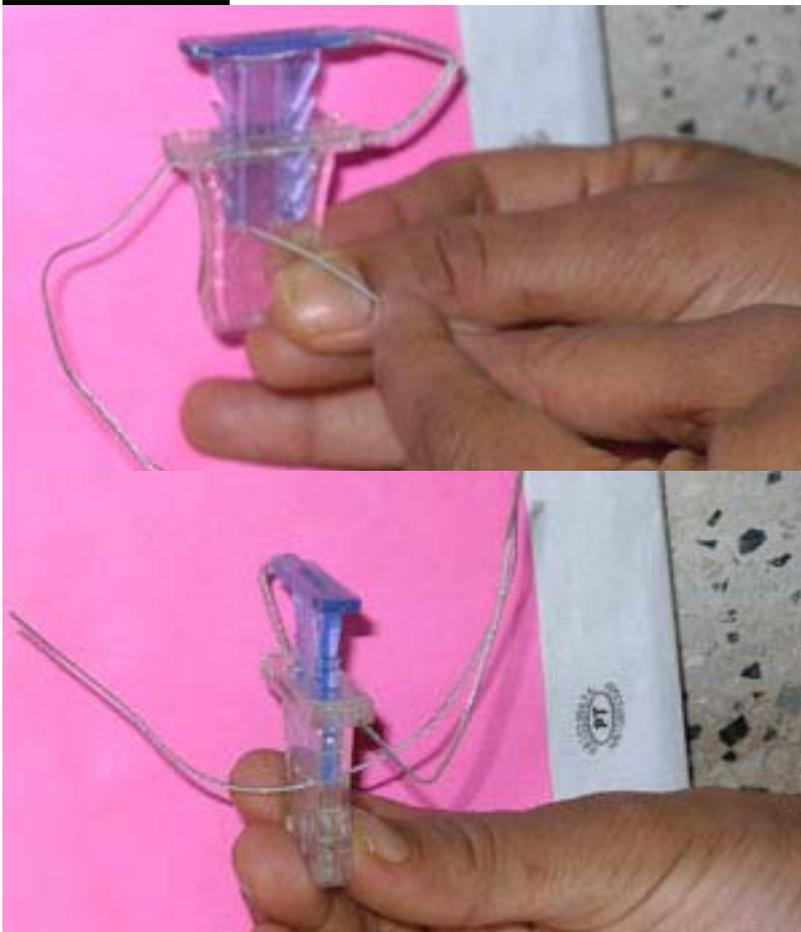
## Images

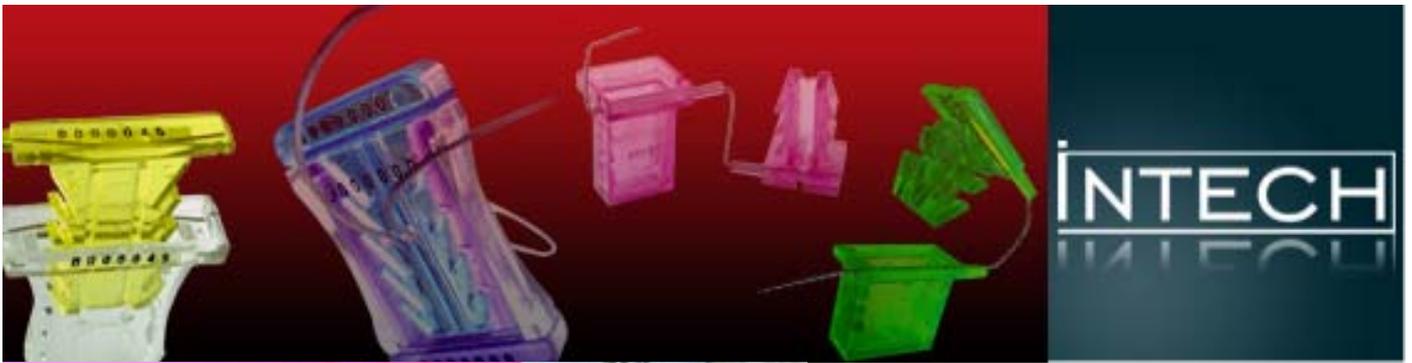




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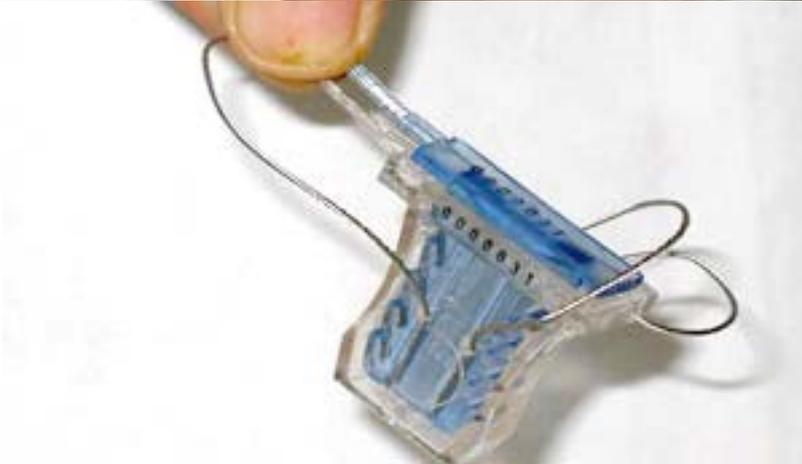
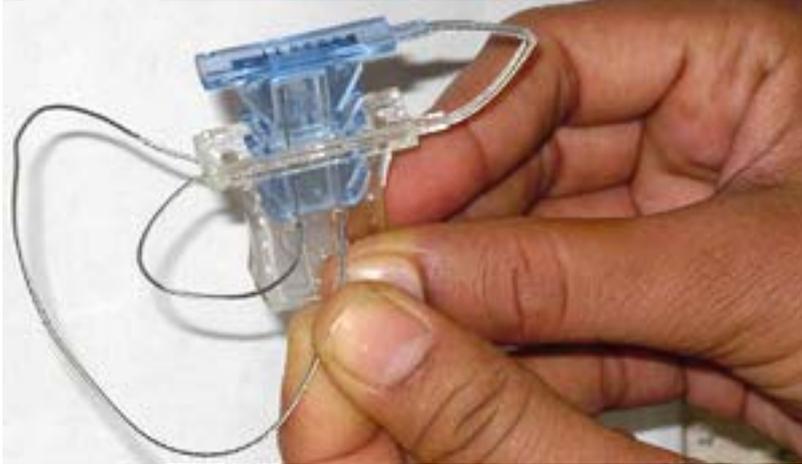
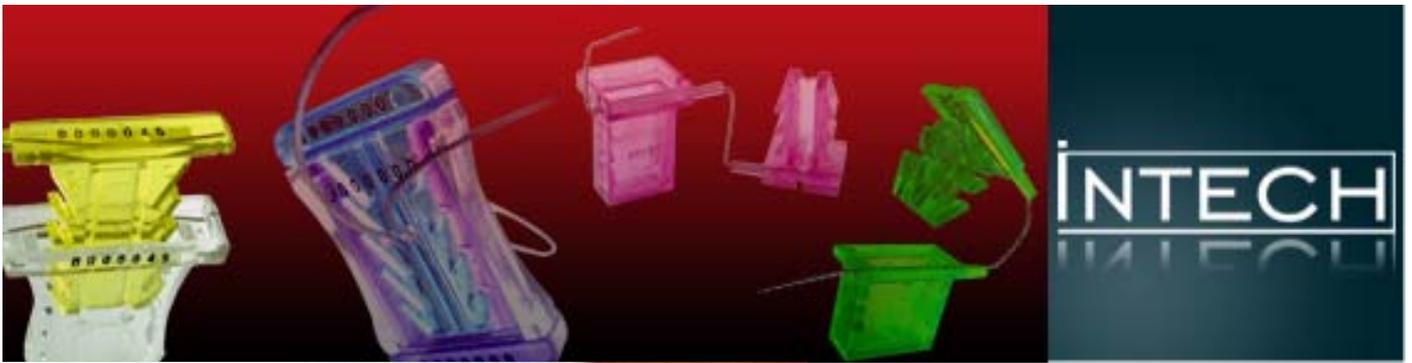
## Installation





266/3, Phase II, G.I.D.C., Wadhwan City-363035,  
Dist. Surendranagar, (Gujrat) India.  
Ph.: 02752 240070 | Fax. : 02752 243770  
Mr. Atul Patel 09825223750 Email: Intech\_3@hotmail.com

[www.intechsecurityseals.com](http://www.intechsecurityseals.com)



266/3, Phase II, G.I.D.C., Wadhwan City-363035,  
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