

Electro
osmotic
damp
proofing

LECTROS
INTERNATIONAL LIMITED

Electro osmotic damp proofing

History

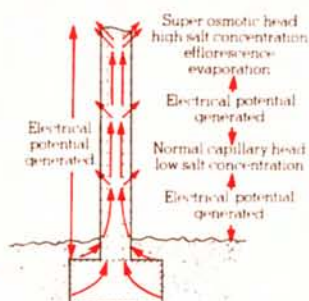
18th Century - Germany: It was discovered that applied voltage affected capillary action.

19th Century: It was further discovered that water was moved from a positive anode to a negative cathode when an electrical potential was applied.

20th Century: The emergence of passive and active methods of electro osmotic damp proofing.

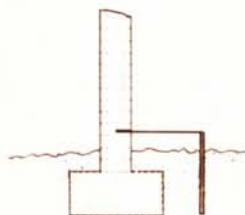
Theory

Moisture rises from the earth by capillary action. It was believed that an electrical potential developed between the wall and the earth. Interference with this naturally generated electricity would depress the rise of moisture.



Passive Systems

These are usually based on earthing a suitably placed copper strip. Holes are drilled into a wall at approximately half metre intervals extending some two thirds of the way through the wall. Copper electrodes formed from the copper strip are inserted into these holes and then backfilled. The whole installation is then connected to an earth rod or series of earth rods so shorting out the wall potential.



Active Systems

If an electrical potential from an external power source is applied across a damp porous material a force will be exerted causing water to move towards the cathode.

Materials

Longevity is the main object when assessing the suitability of materials to be used in active electro osmotic damp proofing systems. This restricts the range of suitable conducting elements to a mixture of noble metals and suitable substrate materials. The combination of platinum group elements which have extremely low dissolution rates when used as anodes and titanium as the substrate material makes an ideal combination for powered electro osmotic damp proofing applications. Titanium has exceptionally good corrosion resistance due to the formation of a tetragonal form of titanium oxide on its surface when exposed to the atmosphere. Since titanium depends for its passivity on the presence of an oxide film it is, therefore, significantly more resistant to corrosion in oxidising solutions. Titanium is resistant to attack in mixtures of strong sulphuric/nitric, hydrochloric/nitric acids and hydrochloric acid containing free chlorine. Corrosion resistance is significantly increased by the use of an impressed positive potential on the titanium.

The platinum group element coated onto the titanium allows the applied current to flow into the wall and prevents the substrate material - titanium - from oxidising with the resultant loss of electrical conductivity.

Star features

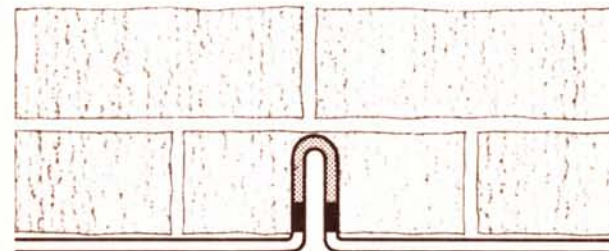
- * Rugged, reliable, virtually indestructible.
- * 30 year warranty.
- * Extensive use of grade 1 commercially pure titanium giving outstanding reliability and resistance to physical and chemical attack.
- * Fast and precise jointing using grade 1 commercially pure titanium crimp connectors.
- * The only system with a fast start characteristic.
- * Very low power consumption.
- * Minimum inconvenience during installation.

Advantages

The Lectros* system of active electro osmotic damp proofing is unique in the way it uses titanium and platinum group elements to carry all positive voltages. No other active system offers the safeguards against accidental or deliberate abuse as the Lectros* system.

The Lectros* system has been intensively researched and tested under extreme environmental conditions so ensuring long term trouble-free operation

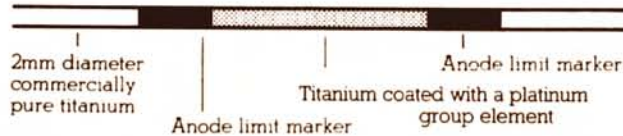
The Lectros* system is the simplest active electro osmotic system yet devised. Due to its high efficiency the anodes need only be placed a short distance into walls for full control over rising damp.



Such is the versatility of the Lectros* system the anode section, being only 2mm in diameter, may be bent or shaped on site to fit any irregularly shaped hole. The Lectros* system also ensures that all of the costly anode section is exposed in the wall thus eliminating wastage.

Technical data

Grade 1 commercially pure 2mm diameter titanium wire is interconnected at intervals with anodes. The limits of the coated anodes are indicated by two distinctive coloured bands.



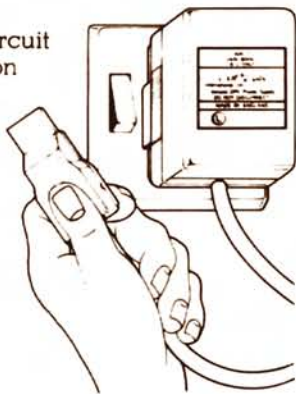
The titanium wire, though tough, may be cut with pliers and a join made using titanium crimps ensuring a mechanically powerful and virtually indestructible joint.



Power unit

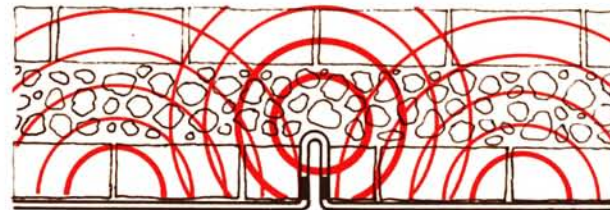
Due to the very high efficiency of the Lectros* system a small yet robust power unit has been developed. It has the following excellent features:—

- 1** Automatic L.E.D. circuit malfunction detection
- 2** Totally sealed unit
- 3** Extremely low power consumption
- 4** Meets all known electrical safety regulations
- 5** Plug-in capability



How it works

After the titanium damp course has been fitted a small voltage is applied to the titanium via the power unit. Immediately all the titanium wire in contact with the wall and anode sections will conduct electricity. The nett result is equivalent to having one continuously conducting anode so enabling a very rapid build up in wall potential.



Initial switch on conditions. Total electrical conduction.

After a period of time an insoluble film of titanium dioxide will build up at the titanium/wall interface. Once this film has become established there is very little further electrical conduction from the titanium and corrosion ceases as long as the protective voltage is applied. The anodes will naturally continue to conduct so maintaining the wall potential.

To summarise, it can be said that the Lectros* system is virtually self-healing — scratch or abuse the titanium and it will quickly form another protective skin.



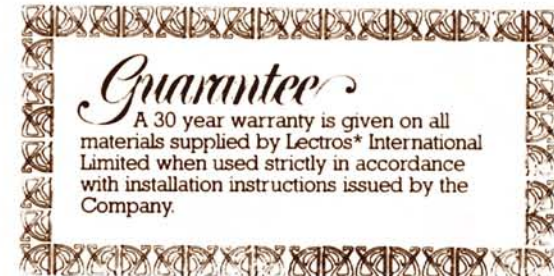
Normal operation. Only anodes conduct.

Systems

Electro osmosis has found increasing acceptance as an alternative to fluids and physical damp courses. When fitted correctly active electro osmotic systems give observably the fastest results. There are few restrictions on the type of property into which it can be installed.

It is Lectros International Limited's intention as the innovators of the finest system available to continuously research and, where possible, improve on active electro osmotic systems.

Lectros International Limited offer full technical back-up facilities — our policy is one of service to our customers.



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