

THICK FILM ELECTRODES FOR SENSORS

BI Technologies Limited - A proud member of the TT Electronics Plc has earned a great reputation for high quality, cost effective thick film components. Dynamic, focused and rich in heritage BI Technologies continues its evolution, driven by customer needs and the technology that serves those needs.

The innovation, experience and expertise in Thick film technology demonstrated over the past 60+ years has made BI Technologies a respected, worldwide resource for technologically advanced thick film products.

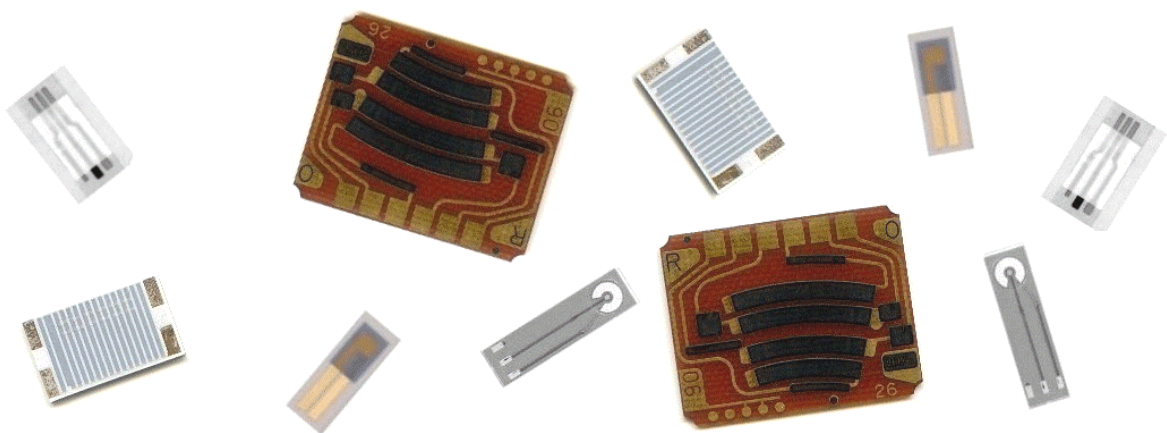
Our core technology consists of printing a variety of conductive and non-conductive thick film materials on Alumina and plastic substrates and processing the printed substrates to manufacture components used in applications as varied as automotive to X-Ray equipment. Our experience in efficient high volume manufacturing enables customer requirements to be transformed into cost-effective solutions.

Electrodes for Sensors

The growth in medical monitoring, diagnostics and detection of environmental contamination has stimulated significant innovation in thick film conductors for use as electrodes in bio-sensing and environmental sensing applications. Thick film technology using screen printing procedure is a simple and efficient method for producing electrodes for sensors. The most attractive characteristic of screen printing technology is its versatility in being able to deposit cost-effectively, a variety of materials on a variety of substrates.

The following pages summarise the Thick Film Electrode capabilities of BI Technologies Limited.

These capabilities are for sensor electrodes only and do not extend to sensor reagents.



TECHNICAL CAPABILITIES

1. GENERAL

- QS9000 Approved Facility
- Clean Room Environment – Approaching class 10000
- Over 500,000 Sq Inches Capacity for Printing and Firing per day
- Double Sided Print Capability
- Via Printing
- Multilayer Capability

2. SUBSTRATES

All substrates are processed in sheet form only in order to maintain print registration to tight tolerances.

Materials	96 % Alumina, Polyester, Polycarbonate, FR4, Customer specified
Standard Thicknesses (Inch)	0.005 to 0.060 inch Customer Specified
Maximum Size (Inch)	6 X 4

3. CONDUCTORS

Material	Resistivity	Line Width (in)	Line Spacing(In)
<u>Fired Conductors</u>			
Gold	6 mΩ / Sq. Max.	0.004	0.004
Palladium Silver	30mΩ / Sq. Max.	0.005	0.005
Platinum Silver	5 mΩ / Sq. Max.	0.005	0.005
Silver	3.5mΩ / Sq. Max.	0.008	0.008
<u>Cured Conductors</u>			
Conductive Polymer			
Silver/Silver Chloride			
Customer Specified			

4. PASSIVATION

Glass
Polymer
Customer Specified

5. REAGENTS

Development of reagent systems, printing or deposition of reagents is outside the present capabilities of BI Technologies Limited.



6. DEVICE SIZE

BI Technologies Limited has the ability to manufacture electrodes in various sizes ranging from 0805 to 4X6 inches.

7. PACKAGING

Bulk Packaging
Tape & Reel
Tube Packaging
Tray Packaging
Customer Specific

8. PROCESS

Printing

All printing is carried out on either manually fed screen printers or automated screen printers. Substrates are registered using centre chucking or corner alignment or specific fixturing.

Firing

Cermet based conductors which are printed on Alumina substrates are fired at temperatures ranging from 600 degC to 950 degC. The actual firing temperature depends on the material.

Glass passivating materials are fired at temperatures ranging from 510 degC to 600 degC. All glasses used are Lead free and Cadmium free.

Curing

Curing of polymer based materials is done either in conveyor furnaces or batch ovens with accurate temperature control.

Testing

BI Technologies will perform in-process inspection in keeping with their established sound practices of process control of screen printing operations.

Final inspection and testing of finished electrodes is subject to negotiation with the customer.

