Semiconductor– HF Reaction Process (etching)

Barben Analyzer Technology, LLC

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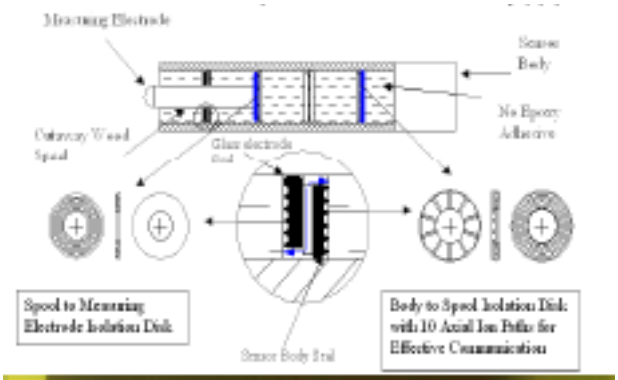

Description of the Axial ion Path Technology

Series 546 pH sensor

APPLICATION:

Hydrofluoric Acid (HF) is a selective solvent for Silicone Dioxide (SiO2) used in Semiconductor Technology of planer passivated devices: transistors, integrated circuits, diodes, rectifiers, SCR, MOS, FET and others.

Buffer HF is used to dissolve silica films produced on the surfaces of silicone and the areas exposed by photolithography. In addition, it also helps dissolve doped silica films such as phosphosilica and borosilica glasses as formed in semiconductor processing.

The reaction is as follows:

$4HF + SiO_2 \rightarrow SiF_4 + 2H_2O$

The concentration levels are extremely high with extreme conditions. The concentrations can be from 10,000 and 25,000 mg/l.

CHALLENGE:

The client was using an ISFET (ion selective field effect transistor) style pH sensor. The initial thought was to use this technology because it did not involve a glass tipped sensor. Without the proper technology, HF has a harsh effect on glass sensors.

In a one year period, the client purchased 2 to 3 sensors per process line and spent a considerable amount of time servicing the sensors.

SOLUTION:

Barben Analyzer Technologies was able to provide a rugged pH sensor with their 546 series sensors, in order to withstand these extreme conditions. In a performance test, **Barben Analyzer Technology out performed the ISFET technology by (8) months.**

TECHNOLOGY

Barben Analyzer Technologies has an Axial Ion Path technology that withstands extreme process conditions.

The axial ion path technology provides:

- Five filtration stages
- Long tortuous path to resist poison ingress
- Non-fouling ion paths,
- Large quantity of KCL
- Nose baffle seals
- Massive reference electrode wires
- Teflon junction
- Specialized glass tip

Please contact either Barben Analyzer Technology or Kube Engineering with your application needs.

Features

- Five filtration stages
- Long tortuous path to resist poison ingress
- Non-fouling ion paths,
- Large quantity of KCL
- Nose baffle seals
- Massive reference electrode wires
- Teflon junction
- Specialized glass tip
- Proper techniques

Instrumentation Sales, Engineering and Service

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Kube Engineering is a leading supplier of fluid handling, measurement and control products for a wide range of industrial process applications

Since 2001, Kube has grown to serve the needs of a broad customer base within a wide range of industries: water, waste water, sanitation, oil production, refineries, power generation, facilities, HVAC, industrial machinery, food and beverage.

Kube is a total solutions supplier, offering instrumentation & mechanical products, engineering services and start-up services. Our commitment is to understand and exceed the expectations of our valued customers, while delivering a high quality product, service and solutions to their most demanding requirements.

Our team of Engineers and Professional Sales Staff are able to assist with design, layout, proper instrumentation, application assistance, supply, service, and product removal on all products we offer.

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