

Nanomet Materials & Technology

UNDER BUMP
METALIZATION

MEMS PROCESSING

ADVANCED PACKAGING

PHOTOVOLTAIC

- > **Nickel**
- > **Cobalt**
- > **Gold**
- > **Palladium**
- > **Tin**
- > **Copper**
- > **Cleaning**
- > **Etching**



ISO 9001:2000
Registered



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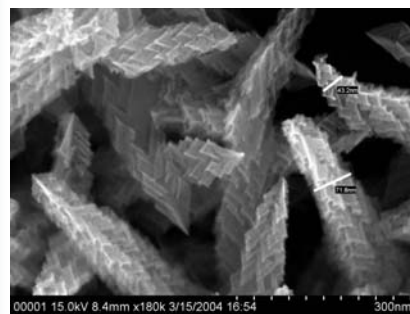


Stapleton Technologies delivers surface finishing process through a range of specialized materials and services to clients worldwide. The core technologies utilize autocatalytic processes in the reduction of metals from salts to solid metal. For over 50 years we have supported our clients and delivered technologies through high purity process chemistry and specialized equipment.

We provide a specific function of enabling clients to integrate immersing process technology into their manufacturing process through process development and equipment engineering. From this effort we have generated core technology that lets us quickly move from prototype to production for clients in the semiconductor and solar industries.

Mobius Solutions ®

These processes are used to metalize wafers with a combination of different metals. A critical aspect of this market is the formulation of process chemistry that has less than 1ppm sodium content. This is very important to the yield of CMOS wafers and the control of the break down voltage of the device. We provide these materials in semiconductor packages with 0.1um filtration and certification. These processes are distributed exclusively by Technic.



Nanomet

This group of processes incorporate an advanced coating technology producing specific structures that provide a new level of performance. These coatings include the Tribol® processes that offer a chrome replacement in unlubricated high wear applications. The photo to the left shows a fractal palladium deposit that can be used in microchip fuel cell applications.

Autonic® Autobond®

These processes provide a range of autocatalytic (electroless) nickel that meet a wide range of material requirements. We also provide a series of products for removal of lead from brass fittings, AutoPure®, so that the drinking water has less than 0.1ppb of lead. Our Galileo® software is used to manage the operations and provides a SQL server to manage the flow of parts and chemistry, including supply chain management. This is an important element of our supply system in serving clients worldwide.

Delivering Value through High Purity Chemical Processes

Engineering Services

Engineering Services are provided by Stapleton to either support clients development programs or Stapleton's basic research. This effort is basic research in materials and coatings and is the first step in most projects to determine the technical viability of a project. This effort involves survey of published sources as well as validation of existing process and basic research in mechanisms and materials for future coatings.

Process Engineering

Stapleton has over 50 years of experience in formulating surface finishing chemistries. These processes represent the core technologies that are tailored to new applications as they arise. This process typically involves the monitoring of a surface condition and the methodic testing of different conditions to enhance the desired effect. Once these changes have been validated a custom material is established and placed into the delivery system.

Production Engineering

In all cases the processes are operated in a tool. This tool supports all the operating conditions and has the capability to meet the production requirements. Tools can be fully automatic, semi-automatic, and manual. Tools can incorporate simple controls or use our Galileo SQL Server and synchronize process operations with our main server.

Tools are custom built and incorporate service utilities to monitor the tool performance as well as the manage the chemistry.

Materials Management

The delivery of materials and the management of the processes for the client is the final step in implementing these advanced coating technologies. This involves the commissioning of the tool and startup of the process.

The Supply Chain Management system tracks the use of materials at the tool.

Products are manufactured using an ISO9001:2000 Quality System to semiconductor standards incorporating Electronic Change Control, ECC, to manage the formulas; Work Orders are used to produce mixing instructions; detailed trace chemical analysis are used to certify the material; laser particle count and Cleanroom packaging completes the process.

Product containers are serialized and incorporate keyed bungs to improve operations on the tool. This permits the electronic tracking of the yield automatically within the tool so that overall costs can be controlled. Products are provided "Ready to Use" with a complete analysis of all trace elements to ppb levels.

Detailed statistical analysis including ANOVA and others can be performed on the data to produce efficient cause and effect studies on specific defects. The tool performance can also be analyzed and service recommended. Tool service and on-site training and development are also provided through a Service Contract.

How Can We be of Service?

We stand ready to meet your most demanding process requirements. We can provide process chemistry for existing facilities or work with you from the beginning to build a complete process and delivery program to meet your most demanding production requirements.

