



MATERION



**ADVANCED
MATERIALS GROUP**

Reclaim and
Refining Services

Reclaim and Refining Services

The Challenge

Precious metals are often lost as a result of internal manufacturing processes, thus increasing the cost of production. Metals can adhere to chamber shields, or remain in cleaning solutions, or become by-products or scrap. The challenge is to recover the greatest amount of precious metal feasible; and to render it in the purest form. This requires technical capabilities that can both reclaim precious metal and refine it – in order to return high-purity metal that meets the customer's requirements

The Solution

Materion employs a comprehensive approach to reclaiming precious metal from the production waste stream, as well as refining the recovered metal.

- New techniques allow us to identify, collect, segregate & recover a wide variety of precious metal by-products
- Chamber shield cleaning for the most effective recovery of metal from shields as well as from chemical solutions
- Two of the largest state-of-the-art chemical and electrolytic refiners in North America
- Choice of multiple refining methods to increase metal recovery
- Refining outturn upgraded to high purity for customer's use in products
- Specialized experts in precious metals materials management assist with metal recovery plans for improved profitability

BENEFITS

One-stop solution for precious metals management offers these advantages:

- Technical expertise based on 100 years of experience in refining, recycling and recovery
- Higher metal returns and fast settlements within the industry
- Ability to support full Mass Balance
- Returned metals tested to identify any trace elements using ICAP, GDMS & XRF
- Strategically located cleaning sites in the US and global recovery presence
- R&D team continuously exploring new methods to increase recovered value



Materion ... Materials to Advance the World's Technologies



KEY INDUSTRIES

We serve diverse industries that utilize precious metals in their production processes.

- Semiconductor
- Sensing
- LED
- Photovoltaic
- Data Storage
- Braze
- Wireless
- Industrial
- Medical
- X-Ray
- Photographic
- Dental
- Catalysis
- Photonics

PRECIOUS METAL REFINING

Multiple technologies and refining processes ensure that customers receive full recoverable value.

Refining Methods

- Blending
- Melting
- Incineration
- Screening/Sifting
- Milling
- Thermal Reduction
- Smelting
- Electrochemical refining
- Hydrometallurgical refining
- Electrochemical refining

RECOVERABLE MATERIALS

We can reclaim precious metals from a broad range of sources.

- Semiconductor and solar cell wafers
- Spent plating solutions
- Large area coating
- Sputtering targets
- Plating baths
- Industrial manufacturing
- Coated films and more

Types of Metals

- Gold
- Rhodium
- Palladium
- Ruthenium
- Platinum
- Others
- Silver

CHAMBER SHIELD CLEANING

Best-cost models can be obtained through use of our PVD materials & chamber shield cleaning services.

- Fullest possible recovery of precious metals from chemical cleaning solutions
- Lower equipment cost of ownership
- Variety of flexible settlement plans with fast turn-around for improved cash flow

ENVIRONMENTAL LEADERSHIP

All our disposal procedures comply or exceed State & Federal regulations.

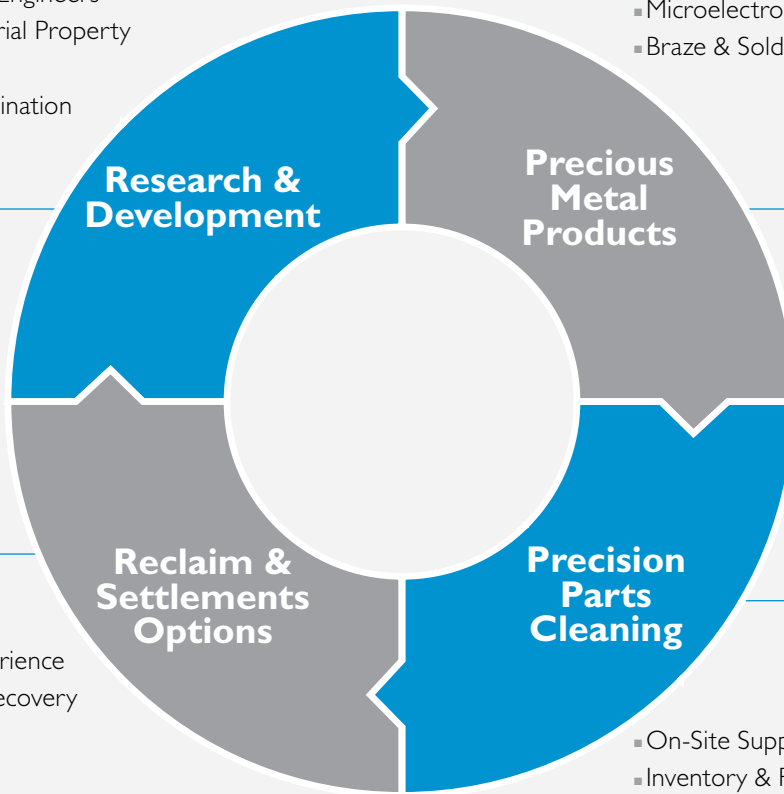
Certifications include:

- ISO 9001:2008 Quality Systems
- ISO 17025:2005 Analytical Laboratory
- ISO 14001:2004 Environmental Safety & Management Systems
- LeanSigma



- Dedicated Team of Experts
- Metallurgists
- Chemists
- Materials Scientists
- Processing/Application Engineers
- Microstructure & Material Property Analysis
- Precious Metal Determination

- Thin Film Deposition Materials
- Evaporation Materials
- Precious Metal Sputtering Targets
- Non-Precious Metal Sputtering Targets
- Microelectronic Packaging Materials
- Braze & Solder Alloys



- 100+ Years of Experience in Precious Metal Recovery & Refine
- Variety of Recovery Techniques
- Inventory Management
- Metal (Pool) Accounts
- Settlement Accuracy Database Manager
- Flexible Settlement Options

- On-Site Support
- Inventory & Fab Management
- Proprietary Chemical Cleaning & Degreasing
- Semiconductor Grade Final Packaging
- Advanced Surface Modification & Coatings



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MATERION CORPORATION
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MATERION ADVANCED MATERIALS GROUP is a global advanced materials and services company, dedicated to providing solutions that enable our customers' technologies and drive their growth. Our products include precious and non-precious specialty metals, precision optical filters, inorganic chemicals and powders, specialty coatings, specialty-engineered beryllium alloys, beryllium and beryllium composites, and engineered clad and plated metal systems. The Materion business is structured to enhance our ability to provide customers with innovative, best total-cost solutions.