



Vacuum Engineering & Materials

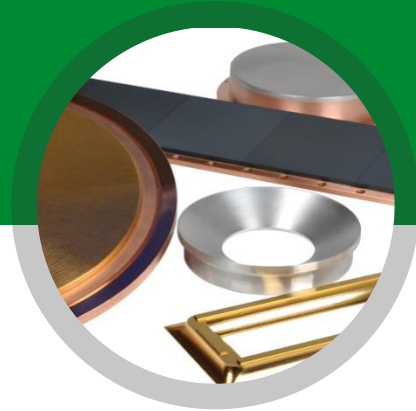


Vacuum Engineering & Materials

-  Global supplier of PVD materials
-  Founded in 1987
-  Headquartered in the Silicon Valley
-  Over 300 customers worldwide
-  Extensive manufacturing capability
-  Experienced technical support team
-  World class customer service



We Offer a Full Range of Products and Services



Products

- Sputtering Targets
- Evaporation Materials
- Crucible Liners
- Backing Plates
- Chamber Components

Services

- Bonding Services
- Precious Metals Reclaim
- Shield Cleaning
- Hot Press
- Engineering Services

VEM Products



Precious Metals

- Long term partnership with largest precious metals refineries in the world
- VEM manufactures platinum pellets, gold wire and Ultra Pure Gold to reduce spitting events



Compounds

- Develop and manufacture compounds using VEM's powder metallurgy and hot press capabilities
- Manufacturing capability includes 200 ton, 2,000° C hot press
- Products include WTi, SiCr, NiCrSi, and TiAl



Mainstream Materials

- Offer a full range of materials including Al, AlCu, Ti, Cu, W and Ta
- Supply chain management programs including inventory management and consignment programs
- Robust quality management processes and inspection capabilities

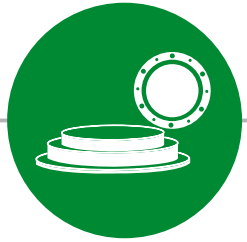
We Have Extensive Manufacturing Capability

- 250 ton, 2000° C Vacuum Hot Press for targets ranging from 50mm – 450mm
- Powder Lab with multiple blending tools including an Eirich Blender for quick homogenous material blends
- Induction Melting Equipment, Process Logic Controlled, to ensure a repeatable process
- Inductively Coupled Plasma (ICP-OES) System for material analysis
- High-purity Indium Bonding capability used to adhere sputtering targets to backing plates
- C-scan Ultrasound to ensure the integrity of targets and backing plates



VEM Services

Target Bonding Services



- High Purity Indium Bonding
- >2,000 bonds per year

Shield Cleaning



- Cleaning of sputtering and evaporation shields and vacuum components used in PVD & Etch chambers
- Experienced Operations team

Precious Metals Reclaim

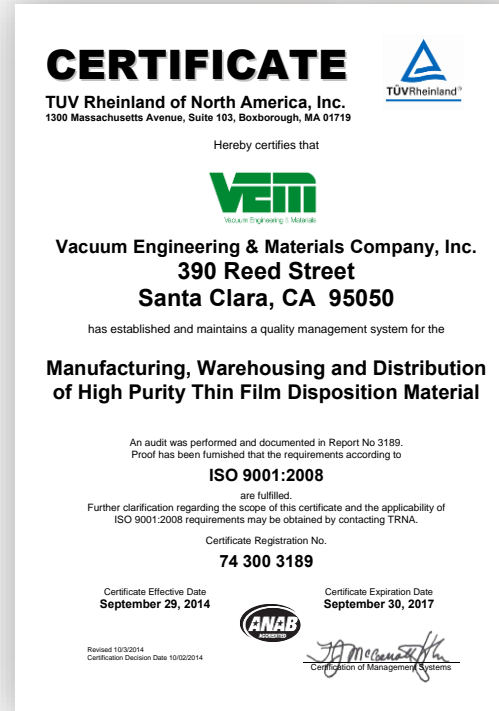


- High return rate
- Short settlement times



Our Quality and Compliance

- ISO9001:2008 Certified
- RoHS Compliance
- Quality Systems: CAPA, SPC, 8D
- Conflict Materials Compliant



We Serve Diverse Markets



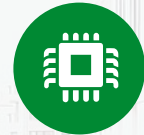
**RF Wireless
Communication**



Photonics



LED's



MEMs



Power Devices



Photovoltaics



Memory/Logic



**Advanced
Packaging**

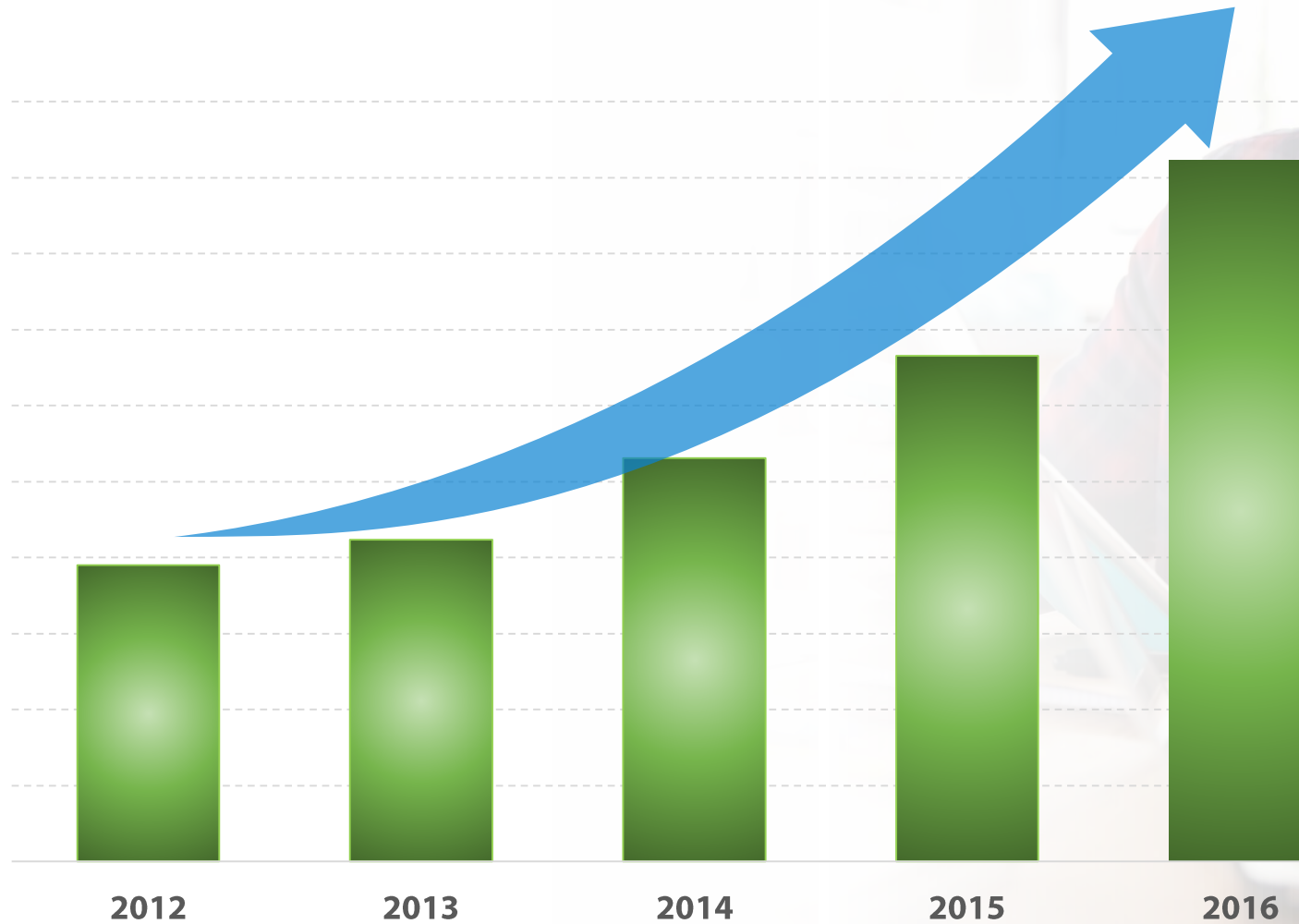


**Emerging Display
Technologies**



Data Storage

We've Grown with Our Customers



VEM' s Management Team



Bob Kavanaugh
President

Joined VEM in 1994
20 yrs of PVD
materials experience
BA, University of
Southern California



Stephanie McConnell
Chief Financial Officer

Joined VEM in 2009
20 yrs of Finance experience
BS Finance, California
State University



Barry Henson
Vice President,
Operations

Joined VEM in 2007
35 yrs of Operations
experience
Previous Operations
management roles with
Heraeus and Leybold
Materials



Melvin Hirata
Vice President,
Sales/Marketing &
Technology

Joined VEM in 2012
25 yrs of Sales/Marketing
& Engineering experience
BSEE, University of
Hawaii

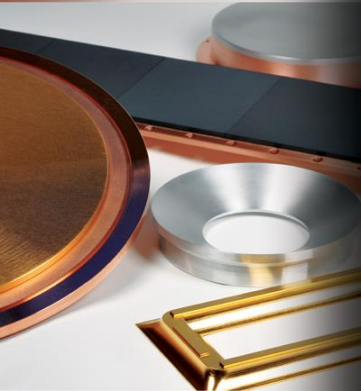
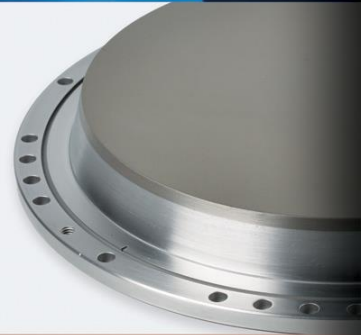
Our Vision

- To be the most trusted supplier to our customers

Our Vision & Mission

Our Mission

- Deliver world class quality products and services
- Build customer loyalty
- Inspire a winning team
- Achieve strong financial performance
- Be a model for our community and environment



VETM

Vacuum Engineering & Materials

