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**UNITED STATES  
SECURITIES AND EXCHANGE COMMISSION  
Washington, D.C. 20549**

**FORM 8-K**

**CURRENT REPORT**

**Pursuant to Section 13 OR 15(d) of The Securities Exchange Act of 1934**

**Date of Report (Date of earliest event reported) May 12, 2008**

**Brush Engineered Materials Inc.**

(Exact name of registrant as specified in its charter)

Ohio

(State or other jurisdiction  
of incorporation)

001-15885

(Commission  
File Number)

34-1919973

(IRS Employer  
Identification No.)

17876 St. Clair Avenue, Cleveland, Ohio

(Address of principal executive offices)

44110

(Zip Code)

Registrant's telephone number, including area code 216-486-4200

Not Applicable

(Former name or former address, if changed since last report.)

Check the appropriate box below if the Form 8-K filing is intended to simultaneously satisfy the filing obligation of the registrant under any of the following provisions (see General Instruction A.2. below):

- ☐ Written communications pursuant to Rule 425 under the Securities Act (17 CFR 230.425)
- ☐ Soliciting material pursuant to Rule 14a-12 under the Exchange Act (17 CFR 240.14a-12)
- ☐ Pre-commencement communications pursuant to Rule 14d-2(b) under the Exchange Act (17 CFR 240.14d-2(b))
- ☐ Pre-commencement communications pursuant to Rule 13e-4(c) under the Exchange Act (17 CFR 240.13e-4(c))
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### Item 7.01 Regulation FD Disclosure

On May 12, 2008, Brush Engineered Materials Inc., an Ohio corporation (the “Company”), updated the “Current Investor Update,” a slide presentation on its website, a copy of which is attached hereto as Exhibit 99.1. This slide presentation shows the Company’s corporate strategy and the financial results through the first quarter of 2008.

### Item 9.01 Financial Statements and Exhibits

Exhibits:

<u>Exhibit Number</u>	<u>Description of Exhibit</u>
99.1	Current Investor Update

### SIGNATURES

Pursuant to the requirements of the Securities Exchange Act of 1934, the registrant has duly caused this report to be signed on its behalf by the undersigned hereunto duly authorized.

Brush Engineered Materials Inc.

May 12, 2008

By: Michael C. Hasychak  
Michael C. Hasychak  
Vice President, Treasurer and Secretary

## *Forward-Looking Statements*

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These slides contain “forward-looking statements” within the meaning of the Private Securities Litigation Reform Act of 1995. These statements involve known and unknown risks, uncertainties and other factors that could cause the actual results of the Company to differ materially from the results expressed or implied by these statements, including health issues, litigation and regulation relating to our business, our ability to achieve profitability, significant cyclical fluctuations in our customers’ businesses, competitive substitutes for our products, risks associated with our international operations, including foreign currency rate fluctuations, energy costs and the availability and prices of raw materials and other factors disclosed in periodic reports filed with the Securities and Exchange Commission. Consequently these forward-looking statements should be regarded as the Company’s current plans, estimates and beliefs.

The Company does not undertake and specifically declines any obligation to publicly release the results of any revisions to these forward-looking statements that may be made to reflect any future events or circumstances after the date of such statements or to reflect the occurrence of anticipated or unanticipated events.



# *Brush Engineered Materials Inc.*

## *Profile*

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- Publicly traded since 1956: NYSE-listed since 1972
- Founded 1931 as Brush Beryllium Company, recently celebrated 75th anniversary
  - Building off earlier pioneering technical work at Brush Laboratories
  - Initial scope was development of commercial markets
- With onset of WW II and post war period, significant growth in defense and eventually, aerospace applications
- Mid-70s: major expansion of new commercial markets
- Today, commercial markets represent over 90% of revenues



## *Brush Engineered Materials Inc. Profile*

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- A leading manufacturer of high performance specialty engineered materials and services ... *an enabling materials technology company*
- Four segments...with operations, service centers and major office locations in North America, Europe and Asia
- Serving long-term growth oriented global markets from consumer electronics to heavy mining equipment



# *Brush Engineered Materials – Core Competency*

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## **A common approach to markets and culture across our operating companies**

- Collaborating with customers worldwide to solve material application challenges ... *with a focus on enabling technology and services*
- "Own" a Niche orientation ... non-commodity
- Focus on global growth and service
- Constantly looking ahead to realign product and service portfolios towards favorable trends ... targeted to achieve strong profitable growth
- Employees who are *passionately* focused on exceeding customer expectations



# Overview

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- Company: Brush Engineered Materials Inc.  
founded 1931, publicly traded since 1956
- NYSE Ticker: BW
- Shares Outstanding: Approximately 20.4 million at 3/28/08
- Market Cap: Approximately \$540 million at 3/28/08
- Component of: S&P Super Composite 1500, Russell 2000  
S&P Small Cap 600
- Annual Revenue: \$956 million @ 12/31/07
- First Quarter Revenue: \$226 million @ 3/28/08
- First Quarter Diluted EPS: \$0.22 for Q1-2008 which includes an accounts receivable correction relating to 2007, a change in a deferred tax asset valuation and non-recurring purchase accounting costs, or an operating rate of \$0.35 excluding the above items
- Debt to Total Capitalization: 20% at 3/28/08



## 2007 Recap

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- Record sales of \$956 million, up 25% over 2006
- Earnings per share of \$2.59 compares to prior year's \$2.45
- Earnings per share of \$1.79\* compares to prior year's \$1.38 excluding items that should not repeat
- Sales growth, adjusting for metal price increased 20%
- A new annual sales high, even after adjusting for metal price inflation
- Twenty consecutive quarters of sales growth, nine consecutive quarters of double digit growth
- Operating profit was 6.4% of sales (excluding the benefit of non-recurring charges and metal price inflation) compared to 5.7% in 2006

\* \$1.79 excludes a litigation settlement, lower of cost or market charges, the loss on the sale of :  
the sale of low cost ruthenium purchased in 2006



## *Q1 2008 Recap*

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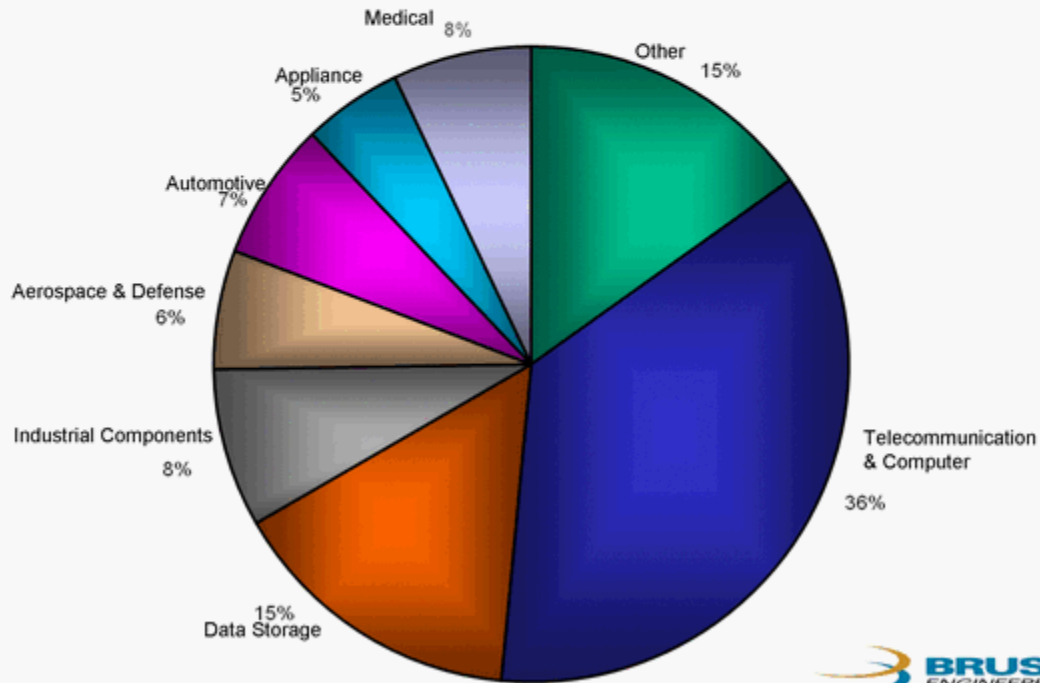
- Sales of \$226 million
- Earnings per share of \$0.22\*
- Acquisition of assets of Techni-Met, Inc. for \$87.4 million
  - Techni-Met produces precision precious metal coated flexible polymeric films used in a variety of high-end applications, including diabetes diagnostic test strips.

\* Includes an accounts receivable correction relating to 2007, a change in a deferred tax asset valuation and non-recurring purchase accounting costs



# *Global Leader in High Performance Engineered Materials*

**Q1 2008 Revenue by Market**



# *Advancing the World's Technologies*

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- Strong customer collaboration ... providing enabling technology solutions and service
- Materials that meet design challenges requiring
  - Strength
  - Electrical conductivity
  - Weight reduction
  - Reflectivity
  - Reliability
  - Miniaturization
  - Corrosion resistance
  - Thermal conductivity
- Targeting profitable growth applications in growing markets



# Typical End Uses

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Defense

Notebook computers  
& network servers



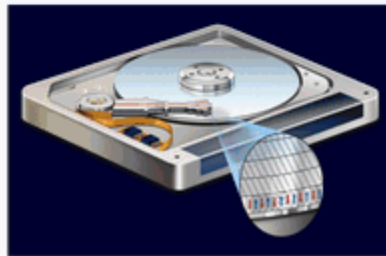
Cellular phones, i-Pods and other  
wireless communication devices



Commercial  
Aerospace



Electronic components  
in cars and trucks

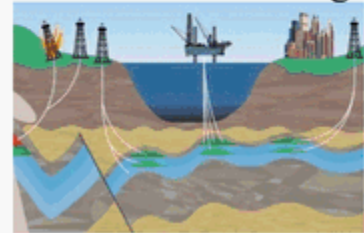


Data Storage

Medical  
Devices

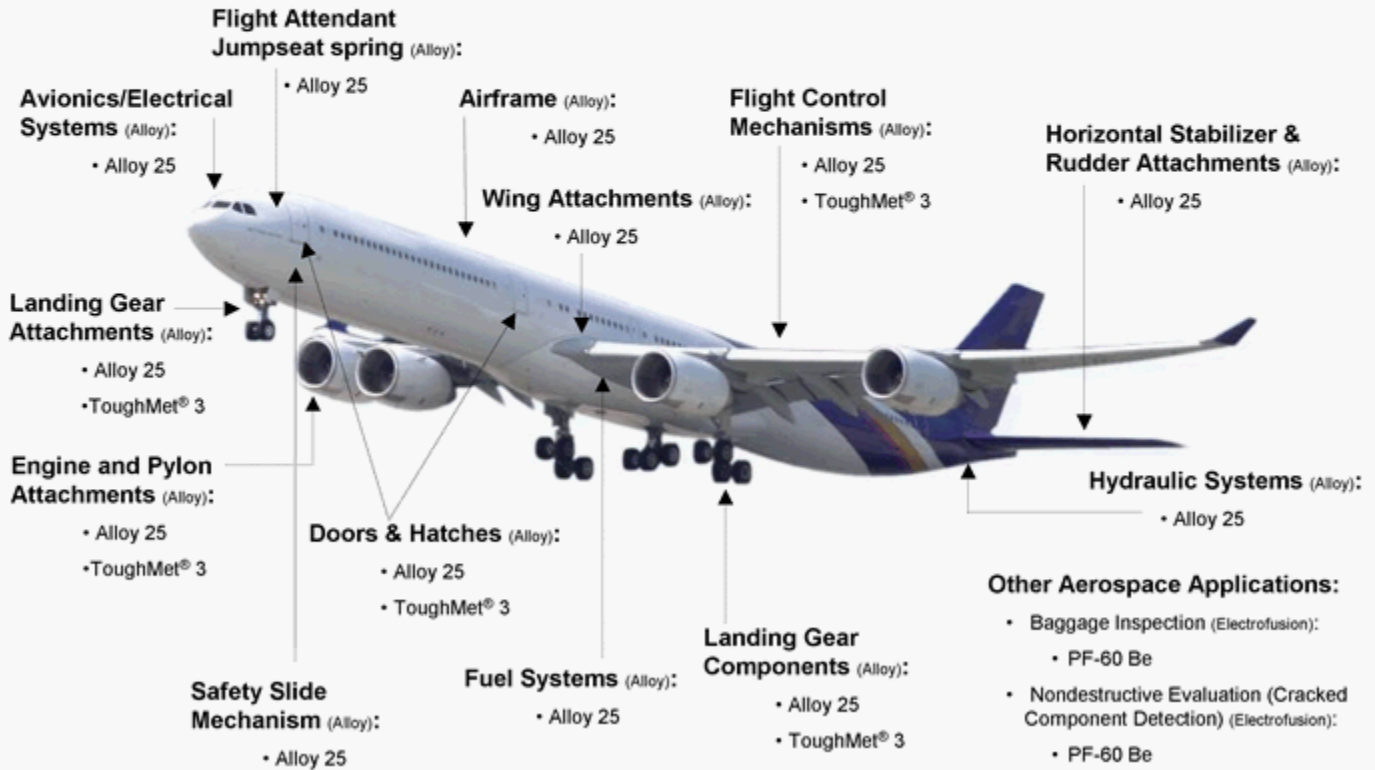


Industrial products for  
Oil & Gas and Mining



 **BRUSH**  
ENGINEERED MATERIALS

# Applications – Aerospace



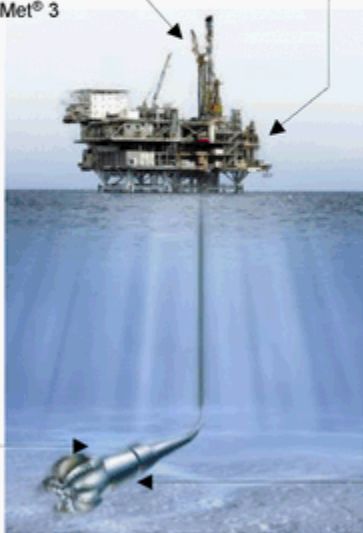
# Applications – Oil & Gas

## Wellhead Control Equipment (Alloy):

- Brush Alloy 25
- ToughMet® 3

## Structural Rig Components (Alloy):

- ToughMet® 3



## Drill Bits (Alloy):

- Brush Alloy 25
- ToughMet® 3

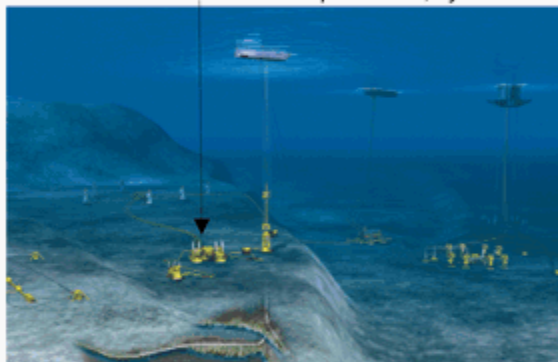
## Directional Drilling Equipment (Alloy):

- Brush Alloy 25
- ToughMet® 3

## Under Water Wellhead Equipment (Alloy):

- Brush Alloy 25
- ToughMet® 3

*Blow out preventers, hydraulic actuators*



## Other Oil & Gas Applications:

- In Situ Elemental Analysis (Electrofusion):
  - PF-60 Be; IF-1 Be
- Down Hole X-Ray Inspection (Electrofusion):
  - PS-200 Be

# Applications - Cell Phones

## Grounding Clips and Audio Jacks (Alloy):

- Brush 60
- Alloy 25/190/290

## Internal Antenna Contacts (Alloy):

- Brush 60/17410
- Alloy 25/190/290

## Internal Electronics (WAM):

- Thin Film Materials – Power amplifiers, SAW and BAW devices, filters, and IC's
- Frame Lid Assemblies for SAW
- Thin Film Material for backlight applications using LED technology
- Shield Cleaning

## Micro Mezzanine Connectors for LCD Screen (Alloy):

- Brush 60

## Battery Contacts (Alloy):

- Brush 60
- Alloy 25/190/290

## I/O Connector Contacts (Alloy):

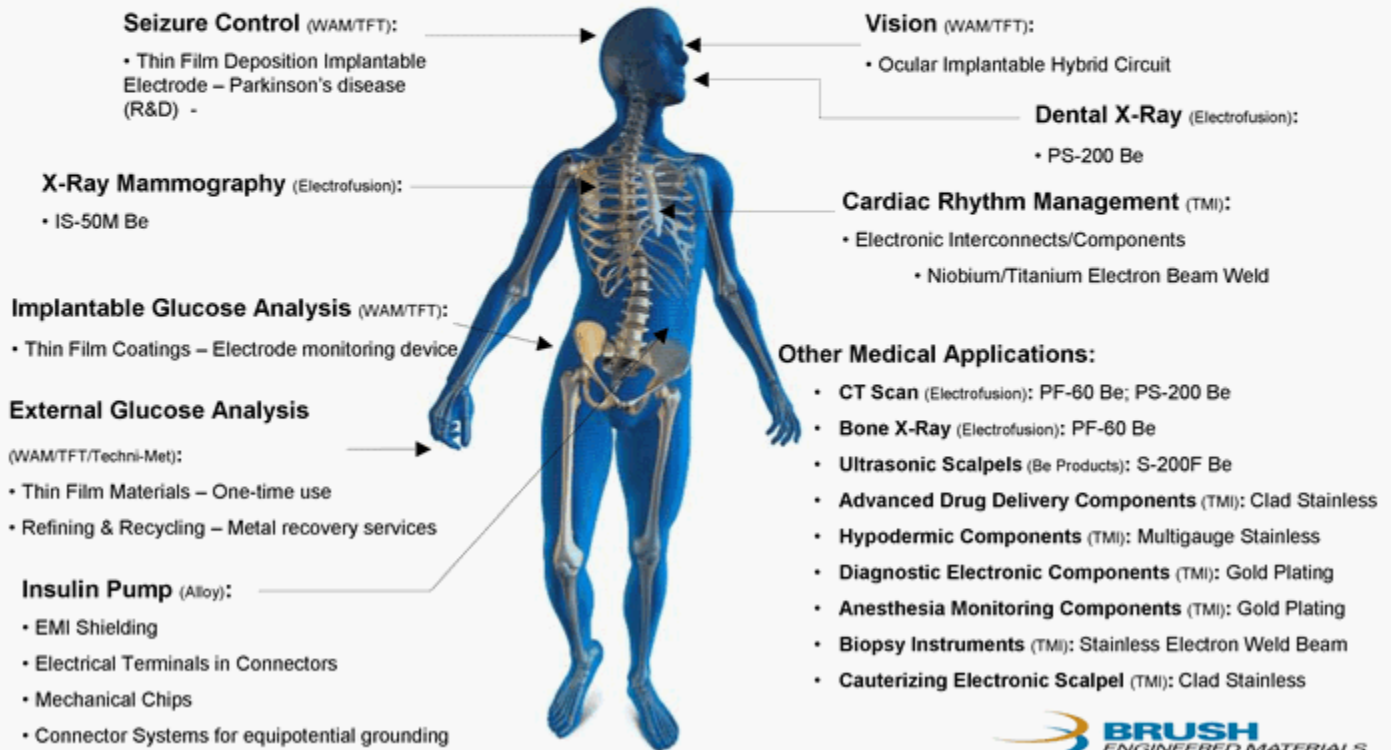
- Brush 60/17410
- Alloy 25/190/290

## Other Cell Phone Applications:

- **Circuit Board and IC Inspection** (Electrofusion/ Be Products):
  - PF-60 Be; IF-1 Be; AlBeMet 162
- **RoHS Compliance Assurance** (Electrofusion):
  - PF-60 Be; IF-1 Be



# Applications – Medical



## *Investment Highlights and Strengths*

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- Global Leader in High Performance Engineered Materials
- Unique Status as Fully Integrated Provider of Beryllium-Containing Products
- Broad Metallurgical Capabilities in Precious and Non-precious Metals
- Global Sales and Distribution Network
- Sales Based on End User Specifications
- Niche Oriented Product Offerings
- Strong Value Proposition in Served Markets
- Strategic Customer Relationships
- Significant Technical Capabilities
- Positive Long-term Market Trends
- Strong Growth in New Products, a culture of Innovation
- High Barriers to Entry
- Capacity to Support Profitable Market Growth
- Strong Balance Sheet
- Strong Cash Flow



# *Brush Engineered Materials Inc.*

## *Organized into Four Separate Reportable Segments*

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- **Advanced Material Technologies and Services**

Advanced Material Technologies and Services consists of Williams Advanced Materials Inc. (WAM)

- **Specialty Engineered Alloys**

The Specialty Engineered Alloys segment consists of Alloy Products which includes bulk and strip form copper-based alloy products, hydroxide and the Company's line of ToughMet® materials

- **Beryllium and Beryllium Composites**

The Beryllium and Beryllium Composites segment consists of Beryllium Products including beryllia ceramic manufactured by Brush Ceramic Products Inc.

- **Engineered Material Systems**

The Engineered Material Systems segment is comprised of Technical Materials, Inc.



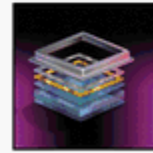
# *Advanced Material Technologies and Services*

## *Q1 2008 Sales: \$120.7 million*

### **Williams Advanced Materials (WAM)**

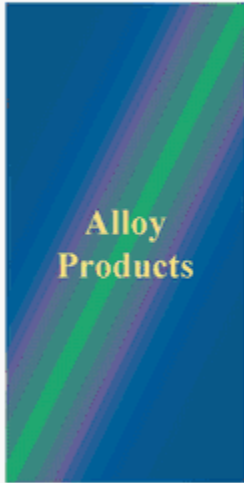
#### **\$120.7 million; 53%**

- Precious metal and specialty alloys for high reliability applications
- Products include precious and non-precious metal vapor deposition targets, frame lid assemblies, clad and precious metal preforms, high-temperature braze materials and ultra fine wire
- Industries served include magnetic and optical data storage, semi-conductor, performance film, wireless/phonics and precision optics



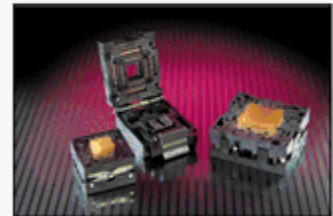
## *Specialty Engineered Alloys*

### *Q1 2008 Sales: \$71.3 million*



**\$71.3 million; 32%**

- Copper and nickel-based alloy materials, most of which incorporate beryllium
- Strip products are used in electronic connectors including PDA's, wireless communications equipment, notebook and network computers and automotive electronics that require high strength, formability and electrical conductivity
- Bulk products are rod, bar, tube and plate products for heavy equipment and aerospace bushings and bearings, oil & gas components and plastic mold materials where strength, corrosion and wear resistance, thermal conductivity and lubricity are critical performance requirements



 **BRUSH**  
ENGINEERED MATERIALS

## *Beryllium and Beryllium Composites*

### *Q1 2008 Sales: \$13.4 million*

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#### **Beryllium Products**

**\$13.4 million; 6%**


- Pure beryllium and aluminum-beryllium composites for high-performance applications, principally for medical, space and defense applications where stiffness, strength, lightweight, dimensional stability, reflectivity and x-ray/nuclear properties are critical.



## *Engineered Material Systems*

### *Q1 2008 Sales: \$17.7 million*

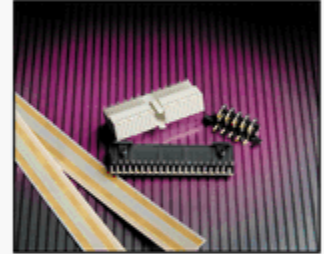
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#### **Technical Materials, Inc. (TMI)**

#### **\$17.7 million; 8%**

- Engineered material systems, including clad, plated and electron beam welded metals used in demanding connector applications
- Combines precious and non-precious metals in strip form for use in complex electrical components for telecommunications systems, computers and automotive electronics



# *Fully Integrated Beryllium Producer*

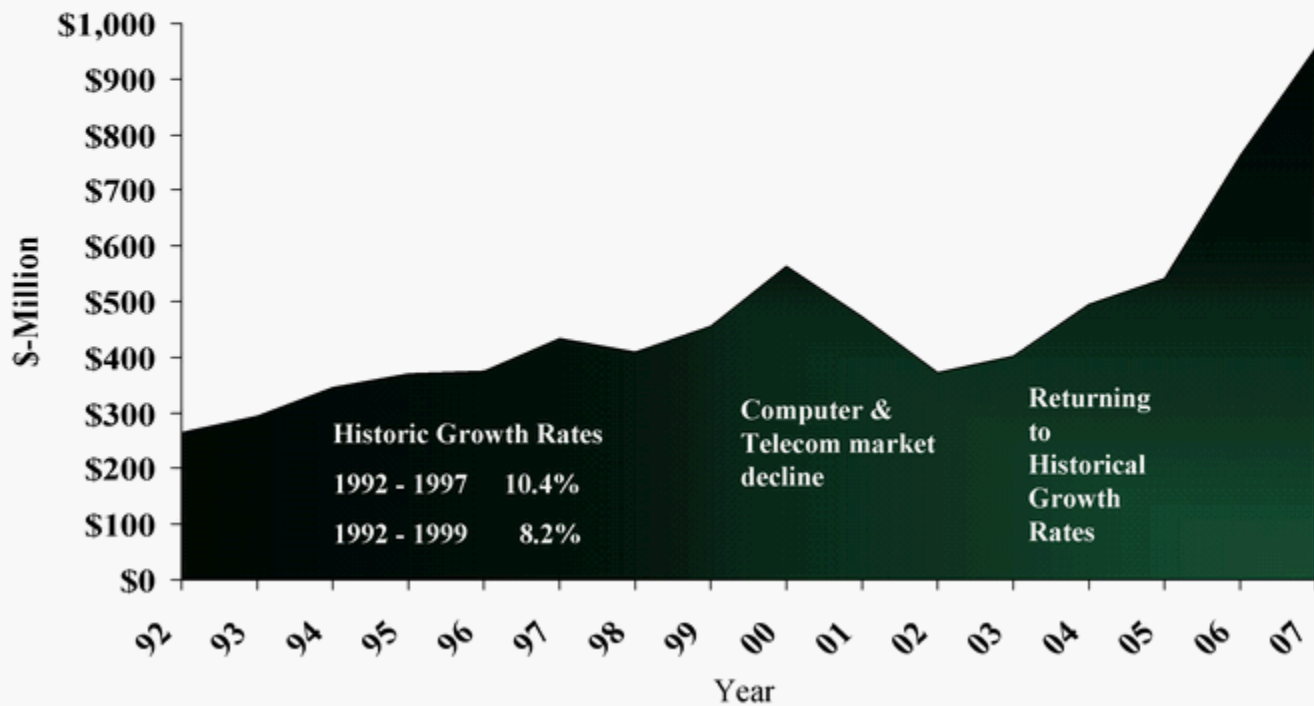
- Beryllium and beryllium alloys are critical to many high performance applications
  - Strong
  - Lightweight
  - Good formability
  - High reliability
  - Thermal and electrical conductivity
  - Corrosion and wear resistant
- Operate the only active bertrandite ore mine in the developed world
  - 7,500 acres in Juab County, Utah
  - Approximately 100 years of proven reserves



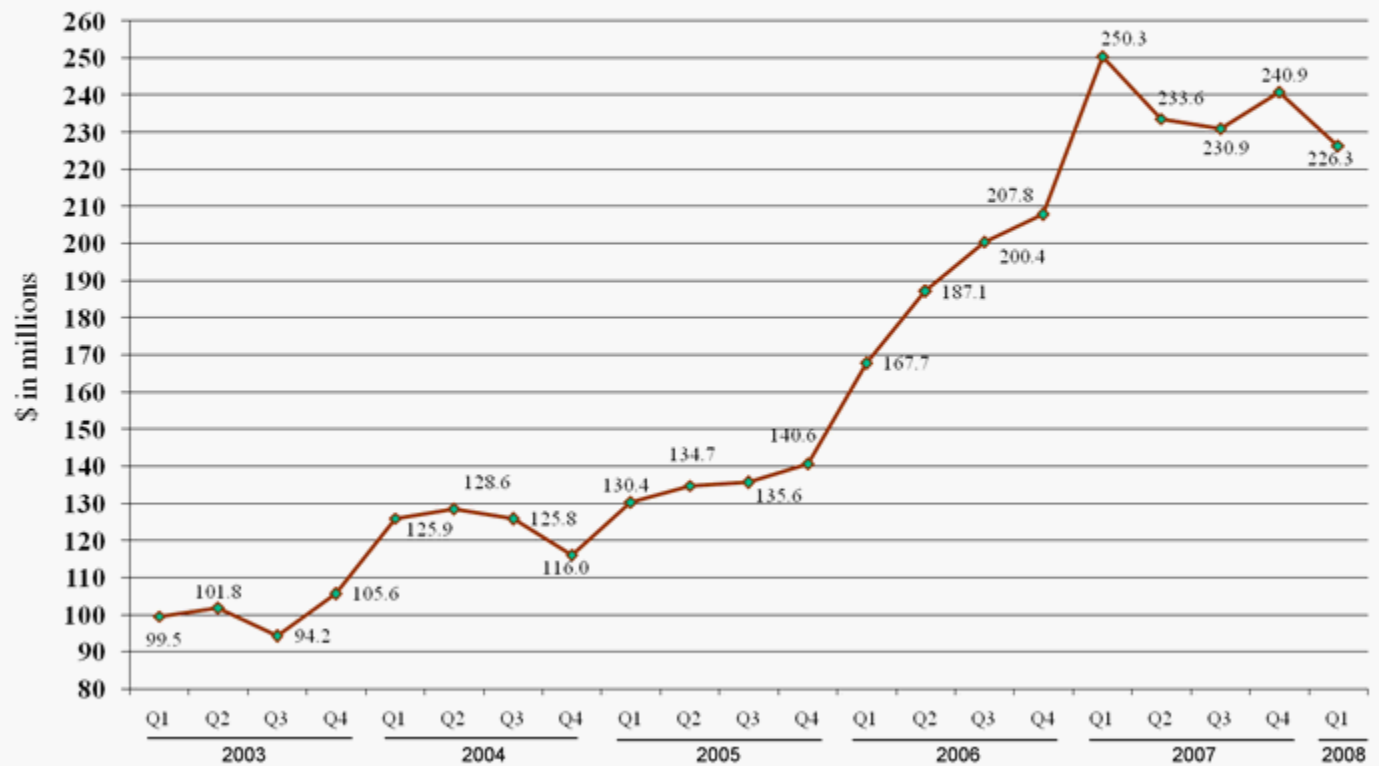
## *Key Financial Statistics*

\$ in millions	<u>2004</u>	<u>2005</u>	<u>2006</u>	<u>2007</u>
Sales	\$496.3	\$541.3	\$763.1	\$955.7
EBIT	25.0	19.5	43.8	84.5
Interest	8.4	6.4	4.1	1.8
Taxes	1.1	(4.7)	(9.9)	29.4
EPS	0.86	0.92	2.45	2.59
G.P.%	22.4%	20.3%	21.2%	20.6%
O.P.%	5.0%	3.6%	5.7%	8.8%
Depreciation & Amort.	21.2	21.7	24.6	23.9
Capital Spending	9.2	13.8	15.5	33.6
Debt	72.5	57.2	48.9	35.5
Cash	49.6	10.6	15.6	31.7
Debt/Total Cap.	26%	21%	15%	9%

*In 2001, the computer and telecom market decline drove sales back to mid-90's levels  
In 2003, growth began to return to historical rates In 2004-2007 growth accelerated*



# Historical Revenue by Quarter



## *Positive Market Trends*

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- Electronic component manufacturers are being driven by end user demands to produce products that are smaller, lighter and faster
  - Increased electronic component performance characteristics require materials that have enhanced mechanical, electrical and thermal properties
  - Growing opportunity for thin film physical vapor deposition (PVD) products in the data storage, semiconductor, solar and medical markets
  - Spending and conditions in the telecommunications and computer market have improved
  - Conditions continue to be strong in the oil and gas, undersea, aerospace and heavy equipment markets.
-

# *Capacity to Support Profitable Market Growth*

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*Well-positioned to support rapid sales growth with minimal incremental cash investment*

- Operating with available excess capacity in Alloy Products
    - Minor debottlenecking investments are required
  - WAM's Brewster, New York facility doubled its capacity in 2007
  - Second phase of WAM's Brewster, New York facility expansion to be completed in 2008
-

## *Our on-going value creation initiatives are focused in three key areas*

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### Growth

- Expanding and diversifying the revenue base
  - Targeting profitable niche growth applications in growing markets
  - New product innovation and service
- Ongoing global expansion
- Strategic acquisitions, fast accretion

### Margin Improvement

- Lean Sigma-driven operating efficiency improvement
- New higher value add products
- Cost reductions

### Fixed and Working Capital Utilization

- Inventory turn improvement
  - Lean Sigma-driven factory utilization gains
-

*New Products - Growing Applications in Growing Markets (all >10% annual growth expected) ... examples*

<u>Product</u>	<u>Market</u>	<u>Driver</u>	<u>Division</u>
PVD Magnetic Media	Hard Disk Drive	Increase Storage capacity	WAM
PVD - UMB	Consumer Electronics	Miniaturization	WAM
PVD - Evap Pro	Compound Semi-conductor	Miniaturization	WAM
Chamber Service	PVD Customers	Service demands	WAM
PVD - Visilid	Optics	IR Wavelength	WAM
Alloy 390 Strip	Portable Elec	Miniaturization and	Alloy
ToughMet®	O&G, Aerospace, Heavy Equipment	Reliability	Alloy
Clad Stainless-Aluminum Strip	Hard Disk Drive	Increase storage capacity	TMI

## *Balance Sheet*

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(\$ in millions)

	<u>2000</u>	<u>2004</u>	<u>2005</u>	<u>2006</u>	<u>2007</u>
Balance Sheet Debt	\$128.4*	\$ 72.5	\$57.2	\$48.9	\$35.5
Debt to Debt Plus Equity	36%	26%	21%	15%	9%

\*2000 Balance Sheet debt includes major equipment lease

\*\*Note - Excludes precious metal consignment  
and other leases of:      \$18.9      \$30.2      \$55.5      \$72.1      \$80.0

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# Segment Sales Review

\$ in millions

	2006		2007		1Q 2008	
	<u>\$</u>	<u>%</u>	<u>\$</u>	<u>%</u>	<u>\$</u>	<u>%</u>
Advanced Material Technologies and Services	\$343.4	45%	\$519.9	54%	\$120.7	53%
Specialty Engineered Alloys	275.6	36%	290.0	30%	71.3	32%
Beryllium and Beryllium Composites	57.6	7%	60.5	6%	13.4	6%
Engineered Material Systems	68.7	9%	70.9	7%	17.7	8%
Other	<u>17.8</u>	<u>3%</u>	<u>14.4</u>	<u>3%</u>	<u>3.2</u>	<u>1%</u>
TOTAL	\$763.1	100%	\$955.7	100%	\$226.3	100%



# Segment Earnings

Operating profit in millions

	<u>2006</u>	<u>2007</u>	<u>1Q 2008</u>
Advanced Material Technologies and Services	\$30.5	\$59.4	\$5.3
Specialty Engineered Alloys	7.9	7.6	0.7
Beryllium and Beryllium Composites	7.4	7.8	0.2
Engineered Material Systems	2.7	4.7	1.4
Other	<u>(4.7)</u>	<u>5.0*</u>	<u>0.4</u>
TOTAL	\$43.8	\$84.5	\$8.0

\* The Other segment earnings of \$5.0 million in 2007 is primarily due to a gain in Q4 recorded as a result of a legal settlement



*Brush Engineered Materials Inc.*  
*Organized into Four Separate Reportable Segments*

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- *Advanced Material Technologies and Services*
  - Specialty Engineered Alloys
  - Beryllium and Beryllium Composites
  - Engineered Material Systems
-

# *WAM Vision*

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- Globally Recognized High Quality/Technology Supplier of Products and Services for “State Of The Art”, Emerging and Leading Edge Markets and Industries.
- Williams will Create a “Unique” Business Model with its Central Focus being to Relentlessly Strive for Product Differentiation through a Combination of Technology, Services and Quality, Providing “Remarkable” Solutions.
- Our Business Values and Corporate Integrity will be the Cornerstone of the way we relate to our Customers, Partners, Suppliers, the Communities we Reside and most Importantly our Employees.



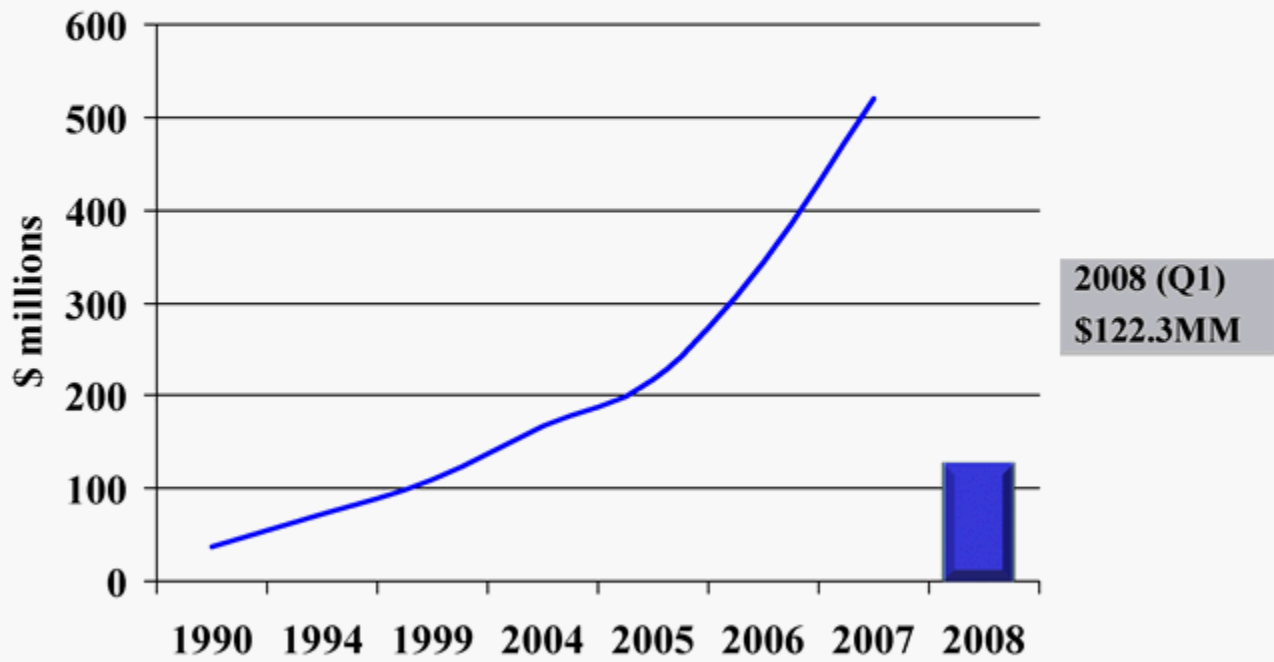
# *What We Do*

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Williams Advanced Materials develops, manufactures and markets materials, thin film deposition technology and services of unique value for the Magnetic and Optical Data Storage, Medical, Wireless, Photonics, Semiconductor, Optics, Security, Hybrid Microelectronics, Defense and Performance Coating industries. We also support emerging technologies such as Photovoltaic, Solid State Memory, Flexible Cable, and Nanotechnology. Williams' products are primarily based on specialty and unique materials used in high reliability and performance applications.

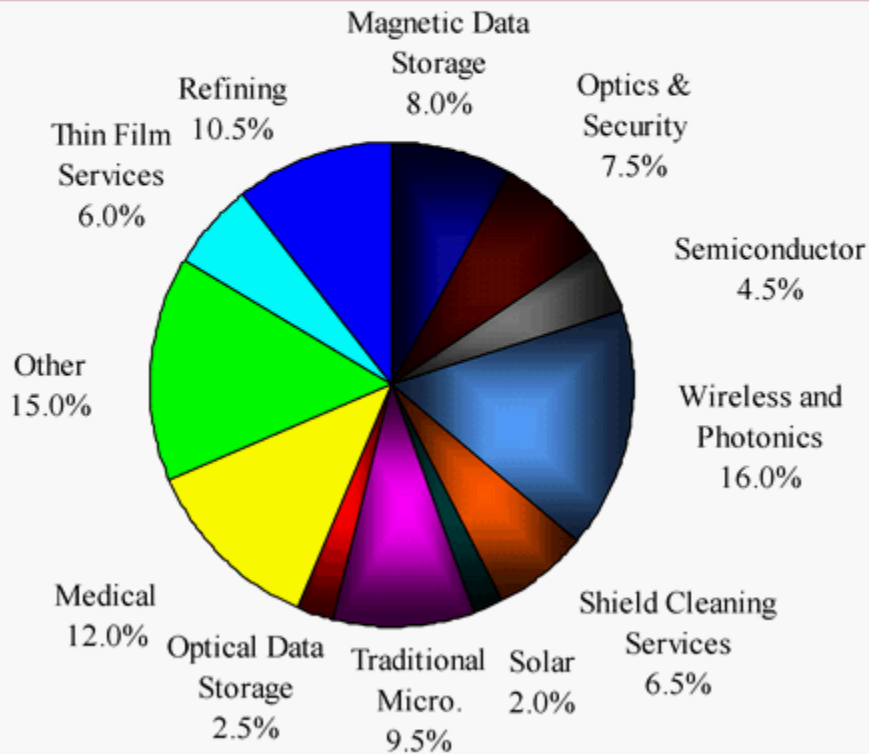


# *Sales History*



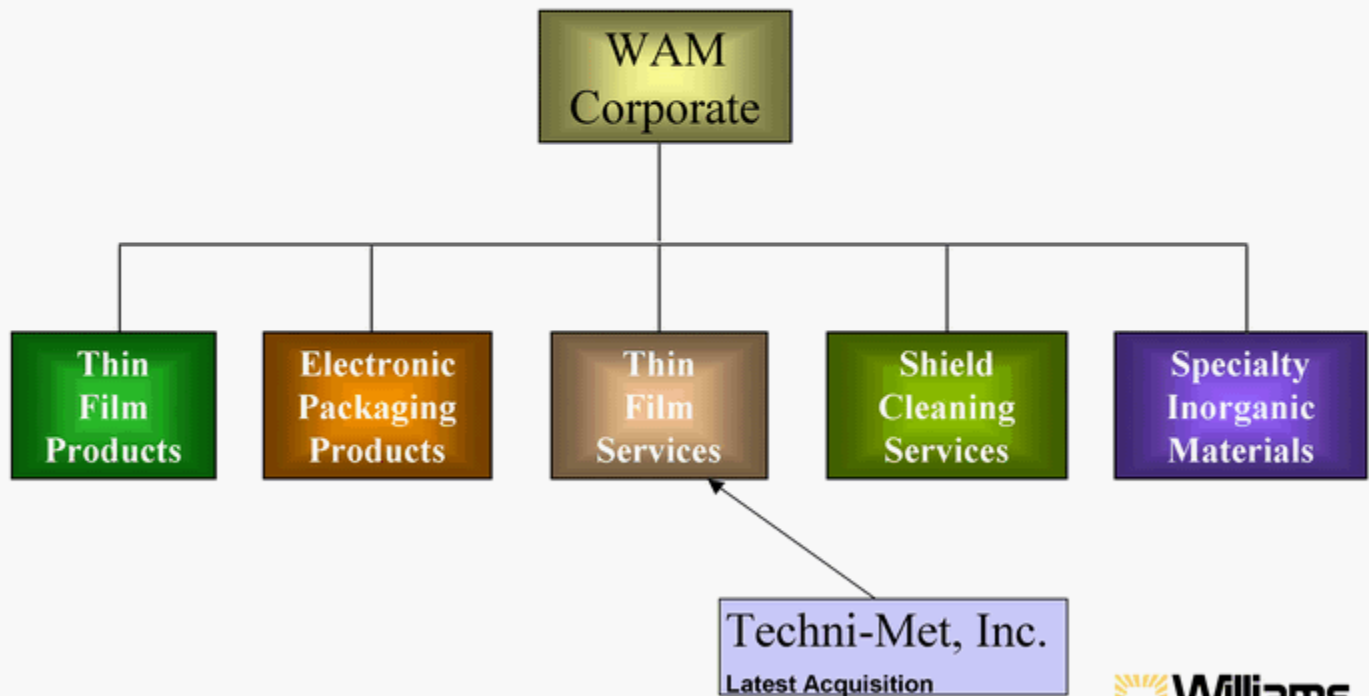
# *Revenue by Market*

Q1 – 2008



# 2008 Business Structure

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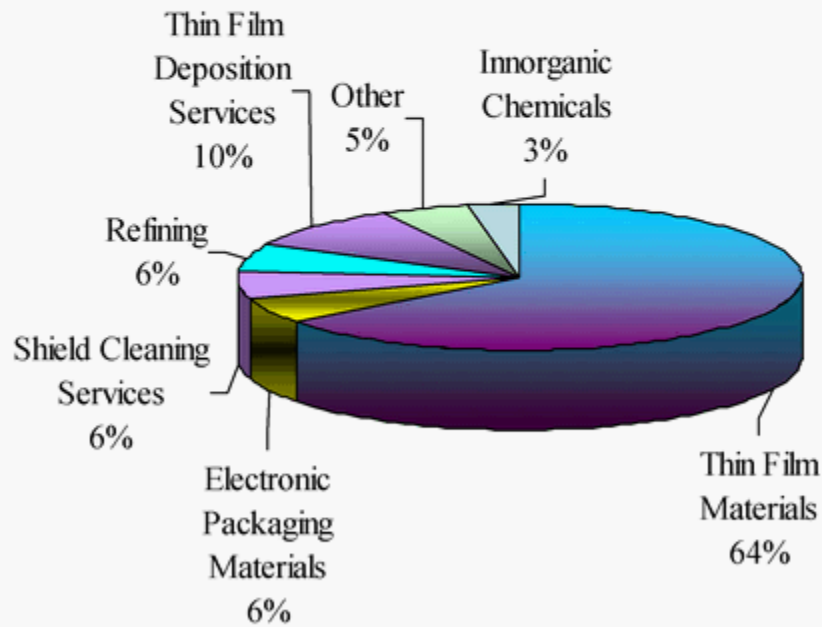


# *Product Mix*

## *2007*

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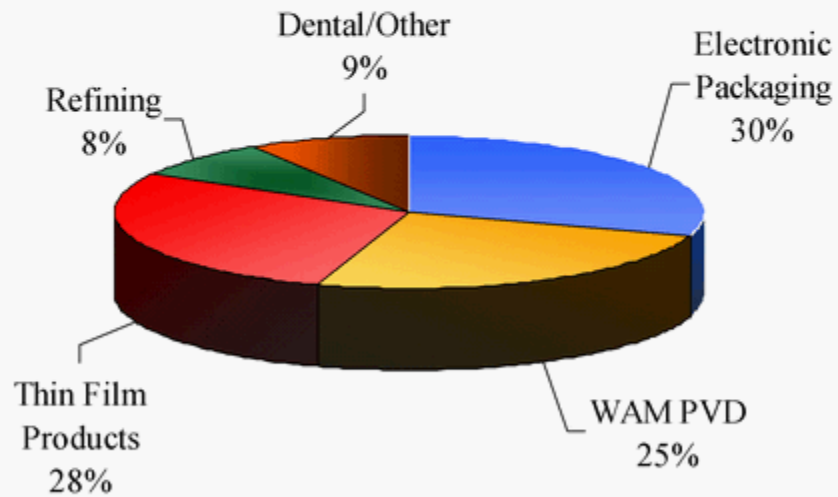


# *Product Mix*

## *2003*

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# *Augmentation History*

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- Williams Precious Metals Acquired in 1987
- Advanced Materials Technology 1989
- Hydrostatics Inc. 1994
- Pure Tech Inc. 1998
- Wheatfield ( Greenfield) 1998
- Semi Alloys Inc 2001
- Honeywell FLA (Technology) 2003
- OMC Scientific Ireland 2004
- Thin Film Technology 2005
- CERAC inc. 2006
- Suzhou, China (Greenfield) 2007
- Louny, Czech Republic (Greenfield) 2007
- Techni-Met 2008

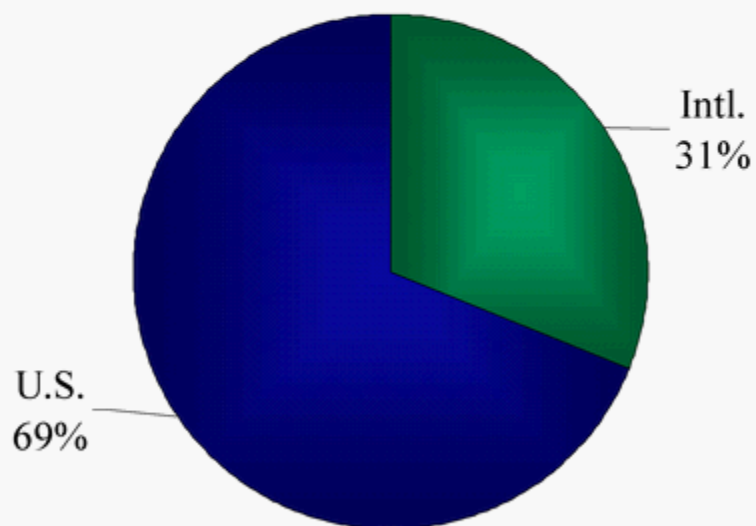


# *International/Domestic Revenue*

## *2007*

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# *Thin Film Products*

- **PVD Materials**

- Precious Metal Target Materials
- Non-Precious Metal, Cermets, Ceramics
  - Vacuum Induction Melting
  - Hot Pressing
  - Vacuum Hot Pressing
  - Hot Isostatic Pressing
- EVAPro™ Grade Evaporation Materials
- Localized Target Bonding

- **Chamber Services**

- Shield Cleaning and Conditioning
- Arc Spraying – Electro-polishing
- PM Refining and Upgrading
- Logistics Support



Buffalo

Brewster

Milwaukee

Wheatfield

Singapore

Taiwan

Santa Clara

Ireland

Suzhou,  
China

Louny, Czech

 **Williams**  
ADVANCED MATERIALS

# *Packaging Materials*

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- FLA/Combo-Lid®
- Seam Seal/Microlid™
- Preforms
- Clad Materials
- Braze Materials
- Ni Alloys
- Dental
- Packages (Zentrix)



Buffalo  
Singapore  
Wheatfield  
Buellton  
WAM  
Taiwan  
WAM Philippines

# *WAM Headquarters*

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Buffalo, NY USA –

- 100,000 Sq. Ft. overall, 6,500 Sq. Ft. of clean-room, state-of-the-art machining/ milling/rolling/stamping/ cladding centers, target bonding, high purity refining/recycling, metals casting & automated plating
- Full analytical capabilities, product Research & Development.



# *Specialty Alloys Operations*

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- Wheatfield, NY
  - 30,000 Sq. Ft. with volume vacuum casting, rolling, annealing, powder atomizing and machining. 10 acres for expansion.
  - Shield metal recovery and cleaning / Clean room packaging



# *Williams Thin Film Products Operations*

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- Brewster, NY USA –
  - 80,000 Sq. Ft. with vacuum melting, hot-pressing, milling, hot & cold rolling, automated machining, grinding, powder metallurgy lab, particle sizing and target bonding capabilities.
  - Dedicated R&D staff and capabilities to support rapid new product development in key markets.



# *Techni-Met*

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- **Windsor, CT**

- 2 facilities - total of 75,000 sq. ft.
- 48 employees – two (2) shift operations.
- High Value Added Precision Coated Materials.
- Continuous Vacuum Deposition of Inorganic Materials onto Rolls of Flexible Polymeric Films and other Substrates.



# *Far East Operations*

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## WAM Far East Ltd.



### Singapore

- Target bonding, bonding wire production, Combo-Lids® assembly



### Subic Bay, Philippines

- Combo-Lids®, low-cost lids and preform - assembly, inspection and packaging.

## WAM TAIWAN



### Taoyuan County, Taiwan

- Target bonding, evaporation materials & bonding wire.



# *Suzhou - China*

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- Suzhou, China
    - 20,000 Sq ft.
    - Target & Evaporation materials manufacturing, Target bonding services, Distribution, Warehousing, Sourcing, MgF manufacturing and packaging
    - Located near Shanghai Airport and close to many technology centers located in Eastern China.
    - Markets Serve: Semiconductor, UBM, Security and Optics
-

# *OMC - Limerick*

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- Limerick, Ireland – OMC Scientific, Ltd.
  - Subsidiary of WAM
  - Provides precision parts cleaning and reconditioning services for film Physical Vapor Deposition (PVD) customers in Europe.
  - Unique technology applied to opportunities in North America and Asia.
  - Efforts focused in the semiconductor, magnetic media and other based markets.



# *OMC- Czech*

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- Louny, Czech Republic
    - Provides precision parts cleaning and reconditioning services for film Physical Vapor Deposition (PVD) customers in central and eastern Europe
    - State of the art cleaning, stripping and packaging operations
    - Machining capabilities for Optical Media and other PVD segments
    - Markets Serve: Semiconductor, Compound Semiconductor, UBM, MEMS, Data Storage
-

# *Thin Film Technology (TFT)*

---



- Buellton, CA
  - Subsidiary of WAM
  - Thin film coating and substrate patterning.
  - Visi-Lid™ supply chain management.
  - Capabilities: Electron Beam Evaporation, DC/RF Magnetron Sputtering, Photolithography (Substrate Patterning), Dicing, Tooling design, In House Machine shop



# CERAC

---



- Milwaukee, WI
  - Subsidiary of WAM
  - Physical Vapor Deposition (PVD) materials for ophthalmic, optic and performance applications.
  - Specialty Inorganic Materials
  - Unique technologies in chemical and powder processing



# *Global Service and Support*

---

- **Regional Offices** (Sales and Applications Engineering support)

Buffalo, NY  
Brewster, NY  
Boston, MA  
Tucson, AZ  
Santa Clara, CA  
Buellton, CA  
Milwaukee, WI  
Dallas, Texas  
Windsor, CT

Tokyo, Japan  
Taoyuan, Taiwan  
Singapore  
Manila, Philippines  
London, England  
Seoul, Korea  
Limerick, Ireland  
Shanghai, China

- **Representative**

Italy  
Sweden

France  
Israel

China  
India

Germany



# *New Product and Technology Development*

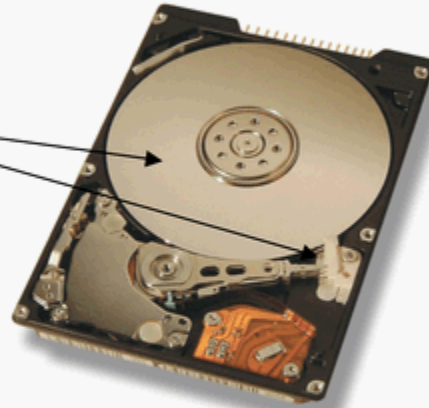
---

- Optical Filters
- Bio-Sensors
- Materials for Thin Film PV (Solar): Cu(I)Ga(S), CdS, CdTe, TCO Materials, etc
  - Ag Alloys for Solar backside contact
- New Cleaning Methods for Shield Cleaning
- Magnetic Data Storage
  - Media Materials; Oxide Gen II and Eco-Ru
  - Head Materials Heusler Alloys & FePt
- Flexible Solar Cells
- Nanotechnology Powder Materials



# Key Markets – Magnetic Head and Media

- Sputtering Targets/ Evaporation Materials (Precious Metals, Alloys, Non-Precious Metals, Alloys, Magnetic Materials, Heusler Alloys and Oxides)
- Chamber Services complement materials offering.



*Example – Hard Disk Drive PMR  
Material Stack*

Recording Layer	CoCrPt + Oxide
Orient Interlayer	Ru
Soft Underlayer	Iron & Cobalt Based Alloys
AFC Layer	Ru
Soft Underlayer	Iron & Cobalt Based Alloys
Substrate (Glass or Aluminum)	



# *Key Markets – Wireless and Photonics*

---

Thin Film and Packaging materials for varied wireless and photonic applications including RF Power Amplifiers, HBT's, SAW Devices, Light Emitting Diodes (LEDs), Laser Recorders and Micro Electro Mechanical Systems (MEMS)



# *Key Markets - Thin Film and Electronic Packaging Materials & Services*

*Night Vision (Defense)*

## **Thin Film Deposition Services**

- Coated Infrared Optics
- Hermetic Windows for FPA Packaging
- Flexible Interconnects



## **Williams Thin Film Materials**

- Sputtering Targets for FPA Manufacturing
- High Purity Infrared Coating Materials

## **Electronic Packaging Materials**

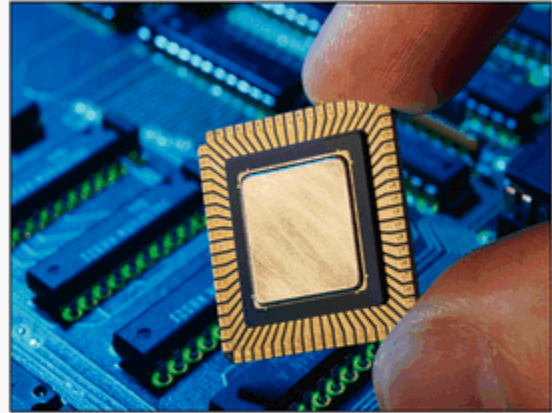
- Precision Machined Components
- High Purity Solder Materials



# *Key Markets – Semiconductor Packaging*

---

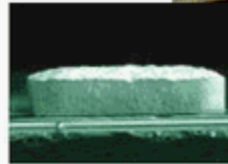
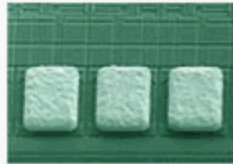
- High reliability semiconductor packaging materials.
- Applications focused in space, military and satellite market segments.



# *Key Markets – Semiconductor Wafer Fabrication*

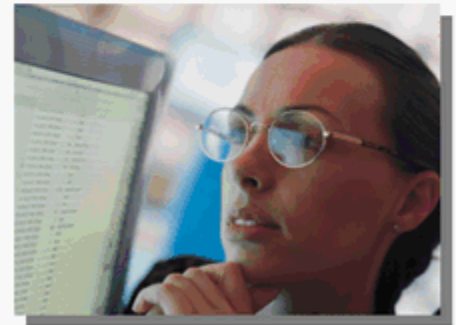
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- Thin film materials and chamber services for silicon wafer and UBM (Under Bump Metallization) technologies.
- Numerous commercial and military microelectronic applications.



# Optics Markets

- **Security**
  - $\text{ZnS}$ ,  $\text{MgF}_2$ ,  $\text{SiO}_2$
- **Laser optics**
  - $\text{ThF}_4$ ,  $\text{YF}_3$ ,  $\text{SiO}_2$ ,  $\text{Ge}$
- **Communications**
  - $\text{SiO}_2$ ,  $\text{Ta}_2\text{O}_5$ ,  $\text{Nb}_2\text{O}_5$ ,
  - $\text{LaB}_6$  Cathodes
- **Ophthalmics**
  - $\text{SiO}_2$ ,  $\text{Al}_2\text{O}_3$ ,  $\text{Ti}_3\text{O}_5$ ,  $\text{Cr-SiO}$



# *Opto-Electronic Markets*

---

- **Resistor material for hybrid circuits**
  - Cr-Si, W-Ti
- **Projection Display Products**
  - $\text{HfO}_2$ , Cr,  $\text{SiO}_2$ ,  $\text{MgF}_2$
- **Clear conductive coatings**
  - ZnO
- **Data Storage**
- **Photovoltaics (Solar)**
  - CdS, CdTe, Cu-In-Ga-Se



# *Specialty Inorganics Markets*

---

- **Protective coatings for aerospace applications**
  - $\text{TiB}_2$ ,  $\text{B}_4\text{Si}$
- **Defense Applications**
- **Semiconductor gas precursors**
  - $\text{Zn}_3\text{As}_2$
- **Data Storage**
- **Medical devices**
  - $\text{V}_2\text{O}_5$
- **Specialty Batteries**
  - $\text{Li}_2\text{O}$ ,  $\text{CoS}_2$



# *Key Markets - Defense Applications*

## *Aerospace*

---

### **Thin Film Technology**

- Large Area Coating of Irregular Shaped Flight Components
- Coatings on Composite Materials
- Thin film hybrid circuits
- Specialty Engineered Films



### **Williams Thin Film Products**

- Sputter & Evaporation Materials for critical surfaces

### **Williams Advanced Materials**

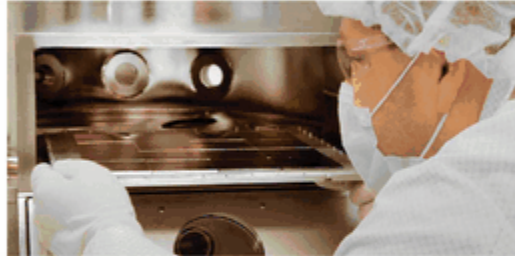
- Hermetic Combo Lids
  - High Purity Solder Materials
  - Precision Machined Components
-

# *Key Markets - Medical (Sensor) Applications*

---

## **Thin Film Deposition Services**

- Batch Sensor Electrode Manufacturing
- Roll to Roll Strip Sensor Manufacturer
- Metal Deposition and Precision Slitting



## **Williams Thin Film Products**

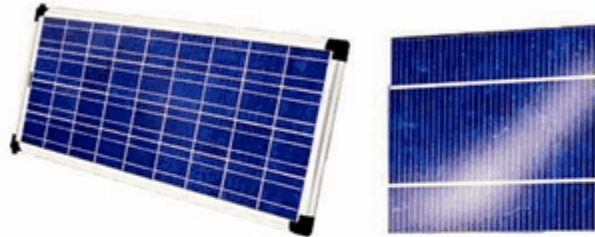
- Sputter & Evaporation Materials for Sensor Manufacturing
- Refining and Recovery
- Shield Cleaning Services



# *Photovoltaic Solar Applications*

---

- **Thin Film Materials**
  - **Targets and Evaporation**
  - CIG(S), CdTe, CdS, AZO, GZO, Ag, Ti, Al, CuGa
- **Thin Film Deposition Services**
  - TCO Coatings (ITO)
  - R&D Thin Film Stack Development
- **Chamber Services**
  - PVD, PECVD Shield Sets
  - Added Value Services



# *Global Chamber Services Value Package*

---

- **SHIELD CLEANING SERVICE DESCRIPTION**
- **STRIPPING**
- **SURFACE TEXTURIZING**
- **FINAL CLEAN AND CLEAN ROOM PACKAGING**
  - Ultrasonic cleaning with particle count monitoring
  - Drying a.k.a. baking a.k.a. outgassing
  - Clean room packaging
  - These steps must take place in a class 100 clean room (2007) and SPC data must be collected
- **PACKAGING FOR SHIPMENT**
- **PRECIOUS METAL REFINES AND SETTLEMENT**
- **LOGISTICS**



# *Chamber Services/Refine*

---



# *Thin Film Services*

## *Capabilities & Markets*

---

- **Production Capability**

- Thermal Evap. & E-Beam Evaporation
- IBD E Beam Evap.
- DC/RF Sputtering
- Comb. Evap/Sputter
- TF Hybrid Substrates
- Photolithography
- Specialty Coatings
- Dicing / Singulation
- Electroplating

- **Markets Served**

- Optics A/R
- Infrared Long & Mid
- Telecom
- Defense
- Medical
- Microwave
- Hybrids
- Sensors
- NIST Standards
- Semiconductor



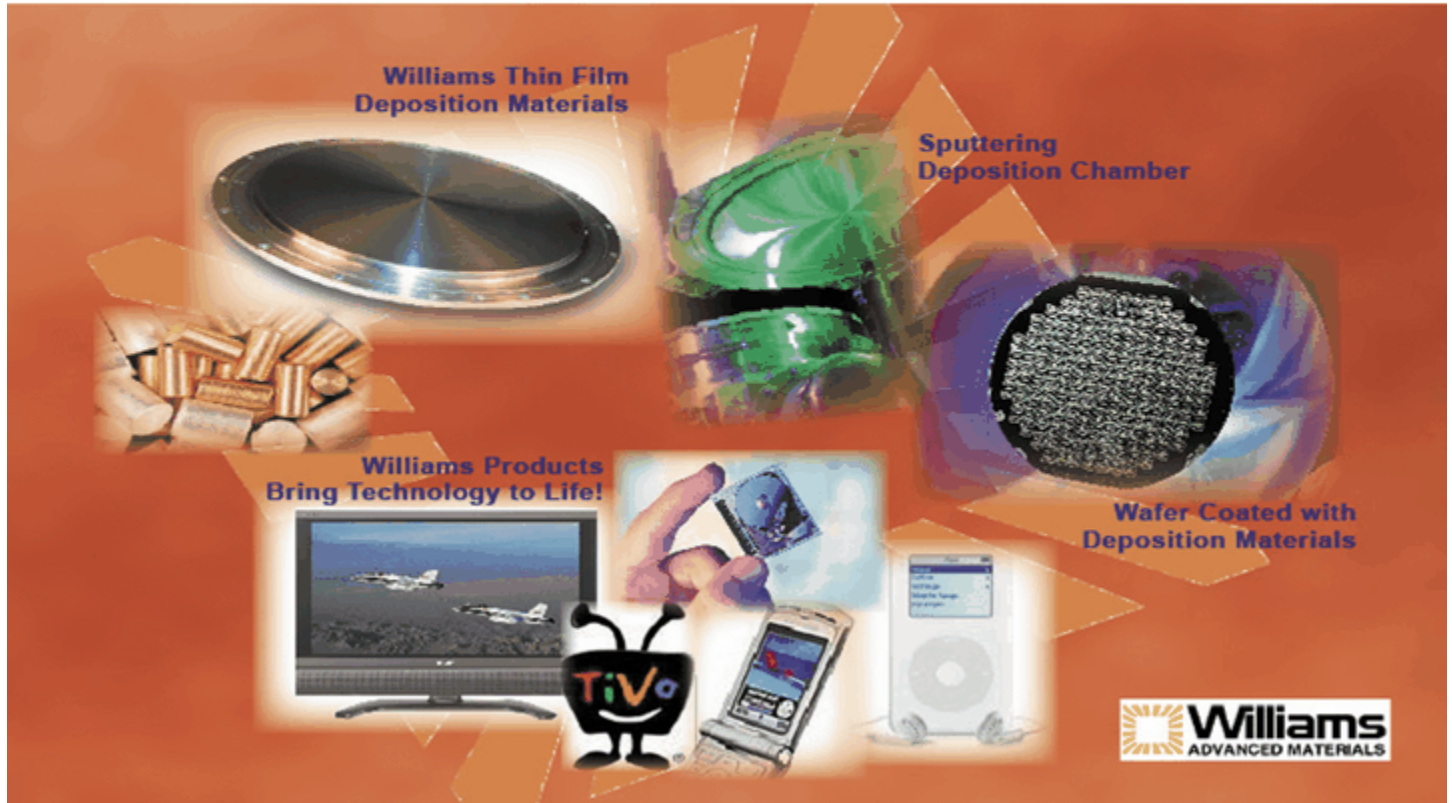
# *Distinctive Competencies*

---



# *End Product Examples Utilizing Thin Film Deposition Materials*

---



# *New Horizons*

---

- TDP, Solar----Rotatable Targets
- FCCL
- Medical Sensors
- Nano Materials ( Powders)
- Expanded Global Chamber Services
- Optical Sensors Fabrication
- Solar Energy-packaging, inorganic compounds, metal/  
alloy solutions

*Brush Engineered Materials Inc.*  
*Organized into Four Separate Reportable Segments*

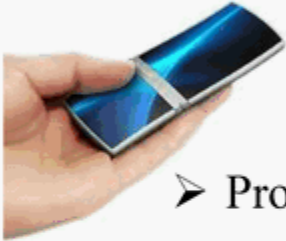
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- Advanced Material Technologies and Services
  - ***Specialty Engineered Alloys***
  - Beryllium and Beryllium Composites
  - Engineered Material Systems
-

# Brush Specialty Engineered Alloys & Brush Resources Vision

---



- Provide *technical expertise* and *flexible services* to deliver value through *innovative, practical engineered material solutions*.
- Our *products and services* coupled with our *global distribution and logistics network* are relied upon by our customers making us their *trusted growth partner*.



## *Brush Specialty Engineered Alloys & Brush Resources Mission*

---

*Safely* and *reliably* provide the *highest quality*, *innovative* products and services, *fast* and *on-time* to all customers, when they want them at the *lowest possible cost*.



# *Alloy Products*

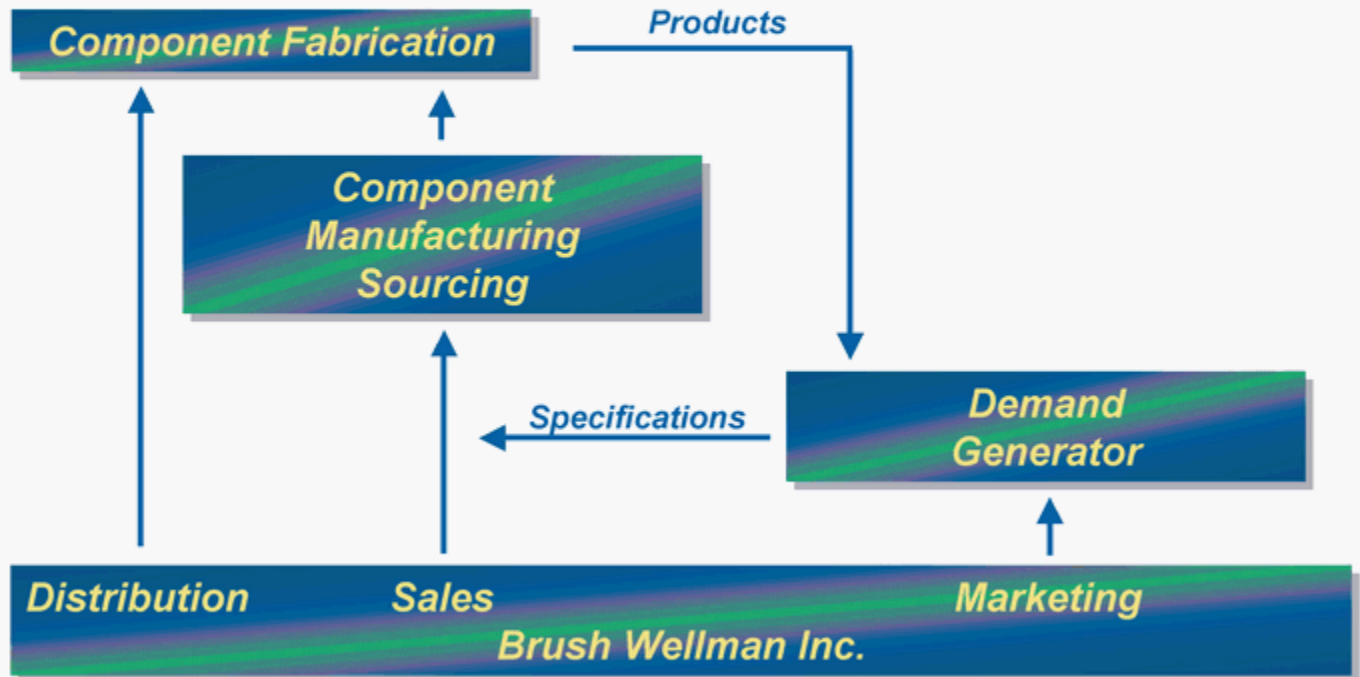
## *Operations Strategy—Lean Sigma*

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- ***Safety*** practices to provide an injury and illness free workplace
- ***Lean Manufacturing*** to reduce cycle times, further increase capacity, and provide industry leading service to our customers
- ***Six Sigma*** to provide industry leading product quality and to reduce costs
- ***Supply Chain Management*** to provide exactly what is needed, when it's needed, to where it's needed in exactly the right quantity
- ***Total Productive Maintenance*** to provide industry leading equipment reliability



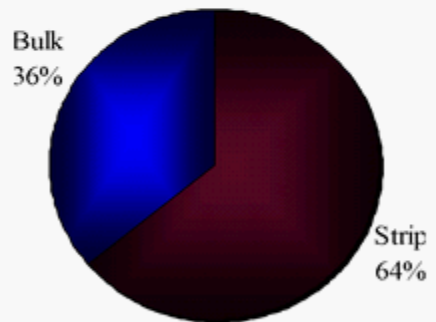
# *Sales Based on End User Specifications*



# *Brush Specialty Engineered Alloys*

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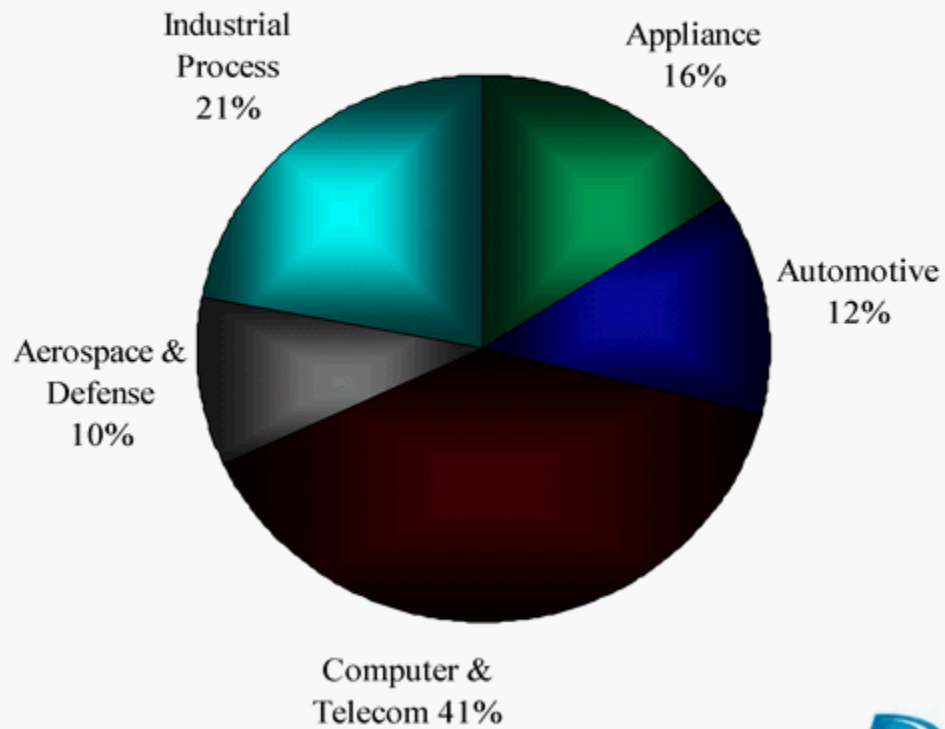
- The primary business within the Specialty Engineered Alloys Segment, Alloy Products sales Q1 2008 were \$73 million.
- Manufactures and sells copper and nickel based alloy systems metallurgically tailored to meet customers' specific performance requirements
- Product families:
  - Strip products include thin gauge precision strip and thin diameter rod and wire. These products provide a combination of high strength, formability and electrical conductivity for connectors, contacts, switches, relays and shielding used in mobile communications devices, wireless communications equipment, storage area network systems, data networking equipment, servers, personal computers, appliances, and automotive electronics.
  - Bulk products include rod, bar, tube and plate. These products are known for superior strength, corrosion and wear resistance, thermal conductivity and lubricity. Applications include bearings and bushings for aerospace and heavy equipment, resistant welding components, oil & gas drilling components, plastic mold tooling and telecommunications housing equipment.



# *Alloy Products Revenue by Market*

## *Q1 2008*

---

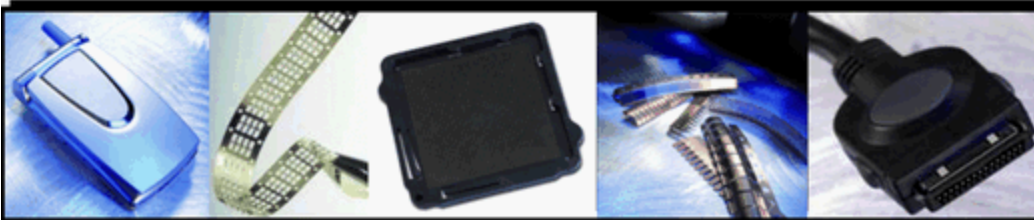


# *Strip Alloy Applications*

*(strength, conductivity, spring characteristics)*

---

- Automotive electronics
- Appliance switches
- Pressure Responsive Devices
- Fire Extinguisher Sprinkler Heads
- EMI Shielding
- Current Carrying Springs and Relays
- Integrated Circuit Sockets
- Electrical and Electronic Connectors in Mobile Handsets, PDA's, Base Stations, Storage Area Networks, Servers, and Personal Computers



**BRUSH**  
WELLMAN  
ALLOY PRODUCTS

# *Strip Products - Strategy*

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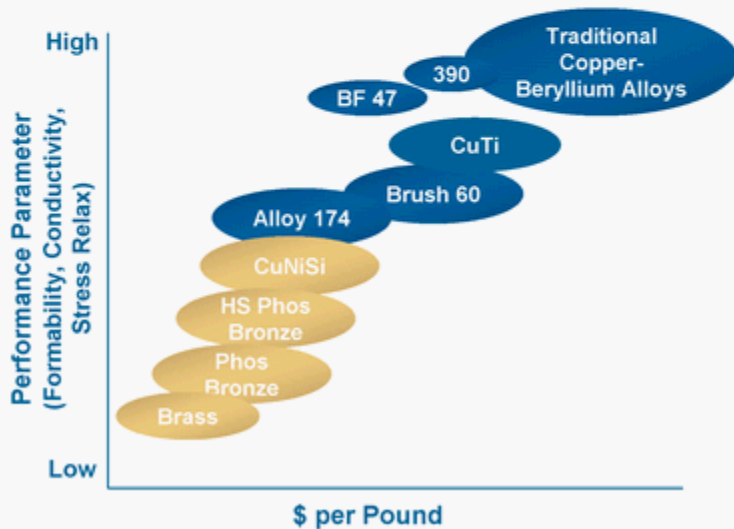
- **Maintain focus on major end-use markets**
  - Computer
  - Telecommunications (mobile & Infrastructure)
  - Automotive
  - Appliance
  - Military
  - Medical
- **Defend leadership in traditional alloy strip, rod & wire**
  - Reduce total cost of manufacture to allow penetration of mid-range alloy applications
  - Enhance product properties to provide additional value to customers
- **Introduce new alloys to meet needs of targeted market opportunities**
- **Geographic Growth**



# Strip Products Strong Value Proposition

*Copper-beryllium alloys, while premium priced, provide best-in-class performance*

## Competitive Alloy Comparison



Note: Blue denotes Brush Engineered Materials' alloys; beige represents competitive materials.

## Brush Value Proposition

- Unique, high-performance materials
- Technical design capabilities
- Outstanding service center network
- Global marketing, sales and distribution

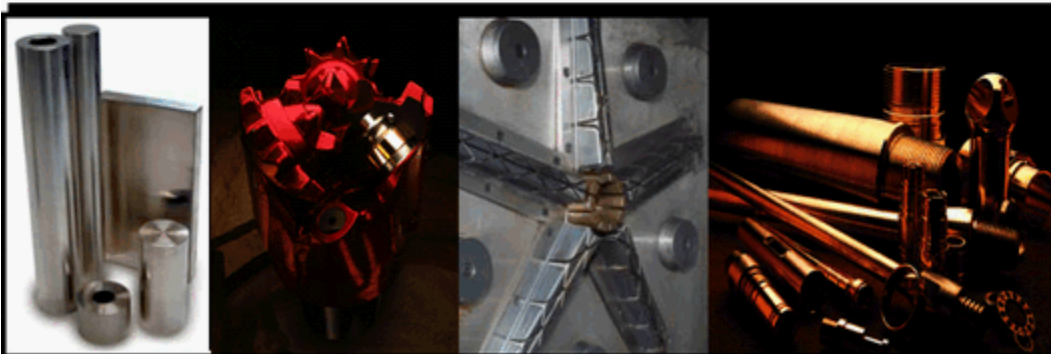


# *Bulk Alloy Applications*

*(strength, corrosion resistance, non-galling, conductivity)*

---

- Aircraft Bushings
- Heavy Equipment Bearing and Wear Applications
- Oilfield well drilling, completion and production equipment
- Plastic Injection & Blow Molds
- Power Generation
- Tooling for Metalworking
- Undersea/Marine Housings for Telecom & Instrumentation
- Welding Electrodes & Dies



**BRUSH**  
WELLMAN  
ALLOY PRODUCTS

# *Bulk Products - Strategy*

---

- **Maintain focus on traditional end-use markets**
  - Aerospace
  - Oil & Gas
  - Plastics
  - Power Generation
  - Resistance Welding
  - Undersea
- **Introduce new alloys or product forms to meet needs of targeted market opportunities**
- **Focus on new non-traditional growth markets**
  - Bearings, Heavy Equipment & Mining, Marine, advanced Oil & Gas well components, Offshore & Downhole technology, and Pumps
- **Geographic Growth**
  - Expand commercial operations in Asia Pacific, improve customer awareness and distribution



# *MoldMAX<sup>®</sup> Alloys for the Plastics Industry*



Brush Wellman engineers use infrared imaging at the customers facility to pinpoint where MoldMAX<sup>®</sup> will provide the maximum benefit.

## **Value Proposition**

- Provides molders with 20-40% increase in productivity
- Capital avoidance due to increased productivity
- Enables improved quality of molded parts
- ROI < 3 months

## **Technical advantages**

- Hardness of steel with the thermal conductivity of copper
- Fast machining rates
- High polishability



# *Lorain Casting Facility*

## *Spinodal and EquaCast® Technology-Winning!*

---

High performance copper based engineered materials:

- Strength and hardness is comparable to copper beryllium products
- Thermal conductivity

The value proposition differentiates:

- Corrosion resistance
- Superb tribological properties (low friction, excellent wear resistance) adding value in reliability, uptime, and maintenance savings
- Machinability and design simplicity adding cost benefits to offset increased material costs
- Casting capability including size, shapes, tubes and quality
- No EH&S issues

Developing applications in markets where we are strong:

- Drilling Equipment, Aircraft Parts, Mold Tooling

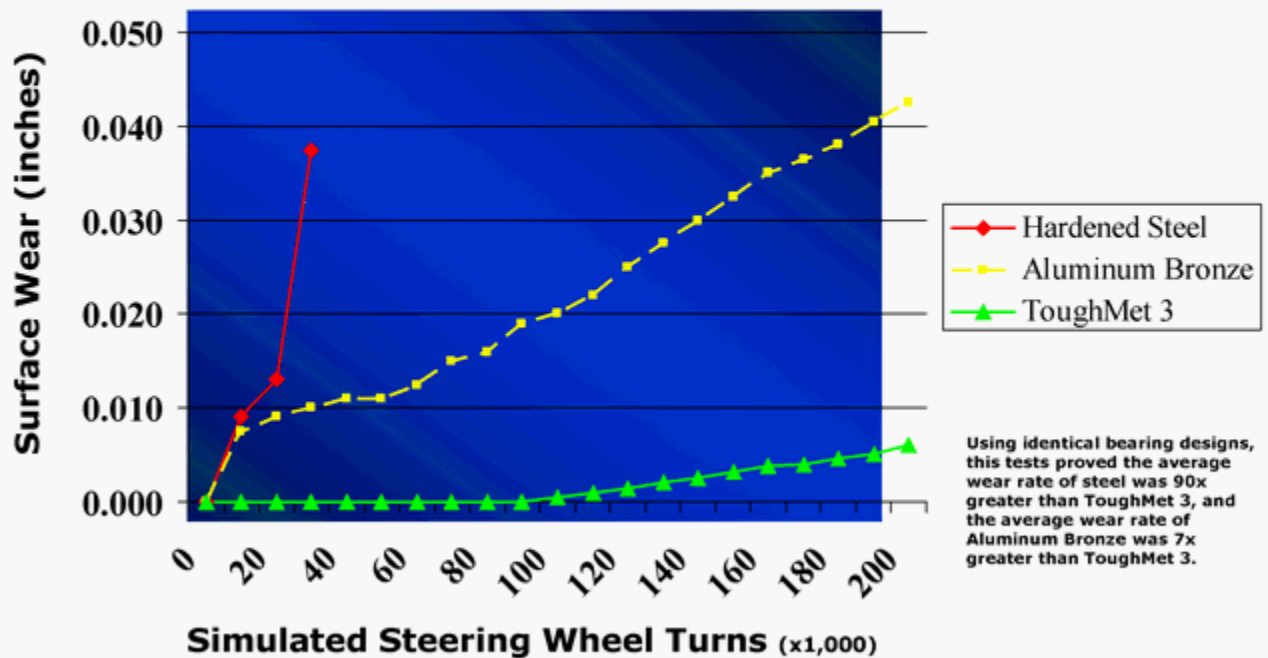
Developing markets/applications where technology is strong:

- Oil Well Completion Equipment, Mining, Heavy Equipment, Drivetrain Components, Hydraulic Systems, Engine Bearings, Semiconductor Fabrication

Lorain Technology: Expanding Brush Wellman's market and application reach



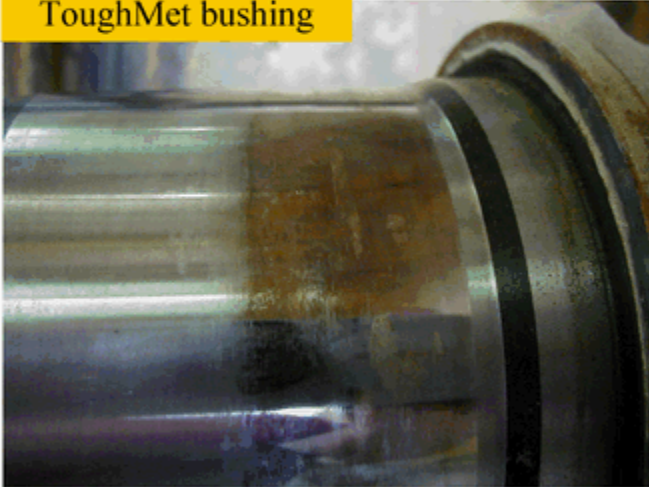
# *ToughMet® Outlasts Conventional Bearing Materials in 300-ton Mining Truck Steering Test*



# *ToughMet® Bushings Protect Steel Mating Parts.*

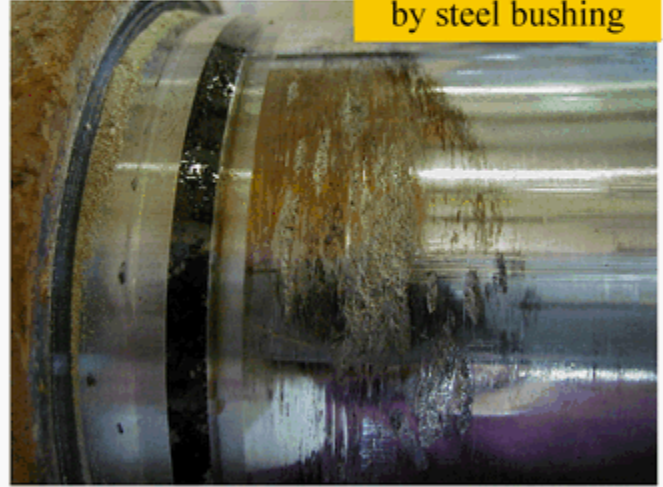
## *Example: Lubrication failure on bulldozer undercarriage*

Steel pin protected by  
ToughMet bushing



Left side pin after 500 running hours  
against ToughMet 3 CX105 bushing.

Steel pin damaged  
by steel bushing



Right side pin after 500 running hours  
against hardened steel (HRC 50)  
bushing.

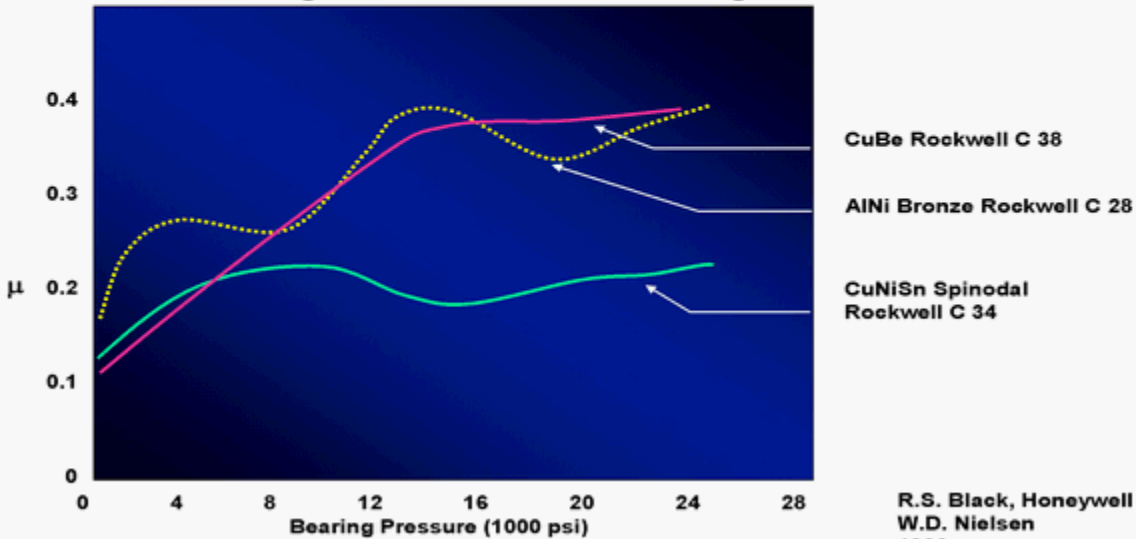
Pin hardness = HRC60.



# *ToughMet<sup>®</sup> Industrial Components Results:*

## **ToughMet<sup>®</sup> Alloy Bushings Provide Superior Power Efficiency Performance**

in a Comparison of Dynamic Coefficient of Friction  $\mu$  vs  
Bearing Pressure for Three Bearing Materials



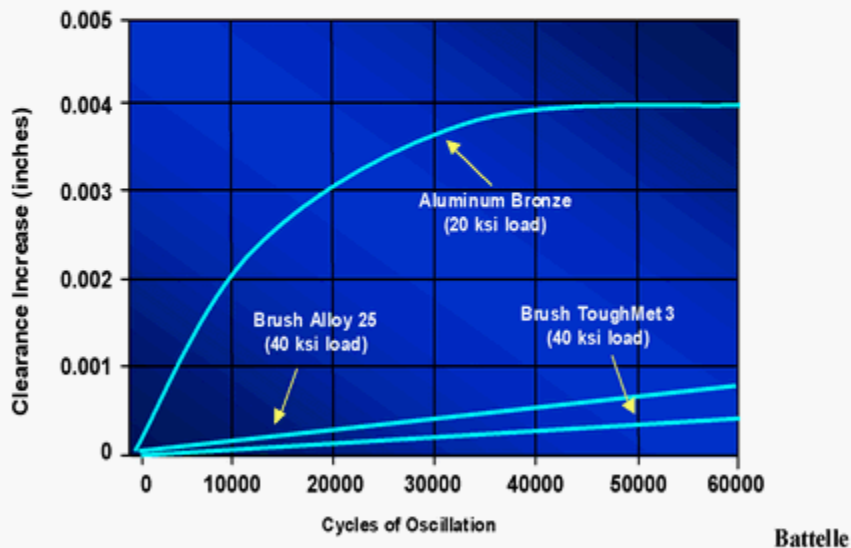
R.S. Black, Honeywell  
W.D. Nielsen  
1996



# *Significantly Higher Durability has been Confirmed for ToughMet®*

---

## Comparative Sleeve Bearing Wear Tests.

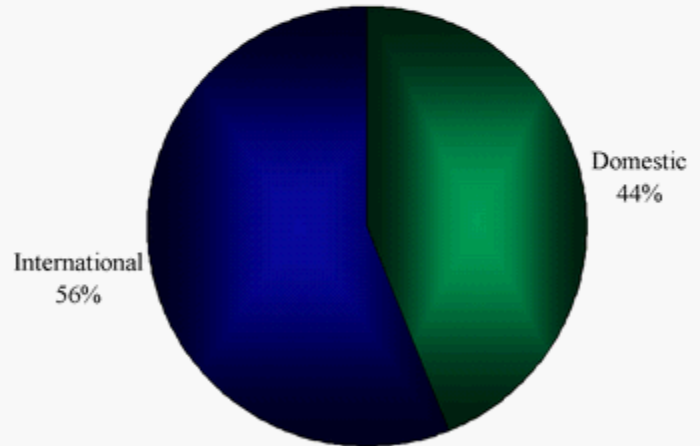


# *Brush International, Inc.*

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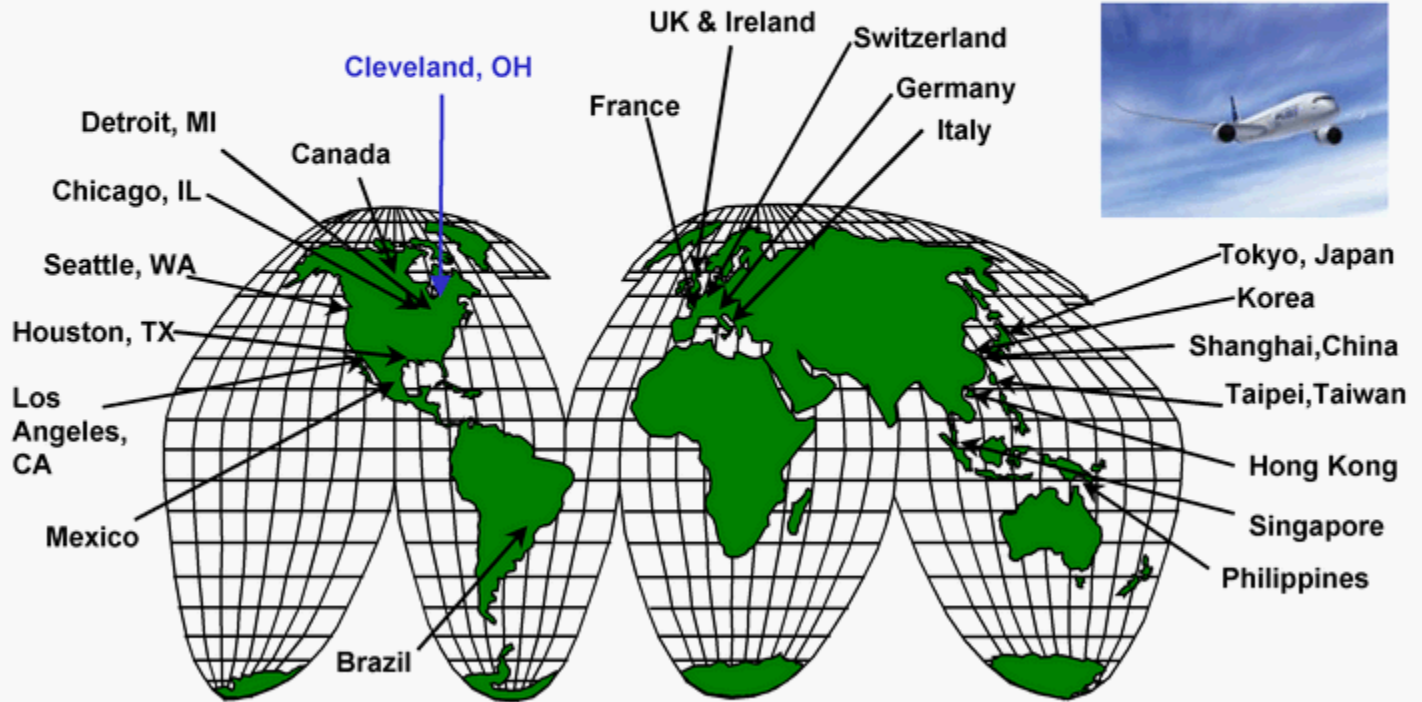
- Brush International Inc. is a wholly owned subsidiary of Brush Engineered Materials
- Service centers in Germany, England, Japan and Singapore
- Representative offices in Korea, China and Taiwan
- Primary focus on the distribution of alloy products while providing local support to other Brush Engineered Materials' subsidiaries operating internationally

*Alloy International/Domestic Revenue  
Q1 2008*



# *Global Sales and Distribution Network*

---



*Global Reach..... Local Service*

---

*Brush Engineered Materials Inc.*  
*Organized into Four Separate Reportable Segments*

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---

- Advanced Material Technologies and Services
  - Specialty Engineered Alloys
  - ***Beryllium and Beryllium Composites***
  - Engineered Material Systems
-

## *Beryllium and Beryllium Composites Comprises two business units*

---

- Brush Beryllium Products
- Brush Ceramic Products

# *Brush Beryllium Products*

---

## Products

Beryllium Metal - One of the lightest metals known

- Family of vacuum hot and hot/cold isostatically pressed powder-derived metals

AlBeMet™

- Family of lightweight alloy composites
- Extruded, rolled sheet and hot isostatically pressed powder-derived metals

**BRUSHWELLMAN**  
ENGINEERED MATERIALS

# *Brush Beryllium Products*

---

## Products - Cont.

- |                               |   |
|-------------------------------|---|
| E-Materials                   | <ul style="list-style-type: none"><li>- Family of low expansion, lightweight electronic packaging materials</li><li>- Composites of beryllium metal and beryllium oxide</li></ul> |
| Beryllium Oxide/<br>Chemicals | <ul style="list-style-type: none"><li>- Ceramic-grade beryllium oxide powder</li><li>- Specialty beryllium-containing chemicals</li></ul>   |

**BRUSHWELLMAN**  
ENGINEERED MATERIALS

# *Brush Beryllium Products*

---

## Facilities

Elmore, Ohio

Fremont, California

**BRUSHWELLMAN**  
ENGINEERED MATERIALS

---

# *Brush Beryllium Products*

## *Key Product Attributes*

---

### ➤ Be/AlBeMet™

- Light Weight (Density)
- High Stiffness (Elastic Modulus)
- High Thermal Conductance/Capacity
- Low Thermal Expansion

### ➤ Be

- Transparent to X-Rays
- Neutron Reflector

# *Brush Beryllium Products*

---

## Primary Competition...Alternative Materials

Organic Composites (e.g. Carbon epoxy)

Silicon carbide

Metal Matrix Composites (e.g. Al - silicon carbide)

Pyrolytic graphite

Aluminum (high strength grades)

**BRUSHWELLMAN**  
ENGINEERED MATERIALS

# *Major Defense/Aerospace Applications for Brush Beryllium Products*

---

## Optics

Optical substrate and support structure for visual and infrared target acquisition systems (fighter aircraft, helicopters, unmanned aerial vehicles, tanks), surveillance systems and astronomical telescopes.

## Satellites

Structures and sensors for defense and commercial telecommunications satellites.

## Electronics

Electronic packaging for defense avionics, radar and electronic countermeasures systems for helicopters and fighter aircraft. Applications include circuit boards, covers and packages.

**BRUSHWELLMAN**  
ENGINEERED MATERIALS

---

# *Major Commercial Applications for Brush Beryllium Products*

---

## X-ray Windows

Radiographic tube components for \* medical diagnostic (x-ray, mammography, CAT-scan), \* industrial and \* scientific equipment.

## Optical Scanners

Mirrors for laser scanners used in reprographic and other high-performance laser applications.

## Motion control

Structural components for high-precision semiconductor processing and industrial robotic equipment

## Acoustics

High performance speaker components

**BRUSHWELLMAN**  
ENGINEERED MATERIALS

# *Major Applications, New Products and Platforms*

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## *Brush Beryllium Products*

<u>Product</u>	<u>Market</u>
New AlBeMet Products	Defense
Fabricated Products	Defense
Acoustic	Speakers
High grade Be foil	Medical x-ray

**BRUSHWELLMAN**  
ENGINEERED MATERIALS

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# *Beryllium Products*

## *Brush Ceramic Products*

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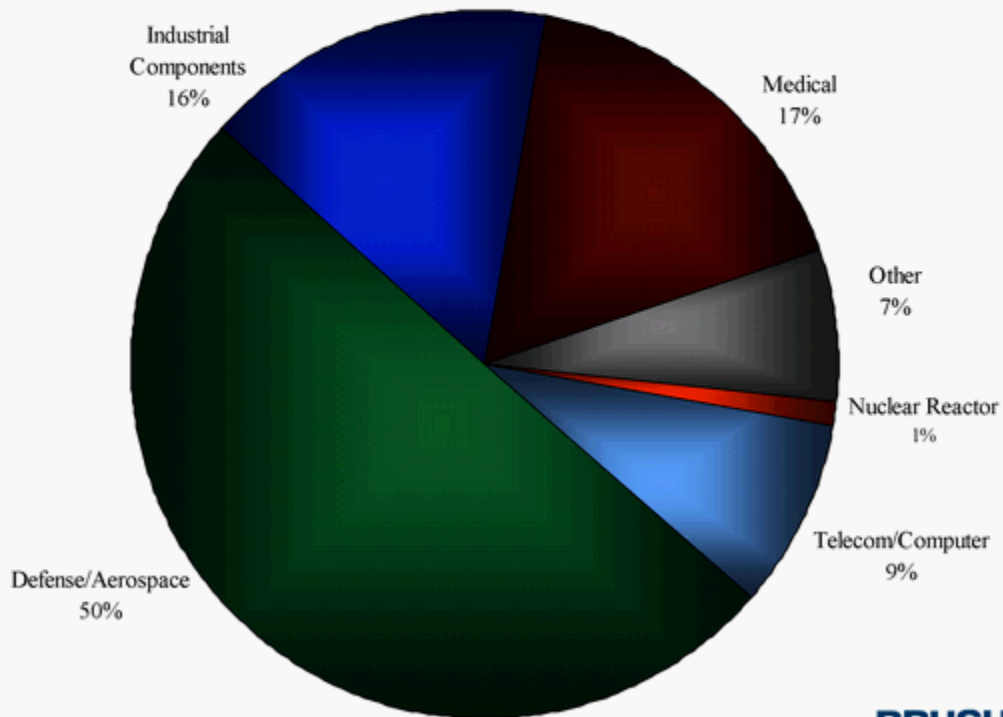
- Located in Tucson, Arizona
- Products
  - Ceramic substrates used in commercial and military packaging applications
  - Ceramic laser bores for gas lasers used in medical and industrial applications
  - Machined ceramic components used in military, oil and gas, semiconductor and microwave applications

**BRUSHWELLMAN**  
ENGINEERED MATERIALS

# *Beryllium and Beryllium Composites*

## *2008 Revenue by Market*

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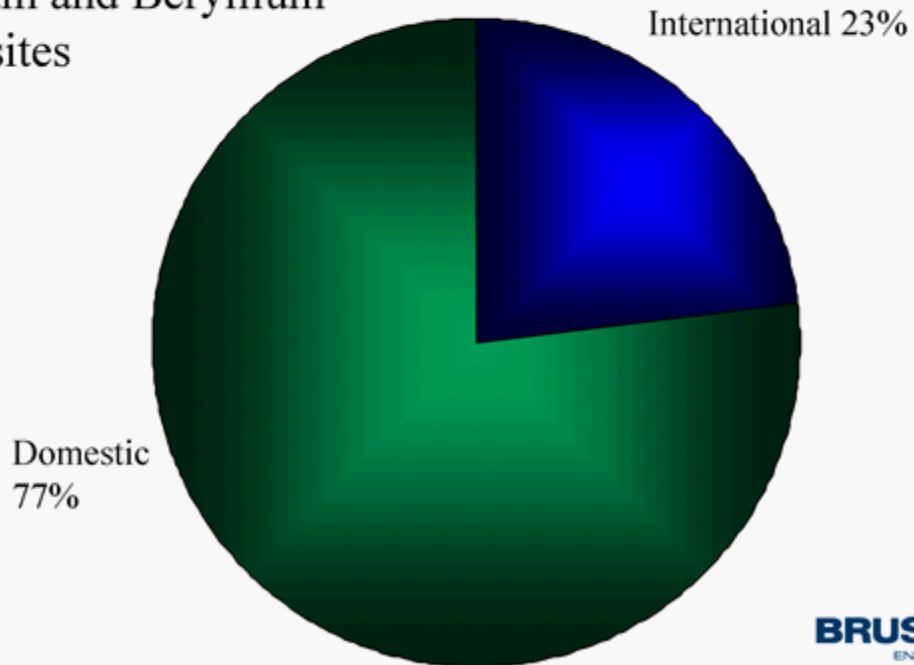
**BRUSHWELLMAN**  
ENGINEERED MATERIALS

# *International/Domestic Revenue*

## *2008*

---

Beryllium and Beryllium  
Composites



**BRUSHWELLMAN**  
ENGINEERED MATERIALS

*Brush Engineered Materials Inc.*  
*Organized into Four Separate Reportable Segments*

---

---

- Advanced Material Technologies and Services
  - Specialty Engineered Alloys
  - Beryllium and Beryllium Composites
  - ***Engineered Material Systems***
-

# *Technical Materials Inc.*

## *2008*

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“Providing engineered metal strip products to leading technology manufacturers around the world.”

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## *Market History*

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- Founded in 1968, TMI's continuous clad and inlay technology produced high-reliability connector and switch materials for the telecom industry.
  - Today TMI's products are used throughout the world by virtually all major technology markets. As a leader in reel-to-reel composite metals engineering, TMI differentiates itself through proprietary process technologies.
  - TMI worldwide sales continue to increase and in 2007 additional inroads were made in Europe and Asia.
  - In 2007, New Product Sales accounted for approximately 31% of TMI's sales volume.
-

# *TMI Process Technologies*

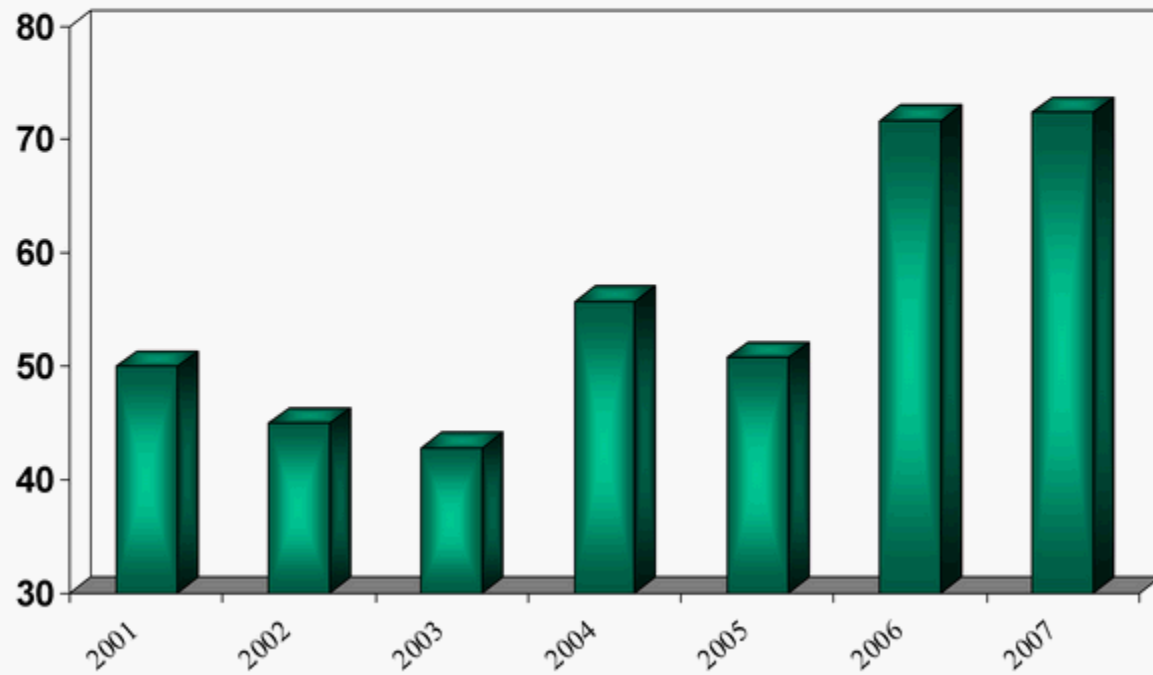


- Cladding
  - Inlay
  - Micro Laminates
- Electroplating
  - Gold, Silver, Base Metals
  - Selective and Overall Coatings
- Profiling
  - Milling
  - Skiving
- Continuous Electron Beam Welding
- Lead-Free Solder Coatings

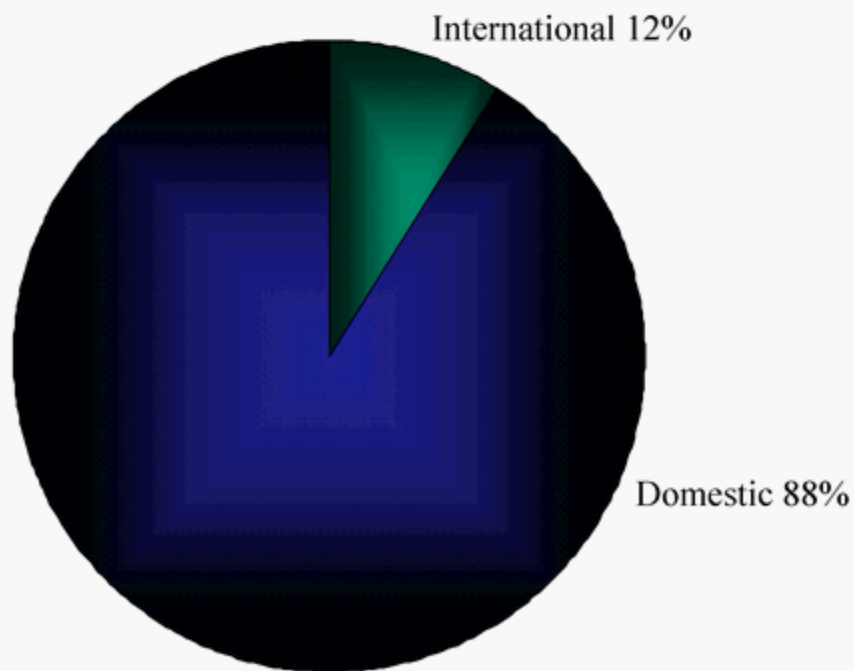
# *TMI Sales Growth*



\$ in millions



# *International/Domestic Revenue* *2007*



# *Our Vision*



- To be a leader in creating innovative engineered material solutions and services that make our customers competitive in global markets.

# *Technology Leader*



- Quality
  - ISO 9001-2000, Certified by Bureau Veritas
  - ISO 14001, Certified by TÜV
  - Unique Tolerance Capabilities
  - Extensive Digital and Vision-Controlled Processing
- Engineering
  - Metallurgical Design
  - Technical Customer Support

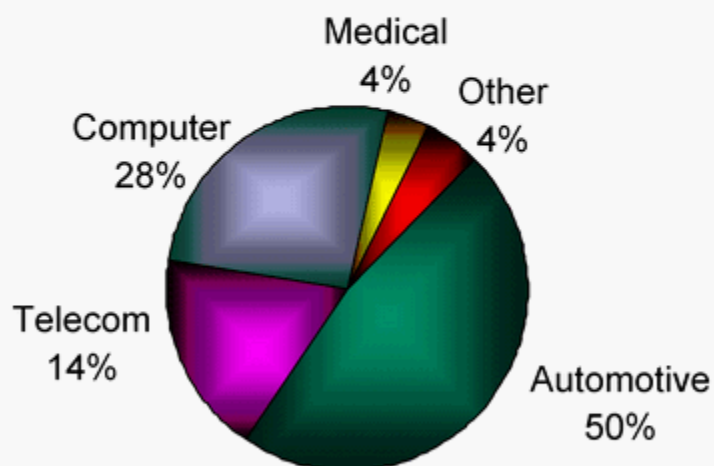


## *Our Major Markets*

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2007

- Automotive
- Consumer Electronics
- Computer
- Semiconductor
- Energy
- Medical



# *Strategic Growth Markets*

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- Computer Hard Drives
  - Medical Devices
  - Energy Systems
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## *Application: Computer*

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- *Hard Drive Suspension Materials*

- Stainless/Aluminum Composites
  - High Stiffness-to-Weight Performance
  - Supports Higher Data Density Media
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# *Application: Medical*

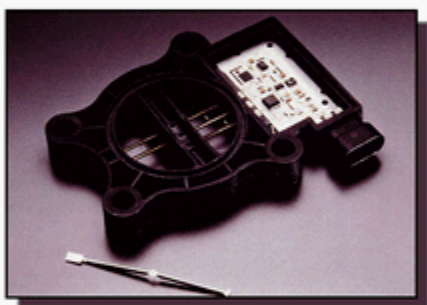


- *Implant Materials*

- Electron Beam Welded and Clad Interconnects
- Niobium, Tantalum, Titanium, and Stainless Steel Systems

## *Application: Automotive*

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- *High-Reliability Connector and Leadframe Materials*
    - Safety Devices
    - Engine Performance Sensors
    - Hybrid Components
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# *Application: Consumer Electronics*

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- Leadframes for Digital Camera Sensors
- Cell Phone Passive Components

## *Application: Energy*

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- High-Performance Battery Materials
- Solar Cell Interconnects
- High-Temperature Fuel Cell Clad Materials

# *2008 Growth Strategy*

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- Continued Expansion of Electroplating through Process Technology Advantages
  - Focus on Clad and Electron Beam Weld Product Development in High-Growth Niche Markets
  - Continue to Expand TMI's Presence in Europe and the Far East
  - Continued emphasis on New Product and Market Development
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# *Beryllium Health and Safety*

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*Brush has continued to make progress on issues related to beryllium health and safety*

- Improved worker protection programs in place
  - Rates of sensitization down among new workers
  - Strong focus on regulations related to beryllium exposure
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# *Litigation*

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	<u>Total Cases Pending</u>	<u>Total Plaintiffs (including spouses)</u>
03/30/07	12	52
06/29/07	10	32
09/28/07	10	32
12/31/07	9	31
3/28/08	9	31

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# *Litigation*

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- In the first quarter 2008, there were no changes in the case load from end of 2007. There are currently nine cases pending, including two purported class actions. No cases were filed, settled or dismissed during the quarter.
  - Our caseload and number of plaintiffs will vary from quarter to quarter depending on new cases, additional plaintiffs, settlements, dismissals, amendments to complaints, etc.
- The Company believes it has substantial defenses in pending cases.