

Heraeus



**Your partner for
advanced PVD materials**

Thin Film Materials Division

W. C. Heraeus

Draw from our experience and know-how in sputtering targets



Heraeus – a name and a commitment

Thin Film Materials is a specialized division of W. C. Heraeus, a company of Heraeus Holding GmbH. Representing over 150 years of innovation, Heraeus is a precious metals and technology group with over 9,000 employees around the world. As a competent and reliable partner for all precious metal and special metal processing needs, Heraeus remains a name you can count on.

The Thin Film Materials Division (TMD) of W. C. Heraeus is one of the world's largest – and most experienced – developers and manufacturers of high purity sputtering targets and evaporation materials. With our global network of sales and service offices, production facilities and bond shops, we provide our customers the technical support and rapid logistical response needed in today's 24-hour manufacturing environments – around the world.

But that's not all. We continue to work closely with you – leading industry manufacturers, production system suppliers, and research institutes – to continually develop new, high performance products.

Heraeus TMD is your ideal partner for advanced materials solutions.

Business excellence

Based on the European standards for Business Excellence (EFQM), we strive to implement excellent business processes throughout our organization. For us, this means more than excellent results. We have ongoing review processes in place to continuously improve how we manage our employees, develop our strategies, and use our resources. The goal is to consistently better both employee and customer satisfaction – and to be a good corporate citizen.

Using our experience to help solve your production challenges



The manufacturing process

Casting / Melting

VIM
e-beam
continuous casting

Powder Metallurgy

atomizing / blending
pressing
CIP
hot pressing
HIP
thermal spraying

Thermo Mechanical Treatment

forging / rolling / extrusion
sintering / homogenization / recrystallization

Mechanical Tooling

sizing
milling / turning / grinding

Bonding

soldering
glueing
plating

Quality Control

A complete production chain

We have manufactured our own targets since the beginning of industrial scale sputtering. Our materials development capabilities range from prototyping to mass-production – including advanced manufacturing processes, sophisticated material procurement capabilities and rigorous quality control.

Casting, rolling, pressing, sintering, and spraying – these are all precise processes in the production of sputtering targets and evaporation materials that demand expert knowledge and the right hardware. They are complemented by a full range of industrial material processing and treatment

procedures that include cutting, milling, sawing, grinding, and soldering, etc.

The advantage of control

Optimized and reliable target manufacturing is a logical result of our innovative R&D activities – usually done in cooperation with you, our customers. We continually invest in the most advanced manufacturing equipment. Controlling the whole production chain offers you key advantages – minimizing production time, optimizing quality control efforts, and ensuring an optimized product.

Testing

Finally, our comprehensive testing and analytical capabilities assure that every target is of the highest quality.

- X-ray fluorescence and diffraction analyses (XRF & XRD)
- Induction coupled plasma spectroscopy (ICP)
- Glow discharge mass spectroscopy (GDMS)
- Fusion and gas extraction analysis (LECO)
- Metallography
- Scanning electron microscopy (SEM)
- Ultrasonic testing

Specialists for a wide range of thin film applications



What do we do? Our versatile product development specialists work with you to meet even the most demanding production parameters in a wide range of thin film applications.

This wide range of expertise and production know-how is unique in the industry. Our core markets include:

- Large area coatings
- Magnetic data storage
- Electronics

In addition, our extensive line of high quality sputtering targets and coating materials cover many other important thin film applications, including:

- Flat panel displays (TFT, PDP, OLED, etc.)
- Optical disc storage media (CD, CD-R, DVD, etc.)
- Solar and photovoltaic cells
- Optics

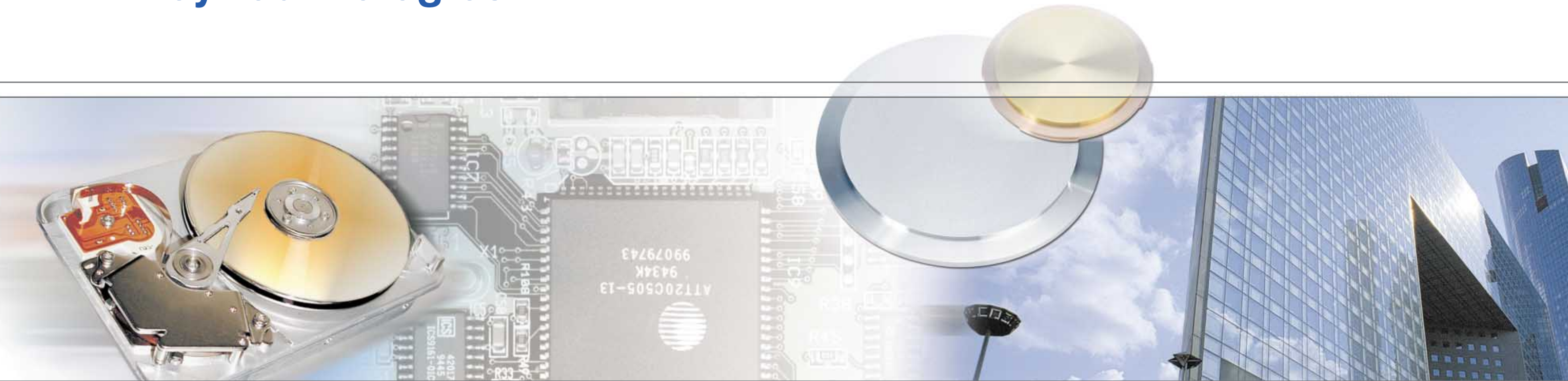
Flat panel displays is just one of many examples of how we continue to upgrade our manufacturing and development capacity for all our products. Today we provide clean room quality materials used for TFT and OLED manufacturing applications – and constantly develop and test materials for emerging applications in this dynamic market.

Maintaining the technology lead

While we offer products that have remained unchanged and have performed well for over 20 years, almost 50% of our current coating materials are less than 5 years old. And this number is set to increase in the future, as we – together with our customers – continue to develop and optimize improved coating material solutions to meet new market demands.



A global leader in key technologies



We have three core markets: large area coating, magnetic data storage and electronics. In both large area coating and magnetic data storage TMD remains the undisputed market leader for advanced sputtering targets and coating materials. We are also growing rapidly in electronics. Our expertise in materials technology and process optimization support enable you to meet today's stringent production and cost parameters.

High-performance glass coatings

We have been a technology leader in large area coating applications since the beginning of industrial-scale glass coating. Used predominantly by the flat glass and web industries, our sputtering targets enable the smart windows and sophisticated glass surfaces used in modern buildings and automobiles. Our portfolio of sputtering targets includes all the key pure metals used in large area coating applications, as well as all the popular alloys, and ceramics. These are produced in different shapes (planar and rotatable, sprayed and cast) and sizes – up to 4 meters in length or several 100 kg in weight.

Complex layers for high density magnetic data storage

As the world's largest target manufacturer and supplier to the hard disk industry, we understand the complex metallurgy behind this high density storage technology.

Our materials development capabilities range from prototyping to mass-production. Our advanced manufacturing processes, sophisticated material procurement capability and rigorous quality control assures our customers – the leading hard disk manufacturers – compatible and reliable target quality for all stages of the manufacturing process.

Working in a clean room environment

We work with leading electronic and semiconductor companies, and coating equipment suppliers, to test and optimize a range of targets and evaporation materials for various types of electronic and semiconductor applications:

- Front & back-end metallization
- Die attach
- Telecom and sensors
- MRAM

The precise tolerances needed for mass-production of integrated circuits and discrete electronic components place extremely high demands on the purity and quality of the coating materials. This is why all our targets and evaporation materials are cleaned and packaged in a clean room environment.

We work with you – anywhere in the world



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Heraeus Incorporated
Chandler, Arizona, USA



Heraeus Materials Technology Shanghai Ltd.,
Shanghai, China



Heraeus Materials Technology Taiwan, Ltd.,
Taipei, Taiwan



Technical Support

The products based on thin film technology range from the highly specific to mass commodities. Their production demands a high level of process and technical support. For us, this means providing you with around-the-clock availability, innovative products and quick delivery, no matter where your production line is located.

Global Network

Our global network of sales and service offices comprises locations in over 20 countries. In addition, our network of bond shops – in Asia, Europe and North America – are located close to the customer site for quicker turnaround and lower processing costs.

Our sales and service professionals are there, where and when you need them.

Sales representatives in:

<i>Brazil</i>	<i>Czech Republic</i>
<i>The Emirates</i>	<i>Japan</i>
<i>Germany</i>	<i>France</i>
<i>Italy</i>	<i>Korea</i>
<i>The Netherlands</i>	<i>Singapore</i>
<i>Spain</i>	<i>Sweden</i>
<i>Turkey</i>	<i>USA</i>

The technology of quality

An essential element of our services are the consistently high-quality processes and official certification. All our manufacturing parameters and processes are certified (ISO 9001: 2000, etc.). These guidelines provide total transparency for our customers – individual quality controls, tracking the production parameter, and even identifying the source of the raw material. This assures absolutely consistent material quality – and reliable production results for our customers.



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