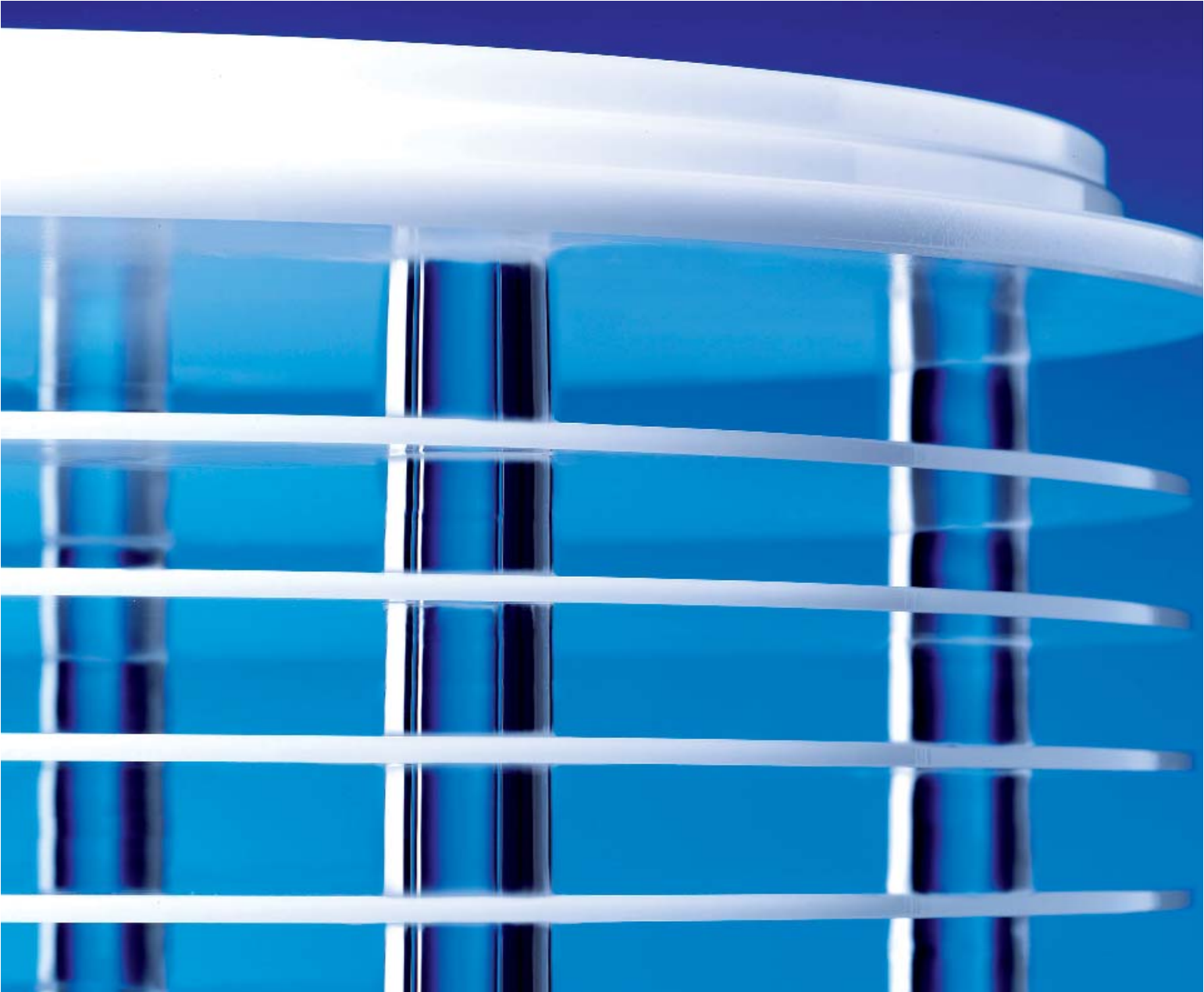


Heraeus

WISAG



Heraeus Quarzglas

Tailored Solutions to Specific Customer Needs

Heraeus Quarzglas – Join the global QuartzNet



As the world's largest integrated quartz glass producer, Heraeus Quarzglas has accelerated innovations in quartz glass technologies for over 100 years. A standard program of over 5000 products testifies to its inventiveness and technological diversity. Every product is tailored, regarding properties and shape, to the relevant field of application. For this purpose, all common manufacturing and processing methods are employed. Special, proprietary technologies complete our spectrum of capabilities. Heraeus Quarzglas develops, produces and supplies tailor-made solutions from base material to complex system components from one source.

Your Benefit: Global Network

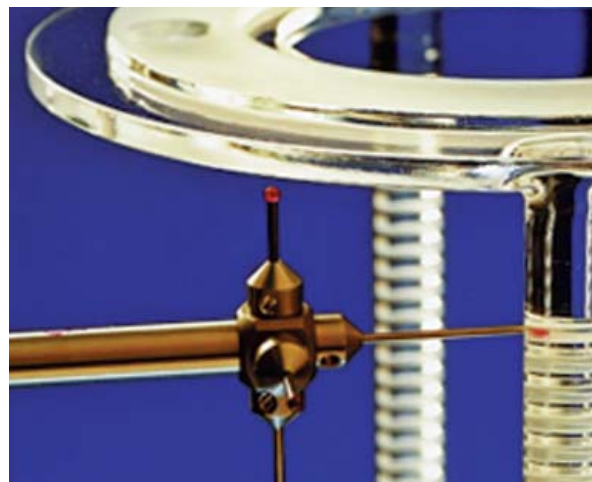
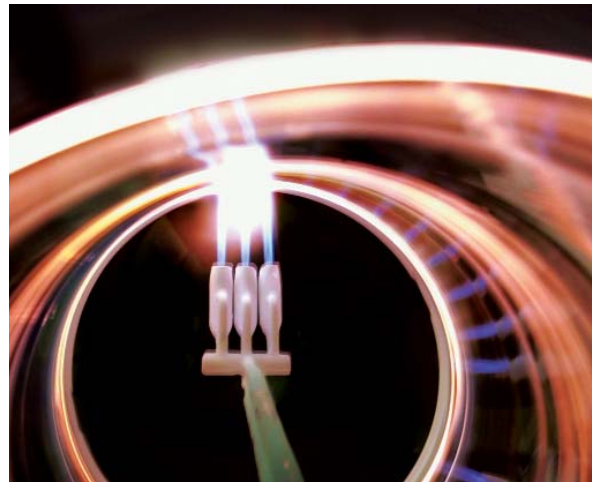
The global fabrication network of Heraeus Quarzglas is the basis for top product quality and reliability. Capacity peaks can be absorbed by our robust but flexible network which is qualified for all major OEMs. For this purpose, every location has special core competences for quartz glass production or processing. A cooperation with Heraeus Quarzglas also opens up opportunities to optimize procurement. As other companies within the Heraeus group deliver products such as bonding wires, soldering pastes, SMT adhesives or targets to the semiconductor industry, the formation of strategic partnerships is an obvious approach.

Your Benefit: Product Quality

Products made by Heraeus Quarzglas meet specific customer requirements. They have been optimized in respect of properties, shape and quality to suit individual applications. At Heraeus Quarzglas, product development starts right back with the base material. After all, the main properties are established at this stage. In many cases, such joint development projects, where all material grades and even synthetic material is used, lead to completely new materials. An example is the opaque quartz glass OM 100, whose extraordinary properties enabled its use in many products.

In further stages of product development it is crucial to maintain the base material's purity grade over the whole fabrication process. For this purpose, Heraeus Quarzglas has developed special methods, based on proprietary know-how and attributes great importance to extreme accuracy. The high quality of our quartz glass products is therefore no coincidence.

- Cleaning before and after each processing step
- Use of ultra-pure process and cleaning media
- Intensively trained, highly experienced staff
- Specially optimized processing tools to avoid potential contamination sources (materials free from copper and iron)
- Permanent, in-line process quality management



At Heraeus Quarzglas, tailor-made solutions start right from the beginning by selecting the optimum base material. As the world's largest integrated quartz producer, we offer competence at all stages of product development.

Worldwide Presence

Efficient Development and Production Management



Germany (Headquarters)

Hanau (Headquarters)
Kleinostheim, Bitterfeld (production sites)
Quartzware fabrication, base material fabrication
Single wafer/batch technology, 300mm technology, hot/
cold processing, tubes, rods, opaque, solids, qualified for
major OEMs, research and laboratory for quartz, crucibles,
microlithography/standard optics, lamp materials

Great Britain

East Kilbride, Scotland (production site)
Quartzware fabrication, Thermocouples
Single wafer/batch technology, hot/ cold processing, tubes,
rods, opaque, solids, qualified for major OEMs, thermo-
couple manufacture & calibration

China

Shenyang (production site), Shanghai (sales office)
Quartzware fabrication
Single wafer/batch technology, 300mm technology, hot/
cold processing, tubes, rods, opaque, solids, qualified for
major OEMs

Japan

Tokyo (Corporate Headquarters of joint venture partner
Shin Etsu Quartz Products; sales office)
Takefu, Koriyama, Kumamoto, Sasebo, Yamagata
(production sites)
Quartzware fabrication
300 mm technology, qualified for major OEMs, crucibles,
microlithography/standard optics, lamp materials, fiber optics



Korea

Jinchon-gun, South Korea (production site)
Quartzware fabrication
300mm technology, hot/cold processing, qualified for major OEMs

Taiwan

Hsin-Chu, Chia-li (production sites)
Hsin-Chu (sales office)
Quartzware fabrication
300mm technology, hot/cold processing, qualified for major OEMs

USA

Austin, Texas (US Headquarters)
Buford, Georgia; San Jose, California (sales offices)
Quartzware fabrication
Single wafer/batch technology, 300mm technology, hot/cold processing, tubes, rods, opaque, solids, qualified for major OEMs, lamp materials, optics

Service & Technologies

Lifetime Partner for your Quartzware Products

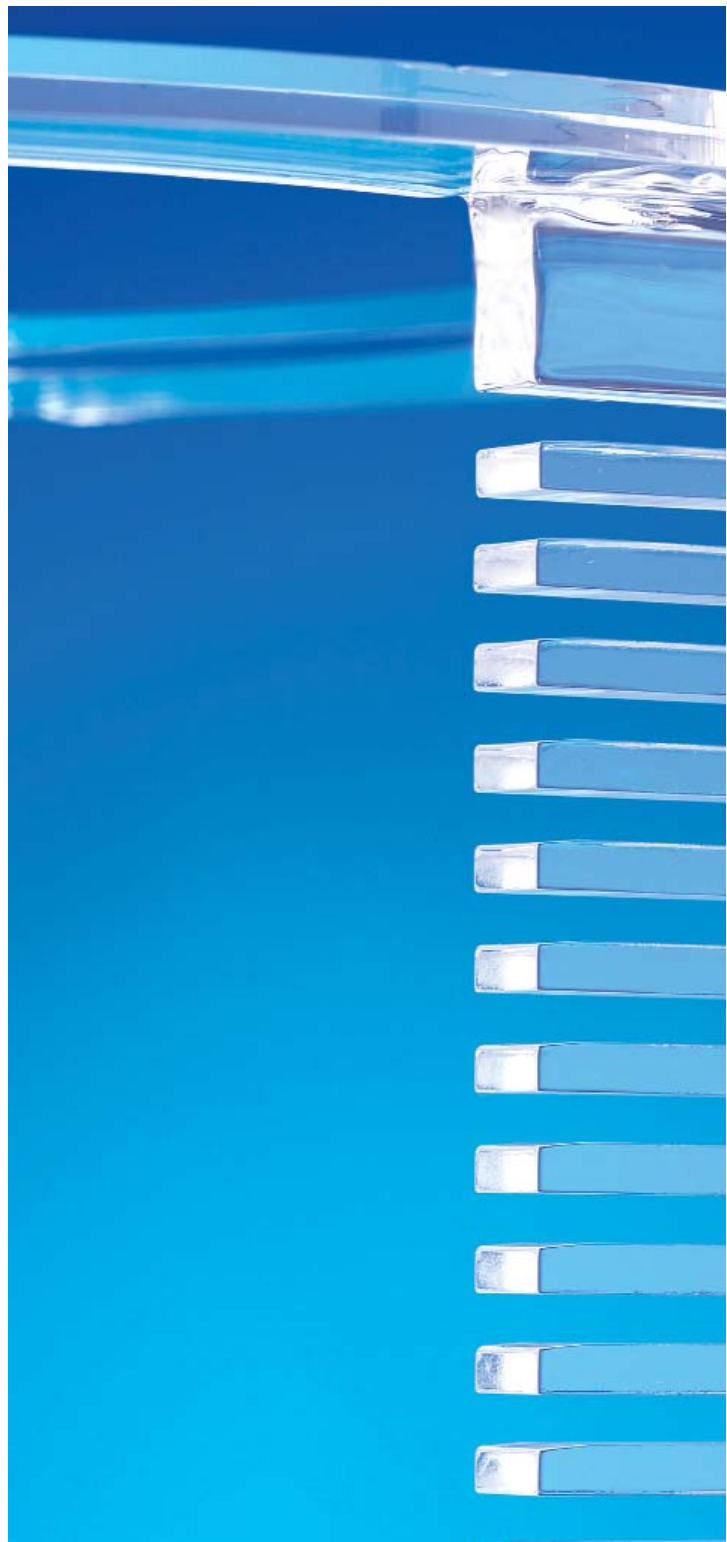
In addition to product variety and global presence, a competent and reliable customer support over the whole service life of your quartzware products is part of the Global QuartzNet. Services range from cleaning and repair to re-engineering up to stock management. For our customers, this means: efficient usage and full availability of quartzware products free from time or effort.

Heraeus Quarzglas' fabrication network, together with its joint venture partner Shin Etsu Quartz Products is qualified for all major OEMs. This organization has a flat structure and manages development and production capacities flexibly. Our customers therefore benefit from the high availability and accessibility. On request, our products are available ready to install.

R&D

Heraeus Quarzglas' physics and chemistry laboratories make important contributions to the development of new quartzware products. Employing infrared measurement technology, the permeability and coloring of materials is determined. Scanning electronic microscopy reveals information on surface characteristics. Purities, even in the ppt range, are measured by atomic absorption spectroscopy and ICP-MS analyses. These data provide a deeper understanding of microscopic and macroscopic processes in quartz glass. This to a great extent, is the basis of our innovative power. For this purpose, Heraeus Quarzglas regularly dedicates a fixed portion of its turnover to investments in this area. Advanced measurement and analysis technology is the platform for continuous product improvement.

Another task of the chemistry laboratory is to ensure compliance with the required material grades. It is hence an important component of quality management. To this end, we determine, for example, the iron and copper content on the surface using non-destructive analyses.





Overview of our support services:

- Repair / Cleaning / Recycling service
- Re-use / Refurbishment
- Cleaning
 - Final Cleaning – ready to install service
- Characterization
 - Analytical services of certified chemistry laboratory
 - ICP-MS / OES of surface and bulk material
- Customized surface solutions
 - Special Surface Treatment, chemical roughening
 - Sandblasting
- Design support
 - Re-engineering
 - In-house FEM simulations
- Advanced manufacturing
 - Robot fire-polish
 - Automated welding procedures
- Material engineering
 - Synthetic quartz
 - High-viscosity synthetic quartz for HT-processes
- Further R&D
 - High-reflective quartz coating (e.g. for lamp tubing)
 - Quartz bonding techniques
 - Synthetic opaque material

Germany

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