



HAUSER OPTIK
Präzision in Glas

HAUSER OPTIK
PRECISION IN GLASS.



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HAUSER OPTIK - a name stands for quality

- **Since 1921 a producer of optical components**
- **Hauser nowadays is an established player in the market of optical manufacturers**
- **And also one of the leading companies for precision spheres worldwide**



TRADITION

Close to 100 years
of optical production

HAUSER MILESTONES

- 1921** - Founding of the company in Reichenbach (Saxony) - Initially pressed lenses and reflectors for bicycles
- 1952** - Moving to Solms, also due to the close connection to ERNST LEITZ
- 1952** - First producer of pressed aspheres in the world
- 1960** - Starting the production of precision spheres
- 1982** - Production of the first CD players (SONY) with HAUSER lenses
- 2001** - Moving to the new company building
- 2014** - Certification to DIN EN ISO 9001: 2015
- 2015** - Hauser Optik gets involved in the research and production of the new standard kilogram

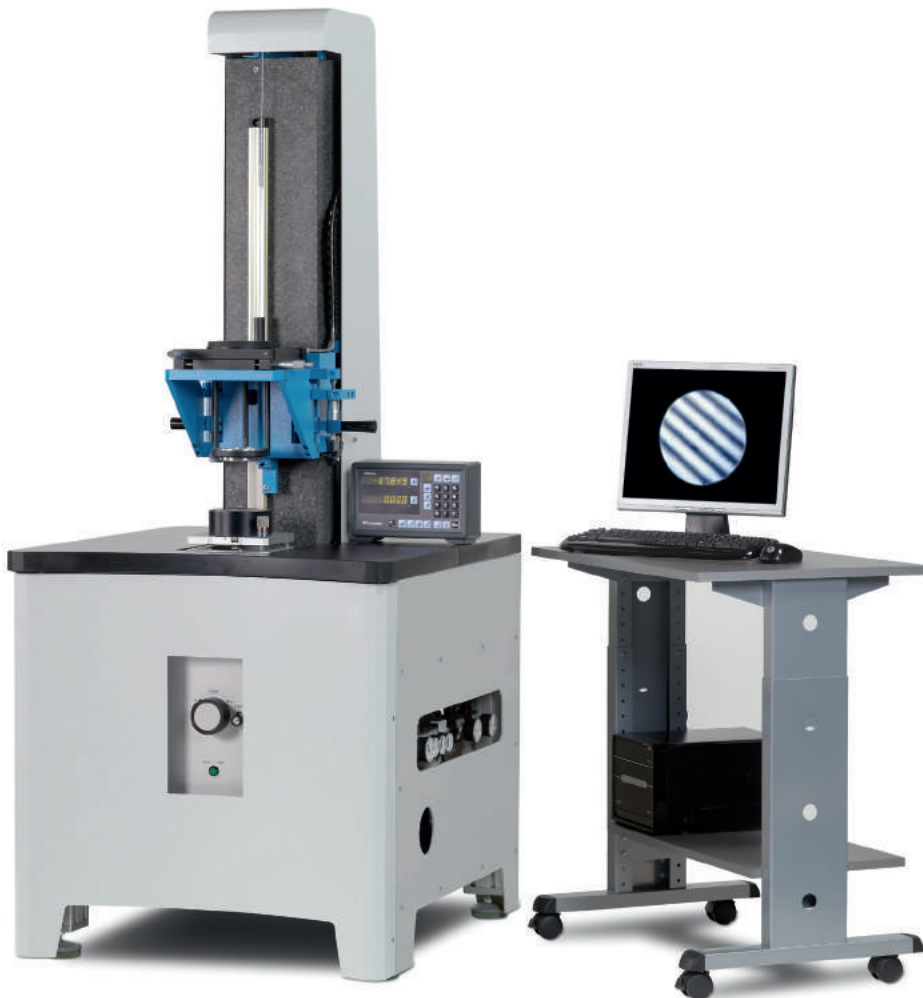
INNOVATION

Hauser and the new Standard kilogram



- The 129-year-old „international kilogram prototype“ has lost some weight, however
- A new definition for the kg was needed
- HAUSER plays an important role in this
- Since 1889 the Standard kilogram is defined by a 3,9 centimetres large cylinder of platinum and iridium
- The prototype kilo has lost 50 microgram, perhaps by abrasion or due to gassing out of hydrogen
- In high precision industries even the 50-millionth part of a gram makes a difference
- This 129-year-old metal cylinder is now about to be replaced by a ball made of silicon-28 with a diameter of 9,4 centimetres
- Price about 1 million Euro
- Extremely long-term-stability, easy handling and cleaning
- A JOINT RESEARCH PROJECT between HAUSER OPTIK and the PTB, Braunschweig, since 2015

HAUSER OPTIK - Ein Name steht für Qualität



- Within this period HAUSER with its excellent international reputation produced high-precision balls for the PTB as samples and prototypes to experiment with
- Calculation of the kilogram and its manifestation in silicon is a very complicated matter
- Now the number of atoms needed for one kilo can be calculated
 - This specifies the kilogram one and for all
 - The balls must be shaped perfectly
 - The pore size is as little as 0,1 nanometre
 - HAUSER will be able to produce very cost-efficient balls of natural silicon and market them worldwide
 - With the exception of PTB, HAUSER OPTIK is the only one with the technology to produce by far the roundest object of its kind anywhere
 - For managing directors Wolfgang und Stefan Hauser this cooperation means a great honour
 - We are fully aware that such an important project is a once-in-a-lifetime event



HIGHTEC

High precision technology
& a long lasting experience

- High precision technology & a long lasting experience are the basis for the high quality of all HAUSER products

...and also the basis for the JOINT RESEARCH PROJECT with the PTB - the new standard kilogram



PRODUCTS. PRECISION.

HAUSER - a complex product range

- Precision Spheres
- Precision Semi-Spheres
- Drum Lenses
- Aspherical Lenses
- Spherical Lenses
- Lighting Optics
- Free-Form Surfaces
- Plane Optics

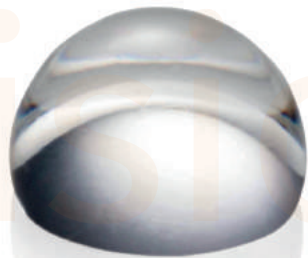




PRECISION SPHERES AND SEMI - SPHERES

HAUSER is one of the leading companies worldwide for the production of high precision balls

- The diameter tolerance is at +/- 0.001 mm and can be less on request
- The spherical roundness is less than $\lambda / 10.$, at a measured length of λ 632.8 nm
- Production sizes: < 0,5 mm - 120 mm



Precision spheres

DRUM LENSES

The basis for drum lenses are precision spheres
They will be polished for getting a cylindrical shape

Production sizes:

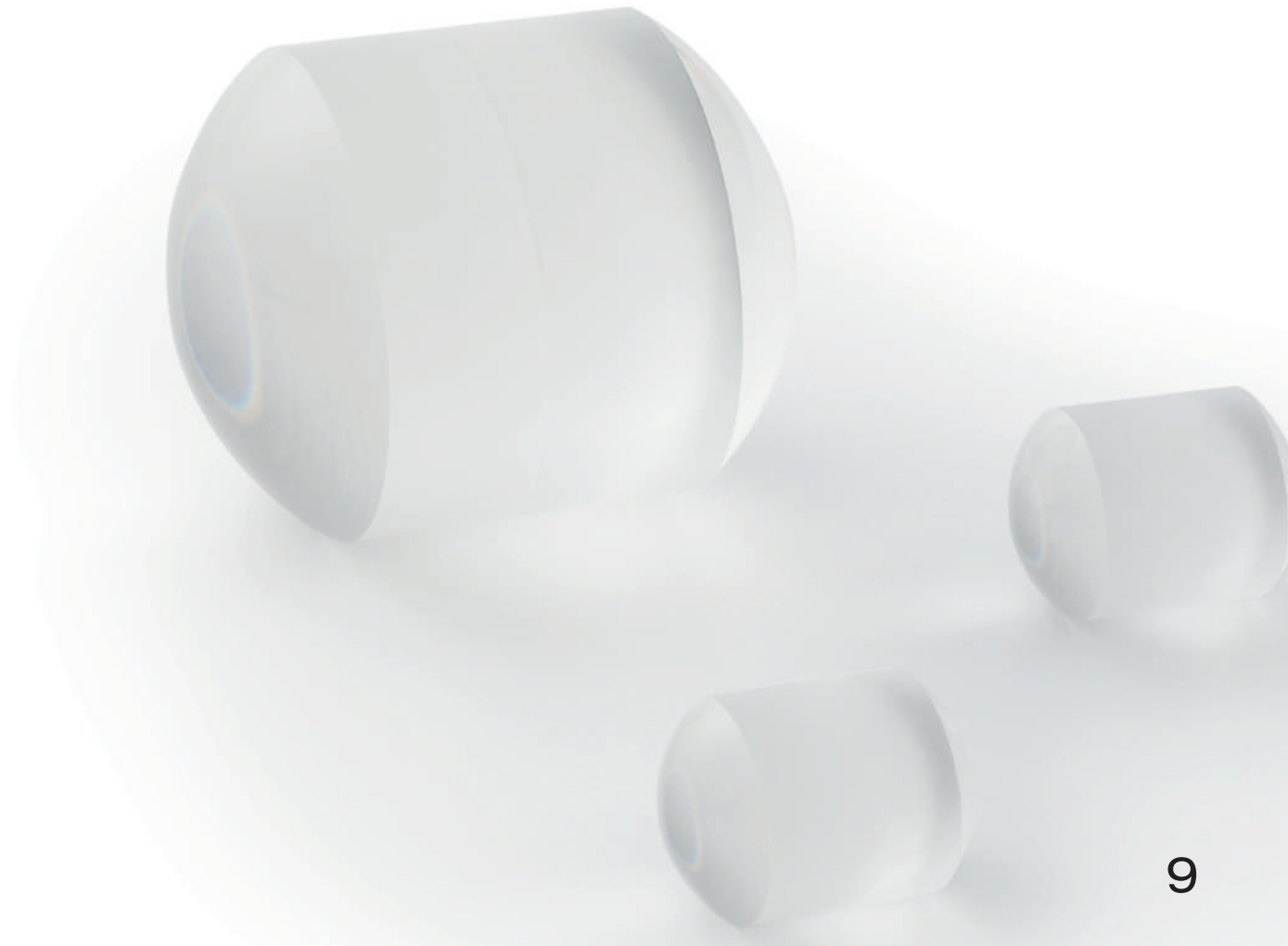
< 3 mm - 100 mm

Input materials:

- All optical glasses
- Quartz
- Silicon
- CaF₂ (calcium florid)
- Metal
- Germanium

Applications:

Fiber couplings,
Endoscopy, etc.



ASPHERICAL LENSES

- Made for avoiding spherical aberration
- Long tradition at HAUSER
- In the 1940`s HAUSER was the first company to be able to produce blank-pressed spheres (and aspheres)

Input materials:

- Liba 2000 +
- F2
- Borosilicate

Applications:

Sensors, LED technology,
Endoscopy,
Ophthalmoscopy,
Projectors, etc.



SPHERICAL LENSES

- Traditional lenses for focusing, collecting or scattering light
- One of their two sides is the section of a ball
- Also used with an achromatic function in certain systems



Input materials

conventionally made spheres:

- All optical glasses
- Quartz
- Silicon
- CaF₂ (calcium florid)
- Metal
- Germanium

Input materials

blank moulded spheres:

- Liba 2000 +
- F2
- Borosilicate

Applications:

Sensors, LED technology, Projectors, Binoculars, Ophtalmoscopy, Endoscopy, etc.



LIGHTING OPTICS

- High Quality mirrors and lenses for perfect light yield, accuracy and general efficiency
- Aspherical and spherical lenses
- One- and two-sided blank-pressed
- Spherical lenses in cut and polished forms



Applications:
lighting technology,
LED, etc.

FREE-FORM SURFACES

- Many different shapes and functions
- Many special applications
- Mainly designed for customer`s wishes and special requirements



Input materials:

- Liba 2000 +
- F2
- Borosilicate

Applications:

pushbuttons,
electric door-openers,
light barriers, etc.



TOGETHER WE CAN DO MORE with:

- **The Know-How of many long-experienced employees**
- **The spirit and dynamics of the younger specialists**
- **Short paths within our company**
- **The technical competence of the whole HAUSER team**
- **Family-like atmosphere**

SUCCESS BASED ON THE INTERACTION OF MANY IDEAS



“The strength of the team is each individual member.
The strength of each member is the team.**”**



CUSTOM SOLUTIONS

- **Most of our products constructed specifically to customers requirements**
- **Sometimes similar to the standard**
 - sometimes completely new
- **many different materials**
- **Great variety of shapes and designs, especially in the area of free-form surfaces**
- **Special flexibility**
 - Small series possible
 - Very quick product development if demanded





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