### Discover SCHOTT





#### Specialty glass for more than 130 years

Our competence lies in the areas of specialty glass and glass-ceramics.

The company's founder Otto Schott is considered the founder of the specialty glass industry.

Since Otto Schott, innovations have always been a part of SCHOTT's DNA.



# Innovations in specialty glass

1884 Optical glasses
1887/1893 Invention of borosilicate glass
1911 FIOLAX® glass tubing for pharmaceutical packaging
1939 Glass-to-metal seals
1964 Fiber optic components for light and image guides
1968 ZERODUR® glass-ceramic for telescope mirror substrates
1973 CERAN® glass-ceramic cooktop panels
1994 BOROFLOAT® Borosilicate glasses with the microfloat process
2002 NEXTERION® coated substrates for Microarrays
2009 Xensation® Cover glass for touch applications
2016 Ultra-thin glass was awarded the German Industry Innovation Award
2017 iQ<sup>TM</sup> platform for pharmaceutical packaging

#### **Innovations in specialty glass**





#### Historic milestones

1884 Founding of the company in Jena

1889 Ernst Abbe founds the Carl Zeiss Foundation

**1891/1919** SCHOTT becomes a foundation company Sole owner: the Carl Zeiss Foundation

**1948** After World War II the original factory in Jena was expropriated and the company was divided into east and west

**1952** Rebuilding of the foundation company in Mainz, Mainz becomes the headquarters of the SCHOTT Group

As of 1963 Continuous internationalization

**1991/1995** After German Reunification, SCHOTT also seized the opportunity to reunification.

2004 Conversion into a corporation, SCHOTT AG





# Milestones of internationalization

1900 Export share reaches nearly 50%

1954 First production site outside of Germany (Brazil)

As of 1963 Establishment of production sites and sales offices in Western and Southern Europe, first sales office in the USA

1966 First sales office in Asia (Japan)

**1969** First production site in the USA

**1974** First production site in Asia (Malaysia)

As of 1993 Establishment of production sites and sales offices in Eastern Europe

2002 First production site in China

**2017** New pharmaceutical packaging plant in Jinyun (China)

**2017** 86% of worldwide sales are generated outside of Germany





#### Acting responsibly

Our founders, Otto Schott and Ernst Abbe, made the responsibility for employees and their families as well as for science and society part of our corporate culture.

We are committed to this responsibility with conviction.



#### Commitment Focus on employees and their families

The health and safety of our employees is always our top priority.

Programs for balancing family and career.

Qualification is the key for success: high-quality professional education, promotion of training and development.



#### Commitment A pioneer in environmental protection

Responsible use of raw materials.

Continuous process improvements of production by lowering of energy and water consumption and by reducing emissions and hazardous substances.



#### Commitment Corporate social responsibility

Run for Children® – Charity run in favor of handicapped, ill and socially disadvantaged children.

Support for sports clubs in Mainz and Jena.

Local corporate social responsibility activities all over the world.



#### Commitment Dividends to promote the sciences

With the dividends from SCHOTT and ZEISS the Carl Zeiss Foundation promotes the sciences at universities in the German federal states Baden-Wuerttemberg, Rhineland-Palatinate and Thuringia.

In the last three years SCHOTT has payed dividends in the amount of nearly 24 million euros to the foundation.

Since 2007, the foundation has approved funding of more than 120 million euros.

#### Our goal is sustainable growth

FY 2016/17, all figures in EUR



#### Our business is global

86% of worldwide sales are generated outside of Germany



#### **Specialty glass – a high-tech material**

Glass is made by melting quartz sand and other raw materials



#### **Broad product portfolio for many industries**



Home Appliances



Life Sciences



Automotive



Pharma



Electronics



Astronomy





#### Home Appliances Setting standards

SCHOTT CERAN<sup>®</sup> innovative glass ceramic cooktop panels for electric, induction and gas ranges.

Processed flat glass for baking ovens, gas cookers, refrigerators and washing machines.





#### Fireplace Market

#### Cozy warmth

SCHOTT ROBAX<sup>®</sup> glass-ceramic for fireplaces and stoves – engineered in Germany.

Inspiring 3D fire viewing panels in thousands of variations.

Innovative decorations and functional coatings, e.g. heat- or anti-reflective coating.



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#### Pharma Delivering purity

FIOLAX<sup>®</sup> glass tubing for safer primary pharmaceutical packaging.

High quality ampoules, vials, cartridges and prefillable syringes made of glass and high-tech polymer.

SCHOTT pharma services: Analytical lab services for pharmaceutical packaging.



#### Electronics Reliable protection

Hermetic sealing technologies, namely glass-to-metal, ceramic-tometal as well as full ceramic seals to reliably protect highly sensitive electronic components and enable high speed data transmission.



Industrial and Environmental Technology

#### Optimizing productivity

DURAN<sup>®</sup> glass tubing for use in plant engineering, for ozone generation, flue gas desulphurization or algae cultivation in photobioreactors.

# Consumer Electronics Durable surfaces

Extremely strong cover glass for use in mobile devices and other displays, such as in automotive applications.

Hard & Clear coatings that significantly increase scratch resistance and reduce glare for cover glass.

CONTURAN<sup>®</sup> DARO glass that perfectly combines anti-reflective with anti-fingerprint properties.



#### Optics Sharpening the view

More than 120 types of optical glass for use in high-tech applications in the areas of consumer optics, electronics, laser technology, medicine and biotech.

Lenses, prisms and filters for camera systems, high-performance projectors and laser tools.

Thin glass for micro-optics, imaging sensors and biochips.

ZERODUR<sup>®</sup> glass-ceramic for use in high-precision measurement technology and microlithography.



#### Life Sciences Brightening healthcare

Lenses, prisms, filters, and fiberoptic light and image guides for microscopes and medical devices.

Glass powder for aesthetic and durable dental fillings and composites.

NEXTERION<sup>®</sup> coated and uncoated substrates for research and diagnostics.

Bioactive glass powder for remineralization and smoothing of the skin.

#### Aviation Perfect atmosphere

Unique sensor-controlled LED cabin lighting and innovative seat illumination.

Anti-reflective glass and optical filters for cockpit instruments.

Hermetic housings for the protection of sensitive aircraft electronics.



#### Automotive Electrifying mobility

Ambient lighting for vehicle interiors.

Hermetic glass-to-metal sealed housings for the protection of electronics and sensor technology, e.g. for airbag igniters.

Special glass tubes for halogen lamps.

Fiber-optic components for outdoor lighting and data transmission.





#### Astronomy

### Opening new horizons

ZERODUR<sup>®</sup> glass-ceramic mirror substrates for use in the world's largest telescopes.

Radiation-resistant glass and filters for use in astronomical instruments.



### Passion for innovation

We are driven by the challenges that our customers and markets face.

Our innovative strength is reflected in more than 3,000 patents worldwide.

Otto Schott Research Center in Mainz: one of the world's leading glass research institutions. Other application centers are located in the US and Asia.

We stand for "glass made of ideas".





### Extensive competencies

450 researchers work on futureoriented solutions in a worldwide R&D network.

Their focus is on the core competencies

- Material development
- Melting technology
- Hot forming
- Coating techniques
- Laser processing
- Mathematical process simulation



#### CERAN<sup>®</sup> The original

SCHOTT CERAN<sup>®</sup> glass-ceramic cooktop panels bring high-end technology and sophisticated design into every kitchen – since 1971.

SCHOTT CERAN Miradur<sup>®</sup> is the first and only scratch-resistant glass-ceramic cooktop panel that is almost as hard as a diamond.



### ZERODUR® The quality

With its extremely low thermal expansion, ZERODUR® glass-ceramic has been the substrate of choice for telescope mirrors for 50 years.

For the Extremely Large Telescope (ELT), the European Southern Observatory (ESO) is again relying

The ELT will be the world's largest eye for looking into space.



### Thinner than a human hair

With a minimum thickness of only 0.025 millimeters, SCHOTT's ultra-thin glass is the thinnest glass in the world - yet extremely flexible and stable.

These advantages open up new possibilities for technical progress for product developers.



### New ground for diagnostics

Glass wafers and NEXTERION<sup>®</sup> coated substrates for Microarrays or lab-on-a-chip solutions enable fast, reliable and reproducible results for diagnostic applications.

More over, highly flexible fiber optics made of PURAVIS<sup>®</sup> glass fibers and innovative LED light sources enable precise and long-term stability light in analytical instruments.



#### Increase flexibility with iQ<sup>™</sup>

iQ<sup>™</sup> is our holistic platform that allows pharma manufacturers to flexibly fill vials, syringes or cartridges on the same line.

SCHOTT supplies these different containers in a standardized tub, which reduces changeover times to only a few minutes.

 $iQ^{TM}$  decreases complexity and saves time – all in the interest of the patients.



#### Specialty glass The material of the 21st century

SCHOTT

What's your next milestone?

