Pharmaceutical Systems
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Cartridges
SCHOTT is an international technology group with more than 125 years of experience in the areas of specialty glasses and materials and advanced technologies. With our high-quality products and intelligent solutions, we contribute to our customers’ success and make SCHOTT part of everyone’s life.

SCHOTT Pharmaceutical Systems is one of the world’s leading suppliers of glass tubing and primary packaging for the pharmaceutical industry. We provide our customers quality solutions while meeting their highest demands with our material expertise, specialized analytical lab services, and a broad product portfolio; including ampoules, cartridges, vials and syringes made of glass and COC polymer. Our state-of-the-art production facilities and our products comply with the highest international quality standards for pharmaceutical needs.
With SCHOTT, you team up with a truly global partner. Our extensive production network of 17 packaging and 5 tubing production sites offers safe supply, technical support and local service.

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Cartridges for all kinds of pharmaceutical applications
SCHOTT cartridges are designed to meet the highest pharmaceutical requirements ensuring excellent production performance on high-speed filling lines. Our cartridges are the ideal packaging solution for insulin administration, pen systems, pump systems, auto-injectors, and needle free injectors.
For special requirements such as by-pass and chemically strengthened cartridges, personalized designs can be developed in partnership with the customer.
A comprehensive portfolio made of SCHOTT glass

Pen cartridges
- Recommended designs from 1 to 5 ml
- ClearLine, TopLine

By-pass cartridges
- Customized sizes
- ClearLine, TopLine

Customized cartridges
- 1 to 10 ml
- ClearLine, TopLine

Dental cartridges
- 1.8 ml, 2.2 ml
- StandardLine
Tailored quality

From standardized to customized quality options
Market developments such as tightened regulatory demands, the evolving importance of biotech drugs and cost sensitivity in the healthcare sector impose increasing requirements on drug delivery systems. A broad variety of container geometries and quality levels enables us to identify the primary packaging solution that meets your distinctive needs.

All SCHOTT cartridges comply with the international norms Ph.Eur., USP, and JP. Strict quality control and excellent process capability are guaranteed by our technologically advanced production lines enhanced with high-precision forming tools. All of our products are manufactured and packed in environmentally controlled areas certified by ISO 9001 and ISO 15378.

StandardLine – 100% camera inspected for dimensions
StandardLine by SCHOTT is designed to deliver reliable performance on our customers’ filling line. The features of StandardLine include:

- Production in cGMP environment
- Statistical process control
- 100% dimensional inspection

ClearLine – 100% camera inspected for dimensions and cosmetic defects
ClearLine by SCHOTT offers excellent performance on high-speed filling and packing lines. The features of ClearLine include:

- Production in cGMP environment
- Statistical process control
- 100% dimensional inspection
- 100% cosmetic inspection
- Tightened AQL levels
TopLine – 100% camera inspected for customized dimensional and cosmetic parameters
Bespoke TopLine products meet customer defined specifications with narrowed tolerances for dimensional and cosmetic aspects. TopLine products are developed in close cooperation with the pharmaceutical company to substantially reduce overall costs by optimizing incoming inspection and production performance.

The features of TopLine include:

- Production in cGMP environment
- Statistical process control
- 100% dimensional inspection
- 100% cosmetic inspection
- Customized AQL levels
- Reduction of customer risk management
Integrated glass and process expertise

From raw materials to SCHOTT FIOILAX® glass tubing
More than 125 years of experience in glass technology and manufacturing guarantee the superior quality of SCHOTT glass tubing. FIOILAX® borosilicate glass tubes are Type I glasses of highest hydrolytic resistance. Excellent barrier and cosmetic properties, high chemical resistance, light protection as well as tight geometric tolerances in diameter and wall thickness are the starting point for manufacturing high quality products with an outstanding process capability designed for state-of-the-art filling lines.

Melting process
The manufacturing plant houses several tanks, which operate at a melting temperature of around 1600°C. FIOILAX® tubing is produced from raw materials that conform to world wide standards. SCHOTT’s own sorted cullets are used in the melting process. Our stable glass composition means stable chemical properties in our customers’ filled container.

Tube drawing
SCHOTT glass tubing is produced in a continuous drawing process resulting in optimum geometrical and optical quality. This minimizes the breakage risk in high-speed filling lines and leads to higher yield and stable production processes. In addition, the outer tubing surface can be coated to avoid scratches during transportation and handling.

Tube processing
In order to avoid contamination during storage, transport and processing, SCHOTT FIOILAX® tubing is separated with low particle content and sealed using flame.

Quality control
All of SCHOTT’s tubing plants across the world adhere to the same quality management policy. Our state-of-the-art inspection system ensures that the strictest standards are continuously met. All data are collected in a special pallet certificate for complete traceability. Highest levels of quality are assured throughout the whole production process.
From tubing to high quality SCHOTT containers

Quality is the most important driver to improve our customers’ production yield in order to ensure the production performance performance on high-speed filling lines. Our expertise in glass converting in combination with our qualified workforce ensures the consistent high quality level of our products. SCHOTT cartridges are manufactured on high-tech production equipment with the latest online inspection systems. In addition, they are packed in a protected environment to avoid contamination.

Forming process

High-precision forming technology is combined with our proven glass expertise to guarantee superior quality and a high process capability. Our improved process handling avoids glass-to-glass contact along the production line to ensure we deliver products with strict cosmetic standards and minimum breakage risk at the customer end.

100% In-process control (IPC)

All critical dimensional parameters and cosmetic attributes are 100% inspected during manufacturing utilizing the latest vision technologies and our proprietary inspection systems with automatic classification of defects by type, size and position on the container. This allows our customers to realize improvements in throughput and minimize incoming inspections, thus reducing rejection costs.

Statistical in-process inspection (SPC)

Efficient performance tracking is facilitated by continuous process monitoring via real-time manufacturing data to ensure quality, dimensional stability and less production downtimes for our customers.

Packing process

Raw material and product handling is the key to premium quality. Automated smart pick-and-place systems guarantee gentle care of our products from loading through final packaging ensuring the cartridge is sustained with the least amount of handling and reliable product side segregation for traceability in the final package. SCHOTT cartridges are packed in a protected packaging zone that prevents the introduction of particulate influences.
Customer service right from the start

Global design standards for a shortened time-to-market
Industry pressure to accelerate drug development and launch can pose challenges to manufacturers of cartridge based drug delivery systems. SCHOTT offers individual support by recommending tenured formats that ideally satisfy your demands and can be produced according to existing specifications. Thereby, the time-to-market of drug delivery systems can be reduced significantly. For immediate availability of 3.0 ml pen cartridges, we even provide delivery from stock.

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<tr>
<th>SCHOTT Recommended Design</th>
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<tbody>
<tr>
<td>Drug Substance</td>
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<tr>
<td>GLP - 1</td>
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<tr>
<td>HGH</td>
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<tr>
<td>Insulin*, GLP-1</td>
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* Standard from stock available

Customized solutions for innovative device requirements
SCHOTT offers individually designed cartridges in order to meet new device requirements. Important dimensions that have to be considered for a new design are total length (l1), external diameter (d1), internal diameter (d2) and glazing diameter (d3). We develop the ideal dimensions for specific drug delivery systems in close cooperation with our in-house FIOLAX® tubing supply and our customers.

Crown
Hot forming

Body FIOLAX®
Clear glass tubing

Bottom
Hot forming
Advantages at-a-glance

Glass expertise
The right chemistry is with SCHOTT: In close cooperation with our customers, we continuously develop new solutions and process improvements based on 125 years of glass expertise and proven supplier track record.

Compliance
Tailored container solutions for different regulatory, market, product and process requirements meet today’s and tomorrow’s customer demands.

Reliability
We offer a safe and secure global supply through 17 packaging and 5 tubing production sites, each equipped with identical production technology and involved in continuous know-how exchange.

Value
Total cost of ownership put into practice: A 100% cosmetic inspection that ensures high yields in customer filling lines and a tight inner diameter tolerance of up to 0.05 mm that minimizes residual volume are just two ways we add value for our customers.