SCHOTT

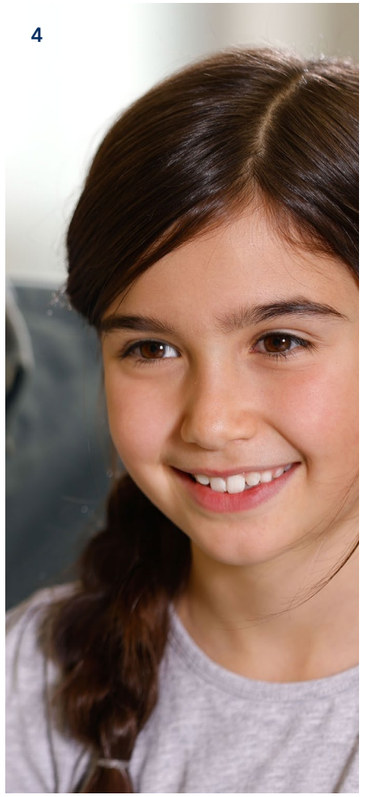
Patient safety starts with us.

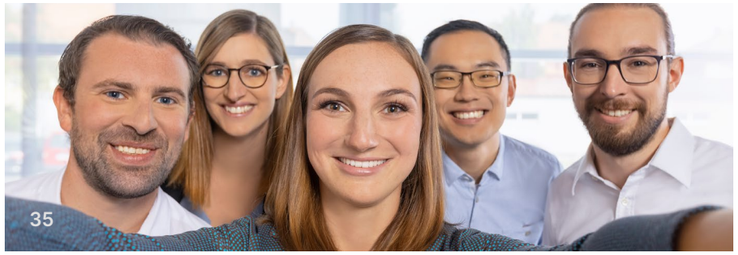
Type I borosilicate glass tubing for pharmaceutical primary packaging.

Pioneering solutions since 1884.

We make what seems impossible possible. That's because here at SCHOTT we believe that shared responsibility, experience, and close collaboration generate groundbreaking solutions. As a global material technology group, we find new ways to shape a better future – for both our customers and partner companies. Responsibility for science, society, and the environment is deeply rooted in SCHOTT's DNA as a foundation company. With 17,400 employees in over 30 countries, we are a competent partner for many high-tech industries, specifically health, home appliances, consumer electronics, semiconductors, optics, astronomy, energy, and aerospace. Whatever challenges the future may bring, we look forward to finding innovative solutions and turning visions into reality.

With a production capacity of roughly 230,000 tons and production sites in Europe, South America, and Asia, SCHOTT Tubing is one of the world's leading manufacturers of glass tubes, rods, and profiles. Around 60 types of glass have been manufactured in a wide range of outer diameters and lengths on the basis of multi-site strategies in development, production and quality assurance. SCHOTT Tubing offers tailored products and services for international growth markets such as pharmacy, electronics, industrial, and environmental technology.





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Our commitment to patient safety

Patient safety is a top priority in the pharmaceutical industry.

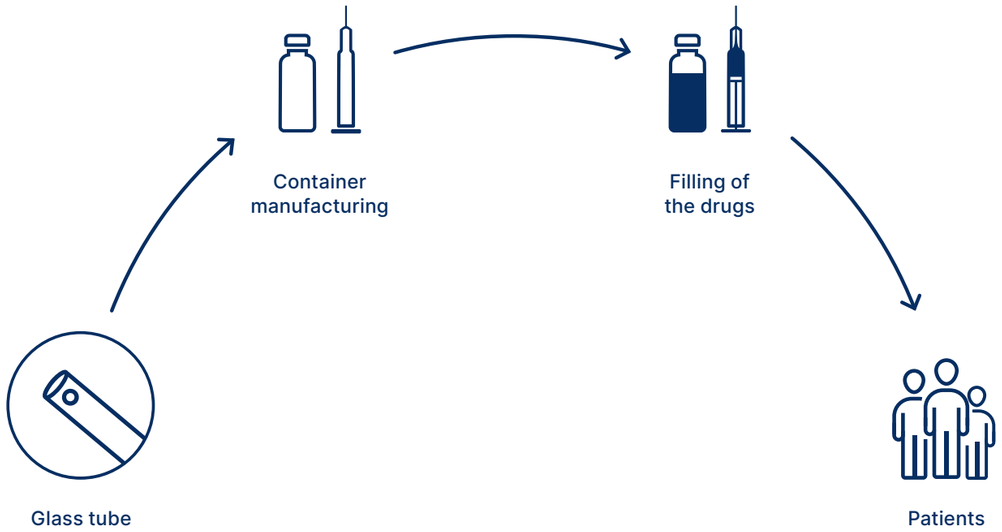
In addition to the development and manufacture of reliable and effective drugs, the provision of high-quality and safe packaging plays an equally important role in protecting patients.

Packaging materials must ensure that the efficacy of drugs is maintained and patients can be treated without any risks.

That’s why we rely on glass. Our responsibility starts with our glass tubes, which serve as the starting material for the production of first-class primary packaging solutions such as syringes, cartridges, vials, and ampoules.

We go beyond just glass production and always aim at patient wellbeing and therapy success.

Patient safety begins with the right material



Providing safe packaging plays a key role in protecting patients.

Why you can rely on glass

Unlike other materials, glass is characterized by its high inertness, thus limiting interactions with the drug to an absolute minimum. In addition, glass is excellent for sterilizing and remains stable and neutral, which preserves the purity and quality of the drug.

When it comes to packaging for injectable drugs, the material of choice is Type I glass. Type I is a designation that is defined by regulation in the ISO standards and pharmacopoeias. These are essentially borosilicate glasses, which have a high hydrolytic and thermal shock resistance due to their significant boron oxide content. Type I stands for the necessary glass quality and is both required and recommended globally, especially for the packaging of parenteral drugs.

Patient safety comes first – which is why Type I glass is the material of choice for primary packaging.

Impermeability
Glass is completely hermetic and therefore protects the contents from contamination, moisture, and oxygen.
This preserves the sterility of the drug.

High chemical resistance
This refers to the ability of a substance to withstand chemical attacks. Type I glass is characterized by a high degree of resistance. This prevents undesirable interactions or chemical reactions, ensuring the quality of the drug is preserved.

Transparency
The visibility and thus the identification of the contents make visual inspection easier. It also enables the user to reliably check the drug's condition.

High temperature resistance
Glass can endure both extremely high and low temperatures. This property allows for a wide range of applications in various processing and storage conditions.

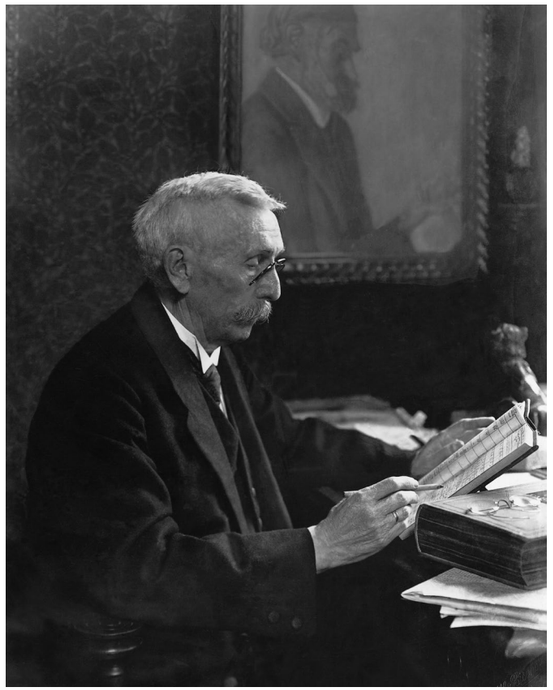
Shelf life
Glass is an extremely stable and durable material.
It retains its shape, structure, and properties even over long periods. Glass is said to have a theoretically infinite durability.

Glass is our DNA

As a pioneer and developer of Type I pharmaceutical glass, we can proudly look back on a proven track record of success and are among the world's leading manufacturers of specialty glass. By inventing borosilicate glasses, we have laid the foundation for the safe primary packaging of medicines, which is still considered the gold standard in the pharmaceutical packaging industry today.

As a trailblazer in the pharmaceutical glass sector, we set a high industry standard. Our strict quality standards set the bar high and we continue to improve our products and processes in order to meet the constantly evolving requirements of the pharmaceutical industry.

Additionally, our innovative spirit and dedication to excellence allow us to create pioneering solutions that meet current standards and anticipate future challenges. This way, we shape the future of the pharmaceutical glass sector and ensure our customers always receive the highest quality and safety. Looking ahead, the next major step awaits us in 2027, as we fundamentally rethink melting technology. This is one of our most ambitious milestones on the way to climate-neutral production (p. 15 >).



Otto Schott, Founder

Glass from the glass pioneer and developer of borosilicate glass

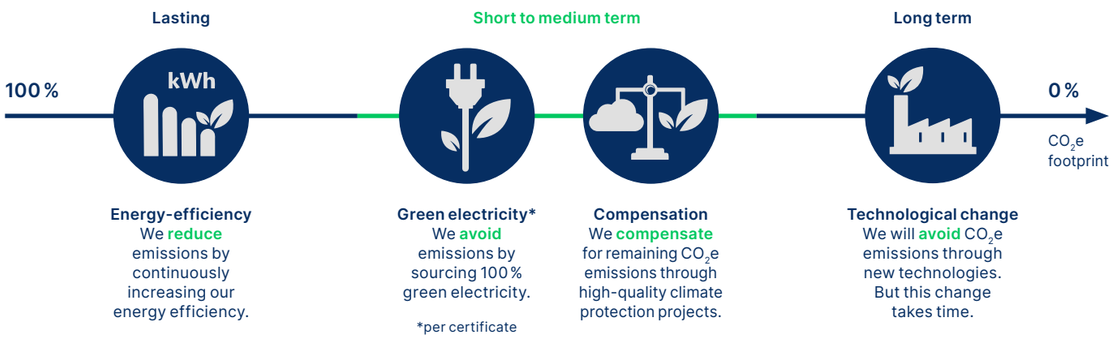
Shaping the future sustainably

As a foundation company, we are aware of our responsibility and the importance of close cooperation. Our goal is to promote innovative solutions for sustainable development. We are fully committed to this mission and are already thinking about the challenges of tomorrow today. As a global material technology group, we are dedicated to finding innovative ways to create a positive future for our customers, partner companies, and society as a whole.

A group on the way to decarbonization
We have set ourselves the ambitious goal of decarbonizing our production (Scope 1 + Scope 2). Since 2019, we have already made significant progress in our efforts to reduce the SCHOTT Group's CO_2e footprint. One goal is to only use electricity from renewable energies in the future. Since the end of 2021, we have been meeting 100 percent of our global electricity needs with renewable energy supported by corresponding guarantees of origin. In this context, we place significant value on high-quality green electricity certificates. Our sustainability journey now focuses on driving technological change and introducing innovative processes and products for greater sustainability.

Learn more

Timeline of the overarching SCHOTT action plan (Scope 1 + Scope 2)
Since 2019, we have reduced our company's CO_2e footprint by approximately 60 %.



Science Based Targets Initiative (SBTi)
SCHOTT has adopted more ambitious climate protection targets that also include Scope 3. We have had these reviewed and confirmed by the SBTi.

EcoVadis
The international agency for sustainability assessments once again awarded SCHOTT a gold medal in 2024.

German Sustainability
Award 2024 in the Glass and Ceramics Industry division and special award in the Climate category.

We recognize that we are still at the beginning of our comprehensive sustainability journey. We are, therefore, delighted that our commitment is already being recognized, which motivates us to continue pursuing our path with determination.

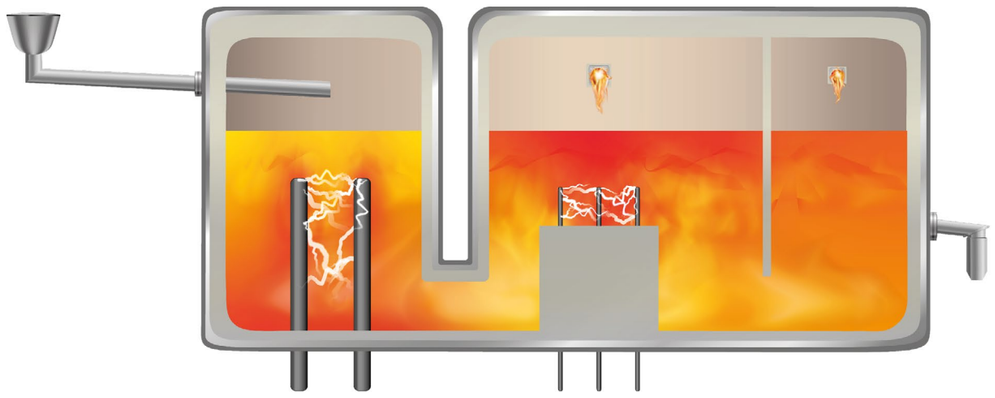
A new level of glass transparency

In a decisive step towards greater sustainability, SCHOTT Tubing is setting an ambitious milestone by expanding its product portfolio and an innovative production technology: the next-generation heavy-metal-free FIOLAX® Pro OCF (Optimized Carbon Footprint). This Type I glass will have a 50 % reduced CO_2e footprint compared to our traditional FIOLAX® *. The improvement is made possible by a significant change in our melting technology. We are building an electric melting tank powered by 100 % green electricity at our main pharmaceutical glass tubing site in Mitterteich (Germany), which will be operational by first quarter of 2027. This enables the production of glass tubes for the pharma industry with up to 80 % less CO_2e emissions during the melting process alone.

The reduced Product Carbon Footprint (PCF) thus has a significant impact on the footprint of the final primary packaging. These advances make a significant contribution to reducing the environmental impact of our products. To make our efforts transparent, we will provide detailed information, including the externally certified calculation method and the resulting PCF values. We are convinced that these groundbreaking changes will have a positive impact not only on our products but on the entire industry. SCHOTT Tubing remains committed to environmentally friendly innovation, setting standards for the sustainable future of the pharma industry.

*Calculation of greenhouse gas emissions from cradle-to-gate per kilogram of saleable glass tubing compared to the market average for borosilicate glass tubing [average value according to ecoinvent 3.10; glass tube production, borosilicate // DE].

Melting process with green electricity



At our main site in Mitterteich, Germany, pharmaceutical specialty glass is being melted with less CO_2e emissions for the first time.

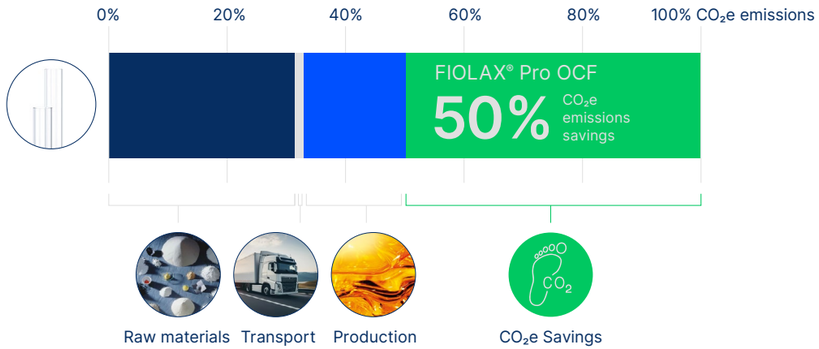
„We plan to drastically reduce CO_2e emissions in the production of glass tubes. This requires innovative, groundbreaking technologies."

Dr. Patrick Markschläger, Executive Vice President
Business Unit Tubing SCHOTT AG

Joining forces for more sustainability

We are proud to be a member of the Science Based Targets initiative (SBTi), which not only serves as a guide for our own ambitious reduction plans but also as inspiration for other environmentally friendly initiatives. Our commitment goes beyond our own goals – we also want to help our customers achieve their own sustainability goals. For this reason, we are planning additional measures, such as a common material cycle of cullet and pallets that meet individual customer needs.

These strategic steps will help support the ambitious sustainability goals of primary packaging manufacturers and their partners throughout the value chain. Our focus is on transparency and trust. With products like FIOLAX® Pro OCF (p. 22 >), we already want to work with you on a greener future today.



Discover the breakdown of emissions for FIOLAX® Pro OCF.

Premium quality for you

„When it comes to high-quality pharmaceutical packaging, consistent dimensions, precise tolerances, and high visual quality are essential for our glass tubes. With perfeXion®, we are taking global quality control and quality assurance to an unparalleled level.“

Dr. Karsten Hennig,
Head of Quality Management

Quality control
Each of our glass tubes is checked for both visual and dimensional irregularities using various fully automated online inspection devices and integrated data collection and evaluation. If it does not meet our quality requirements, it is sorted out and reprocessed in the melting tank. Thanks to the 100 % control in the perfeXion® tube production process, we can meet even the most demanding quality requirements. Additionally, we have significantly enhanced traceability options in the pharmaceutical production chain. This improvement is due to the data generated and the depth of data available through the process.

perfeXion®
Zero defect approach

Read more online.

Quality Management System
SCHOTT Tubing has a central quality management system with a globally uniform standard. This ensures the consistent quality and full interchangeability of our glass tubing.

Quality promise
Our comprehensive product specification – Technical Performance Specification (TPS) – is updated at regular intervals to take market and customer requirements into account.

Quality coaching
All our production employees undergo quality assurance training every six months.

Quality assurance
Operational quality inspectors accompany production in order to safeguard processes and continuously improve manufacturing.

Business Continuity Management
As a pioneer in glass tube production, SCHOTT Tubing has set up a business continuity management system in accordance with ISO 22301 “Security and Resilience” for its sites Mitterteich and Rio de Janeiro, which have been certified by TÜV Rheinland. For this purpose, critical processes were identified, failure analyses and risk analyses were carried out, and response plans were created to avoid potential critical interruptions of the process chains. The other tubing sites will be certified successively.

Certification
All SCHOTT Tubing sites produce pharmaceutical glass tubes in accordance with the GMP quality standard ISO 15378, certified by TÜV Rheinland Germany.

TÜVRheinland® CERTIFIED
Management System
ISO 9001:2015
ISO 15378:2017
www.tuv.com ID 9108654402
Germany

TÜVRheinland® CERTIFIED
Management System
ISO 9001:2015
ISO 15378:2017
www.tuv.com ID 9105082675
India

TÜVRheinland® CERTIFIED
Management System
ISO 9001:2015
ISO 15378:2017
www.tuv.com ID 9105068726
Brazil

TÜVRheinland® CERTIFIED
Management System
ISO 9001:2015
ISO 15378:2017
www.tuv.com ID 9000019772
China

Download certifications here.

SCHOTT Type I glass tubing portfolio – your best choice

The extensive product range of high-quality Type I borosilicate glass tubing has been developed to produce safe primary packaging materials that protect drugs and safeguard their effectiveness.

FIOLAX® and BORO-8330™ serve as the source material for high-quality primary packaging solutions such as syringes, cartridges, vials, and ampoules. These borosilicate glasses are characterized by high temperature resistance, low alkali content, and excellent hydrolytic and chemical resistance.

Our range of Type I pharmaceutical glasses includes a number of options. These meet the requirements of the pharmacopeias (Ph. Eur., USP, ISO, JP, ChP, YBB, REACH, RoHS) and regulations for pharmaceutical packaging.

FIOLAX® Pro

FIOLAX® clear

FIOLAX® amber

BORO-8330™

SCHOTT Type I portfolio
pp. 20 – 25 >

Application portfolio
pp. 26 – 33 >

Which type of glass is the most suitable tailored to your needs?
SCHOTT Type I Decision tree p. 18 >

„Type I glass **minimizes the risk** of drug-container interactions.“

Dr. Claudia Heinl,
Senior Product Manager Pharmaceutical Tubing

Decision tree for SCHOTT Type I glass

Our range of Type I pharmaceutical glass tubing includes a number of options. Select the right glass type for your pharmaceutical primary packaging according to your requirements.

Online TPS Configurator
Find the perfect glass tubing for your needs in just a few clicks

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The right glass for your needs

- without **light protection**
  - without special focus on an **optimized CO_2e footprint**
    - enhanced **extractables** requirements, e.g. biotech
      - enhanced **strength** requirements → p. 22, p. 23 **FIOLAX® clear CHR + OS**
      - normal **strength** requirements
        - **new** drug approval → p. 20 **FIOLAX® Pro**
        - **commercial** drug → p. 20, p. 23, p. 25 **FIOLAX® Pro, FIOLAX® clear CHR, BORO-8330™**
    - normal **extractables** requirements, e.g. small molecule entities
      - enhanced **strength** requirements → p. 23 **FIOLAX® clear OS**
      - normal **strength** requirements
        - **new** drug approval → p. 20 **FIOLAX® Pro**
        - **commercial** drug → p. 20, p. 22, p. 25 **FIOLAX® Pro, FIOLAX® clear, BORO-8330™**
  - distinctive focus on an **optimized CO_2e footprint** → p. 20 **FIOLAX® Pro OCF**
- with **light protection** → p. 24 **FIOLAX® amber**

Light protection | **Optimized CO_2e footprint** | **Extractables** | **Strength** | **Approval**

FIOLAX® Pro

FIOLAX® Pro is free of heavy metals and has excellent hydrolytic resistance and an improved extractables profile. This makes it ideal for future requirements, especially in the field of biotechnologically manufactured pharmaceuticals.

CO_2e optimized – the FIOLAX® Pro OCF (Optimized Carbon Footprint) product line will be produced in our Germany based first electric melting tank powered by 100 % green electricity, starting first quarter 2027. This results in a 50 % lower CO_2e footprint (Product Carbon Footprint, PCF) of these tubes*.
More information pp. 10 – 13 >

The future proof

The high-performance and future-proof premium glass, optionally with reduced CO_2e footprint.

Free of heavy metals, in particular

As Sb Sn

Product benefits

Excellent – free from heavy metals and excellent hydrolytic resistance for a minimal level of interactions

High quality – first-class cosmetic quality and dimensional accuracy thanks to perfeXion® process technology for increased container precision and lower reject rates

Customized – customizable specifications (best-value options), including zero defect options for individual needs

Customization options
Tube-end finish, anti-scratch coating, zero defect options, tighter tolerances

Compatibility

For all pharmaceutical container formats and sizes

For all drugs, especially parenteral drugs including biopharmaceuticals

Read more online.

Now available – the CO_2e footprint for FIOLAX® Pro OCF as the first product in our portfolio! In order to guarantee a high level of reliability and transparency, both the value and the PCF guideline for its calculation are certified by the external, accredited GUTcert institute.

Greenhouse Gas Protocol Product Standard & TfS Guideline & ISO 14067
Conformity of the SCHOTT PCF Guideline Version 1
GUTcert AFNOR Group

SCHOTT PCF Guideline 1.0
Greenhouse Gas Protocol Product Standard ISO 14067 & TfS PCF Guideline
FIOLAX® Pro OCF
GUTcert AFNOR Group

If you plan to (re)validate your primary packaging with FIOLAX® Pro, SCHOTT Tubing can help.

We will gladly provide you with technical documentation on FIOLAX® Pro.

Request FIOLAX® Pro technical documentation now.

*Calculation of greenhouse gas emissions from cradle-to-gate per kilogram of saleable glass tubing compared to the market average for borosilicate glass tubing [average value according to ecoinvent 3.10; glass tube production, borosilicate // DE].

FIOLAX® clear

This high-quality Type I borosilicate glass offers excellent chemical and hydrolytic resistance, impermeability, and neutrality. For optimal protection of the contents against premature aging and loss of effectiveness.

The original
The global premium standard with proven compatibility and quality-tested track record.

Product benefits

Trusted – proven compatibility with thousands of drugs worldwide, premium industry standard since 1911

High quality – first-class cosmetic quality and dimensional accuracy thanks to perfeXion® process technology for increased container precision and lower reject rates

Customized – customizable specifications (best-value options), including zero defect options for individual needs

Customization options
Tube-end finish, anti-scratch coating, zero defect options, tighter tolerances

Compatibility

For all pharmaceutical container formats

For all drugs, especially parenteral drugs

More information on all FIOLAX® clear variants.

FIOLAX® clear CHR

For FIOLAX® clear with controlled hydrolytic resistance (CHR), not only is the hydrolytic resistance of glass grains monitored and specified but also that of the inner surface of the tube. The composition of FIOLAX® clear remains unchanged.

The ambitious
The glass with certified extraction limit for sensitive formulations.

Compatibility

For all pharmaceutical container formats

Especially for sensitive formulations and biopharmaceuticals

FIOLAX® clear OS

For FIOLAX® clear with optimized strength (OS), special attention is paid to avoiding surface defects that can reduce the strength of the glass. The composition of FIOLAX® clear remains unchanged.

The strong
The glass with an even tighter visual specification for increased strength requirements.

Compatibility

For all pharmaceutical container formats

For high strength requirements, e.g. for containers with reduced wall thicknesses

FIOLAX® amber

FIOLAX® amber is a tinted glass with a proven track record in ensuring the long-term stability of light-sensitive drugs.

The UV hero

Glass with reliable UV protection for light-sensitive drugs.

Product benefits

Reliable – protection against ultraviolet light according to the light protection requirements of Ph. Eur. and USP in line with ISO formats

High quality – first-class cosmetic quality and dimensional accuracy thanks to perfeXion® process technology for increased container precision and lower reject rates

Customized – customizable specifications (best-value options), including zero defect options for individual needs

Customization options
Tube-end finish, anti-scratch coating, zero defect options, tighter tolerances

Compatibility

For all pharmaceutical container formats, especially vials and ampoules

For all drugs, especially photosensitive parenteral drugs

Read more online.

BORO-8330™

This Type I glass is characterized by a high boron content and excellent resistance to temperature changes due to the low expansion coefficient.

The robust

The 3.3 glass tried and tested in the American pharma market and laboratory industry.

Product benefits

High quality – first-class cosmetic quality and dimensional accuracy of vial tubing thanks to perfeXion® process technology for increased vial precision and lower reject rates

Safe – high hydrolytic resistance to minimize drug-container interactions

Proven – 3.3 glass is known worldwide as a laboratory specialty glass

Customization options
Tube-end finish, anti-scratch coating

Compatibility

For all pharmaceutical container formats, especially vials and ampoules

For all drugs, especially parenteral drugs

Read more online.

Syringes

To manufacture glass syringes, tight geometric tolerances of the tube glass are crucial. A precise inner diameter can positively affect the functionality of the syringe, e.g. for increased dosing accuracy and a more even gliding force of the syringe plunger for the least painful injection. Therefore, patients benefit particularly from high-quality tube glass.

perfeXion® quality control
We meet these demanding requirements through comprehensive 100 % inspection of each individual tube.

Tighter tolerances
Not only do we meet, but we already exceed the required outside diameter tolerances in accordance with ISO 11040-4 with our standard dimensions.

Best value
Tolerances and specifications can be tightened even further for particularly stringent requirements.

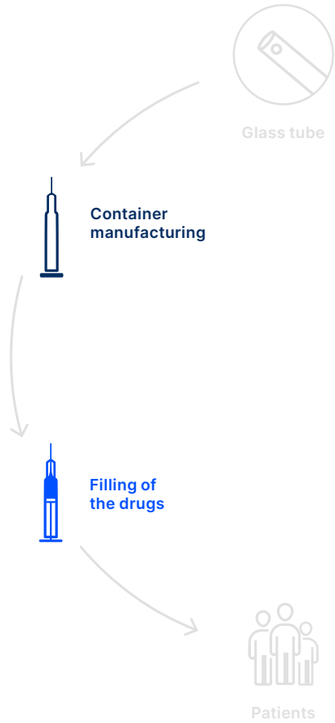
Syringe tubing

Syringe size according to ISO 11040-4	OD ± tolerance [mm]			ID ± tolerance [mm]		
	SCHOTT standard	SCHOTT Best value !	ISO standard	SCHOTT standard	SCHOTT Best value !	ISO standard
0.5 ml	**6.85** ± 0.08	down to ± 0.05	± 0.10	**4.65** ± 0.08	down to ± 0.05	± 0.10
1 ml	**8.15** ± 0.09	down to ± 0.05	± 0.10	**6.35** ± 0.09	down to ± 0.05	± 0.10
1 / 2 / 2.25 / 3 ml	**10.85** ± 0.09	down to ± 0.05	± 0.10	**8.65** ± 0.09	down to ± 0.05	± 0.20
5 ml	**14.45** ± 0.09	down to ± 0.07	± 0.10	**11.85** ± 0.09	down to ± 0.07	± 0.20
10 ml	**17.05** ± 0.15	down to ± 0.09	± 0.20	**14.25** ± 0.15	down to ± 0.09	± 0.20
20 ml	**22.05** ± 0.17	down to ± 0.09	± 0.20	**19.05** ± 0.15	down to ± 0.09	± 0.20

Specification for all FIOLAX® glasses. Specification for BORO-8330™ may vary.
Special dimensions also available.
OD = outside diameter | ID = inside diameter

Why choose quality glass tubing for syringes from SCHOTT?

- Tighter tolerances than those specified by the ISO standard for standard syringe tubing, as well as further reducible outer and inner diameter tolerances of down to ± 0.05 mm when needed, enable more precise shaping.
- 100 % online inspection of cosmetic quality through our perfeXion® process control supports a high yield during the visual final inspection.
- A tightly tolerated inside diameter reduces silicone oil consumption and makes it suitable for silicone-free syringes.
- Tight ID tolerances for higher dosage accuracy reduce overfilling losses and support consistent syringe plunger gliding force.
- Detection and rejection, especially of open airlines on the inside, prevents a possible negative effect on the sterility of the syringe.



Cartridges

When choosing glass tubing for cartridges, its resistance to mechanical stress is an important selection criterion. This means that glass with high cosmetic quality is advantageous. In addition, tight geometric tolerances enhance precision in the processing workflow and the functionality of cartridges when used in pen or pump systems.

perfeXion® quality control
We meet these demanding requirements through comprehensive 100 % inspection of each individual tube.

Tighter tolerances
Even with our standard dimensions, we exceed the required outside and inside diameter tolerances according to ISO 13926-1.

Best value
Tolerances and specifications can be tightened even further for particularly stringent requirements.

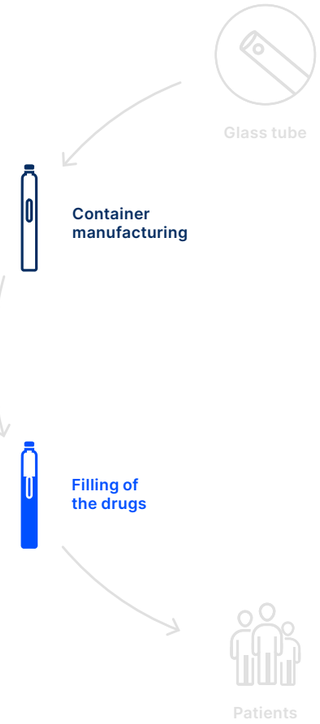
Cartridge tubing

Cartridge size according to ISO 13926-1	OD ± tolerance [mm]			ID ± tolerance [mm]		
	SCHOTT standard	SCHOTT Best value !	ISO standard	SCHOTT standard	SCHOTT Best value !	ISO standard
1.00 – 1.80 ml	**8.65** ± 0.09	down to ± 0.05	± 0.10	**6.85** ± 0.09	down to ± 0.05	± 0.10
1.50 – 3.00 ml	**10.85** ± 0.09	down to ± 0.05	± 0.10	**8.65** ± 0.09	down to ± 0.05	± 0.10
1.50 – 3.00 ml	**10.95** ± 0.09	down to ± 0.05	± 0.15	**9.25** ± 0.09	down to ± 0.05	± 0.10
3.00 ml	**11.60** ± 0.09	down to ± 0.05	± 0.15	**9.65** ± 0.09	down to ± 0.05	± 0.10

Specification for all FIOLAX® glasses. Specification for BORO-8330™ may vary.
Special dimensions also available.
OD = outside diameter | ID = inside diameter

Why choose quality glass tubing for cartridges from SCHOTT?

- Tight outer and inner diameter tolerances promote precise shaping of the flange, neck, and shoulder.
- 100 % online inspection of cosmetic quality supports a high yield during the visual final inspection.
- A tightly tolerated inside diameter of down to ± 0.05 mm promotes higher dispensing accuracy and thus reduces overfill losses, which is especially important for multiple dosages.
- Detection and rejection, especially of open airlines on the inside, prevents a possible negative effect on the sterility of the cartridge.



Vials

Tubular glass vials are truly all-rounders, covering a wide range of drugs packaged in them, from simple diluents to highly sensitive biopharmaceuticals. To ensure effective protection against premature aging and loss of efficacy over a long period, high chemical resistance and low leaching of the tubing glass are essential.

perfeXion® quality control
We meet these demanding requirements through comprehensive 100 % inspection of each individual tube.

Tighter tolerances
Not only do we meet, but we usually exceed the required outside diameter tolerances in accordance with ISO 8362–1 with our standard dimensions.

Best value
Tolerances and specifications can be tightened even further for particularly stringent requirements.

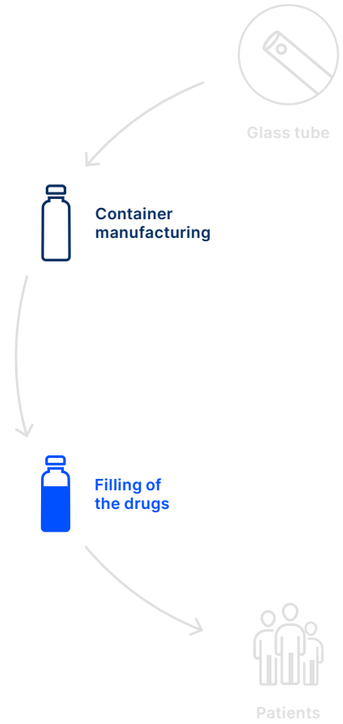
Vial tubing

Vial size according to ISO 8362-1	**OD** ± tolerance [mm]			**WT** ± tolerance [mm]	
	SCHOTT standard	SCHOTT Best value !	ISO standard	SCHOTT standard	ISO standard
2R, 3R, 4R	**16.00** ± 0.14	down to ± 0.12	± 0.15	**1.00** ± 0.04	± 0.04
6R, 8R	**22.00** ± 0.19	down to ± 0.17	± 0.20	**1.00** ± 0.04	± 0.04
10R, 15R	**24.00** ± 0.19	down to ± 0.17	± 0.20	**1.00** ± 0.04	± 0.04
20R, 25R, 30R	**30.00** ± 0.20		± 0.25	**1.20** ± 0.05	± 0.05
50R	**40.00** ± 0.40		± 0.40	**1.50** ± 0.07	± 0.07
100R	**47.00** ± 0.50		± 0.50	**1.70** ± 0.07	± 0.07

Specification for all FIOLAX® glasses. Specification for BORO-8330™ may vary.
Special dimensions also available.
OD = outside diameter | WT = wall thickness

Why choose quality glass tubing for vials from SCHOTT?

- A consistent wall thickness ensures uniformly precise shaping of the shoulder, neck (including blowback), and bottom.
- A very wide dimensional portfolio covers nominal filling volumes of up to 100 ml and enables customer-specific and exceptional OD / WT combinations.
- A closed tube-end finish with a small vent hole like DENSOCAN® offers various benefits for transportation and processing.
- Vials made out of SCHOTT glass are extremely versatile and meet a wide range of requirements, e.g. compatibility even with highly sensitive drugs; from cold storage at – 80 °C to final sterilization at 121 °C; storage of liquids or freeze-dried products.
- Precise outer diameter enables smooth operation even on high-speed filling lines.
- The high chemical resistance minimizes drug container interactions, which is especially important for demanding biologics.



Ampoules

Ampoules are very thin-walled primary packaging materials, which increases the requirements for the tubing, particularly for consistent and tightly toleranced wall thickness. This allows high-quality and precise ampoule geometries to be produced, which always require a constant breaking force to open, thus minimizing the risk of injury when opening the ampoule.

perfeXion® quality control
We meet these demanding requirements through comprehensive 100 % inspection of each individual tube.

Tighter tolerances
Not only do we meet, but we usually exceed the required outside diameter and wall thickness tolerances in accordance with ISO 9187-1 with our standard dimensions.

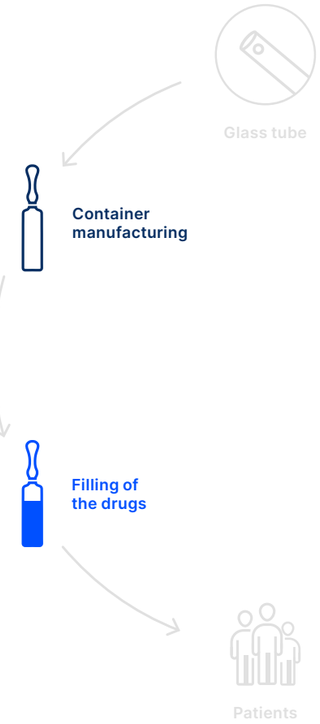
Ampoule tubing

Ampoule size according to ISO 9187-1	**OD** ± tolerance [mm]		**WT** ± tolerance [mm]	
	SCHOTT standard	ISO standard	SCHOTT standard	ISO standard
1 ml, 2 ml	**10.75** ± 0.12	± 0.15	**0.50** ± 0.02	± 0.03
3 ml	**12.75** ± 0.12	± 0.15	**0.50** ± 0.02	± 0.03
5 ml	**14.75** ± 0.12	± 0.15	**0.55** ± 0.02	± 0.03
10 ml	**17.75** ± 0.14	± 0.20	**0.60** ± 0.03	± 0.04
20 ml, 25 ml, 30 ml	**22.50** ± 0.19	± 0.25	**0.70** ± 0.04	± 0.04

Specification for all FIOLAX® glasses. Specification for BORO-8330™ may vary.
Special dimensions also available.
OD = outside diameter | WT = wall thickness

Why choose quality glass tubing for ampoules from SCHOTT?

- High cosmetic quality reduces possible yield losses during further processing.
- A constant and tightly tolerated wall thickness supports uniformly precise shaping of the shoulder, tip, and bottom.
- The DENSOCAN® tube-end finish reduces borate evaporation during processing.
- High chemical resistance minimizes interactions between drug and container, such as a pH shift of unbuffered solutions.
- Tolerances, which are usually tighter than the corresponding ISO standard, enable smooth operation even on high-speed filling machines and accurate filling with tight tip geometries.



What we do for you

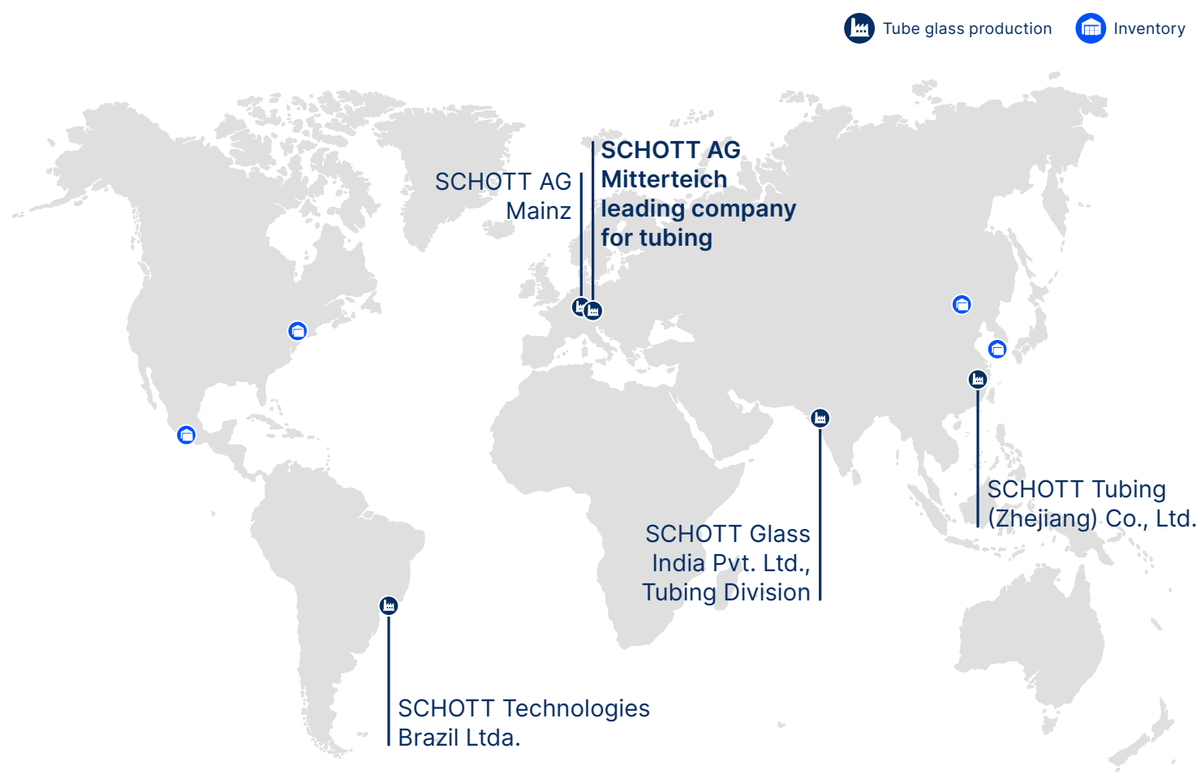
SCHOTT Tubing employs over 2,200 pioneers with unstoppable curiosity. They constantly reinvent glass and take responsibility for our planet. With more than 140 years of experience in glass technology, we are firmly focused on the future.

We always prioritize close collaboration with our business partners. Our comprehensive services ranges from supporting scientific inquiries to sample analyses. You benefit from the in-depth knowledge and experience of our dedicated team of experts in the areas of glass materials, product properties, and processing techniques. This enables us to provide consultancy services in all areas where pharmaceutical glass tubing is utilized. Our digital service offering complements our extensive portfolio.

No matter the size of the company, we will work together to find solutions for tomorrow's progress. With a presence all over the world, from Asia-Pacific to Europe and Americas, we are always close by. Our local sales offices provide on-site advice tailored to country-specific requirements and support you through to the market launch of your primary packaging material. This geographical proximity to the markets offers you benefits such as cost efficiency, supply chain optimization, and risk minimization through supply security and stability.

Together with you, we strive to enable a healthier world.

Close to you – worldwide



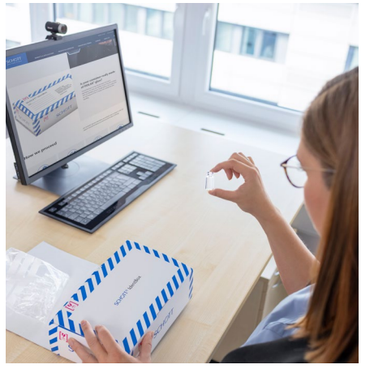
Scientific support and expert advice

Our experts are available to you as knowledgeable contacts for all matters related to pharmaceutical glass throughout your entire value chain.

Book a free consultation now!
pharma.tubing@schott.com

Technical and scientific customer consulting
Our scientific service specialists are available to provide free comprehensive support and advice on your challenges, and answer any questions you may have about product properties, processing, the versatility of pharmaceutical glass tubing, or sustainability. The expertise of our team of qualified professionals ranges from knowledge of the chemical and physical properties of the glass through to pharmaceutical solutions and processes, and can optimally address your individual needs and challenges.

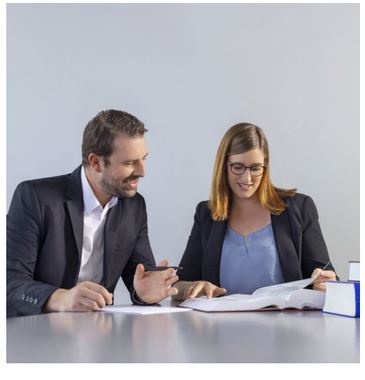
Sample analysis and glass defect analysis
Whatever your specific challenge or application, we offer tailor-made solutions for your project, including material and process analyses. If your concern is preventing glass breakage or detecting glass defects, we can help you improve quality and efficiency in your production. Our team of experts is available at any time to carry out fault analyses and jointly develop solutions that will optimize the entire process chain.



Is your container made of SCHOTT glass?
Counterfeits also affect the pharmaceutical packaging industry. As a pharmacist, you have the option of having the primary packaging analyzed by us free of charge.

How? Contact us at pharma.tubing@schott.com
We will take care of everything else.

Read more online.



Regulations
What standards and regulations apply to your primary glass packaging? From ISO to pharmacopeias, our team of experts will guide you through regulatory requirements, regulatory standards, and the latest changes in international pharmacopeias.

Digital Services 24/7

The SCHOTT Tubing customer portal acts as your comprehensive online information, ordering, and service platform. It offers round-the-clock access to extensive ordering and logistics functions as well as to important quality data and other smart services.

Log in at
schott.com/shop/tubing

Ordering simplified
Enjoy the convenience of quick and easy ordering as well as immediate price and inventory transparency.

Order history and status
Simplify your order and logistics management with a transparent overview of placed orders and retrieval of the order status.

Document management
Save time and money and benefit from the centralized storage of your order-related data documents, certificates, and package labels. Conveniently access all relevant certificates, such as glass types, melting tanks, pallets, PCF declaration or GMP certificates. We will inform you as soon as there are updates to your certificates. All pallet labels are available for you to download or reprint.

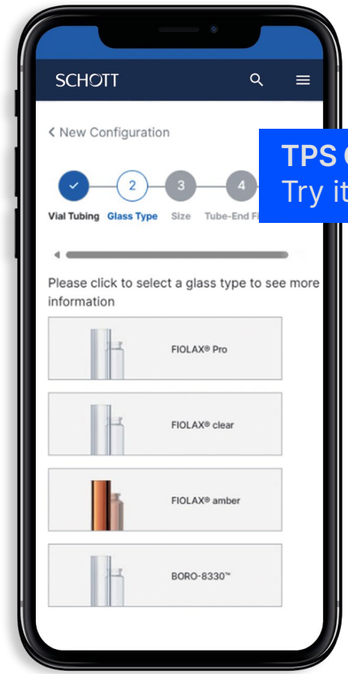
Quality data and statistics
Optimize your documentation and ensure traceability by easily accessing all your quality data and downloading your batch certificate, for example. You can also easily receive individual sales statistics with detailed information on order quantities, delivery conditions, etc.

Digital TPS 2023
Access all the technical information on our Type I borosilicate glass tubing in the browsable online catalog of the current technical specifications (TPS).

TPS Configurator
Use our new TPS Configurator to quickly select the ideal Type I glass tubing for your needs in just a few clicks.

> Available for customers in the customer portal

View video on how it works.



TPS Configurator
Try it now!

Your advantages at a glance

- Reduced process time thanks to fast orders.
- Reduced process costs thanks to up-to-date information on the order status and immediate availability of order-relevant documents.
- More transparency through clear information on quality data, certificates, sales statistics, and more.
- More flexibility thanks to 24/7 availability and independent management of profile data.
- Optimized documentation management and traceability through immediate access to relevant documents and data.
- Unique certificate subscription service for automatic notification of updates and new certificates.
- Optimized logistics management and logistics planning through independent coordination of deliveries.
- If you have your own ERP software and want to connect it to our system, we offer seamless integration for electronic data exchange (EDI).

First-hand glass expertise

FIOLAX® Academy

The FIOLAX® Academy offers first-hand knowledge and training in the field of glass for pharmaceutical packaging along the entire value chain. State-of-the-art science and technology made available to you by experts in this field.

We can customize the 13 subject areas to your specific requirements.

Find out more at
fiolaxacademy.com

Choose from the following modules:

The world of pharmaceutical glass tubes

1 Glass basics
2 Traceability
3 Regulatory aspects
4 Strength & breakage
5 Benchmark

Pharmaceutical glass tubes along the value chain

6 Borate evaporation
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9 Hydrolytic resistance
10 Extractables & leachables
11 Delamination
12 pH shift
13 Light protection

Patient safety starts with us.

SCHOTT AG
pharma.tubing@schott.com
Phone +49 (0)9633/80-0
/company/schott

schott.com

SCHOTT AG, Erich-Schott-Strasse 14
95666 Mitterteich, Germany

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