

newsflash

PHARMACEUTICAL PACKAGING



SCHOTT
forma vitrum

ISSUE 14 | July 2010

NEWS

New Manufacturing Facility for Pharmaceutical Packaging in Russia



SCHOTT forma vitrum will be opening a manufacturing facility for premium quality ampoules and vials in Russia.

The new plant that is expected to go into operation at the end of 2010 will be located in Zavol-

zhe, near the Russian city of Nizhny Novgorod.

"The new plant in Russia represents yet another important step in our global growth strategy in the area of pharmaceutical systems. This will allow us to further extend our leading position in the area of high-quality pharmaceutical packaging in Russia and we will be able to satisfy local demand even better in the future," notes Ralf Bouffleur, Vice President, Pharmaceutical Packaging.

SCHOTT Pharmaceutical Packaging will employ around 60 employees in Russia initially. Plans call

for this figure to increase to 200 by 2014. The company will then be able to produce several hundred million ampoules and glass vials made of SCHOTT Fiolax® glass tubing. The new, modern plant will manufacture according to cGMP guidelines ("Good Manufacturing Practices") and the products will meet the high international standards for primary pharmaceutical packaging.

SCHOTT is the first international group that manufactures primary pharmaceutical packaging made of glass to open a production facility in Russia. The company has been selling ampoules, vials, cartridges and syringes to the Russian market already since the beginning of the 1990s. In the past, Russian customers have been supplied mainly from the existing pharmaceutical packaging site in Hungary.

EDITORIAL



Dear Readers,

Every one of us would like to be able to see into the future sometimes to learn whether we are actually doing things right today. In these moments, it can be quite helpful to step back and take a look at the past.

The roots of SCHOTT forma vitrum in St. Gallen, for instance, go back 80 years. If we were to take the time today to scroll through our history, we would inevitably discover the keys to our success: innovative products, state-of-the-

art technology, service orientation, closeness to our customers and global expansion.

We plan to keep writing this success story. For instance, we will be the first international group opening a new manufacturing facility for pharmaceutical packaging in Russia soon.

In Lebanon, U.S., we have just succeeded in having our new ready-to fill syringe production line validated. Now, we are going into mass production with SCHOTT InJentle and offer our customers a specialized array of analytical and packaging support with our SCHOTT pharmaceutical services. As you can see, we are ready for the future.

For now, we hope you enjoy reading our latest edition.

Sincerely yours,
Ralf Bouffleur
Vice President,
Business Segment
Pharmaceutical Packaging

NEWS

SCHOTT U.S. Validates Ready-to-Fill Syringe Production Line

The SCHOTT Pharmaceutical Packaging site in Lebanon, PA, has completed facility and equipment validations of its new syringe production line in North America.

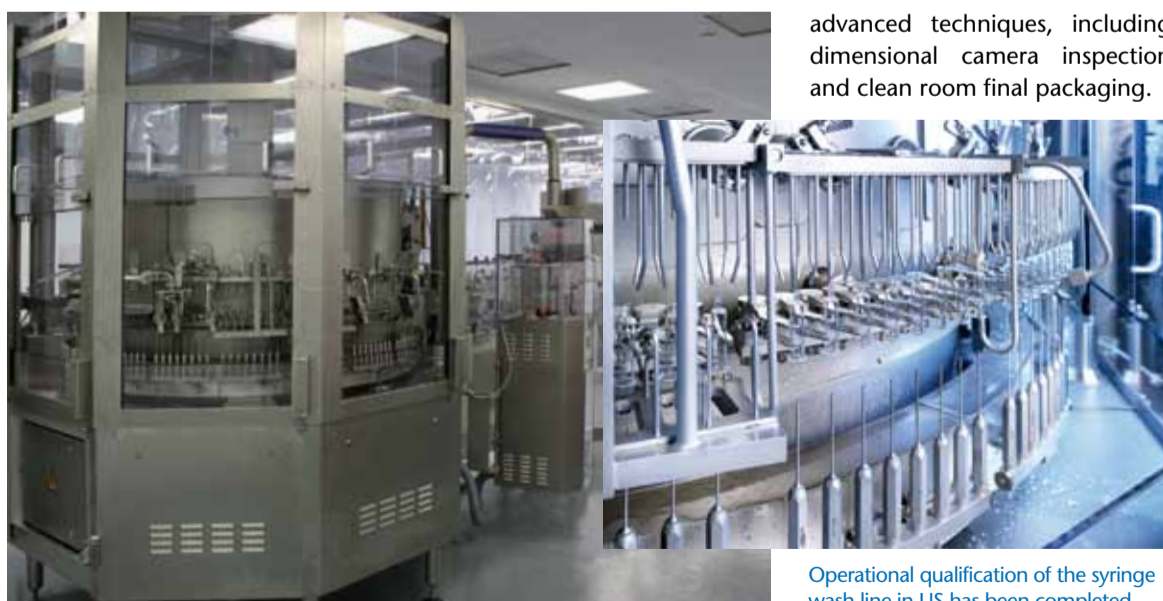
SCHOTT announced the product validation of its first ready-to-fill syringe customer with several others in process. This is a major milestone, as the facility had previously produced only vials and cartridges for the pharmaceutical industry. Until now syringes for the US market were imported from the plant in Switzerland.

"We have completed operational qualification of the syringe wash line," said Renard Jackson, Vice President of SCHOTT North

America, Inc. and General Manager of its Pharmaceutical Packaging Division. "We are now prepared to assist additional customers with their commercial production requirements for ready-to-fill syringes."

With the addition of ready-to-fill syringes to its portfolio of vials and dental cartridges, SCHOTT is only the second company to produce high quality ready-to-fill syringes in the United States.

SCHOTT products and production processes conform to the U.S. Food and Drug Administration's current good manufacturing practice (cGMP) standards. The production line incorporates the most



advanced techniques, including dimensional camera inspection and clean room final packaging.

Operational qualification of the syringe wash line in US has been completed.

ON TOUR

Competence Center in the City of a Thousand Stairs

The city of St. Gallen lies about 700 meters above sea level and is thus one of the highest located cities in Switzerland. It is the economic center of Eastern Switzerland and has a population of about 70,000. Due to its unique topography, St. Gallen is also referred to as the city of a thousand stairs.

The city was founded by monks back in the 7th century. A historical landmark of St. Gallen is the Abbey Library, one of the largest and oldest monastery libraries in the world which belongs to the UNESCO world cultural heritage. Soccer is an important topic in St. Gallen: The city is home to FC St. Gallen, the oldest soccer club in Switzerland and the second oldest

of the European mainland that was founded in 1879.

SCHOTT forma vitrum is not quite as old, but its origins can be traced back some 80 years to December 1930. Since 1998, the company has a cooperation with SCHOTT AG, the international technology group with headquarters in Mainz, Germany.

SCHOTT forma vitrum Switzerland produces syringes of glass and high-tech polymer, as well as pen cartridges and vials of glass. In total, at SCHOTT in St. Gallen some 480 people from 36 countries produce around 700 million products per year, 90 percent of which are exported.

"Pre-fillable syringes represent an important growth field for

the future for the site," says Uwe Tomschin, Managing Director in St. Gallen. They are manufactured in a variety of different versions and are delivered as complete sets including all necessary components. In the field of vials, St. Gallen plays a leading role in manufacturing double chamber vials, for example. This sophisticated product is used for special applications such as cardiac emergency drugs, for example: the solvent is contained in one chamber, while the powdered medication is stored inside the other chamber.

Today, the site has also the role of a competence center for syringes, vials, and pen cartridges for the pharmaceutical packaging business of SCHOTT group. "At the same time," Tomschin adds, "the site has a flagship function when it comes to developing machines and processes for all of the 13 pharmaceutical packaging sites all over the world." For instance, the ramp-up of the syringe business at the U.S. site in Lebanon was supported from Switzerland. Also the proprietary development and worldwide internal roll-out of the highly ad-



St. Gallen is the competence center for syringes, vials, and pen cartridges for the pharmaceutical packaging business of the SCHOTT group.

vanced AIS automated camera inspection system is located at the Swiss site.

"Last but not least," says Tomschin, "SCHOTT has a large network in the region that includes the University of St. Gallen, which has an excellent international reputation as a business school," and also works very closely with the renowned Swiss Federal Institute of Technology in Zürich, for example. SCHOTT is the largest industrial employer in St. Gallen and benefits from the excellent infrastructure in Switzerland.



forma 3⁺ prefillable syringes are produced under clean room conditions.

Site at a glance

SCHOTT Schweiz

Location:	St. Gallen, Switzerland
Employees:	480
Products:	syringes, vials, cartridges
Production area:	30,000 m ²
Quality certification:	ISO 9001, ISO 15378, ISO 14001

NEWS

From Syringes, Tours and Totem Poles

Horst Koller is responsible for regulatory affairs and quality R&D at SCHOTT Pharmaceutical Packaging. In this position, he ensures that SCHOTT is always on top of the latest information on new regulations and standards, and he is responsible for their implementation at all SCHOTT manufacturing plants worldwide.

In addition, he contributes his expertise to develop and optimize international quality packaging norms and standards – for example, as a member of the DIN and ISO committee on injection devices.

Thanks to his expertise, SCHOTT forma vitrum has a direct line, so to speak, when it comes to all of

the issues that pertain to standards and regulatory affairs on syringes and learns at a very early stage what regulations are planned and what new testing methods phar-

maceutical companies and syringe manufacturers can expect to see.

Koller travels all over the world each year to deal with issues like standardization, drug master files



Horst Koller is a regular speaker at international conferences...

...and a passionate motorcyclist



and regulatory matters. He heads workshops, holds international lectures on case studies about, for example, syringes, and is also a regular speaker at scientific conferences

Injection devices have always played an important role in his career. Koller was born in Bavaria, Germany and worked as a medical technician before studying

biotechnology. He first worked in a technical genetic laboratory in manufacturing, but then joined the engineering department and was responsible for all of the engineering processes – in other words all of the technology used in the area of development, production and final processing.

"Because we also worked with infectious products, we had to introduce highly sophisticated processes," he notes. Koller is responsible for all of the machines and devices that come into contact with medical products.

His first day of work at SCHOTT was in the New Products de-

partment in Mainz, Germany, in March of 2000. Here, he worked on the pilot plant for SCHOTT TopPac COC polymer syringes and finally transferred this pilot plant to St. Gallen in Switzerland where he took care of upscaling this system there. He then worked as quality manager for SCHOTT in Switzerland and was the project manager for an R&D project in the United States. In 2003, he became head of Scientific and Regulatory Advisory and set up his own laboratory for syringes and other primary packaging products made of plastic and glass. Functional tests that are described in both ISO and DIN standards were developed, verified and qualified under his leadership. His broad expertise in technical and regulatory subjects qualifies him to support customers in selecting ideal system combinations that fit specific and complex customer requirements.

The fact that his work involves a lot of traveling all over the world doesn't really bother Koller that much. "Traveling is one of my hobbies," explains the passionate motorcyclist who once took an 8,500 km tour through Australia; he loves being on the road with a tent and a sleeping bag anyway. In his adopted home of St. Gallen, he also spends time practicing with his rock band in hopes of finally giving a concert one day. His favorite showpiece is an electric guitar he built himself and then had decoratively carved by the native Canadian artist Ed E. Bryant, a Tsimshian Indian from British Columbia. Koller has also taken carving courses from him and even produced his own small totem poles with Bryant's help.

MASTHEAD

SCHOTT forma vitrum
NEWSFLASH

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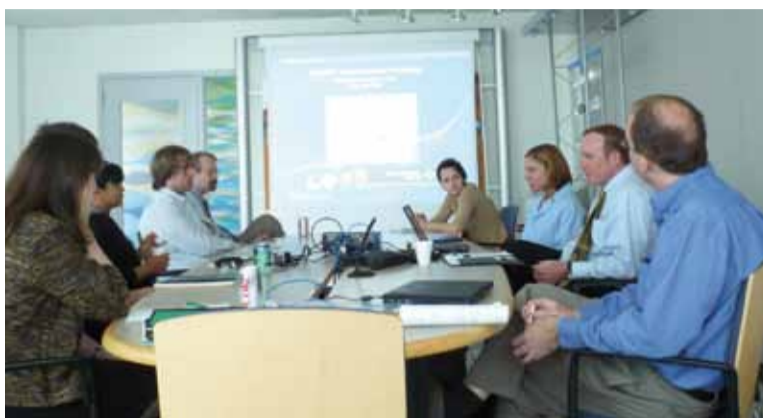
EVENTS

Student Tour Brings Biotech to Life

Biotechnology students expanded their educational horizons with an on-site mini-course in the exacting art and innovative science of pharmaceutical packaging at the SCHOTT manufacturing facility in Lebanon, Pennsylvania.

A panel of experts and an up-close look at one of the world's most technologically advanced pharmaceutical packaging manufacturers: such was the result of a chance meeting on a plane bound for Philadelphia early this spring between Gary Waller, Director North America Sales and Marketing, SCHOTT Pharmaceutical Packaging, and Lori Maramante, science faculty and biotechnology instructor at Delaware Technical & Community College in Georgetown, Delaware.

Four students and two faculty members made the four-hour drive to the SCHOTT facility. There they were met with a tightly packed schedule and a team of SCHOTT experts to guide them through it. First on the agenda: a global business overview of the SCHOTT organization. It was an eye-opener for the students, who knew SCHOTT only from an In-



Four biotechnology students and two faculty members visited the SCHOTT pharmaceutical packaging facility in Lebanon, Pennsylvania.

"I learned firsthand how a production facility operates under the coordination of quality assurance and quality control. It is also very valuable to apply the things I learned in class to a practical environment."

Juliana Letterie, student

ternet search. Next, garbed in lab coats, toe guards, and safety glasses, with hair nets and shoe covers, the students were given a detailed tour of the vial, dental cartridge, and syringe processes by Michelle

Ellwanger, Director of Quality and Regulatory Compliance, Pharmaceutical Packaging, SCHOTT North America. There they were most impressed by the Automated Inspection System (AIS) developed by

"I was impressed by how efficient the machines were, how it self-checked and discarded flaws that were just nanometers off."

Virgil Morris, student

SCHOTT which uses a unique camera system to take multiple photos of each product to inspect and even classify any cosmetic or dimensional defect.

The highlight of the visit, however, was the presentation by Dr. Dan Haines, Advanced Materials and Coatings Research Scientist, SCHOTT North America. His subject: SCHOTT pharma services, which utilizes a core team of scientists based in Germany, Switzerland and the U.S. but draws

on 600 SCHOTT scientists and engineers worldwide to provide specialized analytics and expertise in materials, products, and processes that enables SCHOTT pharma services to support customers by finding solutions to the most challenging packaging requirements. "We're like CSI, the crime scene investigators," he told the students. "We combine

"I find it amazing the way SCHOTT, particularly the R&D department, works with their clients to not only identify the cause of the problem, but to find the possible solutions."

Liudmila Mikhno, student

"The fact that each container was tested individually multiple times really impressed me. They really put their customer first..."

Nathan Hill, student

tions" and he gave some real life examples to prove it.

For all parties, the day was an unqualified success, with both sides open for a continued relationship. "So much work goes into creating a quality container; usually the focus is on the product that goes in it," says Maramante. "This helps our students complete the process, and in doing so, exposes them to a whole new way of looking at biotechnology, what they learn in the classroom and what to value as they move forward in their education and into their careers."

technology and expertise to dig out the root cause of issues and recommend specific solu-



The students were most impressed by the Automated Inspection System (AIS) developed by SCHOTT.

NEWS

SCHOTT Injente® Begin Mass Production

SCHOTT forma vitrum will start mass production of the highly innovative staked needle syringe system SCHOTT Injente® in its Lebanon, Pennsylvania facility at the end of this year. Injente was developed for the special requirements of highly sensitive drugs. Its unique design offers improved drug stability and a gentle application.

"There is a growing segment of biotech drugs that are not only highly effective but also very sensitive," explains Ralf Bouffleur, Vice President, Pharmaceutical Packaging, SCHOTT AG. "The reliable protection of these drugs during storage is now calling for innovative packaging solutions like the SCHOTT Injente syringe."

"The drug is not in contact with the needle or the adhesive during storage," says Carmen Heiter, Product Manager, Syringes. "This prevents sensitive drugs from interacting with the adhesive or the metal of the needle." The innovative seal design allows the drug to flow into



the needle only at the very moment when the syringe is opened, i.e. when the needle shield is pulled off. The tamper-evident closure enables physicians or patients to determine if the syringe is still unused.

SCHOTT Injente syringes exhibit a wide range of additional advantages. For example, the syringe is completely tungsten-free. Because of the unique design, the needle point is fully protected and does not touch the needle shield or any other material.

SCHOTT forma vitrum is currently preparing for production of the SCHOTT Injente syringe in its Lebanon, Pennsylvania facility. Samples in 1ml long format are available for functionality testing. "SCHOTT Injente is both 'drug friendly' and 'patient friendly,'" says Carmen Heiter. "On the one hand, it enables even very sensitive drugs to be stored safely, on the other hand it offers easy handling and the ability to use particularly thin needles for a gentle application."

NEWS

Quality Award Goes to SCHOTT Brazil

The Sindusfarma Quality Award (São Paulo/Brazilian Federation of Pharma Industries) 2010, conferred on the best companies in the pharma segment, goes to SCHOTT Brasil Ltda in the category Ampoules and Vials for Parenteral Products (Type I glass). Marcia P. Martins, Head of Marketing of SCHOTT Brasil received the award on May 24th in São Paulo, Brazil.

"We are very honored by the recognition inherent in this award," says Martins, "and we are especially proud of the fact that we have won this trophy 13 times in the last 13 years." The positive perception of the quality standards by customers and validation by Sindusfarma "encourage us to continuously enhance our performance," notes Martins.

"The Sindusfarma Quality Award was created to recognize the performance of pharmaceutical industry suppliers in reaching the quality standards demanded by the sector and to emphasize the importance of this collaboration in achieving the quality, safety and efficiency of pharmaceutical products," explains Dr. Lauro Moreto, Executive Vice President



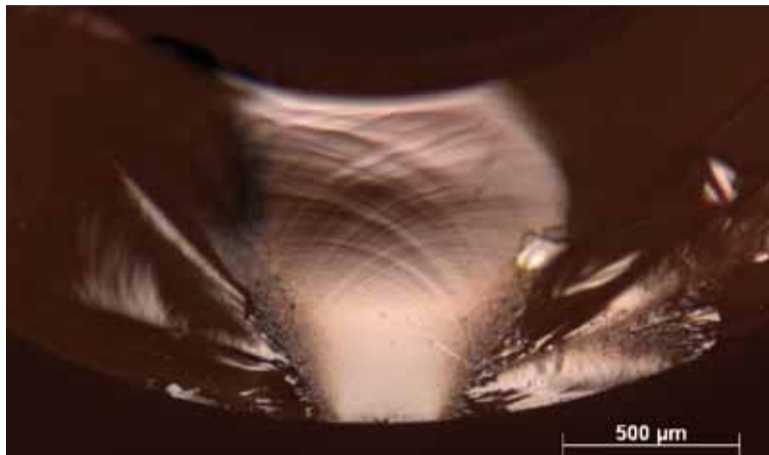
Marcia P. Martins accepts the Sindusfarma Quality Award for SCHOTT Brasil from Dr. Lauro Moreto, Executive Vice President of Sindusfarma.

of Sindusfarma during the opening of the event.

The award identifies best-performing pharma laboratories and pharma industry suppliers over the last 12 months. Established in 1997, the award seeks to further an awareness of the importance of quality systems for all players in the pharmaceutical industry chain.

MATERIALS

Glass Cracks Tell Stories and Leave Behind Clues



Fracture surface of a broken syringe showing the fracture origin and specific markings such as the fracture mirror, Wallner lines, fine hackles, and coarse hackles.

Dr. Florian Maurer, Associate Scientist at the Otto Schott Research Center in Mainz-Marienberg, Germany, has a dream job: "I get paid for breaking glass," he smiles. In fact, every glass object that Maurer gets his hands on inevitably has to break into pieces at the end of his series of tests. And yet, his destructiveness has a scientific purpose. "The goal is to present the customer a prediction of the service lifetime for an entire product batch."

To achieve this, he and his colleagues from the Lifetime and Reliability Department at SCHOTT have been developing a whole range of tests and tools over the

past years in order to ultimately be able to determine the failure behavior of glass products.

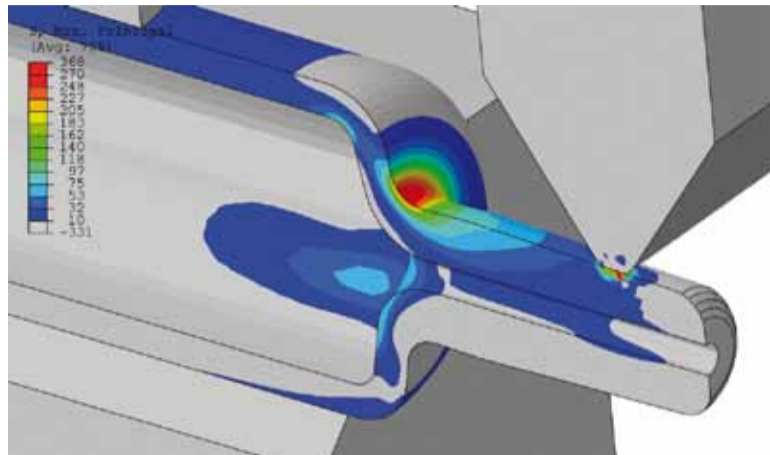
In case of problems such as glass breakage on the filling lines, for example, these analytical findings provide valuable information to the pharmaceutical company on the root cause. Improvements can be recommended related to handling, design or processes to avoid future occurrences.

"The strength of products made of glass is not a material constant, but rather depends on the individual quality of the surface," Maurer explains. Put more simply, one could say that the more scratched up a glass hap-

pens to be, the more likely it is it will break. "For scientists like us, this general insight is obviously not enough. We need to be able to qualify, quantify and assess it." The goal is to make statements as exact as possible on the strength of products made of glass down to even parts per million (ppm) with the help of the measurement techniques used in his laboratory to ensure that, statistically speaking, glass breakage occurs in only one in a million cases.

"Every product made of glass and every glass application can differ to such an extent that we have to apply a customized testing method for each individual case," Maurer explains. For instance, one customer experienced glass breakage on the flange of a syringe, while another customer had the cone broken off. The next customer wanted to know how much pressure he could use to fill a vial and still be sure that it wouldn't break.

"We proceed in a very methodical manner," Maurer says. His most decisive questions are: where are the most severe defects of the glass products, what type of defects are they and how can breakage be estimated and predicted by experimental tests and

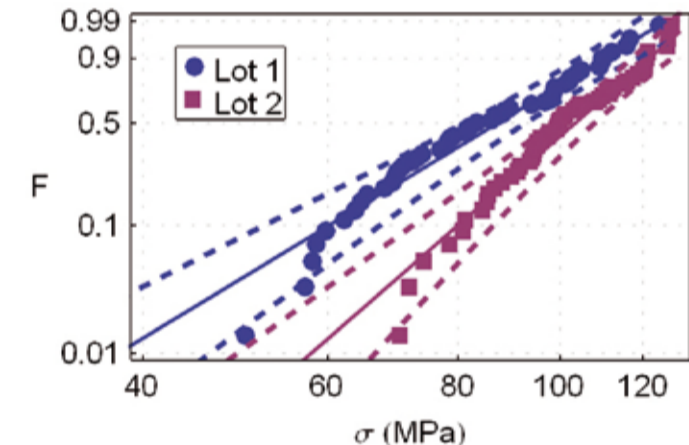


Simulation: stress distribution in flexural loading of the syringe cone.

statistical analysis, respectively? Once the respective series of testing has been completed, a comprehensive statistical evaluation is conducted using sophisticated analytical tools. "Here, we go into much greater detail than simply coming up with an arithmetic mean value," he explains.

Many customers send him shattered samples. This awakens the criminologist in Maurer. The science of investigating the types, origins and causes of damages is called fractography. "We try to determine the causes and propagation of glass breakage based on the fracture patterns and fracture

Computer simulations based on the finite elements method represents yet another complementary tool he uses for answering his questions. This allows for stress distributions to be made visible and, in turn, can provide him with additional important information for use in analysis. Recommendations on how to resolve the respective problem must ultimately be enforceable and reproducible statements. "This is why we have our laboratory certified according to DIN EN ISO/IEC 17025 on a regular basis by the Association for the Accreditation and Certification GmbH (GAZ)," he notes.



Statistical plot showing the failure probability in dependence of mechanical loading.

surface markings of glass splinters by means of optical or scanning electron microscopy," he says. There are principles that apply to every type of breakage because cracks tell stories and leave behind clues. Maurer's motto: "If a glass breaks, I'll try to find out why." The more information he receives from his customers, the more quickly and accurately he is able to make a statement.

Glass breakage has become a highly relevant topic for the pharmaceutical industry, one that has been gaining in importance only recently. "We've managed to develop a lot of impressive expertise in this area over time," concludes Maurer, who provides his assistance to customers through SCHOTT pharmaceutical services, which offer a specialized array of analytical and packaging support.

NEWS

Textbook on Lyophilization With Authors from SCHOTT

A new edition of the well-known standard work "Freeze-Drying/Lyophilization of Pharmaceutical & Biological Products," published by the two authors Prof. Louis Rey and Dr. Joan C. May, will be released this summer.

The approximately 500-page volume that experts often refer to as the "Bible of Lyophilization" deals with the topic of "Pharmaceutical Packaging for Lyophilization Applications" in one chapter.

Claudia Dietrich, Global Product Manager for Vials & Coating at SCHOTT forma Vitrum, Florian Maurer and Holger Roehl, who work for SCHOTT AG in Mainz, and Wolfgang Frieß from the Ludwig Maximilian University in Munich acted as co-authors.

The authors discuss glass vial breakage in the lyophilization process, one of the most severe failure modes in the product lifetime for pharmaceuticals that are preserved by lyophilization, on 13 pages in total.

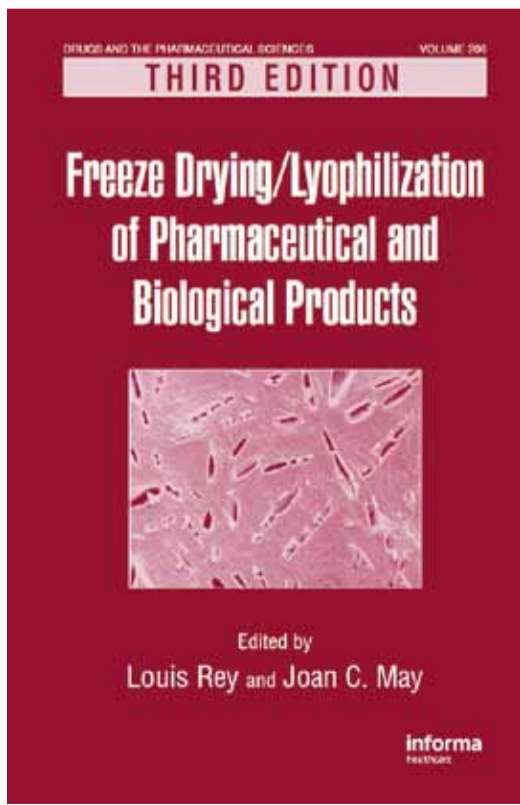
In this scientific article, they present the contributing factors that can lead to glass breakage and present methods of testing

for the strength of a glass product, like burst-pressure and thermal shock testing. The shape of a glass vial is an important factor, for example. A modification can reduce breakage by up to 60%.

The authors view the Finite Element Method (FEM) as very suitable for optimizing the geometry of a vial. Coating of glass vials also contributes towards improving the lyophilization process.

This scientific publication in the third edition

will cost 219 euros and can be ordered over the Internet (www.informahealthcarebooks.com) or at book stores by using the ISBN 9781439825754.



The third edition of the „Bible of Lyophilization,“ has been published

EXHIBITIONS & EVENTS

Come and see us at

- CPhI / ICSE , Paris (F), October 5-7, 2010
- PDA Pre-Filled Syringes and Injection Devices, Las Vegas NV (USA), October 18-21, 2010
- Pre-filled Syringes Conference, London (UK), October 25-27, 2010
- China Pharm, Beijing (CN), October 26-29, 2010
- API China, Suzhou (CN), November 10-12, 2010
- AAPS, New Orleans LA (USA), November 14-18, 2010
- PDA Freeze-Drying Conference, Vienna (A), November 23-14, 2010
- Pharmtech, Moscow (RU), November 23-26, 2010
- CPhI, Mumbai (IN), December 1-3, 2010