HARRO

The Customer Magazine
by Harro Höfliger

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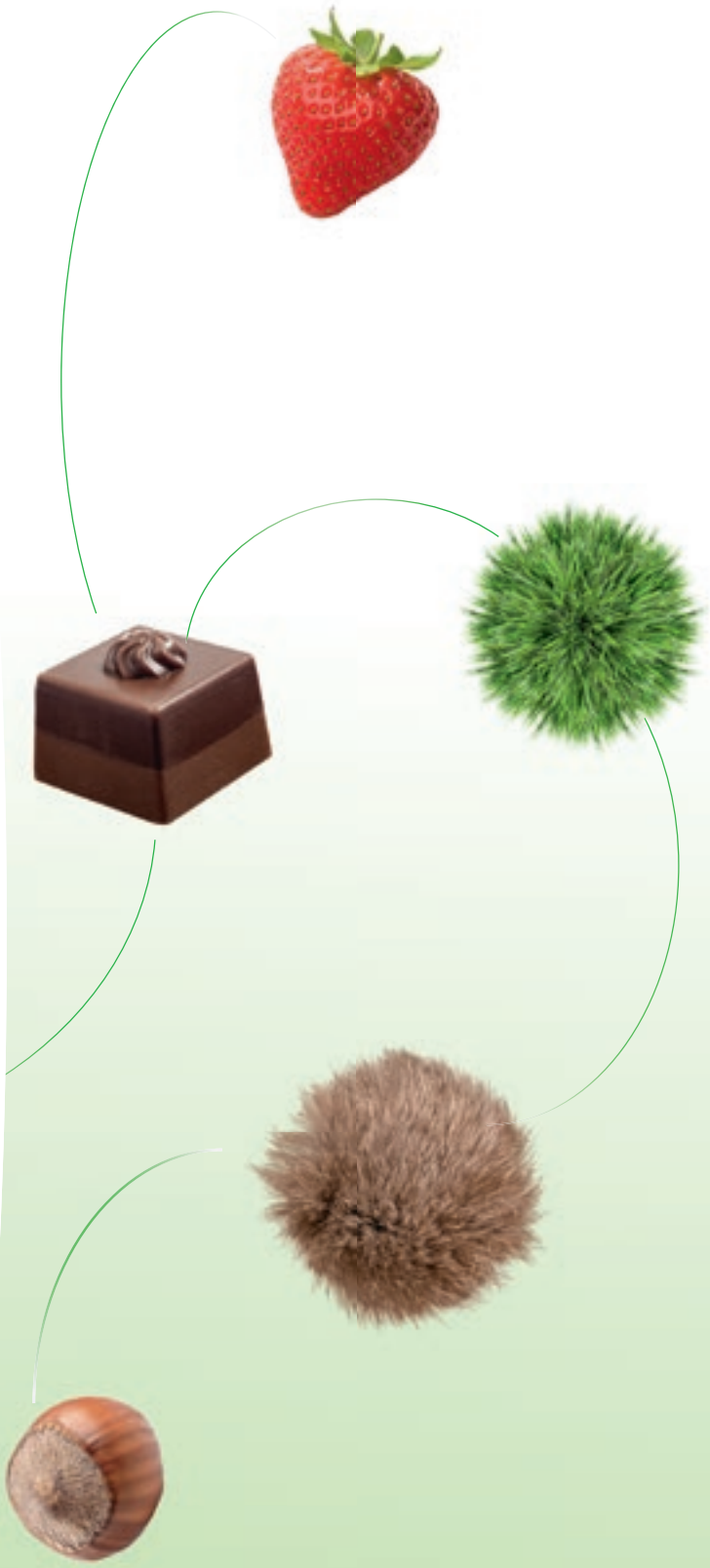

Allergies?

Or not? The ImmunoCAP™ test dispenser by Thermo Fisher helps to detect allergies.

Harro Höfliger

Looking ahead by tradition

Qualified employees are indispensable on the way to a digitized workplace. Harro Höfliger has strategies to find them.
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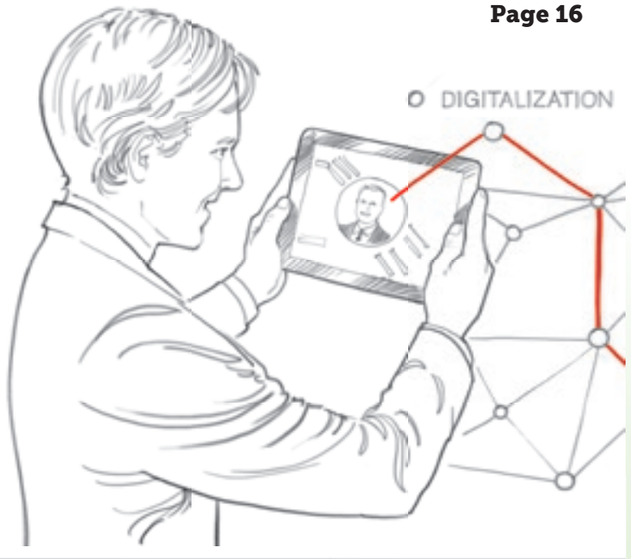

Building blocks for a successful product

The perfect product and the right processes: DS Technology advises customers according to their needs.
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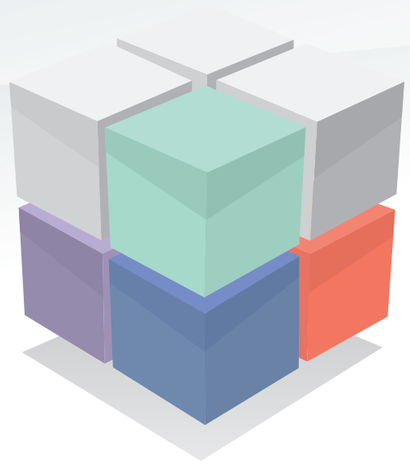

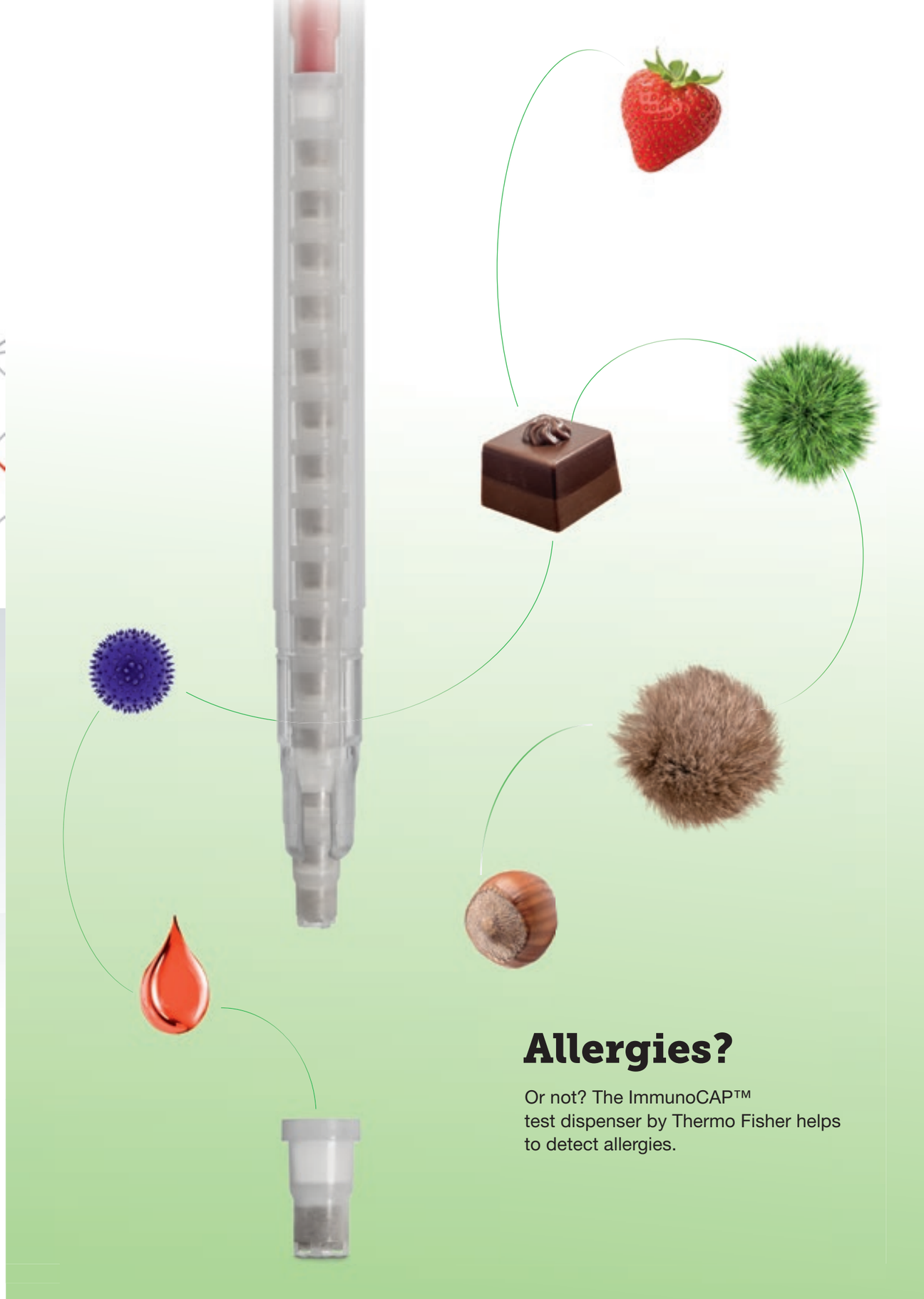

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Dear Readers,
dear Business Associates,

For decades, Harro Höfliger has been synonymous with innovative customer-specific production solutions. In the implementation of these solutions we often make the impossible possible. For this purpose, it has always been necessary to acquire highly qualified employees for our company. In today’s high tech environment, our employees have to be able to face the added challenges of digitization and Industry 4.0. Consequently, we have begun to integrate occupational profiles into the company that have not been particularly relevant to us as a machine manufacturer in the past. But going forward, visionary software and electronics specialists as well as business analysts will work hand in hand with our engineering experts.

We will face the shortage of skilled workers and meet it head on. We cooperate with schools, select dual education cooperative universities and advanced technical universities with the purpose of generating interest in Harro Höfliger among ambitious young people early on, and retaining them in the long term. Traditionally, our apprenticeship ratio is at ten percent. And we work hard to ensure that new and long-standing employees can develop and flourish with us. Freedom and space, responsibility, fostering individual talent, and an authentic corporate culture based on trust and appreciation make us an attractive employer and reliable partner.

Motivated employees ensure our success – and that of our customers. With innovative ideas and accumulated know-how, our teams develop highly complex software, new services, tools and interfaces that make your work easier and safer in a networked digitized industry. Impossible, you think? This is our incentive!

Your

Uwe Amann
Managing Director Human Resources at Harro Höfliger

“Scandinavia is setting trends”

One of the first international markets served by Harro Höfliger was Scandinavia. Mikael Blomgren, Area Sales Manager Scandinavia, tells us how this came about and what the future holds in store.

What were the beginnings of Harro Höfliger in Scandinavia?
It all began in the late 1970s. Ulf Engström was selling machines for the food industry in Scandinavia on his own when he met a customer who was in need of a filling machine that did not exist on the market yet. So Engström contacted Harro Höfliger who helped him with this difficult task. We received our first order from the medical sector in the mid-1980s. The first step into this new business area for Harro Höfliger back then was a cartridge assembly and sealing machine for a Nicorette inhaler.

How is the branch office set up today?
Today, we are based at Uhlmann Nordiska near Gothenburg, where ten employees work for Excellence United, more specifically for the companies Bausch + Ströbel, Glatt, Harro Höfliger and Uhlmann. As Area Sales Manager, I work exclusively for Harro Höfliger and serve the markets in Sweden, Denmark, Norway, Iceland and the Baltic states. Customers appreciate the synergies and benefits that the group of companies provide.

“With our Pharma Services, we support our customers at a very early development stage.“

Mikael Blomgren, Area Sales Manager Scandinavia

Which market trends do you see for the future?
Scandinavia has always been setting trends in the pharmaceutical market. There are many large, leading companies producing for the world market and working on product innovations. They need new, automated processes – and we can help. With our Pharma Services, we support our customers at a very early development stage. I believe that many more innovations will come from Scandinavia; for example body-scan sensors or intelligent auto-injectors, and I look forward to my work in this area.

New series of symposia: Inhalation Insights

INHALATION INSIGHTS

Together with partner companies, Harro Höfliger will launch a new series of symposia in the second half of 2018 under the title Inhalation Insights. In Asia and South America, experts from leading industry representatives will talk about the challenges of device and formulation development as well as about product protection and packaging solutions. “With Inhalation Insights, we want to give interested visitors practical insights into the production of inhalation products and learn from each other in joint discussion rounds,” says Marco Laackmann, Leader Business Unit Inhalation at Harro Höfliger.

Partners for decades: Harro Höfliger and Manfred Reiser, longtime Managing Director of Design.

New corporate structure

Previous Senior Manager Harro Höfliger has transferred to the newly created Supervisory Board.

By appointing a Supervisory Board at the beginning of 2018, Harro Höfliger has become even more effective. The Chairman of the Supervisory Board is the previous Senior Manager, Harro Höfliger. Like his decades-long partner, Manfred Reiser, he has retired from the company management. The Supervisory Board is completed by Siegfried Drost, Managing Director at Excellence United partner Uhlmann, and Hartmut Jenner, CEO of the global family business Kärcher.

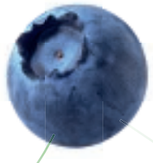
With this organizational milestone, the management considers itself well prepared for future challenges. CEO Thomas Weller explains: “This is not about technology and products – those are our key strengths. This is about planning, structuring and ensuring the right strategies, especially given our continued growth and complex challenges such as digitization and shortage of skilled workers.”

Company founder Harro Höfliger adds: “For years, the enterprise has been managed very successfully by the second generation. As a member of the Supervisory Board I will be able to assist in the company’s further development with my experience, supported by Siegfried Drost and Hartmut Jenner with their expertise and a critical view from the outside.”

Manfred Reiser, Managing Partner until 2009, and member of the company management until the end of 2017, will also continue to support the company with his technical expertise in an advisory capacity. The experienced engineer joined the organization as a co-partner in 1983. As Managing Director of Design, he made a significant technical contribution to the development of the company. His many groundbreaking designs include high-performance machines for the pouch packaging of instant products and the SM machine series for applying seals to bottles. Furthermore, the capsule filling machine series KFM – a predecessor of today’s Modu-C family – was designed under his leadership.

Hartmut Jenner and Siegfried Drost will contribute to the company’s further development as members of the Supervisory Board.

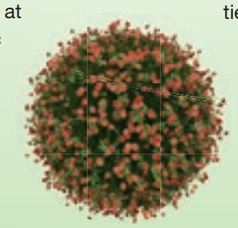
Andreas Dalferth, Alfred Kärcher GmbH & Co. KG, Uhlmann Pac-Systeme GmbH & Co. KG



An evergreen in aiding diagnosis of allergies

For decades, the ImmunoCAP™ test dispenser by Phadia AB, a Thermo Fisher Scientific company, has been used by doctors and laboratories to aid in the diagnosis of allergies.

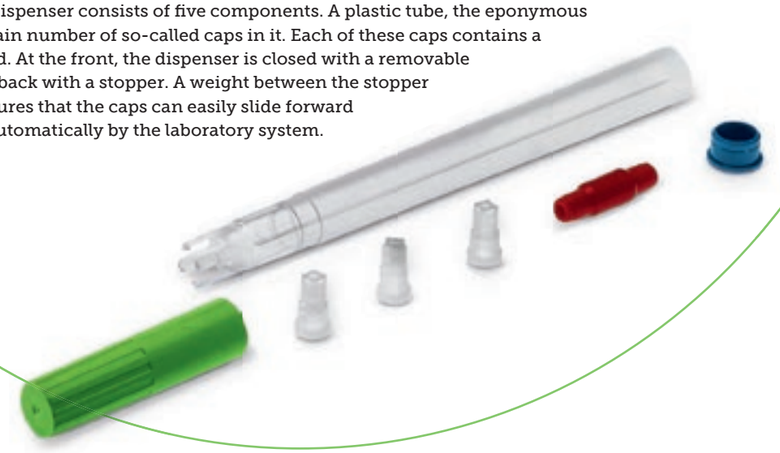
The demand for devices aiding allergy diagnosis is growing, reflecting the steadily rising number of allergy sufferers worldwide. Children are also showing symptoms of allergies at an increasingly earlier age. This often includes colds and itching, but also headaches or asthma. “This development is particularly noticeable in industrial regions such as Europe, the United States or Japan,” explains Magnus Askvid, Manager Production Engineering at Thermo Fisher Scientific in Uppsala, Sweden. He considers these regions the key markets for the ImmunoCAP™ assays, the company’s proven diagnostic tool for decades.

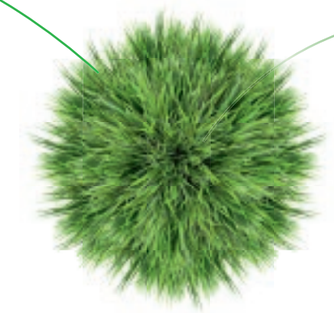


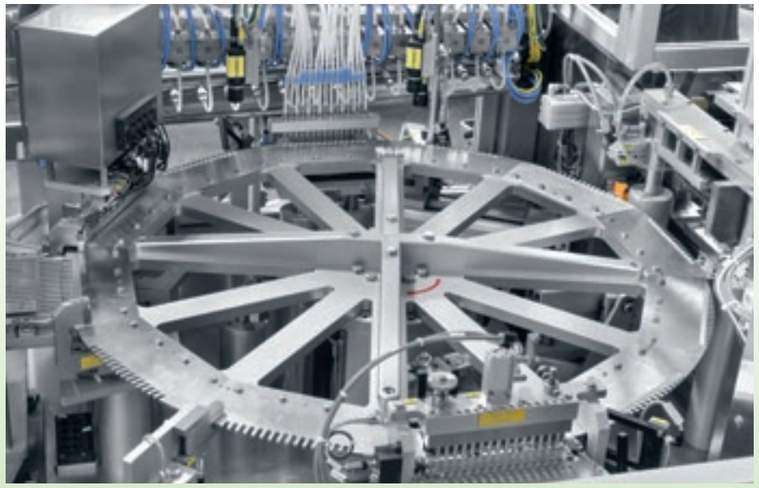
An allergic reaction is always an overreaction of the immune system to a certain, often harmless substance that is recognized as foreign. It then forms antibodies, so-called immunoglobulins that can be detected with a CAP-test (carrier-polymer-system). With its quantitative detection of specific immunoglobuline E (IgE), ImmunoCAP™ Specific IgE makes it possible to determine sensitization at an early stage, often before clinical symptoms have developed in a patient. IgE detection is nothing more than counting antibodies for a specific allergen in the blood. “With ImmunoCAP™ it is possible to test sensitization to well over 500 different allergens,” says Magnus Askvid.

Design and structure of an ImmunoCAP™ test dispenser

The ImmunoCAP™ test dispenser consists of five components. A plastic tube, the eponymous dispenser, carries a certain number of so-called caps in it. Each of these caps contains a sponge soaked in liquid. At the front, the dispenser is closed with a removable plastic hat and at the back with a stopper. A weight between the stopper and the last cap ensures that the caps can easily slide forward and be removed automatically by the laboratory system.



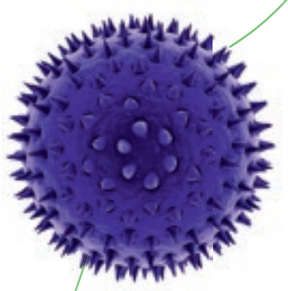




The caps are fed to an intermittently rotating turret, where the sponges are inserted.

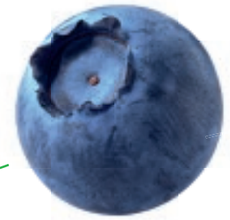
The test principle

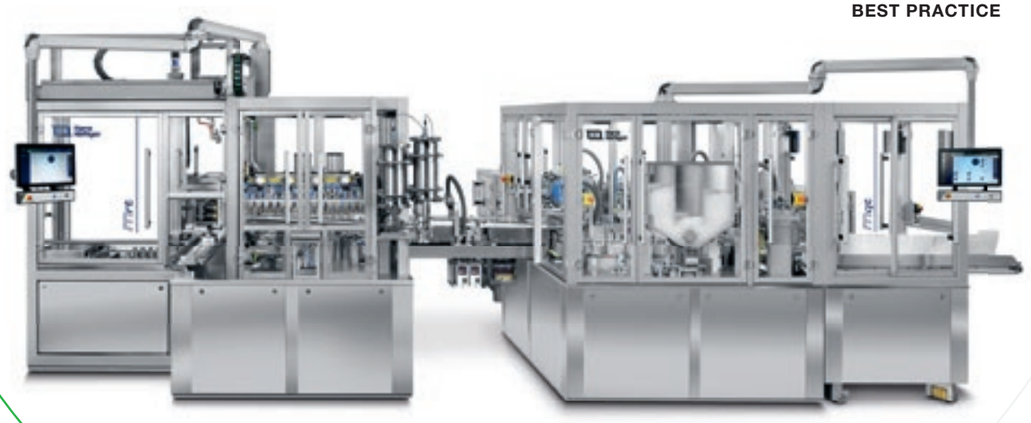
For the IgE test, the physician takes blood from the patient’s vein or a capillary vessel. The obtained serum or plasma is added to the ImmunoCAP™ Allergen in a laboratory system and the number of the respective antibodies is determined. The result can confirm or rule out allergen sensitization. An allergy diagnosis is then made by the physician, based on a detailed medical history and further clinical examinations. “The measurement of the IgE antibodies circulating in the blood, however, enables an objective assessment of sensitivity to an allergen and helps the physician to prepare an allergen avoidance strategy and an individual treatment plan,” explains Magnus Askvid.



"For us it was important to entrust a partner with the development of the machine, who can confidently respond to changing requirements."

Magnus Askvid,
Manager Production Engineering at Thermo Fisher Scientific





The assembly system of the ImmunoCAP™ test dispenser consists of intermittent machines.

The sponges are punched in parallel from fleece soaked in IgE liquid and then pushed into the caps.

Long-standing partner

Harro Höfliger has been supporting Thermo Fisher for more than three decades with the product assembly of the ImmunoCAP™ test dispenser. At the end of 2017, the fifth machine was delivered to Uppsala.

In this system, the individual parts of the ImmunoCAP™ test dispenser are fed as bulk material to two coupled machines. Separated in units of 15, the first machine pushes the caps into an intermittently rotating turret. Its first station serves to insert the sponges which are punched in parallel from fleece soaked in liquid. A camera controls the presence and position of the punched parts. Subsequently, the pass-caps are moistened with buffer liquid. This is again followed by an optical dosage control. Any fail-parts will be rejected. The caps are then conveyed to the next intermittent machine, where the dispenser tubes begin their journey.

Here, a camera checks the plastic tubes for damage before they are filled with caps. By recipe pre-selection, the fill quantity of the dispenser can be varied from ten to 16 caps. A slight vibration of the tube after insertion ensures that the caps slide into each other easily. A mechanical fill level control checks the tubes for correct filling. A weight is placed on the last cap and its presence is confirmed mechanically. The stopper closes the ImmunoCAP™ test dispenser at the back end. In the last assembly step, the hats, which are fed via a spiral conveyor, are fitted. Grippers place all good dispensers into folding boxes in layers of ten.

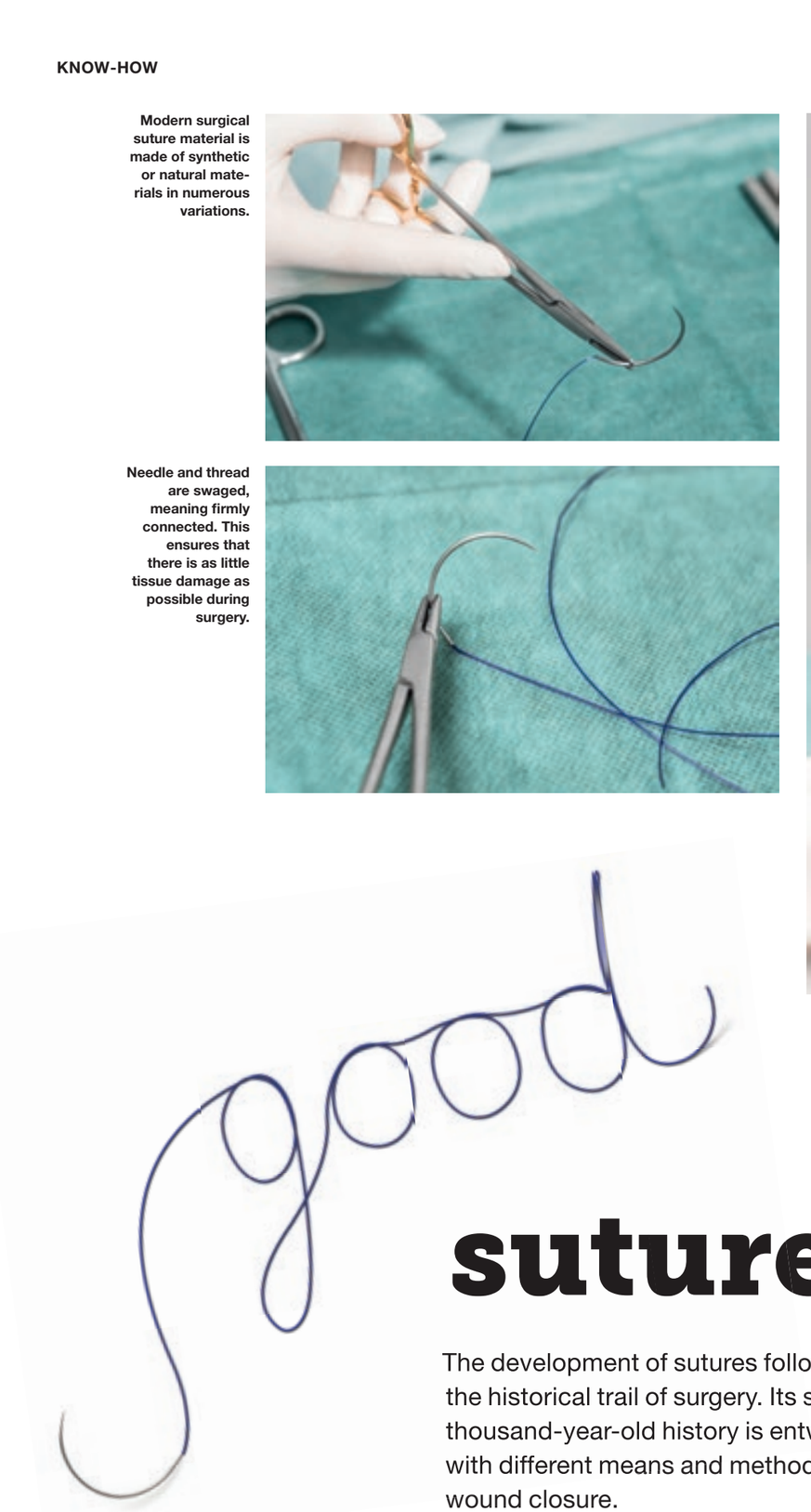
About Thermo Fisher Scientific

Thermo Fisher Scientific Inc. is the world leader in serving science, with revenues of more than 20 billion dollars and approximately 65,000 employees globally. The mission is to enable customers to make the world healthier, cleaner and safer. Through the premier brands – Thermo Scientific, Applied Biosystems, Invitrogen, Fisher Scientific and Unity Lab Services – the company offers an unmatched combination of innovative technologies, purchasing convenience and comprehensive services.

KNOW-HOW

Modern surgical suture material is made of synthetic or natural materials in numerous variations.

Needle and thread are swaged, meaning firmly connected. This ensures that there is as little tissue damage as possible during surgery.



suture!

The development of sutures follows the historical trail of surgery. Its several-thousand-year-old history is entwined with different means and methods of wound closure.

Modern suture materials have to meet a wide range of requirements. Crucial factors are, among others, gliding properties and tear resistance.

Various predecessors of modern sutures developed very early. The first indications of surgical suture methods were discovered by researchers in 5,000-year-old Egyptian scriptures, which show, among others things, the illustration of a suture needle with an eye. In addition to plant fibers, another common suture material of the early period were tendons. Later, textiles such as linen were used more and more often. Clear traces of textile suture material were detected and verified on a mummy dated 1000 B.C.

However, wound infections were often the result of using unclean, germ-laden instruments and materials. This did not change until the English surgeon Joseph Baron Lister and his German colleague Curt Theodor Schimmelbusch independently implemented the first usable disinfection and sterilization procedures at the end of the 19th century. From 1868 Lister used gut strings as suture material and disinfected them with carbolic acid – this marks the origin of the first catgut. Advantage of the material obtained from sheep or bovine intestine: It dissolved gradually into the wound without leaving a residue and could be absorbed by the body. With the BSE crisis in the early 2000s, the use of catgut declined rapidly in favor of synthetic materials.

Modern suture materials

While sterility is a basic requirement nowadays, modern suture materials have to meet completely different and multifaceted requirements. In addition to excellent gliding properties of the thread

logo: werbeagentur gmbh

when passing through the tissue to be operated on, high tear resistance and knot security are among the crucial criteria.

As extensive as the requirements for the thread are, the thread itself is just as varied. Synthetic or natural materials are twisted or braided into monofilament (single-fiber) or multifilament (multi-fiber) thread variations. Other options include sheathing or coating of resorbable or non-resorbable threads.

The designs and shapes of modern suture needles are also extremely complex and versatile. To make sure that tissue damage during surgery is kept to a minimum, needle and thread are swaged. This means firmly connected, to keep the needle as thin as possible, rather than pulling a large needle eye through the tissue. Every needle-thread-combination has its own special features which the surgeon, depending on wound and surgical technique, has to take into account when making his choice.

Sophisticated production process

There are some challenges to overcome in manufacturing surgical suture material. After the needle-thread-connection has been swaged, the needle is fastened in the so-called needle park of the thread carrier, the tray. The thread is then wound on the tray with up to 800 revolutions per minute and ultrasonically welded with a paper lid. On the one hand the lid serves as a batch information area and lists the specifications of the needle-thread-combination. On the other hand, it serves as a drying agent in order to ensure a constant quality of the suture material.

During the winding process it is particularly important to control the thread and to make sure that it does not end outside the tray. Various cameras help to comply with the high quality requirements.

Sterile packaging

When packaging surgical suture material, the trays are placed in the molded cavity of an aluminum blister. The lid foil applied to it has a tear-resistant, puncture-proof and breathable Tyvek window which enables sterilization by ethylene oxide gassing. During drying of the gassed blister, the moisture escapes through the Tyvek window, which is subsequently removed. Finally, the blister containing the suture material is sealed completely tight.

The swaged needle-thread-connection is fastened in a tray. Then the thread is wound on the tray with up to 800 revolutions per minute.

Solid relationship

Tu Yongrui, CEO of the Chinese pharmaceutical company Changzhou Siyao, made the first contact with Harro Höfliger in 2002 at a symposium about new administration forms. Since then, they have had a trusting business relationship.

Tu Yongrui (left) has relied on the partnership with Harro Höfliger for years. His company is among the Top 100 Chinese pharmaceutical enterprises.

The pharmaceutical and medical industry contributes about 900 billion euros to the gross domestic product of the People's Republic of China. This corresponds to about 8.5 percent. Tu Yongrui, CEO of Changzhou Siyao, is proud of the important role the company plays in this market.

Facilitating access

Changzhou Siyao supports global enterprises in the development and introduction of their pharmaceuticals and health products to the Chinese market. "We specialize in the production of pharmaceuticals in new dosage forms and various medical fields," explains Tu Yongrui. Siyao's extensive product portfolio includes, among other things, orally dissolving film strips (ODF), the great clinical benefit of which is emphasized by the Managing Director: "ODFs are superior to other dosage forms in many ways, including their ease of use and the quick release and dispersal of the active ingredient."

Tu Yongrui regards the market opportunities of this administration form as very attractive: "Particularly in pediatrics and geriatrics, we see a huge potential for easy-to-administer drugs." Like all industrialized countries, China is also experiencing demographic change. In the case of the People's Republic with their 1.39 billion people, however, the population proportions reach enormous dimensions: While today some 220 million Chinese are elderly, the number will rise to 480 million by 2050. The proportion of children in 2017 was 300 million.

Extensive fields of application

While they administer drugs in a well-tolerated manner, ODFs not only facilitate the life of children and the elderly: "We are continuously working to develop new products for the treatment of chronic diseases such as asthma and allergies, as well as cardiovascular, digestive or mental diseases," says Tu Yongrui.

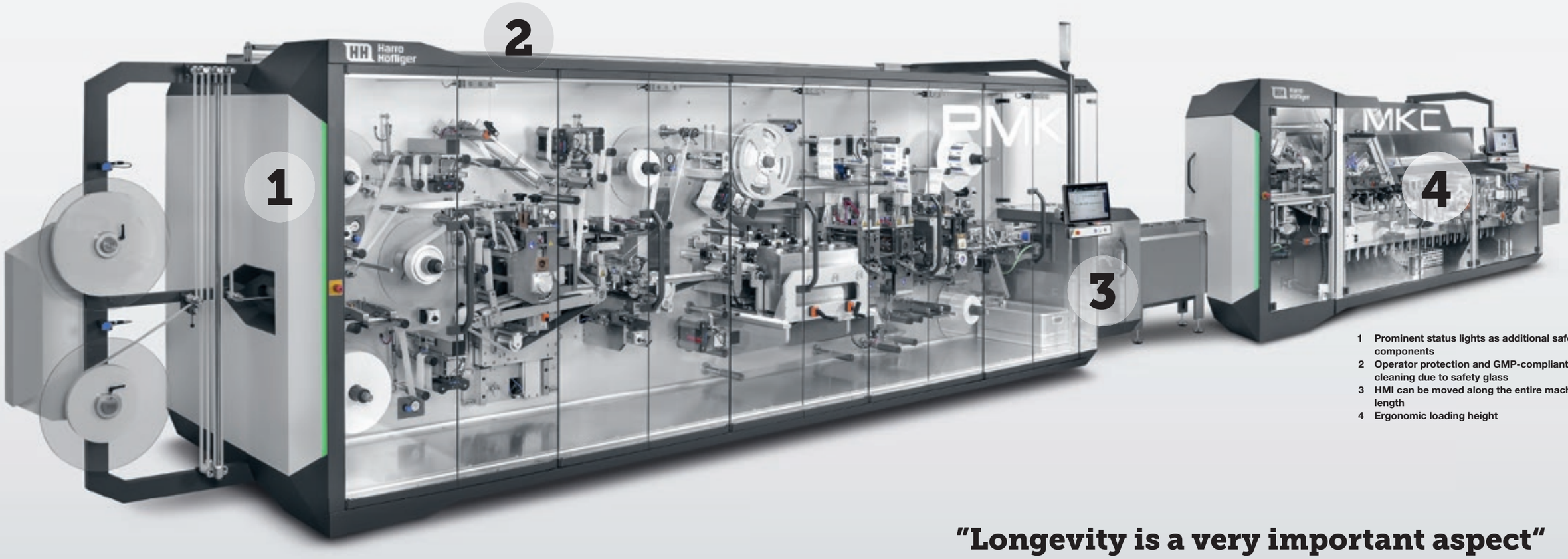
Siyao is also active in other fields. For example, Harro Höfliger has delivered a wide variety of process solutions to Changzhou. In addition to web processing lines used for ODF production or transdermal patches, the Chinese company also purchased machines for capsule filling.

In the future, the company would like to devote even more attention to the healthcare segment and appreciates having a "versatile partner such as Harro Höfliger" at their side who "always addresses customer product requirements".

About Changzhou Siyao

Changzhou Siyao Pharmaceuticals Co. Ltd. with headquarters in Changzhou, northwest of Shanghai, is among the Top 100 Chinese pharmaceutical enterprises. Their core business areas are the development, production and marketing of ready-to-use dosage forms in various fields of application. Siyao is approved and certified by the American FDA and the Chinese CEP as well as the Japanese Health Ministry. With 500 employees, Changzhou Siyao generated a turnover of about 330 million euros in 2017.

TOP INNOVATION



1 Prominent status lights as additional safety components
2 Operator protection and GMP-compliant cleaning due to safety glass
3 HMI can be moved along the entire machine length
4 Ergonomic loading height

Enlarged details of the machine can be viewed online at:
www.harro-magazine.com

Clear lines

The PMK and MKC production and packaging line presents the new turnkey design language.

From a technical point of view, the patch making machine PMK and the connected cartoner MKC have always been in perfect harmony. With the new design elements that will characterize all Harro Höfliger turnkey lines in the future, the combination now gives the appearance of one harmonized system. The clear design language was developed by the agency designship in Ulm. Thomas Starczewski and executive designer Thomas Koch aimed not only for a distinctive look but also for high customer benefit and operator protection. Among other things, generous folding and sliding doors at the PMK provide for improved access during production and service. For the first time, the HMI (Human Machine Interface) touchscreens can be moved by the operators along the entire machine length and ensure comfortable and safe control of the system. The design concept features prominent status lights and light strips as well as linear machine front panels. The panels are made of scratch-resistant safety glass, which is also GMP-compliant and easy to clean. These elements emphasize the high safety and quality standard of Harro Höfliger. As usual, format changeovers can be made quickly and almost tool-free on both machines.

designship, Helmar Lünig

"Longevity is a very important aspect"

Interview with Thomas Starczewski, Product Designer and Managing Director of the agency designship in Ulm.

With your characteristic machine design, Harro Höfliger breaks new ground.
The design was developed by a team and reflects my 25 years of machine design experience and the creative, knowledgeable input of my staff members. The multi-faceted and clear geometric shape results from the realization that design elements from this canon of forms will not become optically boring in a short period of time. Longevity is a very important aspect in the design of machines. Moreover, such a design can also be implemented economically.

What inspired this machine shape?
The design concept of the PMK and MKC is based on the idea to offer the viewer a clear, distinctive and well-arranged overall appearance. This creates trust and visualizes innovation.

First and foremost, one expects that production machines function reliably and are easy to operate.
Why shouldn't production machines also look good? One does not exclude the other. Good design is always the sum of a multitude of optimizations. A good-looking machine also scores points on an emotional level. Modern, clear machine design communicates quality and value, and also emphasizes the expertise of the company.

The machine design recently received the iF Gold Award and he Red Dot Award. Read the entire interview with more questions online at
www.harro-magazine.com

Looking ahead by tradition

Industry 4.0 and digitization: Machine developers are not alone when it comes to meeting new challenges. The decision-makers in Human Resources at Harro Höfliger face the task of recruiting employees at an early stage to meet future requirements. In order to bring the sought-after specialists on board, they pursue several strategies.

A friendly “hello” here, a “good morning” there or a smiling nod from afar: Whoever visits Harro Höfliger in Allmersbach im Tal immediately notices the friendliness of the employees. “Respectful interaction with each other is part of our corporate values. This includes greeting one another in our growing company despite the increasing number of colleagues,” explains Uwe Amann, Managing Director of Human Resources at Harro Höfliger. But anyone who thinks of “values” as “stuffy” is mistaken: “Our employees feel comfortable here. We focus on their individuality and foster their strengths. This has worked well for us in the past few decades. A strategy we would like to continue, no matter how much we grow.” Thomas Weller, CEO at Harro Höfliger agrees: “We learned early on how important it is to secure the best talents who also fit in on a personal level. With such employees, we can achieve anything.”

Setting the course

Finding these highly specialized employees remains a challenge. Like all high-tech companies, Harro Höfliger faces a shortage of skilled workers, and that will not change in the foreseeable future. On the contrary: The increasing degree of digitization and networking at our customers’ production plants requires even more qualified developers and experts on topics that may still be visionary today, but may well be the key to a company’s success tomorrow. Dealing with

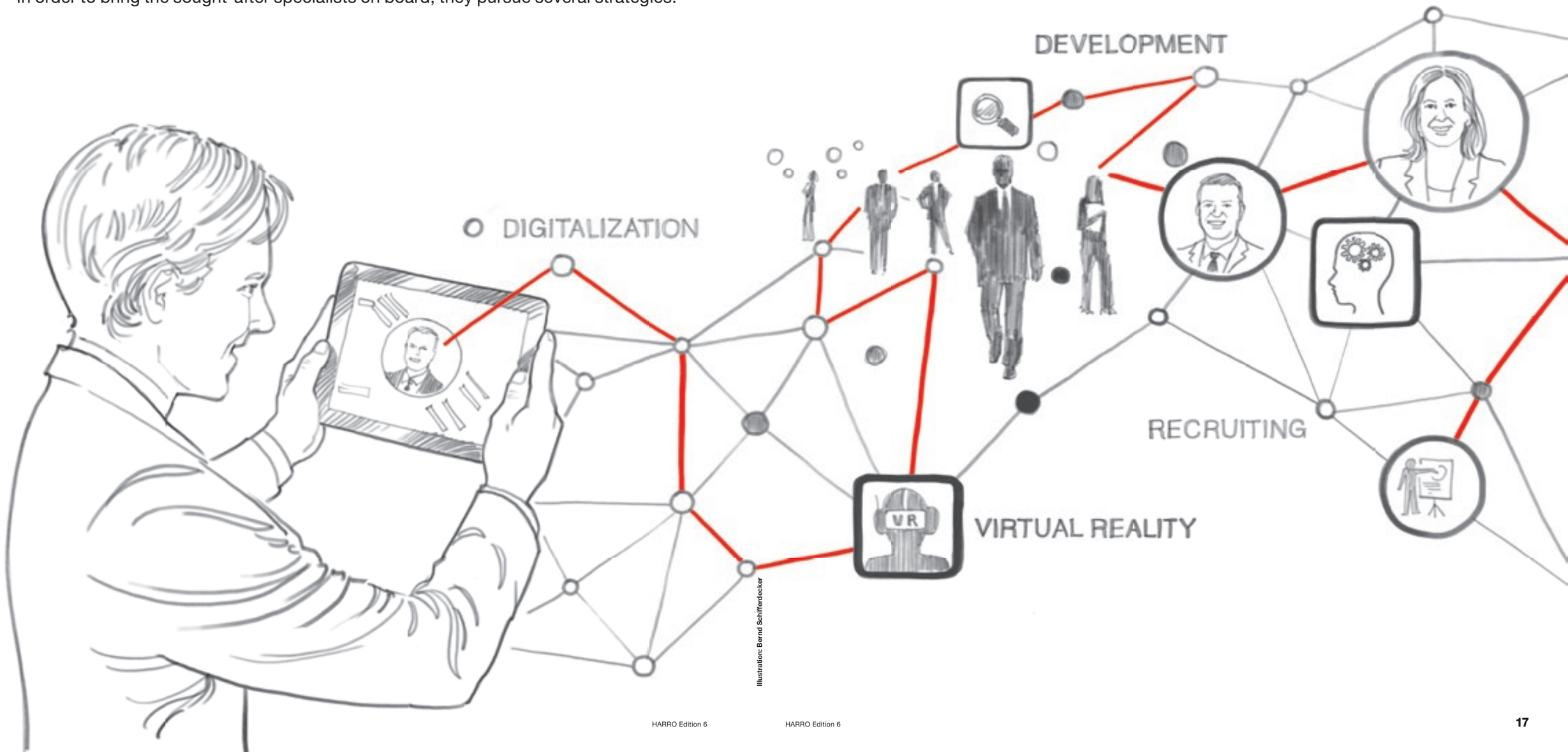


Illustration: Bernd Schifferdecker

new ideas and thinking outside the box is a tradition at Harro Höfliger. This explains why topics such as Deep Learning, Machine Learning, Big Data as well as the question of how to harness these technologies for our customers, now appear on meeting agendas.

Fabian Elsässer, Head of Central Electrics and Software Development, explains: “It is important to find out where our customers are heading, and to make sure at an early stage that we have the necessary know-how in order to provide them with assistance. To achieve this, we need to find ambitious and motivated employees in professions that have not been the focus of our attention thus far, but will become increasingly important in the future. We will need software engineers and data analysts who can cope with the complexity of future productions.”

“It is important to find out where our customers are heading in order to provide them with assistance.”

**Fabian Elsässer,
Head of Central Electrics and Software Development**

Fostering talents

With the goal of instilling interest and enthusiasm for the company in these highly sought-after specialists early on, the HR managers go directly to the source. Uwe Amann: “We have always worked closely with vocational and secondary schools. A completely new example is the partnership with the Albstadt-Sigmaringen University which specializes in IT. In a very short time, we were able to recruit a new employee there. A Business Analytics student will write her master thesis at our company.”

In addition, Harro Höfliger relies heavily on the dual system, which has been a successful model in Germany for years. The high degree of practical relevance is consistent with the company’s training philosophy in many respects. Fabian Elsässer: “The Bachelor and Master theses of our students provide insights into aspects of the future. If we identify topics that might be of potential interest to our customers, we are already developing employee skills in this direction in order to be strong and effective at the appropriate moment.”

As a further advantage, the young people get to know the company from the ground up during their internship semesters and are involved in everyday professional situations. “Our employees enjoy many freedoms. Everyone should be able to develop their full potential according to his or her abilities, but also be ready to take responsibility and make decisions at an early stage. This also applies to our newcomers,” explains Amann. Elsässer adds: “As a supplier of specialty machines we deal with a consistently large number of prototypes. Our customers trust in our know-how. To ensure this, we rely on self-confident employees and foster their respective talents. In addition, we provide every newcomer with a mentor, who not only helps him or her to find their way around the company, but also quickly and professionally helps them reach a superior level of knowledge.”

“Every employee should be able to develop their full potential according to his or her abilities and should be ready to take responsibility.”

**Uwe Amann,
Managing Director of Human Resources**

Developing ideas

Digitization and Industry 4.0, globalization, demography and shifting values bring about changes that we must adapt to. That is why Harro Höfliger experts are exploring ways to make it easier for their customers to work in the changing world of production and labor, finding solutions right here within the company. “Increased networking is making the manufacturing environment more and more complex, and our machines are placing ever-increasing demands on the operator,” explains Elsässer. “We have to take the pressure off them by designing our machines to be easier to operate.” High usability HMI systems are one way. Services that support customer production processes are also becoming increasingly important. As an example, pattern recognition to identify operating errors or augmented reality solutions where operators can adjust a machine using an app on a tablet computer.

Working with these and other systems today and in the future requires close cooperation between experts in new technologies and experienced mechanical engineers. It is a challenge for the managers at Harro Höfliger, but one that they are happy to face. Thomas Weller: “In an environment of trust, anything is possible. Specialists of different disciplines learn from each other, and different generations complement each other. We support this by offering a wide range of qualification programs, trying to include everyone. Ideal conditions for generating future-oriented solutions that help us and our customers to get ahead.” ■

“In an environment of trust, anything is possible.”

**Thomas Weller,
CEO**

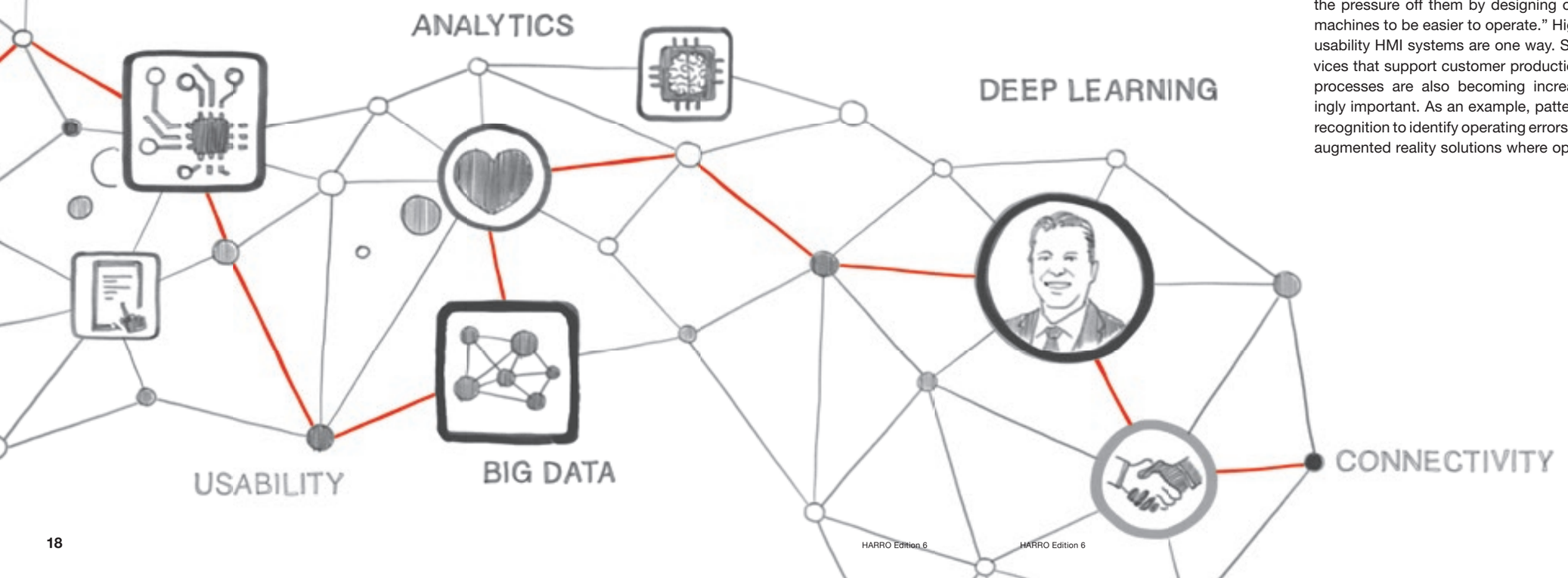


Illustration: Bernd Schifferdecker; photos: Janine Kyofsky

HARRO Edition 6

Inhale – and breathe freely again

For about 20 years, the number of people with asthma and COPD disorders has been increasing continuously. Inhalable drugs provide relief to those affected. With NEXThaler®, Chiesi offers patients a simple and safe inhalation device. For the filling and final assembly of the inhalers, the Italian enterprise trusts in Harro Höfliger.

The World Health Organization (WHO) currently estimates that up to 600 million people are affected by asthma and COPD worldwide. Many patients use inhalable drugs for therapy purposes. However, in many cases they do not use the inhalers correctly which reduces the therapy success or can potentially lead to a health deterioration.

The pharmaceutical company Chiesi with headquarters in Parma has recognized this problem and has developed the NEXThaler®, a powder inhaler which is both easy to handle and safe to use. Its intuitive operation ensures that the intended dose reliably reaches the lungs. Furthermore, a highly effective combination of proven active ingredients assures a well-tolerated treatment in case of difficulty breathing and dyspnea. After every successful inhalation process, a counter indicates to the user the number of medication doses remaining.

When planning to expand their production capacity in 2013, the Italian enterprise banked on the assembly and filling expertise of Harro Höfliger. The turnkey system which was put into operation in the French Blois in 2015, fills and assembles up to 70 units per minute.

Filled with high precision

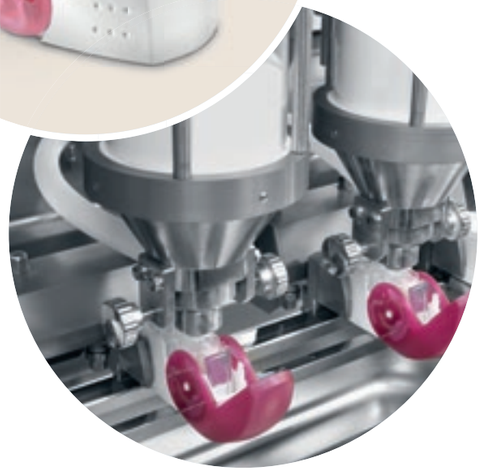
At the start of the filling process, the empty inhaler housings are taken from trays and conveyed to the intermittent oval turret on a puck belt. Gripper units push the housings into the production machine. This is followed by a performance test: After opening the inhaler, a compressed air impulse opens a small flap in the air intake shaft, called the Breath Actuation Mechanism (BAM). This mechanism ensures that the patient inhales deeply enough and, at the same time, serves to activate the counting unit when the inhaler is closed.

Next the empty weight of the inhaler is determined as the basis for the subsequent fill quantity control. A high-precision auger doser fills the powder reservoir of the NEXThaler®, which is then weighed again. The system immediately detects deviations from the defined fill quantity and sorts out inhalers exceeding or falling below the fill weight limit. The appropriate adjustment of the fill system is performed by means of a trend control. The active ventilation of the containment system for operator protection constitutes a major challenge during weighing. It must not compromise the machine's very sensitive weighing units.

Perfect closure

In the next step the caps of the powder reservoirs are fed to the line from a conveyor unit. A high-speed robot arm picks up the individual caps with the correct orientation and places them properly positioned into a transport system for assembly. In order to avoid downtimes of the assembly line at this position, the robot arm works over ten percent faster than required. The subsequent product accumulation controls the buffer quantity. A measuring system detects any improperly mounted caps and rejects the respective devices. Following the detection process, the mouthpieces, which are fed transversely in order to save space, are brought into the lengthwise position for assembly. The mouthpieces are mounted and checked for correct fastening in an assembly station. Closing the NEXThaler® triggers the counting mechanism and a camera checks the counter for correct functionality based on the displayed counter position. An additional control station ensures that only the good products advance and, ultimately, reach the hands of the patients. ■

Closing the inhaler triggers the counting mechanism.



The powder reservoir of the NEXThaler® is filled by means of a high-precision auger doser.

About Chiesi

Chiesi is an international research-focused healthcare group headquartered in Parma (Italy), with over 80 years of experience in the pharmaceutical industry. Chiesi researches, develops and markets innovative drugs in the respiratory therapeutics, specialized medicine and rare diseases areas. Besides Parma, Chiesi has Research & Development groups in France, USA, UK, Sweden and Denmark.

"The wealth of ideas and innovative solutions which the Harro Höfliger team showed during the various project phases really impressed us."

Roberto Bugarin,
Engineering Director at Chiesi

"So much for powder is powder"

In the Swiss municipality Monteggio, located between lakes Lago di Lugano and Lago Maggiore, is the development and production center of Micro-Sphere S.A. In August 2017, the enterprise tripled its production capacities for spray drying and capsule filling, relying, among others, on technology from Harro Höfliger.

Stefano Console, Managing Director of Micro-Sphere S.A., is sitting in the conference room of the bright administration building of a former furniture factory. On a screen, he shows the company presentation and gives a sense of what their experts have been working on. Since 1998 the focus has been on overcoming complex formulation challenges and the partnership-based support of his customers from development to the commercial production of pharmaceuticals.

The studied organometallic chemist Stefano Console has specialized in the business development of small and medium-sized enterprises in the pharmaceutical industry and has been a member of the company's management since 2012. He pays particular attention to focus on a market niche. This applies especially to companies with the size of Micro-Sphere. "Anyone who believes they can offer everything on their own, will not be successful in the long run," emphasizes the native Venetian Console.

With the production and capsule filling of highly potent powders for inhalation, Micro-Sphere occupies a particularly interesting niche. Since completion of the building extension in August 2017, 16 cleanrooms are now available, all of which comply with the requirements of global GMP-standards. Micro-Sphere has been inspected and certified by SwissMedic, the FDA and the Japanese PMDA, among others. The high quality standard is evident when looking at the corporate structure. More than one third of the employees work in the Quality Unit, which includes Quality Assurance and Quality Control.

Partnership-based cooperation

Stefano Console regards a cooperative and trusting relationship with his customers, which the Managing Director deliberately calls "business partners", as an indispensable success factor. This is not the only thing in common with Harro Höfliger, which is something he discovered during his cooperation with the machine manufacturer and highly appreciates. What makes both companies stand out is the approach of always listening carefully in order to be able to offer their project partners a suitable solution package right from the start.

Stefano Console was also listening carefully when, in search for an appropriate dosing solution for highly cohesive and compressible powders, a business partner told him about Harro Höfliger's drum filling technology. "I then contacted Marco Laackmann, Harro Höfliger's inhalation expert. A short time later we made an appointment at the trade show CPhI and soon thereafter met at Harro Höfliger in Allmersbach. It quickly became obvious that we needed a Modu-C with drum filling technology for our field of application."

Ever since, the two companies have enjoyed a strong and cooperative relationship. While Micro-Sphere's employees are considered the leading experts in spray drying pharmaceutical powders, he credits Harro Höfliger with remarkable expertise in the field of capsule filling technology. If the Swiss company is unable to address customer questions about filling methods, "Harro Höfliger is always ready to provide answers," says Console.

The Italian considers the model of the strategic alliance within Excellence United as exemplary. In order to be able to offer your project partners the ideal solution, strong cooperation partners are needed to develop a holistic solution approach. "We also see such a partnership with Harro Höfliger. What makes it so valuable is that we can learn a lot from each other and share the knowledge and experience with the market."

For the dosing of highly cohesive and compressible powders, Micro-Sphere relies on the Modu-C with drum filling technology.

About Micro-Sphere S.A.

Micro-Sphere S.A., with headquarters in Monteggio in the Canton of Ticino, is a contract manufacturer specializing in GMP spray drying and capsule filling. They are considered a leader in the processing of APIs and HPAPIs. With a team of 37 experts, Micro-Sphere supports customers around the world in the development and manufacture of pharmaceutical products with a special focus on spray dried powder and inhalation powder.

micro-sphere sa

www.micro-sphere.com

Micro-Sphere's 16 cleanrooms comply with all the requirements of global GMP-standards.

Roberto Marchet/Micro-Sphere

Building blocks for a successful product

The success of a product depends on a number of factors. Apart from the spark of an idea and a dose of courage, a suitable process and reliable partners are needed. Altogether, they can greatly facilitate market entry.

The product

The XStraw® is an oral administration device in straw format, specially developed for children and the elderly. The pellet-filled XStraw® provides users who have difficulty swallowing with a convenient and safe alternative to tablets or capsules. The application is very simple. Remove the cap, place the straw in a glass of liquid and drink. Depending on individual taste preferences, almost any cold drink is suitable.

The right active ingredient

The pellet technology allows taste masking of potentially unpleasant-tasting ingredients. High-precision dosing systems ensure that every XStraw® is filled with an exact amount of the active ingredient. The right concept opens up the possibility to enter new markets. Partner for the development and production of the pellets is Excellence United member Glatt.

Perfect functionality

Every component of the XStraw® contributes significantly to its functionality. Raumedic provides an ongoing supply of components for the extrusion of the drinking straws and the injection molded caps. The closing caps with desiccant are supplied by CSP. Porex is responsible for the sophisticated control filter.

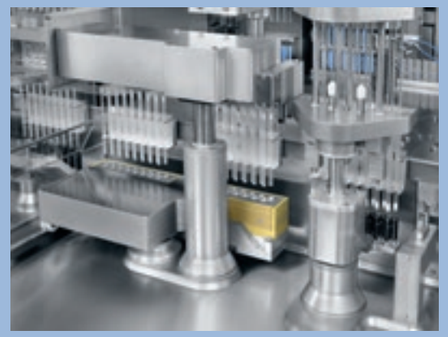
Creative partner

DS Technology GmbH, based in Winnenden near Stuttgart, is the licensor and markets the XStraw® and other medical and pharmaceutical products. Harro Höfliger supplies suitable production solutions. The experts from DS Technology, with many years of experience in the pharmaceutical industry, advise and support interested parties during the entire value creation process. This helps with a fast and safe product launch.

Scalable processes

The scalability of processes plays a key role in pharmaceutical manufacturing. Harro Höfliger offers machine solutions for the XStraw® from the laboratory stage to high-performance production.

Filling with vacuum dosator



Inserting the control filters

Small-scale production

The DST LS for the laboratory stage is a semi-automatic filling and assembly unit with an output of up to 1,000 XStraw® per hour. A workpiece carrier manually loaded with empty straws which contain previously inserted control filters, passes through the filling and assembly processes step by step. The lower end of the tube is deformed, which prevents the control filter from sliding out. At the top, the XStraw® is rounded off. This shaping allows the closure cap to be locked into place and ensures a firm fit. Using a vacuum dosator, the XStraw® is filled with an exact number of pellets before the cap is applied manually.

Large-scale production

For high-performance production, a fully automatic system consisting of three machine units produces just under 20,000 XStraw® per hour. In addition to the automation of all filling and assembly processes, the intermittent oval motion machine has control stations that check, among other things, the filling and the correct closure of the XStraw® by means of a pull force test. Bad parts are detected and ejected. A connected film packaging machine seals the packaging of the XStraw® in a protective atmosphere, followed by online printing. A downstream cartoner packages defined quantities in folding cartons.

Harro Höfliger

Becton Dickinson, Helmar Lünig

Stable process

Becton Dickinson has launched the Libertas™, an innovative injector. For clinical studies and small series of the wearable injector, Harro Höfliger developed a semi-automatic assembly system.

When manufacturing medical and pharmaceutical devices, nothing is more critical than process stability. That is why Harro Höfliger starts with defining a suitable production process for their customers and provides product-oriented solutions for the clinical trial stage and small series production – such as for the Libertas™ by Becton Dickinson (BD). This portable injector adheres to the skin and enables patients to self-inject subcutaneously. Worn directly on the body, Libertas™ administers large-volume or highly viscous biotech drugs in doses between two and ten milliliters over a defined period of time. The application only requires a few steps. Furthermore, the needle is concealed before and after the injection process. Optionally, the injector can be networked with a Smart Device. That way, BD guarantees the safest and best possible therapy in the comfortable surroundings of your own home. A stable and perfectly performed joining process of the injector components is a basic requirement.

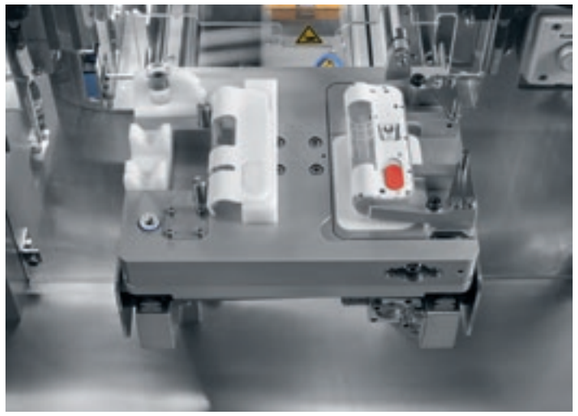
Suitable system for clinical trials

For the test volume production of the BD Libertas™, Harro Höfliger developed the semi-automatic Assembly Lab, a system for the assembly of patch injectors. During the earliest production phase, the system is able to provide process assurances for the final assembly process. The perfectly functioning ensemble consists of four parts: a cartridge containing active ingredient, an intermediate piece, a cover and the main assembly, which includes the needle. The components are placed manually into a workpiece carrier and joined together at seven stations. The scale-up of the final assembly can be easily done.

About Becton Dickinson

BD is a leading supplier of innovative patient and user safety technologies with headquarters in Franklin Lakes, NJ, USA. The company, with 50,000 employees, partners with international organizations to address the most pressing healthcare challenges for people around the world.

BD Libertas™ incorporates BD Neopak™ primary container technology and employs the same cannula technology found in BD's needles. The design and interface of the wearable injector are the result of extensive preclinical and clinical research.



The BD Libertas™ consists of four components. For the final assembly they are placed manually on the workpiece carrier (left). The cartridge, which contains the active ingredient, is automatically inserted into the main assembly (right).

ACHEMA2018

ACHEMA has been the meeting place for experts of the process industry since 1920. For the 32nd time, the fair opens its doors in Frankfurt am Main from June 11 to 15. During the five days of the event, about 170,000 visitors from more than 100 countries can obtain information on the latest news and trends in the industry. In Hall 3.0 Booth F47, Harro Höfliger will present the holistic production process at the center of their trade show display. Under the catchphrase “Lab to Production”, visitors will learn everything about the extensive equipment offerings from laboratory to high-performance production. The Pharma Laboratory provides insights into the research and development of medical devices and pharmaceutical technology. A special focus is on capsule filling, a key strength of Harro Höfliger. All filling systems of the Modu-C product family will be presented, as well as sophisticated barrier technologies. Harro Höfliger’s turnkey expertise will be emphasized by the system consisting of PMK and MKC equipment (see page 14/15). With a machine for filling flexible containers, Harro Höfliger will provide evidence of their distinctive know-how in the field of aseptic production. Furthermore, the Excellence United partner companies, with their future-oriented technologies, will welcome interested visitors in Hall 3.0. On 2,800 square meters, they will demonstrate how customers can use the networked expertise for the creation of innovative products.

Helmar Lünig, Tom Philippi

Visit us:

FCE Pharma
São Paulo, Brazil
22.05.–24.05.2018

Microneedles Conference 2018
Vancouver, Canada
30.05.–01.06.2018

PackExpo Mexico 2018
Santa Fe, Mexico
05.06.–08.06.2018

Achema 2018
Frankfurt, Germany
11.06.–15.06.2018

DPI Dry Powder Inhalers 2018
London, Great Britain
20.06.–21.06.2018

ICRS 2018
Leiden, Netherlands
30.06.–05.07.2018

Inhalation Insights
Kuala Lumpur, Malaysia
05.07.2018

CPhI Middle East
Abu Dhabi, UAE
03.09.–05.09.2018

ERS 2018
Paris, France
15.09.–19.09.2018

Transdermal and Intradermal Drug Delivery Systems 2018
Philadelphia, USA
17.09.–18.09.2018

Maghreb Pharma
Algiers, Algeria
17.09.–19.09.2018

FachPack 2018
Nuremberg, Germany
25.09.–27.09.2018

MVIC 2018
Lund, Sweden
01.10.–04.10.2018

PDA USA 2018
Orlando, USA
08.10.–09.10.2018

CPhI Europe 2018
Madrid, Spain
09.10.–11.10.2018

PackExpo & Healthcare Packaging Expo 2018
Chicago, USA
14.10.–17.10.2018

Medtech & Pharma Platform
Basel, Switzerland
16.10.–17.10.2018

PODD 2018
Boston, USA
17.10.–18.10.2018

Scanpack 2018
Gothenburg, Sweden
23.10.–26.10.2018

Closely linked

Discuss articles from the current HARRO magazine with us and get all the latest news first-hand! We look forward to hearing from you on LinkedIn!

Closer to the action

What motivates us and our employees? What is so special about Harro Höfliger and our team? Find out! On Facebook we offer you insights behind the scenes.

Better informed

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