Ergonomics & demographics

Main topic with guest contributions
EDITORIAL

DEAR VALUED PARTNERS,

welcome, on behalf of all divisions of the Waldner Group.

The global economy is in upheaval, the world of our customers and partners is in a constant state of flux, and the Waldner Group is also undergoing change. We’re tackling the challenges of the future and uncompromisingly aligning ourselves with the needs of our customers in order to develop and implement optimum solutions. In this way, we are also helping our customers get ready for the challenges of the future with regard to workplace design and digitalisation.

That this leads to recognition is something that has been demonstrated again this previous year. The “Laboratory of the Year” award for the CJ Blossom Park research and development centre in Seoul (South Korea) that was equipped by Waldner, the German Innovation Prize for Hohenloher, and the record number of incoming orders for special machines all bode well for 2019.

In order to further increase our effectiveness and competitiveness, considerable efforts and investments have been made in the last few years and months, which are now entering their final stages. Construction Phase 2 at Waldner Laboreinrichtungen is complete, and the flow production for service systems is now up and running, supported by the completely new warehouse logistics. New IT systems are being introduced in order to benefit from the potentials of digitalisation with respect to speed, transparency and tailor-made customer solutions.

Our international presence is also growing, e.g. with the expansion of the office in India and the foundation of the subsidiary in Singapore and its new showroom. We have also completed pioneering and futuristic reference projects in the growth market of South Asia and in the Far East, and further developed our position as a driver of innovation.

The main focus of this issue is ergonomics and demographics (p. 4-9), giving us the opportunity to address the fascinating topic of our last Laboratory Symposium. And yet the young generation is just as interested in “workplace design” – we discuss new forms of training and related successful projects on pages 10-18.

We can all be excited about what the future will bring. Here at Waldner, we are overflowing with ideas and potential new projects, and are already looking forward to being able to present these innovations to you in the future.

Best wishes from Wangen,

Yours Joerg Hoffmann
CEO WALDNER Laboreinrichtungen GmbH & Co. KG
Why complicate things when they can be easy? This is a premise that many people live by. After all, we want to make our private lives and our working lives as pleasant as possible. So we arrange our desks so that everything is within easy reach, and invent robots that do the monotonous, heavy or dangerous work for us. This is good. But it also means that we are sitting more and more – even in the laboratory. And this is not good. Researchers have been saying for a long while, that sitting is the new smoking. But standing all the time is also not good, and lying down all the time certainly isn’t. Essentially, the next posture is always the best one, i.e. changing positions does you good. Don’t stay stuck in one position. By the way, this also helps in terms of having a (re)think.

And while we’re on the subject of having a rethink: research shows that it’s not having a young workforce that is the silver bullet, but that often mixed teams of young and old in particular turn out to be effective – with experience and knowledge coming into contact with fresh ideas. And in any case, due to the change in demographics and the associated labour shortage, it will soon be the case that we won’t be able to do without a single good, experienced employee. Therefore, we should ensure that employees remain fit and healthy for as long as possible – which is known to be something that starts in one’s younger years. It is also necessary to consider where and how we can employ those who are no longer suitable for employment in all areas.

“Anyone who doesn’t make time for exercise, will very soon have to make time for being ill.” *

*Ingo Froböse, professor for prevention and rehabilitation in sports at the German Sport University Cologne.

We like sitting down
When it comes to heavy manual labour, it is now possible to find exoskeletons on the market, which support workers and protect them against one-sided or heavy loads. It is more difficult, however, to help those who spend a lot of time sitting in front of the PC. There is no exoskeleton for this, rather a strong basic instinct to stay in one’s comfort zone and – as already mentioned – a wellorganised desk. Both of these factors deter employees from moving. An external trigger can help, e.g. bosses who lead by example by holding standing meetings (which also means they don’t go on for as long). It’s also possible to trick yourself into moving more, e.g. by – rather impractically – placing the phone and mobile out of reach on a higher table so that you have to stand up to answer it when it rings. If you work in a room with others, you can encourage one another to do some brief stretching or strength exercises. Perhaps that will be the trigger of the future.

Instead of “Are you going to come for a smoke?”*, it will be “Fancy going for a walk around the block?”

GET MOVING!

BEING OLD AND FIT HELPS THE ECONOMY

Demographic change has been a hot topic for a while, not to mention the labour shortage. For companies, employee retention – and keeping them fit and healthy – is becoming evermore important. Often, even small changes help, including changes in attitude.
In an ageing society, the average age of employees is rising. Furthermore, there is expected to be shortages when it comes to recruiting young, new talents. In the coming twenty years, the proportion of the population of working age is going to decline more quickly that the overall population. As “intelligent machines” are not going to fully replace humans in terms of their communicative and creative capabilities in the foreseeable future, commercial decision makers have no option but to address the issue of the employability of older employees. One’s age should essentially not stand in the way of carrying out a task. Ageing will only become a problem in a person’s working life if employees perform one-sided, stressful routine activities over a period of many years.

Performance prerequisites in the ageing process
As part of the natural ageing process, a person goes through a period of maturity, in which they acquire skills, before the degenerative processes increase. The individual ageing process is marked by a change in specific performance and personality characteristics. For example, practical and specialist knowledge, as well as personal and social skills are generally more pronounced in older people. At the same time, health risks – e.g. damage to the spine or cardiovascular system – tend to increase with age.

Structuring work for older people
Work-related degenerative processes can be averted or at least moderated by means of preventative measures and training. This includes measures implemented as part of an ageing-appropriate and age-appropriate work structure. An ageing-appropriate work structure is based on the ageing process, taking into account the entire working life of all age groups within the operation. An age-appropriate work structure on the other hand, focuses on age-specific differences and takes into consideration a change in performance based on life phases.

3 pillars of operational work structure
3 tried-and-tested approaches have emerged to implement this. The first is a structure with humane working conditions and supportive learning. This is because ergonomically designed workstations and regular changes in activities benefit all employees. The second is the anticipation of potential age-related changes. Additional requirements can be compensated for by retrofit modules (e.g. lighting, physical supports) at the workstation, or modifications to the scope of work. The third is to not allow age-related performance limitations become critical to employment. This can include a timely transition from physically demanding tasks to coordination or supervisory activities, or a reduction in night shift work. This results in companies facing the challenge of creating a healthy balance between customised humane performance prerequisites, working conditions, and a multitude of customer requirements.

The aim is to coordinate these constantly changing factors according to the situation. This requires experience, awareness of the problem, social skills and a willingness to learn. However, it is worth investing in ageing-appropriate working conditions that can contribute to the development of personal performance capabilities in an ageing workforce. Companies can only increase their flexibility and innovative strength when this customer orientation is supported by a wealth of experience and the commitment of its employees.
GET UP! MOVING WHILE WORKING IN THE LABORATORY

Humans are spending more and more time sitting down. So much time, in fact, that even a bit of sport after work is no longer enough. A better balance is achieved by simple, natural movements – preferably distributed evenly throughout the working day. And the right inner attitude is the biggest help of all.

DR. ROBERT RUPP

The daily routine of many adults is characterised by sitting. They spend up to 80% of their working hours, and up to half of the time they are awake each day, sitting. This has grave consequences for their health and mental performance. International health research is meanwhile referring to the “sitting disease” and is coming across increasing evidence of a link between long periods of sitting and the emergence of many chronic diseases (e.g. cardiovascular disease and Type 2 diabetes). It is noticeable that even regular sport after work is unable to balance out long periods spent sitting down.

Keep on getting up from your seat
So what is to be done? Current indications increasingly suggest that even regular breaks and occasionally replacing time spent sitting with basic, everyday activities, such as standing, getting up or walking about have a health benefit, as well as a positive effect on well-being, work motivation and productivity. The solution to the issue of sitting is not regular sporting activities after work, rather it has more to do with the integration of simple, natural (micro) movements into the work process – preferably at regular intervals throughout the working day.

The time spent sitting is also on the increase in the laboratory
Up to now, this has been less relevant to laboratory work, as it was characterised by a variety of tasks and regular changes in position and location – in the sense of achieving a sitting-standing dynamic of movement. However, laboratory work has become increasingly similar to classic computer-based office work, which requires prolonged periods of sitting. Future studies forecast that this “sitting trend” will continue to grow. The research of tomorrow will be automated, “free” researchers from a majority of their routine manual labour in the laboratory, and enable them to spend more time on the creative work processes – sitting in front of the computer.

Movement starts in the head
Regular breaks from sitting and work that involves moment are becoming increasingly important for a healthy, productive working life in the laboratory. In order to put this into practice, new “movement-activating” laboratory concepts are required. However, new working environments are not enough. Key to the long-term implementation of a dynamic working style is one’s inner attitude, the mindset of employees, and in particular that of management. In order to set our mindsets and working styles “in motion”, at the Heidelberg University of Education, we are developing various mental training strategies, such as stand up coaching sessions and workshops. Ideally, such behaviour-oriented measures would be combined with spatial movement elements in order to continue to enable movement within the “laboratory of the future”, which will support one’s health and promote productive brain work, because moving one’s legs helps move one’s brain.

Dr. Robert Rupp, Prevention and Health Promotion at Heidelberg University of Education, and leader of the “Kopf-Stehen” project
NEW FORMS OF EDUCATION

A SPACE FOR IDEAS

The Hohenloher makerspace is a bit like a modern, posh version of an inventor’s shed – just without the spatial restrictions. It offers everything the heart could desire in terms of multi-disciplinary education, be that in schools, in industry or even in a library.

Anyone who has ever set foot in a lovingly equipped hobby workshop or inventor’s shed, and glimpsed all of the wonderful tools and technologies, of which most can only dream, will know the feeling. Your hands immediately begin to itch, and you want to dive in yourself right away.

This idea also gave wings to the makers at Hohenloher when they were developing their makerspace.

The makerspace is not restricted by walls. Rather it is a 4 x 5 m space that is integrated into every room and can have a multitude of uses. For example, it can form part of a normal classroom, school science lab or study room, or even part of a laboratory, office or library hall. This is because, after all the experimenting is done, it is easy to tidy the makerspace, pack everything up and fold it all away.

Chairs, height-adjustable tables and

“Our electricity comes from the sky”
Adrian, Year 6
A GOOD IDEA CATCHES ON

The term “makerspace” originates from the USA and was initially used to refer to shops in which software and tools could be used in exchange for low fees. The idea is that everyone should be able to repair or rebuild something there – even if they lack the necessary tool at home. So it’s a bit like a do-it-yourself (DIY) space. The term FabLab, or fabrication laboratory, is also used to refer to the same thing in the international inventor scene. The first FabLab was launched in the USA at the Massachusetts Institute of Technology (MIT) in 2002. In addition to traditional tools, the FabLab also uses digital equipment in particular – combined with modern technology, such as 3D printers. FabLabs are usually public and/or communal, and have spread from the USA to Africa and Europe. German libraries also discovered the makerspace concept a few years ago. The first makerspace was installed in the Cologne city library as far back as 2013.

Advice and teaching materials
There is no restriction to the direction taken when researching, tinkering or crafting. There is a wide range of modules, and Hohenloher not only offers advice, it also works with partners such as Festo to provide the necessary teaching materials. The makerspace is anything but monofunctional. It is actually intended to remove the boundaries between subjects, combine knowledge and offer space for new ideas. Just how this functions is something the pupils at the Ernst-Reuter-Schule in Karlsruhe got to try out for themselves.

Awarded the title of “Digital School” in 2018, and becoming one of the first smart schools in Baden-Württemberg in 2017 (to name but two of its numerous prizes), Hohenloher transformed a space into a makerspace in 2018. This now allows the pupils to independently create and edit video productions and stop motion animations, for example. They have access to 3D modelling and printing, electrical technology and everything you need for coding, robotics and bionics, including, of course, virtual and augmented reality.

What the pupils make from all of this can be seen in a photo shoot by Hohenloher. For example, they use the new technology and every trick in the book to produce an explanatory video clip for their fellow pupils, including catchy music. And they have already programmed a drone and a small electric vehicle. “It didn’t matter whether they were in Year 5 or Year 9,” says Alexander Biller, Head of Marketing and Product Management at Hohenloher. “Each child had different strengths and taught their classmates what they needed to know.” This learning from one another and the enthusiasm of the young people was also infectious for Alexander Biller, and so he came to the following decision with the Hohenloher team: “Some of the pupils will now ‘teach’ our field sales team and show them just what all the equipment can do.” New forms of learning are taking shape in the makerspace.

A concept for adult education as well
The concept is also proving to be of interest for adult education centres and libraries. Makerspaces in libraries are a big trend, as the broader public have the opportunity to try things out for themselves and develop them. “We’re currently in discussion with Munich,” reports Alexander Biller. “There is a great deal of interest in experimental and phenomenon-based learning for strengthening 21st century skills.” Something which was also confirmed at the didacta education fair in Cologne in February. The makerspace at the Hohenloher stand was a major attraction – everyone wanted to get involved and try things out.
POPULAR IMPETUS FOR SCHOOLS

The Hohenloher Academy, with its combination of lightning talks and workshops, gets instructors, designers, architects, outfitters and school operators talking and creates a space to discuss their issues and questions. This is because the way that learning spaces in schools and schools as learning spaces should look can only be resolved by a combination of pedagogy, architecture and facilities.

INTERVIEW

An interview with Jürgen Luga, Programme Director at the Hohenloher Academy since 1st July 2018.

Schools are basically just rooms in which pupils are taught. What is the point of the Hohenloher Academy and its interest in designing these learning spaces?

You see and hear it in the media all the time: the requirements in terms of our skills have undergone a radical change. In order to be fit for the 21st century, it’s necessary to master the 4Cs: communication, collaboration, critical thinking and creativity. As a future tag line for the Academy, we offer an impetus and space for interdisciplinary, creative exchange in order to find suitable solutions for this. As a future tag line for the Academy, I would therefore propose “Viewing schools as a makerspace”. It is all about defining the school as a place in which the learners are able to research their own issues, or at least in part. The point is not only to lecture on the subject, but to provide the opportunity to experience co-creative learning during the events. My predecessor, Dr. Schaffitzel, had already paved the way for this with the Design Thinking workshops.

How can school prepare young people for an increasingly digitalised, and in particular unbelievably complex, world?

Jürgen Luga – Hohenloher Academy Programme Director

Spaces are growing, and the subject of makerspaces (see page 10) is highly topical in schools right now. The DIALOG events held by the Academy offer an impetus and space for interdisciplinary exchange in order to move towards making our schools as a makerspace. It is all about defining the school as a place in which the learners are able to research their own issues, or at least in part. The point is not only to lecture on the subject, but to provide the opportunity to experience co-creative learning during the events. My predecessor, Dr. Schaffitzel, had already paved the way for this with the Design Thinking workshops.

How can the Hohenloher Academy offer support in this respect?

The digitalisation of society is placing greater requirements on the so-called STEM subjects of Science, Technology, Engineering and Maths. IT and technology are therefore becoming increasingly important. At the same time, the need for multifunctional presentation on the topic, the audience would mainly learn how to design a PowerPoint presentation, but not how co-creative learning works. Impetus is important, but please combine it with methods that encourage the participants to act and get involved.

What can you tell us about it?

Have you already had feedback from interested parties or customers?

There is particular interest among school authorities in cooperating with the Hohenloher Academy to offer our DIALOG events. School authorities are where all of the threads come together: the school construction and sanitation, furniture and the equipment for specialist rooms, and to some extent, the teacher training. Synchronising the various needs, and making schools fit for a digitalised world is far more complex than it was ten years ago.

This year, as part of the LEARNTEC digital learning fair, you also offered a training event specifically for specialist room designers and architects – the designer day. What can you tell us about it?

For our first designer day, we considered what would give the participants added value and how we could make the day interesting. It was important that with the company REDNET, we had someone with us who digitalises schools on a daily basis. Then we had two professors, who are experts in pedagogical architecture, and two Design Thinking coaches, who moderated the topic-specific workshop phases. It was an enormous success. The feedback on the format and the content was very, very positive.
A GOOD SCHOOL

A GRAMMAR SCHOOL IN MOSCOW BECOMES A ROLE MODEL

Teaching and learning in the 21st century. A grammar school in Moscow implements what most only talk about doing – with an attractive design, good quality, high tech and considerable flexibility of the laboratory furniture systems. Investors and the school management team are impressed with what is now probably the most advanced school in the country – equipped by Hohenloher.

This school makes you hungry to learn as soon as you walk through the door. The light-flooded atrium, which is four storeys tall, not only connects the various rooms to one another, it also invites the visitor to linger for a while in the breakout areas. In office jargon, you would talk about there being various communication zones. There is an inviting and friendly atmosphere. The students work, or learn, at the “Khoroshkola” using the latest technology: with sophisticated furniture systems including laboratories, workshops and robotic classrooms, of which even scientific institutes can only dream. The classrooms themselves can be arranged as required and can vary slightly in size, thanks in part to the partition walls. It is a showpiece, as the name suggests: “Khoroshkola” can be translated as “good school”.

Forward-looking customers

It wasn’t an easy ride. It needed an investor and a school director who were forward-looking. It also needed a design office with fresh ideas, such as Russian company Martela Ed Design, which enjoys an outstanding reputation in the country thanks to its designs and services. And, of course, it needed a manufacturer of school furniture and fittings, capable of demonstrating all of the options – Hohenloher. The aim was to create a common, technologically smart and functional school room.

Clever, practical solutions were required

“We impressed them with a convincing draft design and the professional renderings of Martela Ed Design,” explains Alexander Krigler, Area Sales
With its new laboratories in Singapore, German science and technology company Merck offers its customers in Asia important expertise on biopharmaceutical production. Waldner has provided safe and flexible laboratory furniture for the labs, which were originally designed as office spaces.
Global company with many names
The German science and technology company Merck is still majority owned by the descendants of Friedrich Jacob Merck – the man who founded the company in Darmstadt in 1668. Since then, Merck has grown into a global enterprise. A company of many names: In the USA and Canada, Merck operates under the name EMD Serono in the biopharmaceutical business, as MilliporeSigma in the life science business, and as EMD Performance Materials in the special chemicals and high-tech materials sector.

www.merckgroup.com

Singapore has a particular appeal for multinational companies. This is hardly surprising, as it lies at the heart of the Asia-Pacific region, has a very strong economy, and business development is very active. German company Merck has already had a presence in the city state for many years, and is now combining its competences and bio-pharmaceutical production subsidiaries together in one building. One floor therefore comprises 3,800 m² of different laboratory spaces. This is where the processes of partner companies are tested in terms of their biological safety, allowing them to authorise the reliability of the medicinal products they produce, while Merck customers are able to examine and improve their own processes. Merck also offers its customers laboratories in a cooperation centre, which are used for training courses, practical demonstrations and process optimisation.

Waldner laboratory planning
Ensuring the optimal equipping of such a range of laboratories with a similarly wide variety of requirements is a challenge. While Irish company PM Group was responsible for the overall design, Merck commissioned Waldner to design the laboratories and their furniture system. During the initial discussions, it came to light that the conditions in the building were anything other than ideal. Designed as an office block, the ceilings were low and the existing ventilation system already took up quite a bit of space. Not only that, but there was only one single wastewater discharge on the entire floor – and that for a planned laboratory area of 1,100 m². As the floor below no longer belonged to Merck, it was not possible to simply “bury” the pipes. At the same time, Merck wanted efficient facilities for its subsidiaries. This required biosafety level 2 compliant laboratories on the one hand, and furniture systems that offered maximum flexibility on the other. No mean feat, in other words.

Extendible installation
Michael Lasko, Area Manager APAC for Waldner in Singapore, reports that: “For the low ceilings, we were able to offer our DIMENSIONS system with service ceiling as a solution. For the wastewater, we decided on – somewhat unconventionally – a discharge system via the ceiling. With the help of chemi- cal-resistant pumps in 20 positions – a discharge system via the ceiling. With the help of chemical-resistant pumps in 20 positions – a discharge system via the ceiling. With the help of chemical-resistant pumps in 20 positions – a discharge system via the ceiling. With the help of chemical-resistant pumps in 20 positions – a discharge system via the ceiling. With the help of chemical-resistant pumps in 20 positions – a discharge system via the ceiling. With the help of chemical-resistant pumps in 20 positions.”

Mobile furniture – including sinks
“We also scored in terms of the main laboratory,” reports Michael Lasko, “because Merck wanted a completely flexible laboratory for the cooperation centre, where a constantly changing set of research groups work. We put the entire furniture system on castors. There are even mobile sinks.” Service columns suspended from the ceiling supply the necessary electricity, water, gas, etc. – and can be easily moved around and rehung on the suspension grid as required. This ensures maximum adaptability.

International processing expertise
Waldner also provided a high level of flexibility along the entire supply chain. Michael Lasko acted as the on-site contact person, working closely with Sabrina Gomm from the project team in Wangen, where she dealt with the project handling. During the critical phase, she was naturally also on site in order to clear up any issues on the spot before installation began. Close contact is indispensable in the implementation phase in particular in order to achieve the highest level of customer benefit in the end.

Tight schedule
In particular when there is a tight schedule, all of the trades have to work seamlessly with one another. In this project, it was also necessary to have very restricted working hours on the construction site, because being located in the middle of an office block, noisy activities could only be carried out at night. All possible room for manoeuvre was used for Merck in order to meet the opening date. Sabrina Gomm explains that “to optimise the assembly process, we restructured the project according to the production process and thus achieved a quicker delivery of the goods, prioritised according to the effort of assembly.”

Delighted customers and visitors
Merck is delighted with the end result – an attractive 1,100 m² laboratory. There are also office spaces and a reception area – and enough space for two additional subsidiaries that are going to move into the building. And the Waldner Team is going to be a part of this, too. But the flag- ship laboratory is already sparking considerable interest among other companies.
The building that in 1871 housed the steam-powered reciprocating pumps that supplied groundwater to a mighty water tower, guaranteeing a water supply for Karlsruhe, is now the location of the DVGW-Technologiezentrum Wasser (TZW). Firstly, they — broadly speaking — test all products, materials and substances that come into contact with drinking water for compliance with the stipulated values and standards. Every tap or boiler that has passed testing here meets the high quality criteria of the Deutscher Verein des Gas- und Wasserfaches e.V. (DVGW – German Gas and Waterworks Association).

Secondly, the researchers work together with international colleagues in the area with the lower water extraction in the area, a beautiful pillar was discovered, which was to remain visible if possible. The extension dimensions. But there were a few things to deal with. While gutting the site, a beautiful pillar was discovered, which was to remain visible if possible. The extension of 6 rooms were thus created in the old brickwork and an extension from 1989.

Gunther Funke, Director DIMENSIONS at Waldner, was the technical contact for the TZW, and enthusiastically reports that “here, we could demonstrate on a small canvas everything we’re capable of.” And this started with the customer’s plans. As the customer had only very old floor plans available, the TZW approached Waldner with a series of hand-drawn sketches. Although, it already had clear visions of what it required for the laboratories, it was open to how these visions were to be realised.

“After a comprehensive preliminary discussion, we first transferred the initial sketches to a DWG-format CAD file necessary for the design and construction,” said Gunther Funke. After an on-site visit the plans were then adjusted according to the exact data — and the project carried out precisely according to these dimensions. But there were a few things to deal with. While gutting the site, a beautiful pillar was discovered, which was to remain visible if possible. The extension constructed in the 1980s had also led to two different ceiling heights. “It would have been impossible to install a conventional laboratory and its technical building services here. However, with our flat ducts we were still able to install the service ceiling with everything the customer wanted, despite the tight spaces. And the service ceiling now runs via our flexible suspension solutions at a uniform level throughout, despite the difference in height between the 2 connected buildings,” explains Funke.

**All trades from a single source**
DIMENSIONS was able to start the installation just 3 months after the contract was placed. “That is really unusual. Especially as the renovation work, such as the tiling and laying the screed changed the final dimensions of the room by a few millimetres,” says Gunther Funke. Nevertheless, the final handover took place just 6 weeks later. That it all happened so quickly is also due to the fact that Waldner managed all of the laboratory trades. Gunther Funke: “We offer an all-in-one-package. Our customers only have to arrange the floor fitters and painters. Not only do we design the rest, we also use our own installers on site. So, instead of having to coordinate 5 or more different companies and trades, the customer has only the one point of contact – us.” That not only saves them time, but also a great deal of hassle, while ensuring the highest quality. “We were also lucky to have a good partner in TZW. The coordination processes were absolutely seamless.”

Thanks to the DIMENSIONS system, the Waldner team were also able to be flexible and react quickly throughout the conversion – including having to move a wall by 50 cm on request at the last minute. A total of 6 rooms were thus created in an area of approx. 150 m², including a photo laboratory and a special area of approx. 150 m², including a photo laboratory and a special room for odour tests. The furniture included sinks, wall benches and various cupboards, along with Waldner fume cupboards and flexible service columns. Gunther Funke is visibly proud: “We really were able to implement everything here that DIMENSIONS has to offer in terms of services and solutions.”
There are various models of DOSOMAT machines for filling pouches – and each one is customised according to customer requirements.

When we go on a trip it is best to carry food and snacks in a small bag. It saves space. And this is also one reason why industrial pouch packaging is becoming ever more popular in the animal feed sector and food industry. But how do you fill pouches with food on an industrial scale? Our editor, Anke Biester, pays a visit to the Waldner DOSOMAT assembly hall.

From cat food to red cabbage – instead of an aluminium or glass container, an increasing number of pouches can be seen on supermarket shelves. But why? And how does the food or cabbage get inside? To answer this question, I arranged to meet up with Robert Weber, design engineer at DOSOMAT. We’re standing in the ginormous assembly hall of Waldner, in front of an 18 metre-long packaging machine, which is currently running through its last test series before being delivered to the customer.

Held tight like this, in the next step, they are printed with the best-before date. This makes sense, because the pouches are currently still flat like a piece of paper. “Because the ink used changes colour after sterilisation, it is also a good indicator for this process,” explains Robert Weber.

Individually controlled servomotors
And how do the flat pouches now open up in order to be filled? Once again, little suction cups are used, which pull the pouch open from the front and back, while the clips are pushed together – and then bingo! Not only is the top of the pouch open, but also the bottom, its standing surface. But what if it doesn’t work like that? That could happen, couldn’t it?
Bernd Bodenmüller smiles: “Take a look. At the next station we check the entire thing with a light curtain and a blast of sterile air. And that’s the clever thing: if a pouch remains closed, it simply moves on – it just isn’t filled. The advantage is that the filling process carries on regardless, filling the other intact pouches in the line without any issue. This means there is no downtime.” All this is possible by numerous servomotors that are capable of directing each and every pouch. “We measure and save all of the available parameters for each pouch in real time. This way we can quickly identify any potential faults during filling,” explains Bodenmüller. “Take a look at the control panel. We are able to check everything that is going on in the filling head, flatting the top of the pouch closed, and I hear a quiet, high-pitched squeak as the vibrations and pressure of the ultrasound unit seal the pouch. A fast and secure method. I discover something is wrong with the machine, I’m impressed with everything the two of them and the DOSOMAT team have come up with in terms of the design. I would love to take another look at the control panel and simply keep watching the clips and servomotors doing their jobs, but the 2 engineers have to go. Their mobile phones have been ringing the whole time. Demand is simply too high.”

The pouches get filled into pouches. Reliable, hygienic machines ensure products can be filled into pouches. The DOSOMAT machines ensure reliable, hygienic filling.

The pouches are filled into the pouches. Reliability and hygienic machines ensure products can be filled into pouches. The DOSOMAT machines ensure reliable, hygienic filling.

Sealing with ultrasound
How do they come up with such ideas, I wonder? – Meanwhile, the machine continues its demonstration with the sealing process. The clips part, flattening the top of the pouch closed, and I hear a quiet, high-pitched squeak as the vibrations and pressure of the ultrasound unit seal the pouch. A fast and secure method. I discover that the air is first pushed out of the pouch using steam, CO2 or N2 – and this then adjusts the intake stroke for, in this case, the cat food. I find out that it is at this point, by the way, that specific pouches can be removed for sampling. The machine lays all of the other pouches in trays, which are then sent for sterilisation. And that’s it! “For every pouch, we automatically collect a data set of approx. 30-40 parameters,” says Bernd Bodenmüller, who programmed the machine. “It is a bit like an individual electronic calling card that is attached to each pouch. It is easy to use for statistical analysis, and if there are any returns, it is easy for manufacturer to work out where the problem occurred. It’s heading in the direction of Industry 4.0.” And what happens when something is wrong with the machine, with its myriad of individual parts? Bernd Bodenmüller taps on the panel and I see an exact representation of the machine. “Thanks to the detailed overview on the control panel, we are able to check everything down to individual format plates. We’re able to find a needle in a haystack, no problem. Another unique feature is that, not only can we then easily remove the individual form plates, we can continue with production without them, in other words, with a gap and the other form plates still in place. This means that the machine doesn’t stand idle while maintenance is undertaken.”

A wide range of products can be filled into pouches. The DOSOMAT machines ensure reliable, hygienic filling.

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Bernd Bodenmüller and Robert Weber from Waldner tinker with the sophisticated solutions of the DOSOMAT pouch machines.

Bernd Bodenmüller smiles: “Take a look. At the next station we check the entire thing with a light curtain and a blast of sterile air. And that’s the clever thing: if a pouch remains closed, it simply moves on – it just isn’t filled. The advantage is that the filling process carries on regardless, filling the other intact pouches in the line without any issue. This means there is no downtime.” All this is possible by numerous servomotors that are capable of directing each and every pouch. “We measure and save all of the available parameters for each pouch in real time. This way we can quickly identify any potential faults during filling,” explains Bodenmüller. “Take a look at the control panel. We are able to check everything that is going on in the filling head, flatting the top of the pouch closed, and I hear a quiet, high-pitched squeak as the vibrations and pressure of the ultrasound unit seal the pouch. A fast and secure method. I discover something is wrong with the machine, I’m impressed with everything the two of them and the DOSOMAT team have come up with in terms of the design. I would love to take another look at the control panel and simply keep watching the clips and servomotors doing their jobs, but the 2 engineers have to go. Their mobile phones have been ringing the whole time. Demand is simply too high.”

The pouches get filled into pouches. Reliable, hygienic machines ensure products can be filled into pouches. The DOSOMAT machines ensure reliable, hygienic filling.

The pouches are filled into the pouches. Reliability and hygienic machines ensure products can be filled into pouches. The DOSOMAT machines ensure reliable, hygienic filling.
ERGONOMICS ON THE ISOLATOR

SO THAT EVERY HAND MOVEMENT WORKS

No matter whether large or small, broad-shouldered or narrow – Waldner adapts its isolators to the respective user. Just how that works with a 1:1 wooden model is demonstrated by Benjamin Sauterleute at the Waldner technical centre.

Of course, the number one priority when it comes to an isolator is safety. Even the leak tightness requirements now lie in the nano-range. But anyone who has ever tried working sensibly while wearing gloves that are too big or too small will immediately understand that the ergonomics of an isolator is certainly a matter of safety.

With an isolator, the height of the glove ports and the distance between them are also important. If they are too high, you have to stand on your tiptoes, but if they are too low, you have to bend your knees the whole time. If they are too far apart, it’s impossible to reach in properly with your arms stretched so far apart. And it is also impossible to work with your arms pressed together in front of your chest and not far enough apart. “It’s only when you can perform all of the work steps comfortably and reach everything in the isolator that you are working safely with respect to yourself and the product,” says Benjamin Sauterleute, responsible for sales at Waldner Process Systems, getting straight to the point.

Customisation
But how do you adapt the ergonomics of an isolator? “If a customer orders an isolator from us, we build a mock-up, a 1:1 wooden model of the design of the isolator,” explains Benjamin Sauterleute. It is usually three weeks after the order that the Waldner technical centre is ready. In an ideal situation, the operators who will later work with the isolator and know the process steps will come and test the model, running through the planned work processes. “If there are several people, then the largest and the smallest come, if possible.” says the salesman and customer service representative.

A roller conveyor for weights
In order to test the planned work steps in as realistic conditions as possible, the Waldner team have a few tricks up their sleeves. As a stand-in for the materials to be processed, depending on the required consistency, they use sand, flour or grains. A mock-up is also made of the instruments used, such as a set of scales or a screen. After all, it is important to see where the scales will stand later, and whether they need to be lowered, for example.

Another clever feature is that in order not to have to enter information cumbersomely on the outside panel and then put your hands back in the glove ports on the isolator during the weighing process, Waldner has integrated screens and control panel in the rear wall of the isolator. If this is not possible due to the nature of the material being processed, special switches in the isolator or external foot pedals make operation easy.

The ergonomic set-up of the isolator is a key step, and usually takes 1-2 days. “Often, the mock-up is modified or rebuilt overnight,” says Benjamin Sauterleute and continues: “If a new process is involved, we also request an early mock-up, so that the customer can check in good time whether their process functions in the system with the planned dimensions.”
Anyone who works in a laboratory knows that at some point, something will break or make strange noises, or a warning light will come on. Up until now, it has usually been necessary to inform the laboratory manager, who calls customer service, who then sends out a service engineer who gives everything the once over, orders a spare part and comes back to fit it a few days later. A complicated and protracted process. Especially when this prevents you from getting on with your work.

Your own customer login for all data

The Waldner Global Customer Service (GCS) team thought that this would be quicker with the help of digital technology, and so they are now in the process of exploring all of the possibilities offered by such technology. In future, the situation described at the outset will now unfold as follows: When the problem occurs, any laboratory employee will simply be able to scan the QR code on the equipment (e.g. their laboratory fume cupboard) and be connected directly to the Waldner technical support web page, allowing them to send a message, or call the hotline number. Problems can often be resolved with specific instructions, without having to go to site. This saves the user time and costs. The customer is able to find the contact person responsible for them and their queries on www.waldner-gcs.de. The customer is able to find the construction, disassembly and reassembly processes of a worksheet, from the respective company network and checking the equipment, is possible with most devices. Or by the customer putting on the smart glasses provided by Waldner. These glasses enable the customer to show the Waldner experts where the problem is using a separate mobile phone. A screen integrated in the glasses then allows the engineer to show the laboratory employee where to check a connection or fuse, for example – in many cases it is possible to solve a problem in such a simple manner. It also helps rule out potential operator errors. If it is still necessary to send an engineer to site, the engineer will already know what the problem is likely to be, thanks to the “preliminary smart glasses diagnostics”. “This increases the first-time fix rate, reduces the costs incurred by the customers, and boosts efficiency.” summarises Ulrich Loehr, Director Global Customer Service at Waldner Laboreinrichtungen.

A look behind the technology

Engineer Viktor Chlebik adds that “this has significantly increased our options with regard to remote diagnostics. We even have an endoscope that the laboratory employees can use to look into extract air ducts and such like – with us taking a look at the same time. This is what the spare mobile phone is for, as confidential information is transmitted via a secure line.” He is enthusiastic about the possibilities offered by the new technology, and even uses it with his own colleagues. “We’re already using augmented reality glasses in our subsidiaries, such as the one in Singapore. Just this morning I used them to help a colleague with a tricky question.”

Measuring the entire room with 3D laser scanners

Another digital tool that Waldner is using more and more often is the 3D laser scanner. It is placed at several points around the room and takes measurements accurate to the millimetre – it doesn’t matter whether furniture or equipment is in the way. The advantage is that no dimension is missed, and all dimensions are readily available and can be called up again later. The equipment has a deviation of just 1 mm, even at a distance of 10 metres. This makes it possible to carry out the design, disassembly and reassembly processes precisely and promptly.

Focus on customer benefits

“On its own, digital technology is no silver bullet,” stresses Ulrich Loehr, “it is always important to be there for the customer. And with our global, 24-hour service hotline available 5 days a week, we are. Our customers always have access to our knowledgeable Waldner employees.”
NEW FACES

IAKOVELY, ANTON
Introducing… Anton Iakovlev, 32 years old. I’m single and live in Moscow. I’ve been with the company since the subsidiary was opened in 2013, and started here as a service engineer. General Director of the Waldner RUS subsidiary. What matters to me in my job: Dedication, ability to non-standard solution, diplomacy and team work are the most important things in my autonomous work. Why I work for Waldner: I like the way of working at Waldner – and the associated travel. I also appreciate being able to grow with our subsidiary as part of Waldner and develop us further. What I do in my free time: I enjoy reading, practice yoga and like to go hiking. But I also enjoy spending time with my friends.

MORITZ WALTER
Introducing… Moritz Walter, 34 years, married, 2 children. I come from the region around Böblingen/ Calw. Research and Development Manager at Waldner Laboreinrichtungen. What matters to me in my job: Having an open-minded and trusting working environment between superiors and employees, and working in multi-disciplinary, motivated teams. Why I work for Waldner: Developing new ideas in the laboratory sector, conducting tests together with customers, and later seeing the product being used by the customer has very much appealed to me as a challenge at Waldner. What I do in my free time: Spending time with my family, building and flying quadrocopters, keeping fish and reptiles.

TOBIS KNEBEL
Introducing… Tobias Knebel, 42 years, married, 2 children. Responsible for Marketing at WALDNER Laboreinrichtungen. What matters to me in my job: First and foremost, having an open-minded relationship with others, and mutual respect. We do not resolve challenges alone, but together as a strong team. Why I work for Waldner: Waldner has a long history, but also enormous potential for the future. When our markets and customer expectations change, we have to view it as an opportunity. This is because if we dare to try new things and leave the well-trodden path, we will develop surprising solutions and delight our customers. What I do in my free time: I like to spend time outdoors, mountain biking, climbing or sailing, and of course, I also like spending time with my family.

NEW PREMISES

THE WALDNER LIAISON OFFICE IN SINGAPORE BECOMES A SUBSIDIARY

Waldner Laboreinrichtungen has another subsidiary in the Asian region. The Waldner subsidiary in Singapore is officially opened.

“We have now established ourselves very well in the market, and with the founding of the subsidiary, we want to signal to our customers that Waldner’s high level of expertise is available locally,” says Maximilian Englisch, Manager of the Waldner subsidiary in Singapore, explaining the reasons behind the move. Waldner already had a presence in Singapore in 2016, with its Liaison Office. Since then, the laboratory outfitter has undertaken some high-profile projects and even won “Lab of the Year Award 2018” with its laboratory furniture for the South Korean corporation CJ. Meanwhile, not only have projects been secured and completed, the subsidiary also supports its customers by providing service and preventative maintenance of the laboratory furniture systems. “We are proud that we are able to offer our customers a comprehensive local service,” says Englisch. He also adds that the office area in Singapore boasts a large exhibition space, in which Waldner is not only able to give live demonstrations of the flexible furniture systems and most important types of fume cupboard, but also present the highly flexible space solutions and service supply systems of Waldner DIMENSIONS.
HOHENLOHER ADVANCEMENT AWARD

SPACE FOR “JUGEND FORSCHT”

Almost everyone in Germany is now aware of the “Jugend forscht” (Youth researches) competition – but less well known is the existence of the “Hohenloher Advancement Award”, presented as part of this in Baden-Württemberg. Word has already got round that many do not know, that it’s not only school pupils who can take part, but apprentices, and students in their first semester. Entrants must not be older than 21. For those under 15 years of age, who are in Year 4 at least, the youth competition is called “Schüler experimentieren” (Pupils’ experiment) and does not take place on a national level.

Impressive results of youth researchers

The favourite subject for research continues to be biology, which accounts for 23% of all registered youth researchers. Chemistry is in second place with 19.2%, and technology is in third place with 18.7%. It never ceases to amaze Dr. Marianne Rädle what the young people are able to come up with in the STEM subjects (science, technology, engineering and maths) in terms of research work. Dr. Rädle has been the manager of the competition on the state level in Baden-Württemberg since 2009, and was previously a member of the jury and a support teacher for “Jugend forscht”. They are so enthusiastic about and engaged in their scientific questions,” she says, describing her experiences.

“Other things the majority of outsiders find difficult to imagine is the generally difficult circumstances in which the young people pursue their scientific curiosity at this early stage.

“Few schools have extra space where the pupils can meet to do their “Jugend forscht” work. Most of them store their experiments on a trolley, which they wheel out and then work on their experiments in an available space, having to pack it all up again and find somewhere to put the trolley.” A considerable amount of effort. Dr. Marianne Rädle was therefore delighted when she was contacted by Waldner in 2012, and the idea for an advancement award for school equipment was born. “When someone has a space and can equip it with modern facilities – it is worth its weight in gold!” says the biologist and maths teacher. And it soon became clear that there would be an extra award for “Jugend forscht” participants in Baden-Württemberg. Anyone who applies for this award will be supported by Hohenloher with a professional laboratory furniture system for their science space.

Every school needs something different

The “Jugend forscht” manager was also surprised that needs of the schools, and the pupils, are so varied. The first to win the award in 2013 was the Johanna-Geissmar-Gymnasium (then called the Peter-Petersen-Gymnasium) in Mannheim, which was in the lucky position of being able to have its new “Jugend forscht” space fitted out with the “Variothek” mobile pupil’s workspace thanks to the advancement award. However, the latest prize winner in 2018, Maria-von-Linden-Gymnasium in Calw, was very different. Here the pupils and “Jugend forscht” teacher were happy to receive: new cabinets! It is hard to imagine, but up until now, they had nowhere suitable to store their experiments – and now they are proud of their own red cabinets that they have been able to afford thanks to the “Hohenloher Advancement Award”.

“The first time we advertised the ‘Advancement Award’, we didn’t know how it would be received,” explains Dr. Marianne Rädle, “but you have to take a chance on things, and we were certain that the schools would be interested. We know the challenges they have to face.” In previous years, there has always been between 20 and 30 schools that have applied. Many of them have made repeat applications. After all, every new year offers a new chance. “The selection takes place at the beginning of December, when the competition managers meet – and it’s not easy,” says Dr. Marianne Rädle. “We carefully weigh up who we take. And as I’ve said, we know the schools well, and many of them could really do with this prize.”

There is considerable interest, and the need is there. “We hope that the award continues to exist for a long time to come.” By way of the typical, the 2019 award winner has already been announced. It is the Schulzentrum Freiamt, a primary and secondary modern school.

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