EHEDG CONNECTS

CERTIFICATION
GUIDELINES
EXPERTISE
NETWORK
TRAINING

edition 2

Magazine of the
European Hygienic
Engineering & Design Group

HYGIENIC ENGINEERING & DESIGN:

FROM MINDSET TO REALITY

Hygenic Design In Practice

Sachsenmilch | Mondelēz

Schneider Weisse | Nestlé

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Spray & Fluid Bed Drying

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EHEDG CONNECTS CONTENT OVERVIEW

Exploring new horizons

“A strong, well-organized foundation with a deliberate value strategy, built on present-day statutes and clearly defined operational guidelines - that is what the members of the EHEDG leadership set out to achieve back in 2015. Now that I am well on my way in my second term of this presidency, I am happy that the EHEDG organization is well on track: the new election processes and allocations of resources are implemented, the advisory board and executive committee structures are well established, and with our dedicated sub-committees in place, this foundation now has the hands and feet it needs to operate effectively.

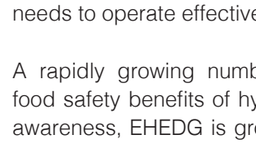
A rapidly growing number of food producing companies recognizes the many food safety benefits of hygienic engineering and design. With this emerging global awareness, EHEDG is growing rapidly as well. The European Hygienic Engineering and Design Group foundation is now truly becoming the preferred global knowledge community for sharing contemporary insights in how to raise food safety to a whole new level.

EHEDG will continue to operate as a foundation for the common benefit of its members, because this community thanks its comprehensive body of knowledge exclusively to its voluntary contributors. Food safety is the result of a team effort. We may all be experts in our own rights, but we are connected by our shared concern for food safety. Together we continue to build on what our predecessors have created over the course of decades: a leading hygienic engineering and design knowledge community with a global impact.

As we move on, we continue to close the remaining gaps in our product portfolio. While new EHEDG Guideline Documents are being developed, existing ones must be updated to stay relevant. We’d like to broaden our certification scope to meet the growing industry demand for certified food-safe processing and handling systems. Simultaneously, we develop new ways to make our training and education programs accessible for everyone. We consistently focus on maximizing the practical value of the products and services that EHEDG offers, because above all, we want to make sure that scientists, food industry stakeholders and equipment suppliers can reap many practical benefits from their EHEDG memberships.”

Yours Sincerely,

Ludvig Josefsberg



B.E.S.T. European Hygienic Design Project

Nestlé applies hygienic design standards in renovation project in Boué, France

Romain Philippe Balet

We all grew up with Nestlé. From our first baby food to our favorite late-night snack - many food products that accompany our daily lives are produced by this Swiss multinational food company. Nestlé is one of the largest food companies, with 308,000 staff members, 413 production factories, selling products in 190 countries and a total annual turnover of CH 91.4 billion. "Our project in Boué illustrates how we implement quality and food safety regulations on all project and operation levels."

The hygienic engineering mindset at Nestlé

Hugo Piguet, who is an elected EHEDG Advisory Board Member, and responsible for hygienic engineering and design at Nestlé: "Nestlé has emphasized and underlined the importance and value of hygienic engineering and design right from the start. Nestlé took part in establishing EHEDG back in the early nineties, and has been consistently active in EHEDG leadership teams and working groups ever since. Working for the largest food processing company enables us to roll out hygienic engineering and design company standards and processes on a global scale. However, no food factory development project is ever a cut and paste job. Every single one demands for a tailored approach, but must also align to Nestlé's mature set of food safety standards and of course the latest EHEDG Guidelines. A clear hygienic design mindset is key, rooted in well-aligned process management. Our project in Boué/France illustrates how we implement quality and food safety policies on all project and operation levels."

Sustainable Transformation

B.E.S.T. is an acronym for Boué European Sustainable Transformation. The goal: a comprehensive renovation of one of Nestlé's historical sites in France. Our questions are answered by Nestlé Project Manager Romain Philippe Balet and Project Director, Processing Solutions at Tetra Pak Håkan Blohmé.

What was the main challenge?

Romain Philippe Balet: "To integrate the renovation and modernisation works with the logistics of the operating plant. Some of the original buildings at the Nestlé factory in Boué are more than a hundred years old, and every building has its own unique structural challenges. In the past, this factory has produced instant milk powders for the beverage industry. Later, Nestlé produced infant formula products here, so many of the existing process infrastructure elements have organically developed over the past decades. We first had to determine if our goal to transform this existing factory into a more efficient plant was economically feasible and technical and operational possible. There was a lot to consider, like how to revamp 50% of the old buildings including two complete wet processing lines. All operations had to be done without compromising the ongoing production processes. It was a very complex puzzle to complete, but not impossible to do if done very methodologically."

So how did you do it?

"In early 2018, we kicked off our feasibility study which covered our main product, process, utilities, building, quality, operations and site project management. We started off by taking a good look at the existing floor plans and investigated the possibilities to improve the zoning, to make it clearer and more functional. We paid special attention to the people and material flows, because when the factory was built more than a hundred years ago, most processes took place quite differently. Then we looked further into the process equipment design to determine what elements could be reused and where we had to deal with trade-offs related to the existing factory design. In our quest to find the best possible solutions within the boundaries of the existing infrastructure, we made 3D-scans of the interiors that were used to create a virtual representation of the factory, in which we could freely move around equipment parts and constellations. Our selected (main) equipment supplier for this project and engineering partners, which were responsible for delivering turn-key solutions for process equipment, later repeated this process in a more detailed way, to integrate the more detailed engineering of the plant interior."

What's new and what elements did you manage to reuse?
"Since the goal was to ramp up the productivity of the plant, we took our target productivity rates of the spray dryer installations as a starting point. From that pivotal perspective we looked at the dry and wet processes, from the milk reception up to the dryers, to determine the maximum capacity of the existing installations. Our objective was to reuse as many elements as possible, provided that it would be logistically feasible and hygienically sound to do so. Then we performed all necessary adjustments and replaced all other elements with new equipment for different handling stages, ranging from heat treatment to the evaporators, process handling, tipping, transfer, storage and dosing of powders. All components needed of course to comply with our company standards, as well as the EHEDG guidelines. We had to evaluate everything from the conveyor lines to the blowers, while consistently balancing trade-offs with regard to factory practices."

How did your team members work together to make this as success?
"This project is like an enormous puzzle where every piece has to fit together, from the floor plan design to the integration of the new installations into the existing process lines and all the logistics that come along with that. It was clear from the beginning that this project would require excellent teamwork, and a very well-structured and effective approach. That's why we applied the V-model development process that incorporates several predefined validation steps. It enabled us to adapt our engineering to the actual outcome of each phase. As you can imagine, the restructuring of the existing building was much more complex than the design of the new building. Integrating new equipment in this existing environment, and interfacing them with existing equipment is always a challenge. That's why we strived to place most new elements, like a completely new CIP installation, in the new building, while reusing some of the old parts of the site that are situated closer to the warehouse. The requirements for the mostly closed process installations in the new building were very different from those in the old building. By working step-by-step towards a clear goal, we managed to transform this factory site into a modern facility that operates much more efficiently than before. This is a real-life example of what's possible with the newest technology, the right expertise, full commitment and great teamwork."

Nestlé & Tetra Pak

Håkan Blohmé

How did Tetra Pak add value to the renovation project in Boué?
Håkan Blohmé, Project Director, Processing Solutions at Tetra Pak: “Since Tetra Pak has been a supplier for Nestlé for more than six decades now, we have a deep understanding of their needs. The combined knowledge, experience and insights of the professionals in our organization, combined with an extensive product portfolio that integrates latest technology and know-how to meet all customer requirements, enables us to support all areas of the renovation project in Boué, from initial discussions, through engineering to installation and start-up.”

How did Tetra Pak go about to deliver turn-key hygienic design solutions and integrate them into the existing infrastructure?
Blohmé: “Our team consolidates all areas of expertise required for a complex extension and revamping project like BEST. This means we could deliver an automated line, from wet and dry ingredients, through the mixing, compounding, standardization, heat treatment, evaporation to the feed and the existing dryers. However, maybe the most important key success factor is the way we collaborate with Nestlé. In the Boué (BEST) renovation project, we took an immersive approach, starting from identifying the specific needs and constraints in the project. Based on this analysis and utilizing the respective strengths and experiences of both Tetra Pak and Nestlé, we created a solution together in an iterative process. The result is a design that makes best use of the existing factory while applying optimal and food safe solutions and equipment.”

What value has EHEDG for Tetra Pak in projects like these?
Blohmé: “EHEDG is a backbone when we design any equipment or solution for food production, and is particularly important in a production line for infant formula. It provides the baseline standards that should not be compromised. Both Nestlé and Tetra Pak have long experience with EHEDG. In this project we particulary focused on the food safety aspects in order to develop a factory that will be a role model and future benchmark for many.”

The Mondelēz International mindset on food safety and hygienic design

ALIGNING PROCESSES AND PEOPLE TO RELIABLY MEET HIGH EXPECTATIONS

How do companies across the world approach hygienic engineering and design to advance food safety? Dr. James Hartley, Associate Director of Global Sanitation at global snacking company Mondelēz International, explains how the company aligns more than 100 production sites, quality policies, standards and production teams so it can claim a leading position in food safety. Dr. Hartley: “The best food safety results are obtained by consistency, in our company-wide approach to hygienic design, in our alignment of policies, and in our exchange of knowledge, both within Mondelēz International and the European Hygienic Engineering and Design Group.”

What is the Mondelēz International approach to food safety?

Dr. Hartley: “Mondelēz International is a truly global company. Our high-quality snack products and beloved brands such as Milka, Oreo, Cadbury, Lu and Côte d’Or, are enjoyed in over 150 countries, resulting in total annual sales of around US$26 billion. Our purpose is to empower people to snack right by offering the right snack, for the right moment, made the right way. Within Quality and Food Safety, this purpose is delivered by the Mondelēz Global Quality Chain Management System and the Consumer Inspired Quality framework, which puts the consumer at the heart of all we do. There is simply no room for food safety fluctuations. We must ensure that every single one of our snack products, wherever in the world it may be consumed, is safe to eat, and of course is of a consistently high quality to satisfy our consumers’ expectations.”

Dr. James Hartley

How do you do that and what does EHEDG contribute?

“With over 100 factories in the group and thousands of suppliers, alignment of policies, standards and real-life expectations is of critical importance. For Mondelēz International, the foundation of this alignment is rooted in our Quality Policies and Standards. These define both what must be achieved and how it needs to be done. Mondelēz International, and its predecessor Kraft Foods, have long been active participants within EHEDG including current membership of the Advisory Board (Dr. Matilda Freund), and many of the EHEDG Guideline Documents now in existence are the result of the input and collaboration of past and present members from the company. In turn, these EHEDG Guideline Documents have been incorporated into our specific Policies and Standards for many aspects of hygienic design, including compressed and environmental air, culinary steam, equipment design and Clean-In-Place (CIP) systems. These form the basis of how we specify requirements both for our own factories and also for Original Equipment Manufacturers (OEMs). Other contributions relate to GFSI Technical Working Groups, where Mondelēz together with other EHEDG members supports the development of new requirements and guidelines (such as Chemicals in Food Hygiene and the Hygienic Design benchmarking extended Scope K requirements) both at working group and board level (Dr. Roy Kirby).”

How do you apply these requirements?

“At Mondelēz International, we have clearly defined work processes for the introduction of new equipment into our manufacturing facilities. This is a multi-disciplinary effort, including input from Engineering, Procurement, Quality, Food Safety, Sanitation, EHS and of course the eventual end-users in the factory. This process covers not just hygienic design, but a wide range of topics to ensure that the eventual design and installation will deliver the required quality, throughput, cleanability, reliability and safety for our products and people. These work processes are defined globally and implemented locally, to ensure a consistent approach throughout the company.”

Sounds like a sensible approach, so what are the results?

"It should be common sense, but the earlier in the process that you incorporate hygienic principles, the better the end result. Retrospective corrections to designs are typically more expensive and less satisfactory than earlier considered implementations. This is why we incorporate a hygienic design specialist assessment at the project development stage, before any design is locked and any capital request is submitted. This ensures that the basic hygienic design and performance requirements are built in at the start, using techniques such as FMEA (Failure Mode Event Analysis) and Design for Centerlining to do this. As the project develops, further direction is given through the acceptance testing processes. These are carried out both at the OEM before the equipment is installed, and also following installation at the site prior to start-up."

"HYGIENIC DESIGN PLAYS A CRITICAL PART IN ENSURING THAT OUR SNACKS ARE ALWAYS MADE THE RIGHT WAY."

What role does hygienic engineering play in all these processes?

"Hygienic design specialists support engineering by pro-actively identifying equipment that meets our requirements in advance of a specific project. This allows the creation of a 'menu card' of categories of equipment for our project engineers to select from, depending on the specific requirements of a project. This is another area where EHEDG Guidelines and our company requirements work together. I had a recent experience where I went to an OEM to evaluate the hygienic design of their equipment for inclusion onto a menu card. When I went through the Mondelēz requirements, they recognised many of them as being based on EHEDG Guideline Documents which they had already built into their design. This alignment meant that the OEM was in a position to be much more quickly approved."

Processes are important, but what about your staff? How do you educate them?

"Building the knowledge and capability of our teams with respect to sanitation and hygienic design is a key focus for us. We have a structured approach to this, through a comprehensive series of e-learning, webinars and face-to-face training courses that we deliver to hundreds of our colleagues around the world each year. We also have specific communities of practice, where experts from around the company come together to share and discuss best practices, design training materials, review and update our policies and standards, and keep up to date with developments in our field. To support the development of our suppliers, and to accelerate the understanding of our requirements, we give our OEMs access to a specific website containing the relevant Mondelēz standards and guidelines. This site also includes training documentation and webinars to assist with building that technical understanding essential to work with us. To achieve our ambition to lead the future of snacking, we aim to have the right snack for the right moment made the right way. Hygienic design has a critical part to play in providing the foundations for food safety and ensuring that our snacks are always made the right way."

Money well-spent is money well-planned

“Money is a powerful tool, and just like with every other powerful tool, we need to stay very alert when utilizing it. Since EHEDG can only spend each euro once, the financial choices that we make significantly determine the course and effectiveness of the European Hygienic Engineering and Design Group.

Before I continue with explaining myself, I would like to express my gratitude to all board members for successfully realigning the internal EHEDG organization. The newly established committees, policies and procedures enable us to manage more EHEDG activities more effectively, and to enable more industry members and EHEDG volunteers to contribute to our working groups and regional sections. Well-structured and consistently executed financial procedures help us to substantially contribute to global food safety with hygienic engineering and design.

I’ve been the treasurer of EHEDG for twenty-three years now, monitoring and balancing incoming and outgoing financial streams, evaluating financial plans and discussing budget allocations. During those years, different EHEDG leadership teams have voted for different ways to allocate our financial resources. We all want every euro to be well-spent, on operations that effectively serve the EHEDG mission. When looking back now, some euros were certainly less well-spent than others. Our EHEDG World Congress 2018 in London was expensive. It was great, but still too expensive, because it was more expensive than planned. I learned from that. No more open budgets. I never want to have sleepless nights again (frantically looking for ways to do damage control). It is also one of the reasons why I’m especially satisfied with our new budget approval procedures: they provide a strong foundation of checks and balances that protect our budgets and help us to preserve our full financial accountability and transparency.

This is how it works: every year, starting in September, all working groups and regional sections submit their activity plans for the following year. The individual budgets are determined based on clear sets of key performance indicators (kpi’s) that relate to planned activities like presentations, events and the development of new guidelines. The EHEDG leadership then decides on the allocation of available funds. The kpi’s are monitored throughout the financial year, and if they don’t align with the original budget requests, funds are booked back and budgets adjusted.

Within our new organizational structure, the financial budget responsibility lies with the chairs of the three EHEDG Sub-Committees for Regional Development, Communication and the EHEDG Product Portfolio for certification, training and education, and guideline development. My role as EHEDG Treasurer is to balance these budgets effectively by planning, to a certain extend predicting the incoming and outgoing money streams.

So how can we keep track of our progress? The EHEDG community, online and offline, is growing quickly, that’s for real. And since most of the incomes derive from membership fees, the growth of EHEDG strengthens our financial possibilities, because money is a powerful tool, to get things done in real life, but real life is also unpredictable, and never without risks. Our financial and strategic plans enable us to keep up with the times and offer what our members ask for: added value in usable formats that help them in their efforts to improve food safety by hygienic engineering and design.

As long as I am your treasurer, I will make sure that EHEDG continues to be financially healthy, but it’s also a non-profit foundation exclusively serving an important societal purpose. That’s why we plan to keep on spending every euro that’s coming in effectively. Apart from one annual budget, that we reserve to guarantee a lasting operational foundation, my creed is that all money coins should roll in the right directions, the one we planned - money well planned is money well spent.”

Yours sincerely,

Piet Steenaard, EHEDG Treasurer

P.S. Allow me to finish on a personal note: I will turn 73 years old this year, and however much I would love to continue doing this rewarding work, I can’t be your treasurer forever, so if you happen to know how to handle money consciously, then please feel welcome to step forward to join this wonderful team of volunteers.

Piet Steenaard

Hygienic design saves traditional brewing process

Schneider Weisse: full control over beer quality

Brewmaster Hans-Peter Drexler shows how the Schneider Weisse brewery regained full control over its quality parameters while staying faithful to its Bavarian brewery traditions. By implementing EHEDG certified hygienic design equipment, the pure taste of Schneider Weisse wheat beer, brewed in line with the German 'Reinheitsgebot' beer purity law since 1872, can be enjoyed by future generations of beer-connoisseurs.

Yes, beer is considered food, at least in Bavaria it is. In this southern part of Germany, it has been officially so since 1516, the year that Duke Wilhelm IV wrote history by drafting the first food law in the world. A contemporary version of 'Das Reinheitsgebot' still regulates the purity of Bavarian beer until this day.

Beer and Bavaria go together like Bavarian Beer and Bratwurst with Sauerkraut, and not only Germans can enjoy it. Beer is exported from Bavaria to beer connoisseurs all over the world. Consequently, many new breweries emerged in Bavaria, but only a handful brands brew the traditional Bavarian Weissbier like the Schneider Weisse G. Schneider & Sohn GmbH brewery does: in the authentic traditional way, by adding the yeast to the wort in open tanks, and by letting the final fermentation stadium continue inside the closed bottle to make the beer even more tasteful and refreshing.

The impressive neoclassical Befreiungshalle (Hall of Liberation), that commemorates the victory over Napoleon in 1815, dominates a hill above the town and oversees the picturesque village and the Danube river. The historic building of the Schneider Weisse brewery is situated at the central market square of Kelheim. In 1607, it was transformed into a wheat beer brewery by the Bavarian Dukes of Wittelsbacher. In 1928 the Schneider family, that had been brewing wheat beer since 1872 in Munich, continued brewing the legendary Schneider Weisse wheat beer here in Kelheim. After the 1970's, the wheat beer market expanded and step-by-step the distribution spread out globally.

Brewing Master and Executive Director Technology & Logistics Hans-Peter Drexler: "The challenge was to keep the high quality level consistent

while transitioning from a local to an globally distributed product. As a reaction to unexpected beer quality fluctuations and product callbacks in 2004, the brewery started a journey that would introduce modern hygienic engineering and design to the traditional brewery process, while simultaneously preserving our unique traditional brewing process."

Controlling food safety and beer quality

Drexler was on site when the first problems arose, and recalls the events as they unfolded: "One of the hygiene challenges related to our traditional brewing process is that our brewing is done under relatively high processing temperatures and that we don't apply pasteurisation techniques that would compromise the taste of the final product. We always test the quality of each batch in our in-house laboratory, and product faults have occurred before, but could always be corrected. However, the microbiological balance within the process seemed more and more seriously disturbed and out of our control, resulting in a significant increase in product faults. Since we didn't know what caused the fluctuations, we decided to systematically investigate all probable causes. But where to start?" Drexler: "We suspected that the decline in product quality had to be related to some source of microbiological contamination, and together with the experts of GEA we started looking into those parts of the installation that were the most difficult to clean and replaced some couplings and valves, but that didn't solve the problem. We started looking into the design of areas that were not initially conceived as being hazardous, like the whirlpool, where the wort that was cooked to a hundred degrees Celsius is rotated to secrete the turbid residues which are gathered at the bottom of the whirlpool while the remaining clear wort is pumped out from above. We found out that the drain valves within the whirlpool didn't comply with the latest EHEDG Guidelines, so we replaced them by GEA valves that didn't have any dead spaces. This intervention resulted in an instant improvement of the beer quality, but as it turned out, we weren't quite there yet."

Looking further down the road

As Schneider Weisse and the hygiene experts of GEA looked further into other areas of the process lines that could potentially have caused the problems, they turned their attention to other areas in the process. Drexler: "We discussed the cleaning circumstances of buffer tanks, that where situated between the fermentation and the bottling process, and discussed different possibilities to improve them, while at the same time also considering the effects of every intervention on the final taste of our beer. We had to go about very carefully, because obtaining a consistent beer quality was just one goal we wanted to achieve - the other was to preserve the original taste of Schneider Weisse wheat bier. That's why our quality control system consists of three steps. We start off by analysing the chemical and technical properties of each batch of our beer production in our testing laboratory, like the amount of alcohol and flavouring and the CO2- and PH-levels. Then there is a microbiological analysis phase that analyses the amount and combinations of the microbiological components that strongly determine the flavour. The third testing stage is the tasting."

"THE CHALLENGE WAS TO KEEP THE HIGH QUALITY LEVEL CONSISTENT WHILE TRANSITIONING FROM A LOCAL TO A GLOBALLY DISTRIBUTED PRODUCT."

Dream job

Every week, a panel of professional beer tasters gathers in a special beer 'Stube' in the Schneider Weisse brewery to thoughtfully taste, judge and discuss even the slightest variations in the overall taste of the final products. Drexler: "Yes, that sounds like a dream job, but it's actually very serious work, because in the brewery, we utilise the combined outcomes from all of these tests to adjust our settings, like the amount of hop we add to the process. Beer is a natural product, so there are always variations to adhere too, due to variations in the taste of the natural ingredients. To brew beer with a consistent taste and quality, we have to control all of these fluctuations by adjusting our process accordingly. Even in these modern times, where we use high-tech monitoring systems to analyse the DNA-structures of the microorganisms in the beer, the sophisticated taste buds of a professional Bavarian beer taster is still the ultimate reference for monitoring flavour consistency."

Back to beer business

After replacing various process components by EHEDG certified materials, Schneider Weisse G. Schneider & Sohn GmbH decided to invest in a new brewery process line to produce a range of new Schneider Weisse beer variations, like alcohol free and clear (filtered) wheat beers. Drexler: "It was the sign of the times back then, and we made good use of the extra investment opportunities to further optimise all of our ongoing processes, because after initially having restored the consistency of our product quality by replacing the drainage valves in our whirlpool installations, we experienced an unexpected downturn. It was caused by the yeast accumulation installation, that turned out to contain a few completely hidden weak points. We solved that problem by replacing the complete installation." Schneider Weisse G. Schneider & Sohn GmbH consulted GEA again to develop a comprehensive hygiene concept that covered all separate installations in conjunction with all the relevant design criteria based on EHEDG Guidelines. Drexler: "Together with a team of Experts from GEA, led and conducted by Anton

Ladenburger, we then improved the hygienic designs of the drainage system, the water and air conditioning, the mixing mechanics and the beer feeding system. Traditional Bavarian wheat beer needs to be fed with ‘Speise’ (unfermented wort) shortly before bottling. It is like feeding the yeast shortly before bottling to activate the final stage of fermentation inside the bottled product. This has to be done very precisely. If you put too little in, the carbonation and taste will be too flat, and if you put too much in, there will be too much CO2 causing the bottles to burst. Since this last addition enters

“WE SUCCEEDED IN GRADUALLY IMPLEMENTING HYGIENIC ENGINEERING AND DESIGN IN A VERY TRADITIONAL BREWING PROCESS, WITHOUT COMPROMISING ON FOOD SAFETY OR TASTE. “

the final product, this stage must be conducted in an extremely clean environment to prevent microbes to enter the bottle. One could say that this last brewing stage is not only crucial to obtain the widely appreciated taste of Schneider Weisse white beer, but also to the food safety of the beer.”

Future-proof future

When looking back on this period between 2004 and 2008, Drexler and his colleagues can safely say that the Schneider Weisse brewery has managed to safeguard the unique taste and quality as well as the food safety of their nutritious beer brands. Drexler: “We succeeded in gradually implementing hygienic engineering and design in an essentially very traditional brewing process, without compromising on taste. We did it step-by-step, without breaking the bank and without losing our identity and credibility as one of the best Bavarian brewing houses since 1872. And thanks to our commitment and the expertise of the professionals at GEA and EHEDG, we haven’t had any problems since 2008. We protect our strong legacy, our traditions including our Reinheitsgebot, and we guarantee the food safety of our beer. So why not give it a try and experience the real taste of our Bavarian beer brewing tradition? It’s all in there. After all, Schneider Weisse beer is more than just a beer beverage, it’s like healthy food, an honest nutrition for your body and spirit. Grüss Gott und Zum Wohl.”

EHEDG Regional Sections connect people and their expertise

“Good news travels fast, but good advice can take much longer to sink in, especially when the following-up requires new investments and extra efforts. For three decades now, many volunteers have contributed to EHEDG guideline documents, certification, training and education programs, meanwhile advocating the value of hygienic engineering and design within their own companies. Together they created a whole new industry platform, aimed at advancing food safety, sustainability and productivity. And now, in this golden era of hygienic design, more and more producers, equipment developers and education institutes acknowledge the benefits of hygienic engineering and design and act upon it.

It seems that we surpassed the critical number of members needed to really accelerate advancements on a global scale. There’s a rapidly growing interest for hygienic engineering and design in the world, and that’s why the EHEDG Sub-Committee Regional Development developed a Global Expansion Strategy that contains, among other things, the goal to have official EHEDG representations in place in 50 countries by the end of 2022. When looking at the current growth rate, I am confident that we will reach this goal.

An even more important mission is to effectively motivate the existing EHEDG Regional Sections around the world to engage more EHEDG member companies in their regions and to offer more regional opportunities to connect. That’s why we introduced various key performance indicators (KPI) that enable us to monitor the regional activities, recommend improvements in specific areas of activity and to nominate the most active regions for an annual award. These indicators also help the EHEDG Regional Sections themselves to plan their activities throughout the year and align them with their own business agendas. These volunteers committing their time to EHEDG illustrate that working for a good cause, building networks, sharing knowledge and doing business can really go hand in hand. In fact, chairpersons of EHEDG Regional Sections regularly testify that becoming active for EHEDG greatly contributed to their professional reputation in the industry.

I am happy to see that all around the world, a growing number of EHEDG Regional Section members have contributed substantially to the growing awareness for hygienic engineering and design, and not solely in quality control teams, but across the board of industries, companies and management levels. I even feel comfortable to predict that from now on, the adaptation rate of hygienic engineering and design will continue to rise exponentially.

Now there are many more new grounds to cover and discover, but the early pioneering years are behind us now. In many regions, EHEDG company members have come a long way, and many of the first company members now actively contribute to EHEDG Working Groups and EHEDG Guideline Documents. By sharing their hands-on expertise, they actively spread the message that implementing hygienic engineering and design is the most effective way to improve food safety, productivity and sustainability. They steadily generated awareness in the European food and pharma industries, and now the time has come to spread the message all over the world.

From Germany to China and New-Zealand, new EHEDG Regional Sections take on their roles as regional ambassadors of EHEDG, organizing local events and training courses, spreading the EHEDG ‘progress by design ideology’ to advance food safety, productivity and sustainability. The members of our EHEDG Regional Development Sub-Committee will continue to support them wherever possible and wishes all EHEDG Regional Sections good of luck and lots of success!”

With best regards,

Andrés Pascual Vidal,
Chair of the EHEDG Sub-Committee
Regional Development.

EHEDG Global Expansion: CHINA

Hygienic design expertise for the benefit of 1.4 billion food consumers

EHEDG is also active in China, where 1.4 billion food consumers are served by a rapidly modernising Chinese food industry, and where volunteers of the EHEDG Regional Section China offer support and raise awareness for hygienic engineering and design.

Since the official establishment of the EHEDG Regional Section in China in 2015, EHEDG volunteers have supported the Chinese food industry in various ways. By exchanging knowledge and by establishing new networking connections in the colourful Chinese food industry sector, with Chinese universities and the Chinese government, these volunteers raise awareness for the benefits of hygienic engineering and design. How did they approach their mission and how are they doing so far?

In this article, Monica Chen (ACO Drainage Technology Shanghai and Secretary of EHEDG Regional Section in China) and Hui Zhang (Hygiene Expert of a multinational company of FMCG and Chair of the EHEDG Working Group Cleaning and Validation) share their views on hygienic engineering and design awareness in their country of birth, where processes tend to unfold slightly differently than in other parts of the world.

Are the Chinese interested in what EHEDG has to offer?

Monica Chen: “They certainly are. China’s food industry is modernising at its fastest pace ever, using more technology to scale up and meet higher standards, and our EHEDG training courses, conferences and seminars are very popular in China. Nevertheless, it took us quite some time to start things up. The first steps towards the acquaintanceship between China and the European Hygienic Engineering and Design Group were taken in 2013, when ACO Industrial opened an office in Shanghai and started gathering professionals while building a local network of food industry stakeholders. One of the strategic aims was to introduce young professionals and Chinese students to western food safety and hygienic design knowledge.”

The food safety regulations in China are complex. How do you find your way around them?

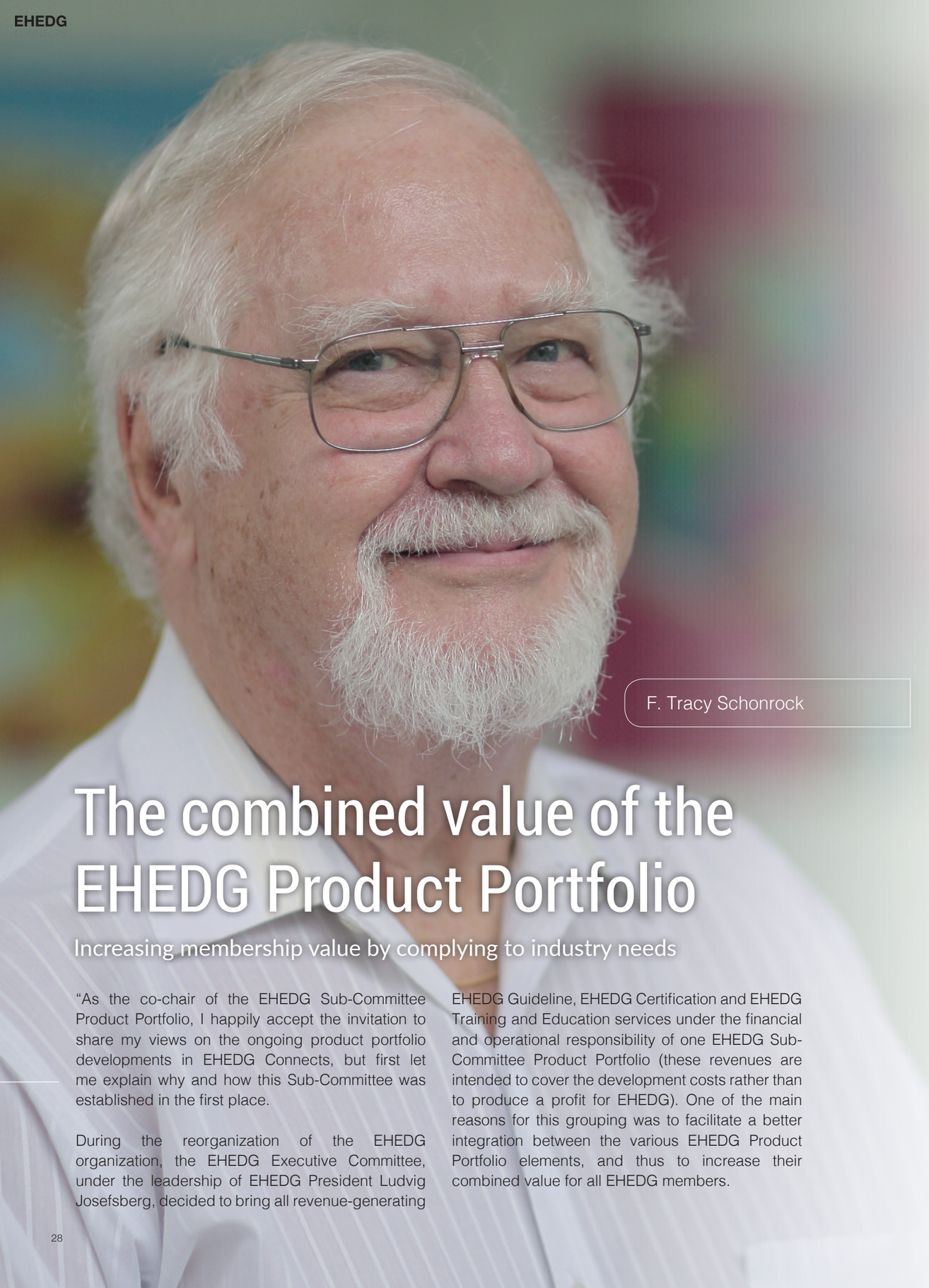
Hui Zhang: “There are many government departments that oversee and enforce the policies in China, including ten national government departments like the Ministry of Health, the State Food and Drug Administration, the Ministry of Agriculture, the China Institute of Food Science and Technology, the State Administration for Industry and Commerce, the General Administration of Quality Supervision, Inspection, and Quarantine, the Ministry of Commerce, the Ministry of Science and Technology, and the National Institute of Nutrition and Food Safety. In addition to these legislating bodies there are also many local and regional food safety agencies active in China. For outsiders, it sometimes seems that there’s no clear formal hierarchy structure between these agencies on the local and national levels, but processes tend to unfold differently in China than in other parts of the world, and you just have to find the right approach to reach your goals. The Standing Committee of the National People’s Congress and the State Council also regulate food safety issues. The Food Hygiene Law of 1995, passed by the NPC, amended the 1982 Food Hygiene Law and still regulates most aspects of food safety.”

How did you approach your goals?

Monica Chen: “After two years, we had established connections with Shanghai Ocean University via the Dean of the School of Foods Science and Technology (SHOU) Wong Wang Chi Xi Chang, who is very committed to convey an hygienic engineering and design mindset to the university students. In 2016, the first group of students of SHOU followed an EHEDG training and after that, more universities and university teachers joined the program, like Jiangnan University in Wuxi. Our strategy is to raise the awareness for hygienic engineering and design from the bottom up, starting with the new generation of professionals that enters the Chinese food industry. In order to introduce EHEDG guidelines and training courses we also wanted to establish an EHEDG Regional Section, but no non-governmental organisation is allowed to be active in China without the approval of the Chinese government. In order to obtain that approval, we first had to find a Chinese organisation that would be willing to accredit our EHEDG Regional Section in China. Eventually, we found a valuable partner, the Chinese Institute of Food Science and Technology (CIFST), which is playing a leading role in the Food Industry in China. In 2015, Mrs. Meng Suhe, President of CIFST visited the EHEDG Foundation Board in Frankfurt to sign the Regional Bylaws between EHEDG and CIFST.”

What will 2019 bring?

Hui Zhang: “We hope of course that the importance of hygienic Engineering and Design for food safety and sustainable economic development will be acknowledged by the legislative organisations in China, because as soon as that happens, things may unfold very quickly. In the meantime, EHEDG China will continue to organise EHEDG training, conferences, seminars and help food factories to innovate.” Monica Chen: “Since the Chinese food industry consists of many different and mostly small sized companies, it’s quite a challenge to find key audiences to maximise the impact of EHEDG. This year we will focus on reaching more students, teachers and the big Chinese food producers to establish a firm base for the future development and integration of hygienic engineering and design expertise in China.”



F. Tracy Schonrock

The combined value of the EHEDG Product Portfolio

Increasing membership value by complying to industry needs

"As the co-chair of the EHEDG Sub-Committee Product Portfolio, I happily accept the invitation to share my views on the ongoing product portfolio developments in EHEDG Connects, but first let me explain why and how this Sub-Committee was established in the first place.

During the reorganization of the EHEDG organization, the EHEDG Executive Committee, under the leadership of EHEDG President Ludvig Josefsberg, decided to bring all revenue-generating EHEDG Guideline, EHEDG Certification and EHEDG Training and Education services under the financial and operational responsibility of one EHEDG Sub-Committee Product Portfolio (these revenues are intended to cover the development costs rather than to produce a profit for EHEDG). One of the main reasons for this grouping was to facilitate a better integration between the various EHEDG Product Portfolio elements, and thus to increase their combined value for all EHEDG members.

EHEDG offers a high membership value by providing a well-balanced combination of products and services, and by ensuring that the EHEDG Guidelines, EHEDG Certification, and EHEDG Training and Education services are well-aligned with the actual needs of our members. Whenever a new EHEDG Guideline Document is published, new hygiene requirements become accessible industry-wide, triggering the need for updated certification, training and education services that align with the practical demands of our members.

Practical needs

How do we know what's valuable to our members and what's not? Well, we ask the industry members to provide us with their feedback. The strength of EHEDG is that most members of the EHEDG Working Groups, Sub-Committees and EHEDG Advisory Board are also industry professionals in their own right. They may have various reasons to contribute to EHEDG with their valuable expertise and time, but maximizing the value of the EHEDG Product Portfolio for their companies is certainly one of them. So, we have a pretty good understanding of the practical value of our offerings and can adjust them according to changing needs.

An example: big food processing companies use our guidelines differently than smaller ones. The bigger EHEDG Company Members usually have their own corporate hygienic design standards, that are (partially) based on EHEDG Guidelines, but also incorporate expertise from other sources. They also often have preferred suppliers for their equipment and therefore generally find less use for conventional guideline approaches that start off with an overview of the different types of equipment that are available and then pointing out which ones have more hygienic designs. Big companies can often leave that up to their own professionals or to system integrators. However, some of the big EHEDG Company Members did express a need for more process-oriented guidelines that they can use as blueprints for their global food safety management activities. We listened and initiated the development of 'horizontal' process-oriented guidelines that describe the comprehensive hygienic design requirements for a certain type of food processing. This resulted in new guidelines focusing on the hygienic design requirements of fresh fish and fresh meat processing in a more comprehensive way.

Another objective of this committee is to realize better consistency and conformity in the way EHEDG products and services are structured. This is particularly important considering the much-needed digitalization of the EHEDG Product Portfolio. We strive to improve the overall user experience for EHEDG members by making specific contents in EHEDG Guideline easily accessible, for example by implementing search and cross-reference possibilities. But before we can take these next steps, we first have to align all existing and new guidelines according to the newly established publication format standards (as issued in the new SCP 2-2 operating procedure). This requires a lot of work and will take our trusted and busy EHEDG volunteers some time to complete. As a first step we asked all EHEDG Working Group members to develop a listing of the key learning points of each EHEDG Guideline. These learning points can then be implemented in existing training materials to further increase the combined value of our product portfolio.

During the past decades, we have witnessed that the most valuable services that EHEDG offers are accomplished by professionals working together constructively in teams, taking small steps at a time, consciously avoiding mistakes by checking and evaluating and discussing everything on a detailed technical level, just like engineers and scientists are trained to do. But in an industry and technology age that is changing faster than ever, this now demands for a continuously ongoing process. That's why all EHEDG Working Groups have now become permanent teams. Unlike before, when working groups would be discontinued after completing their guideline, the working groups can now update parts of their guideline when necessary.

A next big challenge is to bring our EHEDG Certification Training and Education courses into the digital domain. We currently investigate the best possibilities to create an EHEDG Online Academy, that will enable us to reach more people anywhere in the world and to raise the value of our product portfolio by offering online classes, courses and training modules that trainees can access anywhere and anytime. So yes, there's always more work to be done. That's why I want to conclude with a big thank you to all of our dear volunteers, who continue to share their valuable time and knowledge, as humble servants of continuous improvement. Let us feel proud for a moment, that we succeed in raising the awareness for the food safety, productivity and sustainability benefits of hygienic engineering and design, and then continue with improving things, just like we always love to do."

Yours Sincerely,

F. Tracy Schonrock,
Co-chairman EHEDG
Sub-Committee Product Portfolio

The effective food safety culture of Sachsenmilch & Unternehmensgruppe Theo Müller

This is Europe's biggest dairy plant. It's situated in the German town of Leppersdorf near Dresden and it's a convincing paragon of German engineering and efficiency. The dairy company Sachsenmilch Leppersdorf GmbH, a subsidiary of Unternehmensgruppe Theo Müller, produces a wide variety of popular dairy products here. Food safety conditions are optimized with support of EHEDG.

Every single day of the year, 200 Sachsenmilch trucks pick up more than five million litres of raw milk in an area of 200 kilometers around Leppersdorf. They make sure that the enormous cooled tanks on site can continue to supply the many processes taking place. The annual production volume of Sachsenmilch encompasses 2,6 billion pots of yoghurt, 320.000 tons of UHT milk, 150.000 tons of milk and whey ingredients, 100.000 tons of cheese and 70.000 tons of butter.

These numbers, as impressive as they may be, are not the only reason why Sachsenmilch is a leading supplier in the dairy product world. Sachsenmilch also leads by example concerning effective and consistent food safety management, with a company culture that enables every Sachsenmilch employee to embrace hygienic engineering and design rules. Dr. Lars Gorzki, General Production Leader Sachsenmilch Leppersdorf GmbH, explains how they do it.

Which processes are the most hygiene-critical around here?

Dr. Lars Gorzki: "One of the most sensitive processes here is the production of dry mix lactose, a basic ingredient of baby food. To maximize the food safety of the lactose production units, we established an extremely hygienic production zone by implementing EHEDG guidelines while also creating a hygiene focused company culture. That's why everywhere on site you see billboards with babies on them, accompanied by the message: "Our customers, our responsibility." We made it a personal responsibility of each and every employee working here to strictly adhere to these core elements, by posing one simple but meaningful question: 'Would you feed today's lactose product to your own baby?' We have quite some fathers and mothers of young children working on site, and this message really struck a chord."

What about the others?

"To create an effective food safety company culture, you need to first create a solid support foundation, represented by a critical number of workers who are intrinsically motivated to optimize food safety - in this case: the operators of our plant who are also fathers and mothers. In the first two years of the development of this plant, we invested extensively in creating a high level food safety culture by putting the emphasis on everyone's individual responsibility, in order to make it socially acceptable to point out safety hazards to each other. By now, everyone here feels comfortable to address a colleague in case any hygiene regulation might get touched. To make this possible, we of course needed to implement crystal clear rules and regulations, and to find effective ways to convey them to our staff. EHEDG helped us to get everything right. We are proud to be an EHEDG Company Member, and we implement the comprehensive range of EHEDG products and services to optimise food safety at our production site, from the training to certification services to the guidelines and the networking opportunities that EHEDG offers to exchange ideas and best practices with other food companies, hygienic engineering and design experts and equipment suppliers."

How Europe's biggest dairy plant **optimizes food safety with EHEDG**

Can you give us some examples of how you implemented hygienic design on site?

"It all started with the layout of the premises. We positioned the Molke 5 building where the lactose is processed behind another building that we use as a sort of a buffer. There's only one entrance to get into the buffer building, and consequently from there into the different food safety zones. Everyone has to change clothes twice and to avoid any misunderstandings, the floors are coloured to match with the different green and red safety zones. In the red zone (also called the dry zone) where our fluid bed dryers are located, we only use EHEDG certified components and materials. There's decontamination chambers for all equipment going in and out of this zone, all electrical cabinets are hygienically designed, with sloping roofs for easy cleaning, we have online air quality and pressure systems running that we can log into from anywhere in the world. I could go on for a long time here, but believe me when I say that many details are addressed here. However, as soon as we see a possibility for further optimisation, we will look into it. That's another reason why we are an EHEDG company: we stay in touch with the latest developments."

How do you know how effective your efforts are in your day to day operations?

"We monitor everything: the quality of the purified air in the production areas, the presence of microbes on the floors, on the equipment and even in the drains. And we have clear regulations for all processing aspects, not only regarding our cleaning procedures, but also with respect to our employees. They know how to behave in all work areas and situations. For example, momentarily there is a small flu outbreak in this region, so a temporary rule is in effect that prohibits our employees to shake hands. Everyone here understands and respects a rule like that, because we know that it's aimed at minimizing food safety risks. There is a continuous awareness to proactively think about food safety risks, based on our own personal responsibility for the health of our actual end customers. In the end, our customers are not the food companies we supply, but the babies consuming our food ingredients. We make sure that everyone is reminded of that responsibility every day. In fact, personally I don't believe that key performance indicators alone can guarantee food safety. However, I do believe in the value of continuous risk assessment and management. Don't misunderstand me: kpi's are important and that's why we monitor everything, but they are by far not enough to guarantee food safety, not even when you link them to financial incentives. You cannot intrinsically motivate an operator with extra money, but you can do it by conveying a real sense of personal responsibility. At the end of the day, every one of us wants to go to sleep feeling comfortable that our days' work will be for the benefit of our real end-customers: the babies."

EHEDG Sub-Committee Communications:

Connecting people and their expertise: dare to share

“At this point in time, EHEDG enters a new phase of growth, diversification and integration. Together, EHEDG volunteers develop a variety of services, from guidelines to certification, training and education services. These services, which are also referred to as the EHEDG Product Portfolio, offer practical value to food industry stakeholders all over the world, and support them to continuously improve the food safety, productivity and sustainability aspects of their production processes.

As former co-chair and the new chairman of the EHEDG Sub-Committee Communications, my mission is to support the disclosure, and illustrate the practical value of the EHEDG Product Portfolio to the total global food supply chain. I myself receive good support by the industry and communication professionals that make up the EHEDG Sub-Committee Communications and the EHEDG Editorial Board (directly approachable via the e-mail address editorial@ehedg.org). Together we hope to offer opportunities so that anyone may benefit from this golden era of hygienic engineering and design.

So how are we planning to do this? Well, a new era asks for a new communication approach that aligns with the signs of the times. Because I believe that environments were people feel free and safe to share their views, expertise and opinions can lead to valuable real insights and bring forth real progress, especially since food safety is such an important aspect of industrial food processing. EHEDG is an open foundation that wants to create an open, non-competitive knowledge platform enabling us to address hygienic engineering and design challenges together. As you may have noticed, the style of our communication activities has evolved over the course of the past year. We started to regularly publish stories and videos on our online media channels, and we developed a communication strategy plan that focusses on offering all EHEDG members new chances to actually reach out and connect with another - hence EHEDG Connects.

So how do we plan to motivate professionals working in different areas of the food and machinery industry to start sharing their expertise and best (and even worse) practices? For one by creating content that other professionals can comment on. Because while it is certainly true that the global awareness of the food safety, productivity and sustainability benefits of hygienic engineering and design is growing, individual professionals within individual companies can still feel isolated when trying to get hygienic design on their corporate agendas.

Being able to share experiences with like minded experts from other companies can really offer much needed support.

Since communicating not only gives us more insights in processes and technology, but also offers new opportunities to connect. I invite you to carefully listen to what our EHEDG members have to say, because Sharing is Caring. By publishing real life industry stories and sharing them online on social media so that anyone can comment, we are steadily building a communication platform and an online EHEDG community that can prolong, strengthen and substantiate relationships.

Now, to put our own efforts into perspective: when it comes to food safety related news gathering, we don’t have the ambition or resources to rival private publishing companies. We rather focus on raising the general awareness for the benefits of hygienic engineering and design. And instead of focusing on technical details that can be found in the various EHEDG Guideline Documents, we produce articles, videos and interviews that take away barriers between the worlds of technology, academic research and food industry process management. In the upcoming year, we will strive to serve more EHEDG member groups, but foremost, we hope that by publishing new content, we provide an online communication platform that connects people and their expertise all over the world - hence the name: EHEDG Connects. On the following pages, you can get an idea of the effects of our efforts so far.

P.S. I cordially invite you to follow EHEDG Connects online to stay updated on the latest developments, guideline publications and hands-on industry stories on hygienic engineering and design, by visiting EHEDG Connects Online [www.ehedg.org/connects] and to follow our growing online community on the social media business platform LinkedIn: www.linkedin.com/company/ehedg. And please feel free to comment, like and share our posts, dare to share, because sharing is caring.”

Yours Sincerely,

Michael Evers
Chairman EHEDG Sub-Committee Communications

Straight answers to simple questions

Do you have a simple question that you never dare to ask anymore? We understand. Nobody likes to appear ignorant, especially amongst experts, right? But hasn't fear for mockery always been the biggest ball-on-a-chain for innovation? How can we expect to answer difficult questions when even simple ones stay unanswered?

In this series, EHEDG Connects poses simple questions to EHEDG Subject Matter Experts, and invites them to provide straight answers. On the following pages, they answer our questions relating to Spray & Fluid Bed Dryers, Cleaning-In-Place (CIP) and Air Handling. The experts are:

Expert: Karl-Heinz Bahr

Field of expertise: Spray & Fluid Bed Dryers

Professional background:

EHEDG Working Group Member Karl-Heinz Bahr used to work at Cargill for more than 31 years. As a Senior Consultant at Thales Consult, he now offers his supports to food industry clients all over the world.

Expert: Hein Timmerman

Field of expertise: Cleaning-In-Place (CIP)

Professional background:

Food Technologist and EHEDG Advisory Board Member Hein Timmerman is the Global Sector Specialist at integrated cleaning solutions provider Diversey, and chairs the EHEDG Working Group Cleaning In Place, which developed EHEDG Guideline Document 50 on Hygienic Design Requirements for CIP Installations.

Expert: Thomas Caesar

Field of expertise: Air Handling

Professional background:

Director Global Filter Engineering at Freudenberg Filtration Technologies Thomas Caesar is also the chairman of the EHEDG Working Group Air Handling, that developed EHEDG Guideline Document 47 on air handling systems in the food industry.

Spray & Fluid Bed Dryers

Karl-Heinz Bahr

In this series, EHEDG Connects poses simple questions to EHEDG Subject Matter Experts, and invites them to give us straight answers. Our questions on spray and fluid bed dryers are answered by Senior Consultant and EHEDG Working Group Member Dr. Karl-Heinz Bahr, who used to work at Cargill for more than 31 years.

Why do we put food stuff in liquid to then dry it again?
Karl-Heinz Bahr: “For various reasons, but mostly to produce food particles with consistent properties, and to improve the quality of the product, for example by adding vitamins or minerals prior to drying. Many of those dried food products are intended to be dissolved prior to consumption, like milk powder. And of course, after you dry a product, you don’t need to transport the water, so this typically reduces the weight of the product by 70-80%. Transporting dried products is therefore less expensive and better for the environment. Also, the (microbial) stability is much higher in dried products.”

How to get the hygienic dryer that’s best suited to our needs?
“By defining your requirements as clearly as possible. Start off with your product and user requirement specifications. Every detail is equally important: the kind and type of end product you want to produce, the look and feel, the smell and taste. The viscosity and transition temperatures of your product matter, as well as the droplet size required to produce your dry material particles. And let’s not forget about the rheology of your product - it determines the shape and size of the spray nozzles. Furthermore, you have to think about the needed pressure, the temperature, the amount of air, and even the shape of the spray dryer. Some people think that all dryers are the same, but dryers come in various shapes. Also the liquid can be prepared in various ways, so it is not only the spray dryer itself that matters. That’s why the building design and the utilities should be considered as integral parts of the process. The environment has a big influence on the product as well, not only in relation to energy consumption - it also needs to be hygienic and, most importantly, as dry as possible to avoid microbiological issues. The goal is to realize consistent and effective drying processes without wasting resources. Even big food companies cannot do this alone. They seek support from experienced system integrators. To a layman’s eyes, spray and fluid dryers may not look very sophisticated, but they are in fact very delicate thermo-energetic systems.”

Why is that?
“The temperature, pressure and energy balances within the installations determine their effectiveness and the quality of the product. Spray dryer and fluid bed dryer installations are very prone to the slightest fluctuations in temperature, pressure levels, the quality and quantity of the drying air and so on. Therefore, when designing and configuring spray dryer and fluid bed dryer installations, it’s always a challenge to find the best possible balance between the productivity, the water and energy consumption and of course the food safety and quality aspects. You can imagine that to reach this balance, you need a top-class team of suppliers and operators.”

“THE GOAL IS TO REALIZE CONSISTENT AND EFFECTIVE DRYING PROCESSES WITHOUT WASTING RESOURCES”

Sounds like a lot of work. Time consuming? Expensive?
“Spray dryers are not cheap, so you need to do your homework before making investment choices. If you want to educate yourself, the newly updated EHEDG Guideline Document 31 Hygienic Engineering of Spray Dryer and Fluid Bed Plants is certainly a good place to start, since this guideline contains a comprehensive oversight of many hygienic engineering and design principles applicable in spray dryer and fluid bed plants, not only related to the equipment but also for the environment it is placed in. The guideline is developed by experts of the EHEDG Working Group Dry Material Handling. Many details of the process and the environment are thoroughly discussed and related to specific design choices. Because even when you work with an experienced system integrator, you are always better off when you are aware of some of the details that you need to pay attention to. This helps you to make sure you have a hygienically sound spray or fluid bed drying installation in place.”

"SPRAY DRYERS ARE NOT CHEAP, SO YOU NEED TO DO YOUR HOMEWORK BEFORE MAKING INVESTMENT CHOICES"

What are the most common mistakes?
"We have to make a clear distinction between operational and process line design mistakes. First of all, people tend to underestimate the effects of a lack of control over the system process variables, for example when using unconditioned airflows. When the humidity of the air outside of the plant changes, it can affect the system in unexpected ways, resulting in fluctuating product quality or material deposition on the inner walls of the drying chamber, ducting, cyclones and product transport lines. A general rule of thumb is that better hygienic design dryers allow for more inconsistencies in these variables without immediately compromising on food safety and food quality. However, to really optimise food safety in spray dryer and fluid bed dryer plants, one has to look at the system and the environment as a whole: as a combination of design and usage aspects. The process is the product."

The process is the product?
"Yes, because with most dry particle food products, taking samples for product release purposes doesn't make much sense, since it's impossible to take a representative sample. This is particularly true for microbiological testing. In a powder product, only one square centimeter in a full batch could be contaminated while the rest is fine. That means that besides a trustworthy hygienic design of your installation, you need very strictly supervened cleaning procedures and operating instructions and a top-class team to run, clean and maintain the installation. Hygienic engineering and design can definitely minimise contamination risks, but only if all food safety determining variables are fully controlled."

Thanks for your clear answers.

Cleaning-In-Place (CIP)

In this series, EHEDG Connects poses simple questions to EHEDG Subject Matter Experts, and invites them to provide straight answers. Our Cleaning-In-Place questions are answered by Food Technologist and EHEDG Advisory Board Member Hein Timmerman, who is the Global Sector Specialist at integrated cleaning solutions provider Diversey and chairs the EHEDG Working Group Cleaning In Place, which developed EHEDG Guideline Document 50 on Hygienic Design Requirements for CIP Installations.

How does a CIP installation work?
Hein Timmerman: "Cleaning-In-Place, or CIP, encompasses all cleaning activities that don't require any dismantling of production equipment. Most production environments will have one central cleaning unit that is connected to all closed food production processes. This centralized CIP unit is connected to all pipes and components that need to be periodically cleaned internally. Traditionally, CIP installations first rinse the system with warm water, then use an effective, yet affordable, cleaning solution like sodium hydroxide or nitric acid for a thorough cleaning, and finally rinse with water before the production line can be used again."

Have CIP systems evolved throughout the years?
"Yes, they have, and mostly in recent years. For a long time, the 'remote washing machine' approach (with one central CIP station that does all the cleaning in a production environment) has been the most common way to use CIP. But since modern food consumers want more variety on their plates, more and more food producers lean towards more decentralized CIP systems that consist of several satellite CIP units. These new systems are better suited to meet varying CIP demands and therefore offer more flexibility combined with the required traceability. To determine which CIP system is best for you, you really need to look into the specific needs, from the products being processed to the local circumstances. Oftentimes some kind of hybrid system turns out to be the best solution for the job."

Why should CIP installations be hygienically designed?
"First of all, CIP installations should be designed, fabricated, constructed and installed according to hygienic design principles to ensure a continuous and consistently effective cleaning in place operation. Since it is difficult to inspect the cleaning results from the inside, it's extremely important to control all hygienic aspects of CIP cleaning on a detailed level. The best way to achieve this is by applying hygienic engineering and design guidelines throughout all the design, fabrication, construction and installation stages. Another big benefit is that hygienic design CIP installations generally use less water and cleaning solutions, which makes them more sustainable and more efficient in use. The newest CIP systems also focus on product recovery and help to minimize food waste."

What are the main risks regarding CIP?
"Let's start at the beginning. CIP is a cleaning technique that has been very widely applied for many years, and because of that, many things are taken for granted. Some people tend to pose statements like: 'We've always done it like this, so just copy the old CIP system to clean a new process line.' But every process line needs a dedicated system, and if you forget to describe your user requirement specifications right at the start, some food safety parameters will be difficult to control. Also, CIP cleaning is generally done in the middle of the night, and many bulk volume cleaning procedures are not sufficiently validated. Sure, the operator starts the CIP-procedure and checks if it finished before restarting the production process, but a green signal doesn't necessarily guarantee that the end result is satisfactory. New monitoring techniques, that make use of real time sensor data, provide operators with more information to validate real life cleaning results and ascertain food safety risks more accurately, but these types of sensors are expensive, and you will always still need to take samples and perform visual check-ups. We use long camera-equipped endoscopes for this to see what's really going on inside the tubes and equipment. If you want to improve the food safety of your CIP processes effectively without breaking the bank, the best place to start with is the central CIP unit. A clean heart is a good start to achieve trustworthy CIP cleaning routines."

Does the quality of the cleaning solution affect the cleaning results?
"It certainly does. When choosing a cleaning solution, you really need to address the specific cleaning needs with regard to your installation and the product that you produce. A well-suited, tailormade cleaning solution will not only improve the cleaning results, but will also let you accelerate the cleaning procedure, which results in productivity increases. Even more importantly, it dramatically reduces the risks of food contamination, shutdowns and recalls. The importance of good CIP is often undervalued, but only by people who don't realize how much effective CIP significantly contributes to lower total costs of operation. Since CIP is a complex working field that requires the combined expertise of food technologists, microbiologists and engineers with knowledge of flow mechanics, one is well advised to consult the necessary experts before taking any irreversible investment decisions. Another good advice I can give you is to read the hygienic design requirements for CIP installations in the upcoming EHEDG Guideline Document 50.

EHEDG Connects will keep you posted on when that new guideline is ready for download, so make sure to stay connected via:
www.linkedin.com/company/ehedg."

Air handling in the food industry

In this series, EHEDG Connects poses simple questions to EHEDG Subject Matter Experts, and invites them to provide us with straight answers. Our questions on Air Handling are answered by Dr. Thomas Caesar, Director Global Filter Engineering at Freudenberg Filtration Technologies. Dr. Caesar is also the chair of the EHEDG Working Group Air Handling, that developed EHEDG Guideline Document 47 on air handling systems in the food industry.

EHEDG Document 47 only focuses on air quality control for building ventilation. Why?
Thomas Caesar: "When our working group started to work on this guideline back in 2006, it didn't take us long to understand that in order to enhance the practical value of the guideline, we first needed to narrow down the scope of the contents. After all, what use is a guideline that tries to cover everything, but only scratches the surface of the various food safety determining types of air handling? EHEDG Guideline Document 47 is a comprehensive document, that is closely aligned with EHEDG Guideline 48 on building design (as it should be), and it now offers a valuable insight in air quality control for building ventilation. Of course, our working group also plans to publish a guideline on air handling for process oriented air handling as well, but since it's all purely voluntary work, it will take us more time to complete it."


Thomas Caesar

What's so complex about air handling that we need multiple guidelines for it?
"For starters: air is everywhere. In almost all food processes, even closed ones, food gets into contact with the air surrounding it. If this air contains particles that microbes can attach to, food safety risks may arise, so a well thought-out approach to air handling is fundamental for food safety. Since air tends to move around through freely through production plants, we need to approach air handling on all levels - from building ventilation to exhaust air, dust handling and compressed and non-compressed air flows. Each level is a world on its own and should be covered by a dedicated EHEDG Guideline Document. Our working group started off with narrowing the guideline down to building ventilation as this is applicable to many different types of food processing. Our next guideline, however, will focus on process air filtration."

How do I know if my air handling is effective?
"You can install particle counters that provide a better insight in the contamination risks connected to air quality. Since micro-organisms can only spread through the air if the air contains particles that the microbes can attach to, it is safe to say that minimizing the number of particles in the air benefits food safety. Despite of the availability of new technical solutions to monitor air quality in food processing environments, there are still many food producers that only start to improve air handling systems after they are confronted with serious product quality fluctuations. This is mainly due to the fact that most monitoring systems are still quite expensive. The most cost-effective way to monitor the air quality is to monitor the amount of airborne particle in the active air handling units. To do this, you can add special membranes to the filter units that collect the particles and allow users so you can grow and count them. Before you do this, you need of course to know what your critical control parameters are for your specific product."

What are the most common causes for food contaminations by air?
"Air connects everything: exteriors and interiors, different building zones and everything within it. A common cause for bad air quality is bad air flow design. We often see plants with air flowing from a contaminated (technical) area to critical food processing areas. A general rule of thumb is to always lead the air flows away from the critical process areas. That can be quite a challenge in big open spaces with multiple food processing lines. If you don't have a good understanding of the actual air flows in your building, it can be difficult to pinpoint air quality issues related to the zoning design. Examining the sources of the airflows is also a good way to start your investigation. Since most buildings make use of recirculated air, major causes of air contamination can often be traced back to dirty or wrongly installed pocket air filters in the air handling systems, or bad water quality in the humidifier. Installing a filter unit directly above a wet floor doesn't help either. We recommend to use exclusively EHEDG certified air handling components, but it's not only the design of the air handling system that counts, it's also how the people use it, how the maintenance is performed and so on. It's all connected and each air handling system is as good as its weakest link, so you need a comprehensive approach to really optimize food safety in a sustainable way."

What would be the best steps to take in order to improve air handling?
"It all starts with describing your critical control parameters, with making a thorough risk analysis and with qualifying the specific needs for your type of food product. After that, you can consult the EHEDG Guideline Documents. Zoning generally has a big impact on air flows, so the EHEDG Guideline on Building Design is a good document to start with. Then continue with our guideline on air handling with regard to building ventilation. These two guidelines are strongly intertwined, so we made sure that they are well aligned with each other. A relatively new and effective trend is to install air handling units directly at the points where the most critical process steps take place. This enables food producers to decouple their most critical processes from the rest of the air flows in a production environment. Since these locally focussed systems generally need to move much smaller volumes of air, they need less ventilation power than conventional systems and therefore can provide additional benefits like a significant reduction of energy consumption. In the end, it's all about minimizing risks on all levels, from the engineering and design up to the daily usage and maintenance of the air handling systems." EHEDG members can download EHEDG Guideline Document 47 for free here: www.ehedg.org/guidelines"

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New EHEDG Guideline Documents

Every year, many EHEDG Subject Matter Experts support EHEDG Working Groups with their valuable time and expertise to develop new EHEDG Guideline Documents. Amongst others, these three EHEDG Working Groups recently published new EHEDG Guideline Documents. We asked the chairs of the working groups why EHEDG members should download, read and implement these guidelines. Please find their answers on the following pages.

EHEDG Guideline Document 28: Water Treatment
EHEDG Guideline 28 covers hygienic treatment, storage and distribution aspects of water in food and beverage factories. Chair of the EHEDG Working Group Water Treatment Dr. Anett Winkler explains why EHEDG Guideline 28 matters and why anyone concerned with food safety should take the time to read it attentively.

EHEDG Guideline Document 31: Dry Material Handling
Seventy percent of all industrial food processes make use of dry materials produced by fluid bed and spray dryer installations. It's why the EHEDG Working Group Dry Materials Handling consists of experts from various expertise areas. Working Group Chair Dr. Gabrie Meesters: "This EHEDG Guideline Document 31 is a must read for anyone involved in fluid bed and spray dryer plant and component engineering, design and operation."

EHEDG Guideline Document 23: Lubricants
The EHEDG Working Group Lubricants has published a comprehensive update of EHEDG Guideline Doc. 23, that teaches us how to properly use (part 1) and produce (part 2) food grade H1 and HT1 registered lubricants. EHEDG Working Group Lubricants Chair Taco Mets: "If you don't want to put your food safety at risk, and if you want to optimise the reliability and lifetime of your machines, then only the right lube will do."

Download, comply and rest assured
As a valued EHEDG member, you are cordially invited to download these and other topic-orientated EHEDG Guideline Documents at: www.ehedg.org/guidelines.

EHEDG Guideline Document 28:

“H2O revisited”

Effects of water and steam management made crystal clear

EHEDG Guideline document 28 covers hygienic treatment, storage and distribution aspects of water in food and beverage factories. Chair of the EHEDG Working Group Water Treatment Dr. Anett Winkler explains why EHEDG Guideline 28 matters and why anyone concerned with food safety should take the time to read it attentively.

Why do we need to read this guideline?

Anett Winkler: “The quality of water used for food processing can be critical for the final product safety in the marketplace. It also affects the reliability of production processes and foremost: the health safety of personnel. In that respect, if water quality falls below acceptable standards and is allowed to form aerosols, food processing systems can become prone to microbes that can cause a potentially fatal disease in humans known as Legionnaires’ disease. All types of water treatments, directly or indirectly linked to the production process, should therefore render the water microbiologically and toxicologically safe.”

What’s the scope of this guideline?

“This EHEDG Guideline summarizes practices to ensure adequate water and steam qualities for safe use in food and beverage production as well as to how avoid the emergence of Legionella in various types of water systems. The guideline focuses on practices for product water and utility water. Utility water is used in secondary processes where no direct contact with the product occurs at any stage, for example hot and cooling water systems and fire fighting water storage. Product water encompasses the water used as a product ingredient, as rinsing water in food contact areas and water used by personnel for washing, food and drink preparation. All these types of water need to be adequately treated, stored and distributed in accordance to this guideline. EHEDG Guideline Document 28 covers all of these areas, from water sources to water treatments and water distribution systems, and from steam quality to Legionella control.”

How did the development of this guideline come about?

“The first steps were taken in 2003, after some Legionella outbreaks directly related to the use of inferior product and utility water quality had occurred. There was a need for clear guidelines on water management and treatment. It resulted in the development of EHEDG Guideline 23, 24 and 27. These guidelines covered different aspects of the use, storage and distribution of water in food factories and they cleared the way towards better control over water quality aspects, but until recently, there was no comprehensive hygienic engineering and design guideline covering all water management aspects in one document. So the members of the EHEDG Working Group Water Treatment teamed up to integrate the fragmented guideline chapters on water and steam management into one new guideline. EHEDG Guideline Document 28 is the result of that.”

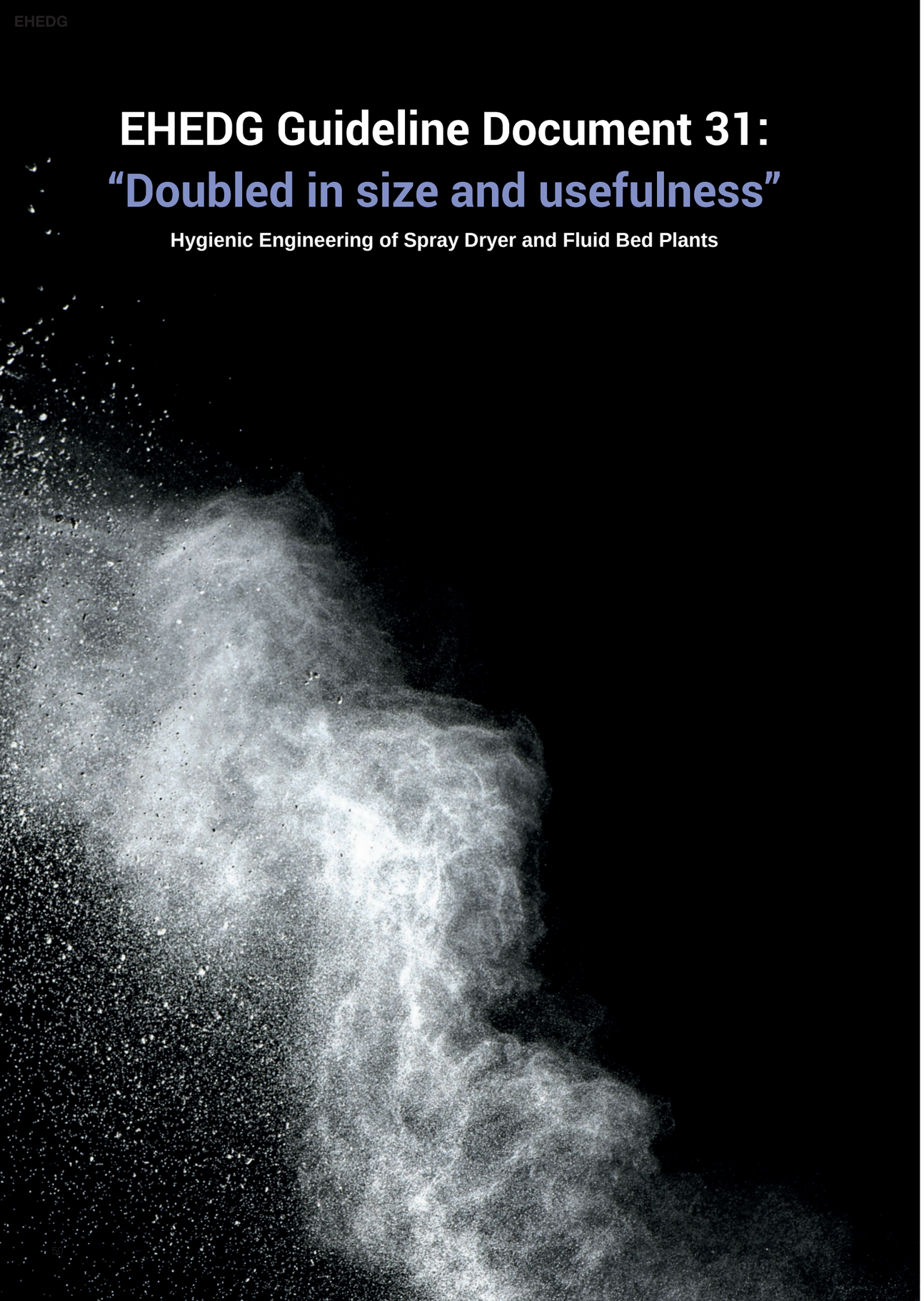
What has changed since 2003?

“Most common water treatment methods remain valid. Some new insights related to the sustainability aspect of water use are included. There have also been some developments in the electrochemical treatment field, but we didn’t include guidelines on how to hygienically re-use processing water in food plants in this document. For this purpose, we refer to the Codex Alimentarius discussion paper on proposed draft guidelines and the current work being done at JEMRA: Risk based framework on water re-use, currently under development. However, since Legionella are especially dangerous when inhaled in an aerosol state, Guideline 28 does contain a section specifically dedicated to that subject. Complementary to existing legislation aimed at controlling Legionella, this guideline highlights especially those elements that are of particular importance for the food industry. So put EHEDG Guideline 28 on your reading list to learn about hygienic engineering and design aspects of different water treatment options, from sourcing via distribution to daily use in food and beverage plants.”

You are welcome to download EHEDG Guideline Document 28 here: www.ehedg.org/guidelines

EHEDG Guideline Document 31:
“Doubled in size and usefulness”

Hygienic Engineering of Spray Dryer and Fluid Bed Plants



Seventy percent of all industrial food processes in the world make use of dry materials produced by fluid bed and spray dryer installations. It’s why the EHEDG Working Group Dry Materials Handling consists of experts from various expertise areas. Like Dr. Gabrie Meesters, chair of the EHEDG Working Group Dry Materials Handling and Assistant Professor Solids Processing and Product Design at TU Delft: “This EHEDG Guideline Document 31 is a must read for anyone involved in fluid bed and spray dryer plant and component engineering, design and operation.”

What’s the most important hygiene rule when handling dry materials?

Gabrie Meesters: “The most relevant general directive is to keep your plant environment as dry as possible during operation. Pathogenic bacteria need nutrition and moisture to multiply, so the best way to guarantee food safety in dry food material processing areas is to effectively prevent condensation and all other forms of humidity. Compared to other food ingredient processes, dry materials come with their own specific challenges. In general, spray dryer and fluid bed plants require less frequent cleaning than wet food processing facilities, but you have to understand the reason why and how to make use of this in a hygienic way.”

So what’s new?

“The previous edition of this guideline was published in 2005. Since then, the worldwide use of fluid bed and spray drying plants has increased significantly. Notwithstanding that most of the applied techniques are based on the same basic technical principles that have been around for ages now, the local circumstances may differ greatly and that’s where this new guideline comes into play. EHEDG Guideline Document 31 not only focuses hygienic engineering aspects of fluid bed and spray dryer installations as such, but also covers food safety determining aspects related to the direct surroundings of these continuous drying process installations, like supply air systems and liquid feed handling. In this updated version, it now covers the total scope, from hygienic plant layout via component design to plant operation within forty pages. So it’s almost twice the size of the previous guideline on this topic.”

Is EHEDG Guideline 31 suitable for all types of particulate material production?

“Yes, you will find valuable insights for every type of dry material process that makes use of either fluid bed or spray dryer technology. Hygiene risks are always linked to process conditions of heat and humidity and the positioning of the process in the whole processing line. Regardless if you are producing simple starch or complex baby-milk powders - all relevant precautions that should be taken to prevent the transfer of allergens between the products, reduce cross contamination risks and avoid growth and survival of microorganisms can be found in this guideline.”

How did you determine the new scope of this guideline?

“Our working group comprises members from various areas of the food industry. We each bring in our own expertise and together we have a comprehensive overview of the practical industry needs. In this guideline we addressed all common misconceptions and mistakes made in engineering, designing and operating fluid bed and spray dryer plants. On request of other EHEDG members, we also included a fair number of schematic overviews that help readers to quickly identify and address hidden risk factors. These overviews help readers to quickly implement hygienic design and operation requirements for their types of particulate materials processes. We decided to primarily focus on the hygienic safety of dry particulate materials, so aspects as personnel safety and environmental protection are not addressed in this document. We also excluded de-watering systems such as centrifuges, decanters and filters, since these are addressed in other EHEDG guidelines. Apart from that, EHEDG Document 31 covers everything you need to know about fluid bed and spray dryers, from materials of construction and air handling systems down to the nuts and bolts, bearings, insulation seals and welding. All of this focussed on plants handling dry materials”

So who should read it?

“Everyone dealing with solids processing, because this guideline offers hands-on instructions to make optimum use of all current hygienic engineering, design and operation insights. When implemented correctly, EHEDG Guideline Document 31 offers full control over all food safety aspects of continuous drying processes. There’s only one way to put it: this is clearly a must read for anyone involved in fluid bed and spray dryer plant and component engineering, design and operation.”

EHEDG Guideline Document 23:

“Only the right lube will do”

How to select, use and produce lubricants that secure food safety and productivity

It’s a rewarding moment for Working Group Chairman Taco Mets and his EHEDG Working Group experts from Fragol, Klüber and Tetra Pak, who contributed to this new EHEDG guideline publication. Mets has been advocating the use of food grade lubricants for almost thirty years now, partly to serve his employers at Van Meeuwen Industries, but also because he’s a mechanical engineer at heart, who strives to take away misunderstandings and to create awareness that the choice and use of lubricants determine the reliability and productivity, longevity and food safety of industrial manufacturing processes. Mets: “This guideline shows food producers and machine equipment engineers that lubricants are vital construction elements that deserve their full attention.”

Are there any industrial processes that don’t need lubricants to work properly?

Taco Mets: “Almost none, but there are considerable variations with regard to the amount of lubricants needed for producing different kind of products. In general, it’s safe to say that closed and dry processes need significantly less lubricants than open and wet processes. With the exception of modern pumps, most industrial production machines need lubricants to function properly. Lubricants avoid wear and prevent internal damage resulting from friction by mechanical forces. All lubricants are meant to establish some kind of “aquaplaning” to separate moving components with a lubricant layer, but only H1 and HT1 registered food grade lubricants also take food safety into account.”

What parameters determine the quality and effectiveness of lubricants?

“Quite a few, but besides viscosity, one of the most important ones is the temperature. Just a rule of thumb: an incremental temperature increase of only ten degrees will half the lifetime of most lubricants. Synthetic lubricants offer a better heat resistance and flow ability at low temperatures, and some fluorinated lubricants are even applicable for temperatures of up to 280 °C, so they can be used to lubricate conveyor bearings in ovens. Another parameter is speed. Machines that operate rather slowly need thicker lubricants with higher viscosities than machines with fast rotating components. Other functional quality determining parameters are directly related to the specific use of an application. A hydraulic system needs other lubricants than a gear box or a compressor. The amount and frequency of relubrication and oil changes is also directly related to the applications, conditions, and the productivity of machines.”

What’s new?

“We included many new and very useful elements, like a list of requirements and recommendations for the use and storage of food grade lubricants, hand-on tips to minimize product contamination risks and information on the deterioration of lubricants during operation and the use of lubricants during maintenance. We also included real life examples with pictures, and a flowchart that illustrates how to shift from conventional to food grade lubricants. This document now offers a lot of practical value. It also clarifies a lot of misunderstandings about lubricants, especially with regard to the H1 and HT1 registrations that are often unrightfully perceived as EC 1935/2004 food contact materials regulation.”

Why does this guideline only focus on H1 and HT1 food grade lubricants?

“Because our EHEDG Working Group members unanimously agree that to optimize food safety, food producers and machine equipment suppliers should exclusively use H1 and HT1 registered food grade lubricants. If you also use conventional (not H1 or HT1 registered) types of lubricants, you will need tight and strict procedures and documentation systems to keep your workers from using the wrong lubricant at the wrong places. Lubrication is an area of expertise that has been greatly underestimated for many years, but there seems to emerge a general awareness now that you just can’t use lubricants that contain lead, chlorine, sulphur or graphite in food production environments. Luckily, there are plenty of food grade lubricants available these days that don’t use toxic additives. This guideline helps you to learn what aspects you have to pay attention to when it comes to choosing the right lubricants for your needs. This basic knowledge will help you not only to protect your gear and your food safety, but it might even save you quite a lot of money in the long run, because lubricants are often sold in package deals and lots of end users don’t really know what they buy.”

Lubricants in package deals? How does that work?

“Lubricants are often sold in combination with machines, because some machine builders want to engage in the maintenance, repair and operations market. And some of them essentially force their machine users to buy aftermarket lubricants (often

rebranded under some private label) by linking it to their warranty policy. It's probably legal, depending on the full scope of their business model, but from a technical and food safety perspective, it is downright bad practice, because it totally disavows the importance of high-quality food grade lubricants. It's another reason why all food and food equipment producers should read this guideline. The right knowledge is always the best way to protect yourself from scams. It's important to create more transparency in the food industry."

Food grade lubricants are expensive compared to conventional lubricants…

"They certainly are, at the moment that you have to buy them, but when you look at the big picture and take the actual use of your machines into consideration, then high quality food grade lubricants often turn out to be very interesting investments. By using H1 and HT1 registered lubricants, food lubricant experts have managed to reduce their processing downtimes related to re-lubrication by up to 90 percent. This guideline helps you to make not only technical, but also well-thought-out economical decisions. Because the better your lubricants match with your applications, the less time and effort you'll have to spend to keep your processes running smoothly. "

What's next?

"This guideline will serve the industry in the upcoming years, but lubricants will continue to evolve in line with new machine equipment industry developments like the ongoing miniaturization of sump volumes, increasing mechanical stress and rising operating temperatures. All of these developments have consequences for the future use of lubricants and will keep lubricant producers busy. In the meantime, EHEDG will develop an update for its EHEDG Training Installation, Maintenance and Lubricants, which will be based on this new guideline as well. Our goal is to make everyone in the industry understand the benefits that good lubrication offers for improving food safety, productivity and reliability of machinery. It's an area where many food producers can still take advantage of untapped reserves, and it all starts with reading this EHEDG Guideline Document 23."

EHEDG Content Contest Winners:

FLOVEYOR

SKF

Iv-Industrie

commercial food sanitation

Which hygienic engineering & design projects deserve the full attention of the global food industry? In our first EHEDG Newsletter of the year, we invited all EHEDG Company Members to submit their article ideas. We received several proposals, but who are we to choose? Why not let the EHEDG members decide for themselves?

So in the second EHEDG Newsletter, we invited everyone to participate in our online EHEDG Content Contest, by submitting story ideas in the comment section of our EHEDG online community on LinkedIn.

After the final submission deadline, all participants were asked to cast their votes for their favourites.

The winning stories are featured on the following pages, for the whole food industry to see. Enjoy their stories and stay connected so you won't miss the next edition of the EHEDG Content Contest.

Follow EHEDG Connects Online
(www.ehedg.org/connects) and EHEDG on LinkedIn (www.linkedin/company/ehedg)

Floveyor: Rhys Walker

Find out how Australia-based equipment producer (and one of the winners of the EHEDG Content Contest) Floveyor optimized the hygienic design of their conveyor systems, helping their customers to advance the hygiene, cleanability, productivity and sustainability aspects of their food production processes.

SKF: Fabio Falashi

Find out how technical solutions provider around the rotating shaft SKF developed an EHEDG guideline compliant bearing system that can withstand regular washdowns without the need for relubrication.

Iv-Industrie: Jeroen van den Boezem

Find out how engineering agency Iv-Industrie develops its hygienic design engineering services and applies hygienic engineering expertise in their engineering projects to advance the cleanability, productivity and sustainability of their clients' production facilities.

Commercial Food Sanitation: Nicole Cammarata

Find out how Commercial Food Sanitation developed their new FoodSafe Conveyance Workshop by aligning hygienic design, engineering, sanitation, and maintenance insights with a clearly defined food safety mindset.

EHEDG Content Contest Winner: Floveyor

How do companies across the world make good use of EHEDG to optimize their products and services? Find out how Australia-based equipment producer Floveyor optimized the hygienic design of their conveyor systems, helping their customers to advance the hygiene, cleanability, productivity and sustainability aspects of their food production processes.

Picture Western Australia in the 1950s. The petrol rationing that was appointed during World War II had been lifted, the economy was booming and a growing middle class now had money to spend on new types of food. This is where the story of Floveyor began, when its founding father, Robert Walker, invented and developed the first aero-mechanical prototype for conveying peanuts in 1958.

Today, Floveyor is a global provider of aero-mechanical conveying solutions that sets industry benchmarks for quality, safety and reliability. Walkers inventiveness has passed on from generation to generation in the family-owned business and its innovation-minded company culture. The Aero-Mechanical Conveyor (AMC, also known as 'Floveyor') became wildly popular due to its ability to convey a vast magnitude of powders and granules efficiently through a single conveyor. The EHEDG Connects questions are answered by the current Managing Director of Floveyor Rhys Walker.

It took Floveyor many decades to adopt hygienic design principles. Why was that?

Rhys Walker: "Historically, Floveyor was mainly targeted towards the industrial sectors, including plastics, chemical, building products and base level foods. The main criteria from our clienteles was conveying their materials from A to B as efficiently as possible, without degradation and minimum maintenance and operational involvement. Although at times upwards of 70% of our sales went into the food industry, majority of these applications were non-hygiene sensitive, where base level food compliance was all that was required. While the larger, more established players within the food manufacturing industries were turning to other technologies for their materials handling, we only used FDA/EC compliant parts and stainless contact surfaces. It wasn't until we started to move away from depending solely on our partner distribution network and began going direct to the market that we started to receive valuable feedback from our food industry customers. We discovered that some clients that had been using our equipment for 30+ years were and moving away from the AMC due to hygiene concerns. From a practical and operational perspective, the equipment still performed flawlessly, but from a quality and assurance perspective, our equipment was difficult for QA teams to validate. Access required tools and there were many dead spots throughout the machine where bacteria could collect. We had never properly developed our recommendations, processes, and accessories for our customers to adequately sanitise our equipment, so end users had to work out how they could clean our conveyors themselves. Some of them completely disassembled the systems to wash all components manually – which was an incredibly time-consuming process."

So you decided to focus on the hygienic design aspects of your products? How?

"We listened very carefully to the feedback we were receiving from the end-users of our products. One of our most notable and valuable end users who turned out to be fundamental to the reengineering of our hygienic range, was Kerry Ingredients in Queensland Australia, a global food producer, who had been using our equipment for over 25 years. At that time (2013/2014), we were exclusively selling our legacy range of conveyors. The maintenance supervisor of the plant described how they adapted our conveyors to bring them up to Kerry's specification. Apparently, this was fairly normal practice, as hardly any local suppliers met their requirements as standard. Kerry Ingredients invited us to fly over to the Queensland site to review their adaptations. Some of the changes included replacing compressible foam gaskets with tangible and cleanable seals, and replacing traditional belt drive arrangements with direct drives. They also updated the cleaning procedures by implementing a straightforward cleaning process for products where cross contamination of colour, flavour or allergens was a potential issue. The feedback was extremely valuable during our reengineering process and resulted in a new successful range of the AMC, now known as the Floveyor Industrial range."

Winner: Floveyor

Hygienic transformation of conveyor product line

When and how did you start utilizing the available EHEDG Guidelines?
"The process enabled us to thoroughly explore the hygienic side of the industry, so we began further consultation with many of our end users and greater networks to really understand everything that was required. In 2015, once our Industrial AMC was complete and released to market, the first two units were sold into PepsiCo by Solids Handling And Process Engineering Co. Ltd., one of our most hygiene-critical partners and conducted a consultative design review with the objective of creating a new hygienic AMC. We reviewed the Industrial AMC in fine detail, highlighting all the areas of concern that would need extra attention. Internally we spent a significant amount of time researching resources, specifications and guidelines for best practice on sanitary applications. This was our first introduction to EHEDG, in particular the EHEDG Guideline Documents 38, 8 and 42. In addition, we also reviewed and utilised ASME BPE-2007, 3-A Sanitary Standards, Inc, EN, ISO, American Meat Institute and various end user hygienic design handbooks. This, together with the learnings from Kerry, was fundamental in the design and development of our new Hygienic range of AMC's."

How did you move on from there?
"With our wish list in hand we assessed our own internal engineering teams capacity, hygienic design knowledge, project orderbook, and willingness to rapidly upskill. We soon realised that our engineering team lacked the detailed knowledge, availability, and extra capacity to undertake the development work without extensive guidance and delays. In addition we found the skillsets we desired for clean design were fundamentally lacking from the Australian industry, being mostly heavy industry and resources focused. In response to this, the decision was made in April 2015 to engage 'Stainless Design', a New Zealand based firm that is specialised in dairy industry engineering and fabrication. This company was known to Floveyor through several of our partners and past work we had undertaken in New Zealand. So we began developing the hygienic AMC together. Floveyor provided CAD models of our new Industrial AMC and we began working systematically through each component of the conveyor, assessing its suitability for hygiene against our hitlist of action points and resources, while making good use of Stainless Design's experience within the New Zealand Dairy Industry. At this point, EHEDG was not yet known to Stainless Design and we loosely used it as a reference guide, favouring New Zealand Dairy Industry best practices and knowledge. Within four months we had completely redesigned our AMC and had our first hygienic variant. The next step was assessing our in-house manufacturing capabilities to fabricate the conveyor. It was decided to outsource the majority of the weldments to Stainless Design, due to their ability to machine and bore components in-house. We were also able to utilise their weld and QA/QC procedures, reducing the time to build a working prototype. In November 2015 we had realized our first operational model of the hygienic AMC, which was far surpassing our expectations of the project."

How did you align your organization to all of these changes?
"By the end of 2015, early 2016, we had restructured our engineering department and employed several highly skilled design engineers to help grow our efforts and capabilities within our hygienic market segments and equipment portfolio. In 2016, the first Floveyor Hygienic AMC was sold to Nestlé Switzerland, it was a mobile solution for decanting 25 kg material bags. In addition to the Nestlé project, we sold a secondary system to a well-regarded contract food manufacturer based in Victoria, Australia. This was a very comprehensive solution involving 1,000L FIBC decanting via hoist arrangement combined with massaging paddles to promote flow, a 25kg manual bag tip station, an automated start/stop material feed as required by packaging machine, clean in place FIBC frame, clean out of place mobile AMC, a clean out of place mobile screw feeder, completely tool-less access for QA/QC validation, etcetera. Floveyors engineering manager, Michael Roberts, heavily

engaged the EHEDG design standards in this project, coordinating the design of the mobile frame, screw feeder, FIBC frame and accessories to the guidelines. The project was delivered in early 2017."

Did this endeavour turn out to be commercially beneficial for Floveyor?
"It certainly did. And we keep on innovating too. We continued to passively sell several our hygienic AMC's through word of mouth and up-sale in the course of the discovery process while promoting and selling our industrial range. Until 2018 we had not undertaken any marketing or promotional activities for our new range. Then in 2018, one of our long-standing customers, a major spice manufacturer within Asia, who had a number of our legacy conveyors, required several conveyors for a plant upgrade they were undertaking. They consulted our partner in Malaysia, Mestre Engineering, who tendered two options for their consideration. One being our Industrial AMC (a vast improvement over the legacy systems they had onsite), and second a Hygienic Mobile AMC. The client decided on the Hygienic AMC and proceeded with an initial order of one before committing on the subsequent units. Our engineering team took the opportunity to completely redesign the AMC to the EHEDG guidelines and standards, in particular working towards EL Class I, EL Class I Aux and ED Class I certification. In addition, we flew our engineering manager over to the EHEDG Congress in the UK to further advance our practice, knowledge and equipment in the area of clean design. With the successful delivery of the mobile unit to our spice end user in Malaysia, we continued our efforts improving and redesigning the externals of the conveyor to improve aesthetics and reduce any potential areas for bacteria and product to build. 2019 Powtech in Nuremberg marked our official release of the Hygienic product range, with new marketing material, website landing pages and partner training conducted."

Sounds like a genuine success story
"It certainly is. And the story continues, because we still see many areas for continuous improvements going forward with our hygienic range of materials handling equipment, utilising EHEDG. Our plan is to send a number of our other design and project engineers, as well as our drafting administrator to an EHEDG clean design course and the next Congress to further develop the skills of our team. Commercially we're still feeling out our end users needs, wants and price point, careful to not over-deliver, but yes, the future looks promising."

Winner: SKF

Rethinking bearing design for hygienic applications

EHEDG Content Contest Winner: SKF
How do companies across the world make good use of EHEDG to optimize their products and services? Find out how technical solutions provider around the rotating shaft SKF developed an EHEDG guideline compliant bearing system that can withstand regular washdowns without the need for relubrication.

Bearings and bearing housings have traditionally been quite problematic from a hygiene perspective. They can be difficult to clean, and require regular re-lubrication, with subsequent costs and risks for manufacturers. SKF Product Development Manager Fabio Falaschi describes his company's quest to develop a washdown resistant bearing system that doesn't limit the operators' freedom to install and maintain bearings in production environments.

How do bearings affect food safety in the first place?
Fabio Falashi: "For equipment operators, bearings create two significant challenges. The first of these is the geometry of the bearing units themselves, which often include voids, flat horizontal surfaces and tight corners that are difficult to clean. The second challenge is the requirement for regular relubrication. It's common knowledge that the ingress of cleaning media into bearings can cause the premature breakdown of lubricants, leading to early bearing failure. As a result, bearings used in food and beverage manufacturing are re-lubricated frequently, implying subsequent costs in labour and materials and the disposal of grease-contaminated water and consumables. These two challenges can interact to create further problems. SKF, with the support of microbiology and hygiene department of RISE (Research Institutes of Sweden) have shown that there is a high level of bacteria content within bearing units and the expelled grease – which can risk food safety."

So the way that bearings are sealed is important?
"Very important. The detergent-water mix used in washdown applications provides worst-case conditions for bearings. Detergents allow washdown fluids to bypass conventional seals, by lowering the surface tension of the liquid. And once fluids enter the bearing, the detergent does its job: bonding to the oils within the lubricant and washing them away. Understanding the role of detergents led us to completely rethink the approach to bearing protection. Conventional sealed bearings attempt to prevent the ingress of water and other contaminants completely, but this is not fully possible under washdown conditions. So instead, we explored a design that turns the behaviour of detergent-water mixtures into an advantage. The approach involves a two-part seal design with multiple interlocking flanges that act as "gutters" in operation. An outer lip of conventional design protects the bearing from particulates and high-pressure water, but any

washdown fluids that pass the seal are channelled along the gutters under the influence of gravity and allowed to drain away without causing harm."

What about the bearing housings? How can they affect food safety?
"That depends on the level of ingress protection, hygienic geometry and surface characteristics. Voids or other features that can trap contaminants should be avoided. In food and beverage applications, the mechanical loads experienced by bearings are usually relatively low. That has encouraged the use of polymer composite housing designs, typically of glass-filled Nylon materials, which can easily be moulded into smooth shapes with desirable attributes such as large internal radii and sloping surfaces. But moulded housing need relatively thin walls and constant wall thicknesses, which creates a requirement for hollow designs and the use of internal or external reinforcing ribs. The voids inside these components are inaccessible, hard to clean and provide a good environment for dirt accumulation and microbial growth."

Not exactly what EHEDG guidelines prescribe...
"Exactly, so to retain the advantages of a moulded housing design while minimising the disadvantages, we decided to explore the use of over-moulding technology. This approach requires a two-step manufacturing process. First the structural parts of the housing are moulded in one operation, then a second material, in this case a flexible rubber, is injected to fill the voids within the part and act as a seal between the bearing housing and the structure of the machine. After evaluating multiple options, we settled on a polypropylene material, reinforced with long glass fibres to deliver the right combination of structural and moulding characteristics. Polypropylene is extremely resistant to chemical attack, and unlike nylon, it does not adsorb water. Additional advantages of the material include a very smooth surface finish under the right moulding conditions and good recyclability at end of life."

Have you done some testing and verification?
"Yes. The improved bearing and housing system has performed well in both in-house testing and evaluation at customer sites. On the test rigs, for example, bearings lubricated with the new grease and fitted with detergent channelling seals have run for 500 hours with continual exposure to a detergent water mix. In washdown tests, cleaning the new bearings required 30 percent less water compared to previous designs, largely because grease discharge has been eliminated. At one customer site, where conventional food and beverage bearings previously needed to be replaced every three months, the bearings using the new lubricant and seal combination have operated reliably for 18 months without relubrication now. And they are still in operation as we speak."

Fabio Falashi

Winner: Iv-Industrie

Engineering food safety: adopting the right mindset

EHEDG Content Contest Winner: Iv-Industrie
How do companies across the world make use of EHEDG to improve their products and services? Find out how engineering agency Iv-Industrie develops its hygienic design engineering services and applies hygienic engineering expertise in their engineering projects to advance the cleanability, productivity and sustainability of their clients' production facilities.

Regardless if you are involved in greenfield or brownfield development projects, the work of engineers can greatly affect the food safety aspects of production plants. So how can we ensure that hygienic engineering guidelines are effectively implemented? EHEDG Connects posed this and more questions to Deputy Director Jeroen van den Boezem and Senior Project Engineer Christian Hospers, who both work at Iv-Industrie, an engineering agency specialized in hygienic engineering.

How would you define good hygienic engineering?
Jeroen van den Boezem: "Good hygienic engineering incorporates food safety considerations in all engineering design aspects of a food production site, from the buildings down to the supporting facilities and process lines, and thus permeates all development levels. Good hygienic engineering is only feasible if the engineering agency has a thorough understanding of all the specific requirements and local food processing circumstances. Whether it concerns new constructions or upgrades for factories, warehouses, utilities and process installations - this understanding is always the foundation on which we base our engineering and consultancy services. We then provide all necessary expertise on hygienic engineering and design, food and process safety, production logistics, hygiene zoning, laws, regulations, standards and guidelines. By hygienic engineering, we enable food manufacturers to pragmatically develop effective and hygienic processes and applications."

How exactly do you determine these hygienic requirements?
Christian Hospers: "Oftentimes, clients approach us with an assignment to engineer a hygienic solution. The first thing we do then is to define what they mean by hygienic design. When they say it has to be easily cleanable, we keep on asking questions, because essentially, every installation is cleanable if you have enough time and resources. Together with the client, we determine their exact needs and requirements, until we have a measurable goal, like for example: this specific part of the process line needs to be cleanable within a time frame of two hours, after which there may only be a maximum number of microbes per square centimeter. Now that is a goal that can be validated, and a clear starting point for our services."

What's the best way to select a suitable engineering agency for a HD-project?
Van den Boezem: "Food and pharma companies are advised to first have a critical look at their own organization and situation, to determine the boundaries of their own expertise and the level of involvement they want in a specific project. Do you expect your engineering agency to primarily execute engineering work while following up on your own hygienic engineering and design standards? Or are you looking for an engineering partner that can challenge you to find new and better solutions that might have been previously unknown to you? It's crucial to be clear about functional requirements right from the start, and to also define hygiene requirements in measurable terms. Having a baseline measurement will help to do this, and of course an early mapping of logistic challenges will limit the impact of a project on ongoing production processes."

What do your engineers need to create the best hygienic design?
Hospers: "Good hygienic engineering starts off with a thorough assessment of all the clients' needs and functional requirements, because to create the best possible engineering design, we need to have a comprehensive overview of all related aspects. We don't need to know every specific technical detail of the food process itself. Our main task however

is to translate functional production requirements into a hygienic building and installation design that serves all functional and food safety goals. So the first thing that a good engineering agency will do is to ask the right questions, and to explain what specific information they need in order to develop the best possible engineering design. It's why we invest extra time and effort in creating effective project teams in the pre-engineering phase. The type of project determines how we do that. In a brownfield-situation, we start with carefully mapping the existing situation. At this stage, we don't analyze anything yet - we initially only collect information. We map the existing situation to know our spatial, functional and logistical boundaries."

How do you implement hygienic design guidelines in your engineering?

Van den Boezem: "Since many hygiene-determining aspects influence each other, many single engineering design choices together determine the final food safety performance of a plant. We often approach engineering projects from a building design level. Zoning is extremely important, and so are logistics and product and people flows. Zooming in on the different process line areas follows up after that. We always strive to minimize food safety risks in the early engineering design phases, for example by adapting the piping routes to optimize cleanability, and by performing maintenance work away from the production areas. And we consistently validate each engineering process step by applying a validation model. In this V-model, the first stage is the most important one, because it determines the requirements which are critical, e.g. which cannot be compromised upon."

What's your best advice for engineering agencies and their clients?

Hospers: "Hygienic engineering is more than a procedure that you can apply just by adopting EHEDG guidelines. To realize effective hygienic engineering results, everyone in the project team must understand the implications of each engineering decision for the hygiene and cleanability of the total solution. It requires a right mindset, based on experience and up-to-date knowledge. That mindset is not something that young engineers learn at their education institutes yet, so by enrolling them in EHEDG training courses, one can ensure that every engineer adopts this hygienic engineering mindset right from the beginning."

commercial food sanitation

Nicole Cammarata

Winner:Commercial Food Sanitation (CFS)

Conveying the message: food safety is a team effort

EHEDG Content Contest Winner: Commercial Food Sanitation
Working in the food industry comes with major responsibilities, and maintaining food processing equipment in a food-safe manner is certainly one of them. Anyone working in a food plant has a role in food safety and must be ready to take on their daily individual responsibilities to minimize food safety risks. Commercial Food Sanitation, an Intralox company, helps them to do that. Together with Intralox Application Engineers, CFS' Food Safety Specialists developed a FoodSafe Conveyance Workshop that covers all critical elements in the conveyor life cycle. Our questions are answered by CFS Global Training Specialist Nicole Cammarata.

How important is it for food producers to train their staff members?
Nicole Cammarata: "Training all team members that work on food processing lines is the most effective investment in food safety, because the majority of food contamination incidents can be traced back to incorrectly performed food handling, maintenance and cleaning practices. It's not enough for team members to know what they should do and how they should perform their duties. You may have a completely hygienically designed process line in place, but if your staff members don't know why they need to consistently follow up on every single hygiene rule, then there's always a risk that they won't comply in a fully dedicated way. That's why we like to start our workshops by illustrating how food safety is affected by personal behavior."

Why a workshop specifically aimed at conveyance systems?
"Conveyors connect different processing stages in a food factory environment. Therefore, it is critical that they operate reliably at all times, and that downtime is minimized. In food plants many conveyor belts are in direct contact with the food products, so in addition to operational excellence, conveyance systems also play a critical role in reducing food safety risks. In this workshop a cross-functional team at the customer's plant learns how to maximize the performance and life cycle of their conveyors and conveyor belts, while simultaneously optimizing food safety. The workshop engages members from different cross-functional teams (maintenance, food quality, sanitation, food safety, engineering, operations, and plant management) to join forces to foster their knowledge and improve collaboration towards a common goal. Consistently maintaining the best possible hygiene is a team effort, and optimum food safety can only be realized when everyone is on the same page. This workshop aligns people and processes with safe product requirements, and it all starts with good communication."

What's so unique about this workshop?
"The FoodSafe Conveyance Workshop aligns maintenance and engineering insights with a clearly defined food safety mindset. Prior to the workshop, the training team that consists of an Engineer and a Food Safety Specialist will walk your production lines. Real examples from the customer's facility are included into the training materials to build awareness and drive company-wide improvements while creating a passion for food safety.

"TRAINING ALL TEAM MEMBERS THAT WORK ON FOOD PROCESSING LINES IS THE MOST EFFECTIVE INVESTMENT IN FOOD SAFETY"

Together, they cover all critical elements in the life of a conveyor, including conveyor design, installation and production start-up, effective hygiene and sanitation, and developing a preventive maintenance program. The one and a half day on-site workshop is the first of its kind to align multi-disciplinary, key personnel on linkage between conveyor performance and food safety. It's a full program that

sparks enthusiasm amongst the participants, and oftentimes underlying procedural issues emerge from these discussions. Collaboratively adapting these procedures can have a very positive effect on daily food safety conditions."

How does it work in practice?

"Each of our trainers has his or her own industry specialization, from meat, poultry and seafood processing, via bakery and snacks, fruit and vegetables to ready-to-eat food products. In the workshop, Food Safety expertise is combined with engineering expertise regarding all the aspects of conveyors. Hygienic risks in the plant's processing lines, like foreign material contamination (FMC) or harborage points on equipment, are considered. Strong and weak spots are pointed out and used as topics for discussion in the workshops. The workshops themselves are very interactive, and throughout activities are included to reinforce theory. Then we apply the learnings in the plant at the end of every workshop; the participants leave with a self-developed and prioritized action list on the topics they will tackle collaboratively to improve conveyor performance and food safety in their plant."

What feedback do you receive? And what's next?

"Clients and trainees value the combination of food safety and engineering expertise and the focus on a preventive, proactive approach to de-risking their conveyors. The workshop offers new opportunities to exchange ideas and address challenges across departments. The value of obtaining new insights in the effectiveness of maintenance and sanitation routines is also appreciated. While we will continue to host training programs in our training centers in New Orleans, Amsterdam and Shanghai, and we are seeing a growing demand for these FoodSafe Conveyance Workshops right on the working floors of the global food industry. Excelling in food safety is the result of a continuous team effort, so we will continue to connect the expertise of specialists across the supply chain to deliver the best training and workshop programs on the market."

The FoodSafe Conveyance Workshop was also selected as a finalist of the Process Expo Innovation Showcase Award (October 2019 in Chicago).

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“NO FOOD FACTORY DEVELOPMENT PROJECT IS EVER A CUT AND PASTE JOB. A CLEAR HYGIENIC DESIGN MINDSET IS KEY, ROOTED IN WELL-ALIGNED PROCESS MANAGEMENT.”

Hugo Piguet, responsible for hygienic engineering and design at Nestlé

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“THE BEST FOOD SAFETY RESULTS ARE OBTAINED BY CONSISTENCY, IN OUR APPROACH TO HYGIENIC DESIGN, ALIGNMENT OF POLICIES, AND IN OUR CONSISTENT EXCHANGE OF KNOWLEDGE WITHIN MONDELĒZ INTERNATIONAL AND THE EUROPEAN HYGIENIC ENGINEERING AND DESIGN GROUP.”

Dr. James Hartley, Associate Director of Global Sanitation at Mondelēz International

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“WE ARE PROUD TO BE AN EHEDG COMPANY MEMBER, AND WE IMPLEMENT THE COMPREHENSIVE RANGE OF EHEDG PRODUCTS AND SERVICES TO OPTIMISE FOOD SAFETY AT OUR PRODUCTION SITE.”

Dr. Lars Gorzki, General Production Leader Sachsenmilch Leppersdorf GmbH

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“WITH THE COMBINED EXPERTISE OF SCHNEIDER WEISSE, GEA AND EHEDG, WE IMPLEMENTED HYGIENIC ENGINEERING AND DESIGN IN AN ESSENTIALLY VERY TRADITIONAL BREWING PROCESS, WITHOUT COMPROMISING ON TASTE.”

Hans-Peter Drexler, Brewmaster at Schneider Weisse

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“EHEDG IS A BACKBONE WHEN WE DESIGN ANY EQUIPMENT OR SOLUTION FOR FOOD PRODUCTION, AND IS PARTICULARLY IMPORTANT IN A PRODUCTION LINE FOR INFANT FORMULA.”

Håkan Blohmé, Project Director, Processing Solutions at Tetra Pak

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