EHEDG CONNECTS

CERTIFICATION
GUIDELINES
EXPERTISE
NETWORK
TRAINING

edition 3

Official Magazine of the European
Hygienic Engineering & Design Group

Productivity
Sustainability

BENEFITS OF HYGIENIC DESIGN!

Food Safety
Food Quality

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EHEDG CONNECTS CONTENT OVERVIEW

Growth, change, adaptation and continuation

Welcome in the golden era of hygienic engineering and design

Back in 2018, the cover of this magazine proclaimed the dawning of a golden era of hygienic design. Little did we know how prophetic this statement would turn out to be in 2020, in the year that a new virus made the whole world acknowledge the importance of hygiene in everything we do. Fortunately, the pandemic didn't affect the global food industry processes as severely as other industries, but this past year made one thing very clear: we need to continue to focus on hygiene in order to remain safe and fit for the future - and hygienic engineering and design plays a pivotal role in ensuring this.

The many volunteers and members of the European Hygienic Engineering and Design Group have always known that hygienic design is a necessity to safeguard food safety, food quality, and the productivity and sustainability of industrial food processing. It is why they continue to commit themselves to support safe food production by developing new guidelines, certification schemes, and training and education modules for the food industry, their suppliers and the learning institutes. They share and combine their valuable expertise to contribute to something fundamentally important: safe food for everyone in the world.

Covid-19 has of course had a great impact on our activities this year, and greatly limited our options to meet each other in person. Nevertheless, 2020 has been a successful year for EHEDG. Our community is growing steadily, within Europe as well as abroad, as illustrated by new EHEDG Regional Sections in Australia, South-Africa, Portugal and Chile. EHEDG is globalizing, because its practical membership offerings are globally valued by a growing number of EHEDG members. Many of them also contributed to significant changes that unfolded in the EHEDG organization this year, like the move of our EHEDG Secretariat from Germany to The Netherlands and the installment of an Operational Director to secure a smooth continuation of EHEDG services. We changed the election period for our Advisory Board and Foundation Board members for similar reasons. Since it proved to be impractical to replace all board members at the same time, we implemented a staggered approach with election periods from 2 to 4 years.

In the upcoming year, EHEDG will continue to grow and diversify, while keeping a clear focus on practical membership needs and industry developments. In 2021, we will focus on new collaborations comparable with those we established with GFSI, 3-A SSI and other communities that share our aim to propagate hygienic design across the world. We will continue to increase the membership value for food processing companies, big and small, equipment suppliers and scientific institutes - for example with new certification schemes, new (on- and offline) networking platforms and new (online) training modules. In doing so, we are strongly supported by all levels of the food industry supply chain. We are moving with the times and what's even more exciting: the times are moving with us. Welcome in the golden era of hygienic design. Enjoy and prosper.

Best regards,

EHEDG President Ludvig Josefsberg

EHEDG Vice-President Patrick Wouters:

The benefits of **hygienic engineering** and **design**

Back in 1989, when the EHEDG foundation was registered in the Netherlands, we could not have imagined that after three decades, the European Hygienic Engineering and Design Group would have become a global community, but it did. EHEDG is represented across the world, by EHEDG Regional Sections on all continents. EHEDG is truly emerging to become a globally recognized and leading authority in hygienic engineering and design.

It's a position that is built on countless hours of guideline development, training and educating the industry on the benefits of hygienic design and the guiding impact of the EHEDG Certification scheme on the food equipment industry. It's also a position that comes with major responsibilities: we have an important role to promote the benefits of hygienic design and to translate these into practical solutions for designers, manufacturers and users of food processing and packaging equipment.

Let's first agree on what those benefits of hygienic engineering and design are. The two most important benefits are defined as: optimised, consistent food quality levels and secure production of safe food, and secondly, as a beneficial additional effect: improved productivity and sustainability due to shortened cleaning times and intervals and minimised water and chemical usage.

When we look at these combined benefits, we conclude that hygienic engineering and design, significantly helps the complete food supply chain to protect its reputation, by minimising food safety and quality issues and the highly negative effects thereof.

This means that the responsibility for safe food products is a shared responsibility. At EHEDG we believe that sharing this responsibility is only possible when we are willing to share our expertise, best practices and opinions freely within a global hygienic design community. By acknowledging that none of us can do it alone, we have created an environment at EHEDG to discuss, to exchange knowledge, and to learn from each other.

Decision makers

The most active, most engaged EHEDG volunteers traditionally have a technical background. That is why EHEDG Guideline Documents are technically sound: they have been developed by technical experts who know what they are talking about. It is also why a growing part of the technical community within the food industry is becoming more and more convinced of the practical benefits of hygienic design. However, we believe that to further stimulate the application of hygienic design equipment, it's also useful to convey investment decision makers of the economic benefits of hygienic design. We therefore aim to address the beneficial economic effects of hygienic design on operating costs, and on the daily efficiency and reliability of production lines, including the attractive outlook on a vertical startup phase without costly validation issues.

Membership Value

At EHEDG we are aware that our members are looking for practical solutions. They are looking for answers to questions like: what level of hygiene do I need? How can I achieve a level of hygienic design that suits my process on a functional and an economical level? Do I need EHEDG certified equipment everywhere, or can I suffice by adapting certain procedures and practices? Our aim for 2021 is: helping our members in making the best strategic choices, by providing new guidelines, by sharing best practices and by compiling expert panels that can provide answers to all of these practical questions. A series of new projects will further increase the value of the EHEDG membership, such as a new hygienic design benchmarking support program, which will provide a methodology for our members to confidently determine the level of hygienic design needed for their particular application, and to correctly interpret the new GFSI Hygienic Design Benchmarking Requirements.

Another initiative is a strengthened collaboration program with 3-A SSI. The 3-A organization defines standards that are enforced by regulatory bodies. EHEDG does not issue standards, but develops guidelines on a wider scope than the current 3-A SSI portfolio. Now it's particularly important for those of our members that deliver equipment and food to the US market to conform to the requirements set by the FDA. We need to fully understand those FDA requirements. And since both EHEDG and 3-A SSI are leading organizations in hygienic engineering and design, we want to share our knowledge and expertise for the benefit of both. As an organization developing hygienic engineering and design guidelines, we therefore also need to know what various international standards are prescribing.

New EHEDG test method

In collaboration with the German Fraunhofer Institute, we developed a new test method to assess the real life cleanability of external equipment surfaces. We are happy to announce that as of now, equipment developers can have their components professionally assessed as to the effectiveness of their hygienic designs. This new method offers our members access to an easy evaluation process, according to a validated EHEDG test method. Based on the test results, companies can ascertain if their designs comply with the required hygienic design requirements. This is an important step towards a new, very reliable and accredited certification method. In 2021, we expect two more EHEDG Accredited Testing Laboratories in Europe to introduce this methodology. During 2021 we plan to have the full test method conforming with the EHEDG Certification program. 2021 is going to be a great year for EHEDG, and for all EHEDG members who strive to yield the benefits of hygienic engineering and design!

With best regards,

EHEDG Vice-President Patrick Wouters

EHEDG Treasurer & Secretary Piet Steenaard:

Strong foundation, healthy organisation, happy global family

It won't come as a surprise that it has been a very strange year for EHEDG. When 2020 started, everything still seemed normal: the EHEDG Sub-Committees were ready to deploy their activities in accordance with their plans and budget allocations, the trainers and speakers prepared for their trips to events and seminars, and everyone was eagerly looking forward to a wonderful EHEDG World Congress in Munich this year. Nobody could have expected that everything was going to come to a grinding halt, that almost all of the planned events would be cancelled or postponed, that it would be a year without educational meetings and hearty handshakes, and that most of our funds would remain to sit in the bank.

What did this year teach us? We learned to team up online and to zoom in and out of each other's home working environments with a mouse click. We grew accustomed to working together effectively while keeping our distance. We managed to get the work done, and that's what counts. Of course, we all long to meet each other in person again, but I expect less travel in the future, simply because we experienced how much we can do by collaborating online. It also means that we can spend parts of our travel expenses on other things, on new projects that increase the value of the EHEDG membership, like developing an Online EHEDG Academy for example.

Strong foundation

EHEDG continues to be a financially healthy organisation. This enables us to continually promote the benefits of hygienic engineering and design, to develop new EHEDG Guideline Documents, EHEDG Certification schemes and EHEDG Training and Education offerings. The financial resources also enable us to support our working groups and our regional sections. As the Treasurer, I don't want people to overspend of course, but I also don't like structural underspending, because underspending means fewer activities. Unfortunately, this is the case this year, but that will change in 2021, because EHEDG is initiating new projects that all EHEDG members will benefit from. For the transition of the EHEDG Secretariat from Germany to the Netherlands, we had to set up a new office in Naarden, with a new staff team, and that costs money of course, but all is within budget. No big surprises here.

'In the past 25 years, EHEDG has been like a second family to me'

For some of you, it will also not come as a surprise that in this same year, in which I celebrated my 74th birthday and my 25th anniversary of being the EHEDG Treasurer, I also decided to hand over my position to my successor. I believe this is the right moment for someone from a younger generation to take over this job, and I am particularly pleased that this new generation will be represented by Matilda Freund, who was elected as the new EHEDG Treasurer this November. Congratulations Matilda, and please allow me to thank you on behalf of all the EHEDG members for stepping forward to carry the responsibility that comes with this role. You've done a fantastic job as our EHEDG President before, and I'm sure you'll also be a great EHEDG Treasurer.

Healthy organisation

When I took on this role about twenty-five years ago, EHEDG was still a small organisation with a handful of members. We've all witnessed the continuous growth of this community since then, we've seen how it became more interesting to the industry, and I've always enjoyed contributing to this success. As EHEDG kept on growing, we had to adapt the structure of the organisation. That was a big task and very enjoyable to do, especially because I see the improvements now, how good it works for our members. I've always been involved in the operational side of things, like the Chamber of Commerce, and the Trademark Protection Procedures. Now that we have a new EHEDG Operations Director, all of these operational tasks go to him, which enables the new EHEDG Treasurer to focus on the financial aspects.

Happy global family

It has been a fantastic time. I plan to stay connected with EHEDG of course, since many of the people that I've met here have become good friends. EHEDG feels like a second family to me - a family of professional volunteers who share their knowledge and talents and experience for the benefits of hygienic engineering and design: food safety, food quality, productivity and sustainability of industrial food processing around the globe. I am proud to be a part of this community.

Best regards,

EHEDG Treasurer / Secretary Piet Steenaard

Introducing:

EHEDG Operations Director **Adwy van den Berg**

Since the early 1990's, Adwy van den Berg has been active as a marketing and sales professional in business and product development, and is used to working in an international environment. After having lived abroad, he and his family returned to The Netherlands, from where Adwy worked as the Client Services Director of the International Student Identity Card (ISIC) for 5 years before he became the first EHEDG Operations Director in the history of the European Hygienic Engineering and Design Group.

Adwy took on his new assignment by first setting up the new EHEDG Headquarters in Naarden (The Netherlands). This office takes over all tasks of the EHEDG Secretariat in Frankfurt (Germany) by the start of 2021. Adwy has a lot on his plate and started with seemingly impossible tasks, like replacing the irreplaceable Susanne Flenner and her team members, and ensuring a smooth transition of all the operational processes from Frankfurt to Naarden. The entire European Hygienic Engineering and Design Group wishes you lots of success in your new role. Now here are our questions:

Has working for ISIC helped you to be ready for your tasks here at EHEDG?

Adwy van den Berg: "Yes. ISIC is in many ways comparable to EHEDG. It's also a layered organization, a foundation with a societal purpose, run by many professional volunteers who love their business, and who work under a board of other highly committed volunteers. There are plenty of differences as well of course, and that's why I first started gathering information to develop a good understanding of the operational processes within EHEDG. I've been in close contact with the staff at the EHEDG Secretariat in Frankfurt and will continue to do so together with my new staff members, and I listen to as many EHEDG volunteers as possible. There's so much to learn, and frankly, my head was spinning a bit with all the information I had to process, analyze and categorize. That's why I am particularly happy Mirjam Steenaard, who has a lot of knowledge of EHEDG, and the new team members Cristina Annoni and Phoebe Wang, whose tasks, amongst others, will be to offer support to EHEDG members and working groups all over the world. "

What does your role as EHEDG Operations Director entail?

"My responsibilities are to first implement the transition of the secretarial processes from Germany to The Netherlands, including establishing the new office, recruiting of team members and securing knowledge transfer. Just like the Secretariat, we will help in establishing and managing working groups, technical committees and projects in cooperation with the chairpersons. Our role is also to support the EHEDG Board, the Executive Committee and Sub-Committees, and to assure that the values, the brand and activities of EHEDG are continuously communicated to the members and outside world. I understood from the Foundation Board that, regarding the latter, the new team in the Netherlands will get slightly different roles and responsibilities, all in due time. And last but not least, I will also be responsible for implementing the approved annual EHEDG budgets."

> "A new team, new tasks, new challenges and new opportunities."

Why did EHEDG decide to transfer the Secretariat from Germany to The Netherlands?

"For various reasons, one of the most important is that, for legal reasons and to guarantee the independence of EHEDG, it was necessary to disconnect the EHEDG from the VDMA. Although the team members of the EHEDG Secretariat in Frankfurt worked for EHEDG, they were still on the payroll of the VDMA. EHEDG first looked into possibilities to move the Secretariat to a new location in Germany, but after the existing team members of the Secretariat in Frankfurt decided to stay with their employer VDMA, and the fact that EHEDG is registered in The Netherlands, it was decided that the new EHEDG Headquarters should be based in the Netherlands as well. Unfortunately, that also meant that we had to let go of our highly valued and knowledgeable EHEDG Secretariat team members in Frankfurt. Susanne, Alexandra and Johanna, I am sure that EHEDG will properly honour your contributions at the next opportunity to meet. For me and my new team members: we are thankful for (and gratefully accept) your kind offer to continue to support us where necessary during the first months of 2021."

How did you approach the transition process and your new tasks?

"I first sat down with the staff members of the EHEDG Secretariat in Frankfurt, where Susanne Flenner, Alexandra Scheinost and Johanna Todsen brought me up to speed. I learned a lot about how they actively support the EHEDG community on a daily basis. Our Chief Certification Officer Mirjam Steenaard informed me on the certification processes, and where I drew up a list with all the responsibilities of the new EHEDG Secretariat, including the supportive administrative functions and support for new projects. The EHEDG Foundation Board asked me to take over some of their current operational board responsibilities, and to establish future partnership collaborations. I basically used the first weeks to inform myself thoroughly, to get a good understanding of the processes and expectations. I also managed to engage in a series of enlightening EHEDG Sub-Committee and EHEDG Working Group meetings, and best of all: I hired two excellent new staff members who I am happy to introduce to you. Their names are Cristina Annoni and Phoebe Wang, and together with Mirjam Steenaard we now have dedicated EHEDG officers responsible for e.g. the EHEDG memberships and certifications, for communication and web services, and for information management, while I myself will bear the end-responsibility for all the daily EHEDG Operations. Together we promise to give our best to offer great support to all EHEDG members and volunteers."

EHEDG Regional Development:

Welcome to the European (Global) Hygienic Engineering and Design Group

EHEDG has been expanding at a steadfast rate for many years now - and this year is no exception. Most of the new members find out about EHEDG through contacts with an EHEDG Regional Section in their vicinity. The engaged EHEDG Regional Section volunteers are happy to point them to the value of the guideline documents, the certification schemes, and the training and business network that companies gain access to once they become an EHEDG Company Member.

We owe great respect to these EHEDG volunteers, who reach out to, educate and convince their regional food industry stakeholders that the benefits of hygienic design far outweigh the initial investment efforts. They succeed in establishing, sustaining and growing their EHEDG Regional Section because they truly believe in these benefits, and they feel comfortable conveying these benefits because they've experienced them in their own daily practice. Improved food safety, food quality, productivity and sustainability - it's there for the taking. The stories in this EHEDG Connects Magazine are practical illustrations of that.

The international growth of EHEDG proves that the efforts of the EHEDG Regional Sections are effective, and that the practical benefits of hygienic design are convincing. Every industry story reminds us of the great diversity of food products and regional food processing demands in the global food industry, which is in fact a colourful patchwork of professionals, food cultures and technologies. EHEDG serves us all, and by connecting people and their expertise in this golden era of hygienic design, we contribute to safe food production, and to improved quality, productivity and sustainability of food processes all over the world. Thank you for your crucial contributions, dear EHEDG Regional Section volunteers!

Do you have an inspiring story to share that illustrates specific needs and best practices in your regional food industry? Please let us know via: **editorial@ehedg.org**

The global perspective: sustainable growth and expansion by Andrés Pascual, Chair EHEDG Sub-Committee Regional Development

How has Corona affected the activities of the EHEDG Regional Sections?
Andrés Pascual: "The crisis had a significant impact on the EHEDG Regional Section activities. Face-to-face meetings were cancelled and most events had to be postponed to 2021. On the positive side: many EHEDG Regional Sections started to develop and organise online events for the first time, and the reactions were positive, so online meetings became a new tool in our arsenal to reach regional food industry stakeholders and inform them about the benefits of hygienic design and the value of the EHEDG membership offerings."

Does EHEDG have global growth ambitions?
"We want to reach as many regional food industry stakeholders as possible, because we believe that our everyone deserves to know the benefits of hygienic design and of the EHEDG membership offerings. But growth is not a goal in itself. We aim for sustainable growth, that focuses on optimizing the EHEDG membership proposition for new members in the various new regions of the world where EHEDG is represented. EHEDG volunteers have recently established new EHEDG Regional Sections in Australia, South-Africa, Portugal and Chile, and we have established contact in nine more countries. We expect to welcome Israel, Slovenia, Canada, Vietnam and South Korea to become new EHEDG Regional Sections before our next EHEDG World Congress in 2022. The other countries that we are working on are Greece, Malaysia, Egypt and Morocco."

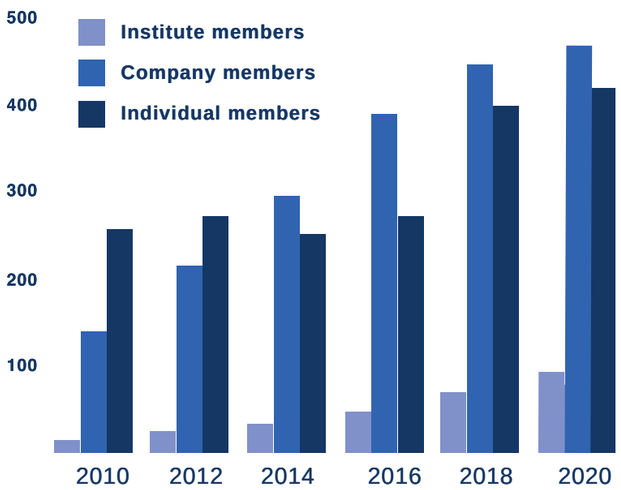
How are EHEDG Regional Sections most commonly established?
"That differs from region to region. Some regional sections started out with a member of a research centre or university, offering to reach out to regional industry stakeholders. In other regions, food industry members or consultants stepped forward and contacted EHEDG to ask us how to establish a new EHEDG Regional Section. There are specific requirements of course, and we make sure that regions won't overlap. We also actively approach EHEDG members in new regions to motivate them to establish an EHEDG Regional Section. Once the first contacts are established, people generally quickly recognize the value of developing a regional network. In the past decades, EHEDG has built up a solid reputation for itself, especially in the equipment engineering domain, and our online presence also helps to generate a global interest for EHEDG."

What are the plans and goals for 2021?
"Our first priority is to offer improved support to the existing EHEDG Regional Sections. We launched a new online tool that helps the regions with their budget requests, and we are compiling new communication packages to support the regions in conveying the benefits of hygienic design in their region. Since EHEDG is now represented in more than 30 countries, each with its own food culture and food industry background, the role of the EHEDG Regional Sections will be increasingly important to spread our message. Only the EHEDG Regional Sections can do that effectively, in ways that resonate within their regional cultural and industrial environments. Despite the drawbacks of last year, we are happy to see that many regions have planned activities for 2021, so I am optimistic that they will continue to work on their relations and collaborations with food industry stakeholders in their regions. Any EHEDG Regional Section out there that needs additional support may contact me or one of our EHEDG Regional Development members. We are here to help each other out."

With best regards,

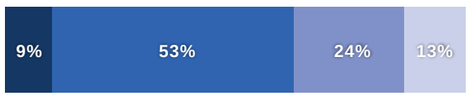
Andrés Pascual Vidal,
Chair of the EHEDG Sub-Committee
Regional Development.

Membership growth since 2010



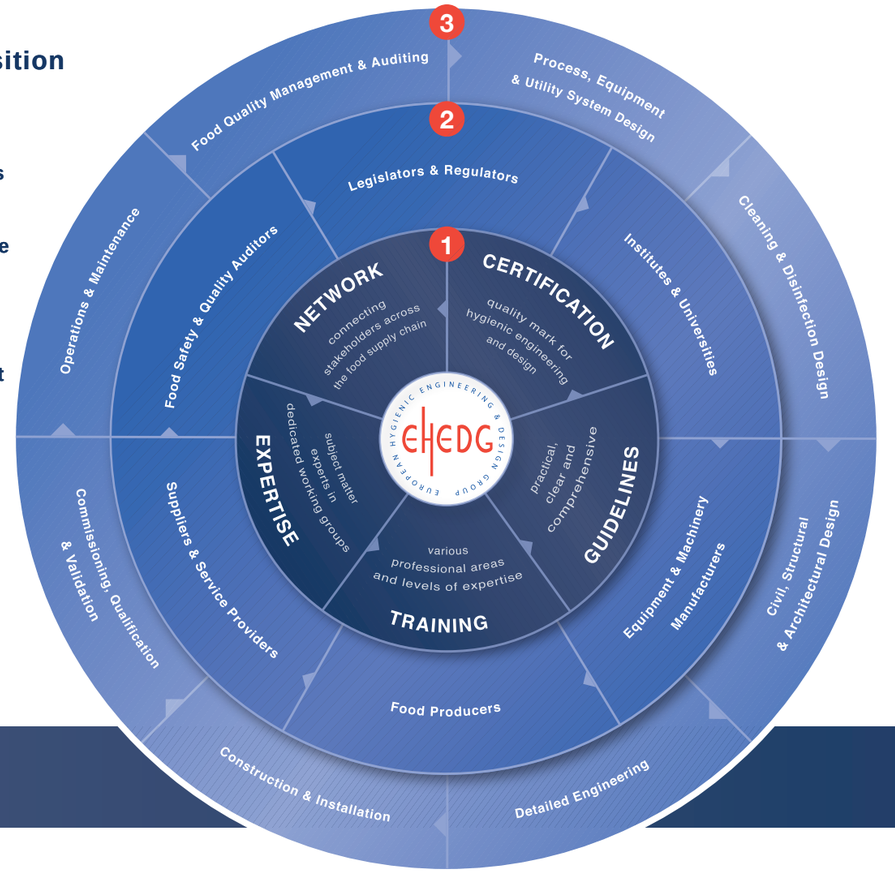
Memberships by category

- Food producers
- Equipment manufacturers
- Plant & process engineering
- Service providers



EHEDG value proposition

1. EHEDG offers these products and services
2. for the benefit of these stakeholders
3. for these development stages of hygienic food processing facilities



Membership developments and EHEDG value proposition in the golden era of hygienic engineering & design

Number of Regional Sections
by geographical area

Number of Company & Institute Members
by geographical area

What's cooking at EHEDG?

Development updates on Certification, Guidelines, Training & Education

As this historic year comes to an end, and face-to-face meetings continue to be restricted, the demand for EHEDG (re-)certification and training services is increasing, while new regulations require EHEDG Working Groups to continually update their guidelines. How will EHEDG manage to deliver? How will EHEDG Training and Education offerings evolve? And what's cooking in the EHEDG Working Groups and in the EHEDG Accredited Testing Laboratories? Our questions are answered by Andy Timperley, chairman of the EHEDG Working Group Certification, by Marc Mauermann, chair of the EHEDG Working Group Training and Education, and by Tracy Schonrock, co-chair of the EHEDG Sub-Committee Product Portfolio.

What are the effects of the pandemic on the EHEDG Certification services?

Andy: "We've managed to keep everybody safe at the EHEDG Authorised Testing Laboratories (ATLs), by coordinating the testing processes and by taking the required protective measures. The staff members of these laboratories are used to wearing protective clothing, and they are already familiar with applying sanitary practices as well. With a quick course on social distancing practices, we managed to tackle the challenges with regard to the testing laboratories fairly easily."

How have the restrictions affected the EHEDG Training and Education activities?

Marc: "EHEDG decided to put all training activities on hold right after the start of the outbreak, so no training events have been organised since March, and no face-to-face-meetings either. So, we put our time to good use in other ways. We made some changes to the organisational structure of the EHEDG Training and Education group, and we redefined the qualification requirements for our EHEDG Authorised Trainers. Meanwhile, we are also busy developing an EHEDG online training portfolio. This is an ongoing project, launched in cooperation with the EHEDG Communication Team. We are currently defining what EHEDG online training and e-learning should look like, and deciding on how to adapt existing and create new learning content for this. It's a rather complex project that takes time. After we've decided on our approach, we will come up with a proposal to the EHEDG Executive Committee."

What about EHEDG Guideline Development? What's cooking in the working groups?

Tracy: "As the EHEDG organisation is growing larger, we strive to standardise our procedures. It is also why the EHEDG Executive Committee, in conjunction with the EHEDG Advisory Board, implemented new rules for certification and guideline development. We want to have standardized procedures that don't change much over time, and we want to harmonise the guidelines to a user-friendly format. Crucial information should be consistently categorised in corresponding sections, so that readers can quickly refer to specific information across documents. Aligning the editorial formats is necessary to ensure that the EHEDG product portfolio can be effectively and efficiently applied in the workspace. Here at EHEDG, we work with extraordinarily capable volunteers. And capable and creative people very often want to do it their way, but EHEDG has a way too. We are setting up a guideline format framework that allows all working group members to focus on the important stuff: the contents of the guidelines. We enable them to apply their creativity to flesh out the guidelines in a well-structured and comprehensive way."

What's your footnote on that Andy?

Andy: "I agree with Tracy of course, and I also hope that all the guideline documents will now include certification requirements and key learning points for training. This will make it so much easier to align the guidelines with the EHEDG certification scheme and the EHEDG training program. The new guideline formats should not only offer the readers valuable insights into best practices, but also clearly define the additional certification requirements."

Marc, the EHEDG Training and Education organisation was also restructured. Why?

Marc: "We redistributed the responsibilities amongst our group members in such a way that we can more effectively deal with the various tasks that we have on our hands, from the new task to develop online training modules right through to the train-the-trainer program that we developed some years ago to periodically update the EHEDG Authorised Trainers on the latest developments. We recently held the first online version of this program, introducing the new five-year re-evaluation requirements. The combination of strict admission requirements for new applicants who aim to become EHEDG Authorised Trainers, the quality EHEDG Training and Education services is now also guaranteed by these new re-evaluation requirements."

Talking about renewal requirements: Andy, did the new recertification requirements affect the demand for the services of the EHEDG Accredited Testing Laboratories?

Andy: "Yes, they did. Due to the introduction of a new 5 Year re-certification cycle, the demand skyrocketed, and the ATLs did their best to ramp up their capacity, but some applicants have experienced delays. We tried to segregate the renewals so that the testing laboratories would not get overloaded but initial demand was extremely high. Our aim is, of course, to keep the customers happy, and to keep the ATLs happy as well, by enabling them to maintain a steady process. We tried to coordinate it in the best possible way to alleviate the pressure on specific ATLs, because the demand varied greatly between regions. In areas with many applications from equipment manufacturers, certification processes may still take a little longer than in other regions."

Tracy, can you give us your leadership perspective on this?

Tracy: “We need to educate the users of the EHEDG Certification Services. They have to understand that EHEDG is a business too: we’re in the business of certifying. Therefore, just like any other business, we have to adhere to our budgets, we have to deal with limited resources, and we need to create a common understanding that, as we grow larger and larger, some procedural aspects need to be regulated more strictly. Take the five-year renewal process for example, which is crucial to safeguard the integrity of EHEDG Certificates, which is in turn vitally important to the equipment users in the food industry. They are putting their trust in the validity of the EHEDG Certificates. So, a five-year recertification cycle helps to protect the integrity of EHEDG. Of course, the equipment producers initially didn’t like the new recertification requirements, and the way it was implemented by EHEDG, and we understand that. Many of us here are engineers too, and we know that engineers change and tweak designs, that they always think of new ways to make a process more efficient, and there’s nothing wrong with that of course, but we also have to acknowledge that some of those tweaks and changes can have an impact on the cleanability of components and installations. That’s why we all have to retest our equipment every once in a while, to make sure everything’s still okay and that the EHEDG Certificate is still valid.”

And what about certifying different product versions?

Andy: “Sometimes the initial certificate only includes one type of pump or one size of a specific valve, and then a company wants to get the best value from their Certificate and says: ‘Okay, we’ve got the EHEDG certificate for the two-inch version - now we want to certify all the other versions as well, from the one inch up to the six-inch version’. That results in a lot more work for everyone involved, because instead of just testing one piece of equipment, a complete range of equipment needs to be certified. We worked very hard to come up with sensible selection criteria that won’t cost the companies an arm and a leg to do dynamic Computational Fluid Dynamics (CFD) modeling. We’re trying to support our customers to effectively determine the maximum scope of their certified equipment.”

Marc, what are your next plans for EHEDG Training & Education?

Marc: “We plan to develop basic online training modules that should develop into an online representation of our basic hygienic design training. We stay away from the advanced training courses, because the trainers and trainees need to physically handle components for that interactive training. I also want to emphasise that these new online training modules are not intended to replace the face-to-face training sessions in any way. Our in-class hygienic design training offerings will remain to be the gold standard. The online training modules are complementary to that gold standard.”

What’s the idea behind the new test method for outer surfaces?

Andy: “EHEDG Certification traditionally applies a range of test methods for cleanability and aseptic capability of closed equipment, such as pumps, valves, sensors and other components that are cleaned/sterilised in place. However, we didn’t have a test method for the cleanability of the outer surfaces of components and that was an area of increasing interest for our members, particularly if equipment is used in open food processing. It’s been a big challenge to develop a method. So it’s not only to support the Certification Scheme, but it’s also to improve the credibility of the Certification Scheme, because at the moment, the only certification criteria that we have are the black and white requirements in the guideline documents.”

Tracy, what was the initial reason to develop this new method?

Tracy: “The development of this test was instigated by the food and processing industry - many of them being EHEDG members. The manufacturers want to address their production facilities in a holistic manner. Certified equipment is just a means to a greater goal to them. They want their entire processing installations and processing areas to be very effectively cleanable. The Test Centre at Fraunhofer IVV is already providing the test to the industry as a credible design evaluation tool and will assimilate the required data for gaining ISO accreditation for the method. It will then be possible to make this test available at EHEDG ATLs and incorporate the method within the Certification Scheme, hopefully in the near future.

How does this test method relate to the directives in EHEDG Guideline Document 8?

Tracy: “There are some similarities with the current testing procedure for the inner surfaces, because this method follows the directives of EHEDG Guideline Document 8, which contains some general hygienic design principles for outer surfaces. However, despite these similarities, this method focuses on a completely different set of parameters. This test method is especially valuable for developers of equipment that’s used in open food processing. Wherever food products are directly exposed to the processing environment, everything in that environment must be considered to have a potential impact on food safety and quality, because anything that comes off the exterior of a pump, or a support leg, or a control cabinet can be aerosolized into the environment and eventually settle on exposed product.”

Marc, does your group have any plans to further align the contents of their training and education offerings to the ever-changing needs of the industry?

Marc: “We are updating existing materials, we develop new presentations and we keep adding new topics and new training formats. And we’ll develop animations and new content for our online training offerings. We analyze trends and aim to develop specific training content for different focus groups, scalable and flexible training courses, depending on the needs of the students or the focus groups. We are always interested in hearing what those needs of our EHEDG members are.”

What are all the different working groups aiming for together? What is the common goal?

Marc: “The expert discussions within the working groups lay the foundation for the guidelines, the certification requirements and the training and education services. All the products and services that together define the value of the EHEDG membership are based on sharing knowledge, exchanging views and reaching consensus on how things should be done to optimise food safety, food quality, productivity and sustainability in food processing environments. New collaborations between the various EHEDG Working Groups will therefore further enhance the EHEDG membership value.”

Andy: “We’re trying to be as effective as possible by pooling our knowledge from the industry, from the equipment manufacturers, from the experts, from the regulatory bodies and bringing everybody together to sing off the same hymn sheet with a clear goal to improve global food safety. That’s always been the goal of EHEDG, to protect the health of the food consumers. So, if we can do that in a well-structured way, with transparency, good communication, good dissemination, good training, then we are achieving our goal.”

Tracy: ”It’s all about food safety, productivity, sustainability, and the reputation of the food processing companies. And all of this is related to hygienic design, isn’t it? As Andy said, it all works towards making your brand so recognizable and so acceptable for all the purposes, whether it be quality, flavor, safety. It’s about brand integrity for the industry.”

EHEDG Sub-Committee Communication Team:

Connecting people and their expertise increases membership value








We are the EHEDG Sub-Committee Communication Team, and two years ago, we embarked on a venture to increase the visibility of the European Hygienic Engineering and Design Group to reach a wider audience of food industry stakeholders. We set up online communication platforms, developed magazines, brochures and leaflets, and we started publishing articles, video reports and interviews on the EHEDG website, LinkedIn, Twitter and YouTube channels.

We managed to realise our first goal: establishing a high-quality group of online followers for our publications. The group of food industry professionals that follows EHEDG online keeps on growing steadily, from 200 when we started out to the current 6000 food processing and food processing equipment professionals that are eager to hear what EHEDG has to say about hygienic engineering and design. So now is the time to share your knowledge and views, in EHEDG Working Groups, and on our EHEDG Publication Platforms. Welcome in the golden era of hygienic design!

Questions to answer

EHEDG wants to be a lively community that actively promotes the benefits of hygienic design by offering hands-on support to the industry. That's why our next goal is to actively connect food industry stakeholders with EHEDG subject matter experts. In the coming years, we plan to find new ways to unpack the wealth of expertise available within this growing expert community, and we need your support to do so successfully.

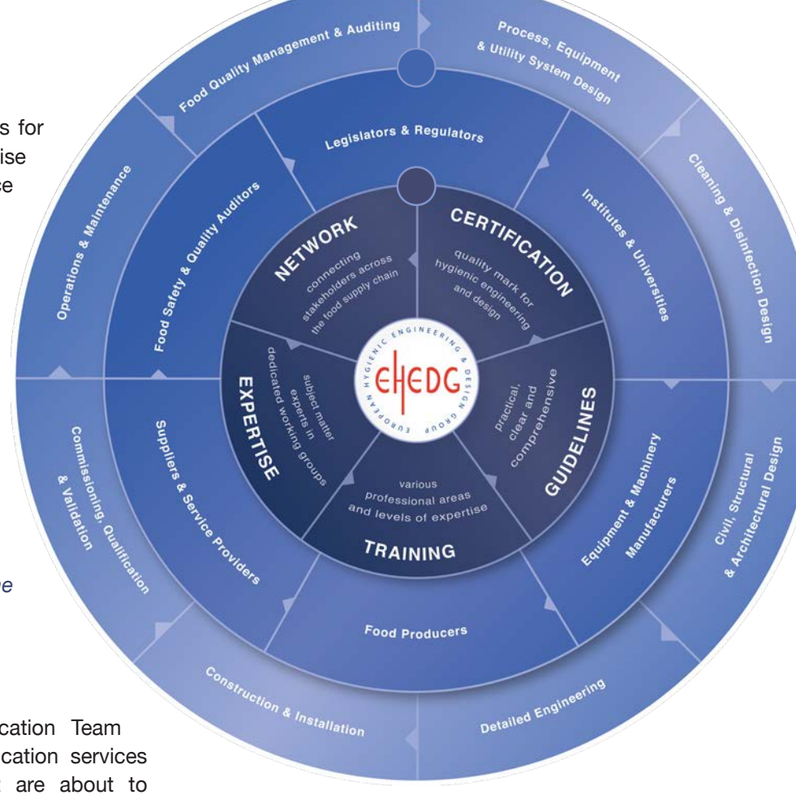
Our audience is looking for practical answers to practical questions about hygienic engineering and design - questions like: what level of hygienic design do I need for my application? How do I reach that level? Where do I start? How do I apply the guidelines, certification and training offerings to optimise the food safety, productivity and sustainability of my food processes? If you can provide clear answers to these questions, contact us. If you can share best practices that illustrate the value of hygienic design, contact us. If you are passionate about a new innovation that can help EHEDG members to move forward, contact us at editorial@ehedg.org.

Tips to get us started

Please have a good look at the illustration. This is what we call the EHEDG Membership Value Wheel. The inner ring shows the EHEDG membership services, followed by a ring with all the stakeholders that benefit from these services in various stages of food equipment development processes (depicted in the outer ring of the wheel).

Where do you fit in?

Did you contribute to an EHEDG Guideline Document and could you help an equipment manufacturer to apply that guideline in an engineering process? Why not share your expertise in one of our future Q&A sessions? Or are you an EHEDG Authorized Trainer who can lead an online masterclass for food producers striving to optimise their operations and maintenance results? Why not let us know how you apply hygienic engineering and design? Send your contact info to editorial@ehedg.org and we might well be able to connect you with your future audience.



The EHEDG Value Wheel puts all EHEDG Product Portfolio services into a practical industry-related context framework. It conveys the practical value of the EHEDG services and defines the content categories related to the various target groups.

Supporting Working Groups and Sub-Committees

The EHEDG Sub-Com Communication Team currently offers a set of communication services for EHEDG Working Groups that are about to publish a new guideline update. These existing efforts are aimed at generating interest and media exposure for the new guideline documents, so that more food industry stakeholders take notice of the practical value of each new official EHEDG Guideline Document. We now plan to expand this communication support by connecting food industry stakeholders with EHEDG subject matter experts who can answer their practical questions. Simultaneously, we are developing an editorial support service for all active EHEDG Working Groups to free them from the burden of tedious wordsmithing, which often consumes big portions of the working group meetings. By making use of this editorial support during the guideline development process, the working group members can focus entirely on discussing the actual contents of their guideline. We expect this to significantly speed up the guideline development processes. Last but not least, we actively support the other EHEDG Sub-Committees (EHEDG Sub-Committee Regional Development and EHEDG Sub-Committee Product Portfolio) in their communication activities.

Future steps: new communication goals and projects

In the coming years, we continue to show to a growing audience that EHEDG helps to make smarter engineering, design and investment decisions for improving food safety, food quality, productivity, sustainability, and consequently the profitability of industrial food processing. We will deliver hands-on, practical information and provide communication support for a number of projects, like the development of new online training modules, new publication materials, online expert platforms, and a more user-friendly EHEDG website. A guideline search engine to unlock the valuable information in the EHEDG Guideline Documents effectively is also in progress of being developed.

We are happy to contribute to the important societal mission of EHEDG to support food safety, food quality, productivity and sustainability, and to present EHEDG to the world as the leading expertise community in hygienic engineering and design. To do that effectively, we need your support, your expertise and your engagement. The first step is to get in touch with, so please do so, by sending us an email at: editorial@ehedg.org. We are happy to connect you through.

With best regards,

EHEDG Sub-Committee Communication

Susanne Flenner, Karl-Heinz Bahr, Lammert Baas, Michael Evers, Cristina Annoni, Bengt Eliasson, Claudia Baenen, Kees van de Watering

Significant boost for hygienic design

New GFSI benchmarking requirements underline necessity for hygienic design

Rick Heiman, Board Member
3-A Sanitary Standards Inc. (3-A SSI)

With the 2020 publication of two new hygienic design benchmarking requirements, the Global Food Safety Initiative (GFSI) paves the way to incorporate hygienic design in food safety management programs. What practical implications can be expected for food processing companies and their equipment suppliers?

Rick Heiman, Board Member of 3-A Sanitary Standards Inc. (3-A SSI) and Patrick Wouters, Vice-President of the European Hygienic Engineering and Design Group (EHEDG) agree: “GFSI deserves much acclaim for taking this important step forward. The new GFSI hygienic design benchmarking requirements demonstrate that hygienic design plays a pivotal role in safeguarding food safety, food quality and productivity across the food supply chain.”

3-A SSI and EHEDG

3-A SSI: The first standards known as ‘3A’ were developed in the 1920s and 3-A SSI today consists of the associations representing U.S. regulatory sanitarians, processors and equipment fabricators. 3-A SSI maintains a large inventory of standards accepted by both USDA and FDA for virtually all types of major food processing equipment and accepted practices for processing systems. 3-A SSI also oversees a voluntary program for use of the 3-A Symbol on conforming equipment.

Website 3-A SSI: https://www.3-a.org/

EHEDG: Founded in 1989, the European Hygienic Engineering and Design Group encompasses members of different stakeholder groups in the food supply chain and has regional sections in Europe and other regions in the world. Its main goals are the promotion and improvement of hygienic design and engineering solutions in all aspects of food manufacture. EHEDG has active working groups for developing and publishing guidelines, develop training materials, organize training sessions, and certify processing equipment components through third party testing facilities.

Website EHEDG: https://www.ehedg.org/

Significant boost for hygienic design

New GFSI benchmarking requirements underline necessity for hygienic design

Patrick Wouters
EHEDG Vice-President

Current status and beyond

The new GFSI benchmarking requirements for the Hygienic Design of Food Buildings and Processing Equipment are published in 2 scopes: JI for building constructors and equipment manufacturers, and scope JII for building and equipment users. Heiman: “JI and JII address both food processing companies and food equipment providers, thus contributing to a better communication between end-users and developers of food processing sites and equipment.”

Wouters (EHEDG): “In recent years, hygienic design guidelines have been widely adopted and applied by food processing companies and their equipment suppliers, which contributed to improved cleanability of food processing lines and environments. But not all food industry stakeholders are sufficiently aware of the necessity of hygienic design yet.

Since the GFSI benchmarking process has been adopted by the global food industry, these new benchmarking requirements are bound to change how hygienic design is integrated in food safety management systems. Consequently, hygienic design will assume a central role in food equipment development processes. We also expect this to have a harmonizing effect on certification systems, since these new hygienic design benchmarking requirements set a clear and unified baseline for all standards.” Heiman (3-A SSI): “Last but not least, we expect these new GFSI hygienic design benchmarking requirements to encourage more food industry stakeholders to look into the proven benefits that hygienic design brings to the table: safe food production, more productive and sustainable food processes due to minimized cleaning intervals, and spotless reputations for responsible stakeholders in the global farm to fork food supply chains.”

EHEDG and 3A-SSI will continue to assist food industry stakeholders and help them understand how to comply with all requirements with regard to the hygienic engineering and design, fabrication, installation, maintenance and cleanability of facilities and food process equipment. For more information, please check out the position paper that 3-A SSI and EHEDG published on this topic, that can be found on the websites of EHEDG (www.ehedg.org) and of 3A-SSI (www.3-a.org)

EHEDG Guideline Documents

New publications, developed by experts, setting new standards for all

New publications
The final publication of a new EHEDG Guideline Document is always a special occasion, which deserves our full attention. That's why EHEDG Connects provides you with an overview of all the new EHEDG Guideline Documents that were published after the previous edition of this magazine. You are cordially invited to benefit from the wealth of expertise that these guidelines contain, to optimise the designs of your process equipment and by doing so, to improve the food safety, productivity and sustainability of your and/or your customer's food processes.

Developed by experts
Each year, hundreds of engineers, scientists and food safety experts contribute their valuable time to EHEDG by developing new EHEDG Guideline Documents. They meet up with their fellow EHEDG Working Group members to discuss practical industry needs, the latest developments in hygienic design and what to include in the new guideline updates.

Setting new standards
EHEDG Guideline Documents are also the basis for the EHEDG Certification and EHEDG Training services. Since every single EHEDG Guideline Document needs to be scrutinised in a thorough peer review phase, it's not surprising that the EHEDG Working Group Members have a lot to discuss, check and double check before submitting their new EHEDG Guideline for publication.

For all
One of the great benefits of being an EHEDG member is to have free access to the fruits of all these continuous efforts and hard work, that can be found in a growing number of EHEDG Guideline Documents (55 in 2020, and counting) to help food industry companies and their suppliers to innovate, integrate and apply hygienic engineering and design equipment, for the benefit of food safety, productivity and sustainability.

EHEDG Guideline Doc. 14
Topic: Requirements for Valves in Hygienic and Aseptic Processes, Third Edition
Working Group Chair: Ulf Thiessen

EHEDG Guideline Doc. 17
Topic: Hygienic Design of Pumps, Homogenizers and Dampening Devices, Fourth Edition
Working Group Chair: Ralf Stahlkopf

EHEDG Guideline Doc. 25
Topic: Mechanical Seals for Hygienic and Aseptic Applications, Second Edition
Working Group Chair: Thomas Böhm

EHEDG Guideline Doc. 34
Topic: Integration of Hygienic and Aseptic Systems, Second Edition
Working Group Chair: Dr. Roland Cocker

EHEDG Guideline Doc. 37
Topic: Hygienic Design and Application of Sensors
Working Group Chair: Dr. Holger Schmidt

EHEDG Guideline Doc. 54
Topic: Testing of Hygienic Weld Joints, First Edition
Working Group Chair: Peter Merhof

EHEDG Guideline Doc. 55
Topic: Hygienic Design Requirements for Bakery Equipment, First Edition
Working Group Chair: Dr. Jürgen Hofmann

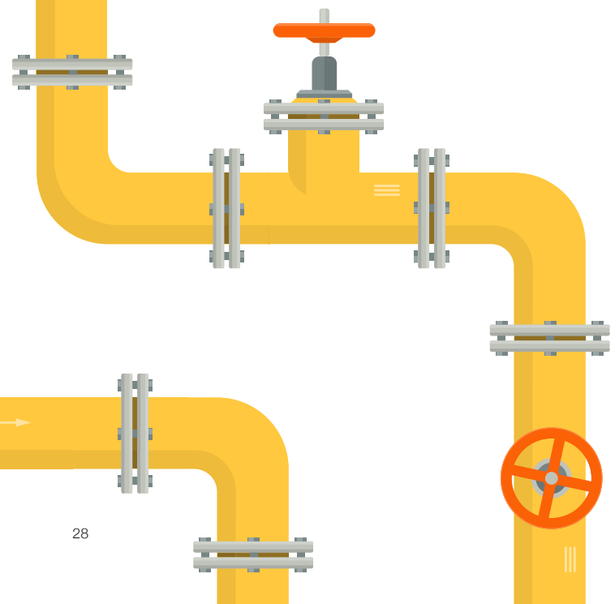
EHEDG Guideline Document 14

Requirements for valves in hygienic and aseptic processes

From the early days of batch processing to our highly efficient continuous production processes - valves have always played an important role in food processing. Valves determine the directions of product flows, they control flow rates and pressure levels, regulate mixture intake, enable product sampling and protect our physical safety on the working floor. They also greatly affect the food safety, food quality, productivity and sustainability of our food processing lines. That is why we better engineer, design, install and maintain our valves in accordance to the newest EHEDG Guideline Document 14. Valve specialist and chairman of the EHEDG Working Group that developed this new guideline update Ulf Thiessen shares his water-tight arguments for applying these updated requirements for valves in hygienic and aseptic processes.

This is edition 3 of EHEDG Guideline Document 14. How has it changed over time?

Ulf Thiessen: “The first edition of this guideline was published a long time ago, but the basic design approaches for valves haven’t changed very much since then. Modern valves still comprise a geometrical valve structure and a gasket, and the cleanability of a valve is mainly determined by how a designer integrates the gasket in the valve. However, the types of gasket materials used to adapt to new types of liquid food types and cleaning chemicals have changed significantly. In this document update, we added some valve types that haven’t been included in the previous version, like the butterfly valve, which has not been considered to be an hygienic valve before. Another valve type that was not clearly stated in the previous guideline edition is the ball valve. It made sense to include the requirements for valve types that are widely used in the food industry. We also adapted the structure of the guideline to make it more user-friendly. We aligned it with the latest EHEDG format requirements which were introduced to harmonise the guidelines to enable more efficient cross-referencing.”



Have the practical needs of the equipment users changed since the last update?

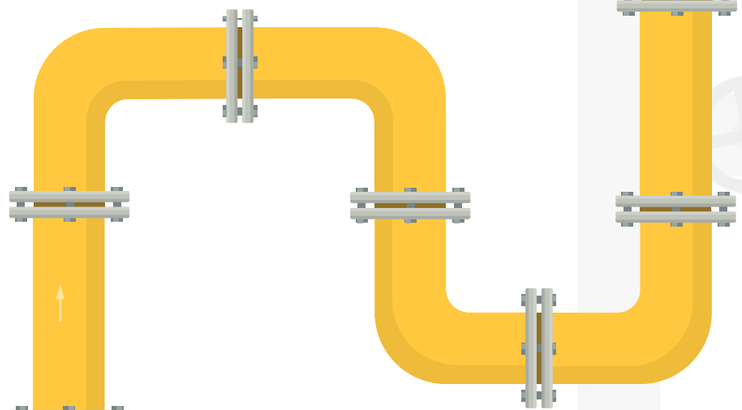
“Food processing companies want to be able to perform their cleaning-in-place processes as effectively and efficiently as possible. In other words: they want to optimise their cleaning performance and minimise their cleaning intervals without compromising on food safety, food quality and sustainability aspects. Since a typical food processing line contains many valves, and since valves are more complex in structure than regular pipes, their impact on cleaning performances can be substantial. The way that valves are engineered, designed, integrated and maintained makes all the difference with regard to the cleanability and consequently the performance of food processing lines. It is why the demand for hygienic design valve equipment keeps on increasing. EHEDG members use our guidelines to learn how to correctly approach a valve design in order to obtain a tight and functional valve.”

How can we be sure about that cleanability performance?

“Since valves are almost never dismantled anymore, design engineers have to make sure that their valve design is tight, that the gasket is neatly integrated in the valve design, and that the valve doesn’t contain any internal dead spaces that will affect the cleanability of the valve. During the development process, they might apply computational fluid dynamics simulations to verify the cleanability of their design options. And then we have the process engineers who need to have an understanding of the cleanability in the wider context of their comprehensive process design: the way that specific valves affect the cleanability of the rest of their closed processes. This document is not tailored to their needs, because this is not a design handbook for process engineers, but rather offers an insight in the minimum design requirements for valves. When valve equipment producers submit their prototypes for EHEDG certification, the EHEDG Accredited Testing Laboratories will compare the cleanability of the valve with the cleanability of a reference pipe that has certain predefined surface characteristics. For the end users of valves, the EHEDG Certificates offer the best guarantee available, but the way the valves are applied can also greatly determine the performance. If a producer, for example, decides to use a valve to process a very sticky product, everything might change, so it’s not only the valve developer, but also the system integrator and the end user who carry the responsibility with regard to food safety.”

How are the contents of this guideline related to other EHEDG Guideline Documents?

“As stated above, the scope of this guideline is clearly limited to the valve designs and not so much to the integration of valves in food processes. For that, we refer to other EHEDG Guideline Documents that focus on hygienic design of closed equipment for the processing of liquid food (Doc. 10), hygienic pipe couplings (Doc. 16), the design of elastomeric seals (Doc. 48) and the recently updated EHEDG Guideline Document 25, which focuses on the design of mechanical seals for hygienic and aseptic applications (see article in this magazine). All of these EHEDG Guideline Documents combined help equipment developers, system integrators and end users of valves to develop a comprehensive understanding of the correlations between valve designs and their cleanability. All EHEDG Working Groups work hard to make sure that the documents are updated regularly, and we are confident that this new guideline update will help our members to benefit from hygienic design and reach the highest levels of food safety, food quality, productivity and sustainability.”



EHEDG Guideline Document 17

Hygienic design of pumps, homogenizers and dampening devices

Pumps, homogenizers and dampening devices are widely used in the global food industry. That is why EHEDG has been developing hygienic design guidelines addressing these devices for a long time. Earlier editions of EHEDG Guideline Document 17 were published in 1993, 2004 and 2011, and in 1998, EHEDG President Huub Lelieveld appointed Ralf Stahlkopf as the first chair of the EHEDG Working Group Pumps, Homogenizers and Dampening Devices. So by now, Ralf Stahlkopf is more than well equipped to answer any of our questions on the development process, the content and the practical value of this comprehensive guideline update.

How did the scope of this guideline evolve over the years?
Ralf Stahlkopf: “This fourth publication still holds the same title as the first edition published almost 30 years ago. The first two editions focused almost entirely on rotary pumps, but right from the start, the working group members were aware that the document should also contain hygienic design guidelines for homogenizers and dampening devices. These devices were firstly included in the third edition and are now again addressed more in detail in this most recent guideline update. This was a sensible step to take because these device types belong to the same family components, with similar hygienic design requirements. The 2020 edition now clearly points out where hygienic design requirements of pumps, homogenizers, dampening devices and other components like hygienic valves differ from one another. It now also contains updated definitions, an illustrative oversight of pump materials (EU, USA) and a fresh set of up-to-date practical examples that help readers to get a quick grasp of the major key learning points.”

How relevant is this guideline for food processing companies and equipment producers?
“Adhering to the guidelines in this document creates the right prerequisites for hygienic food processing and consistent product quality levels. It also helps equipment suppliers to develop components that are at least as cleanable as regular piping components used for liquid food produce.”

Did the combined expertise of your working group members add value to this guideline update?
“This EHEDG Working Group comprises highly qualified professionals who are active in various food industry working fields, from research and development to process, product management and distribution departments. The members of this working group develop and apply the components mentioned in this guideline in the food industry as well as in an academic and institutional context. Once completed, this guideline was peer reviewed by four independent experts, whose comments were consequently incorporated in the final publication. All in all, hundreds of working hours are invested in developing this guideline and I would like to thank all working group members and the EHEDG Secretariat in Frankfurt for their continuous support and contributions.”

Did your WG encounter new challenges (discussions) when developing this guideline? If yes, can you highlight one to illustrate the way you reach consensus?
“One of the main discussion points focused on the flow patterns within the components that result in different cleaning and surface material requirements. The cleanability, as well as the production costs of these components are very much determined by the shapes, the geometry, surfaces and flow patterns. We managed to develop hygienic design guidelines that combine these aspects. We applied these guidelines in an hygienic design component that was tested in an EHEDG Accredited Testing Laboratory. Since the test results confirmed the effectiveness of the approach, it also created consensus amongst the working group members.”

Did you succeed in realising the goal that you initially set for this guideline?
“I believe we did. This guideline is developed to guide and support food equipment users and developers to hygienically design pumps, homogenizers and dampening devices and food processing lines. It advises them how to incorporate these devices in such a way that fluid food products can be safely and hygienically transported, produced and bottled. Simultaneously, this guideline can also help to minimize the impact of components on the quality of food products as well as optimising the productivity of processes due to minimised cleaning time intervals. It’s up to the EHEDG Members now to experience the practical value of this guideline update and benefit from it.”

EHEDG Guideline Document 25

Mechanical Seals

No leaking, no squeaking, no compromises in food safety

Expectations create pressure, and since the last mechanical seals guideline was published way back in 2002, the rising expectations for the new EHEDG Guideline Document 25 put quite some pressure on the members of the EHEDG Working Group Mechanical Seals to deliver a valuable new guideline update.

EHEDG Guideline Doc. 25 proves that they succeeded. It's a comprehensive guideline document that offers great practical value to food processing companies and their equipment suppliers. Thomas Böhm, Head of Engineering Processes & Support at EagleBurgmann Germany GmbH & Co. KG, and the chair of the EHEDG Working Group explains how the expert group members tackled various challenges to get the work done.

Congratulations for reaching this milestone

Thomas Böhm: "Thank you. We are very happy and excited that EHEDG Doc. 25 is finally available. It's such a comprehensive update that it can basically be considered as a completely new guideline. The first edition had 15 pages and nine illustrations, and this one has 82 pages and 140 illustrations. So many thanks to our co-chair Susanne Berezin and all other EHEDG Working Group members for this tremendous achievement."

What was your main goal while developing this guideline?

"In this guideline, we address the functionality, hygienic design and the cleanability of mechanical seals. Of course, mechanical seals are applied in various machine types, with different types of seal chambers that need to adhere to different hygienic design principles. It's a huge difference, for example, whether you deal with a top-drive or a bottom-drive machine. This new EHEDG Guideline Document 25 helps to find the best possible mechanical design for different types of equipment. Another challenge was how to address the variety of applications, because different types of food processes deal with different operation conditions. You see, sealing milk really demands for a different approach than sealing whiskey. And this guideline is not restricted to mechanical seals alone. It also contains seal auxiliary systems, which by the way also come in many variants. Writing and compiling a clear and comprehensive hygienic design guideline for all of these variants was our main goal. It's up to the EHEDG members now to judge if we succeeded in meeting that goal."

Why does this guideline differentiate between primary and secondary seals?

"The primary seal is established by the seal faces of the mechanical seal that slide against each other, but we also have to attend to other possible leak paths and seal them off with secondary seals, which can be O-rings or form elements. The proper functioning of a pusher-type mechanical seal for example is strongly determined by the design of its dynamic secondary seal. These secondary seals also need to be engineered and designed in accordance to hygienic design guidelines to make them easily and completely cleanable. Some seal designs are prone to accumulating deposits, and are therefore unsuitable for hygienic applications. There's been much discussion going on in the food equipment industry regarding the operational and hygiene risks of these secondary seals. With EHEDG Guideline Doc. 25 we aim to clarify how both primary and secondary seals can be designed and applied to minimize food hygiene and food quality risks."

How are all of these parameters categorized in this guideline?

"Three main tables in this guideline summarize the most important parameters. The first one addresses the different seal types. It shows the basic sealing principles for a mechanical seal and their corresponding equipment parts, and helps you to find your way around in the rest of the guideline. The second table offers information on the possible configurations, including possible single and dual arrangements of mechanical seals. The third one deals with the design concepts, which determine how a mechanical seal is connected to the shaft and housing of an equipment. Mechanical seals can be installed part by part or as a pre-assembled cartridge unit. So we have the main drivers, the seal types, the arrangements, and finally, the design concepts. The general idea was to first give a basic understanding of mechanical seals, their features and different design variants. In the second step, we venture deeper into the details and have a closer look at all these variants and their suitability for hygienic applications. Since applications are very specific and lead to many variants, this guideline helps you to find the most suitable options."

Have there been any innovations since the first edition of this guideline document was published back in 2002?

"Certainly, especially with regards to materials, since the requirements regarding the material safety for food applications have changed over the years. We even address technologies which might still be conceived as being exotic for food applications, like gas lubricated mechanical seals, which slowly find more applications in the food industry."

What's the practical value of EHEDG Guideline Doc. 25?

"As the number of pages already shows, there's lots of detailed information and we have lots of illustrations because we thought an illustration helps to understand the details better than just text. So that's one aspect: the variety, the sum of information and the self-explanatory illustrations. We also included a checklist for a quick access and overview of all the major attention points and a set of sample drawings of real designs. In the main body text, you'll mostly find generic sketches that focus on specific details. In the annex you'll then find examples of real mechanical seals and seal auxiliary systems in the field, as they are applied in food applications to give you a better understanding. And finally, we also added a data sheet to help readers to be sure that all important details are covered and to optimize the communication between the users and seal manufacturers. We all hope that it helps to create a better understanding of mechanical seals and to promote the best possible application of mechanical seals in industrial food processing environments."

Free to download for all EHEDG members after login on the EHEDG Website www.ehedg.org/guidelines.

EHEDG Guideline Document 34

Integrating Hygienic Entities

The devil is in the detail. This particularly applies to hygienic processing. Regardless of whether you work for a provider of food-processing equipment, a consultancy in food-safety or sustainability or a food-processing organization - as a hygienic processing professional you know that a chain is only as strong as its weakest link.

But it will be mainly the equipment users, those professionals that bear a daily personal responsibility for the food-safety, sustainability, food-quality and productivity of processes and equipment, that are most likely to lose sleep over this nagging question: 'How can we be sure that our systems as a whole will operate safely, sustainably and effectively, so that we consistently meet all benchmarking requirements? In other words: how can we integrate our hygienic equipment in such ways that the benefits of hygienic design are not compromised by the configuration, installation, operation and maintenance of process-lines within their food-production environments?"
In this interview, the chair of the EHEDG Working Group Integrating Hygienic Entities explains how this new guideline update can help its readers to find answers to these questions, and more. Thank you, Dr. Roland Cocker. The stage is yours:

What are the main target-groups and what is the scope of this guideline?
Dr. Roland Cocker: "This EHEDG Guideline Document is valuable for anyone involved in the development, operation or maintenance of hygienic equipment. That includes end-users, designers, installers, manufacturers, people who maintain it, operate it, clean it, validate it and their management and project-team members. It also contains valuable insights for budget-holders with less-than-expert technical knowledge. Although the scope is too extensive to list here, it does include everything from the selection of materials-of-construction and parts, how to integrate these into larger assemblies, how to integrate given units into lines and so on. It covers cost-effective integration of entities by a phased process, resulting in a prompt completion, whether the end-result is the smallest item, or occupies any level up to enterprise-level systems."

What's the relevance of this new guideline update?
"When we started with the first edition of this guideline, almost all of the EHEDG Guideline Documents focused exclusively on specific types of equipment. However, in practice, even equipment that was certified as hygienic was frequently combined or installed in a way that created hazards to hygienic operation. Despite the fact that these guidelines offered advice on the design of individual components and equipment, we often saw basic mistakes, ranging from reliance for validation and qualification on opinion or tradition rather than objective evidence, to the prevention of drainage and therefore effective cleaning by installation in the wrong orientation. That's why a separate EHEDG Guideline, that focused on the process of integrating hygienic entities, was felt necessary. It was to help many EHEDG members to prevent integration-errors and help others to optimize their existing system-configurations. In this update, we have added several new items, including how to modify or add to existing systems, outlining the hazards involved in this, particularly if the system is kept in production alongside the reconstruction-activities. Related to this are annexes on "renovate-versus-build-new" decision-making and also analysis of risk-assessment decisions regarding food-safety."

As soon as you combine successive components, things tend to get very complex. So how did you approach this complexity in this guideline-update?
"We looked at the way experts in the field operated, as well as at industries that face related hygiene-challenges. We also looked into the solutions they had developed in terms of procedural guidance. We analyzed safety-critical industries, like the engineering, aero-space- and pharmaceutical industries, and investigated how they managed critical risks. After that, we combined all of our findings, extracting the common principles. We purposely adopted some terminologies from related industries, so that we weren't reinventing the wheel. For instance, in automation, we used the design-standard for batch-automation, EN 61512-1:1999 for our terminology, to avoid needless confusion, as many food-processes are already highly-automated batch processes." We have also added sample checklist-suggestions for each of the design-verification activities and made careful distinctions between what equipment suppliers and on the other hand users, should do."

How do you think the food industry is going to apply this guideline?
"First of all, I think many people who are involved in the food industry are already doing much of it. Most automation-specialists, for instance, already use the V-model. But there's always room for improvement. We noticed for example that there's a significant difference between the food and pharmaceutical industries, in that change-management and validation are much better supported in the pharmaceutical industry, as an essential part of current Good Manufacturing Practice (cGMP) regulations. The origin of cGMP-regulations was that small changes in drug-manufacture (thought at the time to be insignificant) had led to the death of some patients. In the food-industry, a percentage of such changes, that could be trapped by a more structured system of change-management, can slip under the radar."

Could this guideline help companies to change that?
"Yes."

What are the most critical process-steps?
"During the design-phases, you first of all have to make sure that you have a comprehensive and accurate set of user- or stakeholder-requirements. Often stakeholders have what we call hidden or latent needs. End-users need to make an intensive effort and project-members need to apply techniques, to draw out these hidden needs. During the subsequent design-phases, we actually verify each phase against the previous one. And that has to be done quite carefully, because the ultimate goal in this chain of events is full compliance with the original user-specification."

What's the best way to get there?
"Design-verifications should be done and should be based primarily on objective evidence, such as verified calculations, references and challenge-testing, not on guesswork, opinion, or tradition. This includes documented verification of legacy specifications and corporate standards. Well-documented and credible risk-assessments may support this. The V-model then illustrates the safe sequencing and the interdependencies of phases in a hygienic project. Every design-phase must be completely agreed upon by everyone in the project-team and it must be checked back against the preceding design-phases, to guarantee that it complies with the user-requirements. One of the important things in a hygienic project is that the implementation-phase should not start until the design-specification has been finalized. After this, design-changes should be prohibited, unless unavoidable, because of the complexity, expense, delays and increased risk of failures if you make changes during the implementation activities. This is often called design-freeze. During the implementation-activities, you're also carrying out various challenges, under the headings of qualification and validation, to ensure that the user-specifications can be met. These challenges can cover all sorts of things, not just equipment, for example, training, analytical procedures and operating-instructions. They all have to be robust, reliable, unambiguous and accurate, to give you the right result without extra cost, extra environmental damage and most importantly, without catastrophic failures of food-safety or food-quality."

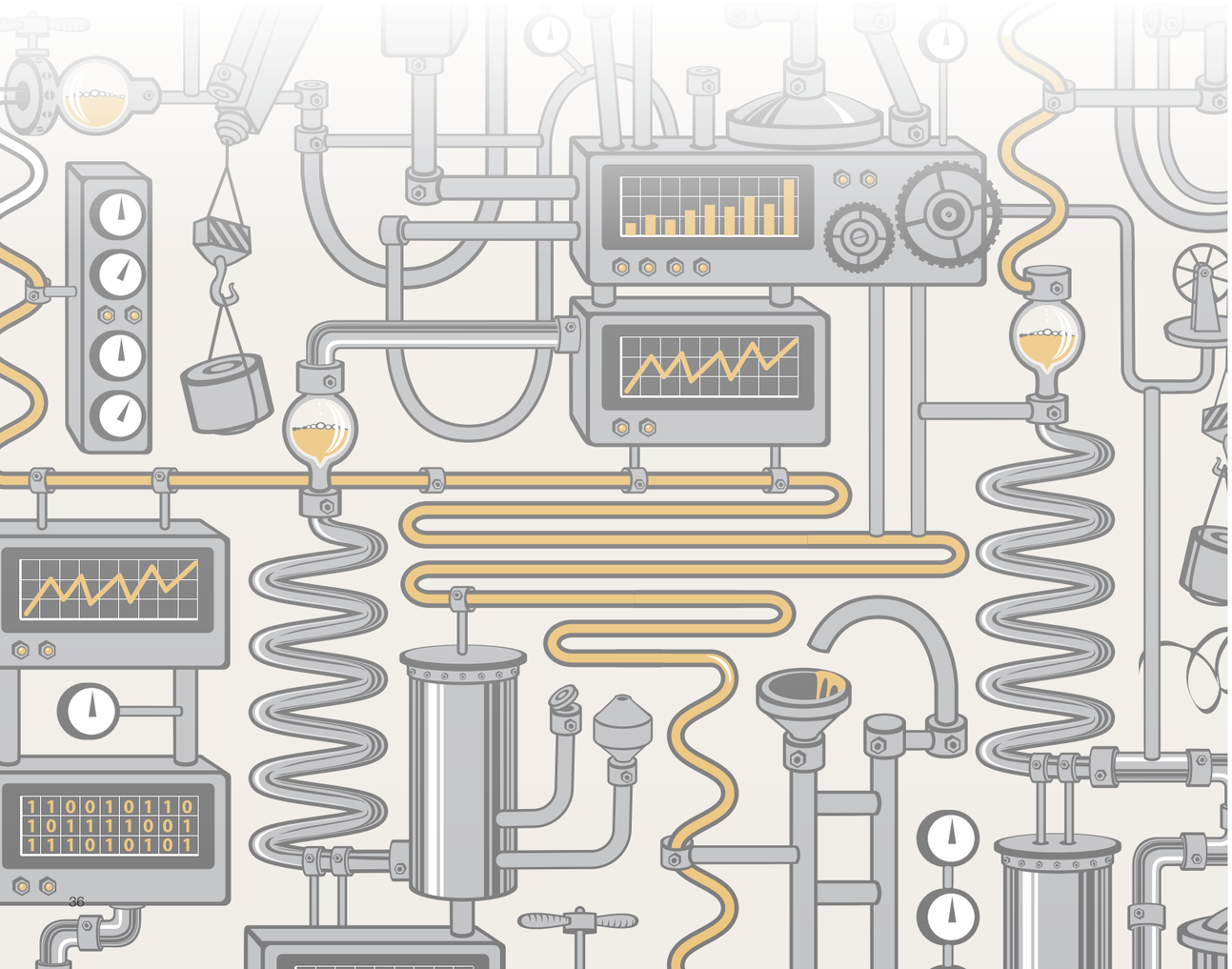
EHEDG Guideline Document 37 offers new insights

Update on hygienic design & application of sensors

EHEDG published the first EHEDG Guideline Document on sensors back in 2007. Since then, sensor technology has evolved significantly and now offers many new possibilities for food safety and food quality control. This is why the EHEDG Working Group 'Sensors' developed a new update of EHEDG Guideline Doc. 37 on Hygienic Design and Application of Sensors. The working group, backed up by coach Knuth Lorenzen, developed a comprehensive yet most practical guideline on hygienic design sensors that also covers good integration practices of sensor-technology in food processing lines. EHEDG Connects asked working group chair Holger Schmidt to highlight the value of this document.

Will this EHEDG Guideline help us to meet requirements for safe and reliable sensor utilisation?

"Yes, I am confident to say that it will, and that's what we targeted when we set out to develop this new guideline update. This document offers a comprehensive view on different aspects of currently available types of sensor technology and the correlations between the technical requirements, the real-life functionality and the hygienic implications of their designs. It will help EHEDG members to balance out the functional aspects of sensors with investment and operational costs, while also considering the hygiene properties and cleanability of specific systems. EHEDG Guideline Doc. 37 also contains best practice examples on how to minimize the impact of sensor integration on the cleanability of the process equipment. We looked into different technologies, from systems that handle simple process control purposes up to solutions that offer in-line and real-time food product quality control possibilities. To visualize the information more clearly, we used 3D graphics instead of photographs. The new graphics offer a better insight into the basic technical features of each technology, and help the reader to better understand the functions and effects on processing and cleaning. These graphics can be used for training purposes as well, but the main purpose is to help EHEDG members to decide which types of sensor is best suitable for their specific applications."



How to know if sensors work correctly and deliver consistently accurate data?

"That's a question that many food food-safety and quality professionals ask themselves regularly. Since sensors foremost need to deliver reliable sensor data, their functioning within the process installations needs to be reliable as well. For a long time, sensor technology has been considered to be expensive, complex and too unreliable for many applications, but this has changed, resulting in a higher data quality and reliability. Where in earlier times one had to work with raw data readings, today more and more sensors are equipped to procedures and interpret data. However, to really make good use of the new possibilities that sensors offer, it is crucial to apply well-structured calibration procedures and protocols and installation processes that comply with the specific requirements of the sensors. Developers of sensors that aim to sell their components to food industry clients should make sure that the design of their sensors minimize the impact on food safety, also in case the sensor gets damaged. Some sensors need to be able to withstand specific heat levels, hot cleaning or sterilization without compromising on performance. The hygienic engineering and design guidelines in the updated EHEDG Guideline Document 37 cover all major sensor types, from sensors for wet applications to sensors for dry matter silo measurements, covering the major standard technologies like temperature, flow, level and pressure sensors."

How did you approach the development comprehensive Document 37 update?

"We first collected and selected best practices from the industry, and categorized them into different technical approaches with regard to cleanability risks like the presence of cleaning shadows. Now there are many different variations on commonly used sensors but only few of them are flush mounted or have an internal antenna construction. By investigating the actual market solutions and relating them to specific food industry needs, we were able to deduct a set of design guidelines that equipment producers can use to optimize the hygienic properties of their sensor systems, while they can help food producers to make better investment choices."

How will this guideline help EHEDG members to optimise food safety?

"This guideline will mainly help food equipment developers and food processing companies to become aware of the sensor-related design aspects that you need to pay attention to in order to minimize food safety risks while simultaneously ensuring system performance. It's also a practical guideline that can help equipment producers and their customers to discern their real-life hygienic design needs for their specific food processing requirements. However, this is not a full measurement handbook, because parts of the cleanability results are determined by local installation circumstances. There are many variables to consider, and this guideline lists many of them, but we couldn't go into the details of all of them. This is where real life competes with the world of science: the working group wanted to supply users with the necessary background information to find the right balance between seeking excellence in hygienic design while also considering the practical functionality and the real life cost aspects."

What other value does this guideline offer to EHEDG members?

"This document allows EHEDG members to accurately determine the hygiene risks of different types of sensors. It will help them to decide which sensor system to choose for which application, and to be confident about the practical implications of that choice, both with regard to the functionality as the cleanability. It will also be a good basis for better communication between food processing companies, system integrators and sensor suppliers."

Free to download for all EHEDG members after login on the EHEDG Website: www.ehedg.org/guidelines.

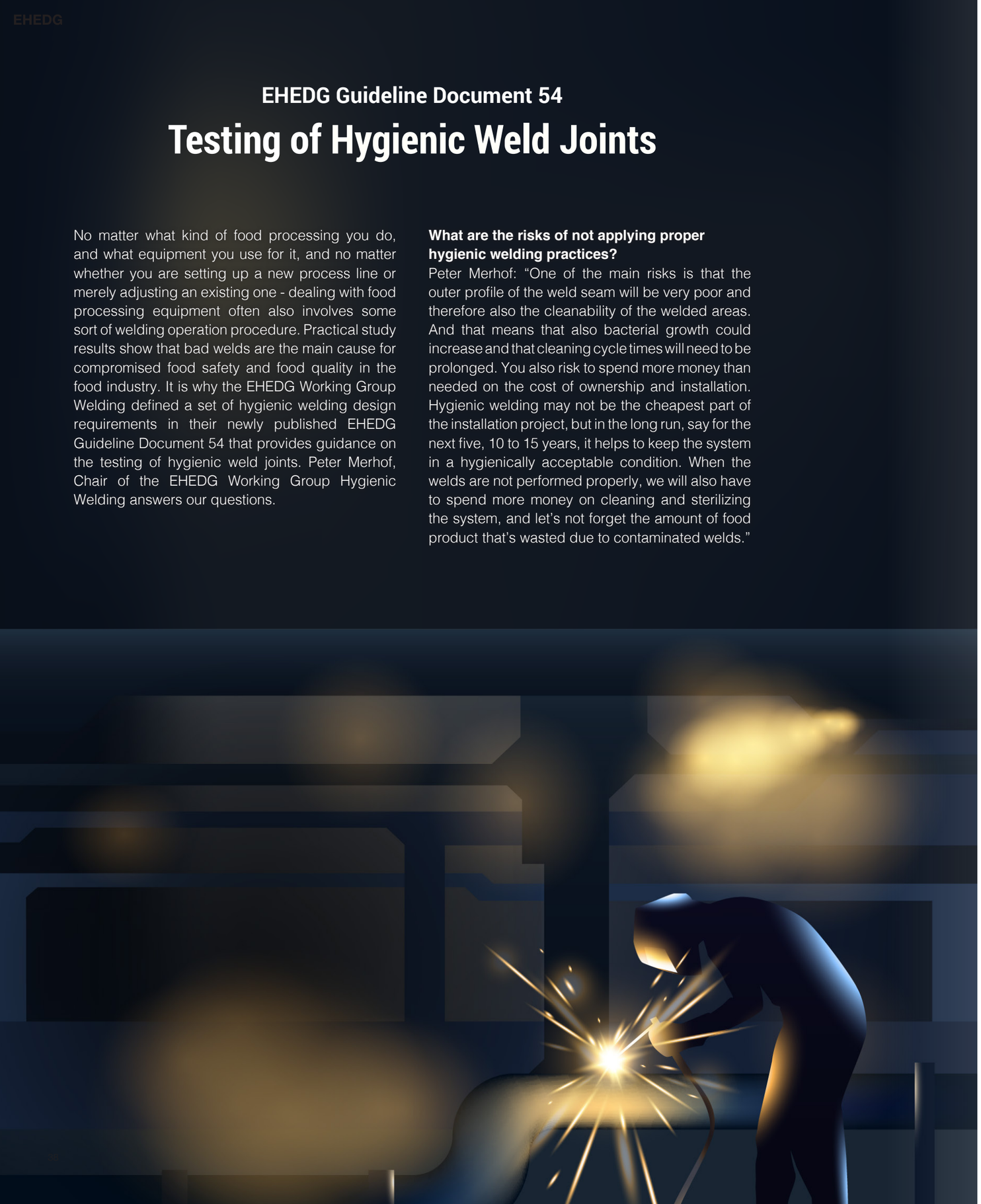
EHEDG Guideline Document 54

Testing of Hygienic Weld Joints

No matter what kind of food processing you do, and what equipment you use for it, and no matter whether you are setting up a new process line or merely adjusting an existing one - dealing with food processing equipment often also involves some sort of welding operation procedure. Practical study results show that bad welds are the main cause for compromised food safety and food quality in the food industry. It is why the EHEDG Working Group Welding defined a set of hygienic welding design requirements in their newly published EHEDG Guideline Document 54 that provides guidance on the testing of hygienic weld joints. Peter Merhof, Chair of the EHEDG Working Group Hygienic Welding answers our questions.

What are the risks of not applying proper hygienic welding practices?

Peter Merhof: “One of the main risks is that the outer profile of the weld seam will be very poor and therefore also the cleanability of the welded areas. And that means that also bacterial growth could increase and that cleaning cycle times will need to be prolonged. You also risk to spend more money than needed on the cost of ownership and installation. Hygienic welding may not be the cheapest part of the installation project, but in the long run, say for the next five, 10 to 15 years, it helps to keep the system in a hygienically acceptable condition. When the welds are not performed properly, we will also have to spend more money on cleaning and sterilizing the system, and let’s not forget the amount of food product that’s wasted due to contaminated welds.”



What are the most common welding mistakes?

“One hygienic welding mistake that almost everyone makes is getting the purging wrong. Many have the issues with over-oxidation and over-penetration of the welds. There are many details that one needs to consider when aiming for high quality hygienic welds, but basically it mostly boils down to poor purging and poor control of the purging processes in welding operations. Welders also often fail to adhere to the required purging times or they do not fix the correct gas flow. That’s negligence of course, but actually also one of the most common mistakes in manual welding processes that I regularly encounter in the working field. Another mistake is that many systems are not designed to use orbital welding equipment. It’s very important to prepare the parts correctly, to clean them and to minimize gaps before the welding process starts.”

What are the most important developments in hygienic welding of the last years?

“One of the biggest developments we had in the past is the improved documentation of the welds. We now know much better how to make data recordings and to monitor the welding process and compare these data with how the welding machine is programmed. Another development is that more and more of parts and fittings now are available on the market to be prepared for orbital welding. Furthermore, the availability of materials and equipment to purge more effectively, to use less gas and to monitor the levels of oxygen in the purge have improved dramatically, even in the last two to three years, let alone during the last five to 10 years. All of this makes a big difference to the quality of the weld.”

What specific challenges apply to welding stainless steel parts?

“The most important thing in welding steel components is to not compromise the high corrosion resistance of the materials. An effective purging, cleaning and correct parameter settings are crucial in this. Certainly, with stainless steel it’s important to prevent oxidation and to maintain the corrosion resistance of the material adjacent to the welding. There are applications in the food industry where corrosion resistance of welds is not particularly critical, for example because you’re handling things that don’t corrode stainless steel. However, there’s always the risk of having to clean hygienic systems with aggressive cleaning solutions that may do more damage to the materials than the actual product going through the pipe. So maintaining the corrosion resistance around the weld and in the area surrounding the weld is absolutely critical.”

How can equipment producers contribute to better hygienic welding practices?

“The accessibility is very important, especially when you have to weld the parts onsite. This accessibility can be influenced by the designers and the engineers. Otherwise, you are not able to use orbital head welds and work in very difficult-to-reach positions and that’s not good for the quality. The problem is often this: you have very good welding equipment, but you have another system designed by somebody who’s not deeply involved in welding. Unfortunately, many engineers and system integrators select the cheapest equipment, they can get their hands on, which is not necessarily the equipment with the best welding properties - it might not be suitable for mechanized welding for example. So many designers of a tube or a piping system don’t take the actual usage and orbital welding properties into account when selecting equipment. That can become tricky later, especially when welding of components with different pipe thicknesses, or in dimensional systems, for example when a pipe head is too short to be put into the weld head. Things like that often occur on site because the components are not properly selected. Basically, this topic should be the focus of both the customer and the supplier. That’s also something we will address in our new EHEDG Guideline Document 54 update.”

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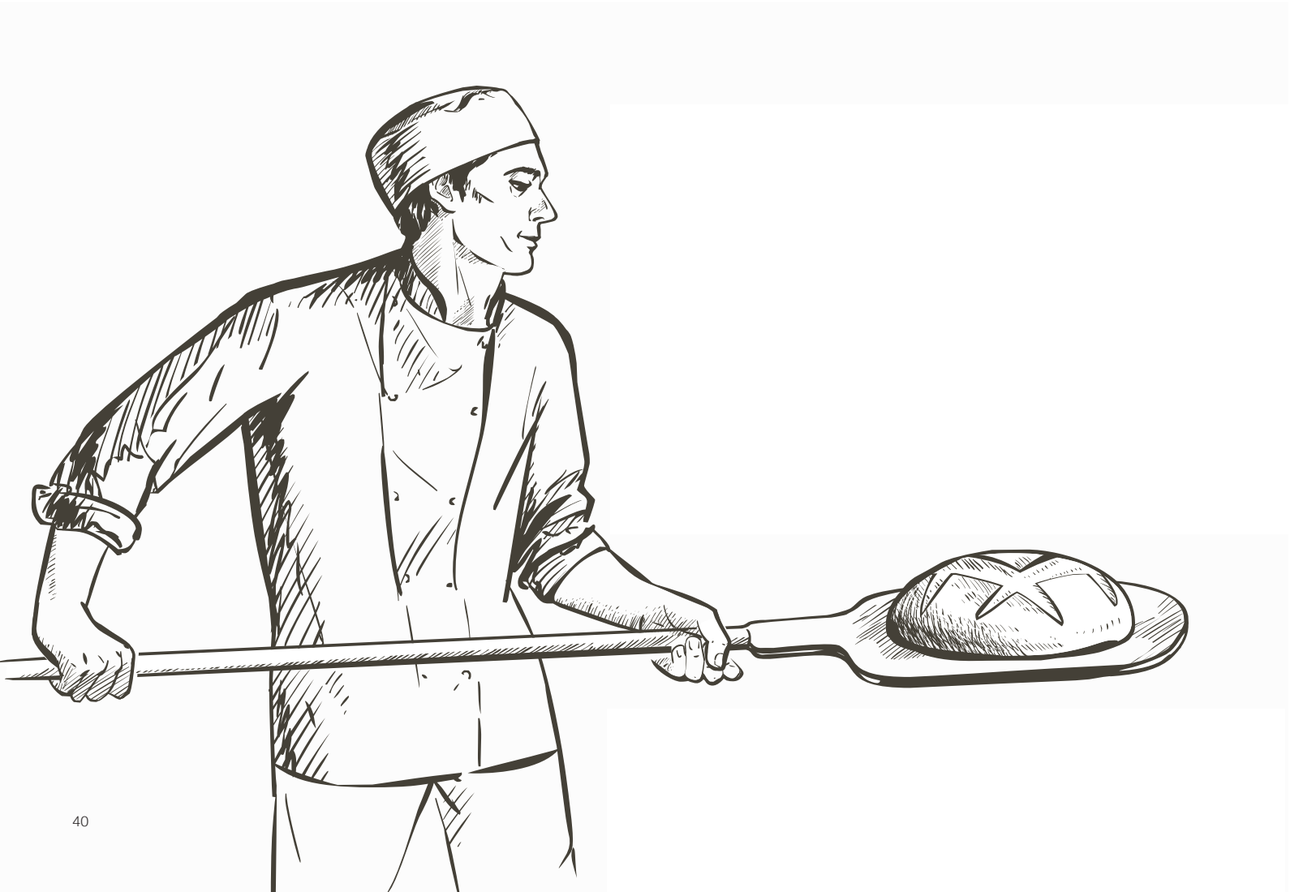
EHEDG Guideline Document 55

Hygienic Design Requirements for Bakery Equipment

After EHEDG Document 49 on the hygienic design requirements for the processing of fresh fish, EHEDG published another guideline that specifically focuses on equipment applied in the production of a specific type of food. Dr. Jürgen Hofmann, chair of the EHEDG Working Group Bakery Equipment, explains why it made sense to develop such a dedicated guideline for bakeries and why this is also great news for the bakery equipment suppliers.

What recent trends in the bakery industry affect food safety?
Dr. Jürgen Hofmann: "We've seen some significant changes taking place in this industry over the past years. Many small craft bakeries expanded and set up larger production facilities. In general, bakeries grew larger and started using increasingly larger and more automated equipment that come with higher hygiene and cleanability demands. Another trend is that bakeries now offer a wider variety of products than in earlier days, from gluten free to organic and halal, so they have to deal with many different food specific hygiene requirements. A normal sized bakery has to comply with more rules these days than twenty years ago, and therefore needs to know much more about hygienic engineering and design."

What are the main food safety challenges in bakery processes?
"Bakery processes are special because they encompass various process steps, each of which have very different requirements, from dry to wet processes in the dough preparation step, and again back to dry processing following after the baking stage. Cleaning 'dry' requires a different approach than cleaning 'wet', so you need various different cleaning regimes and different types of food processing equipment. There are other guidelines that focus on these cleaning requirements, but you also need to know a lot about hygienic design to effectively apply those guidelines. This new EHEDG Guideline Document 55 provides clear overviews on where to clean dry and where to clean wet and the hygienic design requirements that align with that."



What can we expect after downloading this guideline?
"This EHEDG Guideline aims to initiate new technological developments and help the bakery industry to further optimize the food safety, productivity and sustainability of their daily food handling processes. It covers all bakery process stages, from raw material handling and the production of doughs up to the oven and cooling stages. The contents are applicable to various types of baked goods. The guideline takes into consideration equipment for continuous, batch, open and closed manufacturing processes as well as low and high moisture foods. Topics not included are freezing and packaging equipment as well as equipment for the production of confectionery."

What were the most important reasons to develop this guideline?
"EHEDG has been publishing hygienic design guidelines since the early 90's, and bakery food production facilities have come a long way since then, but incidentally, the industry still struggles with food safety contamination incidents related to food processing areas that are hard to clean. After the German bakery industry was confronted with a serious incident in 2012, it became clear that many bakery goods producers were still struggling to implement general hygienic design principles in their process line. At that time, EHEDG already offered a series of EHEDG Guidelines that could also be applied by the bakery industry, but these guidelines still needed to be interpreted correctly and implemented in accordance to specific industrial circumstances, which can differ greatly amongst baking facilities. After the incident in 2012, many industry members expressed the need for an EHEDG Guideline Document specifically aimed at machinery applied in the bakery industry. Right from the start of the development process, both the bakery and the equipment industry expressed a great interest in contributing to this guideline. The working group comprises representatives of both industries and together they defined the most important industry needs and aligned the scope of this guideline to meet those needs."

What extra value does this guideline offer compared to other guidelines?
"Other EHEDG guidelines that deal with open processing equipment mainly contain very general hygienic design principles. A facility designer may apply these guidelines and still be confronted with some weak spots, even though he or she used correct EHEDG-certified equipment components throughout the process lines. This new EHEDG Guideline Document 55 offers a great overview of all guidelines that apply to the specific needs of the bakery industry and does therefore not replace but complement other existing EHEDG Guideline Documents."

Is this guideline also suitable for small and medium sized bakeries?
"Smaller and medium sized companies can definitely benefit from this guideline as well. They have a different view on the equipment and processes than big industrial bakeries, mainly because most of them use their production lines to process various products. This results in different demands with regard to the engineering activities. To gain insights on the specific hygienic design needs of a specific installation, you need to start with a thorough risk assessment and the right documentation. The bigger companies manage to do that quite well, but the smaller ones often lack resources and time to keep up. So, there's a big knowledge gap between smaller and bigger companies. That's why the smaller bakeries heavily rely more on their machinery suppliers to provide them with all the necessary information. If the machine supplier doesn't have, or doesn't provide that information, then the small bakery stays in the dark. That's why we included tables in this guideline that contain equipment that everyone uses. Illustrative pictures and clear descriptions highlight all the weak points of all these equipment types. Whoever reads this guideline quickly understands the implications of buying a certain type of equipment. As a reader, you learn what critical areas you have to pay extra attention to, and then compare the characteristics of the equipment options. We hope this EHEDG Guideline Document will contribute to a wider acceptance of hygienic design in the bakery industry."

Free to download for all EHEDG members after login on the EHEDG Website: www.ehedg.org/guidelines.

Allergen control in food production

Hygienic equipment design and scrupulous changeover cleaning are crucial in preventing allergen cross-contamination, as more and more people suffer from food allergies.

Food allergies are a growing problem among consumers in the western world. While some people report an intolerance to certain foods that make them feel unwell, clinically-diagnosed allergies can – and very tragically do – kill far too many people each year. This happens when they suffer a severe allergic reaction, also known as anaphylaxis, after inadvertently consuming a food ingredient to which they are allergic.

Although food allergies are only part of a larger global allergy problem, which in 2014 affected more than 17 million people across Europe according to European Academy of Allergy and Clinical Immunology (EAACI), they are a very important part of the problem and one that is growing.

Under the EU's Food Information for Consumers Regulation (No. 1169/2011), since 13th December 2014 food businesses and caterers have been required by law to provide customers with accurate information on the EU's 14 major food allergens, if they are included in any food products they produce, sell or serve.

However, experts believe that the number of allergens globally is far more than 14 and is growing as people become allergic to more foods. While many people believe allergies are primarily a problem of the young, more older people are unexpectedly becoming allergic, reports Lynne Regent, chief executive of Anaphylaxis Campaign, a UK charity that supports allergy sufferers. Most allergen product recalls are due to the presence of undeclared allergens caused by labelling errors. However, cross-contamination due to poor production scheduling, poor equipment design and poor cleaning regimes between product changes is also a problem.

Vegan implies milk- and egg-free, whether intended or not

Julia Pepler | Food Integrity Consulting

Cross-contamination of vegan food

Surprisingly, cross-contamination of vegan food – which is growing in popularity – with milk and egg is also an increasing source of recalls because of undeclared allergens. While there is no legal definition of vegan food, people don't expect it to contain things like milk and eggs. But it does happen, as demonstrated by recent recalls of vegan food because of undeclared milk and egg sometimes caused by cross-contamination during production. This poses serious potential problems for those with allergies to these ingredients – especially if they fail to read precautionary allergen labels (PALs) on packs. "Vegan implies milk- and egg-free, whether intended or not," says Julia Pepler, director of Food Integrity Consulting. "We know that consumers will tend to disregard PALs; they are confusing and sometimes they require the consumer to do their own risk assessment, which is unreasonable in my opinion."

Problems of allergen cross-contamination can be exacerbated when foods containing certain allergens are made on the same line as those producing other products that contain different allergens.

"If you have a system – and most factories will – that will make the most vulnerable products first after a deep clean and then maybe progressively introduce more allergens, that is causing all sorts of trouble. Where do you put vegan: does vegan go before the milk-free or after the milk-free and where does the gluten-free go now?" remarks Barbara Hirst, senior consultant for contract research organisation RSSL.

This is also where hygienically designed equipment that is easy to clean and effective cleaning regimes – especially during changeovers – are crucial, says Dr Edyta Margas, global head of food safety at Bühler Group and a member of EHEDG's working group on dry materials and foreign bodies.

Cross-contamination is a risk that is increasing as manufacturers move away from lines and equipment dedicated to making just one product and use more flexible production lines capable of making different products, explains Margas. This flexibility is required to provide companies with the agility they need to respond quickly to changes in consumer demand for different products, she adds.

When changing between products there is also a

question of what level of residual contamination is acceptable, says Margas. This is where testing and validation of cleaning regimes becomes important. But testing alone is not enough, she adds: “You cannot test yourself to safety. Testing is just an additional control measure. Scheduling of recipes is also very important as a control measure.”

Of course, production runs should be organised so that foods free of specific allergens are made before foods containing them and equipment should always be thoroughly cleaned and verified between production runs. But, according to hygiene experts in the sector, this doesn’t always happen as well as it should because of intense time pressures due to customer demand for short shelf-life foods such as sandwiches or other ready-to-eat (RTE) foods, where switching back and forth between different products made on the same line can happen very frequently.

Data analytics can determine which equipment is a changeover bottleneck

Edyta Margas | Bühler Group

The overall food safety challenge – not only allergen control – determines what control measures should be implemented, says Margas. Hygienic design is one control measure and the method of cleaning is another, she says. For example, in the dry food industry which handles products with low moisture content – sectors such as chocolate and cereals manufacturers – you don’t want to introduce water since this encourages micro-organisms to grow, so dry cleaning rather than wet cleaning might be more appropriate, she adds. However dry cleaning is far less effective in terms of allergen removal and brings higher risk of cross-contamination with allergens, when compared with wet cleaning. Therefore, careful risk assessment must be undertaken to introduce final control measures.

Automation and data analytics

Automation can also help to sequence production in order to minimise the chances of allergen cross-contamination, says Margas. This can also help with tracing the path of allergens through factories. Then there is data analytics – an emerging area of interest – which can be used to crunch vast amounts of information on variables such as production throughputs and temperatures to optimise changeovers between products to minimise allergen cross-contamination, she adds.

“You can potentially look at the data to determine which equipment in the process could be a bottleneck in terms of the changeovers,” says Margas. “Because not every piece of equipment is critical. Maybe the most critical is one that is difficult to clean or where there are more residues. That might be the one where you need to focus on the most and do a deeper clean.” Changeover cleans are carried out for quality, integrity or safety. But whatever the reason, they need to achieve the right result, fast, and that can be hugely influenced by the design of the equipment, says Katie Satterthwaite, senior hygiene technologist at retailer Marks & Spencer and a member of the EHEDG working group on cleaning and disinfection.

“Good hygienic design, twinned with a detailed understanding of the equipment, allows effective changeover cleans to be achieved in a matter of minutes,” adds Satterthwaite. “Even though nothing beats elbow grease, the right hygienic design is paramount to facilitate fast and effective cleaning of food processing equipment.”

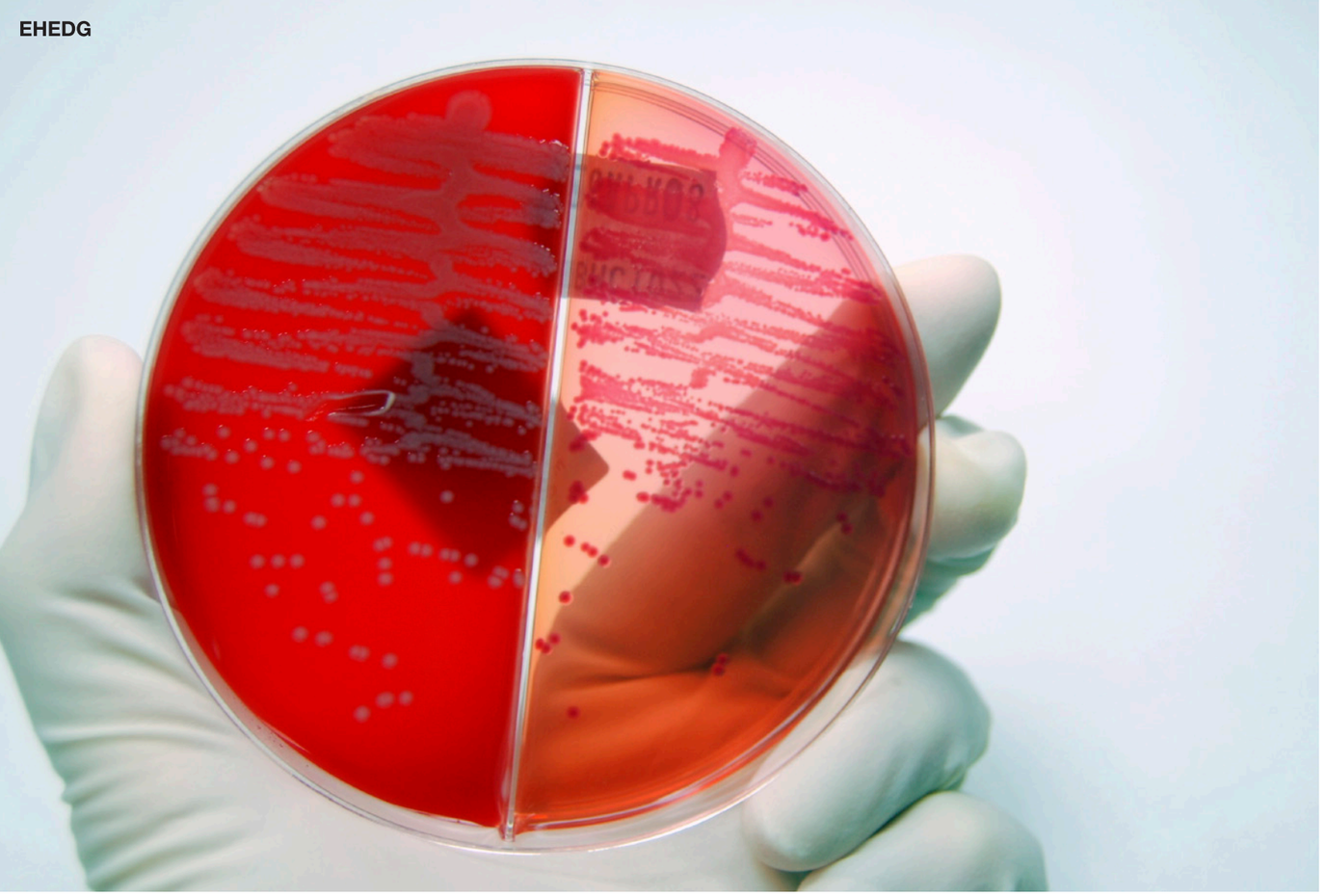
Changeover cleaning to avoid cross-contamination with allergens is becoming an increasing focus of attention, particularly in more complex sectors such as chocolate, confectionery, breakfast cereals and snacks, where different fillings and flavourings may be involved, says Margas. She cited one exceptional example where a production run of five hours was followed by a seven-hour changeover clean before another recipe was run. “This is a very big challenge for the industry,” says Margas. “That’s why hygienic design and the ability to clean fast are very important.

Time and training

While changeover cleaning procedures should be quite straightforward – putting in the physical effort to do it properly, using the right cleaning agent for the job and allowing enough time to do it – it also critical for cleaning staff to clearly understand the dangers of allergen cross-contamination so that they don’t cut corners, say cleaning and hygiene experts.

All too often, however, production demands mean that not enough time is allocated to thoroughly clean equipment between production runs, or incorrect detergents and procedures are used, potentially causing allergen cross-contamination to be missed. For example, because allergens are proteins, which tend to bind to surfaces, it is essential to use detergents with the correct emulsification and saponification properties to remove them.

Avoiding problems also requires well-supervised workers on the shop floor who are often the main culprits for causing cross-contamination – who clearly understand the serious consequences of allergen cross-contamination. This requires proper allergen awareness training that wins the hearts and minds of shopfloor workers.



Chlorate Consequences

EU legislation designed to prevent contamination of foods with pesticides used on crops, is having unintended consequence on cleaning regimes in food factories.

Effective cleaning regimes in food and drink factories to remove dangerous pathogens that can cause serious illness to consumers could be undermined by EU legislation primarily designed to protect people against potentially harmful chemicals used as pesticides in agriculture.

The EU's Plant Protection Products (PPP) Regulation (396/2005) has already hit a range of very effective biocides and disinfectants that are based on quaternary ammonium compounds (also known as QACs or quats) widely used by many food, dairy and beverage processing operations globally, where a provisional maximum residue level (MRL) of 0.1mg/kg has been set, having already been reduced from 0.5mg/kg.
But food industry experts fear this level could be further reduced under a new review currently underway. Unless the importance of quats to the maintenance of good food hygiene and safety is recognised, more problems will be caused to the sector, with consumers also put at risk.

"It could, potentially, under the current review be lowered to the default of 0.01mg/kg," says Peter Littleton, technical director of cleaning chemical specialist Christeyns Food Hygiene, a member of the European Hygienic Engineering & Design Group (EHEDG).

MRLs for chlorates

Following their approval by the European Commission's (EC's) Standing Committee on Plants, Animals, Food and Feed (Scopaff), MRLs have now been set for chlorates in a range of foodstuffs.

Instead of the default 0.01mg/kg – or limit of quantification (LOQ), originally proposed – as a result of product sampling, a whole raft of different chlorate MRLs have been set, which are generally believed to be workable for different produce. The new chlorate MRLs, which are expected to come into force later this year subject to EU approval, range from 0.05mg/kg for oranges, oil seeds and honey to 0.7mg/kg for olives and fungi.

However, industry experts are concerned that because they also cover chlorates derived from rinse water, they will cause problems in countries that chlorinate their potable water supplies.

Chlorate is formed as a by-product when using chlorine, chlorine dioxide or hypochlorite for the disinfection of drinking water (as in the UK), water for food production and surfaces coming into contact with food, explains Littleton.

"Even in the production of sodium hydroxide, the most used cleaning chemical, chloride resides are too high and no technical alternatives are available," says Hein Timmerman, global sector specialist for cleaning chemical and hygiene company Diversey and EHEDG Board member. "But the burden is on the food producer who will be liable for these MRLs. It will take a long process of change in the whole supply chain before these measures can be implemented."

Timmerman adds: "The new regulation is expected to enter into force in early/mid-June 2020 and as it does not foresee any transitional regulations, it will have an impact on the total supply chain.

"This means that the new MRLs for chlorate apply to all goods as soon as the regulation comes into force, regardless of when they were produced (EU goods) or imported into the EU (goods from third countries). Products that do not comply with the new MRLs may not be marketed. This decision will accelerate the need for reducing all sources of chlorates, and not only the use of hypochlorite and its numerous applications in the food industry."

Peter Littleton, Technical Director Christeyns Food

Timmerman explains that elimination of residues will demand a broad approach based on:

- The use of alternative chemical products for sanitation/disinfection;
- The use of other technologies for water treatment;
- Assuring good rinsing of all surfaces;
- And overall application of hygienic design guidelines so no residues can accumulate, stagnate or remain in any area of process equipment

However, he adds that this will have a huge impact on cost, starting with farmers who will suffer economically.

"Chlorination of animal-derived food is not allowed in the EU, while washing of plant-derived food with chlorine disinfected water can be permitted under national regulations – for example salad and vegetable washing," says, Littleton, who is also vice chair of the UK's Society of Food Hygiene and Technology.

"No maximum levels for chlorate in drinking water have been set in the EU, while the World Health Organization (WHO) has established a guideline level for chlorate in drinking water of 0.7mg/l. In many fruit and vegetable commodities chlorate levels exceeding the default MRL of 0.01mg/kg are routinely found."

Based on the available information, Scopaff assumed that chlorate residues result mainly from the use of chlorinated water for food processing (eg washing) and from the disinfection of surfaces and food processing equipment coming into contact with food with chlorinated solutions, he explains.

“The use of chlorinated detergents should not present any issues with regard to chlorate residues in food as they should be thoroughly rinsed from surfaces as part of the cleaning regime to avoid product contamination,” says Littleton. “However, users should be aware that any potable, mains water used [as in the UK] to rinse disinfectant solutions may itself contain chlorate at up to 7mg/l as a result of the treatment by the local water authority.”

The amendment for 396/2005 has introduced an allowance whereby any contribution made by mains water can be deducted from the total level found in a processed food product, however, food businesses must demonstrate that this is the source of the chlorate, he explains. Frozen products and washed leafy vegetables are excluded from this allowance, however, and the limit proposed is absolute, he adds.

While a level of chlorate will come from mains water in the UK, the concentration of this salt can also occur where ‘aged’ solutions of a hypochlorite-based biocide are used, Littleton explains.

Examples can include:

- Bulk tank installations where chlorate salts can settle out and result in an increased concentration as the volume of liquid in the tank reduces. Mixing of this salt into solution can occur when deliveries take place.
- Mixing vessels and interim-holding tanks where flushing or cleaning of the tank does not routinely take place.
- Application vessels such as trigger-sprays.

The best advice with scenarios such as these is to ensure that flushing takes place and tanks are not simply ‘topped up’ each time, this will allow the increase in the concentration of chlorate salts to be mitigated, he suggests.

Karin Goodburn, Director General UK Chilled Food Association

What future for Quats?

Quats, such as benzalkonium chloride (BAC) and didecyldimethylammonium chloride (DDAC), used widely as disinfectants by the food and drink industry, were until a few years ago also used in agricultural pesticides. However, since the EC introduced temporary MRLs of 0.1mg/kg for quats in food, they have fallen out of favour as a biocide. However, they are still widely used and are very effective in the control of Listeria monocytogenes (Lm) within chilled food operations.

Companies such as Christeyns and Diversey are making available alternatives to quats, however Timmerman accepts that their adoption will require a huge change in mindset on behalf of users and have a big impact on the supply chain. It will take a long time for quats to be fully replaced and in the meantime, food safety should not be jeopardised, he adds.

Indeed, quats remain important and cost-effective biocides for many sectors of the international food industry, says Karin Goodburn, director general of the UK’s Chilled Food Association and an internationally renowned microbiologist and food safety expert.

Goodburn leads the Food & Biocides Industry Group (FBIG), which acts on behalf of 20 UK trade organisations. The Global Food Safety Initiative (GFSI) has adopted guidance developed by FBIG on the use of biocides to minimise traces being carried over into food from hygiene uses.

“The EC is aware of this work, the FBIG element of which contributed to gaining special rules for processed (multi-component) foods, where food business operators, if found to have ‘exceedances’ of chlorate MRLs are to be given the opportunity to provide evidence that they arose from hygiene uses, not as PPPs,” says Goodburn.

“I am advising FBIG members to obtain chlorate results from their water suppliers as that is the primary source of chlorate, monitor pesticides residues in food data and identify other sources of potential chlorate in their foods, eg from hygiene.

“We hope that the EC would by default take the same approach to quats as they are vital for Lm control, particularly in processed/multi-component ready-to-eat (RTE) foods.”

Organisations representing the European chilled prepared food market wrote a joint letter to the EC in March urging recognition of the importance of BAC and DDAC to food hygiene and safety. They called for similar recognition to chlorates that traces of quats/QACs in food come from hygiene biocides rather than phytochemicals. The letter called for a single MRL for all commodities other than raw milk (0.1mg/kg) of 0.05mg/kg to be adopted in the review.

“QACs are the most effective hygiene biocides in the control of Lm,” the letter stated. “In Europe, Lm consistently kills more people and has the highest fatality rate of the five most common food poisoning microorganisms.”

Best practices in hygienic engineering and design

Illustrating the safety, quality, productivity and sustainability benefits

Real life industry stories, offered to you by EHEDG Company Members who dare to share their experiences, new insights and lessons learned in real life development projects.

On the following pages, six food industry companies share their best practices in their quests to optimise food safety, food quality, food processing productivity and sustainability. The stories illustrate the value of EHEDG Guideline Documents, EHEDG Certificates, EHEDG Training & Education, and the importance of collaborating and sharing knowledge across all levels of the food equipment supply chain. Thank you dear contributors, for not shying back from sharing your industry stories that inspire others to reap the benefits of hygienic design.

Developing a hygienic design sealing product line

FST innovates with EHEDG for better safety, productivity & sustainability

In this article, three product development experts share their views, experiences and best practices in their hygienic product development work. The experts, who all work for EHEDG Company Member Freudenberg Sealing Technologies, answer the EHEDG Connects questions from the complementing perspectives of hygienic engineering and internal product development, aimed at the practical needs of their global process industry customers.

The product development experts:

Rainer Kreiselmaier
Technical Director Global Process Industry at Freudenberg Sealing Technologies

Christian Kohl
Manager Product Development Application Center Special Sealing Solutions at Freudenberg Sealing Technologies

Frank Lauer
Specialist Design Engineering Application Center Special Sealing Solutions at Freudenberg Sealing Technologies

When did your company decide to become an EHEDG Company Member and why?
Rainer: “FST became an EHEDG company member in 2015. The hygienic design guidelines set up by the European Hygienic Engineering and Design Group are essential for our business in the food, beverage and pharmaceutical industries. We believe that it is very important to exchange information and take part in the development of news guidelines in this field. We rely on EHEDG guidelines when we develop new innovative hygienic sealing solutions for clean production of food, beverages and pharmaceuticals. And last but not least: we are proud to be part of the comprehensive exchange of experiences and knowledge within the global EHEDG community.”

What were the main reasons to develop (and improve upon) your product line of sealing solutions for the food industry?
Rainer: “In modern plants, pressure, temperature and media resistance requirements are increasing. Conventional sealing systems simply cannot keep up with these new demands. Since we are constantly in close contact with our customers, we see how important it is for them to apply hygienically designed seals that are made of high-performance materials. It also motivates us to develop new and improved solutions. Our dedicated experts have accepted this challenge and are always striving for improved designs and materials.”

“We are proud to take part in the comprehensive exchange of experiences and knowledge within the global EHEDG community.”

Rainer Kreiselmaier

How would you describe the importance of sealing solutions with regard to the hygienic properties of process lines in general?
Christian: “The hygienic approach is a big improvement resulting in a higher product safety for foods and beverages consumers and for users of pharmaceutical products such as lotions and medicines. Seals are necessary throughout process lines, wherever static parts are connected, rods need to cross walls or dynamic applications such as valves, pumps or mixers are used. They only make up a small part of industrial process installations, but they significantly determine their hygienic properties. The high purity requirements of process industry plants can only be met with truly hygienic sealing solutions. During the development phase of our hygienic design products we aim to comply with the hygienic design and materials guidelines that EHEDG offers.”

What are the specific challenges with regard to hygiene, productivity and sustainability of the hygienic product line?
Christian: “Elastomeric seals are most commonly used for closing gaps or tolerances in machines. They also have an important function in dynamic applications with no lubrication, where friction coefficients are high, which leads to a high abrasion and a shorter operating lifetime (while requirements concerning operating lifetime are constantly increasing). Another challenge is represented by aggressive product and cleaning media, for example in CIP/SIP cleaning processes. And then there’s the danger of swelling and thus early destruction of the seal. The only way to combat these challenges effectively is to choose the right sealing materials that meet the effective user application requirements. Our new hygienic product line lets our clients combine premium PTFE- and elastomer materials. This makes high tightness, low friction and hygienic design possible without losing the advantages

of a conventional elastomeric seal. Another advantage of using PTFE components is that they can withstand higher pressures."

How do you apply EHEDG products, services and expertise (guidelines, training & education, certification) in your product development processes?
Frank: "Some of our engineers follow the EHEDG Training and Education courses, and we exchange knowledge with EHEDG members during the development of some of our products, while applying the hygienic design guidelines for the design of our new product solutions. As our employees Angelika Ruhm (Chair EHEDG Working Group Seals) and Christian Geubert (Secretary EHEDG Regional Section Germany) are active members in the European Hygienic Engineering and Design Group, we are deeply involved in this knowledge network. EHEDG offers us the unique opportunity to contribute to the development of new hygienic sealing guidelines. And last but not least of course: some of our hygienic line products feature an EHEDG Certified label, which helps end-users to choose for products with decent hygienic design properties like ours."

What practical benefits do your new hygienic line products have?
Rainer: "Our hygienic design products, like for example our Hygienic Usit® and aseptic O-rings, contribute to maximum product safety of foods, beverages and pharmaceuticals. They also optimize the productivity of plants. Since these hygienic products require shorter and fewer cleaning cycles, as well as less cleaning agents, these products also contribute to better sustainability performances. The practical results speak for themselves: longer operating lifetime and fewer maintenance intervals result in optimal machine availability, and most importantly: improved product safety, productivity and sustainability. Our wide hygienic product portfolio is part of a modular system that offers a suitable sealing solution for every application requirement – including critical parts of the application."

How do you approach the configuration of customized solutions? What information do you need your customers to supply in order to realize the best (hygienic) results for them?
Frank: "The deeper our insight in the actual functioning of the customers' applications and conditions, the better we can consult our partners and thus provide the right tailor-made sealing solution. That's why we gladly receive data related to for example required tolerances, the used product media, the occurring pressures and temperatures etcetera. Our well-trained sales engineers are dedicated to guide our customers through the whole development process and offer maximum support, while directly involving our technical experts. Through our Freudenberg Xpress® service and the utilization of state-of-the-art CNC machines the prototyping process is fast, cost-effective and flexible enough to develop high-quality machined sealing solutions for every application."

Hygienic redesign of cereals dryer

Bühler has drawn on three separate EHEDG guidelines to develop a more hygienically designed approach to drying coated cereals

There have been a number of food recalls over the past decade because of bacterial growth in low moisture foods – those with a water activity (Aw) of less than 0.85 – such as ready-to-eat (RTE) cereals, despite the historical belief that the risk was very low.

Recognising this potential problem, cereal manufacturers have sought to eliminate such risks by modifying their production processes and installing equipment that incorporates more hygienically designed features to ensure the highest levels of food safety.

In response to this need, Bühler embarked on a project called Ceres in 2013 to identify where the biggest food safety hazards exist. It used these findings to develop more hygienically designed drying equipment for RTE cereal products, which is easier to clean and reduces the risk of bacterial contamination.

Hygienic design issues

One of the obstacles to be overcome is that RTE cereal products are often sugar coated, which presents several cleaning challenges.

Traditionally, water has been used to clean cereal dryers to remove any sugar build up. However, this greatly increases the risk of bacteria growth. To overcome this problem, Bühler's R&D and Food Safety team embarked on project Ceres in the US. It used the outcome of this work to develop a new approach to drying, called Ceres Plus, that meets today's food safety and hygienic design requirements.

"Our first task was to understand the challenges our customers were experiencing and identify the food safety risks. Then address these challenges and risks with a focus on hygienic design," explains Steve Blackowiak, director of R&D and Food Safety at Bühler in the US.

"We reached out to several of our customers and found they were very excited to participate in our study. Here we gathered information from engineers, operators and maintenance personnel. We visited plants and created a matrix of information that was our source for guidance as it highlighted the challenges with the current supply."

After gathering this information and analysing the results the researchers were able to develop the Ceres Plus dryer for coated cereal products. It is based on the very latest hygienic engineering design principles as espoused by the European Hygienic Engineering Design Group (EHEDG).

During the design phase of the Ceres Dryer, Blackowiak was actively involved with a team of experts to develop a hygienic design guideline for low moisture foods, 'One Voice for Hygienic Equipment Design for Low-Moisture Foods'. The purpose of this document is to utilise existing industry standards, guidelines to define a process that will allow consumer packaged goods and original equipment manufacturers to reach consensus on design criteria for hygienic equipment for low-moisture food manufacturing.

"One of the sources of hygienic guidelines was the European Hygienic Engineering Design Group (EHEDG)," adds Blackowiak. "For the Ceres Dryer development we referenced several EHEDG documents during the design phase: Hygienic Equipment Design Criteria; Welding Stainless Steel Hygienic Requirements; and Hygienic Design Closed Equipment Processing."

The Ceres Plus dryer

The Ceres Plus is a multi-stage dryer design that consists of multiple independent conveyor stages in succession. These provide independent speed control, which allows variable retention time and product depth throughout the drying and/or cooling process.

The different drying stages are separated by a transfer section, or turnover, in which product is gravity transferred from stage to stage. This transfer and repositioning of product promotes

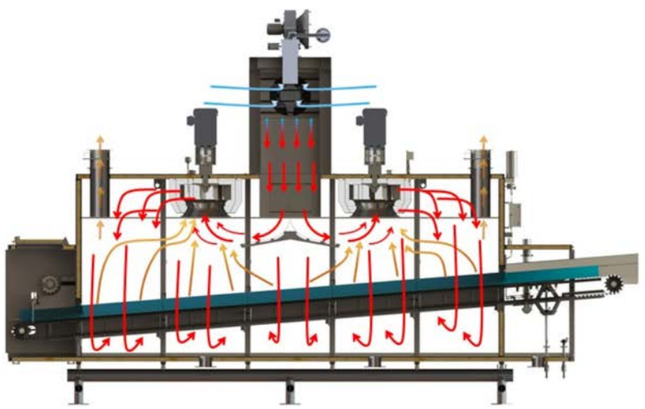
Steve Blackowiak

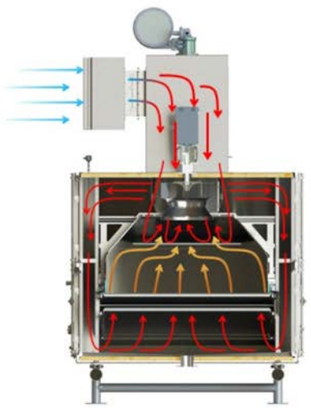
is the Director of Research and Development and Food Safety at Bühler located in Raleigh, North Carolina, USA. With over 40 years' experience in the drying industry, Steve and his team are focused on innovations and hygienic design. Developing industry leading hygienic solutions for drying and cooling equipment. He is active with the food safety community working with others developing guidelines such as the One Voice for Hygienic Design and is a former member of the 3A Education Committee. Steve is driven by his passion and moral obligation to provide safe equipment to the food industry.

drying uniformity and assists in breaking up any clusters that may have formed.

Located at the transfer section of each drying zone is a continuous belt-wash system that allows for belt cleaning during production. The transfer sections are 6ft (1.83m) long and provide access for cleaning and maintenance of the spray manifolds, air knife and scrapers. The equipment's dual plenum airflow maintains colour and moisture uniformity. An internal plenum in each zone directs air from the product beds into the circulating fans and ensures uniform airflow supply along both sides of each zone in the enclosure interior-to-plenum space. Hinged air baffles further direct air beneath the conveyor return level, diffusing supply air up through both conveyor levels, providing air flow up through the product bed.

There are several key features that differentiate the Ceres machine from other drying systems. First, it eliminates the problem in other systems where conveyor bed perforations become 'blinded' from the sugars used in products. Once they are clogged, air cannot move through the food and drying becomes ineffective. In contrast, Ceres' continuous bed wash system cleans the conveyor bed during production. Meanwhile, the equipment's spray manifolds, air knife, scrapers and water management system help to increase uptime.





Next, the Ceres machine is 100% tungsten inert gas (TIG) welded, which provides a much improved surface finish compared with traditional metal inert gas (MIG) welds. All welds are continuous, while welds in direct contact with food are ground smooth to prevent entrapment of residues. By moving all motors, gear boxes and bearings to the outside of the machine the risk of grease and other contaminants are removed from the food. At the same time, it allows for easier maintenance.

Furthermore, the Ceres machine has eliminated the traditional travelling side guides, which can be problematic and present a cleaning challenge. They have been replaced with a hinged side guide which utilises a food grade polyether ether ketone (PEEK) material for easy conveyor access and cleaning. The first Ceres dryer was installed at an RTE cereals plant in the US in 2015 and Bühler then worked with the customer to further develop the system.

"This collaboration allowed us to make improvements to the equipment after each installation," says Blackowiak. "It has provided equipment that addresses the real needs of our customers. It provides engineers with the opportunity to spend time with the equipment on site during operation, which is invaluable. Currently we have a Ceres machine on our manufacturing floor for a facility which is the culmination of our learnings resulting in our best of class coating dryer."

Cleaning-in-place: improved process with hygienic sensors

Endress+Hauser on innovation streak with EHEDG certified components

It doesn't happen frequently that new product developments generate a surge of interest in the food industry, particularly since this industry is not most known for adapting new technologies quickly. But the efforts of Endress+Hauser to develop inline sensor technology that claims to accurately quantify and qualify food produce buildup and fouling pipes, storage, equipment periphery and mixing and process vessels, seems to do just that.

Julia Rosenheim
Product Manager Endress+ Hauser Level+Pressure

Since the German EHEDG Company Member applied a range of EHEDG Guidelines and EHEDG Certification programs to bring this innovation to market, it also awakened the curiosity of EHEDG Connects, leading to questions which were answered by Julia Rosenheim, Product Manager Endress+Hauser Level+Pressure and Tim Schrodt, Regional Industry Manager Europe Food & Beverage Endress+Hauser Deutschland. The result is this EHEDG Connects Magazine article. Thank you Endress+Hauser.

How did Endress+Hauser come up with the idea to develop inline sensor technology to quantify and qualify food produce buildup and fouling?
Julia Rosenheim: "Cleaning, the documentation and the development of criteria for the determination of a cleanliness status is an ever important and interesting subject especially in the production of food & beverages. We had discovered during customer interviews and general industry surveys that cleaning actually is mostly a time-based system where cleaning regimes are defined once and are not adopted easily. On the other hand, cleaning itself is considered non-productive time and therefore does not contribute to the overall added value generation of the companies. So this time needs to be reduced to the minimum.''

But how? Traditional cleaning regimes are normally based on empirical time slots.
"This is where we thought, we could help. Endress+Hauser already provides reliable process instrumentation to determine the controlled variables in the CIP processes. Additionally, we discovered that we can use one of the strengths which our point level system already possessed and work on this. The goal was to provide the customer with a product which could monitor the status of his pipes or tanks in a meaningful way without him opening the system. And if a system is still fouled or buildup is still present, the cleaning is not to be considered successful per se. So this is an easy to explain and easy to record and easy to document parameter."

How does it work?
"The Liquitrend QMW43 is a measuring device containing two circular fitted electrodes which are separated by a layer of isolating food grade PEEK. The inner sensor electrode is used to define the buildup height in conductive and non-conductive media. The outer guard electrode is only used to determine the conductivity of the media and as a determining factor for the buildup height calculation in conductive media. The Liquitrend uses both a capacitive and a conductive measuring cycle for the determination of the buildup height on the sensor. In this way the software in the electronics of the Liquitrend QMW43 can apply the correct measuring algorithm depending on the media which then results in the most exact measurements. "

"By offering a complete range of EHEDG-certified process instrumentation, Endress+Hauser can support its customers in any kind of hygiene process to ensure food safety."

Tim Schrodt
Regional Industry Manager Europe Food & Beverage
Endress+Hauser Deutschland

What stakeholders were involved in the development process and how long did it take them to develop this innovation and bring it to market?
"The complete development was done at Endress+Hauser and we hold the intellectual property in this product. Additionally, we had external stakeholders for the communication testing and also customers who tested the devices before we actually brought the product to the market. As the innovation is based on knowledge we already had about the sensor behaviour in other applications and how we might use it, the development of this new sensor was comparably quick. The whole process, however, starting from the initial idea to the final product launch is never easy and also always takes its time."

What were the main design challenges while developing the initial version of this product?
"One of the main challenges was the commissioning need at the customer site, I guess. We wanted it to be as easy and hands-free as possible with highly repeatable measurement performance. But this is a challenge as measurement is a physical process and not witchcraft. The device cannot know the type and the status of the process it is in unless you program it. But we wanted to really keep the need for any lengthy commissioning at bay. That means of course in the end we had to make some compromises and let the customer make his choices in his PLC instead of a lengthy programming. Another challenge were the performance tests in the lab environment with some of the applications, especially with media like biofilm. Anyone who has ever tried to grow a healthy biofilm in a dedicated area knows what I am talking about."

What EHEDG Guideline information was applied during this development?
"We develop according to EHEDG Guideline Documents, mainly Doc. 8, Doc. 10., Doc.16 and Doc. 32. Additionally, the designs undergo EHEDG fouling and cleaning tests to fully prove the designs' cleanability. When developing

Liquitrend QMW43, we had the advantage of the legacy design which was already used in the point level device for quite some time. This device has also been certified some time ago so we could be pretty positive that we could reach a certification with the design of Liquitrend QMW43 as well when we undergo the required documentation and testing."

How did you test the reliability of the sensor data detection and what role did the EHEDG Certification program play in this?
"Devices which are developed at Endress+Hauser undergo severe performance testing in several departments like development labs, calibration, quality testing and usability testing under real life conditions. We didn't treat the Liquitrend QMW43 any different. The EHEDG certification program did not play a significant role in the device performance tests."

Traditionally, the moment of cleaning is often determined based on 2 criteria: the microbiological condition of the system and the product fouling level of product deposits in the system. Has the correlation between these two criteria been investigated?
"Normally, the hazard of unwanted microbiological activity is higher when the system is not cleaned properly, as then the different organisms have sufficient nutrients and a water activity level sufficient to grow. So yes, there is a natural correlation between product fouling levels - especially product fouling which cannot be cleaned properly - and the microbiological condition of the plant. With Liquitrend QMW43, however, the indication is limited to the aspect of unwanted fouling. It reliably detects this fouling and the continuous measurement output can help the user to determine the severity and nature of the problem at hand."

How suitable is this innovation for food processors who want to optimize CIP-performances? Can you quantify the practical results?
"This development can be of enormous help to food processors who want to optimize their CIP performance, as it helps them to turn the empirical-time-based cleaning into an event driven cleaning which is adaptable to process events like for example product changes. The user knows what is going on in his process and can shorten cleaning cycles or elongate product runs based on the sensors' signals. This may also save some minutes in cleaning time. That doesn't sound impressive at a first glance, but on an annual basis, these possibilities represent significant productivity gains."

How critical is the location of the sensor in the process and what is the recommendation?
"Of course, as with every measuring device, the location in the process is important. Not necessarily for the generation of the sensor signals themselves but for the knowledge which can be gained from them by the user. The best location ideally is closest to the critical control point and the mounting should be in a flush mounted manner to avoid provoking additional not process related buildup formation. That way, the user gets the insight into what happens in his process at the location where he is interested in that knowledge."

Redesigning hygienic and aseptic control valves

SAMSON innovates to evolve and comply, powered by EHEDG

All over the world, food processing equipment manufacturers structurally invest in research and development because they understand that companies who want to continue meeting the ever-increasing demands of the food industry can only stay in business if they keep on improving the hygienic designs, cleanability and functionality of their products. Some fall short, some stay on the ball and some take the lead to create competitive advantages. This is one of those innovation stories which illustrates that hygienic design not only yields benefits for the end-users, but also for the developers of hygienic design food processing equipment.

EHEDG Connects Magazine visits the production facilities of SAMSON Regulation S.A.S near Lyon. This French subsidiary of the globally active SAMSON Group built a solid reputation in fluid control valves and related equipment through sustained innovation efforts over a period of nearly 60 years. One of their latest innovations is an EHEDG Certified Aseptic Control Valve (Type EL class I). Mathieu Gillet, Marketing Team Manager at SAMSON Regulation S.A.S., answers our questions:

What was the initial driver to redesign your hygienic and aseptic valve product?

"We essentially develop for the customer and associated target markets, not for a specific special solution. Recently, we've seen a growth in the demand for aseptic control valves. The rising demands are mainly driven by developments in the beverage market, where new requirements result in a trend toward aseptic processes. That is why, for the development of our Aseptic Control Valve Type 3349, we aim for improved technical characteristics, improved flow path with minimum dead-legs and optimized cleanability, a wider application range (pressure) and optimized production on our end. Whenever we wish to redesign a product, it is to bring new features that will benefit all of our customers. As we produce the products ourselves, with our cutting-edge technology on site, we also aim to optimize our processes. We do this not only for our own benefit, but also to create added value for our customers, for example by enabling shorter delivery times."

Why did you want to unify the designs of your hygienic design and aseptic valves?

"The main reason is to simplify the products for our customers. Facilitated interchangeability (if a client wishes to "upgrade" an installation) and simplified maintenance are just two examples of what a unified hygienic and aseptic valve design can do to help a customer.

We also realize that the "line" separating hygienic and aseptic processes is getting thinner every day. That is why we want to be able to offer the same functionalities (Cv-values, pressure etc.) in both designs. However, this is one of the biggest challenges as we combine three different key elements to put this into place: our production team, our design team and most importantly: the customers. All of these three elements have different objectives and it is in our interest to unify and satisfy all three of them."

How did you approach the redesign process and was EHEDG Training and Education involved in this process?

"Generally, our redesign process is aligned with the feedback we receive from the working field. This means involving not only our sales teams to understand the future needs of our customers, but also our after-sales teams that handle our current products. They also have ideas on what improvements are needed. We always strive to receive more feedback from customers to tailor our developments to meet their needs. The EHEDG training workshops are attended by our design and quality teams. They help us a lot to correctly design the "shapes" of the flow path inside the valves."

How important and how complex is the testing of hygienic and aseptic valves?

"Testing is key, as it allows us to verify the

compliance of our products to the market cleanability requirements. It also allows us to ascertain the performance of our products and to compare that to real life applications. The difficulty here is that the application range is huge. That's why we have to target various industries so we can deeply comprehend their needs. This is not always a simple task, but the work that goes into it is very important nonetheless. EHEDG testing is not a simple task, but the good cooperation between the EHEDG Accredited Test Laboratory (ACTALIA, Mr. Rossi) and our company makes things a lot easier."

How can end users yield practical benefits from using this redesigned valve?

"The practical short-term benefits are: a guaranteed product compliance, while reducing waste and lowering costs. This is accomplished with a very high control precision, less weight/thermal inertia, and an excellent external and internal cleanability. A significant long-term gain concerns the lower maintenance efforts and longer life span of the product. With more spaced out maintenance and shorter cleaning intervals, costs are reduced and customer installations can run uninterrupted over longer periods. All of these elements combined contribute to a quicker return on investment. SAMSON valves have always offered long operational lifespans and the goal of our redesign project is to increase these further."

EHEDG is always interested in sharing industry stories about research and development projects that illustrate the importance of connecting people and their expertise in this golden era of hygienic design. Do you also have an inspiring project to share? Then send your proposal to editorial@ehedg.org and get featured in EHEDG Connects Magazine or EHEDG Connects Online.

A partnership in hygiene design that offers more

Whether fish or poultry, there are no compromises when it comes to hygiene. Van der Graaf produces drum motors for belt conveyors – for the food industry too – and was looking for the right partner to seal its motor shafts. Angst+Pfister is now working together with the European Hygienic Engineering and Design Group (EHEDG) on these projects. The know-how from both is thereby combined to open up new possibilities in hygiene design.

The drum motor for belt conveyors in the food industry: its seal nestles against the protruding shaft.

Home sweet home is the scent of a crispy roast chicken coming out of the oven, then the world is as it should be. Anyone who spoils their family or friends in this way no doubt relies on the proper quality and hygiene of this hearty treat. In order to foster this trust, engineers are constantly developing hygienic designs in food technology – from individual materials and components to complete industrial facilities. Angst+Pfister's sealing specialists contribute to this process.

With the highest level of expertise behind them

In 2019, Angst+Pfister joined the European Hygienic Engineering and Design Group (EHEDG) – a non-governmental organisation dedicated to optimising hygienic design in food technology. Since the 80s, it has been in dialogue with suppliers in the fight against bacterial contamination and issued the strictest requirements. They comply with all regulations from the European Union and the United States' Food and Drug Administration (FDA). "EHEDG membership grants us access to the most qualified specialists in hygiene design" says Jan Boomsma, Product Application Engineer at Angst+Pfister Netherlands.

When it comes to materials, rubber compounds or individual components, Angst+Pfister already commands a high level of hygiene expertise. "Thanks to EHEDG we are now expanding this hygiene expertise to include entire machines in operation, that is, integrated solutions that meet certain industry standards", explains Jan Boomsma. Angst+Pfister combines this with specific client needs like chemical resistance for the cleaning or longevity of components – based on their own know-how. "EHEDG is an exclusive competence network that opens up entirely new possibilities for us and our clients." Together with the Dutch firm Van der Graaf, the first project has been successfully launched.

Drum motors for the food industry

Van der Graaf's customers manufacture belt conveyors. These in turn are used in agriculture, dispatch centres or for baggage transport at airports, and in the bulk goods, automotive and food industries. Whether fish or poultry, when it comes to hygiene design there are no compromises. Van der Graaf manufactures drum motors for such belt conveyors and occupies a leading position in the market because of it; they are suitable for continuous use under the toughest conditions. Drum motors have no external components – everything is enclosed in the drum: The motor and gearbox operate in an oil bath that ensures lubrication and cooling.

Van der Graaf required a seal for its drum motors, which are used, for example, to power digital poultry sorting systems. The seal sits between the shaft and the motor (see picture). Internally it seals against engine oil, and on the outside it should withstand hot water under high pressure during cleaning. In addition, the outer seal must be incorporated into the metal cover so evenly that bacteria have no chance. "Our design prevailed over several competitors", Jan Boomsma notes. The price also played a role in this.

Cost-effective engineering with an eye for the bigger picture

Initially, the project only focused on the external seal against water and dirt – Van der Graaf planned to use an AS type standard seal on the inside. "Thanks to the idea of integrating the inner seal into the whole design and replacing the existing metal spring with a high-tech O-ring made of a polytetrafluoroethylene (PTFE) mixture, we became very attractively priced", Jan Boomsma reports. Because it reduces assembly and maintenance costs. This motivated Van der Graaf to keep working with Angst+Pfister. The teams were all the more delighted when their final design was approved by EHEDG. Tests were also carried out by the expert organisation Dekra – with good results. Angst+Pfister's solution achieved IP69K protection class. The protection class generally indicates how well a casing protects against solid objects and liquids. IP69K means: Neither dust nor hot water can penetrate under high pressure.

Final challenge: Use in the factory

The protection class IP69K by itself does not mean that the solution covers all customer needs. Because of this, Van der Graaf ordered a pre-production series to test in a factory. No small undertaking, as Jan Boomsma recalls: "These companies depend on their production running smoothly. Even if promising innovations hit the market, they have little interest in experimenting, as long as their equipment runs smoothly." It is not easy to receive substantive and rele vant feedback when one is testing the customers of the customer's overseas clients. The test phase accordingly took some time. "If things go badly, the feedback is immediate – if things go well, it just takes some time to be sure." The tests have now shown this, and the first series of seals has been delivered. Angst+Pfister is looking forward to providing more innovative contributions in hygiene design for food technology in the future. Now that's a hearty promise.

A new hygienic cheese packing facility for Lancewood Holdings - a division of Libstar

Powered by Astratek and EHEDG Regional Section South Africa

LANCEWOOD®

Astratek™ manufacturing engineers

With the launch of a new EHEDG Regional Section in South Africa, the South African food industry gained direct access to the support of EHEDG to optimise food safety, food quality and food processing productivity in their region. This interview illustrates how one of the fastest growing domestic cheese producing companies in South Africa benefits from the support of EHEDG Company Member Astratek and EHEDG Regional Section South Africa during the design and development of their new hard cheese packaging facility. Our questions are kindly answered by Lancewood Chief Operating Officer Gert Barnard and Astratek Managing Director Peter Grobler, who is also the chairman of the EHEDG Regional Section South Africa.

Have the changes in food safety regulations affected the way you plan and design your facilities compared to 10-15 years ago?
"There has been a rapid evolution of food safety standards which hugely impacts the design. This results in bigger and more costly facilities where virtually every aspect has changed. This would include: effluent systems and the need for hygienic drain points and separate high risk drains, HVAC systems with positive over pressure and lower RH requirements and virtually every aspect of staff hygiene and garmenting, including separate garmenting rooms to allow for full change in dress from street clothes to factory clothes and captive footwear systems."

When did you first hear about the existence of EHEDG and its Guideline, Training and Certification offerings?
"Astratek briefed us on the benefits of adhering to the EHEDG guidelines as a means of engineering hygiene. This also featured in our equipment selection for the new high speed packing line from Multivac where we observed the benefits of EHEDG guidelines in action."

How would you describe the role of Astratek in the development process?
"Astratek has handled the complete project from initial development and consideration of facility options to eventual project execution and construction management. They initially developed some options from which we selected our preferred option. From there they did the full detailed design including the building and structure, layouts and finishes, materials and flow modelling and all utilities and auxiliaries including HVAC and robot packing lines."

What do you consider/expect to be the result of this collaboration, e.g. the practical/ economical benefits of integrating hygienic engineering and design in this new design?
"This facility will set new standards of hygiene design in South Africa. We expect it to be an attraction for new top and retail customers. The additional space and capacities will be definite drawcards."

Gert Barnard I Lancewood
Chief Operating Officer

Peter Grobler
Astratek Managing Director

What is the primary added value of your services for Lancewood?
“Astratek has a deep understanding of the operation as well as design and construction of food manufacturing plants. We are familiar with the challenges of plant operation and are able to incorporate these learnings into a design of a plant which is cost-effective to build and operate. We strongly believe in fully engineered solutions – no guessing. We are well versed and experienced in the design of food plants and modern hygienic requirements and have been part of the evolution in requirements. Our checklists developed over many years ensure that all aspects are taken care of. Our streamlined process allows us to offer a cost competitive engineering package.”

What are/were the specific challenges with regard to hygienic engineering and design in this project?
“No doubt, hygienically designed plants are more expensive and require more features. Adhering to the requirements while still delivering a cost effective solution is a challenge.”

How do you put EHEDG Guidelines and the EHEDG expertise network community to good use in the interest of Lancewood?
“The EHEDG guidelines provide a practical and definitive set of guidelines that are incorporated into the Astratek design process. We appreciate the clear and unambiguous guidelines. Due to our depth of experience in the design and construction of food plants as well as the operation of such plants, we are well versed in food plant design, and therefore it was not necessary to seek input from the community for this project that may be required for others.”

How do you collaborate with Lancewood to prevent common development mistakes?
“The Lancewood facility design process occurred mainly during the lockdown in South Africa, so much of the design scoping and review was done using Teams video conferences. This proved to be a good process, although more regular and lengthy meetings were required. Being the designers in this project, we saw it as our first task to convince Lancewood of the benefits of EHEDG. They were aware of EHEDG but not of the details and value of the EHEDG Guideline Documents. It was our job to “lift” the relevant clause from the guidelines and not only explain the rewards and benefits to Lancewood Management, but also to sell the costs and benefits of compliance to Lancewood. Then each aspect of the design was discussed at length, generally in short Teams workshops.”

The Astratek Team

What is the relationship between EHEDG Regional Section South Africa, Astratek and Lancewood?
Peet Grobler, on behalf of EHEDG Regional Section South Africa: “Astratek is a member of EHEDG and subscribes to EHEDG as a cornerstone of our design and construction process. We have convinced Lancewood of the benefits of adhering to the guidelines. The Lancewood Management team is highly experienced and well aware of the benefits of good hygienic design.”

How does this project illustrate the developments in hygienic design adaptation in your region?
“South African consumers are a discerning group that demand the highest standards of hygiene, especially within top-end retail. For this reason South Africa has seen a rapid evolution and escalation in hygienic design and safe food production in the last 5 – 8 years and is on par with the standards in well developed countries. The Astratek team is involved in facility designs for multinationals operating in South Africa as well as South African exporters to Europe. We are regularly exposed to the requirements of these markets which are echoed in South Africa.”

What can other South-African food producers learn from this example?
“Attention to detail at the design stage can make a huge difference in ease of operation and operating cost. Ensure that sufficient time is allowed in your process to do the detailed work. Designs must be thoroughly considered from many perspectives to facilitate good operations.”

All the best!

After almost 13 years, it is now time for us here at the EHEDG Secretariat in Frankfurt to say goodbye to you. At the end of the year, the new EHEDG Headquarter Team in The Netherlands will take over. Adwy, Cristina, Phoebe and Mirjam: we wish you much success in further driving the EHEDG organisation forward. We are sure you will do well.

In 2007, EHEDG had 80 company members, 4 active Working Groups and 8 Regional Sections. Today there are 550 EHEDG Company Members, 70 Institute Members, 20 Working Groups and 35 Regional Sections all over the world. In this melting pot of cultures, working with the best experts in the field, who voluntarily contribute their valuable time and knowledge to EHEDG, has been a fascinating and enriching experience.

We will always remember the wonderful events in the various countries, where we enjoyed the warm hospitality of the organisers and where we all reunited as EHEDG friends from all over the world. We hope that you enjoyed the fruits of our hard work to make these events possible.

Thank you for every experience shared, for every friendship made, and for the good times. We will miss you a lot and wish you all the best!

Goodbye for now, and for later: Auf Wiedersehen!

Susanne, Johanna and Alexandra.

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If you want to contribute to future content in this magazine, please send an e-mail to:
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“WE ARE PROUD TO TAKE PART IN THE COMPREHENSIVE EXCHANGE OF EXPERIENCES AND KNOWLEDGE WITHIN THE GLOBAL EHEDG COMMUNITY.”

Rainer Kreiselmaier, Technical Director Global Process Industry at Freudenberg Sealing Technologies

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“WE DEVELOPED OUR NEW CERES PLUS DRYER FOR COATED CEREAL PRODUCTS BASED ON THE VERY LATEST HYGIENIC ENGINEERING DESIGN PRINCIPLES AS ESPOUSED BY EHEDG.”

Steve Blackowiak, Director of Research and Development and Food Safety at Bühler

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“BY OFFERING A COMPLETE RANGE OF EHEDG-CERTIFIED PROCESS INSTRUMENTATION, ENDRESS+HAUSER CAN SUPPORT ITS CUSTOMERS IN ANY KIND OF HYGIENE PROCESS TO ENSURE FOOD SAFETY.”

Tim Schrodt, Regional Industry Manager Europe Food & Beverage Endress+Hauser Deutschland

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“OUR DESIGN AND QUALITY TEAMS ATTENDED THE EHEDG TRAINING WORKSHOPS. THEY HELP US TO CORRECTLY DESIGN THE SHAPES OF THE FLOW PATHS INSIDE THE VALVES.”

Mathieu Gillet, Marketing Team Manager at SAMSON Regulation S.A.S.

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“WE COMBINE OUR EXPERTISE ON COMPONENTS AND MATERIALS WITH EHEDG HYGIENE EXPERTISE. THIS OPENS UP COMPLETELY NEW POSSIBILITIES.”

Jan Boomsma, Product Application Engineer, Angst+Pfister Netherlands

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