

# Hygienic design for bakery technology

THERE IS ROOM FOR GREAT IMPROVEMENT IN RATIONAL, COST-EFFECTIVE CLEANING PROCESSES IN BAKING OPERATIONS. A NEW EHEDG WORK GROUP HAS NOW TAKEN ON THE TASK



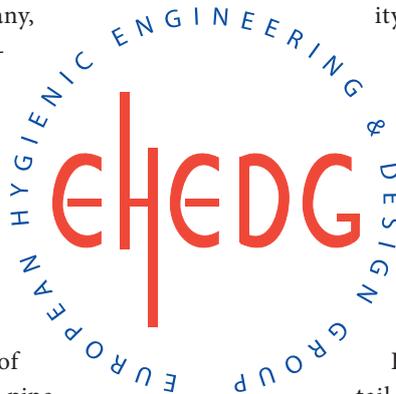
++ figure 1  
Easy to clean is one of the main aspects at machinery with hygienic design

**+** The abbreviation EHEDG stands for “European Hygienic Engineering & Design Group”. This expert community was founded by machine and components manufacturers, practitioners in the food industries and experts from research institutes and health authorities in 1989 – after the enactment of the first EU Machinery Directive – and pursues the aim of contributing to cleaning-friendly plant design and layout in all areas of food production. The EHEDG’s secretariat is located in Frankfurt, Germany, in the VDMA’s [German Engineering Association] office building. The EHEDG’s work involves both the design, installation and cleanability of components and machines as well as their operation, servicing and maintenance from hygiene points of view. The main motto in this respect is simply: “easy to clean”; it is reflected in comprehensive certification codes of practice – known as “guidelines” – for a very wide variety of areas: they range from the hygienic screwed pipe couplings and the design of slipping seals to the steam sterilization of plant components and the hygiene-friendly use of food technology lubricants.

The EHEDG now has more than 25 work groups to deal with this broad field. The latest of these “subgroups” is entitled “Bakery Equipment”. It was officially founded in Frankfurt on 21<sup>st</sup> February 2013, but the idea for it had already come

into being during the iba in Munich in September 2012. The reason for it was the scandal at Müller-Brot. Although other instances of hygiene deficiencies in baking businesses had already occurred previous to that, the catastrophic situations at Müller-Brot with the subsequent company insolvency in February 2012 were what brought the topic of hygiene in baking operations to the very top of the agenda. At the same time the Bavarian Health and Food Safety Authority (Bayerisches Landesamt für Gesundheit und Lebensmittelsicherheit, LGL), whose “Special Food Safety Unit” had already been inspecting baking businesses more intensively since 2008, was already attempting even before the “worst case scenario” at Müller-Brot in Neufahrn, occasionally with shocking photographs, to make those responsible in the industry aware of the problem (at least in Bavaria). For example the problem is addressed in detail in the LGL’s Annual Report for 2011, which says that: “The inspections revealed, for example, that

in the case of big automated baking lines it was necessary to interrupt the manufacturing process and remove casings to enable the discovery of dirt or pest infestations in difficultly accessible internal areas of the plant close to food,” – and goes on to say that: “The deficiencies complained of always involved a high level of dirt contamination of plant, materials and supplies persisting for many years, with mould on



proofing carriers, the unhygienic storage of foodstuffs and pest infestation.”

These unmerciful descriptions naturally raise the following question: were the hygiene problems in a few of the baking businesses also so serious because the machines and plant used in them have deficiencies with regard to cleanability and cleaning friendliness? Walter Gossmann, Management Consultant at the State Guild for the Bavarian Baking Craft (Landes-Innungsverband für das bayerische Bäckerhandwerk), has worked in the food industry for around two decades. In present-day bakery technology he sees to some extent a considerable need to catch up in relation to the “easy to clean” requirement compared to other branches of the food industry: his summing-up is that “In industry sectors with hygienically sensitive products, a start was already made in the mid-90s to purchase intentionally only plants and machines that could be cleaned quickly and easily. The baked goods sector was asleep during this trend, and is now lagging behind the increased expectations applying to hygienic processes.”

The most important aspect in which companies in the baking industry differ from other food businesses – whether they are meat processing companies, confectionery producers or beverage manufacturers – is that the raw material is flour. The characteristic property of flour is that it can become

airborne, at least for a certain time. The consequence: Whenever flour is tipped, conveyed or sprinkled, flour dust can form. This in turn can mix with other particulates in the air and can then – depending on the air flow pattern, be deposited again throughout the entire production area. If it then becomes damp, slippery dirt forms; if it becomes wet, dirty slime is formed. If it then dries out again, a solid crust forms. Flour also consists to the extent of 60 % of carbohydrates, the ideal nutrient for pests of all kinds – from mites to mice.

Some of the main tasks for the EHEDG’s Bakery Equipment work group arise from this characteristic feature, thus the guideline it has developed must take into account the following two aspects above all:

- + Firstly, the open conveying of dry flour should be limited as far as possible by appropriate design to minimize the formation of flour dust.
- + Secondly, all machines and equipment, e.g. mixers, dough dividers, roll-out machines, bread roll plants etc. that come into contact with dough should be designed in such a way that they can be cleaned regularly at reasonable intervals and without great expense. This enables stubborn encrusted deposits of dirt to be avoided.

The new EHEDG subgroup appears to be intent on addressing this problem area systematically and with determination: Dr. Gerhard Hauser – until 2002 tenured professor at the ▶

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++ figure 2

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All machinery that come into contact with dough should be designed in such a way that they can be cleaned regularly at reasonable intervals and without great expense



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Dr. Gerhard Hauser heads the EHEDG's Bakery Equipment work group

Chair of the Process Technology of Disperse Systems at Weihenstephan Technical University and at the EHEDG for 20 years – was appointed as the chairman of the work group at the inaugural meeting on 21<sup>st</sup> February 2013. A total of 25 persons took part in the inaugural meeting. They included, among others, representatives of the manufacturers Zeppelin-Reimelt, Fritsch and Isernhäger and representatives of the producers Wünsche, Bonback and Ankerbrot, as well as one representative each from BÄKO Süd and the BGN (German professional association for statutory accident insurance and prevention in the foodstuffs industry and the catering trade). Project teams were immediately set up for the three basic subareas: “Raw materials management and dough manufacture”, “Further processing up to the oven” and “Oven and cooling”.

The second meeting of the work group then took place on 20<sup>th</sup> June 2013 at the Zeppelin Reimelt GmbH in Rödermark near Frankfurt, Germany. Dr. Hauser made an optimistic prediction after the meeting: “The large number of experts who are taking part in the work group, and the visible great interest in intensive collaboration, have confirmed the confidence that I felt.” The discussion in Rödermark was very intense. The representatives of the bakery businesses who were present were given an opportunity during the meeting to formulate clear requirements with regard to the cleanability of bakery machines and equipment. As a result of this “brainstorming”, the minutes of the meeting include a list of no fewer than 30 points – of which the following is a sample:

- + Employees should be able to dismantle equipments quickly and easily;
- + The work must not be impeded by accessibility;
- + Machines in the wet area must be suitable for low-pressure cleaning, and above all the electrical systems must be leaktight to resist foam cleaning;

- + It is necessary to separate the drive system/controller from the production space;
- + Dead spaces and areas that are inaccessible, e.g. for vacuum cleaners, must be avoided;
- + A division is needed between bread/confectionery/pastries, because the requirements are different;
- + The cleaning cycles in the industry and the artisan craft are different, because the process structures are different (the artisan craft has many different products).

As a first big step, the three project groups initially undertook to prepare an overview of all the “specific apparatus affected”: the plan is for all the machines, devices and equipment items that come into question to be classified according to categories. Dr. Hauser explained this process as follows “For hygienic design it is essential to make a distinction depending on the type of cleaning process, i.e. ‘dry’ or ‘wet/damp’ and depending on whether it is a ‘closed process’ or an ‘open process’”.

The type of cleaning (automatic or manual) also plays an important part in this. Work on this Herculean task was started without delay, and the plan is for it to be continued in top gear at the next meeting. The objective is to define general – universally applicable – requirements for the individual equipment groups. For this purpose the individual project teams will continue their work between the meetings, and will discuss separately during the official meetings only on request.

The next meeting of the EHEDG subgroup for Bakery Equipment will take place on 1<sup>st</sup> October 2013. Dr. Hauser does not want to decide on a general timetable until then. He explains that: “Two to three years are usually needed to prepare a guideline,” adding that: “In the present case, however, the bakery machines area is very extensive.” +++



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