



# Hygienic Design Engineering

The most important requirement for beverage production equipment is the steadfast assurance that the individual components – including the elements connecting and supplying them – all function as one integrated unit.

Certain equipment installed in some production facilities exhibits considerable flaws in its manufacture – often the piping connecting the equipment cannot be cleaned with a CIP system. The root of the problem lies with faulty engineering and unsatisfactory project implementation. Problems begin to emerge when the equipment is commissioned or inspected for the first time. This results in unsafe and inconsistent production processes, quality deficiencies and losses in capacity, which can reach such proportions that these difficulties put the companies concerned at a competitive disadvantage, thus favoring other beverage suppliers.

The Hygienic Design Department works to ensure the cleanability of equipment and components employed in beer and beverage production, effectively contributing to proper design and manufacturing practices in the industry. It also acts as a partner for professional project planning, construction and qualification of both production equipment and the process environment. When expanding existing systems, tests and analytical evaluations are performed to find the most favorable solutions, so that the best choices can be made regarding equipment components or even complete production systems, as the case may be. With Hygienic Design Engineering, the Weihenstephan Research Center offers a package devised to assist with the entire process of investing in new production systems – beginning with the specifications and extending to commissioning and inspection, including confirmation of cleanability. The goal is to ensure the safe and efficient production of food, to achieve the lowest possible total cost of ownership and to fulfill the following standards: EN 1672-2:2009, EN ISO 14159:2007 and EU machinery directive 2006/42/EG (EU machinery directive).

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Detailed planning and analysis can significantly impact and assist in the reduction of project expenses and product costs. It has been proven time and again that the inclusion of hygienic design line qualification as part of project management considerably improves not only efficiency during project implementation but also aids in the attainment of project goals. Integrated project management serves to prevent unexpected costs, which may arise during the course of a project due to the insufficient clarification of technical details beforehand. Should there be a scarcity of personnel available for internal project management, assistance from external experts represents a practical alternative.

**The following tests for assessing quality are conducted at different stages of the process:**

- **DQ (Design Qualification including Hygienic Design Qualification)**

- a review of manufacturer's specifications and customer's specifications to determine whether they are complete, including a catalog of hygienic design requirements for materials, components, construction, etc.
- thorough assessment of the layout of machines and equipment

- **FAT (Factory Acceptance Test)**

- preliminary inspection performed at the factory

- **IQ (Installation Qualification including Hygienic Installation Qualification)**

- on-site testing to determine the correct installation and implementation of the equipment according to the relevant specifications
- particular attention is paid to hygienic design requirements

- **SAT (Site Acceptance Test)**

- technical inspection including validation of cleanability

- **OQ (Hygienic Operational Qualification)**

- assurance of ongoing operations in the production facility
- process optimization

