

Advanced Course on Hygienic Design Amsterdam, 10 –13 December 2012

Program content

1. Introduction

2. Design Constraints and Requirements

- History, Standardization & Legal Aspects
- Machinery Directive; NEN-EN 1672; ISO 14159; NSF 3-A, EHEDG;
- General Food Law

3. Know Your Enemy™

- Damage and losses caused
- Functional microbiology
- Contamination/invasion mechanisms
- Colonisation, biofilms, preservation and death

4. Scientific background EHEDG documents

- EHEDG Test Methods, three tests, results on sheet

5. Hygienic Design of Food Production Systems

- Uses Know Your Enemy™ to explain reasons behind design rules
- Introduction document 8 & 10
- Cleanability
- Bad examples and effective solutions™
- Wider coverage than just equipment

6. Material of Construction

- Stainless steel; carbon; surface finish
- Polymer use; FDA, Limitations, Management, Desorption
- Background information integrity polymer surface (for seals)

7. Welding Stainless Steel

- also set-up project; QA – QC incoming materials
- permanent joint

8. Static Seals and Couplings

- Design principle static seals; examples

9. Case Study: Spray Ball

- Application; define: product contact areas; redesign model

10. Background: Rheology / Thermodynamics

- Newtonian / non-Newtonian fluids; yield value (needed to understand case pump)
- Flow rate; removal of micro-organism; falling film; results for closed equipment applicable to open equipment
- Fouling heat treatment; sterilisation time (needed for heat treatment and reaction time)

11. Valves

- Valve types
- Hygienic versus aseptic
- Double-seat valve
- Case study weir-type valve

12. Dynamics Seals (Pumps)

- Case Positive replacement pump with application; safety valve and yield value

13. Cleaning and Disinfection

Course has up to now been focussed on removing invisible micro-organisms, but firstly visual soil has to be removed

- Cleaning & Disinfection: background, application
- Fouling, cleaning agents, cleaning methods (Sinner circle), CIP, ATP

14. Continuous Thermal Treatment Processes

15. Open Equipment Design

16. Packaging

17. Supporting Activities - Lubrication Use

- FDA, Limitations, Management (following bearings; dynamic seals)

18. Building & Process Lay Out

- design around process, equipment, logistics, etc.

19. Supporting Activities - Installation & Maintenance Procedures

20. Integration of Hygienic Systems

- Risk management paramount –evidenced-based!
- Starts with constraints: law, hygiene hazards, stakeholder requirements
- All steps correct and present
- Right sequence
- Concurrency
- Prescriptive design versus risk assessment
 - Buying and selling hygienic Equipment

21. Case Study (Pilot Plant)

Groups of 3-4 persons at the largest public accessible pilot plant at Nizo Institute in Ede, Netherlands, with various pilot or semi production scale equipment;

22. Plenary Discussion

- presentation each group of results case study

23. Student Course Evaluation

Optional afternoon with choice out of two subjects :

- Dry material handling (Mr. Burggraaf) *or*
- Aseptic Processing (Mr. Cocker)