Simplified Sanitary Design Solutions

3-A Sanitary Standards: 2011 Education Program

Presented by Stuart Salvador, Development Engineer, Paul Mueller Co.
Overview

- What is a Simplified Sanitary Design Solution?
- How do we achieve a Simplified Sanitary Design Solution?
- What are the benefits of Simplified Sanitary Design Solutions?
- How can we effectively implement Simplified Sanitary Design Solutions?
Simplified Sanitary Design Solutions: What are they?
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Definition: A Simplified Sanitary Design Solution is a specific design which can fulfill the following design criteria, relative to an existing design:

- Increases manufacturability by using a less complex manufacturing process.
- Decreases the demands placed on the operator for maintenance of the equipment when used in a sanitary design application.
- Permits easier inspection or testing to ensure conformance with sanitary design requirements.
Simplified Sanitary Design Solutions: What are they?

What is an increase in manufacturability?

- Represented by a decrease in manufacturing process complexity, which can be as simple as shortening the time it takes to complete a process (and thereby reduce variance) or allow for a simpler manufacturing process to be chosen (such as one which requires less technical expertise or skill).
- Results in greater manufacturing repeatability (i.e.: parts are more similar to one another).
- Optimizes one or more manufacturing functions: such as fabrication, assembly, or testing.
Simplified Sanitary Design Solutions: What are they?

**What is a decrease in maintenance?**

- Represented by an increase in product availability (the part being available for use a longer or more consistent period of time) and/or a decrease in maintenance time (the time it takes to restore the part to a state ready for operation).

- Results in a decrease in the product life cycle cost and logistical burden for the end user (such as scheduling and training of personnel).

- Optimizes one or more maintenance functions: such as cleaning, calibration, service, or repair.
Simplified Sanitary Design Solutions: What are they?

What is easier inspection or testing?

- Represented by the ability to conduct an inspection or test faster, with less disassembly complexity or no disassembly at all, and/or using a simpler inspection or test method while still attaining a reliable result.

- Results in a decrease in time spent when developing or fabricating the product, and/or a simpler and faster inspection process.

- Optimizes the verification of product conformance to given tolerances and sanitary design requirements.
Simplified Sanitary Design Solutions: How do we achieve them?
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- Achieving Simplified Sanitary Design Solutions:
  - Design Opportunities
  - Designing for Manufacturability
  - Designing for Maintainability
  - Product Development Strategies
Simplified Sanitary Design Solutions:

How do we achieve them?

✱ **Design Opportunities**

✱ Remove Unnecessary Secondary Joints/Attachments (i.e.: fabricate/mold parts as a whole wherever possible)

✱ **Fittings and Connections**

✱ **Manufacturing Processes**

    ✱ New Processes
    ✱ Consolidate Processes (Series to Single)
    ✱ Streamline Processes (Assembly Line)
Simplified Sanitary Design Solutions:

How do we achieve them?

Design Opportunities Example

Materials: There are many more materials available every day which can be used to inherently account for design parameters which were previously accounted for by specific mechanical designs.

Example:

Springs: Mechanical springs and their potential energy stored through compression can be replaced by materials with equivalent elastic potential energy (i.e.: materials with sufficient elasticity to act as a spring).

Gaskets: Using standardized sanity gasket designs wherever possible.
Simplified Sanitary Design Solutions: How do we achieve them?

- Design Opportunities Example
Simplified Sanitary Design Solutions: How do we achieve them?

- Designing for Manufacturability
- Optimization of Functions:
  - Fabrication
  - Assembly
  - Testing
- Assurance Parameters:
  - Satisfaction
  - Quality
  - Reliability
  - Compliance
Simplified Sanitary Design Solutions:
How do we achieve them?

- **Designing for Maintainability**
- Identify and prioritize the maintenance requirements applicable to the product.
- Focus on increasing the product “up-time” and decreasing the product “down-time”
- Estimate logistical burden and life cycle costs of the product.
- Get customer feedback to ensure satisfactory product parameters.
Simplified Sanitary Design Solutions:
How do we achieve them?

Product Development Strategies

Questions To Be Asked:
- What are the intended functions of the product?
- What are the applicable design parameters (i.e.: sanitary requirements, temperature, pressure, environment)?
- What materials should be used to construct the product?
- What product form/shape suits the application best?
- How many pieces/components will comprise the part?
- What manufacturing processes should be used?
- What inspections/testing and acceptance criteria apply?

Evolutionary Product Development
Lean Product Development
Rapid Product Development
Simplified Sanitary Design Solutions:
How do we achieve them?

- Product Development Strategies
  - Evolutionary Product Development
Simplified Sanitary Design Solutions: What are the benefits?
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- Reduction of Variance
- Reduction of “Cost”
- Reduction of Time-to-Market
- Increase in Quality
- Increase in Reliability
- Increase in Safety
- Consistent Profit, Satisfaction & Regulatory Conformance
Simplified Sanitary Design Solutions: What are the benefits?

How do they reduce variance?

- Reducing the time it takes to produce, maintain, or verify a product commensurately results in a reduction in variability of that product in terms of quality, expected life, costs, and conformance to requirements.

- When a simpler component is used as part of a process application, the process variability will also be reduced.
Simplified Sanitary Design Solutions: What are the benefits?

How do they reduce “cost”? 

- Reducing the time or complexity of fabrication operations, maintenance functions, or inspection can all be directly related to reduction of cost.

- The selection of a “simpler” design will yield lower design and development costs in the long run, even if design selection takes significantly longer, due to decreased downstream design cost.

- The decreased variance and increased reliability of a simpler design will improve product life cycle costs and have less industry impact costs.
Simplified Sanitary Design Solutions: What are the benefits?

- **How do they reduce time-to-market?**
  - Decreasing complexity in the design will shorten the design process and enable easier analysis (also, when and as necessary, more rapid design iterations).
  - Reducing the time it takes to produce or verify the product will increase the speed at which the product becomes marketable.
  - This advantage is not just an initial benefit, but a continuing benefit affecting lead time and supply factors.
Simplified Sanitary Design Solutions: What are the benefits?

How do they increase quality?

- Reducing variability in the manufacturing, maintenance, and verification processes makes the quality control easier from the manufacturing or operating standpoint.

- Easier verification of product results in decreased demand on regulators and inspectors and less gray area to regulate as result of increasing complexity.
Simplified Sanitary Design Solutions:
What are the benefits?

How do they increase reliability?

By making parts simpler and easier to maintain, the reduction in variability will naturally trend towards reliability in achieving consistent results with the product.

Consistency of results ensures that warranty costs are reduced, maintenance plans require less changing and re-configuring, and inspection frequency can be readily planned.
Simplified Sanitary Design Solutions: What are the benefits?

- **How do they increase safety?**
  - Simpler parts have less opportunities for error or for things to “just go wrong” during use.
  - A product that is easier to maintain and clean will result in a decrease in the probability that contamination of food products will occur.
  - Products that have less complexity typically also have less crevices or enclosed areas which are difficult to evaluate.
Simplified Sanitary Design Solutions: What are the benefits?

- All of these factors consistently add up to benefits for all three 3-A stakeholders:
  - Equipment manufacturers will have increased profitability for their parts.
  - Equipment users will have satisfaction from decreased maintenance and higher reliability for their parts.
  - Regulatory sanitarians will have an easier time determining regulatory compliance of products.
Simplified Sanitary Design Solutions: How can we implement them?
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- Simplifying sanitary design starts with the establishment of the requirements, such as exist in the 3-A Sanitary Standards.
- Manufacturers can then optimize a Simplified Sanitary Design Solution to meet those requirements.
- Users and sanitarians must provide feedback on the design and its effectiveness in order to provide an adequate baseline for understanding and improvement.
Simplified Sanitary Design Solutions:

How can we implement them?

- The requirements that enable Simplified Sanitary Design Solutions are:
  - As Uniform and Consistent as Possible
    - Definitions
    - Test Methodologies
    - Interpretations
  - As Easy to Understand as Possible
  - Allowing for as Much Creative Design Space As Possible
  - Not Restrictive of New Technologies and Methods of Manufacturing
Simplified Sanitary Design Solutions: It’s Only the Beginning