

Simplified Sanitary Design Solutions



*3-A Sanitary Standards:
2011 Education Program*

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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?



Simplified Sanitary Design Solutions:

What are they?

- ✱ **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?



Simplified Sanitary Design Solutions: How do we achieve them?

** 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 sanitary 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

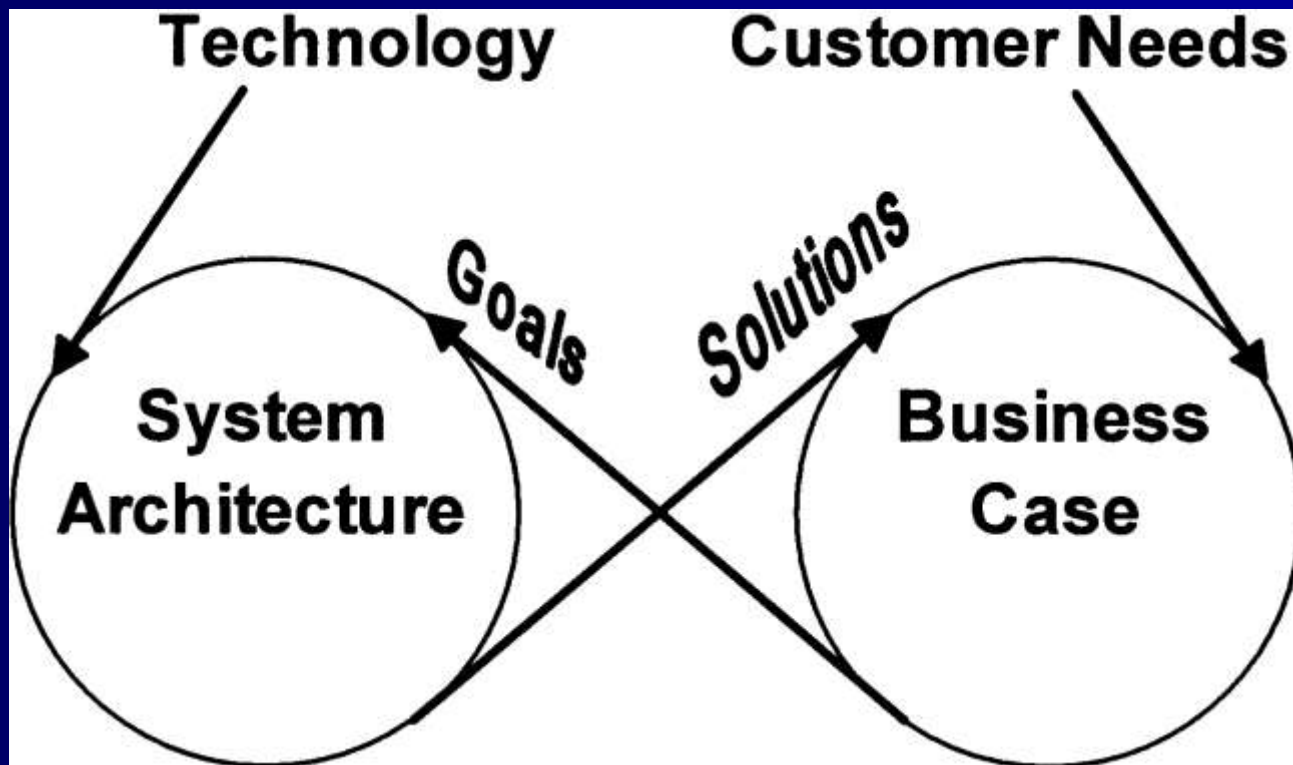
✧ Rapid Product Development

Simplified Sanitary Design Solutions:

How do we achieve them?

* Product Development Strategies

* Evolutionary Product Development



Simplified Sanitary Design Solutions:

What are the benefits?



Simplified Sanitary Design Solutions:

What are the benefits?

- * 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?*

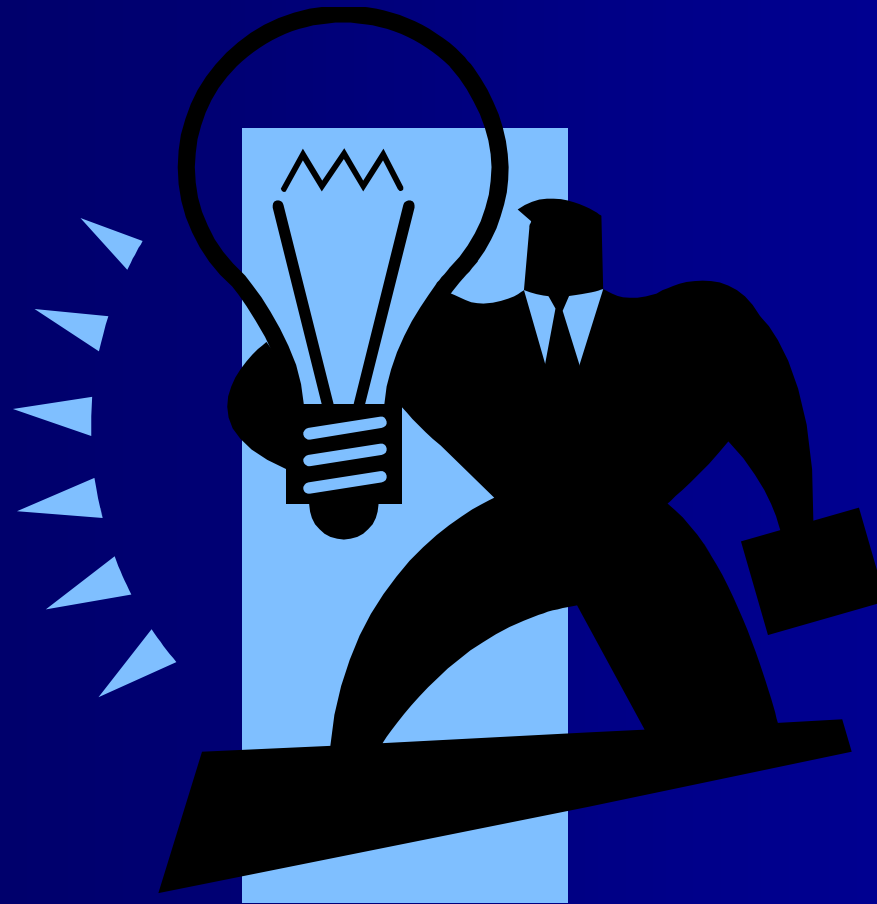
- * Simpler parts have less opportunities for error or for things to “just go wrong” during use.*
- * A product that is easier to maintain and clean will result in a decrease in the probability that contamination of food products will occur.*
- * Products that have less complexity typically also have 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?



Simplified Sanitary Design Solutions:

How can we implement them?

- * 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*

