

## Validation: Your Questions Answered



Published in: Medical Device Technology, Advanstar Communications, December 2001

Validation is often considered to be a complex process that is arduous to implement. This article describes recommended validation techniques and answers to frequently asked questions on how to validate machines and processes.

### **Q: What does validation mean?**

A: The Medicines Control Agency, author of "The Rules and Guidance for Pharmaceutical Manufacturers & Distributors,"<sup>1</sup> defines validation as: "The act of proving in accordance with Good Manufacturing Practice that machinery or processes operate as specified under all conditions." In simple terms this means, proving that what you expect to happen actually happens, and that it happens every time.

### **Q: What does validation mean in the medical device industry?**

A: In this industry, manufacturers have an obligation to prove, through validating the process or machine, that they are achieving zero critical defects.

### **Q: How do I prove I am producing zero critical defects?**

A: Often companies attempt this by sample inspection using the notion of "acceptable quality level." But for a medical device or a sterile surgical implant, what is an acceptable quality level? Any measurable level of defect is not viable for medical products because the result is clearly defective products in the market. Zero defects can only be achieved by controlling the process, and the act of validation is the generation of documentary evidence that the process is controlled.

A proven robust system requires absolute control of the process variables. In the case of a heat-seal packaging machine, these variables are temperature, pressure and time, which allow an operator to control how the pack is being sealed and the seal strength that is produced. Having absolute control over temperature and time and being able to control and repeat pressure is the only way to guarantee a robust system and therefore achieve zero critical defects. It is then through validation of this robust system, you are then able to prove what you expect to happen actually happens, and that it happens every time.

### **Q: How do I start validating my machine?**

A: A validation plan is required and here are some tips before you start:

- Be clear about the benefits you expect. These benefits should be a more efficient process and improved quality of product.
- Set clear objectives and focus on the content of the validation not the methodology. Avoid bureaucracy. The objective is validation, not elegant, but meaning less documents.
- Understand your machine. Only the designer and manufacturer of the machine can normally validate the machine.
- Many companies retrospectively validate machines. They will run a machine under certain conditions and conduct tests. But the machine will only be validated if the precise test conditions can be repeated at anytime in the future.
- Focus on the important things, that is, the elements that affect the product or pack integrity.

## Validation: Your Questions Answered



Published in: Medical Device Technology, Advanstar Communications, December 2001

### **Q: What tests do I complete to validate the machine?**

A: The easiest approach is to rule out the things you do not need to test in order to complete the validation. The recommended technique is to complete a Machine Risk Analysis. This determines where a fault could occur that could produce a defective product. This risk analysis is divided into four areas: Ethical Risk (items that would cause a product recall), Market Risk (for example cosmetic defects), Operations Risk (the functional testing of the machine) and Safety Risk (injury to personnel, covered when the machine is CE marked). Only the ethical area needs to be validated. Use the machine manufacturer to help determine the possible risk areas.

In this approach, risk is defined as any one single event that can create a fault condition. To ensure that no one event can lead to faulty products, it is advisable to adopt a double redundancy policy. Double redundancy is applied to all risks that are identified as a result of completing a risk analysis within the Ethical Area. For example, on each control element install another different, independent element to check that the first one is operating as intended. Every area of the machine that could cause risk to product integrity should be tested (Ethical Risk) and the system challenged in every area where double redundancy has been installed. This focused set of tests derived from the risk analysis will ensure that only pack and product integrity areas are being tested and that the validation file is manageable.

### **Q: What should you do when you cannot use double redundancy?**

A: There are some occasions when you can not apply the double redundancy technique. A splice (which is a joint made with tape) in the middle of a roll of packaging material is one example of this. In this instance, a standard operating procedure (SOP) is compiled. In the case of the splice, the SOP would be to induce a dummy splice every 2 h and monitor the machine to ensure it rejects it successfully. The number of SOPS created for a machine is a good guide to how suitable for the process that machine is. A typical number is 5 or 6; however, if the machine is not self-checking, it will have as many as 25 SOPs.

### **Q: When do I introduce material and product?**

A: Often manufacturers will install a machine, introduce product and material and then attempt the validation process. It is vital that the machine completes the (OQ, Operation qualification) before the PQ (Process or Performance Qualification) is attempted.

### **Q: How often to I validate the machine?**

A: The validation file is a live document that needs to be updated regularly. If you make any changes to the machine, you should go back to the validation file and revalidate the element that has been changed. In some instances the entire machine must be re-validated.

---

<sup>1</sup> Medicines Control Agency, "The Rules and Guidance for Pharmaceutical Manufacturers and Distributors, " Her Majesty's Stationery Office England UK, Date: 1997, ISBN: 0-11-321995-4