

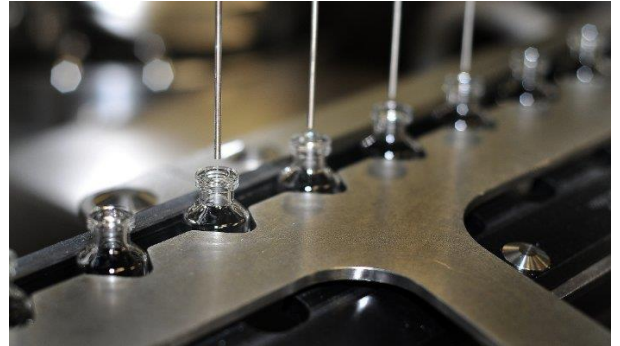


THE RELENTLESS PURSUIT OF SUCCESS. **YOURS.**™

Pharmaceutical Filling is a Growing Industry: Plan Carefully

Fill lines are changing rapidly. It is important to identify your drivers, be aware of your presumptions and understand current technologies. You want to identify the right team and technologies for your product and project.

The drivers for vast differences in fill line technology has come from the need to make injectable formulations easier and less intimidating for the patient. The accuracy of the dosage is important to control patient response and keep quality high and the costs low.



The patient cares about how easy it is to give themselves or their loved ones an injection. This has led to an increase in the use of pre-filled syringes and cartridges. Both are easier for the patient than using a syringe to draw a dose out of a vial. For the manufacturer of the dose, it means that the equipment needed has to fit the dosage form.

The manufacturing company cares about reducing rejects, increasing accuracy, reducing overfill, and improving turnaround time between batches and/or products - all leading to an increase in quality and reduced cost for the patient.

Once you know the type of drug delivery device that you will be filling into, you have to take the time to research the ever-changing technologies:

1. It is important **NOT** to judge your next filling machine by your old filling machine. A lot has changed since then - even if it was only a year ago.
2. Plan to take the time to look at new technologies and new reinventions of old technologies with an open mind. Whatever is old is new again. The top of the fill line companies are looking back at older technologies and reworking them with newer concepts to come up with more accurate and improved systems.
3. Plan to take the time to look at each of the leading fill line providers again. The strengths and limitations of each during your last project will have changed.
4. If you are doing aseptic filling - when was the last time you evaluated the cost of goods model associated with an isolated fill line versus a traditional fill room? Did you know that the decontamination step has changed dramatically even in the past two years? Did you know that isolators are extremely more flexible than they were 10 years ago?
5. If you are manufacturing a terminally sterilized product, do you have control of your bioburden within not only the critical zone of the filling area, but also in the surrounding room?



THE RELENTLESS PURSUIT OF SUCCESS. **YOURS.**[™]

Pharmaceutical Filling is a Growing Industry: Plan Carefully

6. Design for your product or your class of products. For some of the more delicate long chain proteins, you will want to look closely at the shear that could occur within the filling system itself. It is important for the shelf life and quality of your product that you understand what forces are placed upon the compound to be filled.
7. Accuracy is of the utmost importance to the high value products on the market. Accurate filling methodologies can facilitate reducing the amount of overfill on each vial without causing rejects due to under fills. As the system design and machine design has changed, companies have been able to increase the number of units from each batch by reducing the overfill amount. Make sure you protect your cost structure and your patients by knowing how to approach the accuracy puzzle.
8. Reject Reduction - In the past, the tolerance of the filling methodologies were not as easy to adjust as they are now. As servo motors have increased the variability of each of the movements of a filling machine, the operating companies have been able to lose less units to rejects and have been able to increase the number of units from each batch. There are several methods that can be used to reduce the number of rejects. Each operation of the filling machine (filling, stoppering, capping) should be looked at closely to employ advancements to reduce rejects.

Keep in mind, the delivery times of many of these items are over 12 months. As you can see, it takes significant time and effort to thoroughly plan for success in your next fill line project.

About the Author

Christa Myers is a Senior Pharmaceutical Engineering Specialist at CRB with 20+ years of experience providing clients with insight as to how innovative technologies apply to process and facility designs. Her involvement starts with the strategic concept and continues through construction and startup of projects.

With an extensive background in the design of fill-finish facilities, chemical kilo labs, pilot plants, API research and manufacturing facilities, bulk pharmaceutical chemical facilities, highly hazardous compound containment, and biotech process facilities, Christa's broad range of expertise benefits her clients in the design of their facilities.