



REDUCING CLEANING AND CROSS-CONTAMINATION RISK IN SINGLE-USE POWDER HANDLING

Q&A with ILC Dover

In June 2019, ILC Dover will join biopharmaceutical executives to discuss current trends, strategic insights, and best practices in manufacturing, outsourcing, capacity management, quality assurance, quality control, regulatory compliance, operational excellence, supply chain, and logistics at the American Biomanufacturing Summit 2019.

On June 18, ILC Dover will present the topic, Reducing Cleaning and Cross-Contamination Risk in Single-Use Powder Handling. Their case study presentation will focus on how cleaning validation is getting more difficult as the industry gets better at detecting dust and particles; enabling rapid turnover of campaigns to get to market faster; and how powder handling is a bigger challenge than liquid handling, and why it is often overlooked as a potential source of contamination.

Ahead of the American Biomanufacturing Summit, Generis spoke with ILC Dover to discuss their upcoming session, key challenges in the pharma and biopharma industries, and why companies choose to work with ILC Dover.

What evolving containment needs are the pharmaceutical and biopharmaceutical industries currently facing?

The top industry trends can be described by the product or therapy that is being handled. The antibody drug conjugate (ADC) market is growing at an estimated 20% CAGR, and a key issue is safety when handling the product and protection of the product from contamination. The payload component of the ADC requires containment at or below 30.0 nanograms/m³. The isolator designs need to be robust with a clear risk analysis to assure these risks have been mitigated. Once the payload is conjugated with the biologic (Mab's), the ADC must be handled in a sterile environment and so containment for operator and environmental protection is still needed along with processing steps in an aseptic environment.

Another therapy area that is growing rapidly is Cell and Gene Therapy, where donor materials are handled in vivo. This makes the isolation and containment extremely critical to not contaminate the donor cells with particulate or with the cell modification processes like viral vectors.

As the industry gets better at detecting particles and dust, how is cleaning validation becoming more difficult?

There have been advancements in particle detection, and specific to the containment assessments that follow the ISPE SMEPAC protocol, there have been recent significant improvements in Level of Detection (LOD) for the surrogate powders used in the protocol. SafeBridge Consultants, the leading industrial hygiene consultants in the industry, have announced improved analytical methods for particle specificity and sensitivity. This improved method is needed with the recent EMA Guideline on setting health based exposure limits for use in risk identification in the manufacture of different medicinal products in shared facilities. This requires a manufacturer to formally calculate a Permissible Daily Exposure (PDE) that is related to cross contamination caused by residual product after cleaning. The regulation seeks to assure that a patient does not receive a dose of a substance that is not part of their treatment.

How can companies reduce cleaning and cross-contamination risk in single-use powder handling?

In this case the question is the answer. The ISPE guidance "RiskMaPP" clearly states that there is no such condition as perfectly clean. There will always be residual product. By adopting single use technology, the surfaces that will be in direct or indirect contact with the product are not cleaned but they are disposed. This still leaves the equipment surfaces like a mill or dryer, but where containment is used, the entire surface area of the single use product does not require cleaning or cleaning validation. This can reduce the cleaning time and costs dramatically as well eliminating the risk of cross contamination.

How is powder handling a bigger challenge than liquid handling and why it is often overlooked as a potential source of contamination?

Powder handling has always been more difficult than liquid handling for many reasons. The most obvious is that mass transfer methods of powders has significantly more risk than a liquid mass transfer that is easily contained in a tube or pipe. When the liquid is a potent compound it still can be easily contained and remains as a droplet that will not travel airborne like a powder. The greatest risk of the liquid is potential aerosolization which can be contained quite readily. Powders, on the other hand, tend to require mass transfer into processes that can be open and then need to be contained. The containment strategy of "containment at the source" is meant to reduce the risk of particulates getting airborne which can migrate throughout a process suite or further. In addition, particulate is a respiratory risk while liquid compounds do not pose that great of a respiratory risk.

CUSTOMER SATISFACTION

In the biopharma space, ILC Dover's EZ BioPac has been studied to compare the time to dispense a powder. One study showed a 71% time savings with the EZ BioPac, resulting in tangible savings.

Why do companies choose to work with ILC Dover? What quantifiable outcomes have your clients seen after using your services?

ILC Dover brand equity in the marketplace is well known ranging from confidence customers have in our organization as the supplier to NASA for the space suit to the innovation we have made for single use products to handle powders. Recognizing the Quality Control needed as a NASA supplier including documentation and standard operating procedures, ILC Dover customers demand these needed controls are in place and followed. ILC Dover has a Quality culture in the organization and this is an absolute must for stability in customer supply chain security. Our customers have quantified the value of our products which is a different analysis for each product. In the biopharma space the EZ BioPac has been studied to compare the time to dispense a powder and have the EZ BioPac ready to use compared to other powder transfer bags. One study showed a 71% time savings with the EZ BioPac resulting in a tangible savings. For other products like the flexible isolator systems the cost of ownership has been calculated compared to traditional hard wall systems. The cost of ownership includes the capex acquisition costs and considers the consumables cost. In the early introduction of this product there was a misunderstanding of the consumables cost and the general assumption was that consumables would negate the reduced capex cost. To the contrary studies have shown that consumables cost are typically less than cleaning costs and so a single use system returns a savings with each use.

How have your engineered containment solutions been demonstrated to have a significant impact on productivity and profitability?

From a profitability perspective, single use products have shown that an overall lower cost is realized by reducing the need for equipment and floor space and the then direct studies on lower capex and operating costs. This also has a direct impact on productivity by eliminating the cleaning requirements and the associated risks. Biopharma plants have realized that their cadence of manufacturing batches is often restricted by the time to clean stainless steel equipment and hold times to validate the cleaning process. That is a clear restriction in productivity. But even more than that is the risk of if they have contamination in a process. Using stainless steel tanks, valves, and piping instead of single use products has led to an alarming percentage of batch failures. Even at 6%, this is a huge cost to the bottom line. The use of single use systems from ILC Dover provides fast turnaround of batches with no risk.

Where do you see the biomanufacturing industry in the next 5-10 years?

Significant growth is planned in the biopharmaceutical market over the foreseeable future. This is driven by many factors including sociological issues that will make treatment more available for the global population, innovative molecules that are developing to treat and potentially cure patients of disease and cancers that are not being treated now, and new therapies that are being developed. Biopharma manufacturing is growing from the original large molecule substances to combining large and small molecules (ADC), and for the cell and gene therapy in vivo. The expansion of the treatments and the effectiveness of these treatments are driving the rate of growth faster than the traditional pharmaceutical products.

WE ARE ILC DOVER

Recognized globally for our flexible containment solutions, ILC Dover serves customers in a diverse range of industries, including pharmaceutical and biopharmaceutical manufacturing, personal care, food and beverage, chemical, aerospace, healthcare, and government agencies. At ILC Dover, quality is a culture, not a measurement. Our customers will tell you that we cater to their every need and that we're highly innovative, responsive, dedicated, and competitive. We have been innovating since 1947. ILC Dover's visionary solutions improve efficiency, safeguard workers and product, and prevent disasters — proof that we are on the front line of business excellence.

Find out more: www.ilcdover.com