

How Packaging Suppliers in the Drug Delivery Industry Contribute to a Healthier Tomorrow

The challenges to the healthcare industry are constantly changing, causing industry leaders to adapt their offerings to meet varying customer needs and technological advancements. To compete in today's highly-demanding healthcare market, pharmaceutical and medical manufacturers must not only rely on their own expertise in drug development, but also cooperate with partners in the industry with a deep understanding of the challenges and requirements being faced today – especially when it comes to parenteral packaging.

In the ever-evolving pharma market, companies have to provide the appropriate solutions to meet their clients' needs. This includes the development and processing of drugs, introducing new treatment methods, and understanding how to best guarantee drug safety. In order to give primary focus to these issues, it is imperative that drug developers rely on the industry's leading packaging providers to be a strategic partner in developing the safest and most effective parenteral packaging solutions.

No matter how high-quality the drug, without the appropriate packaging, it will not meet the increasing regulations and standards existing in the market. By combining the knowledge and experience of drug developers with the expertise of packaging partners, companies are able to meet the challenges of the pharmaceutical market now and in the future, and thereby, help to make the world a healthier place.

Strong Partnerships for Reliable Drug Packaging

Each existing and newly developed drug has its own unique composition, which makes selecting the right packaging particularly important. As packaging solutions are immediately in contact with the drug product itself, it must be assured that the two products will be compatible. The drug

packaging must be pure, prevent drug product contamination, and be easy to use over an extended period of time. These reasons alone make it necessary for drug manufacturers to choose a packaging supplier with an expertise on which they can rely.

High-quality Packaging Solutions

Suppliers must not only offer a strong product portfolio, but must be a solid partner for developing the ideal packaging solution for each and every drug. The cooperation begins during the first steps of product development and lasts through commercial distribution. During these stages, the drug must be filled, stored, delivered, and administered in the best packaging to remain 100 per cent effective and delivered safely.



Figure 1: Prefilled syringes, vials and cartridges are the preferred methods of drug delivery in the market. Source: Datwyler Sealing Solutions



Figure 2: Vial stoppers and aluminum-plastic seals ensure drug and packaging stability. Source: Datwyler Sealing Solutions

In order to meet the packaging requirements for various drugs, suppliers must offer a wide portfolio of drug delivery solutions. The preferred methods of drug delivery in the industry are via vial, prefilled syringe, and cartridge applications. Below, each delivery system will be examined and the ideal packaging solutions for each will be explored.

The High-performance Solution – Vials

Vial systems are known as one of the most preferred primary containers used for pharmaceuticals. While using this kind of sterile container, it is especially important to use high-quality sealing materials so that the vial applications can effectively protect the drugs they contain.

Elastomeric stoppers are the highest-quality sealing solution for vials. Packaging suppliers use material science and processing technology to develop complex and unique elastomeric compounds and coatings to safely and securely package sensitive drugs without compromising their efficacy. For highly-sensitive drugs, such as biologics, a fluoropolymer

coating can be applied to the elastomer to eliminate the need for siliconisation, which is a known cause of visible and subvisible particles. In addition to being a silicone-free solution, these coatings provide an additional barrier between the elastomer and the drug product.

To ensure absolute integrity of the drug product, an aluminum-plastic seal is crimped onto the vial, providing an additional level of sealing assurance. Developed using the highest-quality alloy and plastic polymers, these seals guarantee the highest level of quality and reliability.

Cartridges for Parenteral Drug Delivery

Cartridges are used in a variety of pharmaceutical and biotech therapies, such as for dental treatments and insulin management. Cartridge delivery requires two packaging solutions: a plunger to dispense the drug product and a combiseal to contain the drug. Both packaging solutions need to be of the highest quality in order to properly and safely deliver the drug.

Plungers are an essential feature of cartridge delivery systems. Used to both seal the container and dispense the drug, the plunger must perform a variety of functions. Made from a specialised butyl-based formulation, plungers provide all of the physical, chemical, and mechanical properties essential for the safe and easy



Figure 3: Plungers and combiseals meet the multiple challenges of cartridge sealing. Source: Datwyler Sealing Solutions



Figure 4: Plungers, needle shields, and tip caps are used to seal prefilled syringes. Source: Datwyler Sealing Solutions

administration of the drug product. For highly-sensitive drugs, the components can be coated with the same fluoropolymer technology as used for vial stoppers. The coating prevents any unwanted interactions with the drug, while also allowing for the same smooth delivery that would be achieved using a siliconised plunger.

As the plunger seals one end of the cartridge, a combiseal is used to seal the other. In combination with a plunger, these rubber-lined aluminum seals ensure the system integrity of the cartridge. Adding a protective laminate to the high-quality alloy creates a barrier against external forces and reduces the risk of abrasion during manufacturing and handling.

The Safest Drug Delivery System – Prefilled Syringes

The containers of choice for parenteral delivery systems are prefilled syringes. Prefilled syringe systems have become indispensable in the world of injectables as prefilled applications, in conjunction with an optimal sealing solution, guarantee greater medical safety. There is a broad range of sealing solutions for prefilled syringes. Plungers, needle shields, and tip caps are used to

seal the prefilled syringes, while also ensuring the system integrity.

Similar to cartridge plungers, prefilled syringe plungers must also play a dual role: providing a reliable seal to external contaminants and dispensing the drug product safely and precisely. To dispense smoothly, a fluoropolymer coating can be applied to the plunger to guarantee excellent manufacturability and provide a protective barrier for highly-sensitive drugs.

Protecting the needle from external forces is also an important aspect when it comes to injectables. Needle shields and tip caps have to guarantee safe and effective processing during production and handling.

Supplier Commitment to Quality and Purity for Reliable Drug Packaging

The aforementioned advanced packaging solutions demonstrate the effectiveness of a reliable and sustainable partnership between a drug manufacturer and its packaging supplier. Fortunately, more and more suppliers strive to not only offer their customers basic services, but offer a deep understanding of the market for parenteral packaging. By encouraging a working synergy, new and innovative solutions can be developed to help make drug products safe and effective, while, ultimately, improving the lives of patients.



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After receiving her Masters of Business Administration from Saint Joseph's University, Kelly began her marketing career as a Promotional Marketing Manager for Coca-Cola. From there, she moved into the healthcare industry, working for medical device manufacturer, Unilife, as a Marketing Associate and then a Program Coordinator. After Unilife, Kelly moved into a Marketing Manager role at SiO2 Medical Products, before finally joining the team at Datwyler Pharma Packaging in 2018 as Marketing Manager for the Americas.