THE CRITICAL ROLE OF UNIFORM-QUALITY CONTAINERS FOR DRUG MANUFACTURING EFFICIENCY

By investing in highly uniform containers that meet precise tolerances, manufacturers can optimise processing efficiency by increasing automation, minimising downtime and reducing waste — all of which lead to indirect cost savings that far outweigh the initial cost savings of using lower-priced goods

Pharmaceutical manufacturers face unprecedented challenges: rising costs, stringent regulations and increasing complexity are forcing drug producers to adapt to ensure efficiency and profitability in competitive markets. At the same time, drug quality is paramount. Contamination, reduced efficacy or safety issues can undermine patient trust, harm brand reputation and, most critically, jeopardise patient safety.

A factor that impacts both the cost and overall quality of finished drug products are the containers used, which play a vital role in terms

of preserving the sterility, stability and efficacy of drug products. Yet, with increasing cost pressures, some manufacturers may be tempted to opt for cheaper alternatives. Although they may seem appealing in the short-term, such decisions can lead to far-reaching consequences. So, how do you go about choosing drug containers that maximise product quality whilst maintaining cost efficiency?

REDUCING THE COSTS OF PHARMACEUTICAL MANUFACTURING

Financial pressures are a constant reality in the fiercely competitive pharmaceutical industry. Generics, which often sell for a fraction of the cost of their branded counterparts, face downward pricing pressure from consolidated buyers, regulatory scrutiny and global competition. Similarly, biologics demand much higher R&D investment yet are constantly being pressured by a new wave of competition from biosimilars. This is forcing manufacturers to adopt strategies that reduce costs while maintaining compliance and quality standards.

Key approaches to cost reduction in pharmaceutical manufacturing are similar to any other manufacturing industry and include the following:

- Scaling-up production to achieve economies of scale, thus significantly reducing unit costs as output increases
- operational efficiencies — such as adopting advanced machinery or streamlining processes — to decrease costs by reducing waste, improving throughput and enhancing quality control
- sourcing lower-cost raw materials and packaging to reduce expenses.

Amongst the latter of these strategies, drug packaging materials and containers often come under scrutiny as a potential area for cost savings as procurement departments assess ways to reduce production costs.

THE HIDDEN COSTS OF LOW-QUALITY CONTAINERS

The assumption that lower upfront costs equate to better value is a common but risky misconception in pharmaceutical manufacturing. Although cheaper drug containers might seem like a logical way to cut expenses, their use often introduces hidden costs that can disrupt operations and undermine profitability with time.

Patient safety is always the top priority in pharmaceutical manufacturing and ensuring that containers protect the sterility and stability of drug products is non-negotiable. However, beyond safety, the efficiency of production processes and the total cost of ownership (TCO) are critical considerations that cannot be overlooked.

Low-quality containers often fail to meet the stringent requirements of modern filling and sealing equipment, leading to production line disruptions. These inefficiencies result in unplanned downtime, slower throughput and additional labour requirements — significantly impacting operational productivity. Moreover, higher rejection rates during quality checks waste both time and materials, leading to an increase in overall expenses.

KEY ATTRIBUTES OF HIGH-UNIFORMITY DRUG PRODUCT CONSUMABLES

For drug manufacturers, it should be clear that choosing drug containers is an investment rather than a cost ... and that opting for high-quality uniform containers offers several key benefits that significantly lower the TCO with time. Although the initial cost may be higher, these containers enhance operational efficiency and reduce long-term expenses.

High-uniformity containers overcome production line issues related to trembling, sticking or climbing during high-speed operations, which become more pronounced as machine speed increases. This causes production lines to jam, requiring machine speeds to be reduced to accommodate the tolerance of the containers. Superior quality glass containers reduce the likelihood of breakages occurring that often stop production processes: broken glass and product spillages must be cleaned from all affected equipment and machinery.

In either case, production output is reduced or stopped altogether, resulting in reduced output and overall efficiency. Considering that each minute of downtime can equate to hundreds of vials not being filled, the financial implications of such a scenario can be severe.

During the inspection process — whether manual or camera-aided — containers failing to meet the pharmaceutical industry's stringent quality standards are rejected. Superior quality containers minimise the risk of contamination of the drug product, or cosmetic defects in the container, and reduce the unnecessary waste and associated costs of doing so.

Incorporating high-quality containers not only improves operational output and product quality but significantly minimises the risk of costly disruptions. The additional cost of higher quality containers is often negated owing to the low number of finished drug products that are discarded — ultimately contributing to an overall lower TCO and enhancing profitability.

SELECTING THE IDEAL CONTAINERS WITH SCHOTT PHARMA

SCHOTT Pharma, a global leader in pharmaceutical packaging, specialises in supplying high-uniformity drug containment solutions that are designed to meet the demanding requirements of modern drug manufacturing. Their drug containment products emphasise uniform dimensions and exceptional cosmetic quality to ensure seamless compatibility with automated filling lines ... and to minimise

downtime and reduce wastage.

CORE PORTFOLIO

Schott Pharma's Core portfolio offers a robust range of primary packaging solutions that's designed to meet the diverse needs of the pharmaceutical industry. This portfolio includes vials, ampoules and cartridges, all of which are crafted with a focus on quality and reliability to support product integrity and operational efficiency.

Their StandardLine products consistently represent the evolving industry standard, ensuring reliability and safety in pharmaceutical applications. They meet the stringent acceptance quality limit (AQL) levels specified in the Defect Evaluation List (DEL) — providing minimal defects and great performance — and comply with the recommendations outlined in PDA Technical Report 43 to reinforce their suitability for pharmaceutical packaging.

TopLine products represent SCHOTT Pharma's higher-quality standard that exceeds industry norms. Containers feature tighter AQL specifications compared with the DEL for superior cosmetic and dimensional precision. All TopLine products eliminate defects classified as "critical" for uncompromised quality; this is achieved using stringent quality controls and in compliance with cGMP standards. The Core portfolio features three types of containers.

Core Vials are a trusted choice for injectable drugs — including generics, chemicals and traditional vaccines; they benefit from StandardLine quality with the option for enhanced cosmetic improvements through TopLine quality. The vials are engineered for ease of filling and administration, and are designed to provide safe, long-term storage by using high-quality glass and stoppers that are the only materials that come into direct contact with the drug products.

Core Ampoules are available in StandardLine quality, providing excellent AQL levels and reliable performance for use with anaesthetics, emergency drugs and a broad range of chemicals. Made exclusively from pharma-grade glass, the container is sealed directly on the filling line. The ampoules eliminate the need for rubber closures and seals without compromising on product integrity. With predefined breakage systems at the stem, they enable precise and reliable drug administration.

Core Cartridges are available in StandardLine and TopLine quality, offering advanced reliability and performance for various drug formulations, including generics, chemicals and emergency drugs, as well as insulin. Cartridges require a rubber stopper, seal and plunger to allow for easy self-administration through pen injectors or on-body devices, enhancing patient comfort and compliance. Their uniform dimensions and high cosmetic quality enhance fill-and-finish line efficiency, resulting in lower reject rates of finished drug products.

In addition to product performance, manufacturing organisations also benefit from access to SCHOTT Pharma's team of technical experts, who provide personalised and ongoing support to optimise processes and address unique challenges. With a robust global infrastructure, SCHOTT Pharma further enhances its value by offering localised support teams to ensure the seamless integration of their containment solutions in diverse manufacturing workflows.

INTEGRATING SUSTAINABILITY INTO DRUG MANUFACTURING

Sustainability is central to SCHOTT Pharma's values. The company prioritises investments in green technologies to create ecofriendly packaging solutions that align with manufacturers' ESG objectives and, at the same time, ensure environmental responsibility without sacrificing quality or performance.

The company's global manufacturing network plays a pivotal role in reducing the carbon footprint of its operations. By strategically positioning production facilities worldwide, the company minimises delivery distances, significantly decreasing the greenhouse gas emissions associated with transportation.

The introduction of FIOLAX Pro vials, ampoules and cartridges mark another significant advancement in reducing the overall carbon dioxide (CO_2) footprint of pharmaceutical products. Manufactured using climate-friendly electric melting technology, SCHOTT Pharma's 10 mL vials, for example, achieve a 50% reduction in emissions compared with traditional methods. Combined with the enhanced production efficiency of FIOLAX Pro results in higher yields to minimise the waste of CO_2-intensive raw materials.

By integrating cutting-edge technologies, sustainable practices and a strategically positioned global manufacturing network, SCHOTT Pharma remains at the forefront when it comes to enabling pharmaceutical companies to deliver greener solutions for a healthier planet.

THE VALUE OF QUALITY: ENHANCING EFFICIENCY AND INTEGRITY IN DRUG MANUFACTURING

In pharmaceuticals and drug manufacturing, the stakes are too high to compromise quality. Although cost reduction is essential in competitive markets, the short-term savings achieved using low-cost containers often lead to long-term inefficiencies and risks that undermine overall profitability. Instead, high-uniform glass containers play a pivotal role in ensuring manufacturing efficiency by reducing reject rates, minimising waste, safeguarding drug integrity and supporting compliance with regulatory standards. To learn more about integrating SCHOTT Pharma's Core portfolio product lines into your drug manufacturing operations, get in contact today.

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