Serialization, Secondary Packaging and the War on Counterfeit Drugs

Background

For the last ten years, preparation for compliance with the Drug Supply Chain Security Act (DSCSA) November 2023 deadline has required significant resource commitments up and down the supply chain. Ultimately, the goal of the DSCSA is to enhance the FDA's ability to help protect consumers from exposure to drugs that may be counterfeit, stolen, contaminated, or otherwise harmful.

KPMG, a global advisory firm, conducted a 2017 survey of leading pharma organizations to determine readiness to meet 2017 DSCSA requirements. At that time (about halfway through the ten-year plan), 45% of survey respondents had already invested \$50 million+, and 100% of survey participants were planning to implement enterprise-level IT infrastructures to manage serialization.

The far-reaching effect of serialization on business practices and processes may be seen in the finding that 86% of KPMG survey participants have extended capabilities for serialization, extracting data beyond their own enterprise to include internal and external suppliers. Interestingly, more than half of the survey participants (52%) highlighted returns credit calculation and diversion monitoring as top organizational priorities for realizing a return on their technology investments.¹

How much do product recalls, withdrawals and safety alerts affect the industry? The table below shows that the combined number of healthcare and wellness product recalls/withdrawals/safety alerts for healthcare and wellness products (drugs + animal & veterinary + medical devices + dietary supplements) accounts for 37% (451) of the total for all product groups between 2019 and 2021.² It will be informative to watch the change over time beginning with the November 2023 DSCSA implementation.

More recently, at the end of 2022, the FDA hosted a virtual public event on DSCSA implementation and readiness efforts for 2023. Among the topics for discussion:

- Readiness for implementation of 11/27/2023 requirements
- DSCSA standards for the interoperable data exchange of product tracing information
- Technical and legal issues
- General impact upon public health and safety, stakeholder costs, benefits and regulatory burden

FDA product recalls, withdrawals and safety alerts, 2019-2021		
Product Group	Number of notifications	Share of total (%)
Food and beverages	779	63
Drugs	275	22
Animal and veterinary	97	8
Medical devices	46	4
Dietary supplements	33	3
Cosmetics	12	1
Tobacco	2	(1)
Biologics	1	(1)
Nutries (1) I are then 0.50% (2) Total data are add due to some diag. (2) Contrast (2) A and (61)		

Notes: (1) Less than 0.5%; (2) Total does not add due to rounding. Source: (FDA, n.d.[6]

Learn more about Colbert Packaging at

www.colbertpkg.com



© 2023 Colbert Packaging Corporation | www.colbertpkg.com | 9949 58th Place, Kenosha WI 53144 | 262.925.4740



According to the session recap, more testing and piloting is needed before November 2023.³ Many in attendance plan to use EPCIS data exchange. EPCIS is the GS1 Electronic Product Code Information Services, an open standard allowing businesses to capture and share supply chain information about the movement and status of goods, both within their enterprise and with their business partners. Event participants expressed a need to have flexible methods, such as the use of data portals and email, that may satisfy the need by smaller entities.

Make sure you fully understand the FDA guidelines and your responsibility up and down the supply chain, as well as your organization's state of readiness. To fully comply with 11/27/23 requirements, all systems and processes must be digitized, and all trading partners must participate. It's a good idea to monitor the FDA website for updates and helpful resources. While you're there, sign up for email updates from the FDA.

A collaborative industry forum is born.

The Partnership for DSCSA Governance (PDG) was formed in late 2019. PDG is a collaborative forum dedicated to developing, advancing and sustaining an effective and efficient model for interoperable tracing and verification of prescription pharmaceuticals in the United States. Membership includes major pharmaceutical manufacturers and pharmacies.

The PDG created "The Blueprint," a critical framework for implementation of the DSCSA's 2023 interoperability requirements.⁴ The PDG Blueprint established a common protocol for the request of, and response with, Transaction Information (TI) as part of that process. In March of 2023, the PDG called for Blueprint test pilots and demonstration projects to be

completed in Q2 of 2023. The FDA's November deadline for compliance is firm. Non-compliance may result in reputational damage, lost business, federal fines and even imprisonment.

What role does your secondary packaging supplier play in compliance with the DSCSA?

Secondary packaging is a critical line of defense for product integrity. To build an effective defense strategy, your packaging supplier must evolve alongside new threats and deploy appropriate measures to maximize product safety. Ensuring the package is prepped to receive serialization codes is a key role in DSCSA deadline readiness. How can this be accomplished?

Serialization affords tracking by origin, batch number and expiration date. Secondary packaging needs to be set up for serialization by designating a blank target area. By way of example, DataLase® photonic printing involves a two-step printing process. First, a conventional printing process like flexography or gravure is used to lay down a laser reactive coating in a patch on to a packaging substrate, such as paperboard. Then, at the latest point in the product supply chain (i.e., at the point of packing or filling), the pre-printed patch is exposed to specific laser wavelengths, activating the coating to print variable data or graphics as required. Each package may then be printed uniquely.

Automated vision inspection systems inspect each carton by carefully examining that area to make certain it is free of any print defect or hickies. During prepress, graphic files are inspected and verified. During the package printing and finishing stage, lightning speed inline inspection automatically ejects press sheets and



carton blanks containing print flaws or die cut errors. Production continues, saving time and money. With pinpoint accuracy, your packaging design team can target specific zones for various quality criteria.

Is your packaging provider equipped with the technology and processes to provide China codes?

Item level identification and traceability is already required in China. Your secondary packaging supplier must apply a 'China Code' (a drug traceability code representing a unique, unit level identifier) to identify the product at each level of packaging. These drug traceability codes consist of a list of numbers, letters and/or symbols as follows:

- The first seven of 20 characters represent the drug identification code
- International standards (ISO/IEC 15459)

Information must be printed in machine and human readable format using a linear bar code, 2D data matrix or RFID tag.

What's the impact of global drug counterfeiting, and how can your secondary packaging provide an essential line of defense?

Pharmaceuticals are the most lucrative sector of the global trade in illegally copied goods. The negative effects on health from counterfeit products range from mild inconveniences to matters of life and death. Especially in the case of pharmaceuticals, the compromise of active ingredients can derail effective disease treatment, possibly prolonging or exacerbating illnesses.

Other quality risks associated with counterfeit goods include improperly stored or transported products, such as medicines that require transport and storage in special, temperature-controlled conditions to maintain therapeutic value. With the impending enforcement of the DSCSA, the ability to track and trace shipments at every stop offers a new level of transparency to improve detection and removal of potentially dangerous pharmaceutical drugs from the U.S. drug supply chain.

Consider this:

- Cases of drug counterfeiting doubled in size from 2014 to 2019, reaching an all-time high of 4,405 cases in 2019. In all cases, China and Hong Kong (China) were identified as the main exporters of dangerous fakes, accounting for more than 75% of seizures.
- A 2017 study by Price Waterhouse Cooper finds that although less developed markets have long been their stronghold, pharma counterfeiters are now using digital channels to penetrate developed countries where traditional drug distribution networks are well-protected.
- Now that it has become relatively easy to purchase prescription drugs online, consumers have been lulled into trusting the safety of the products, because of their accessibility. Increasing public access to online pharmacies only serves to broaden the market for fraudulent drugs. It is estimated that 50% of the drugs for sale on the internet are fake, and that some one million people die annually after taking fake drugs.
- Counterfeit market growth only fuels the appetite of new players.
- As if the cost of life and health weren't enough, brand reputation suffers any time a fake drug carries a brand name, further eroding public trust in the healthcare system.^{5,6}



Defend your brand with overt security features.

While regulatory agencies work to provide the criteria for requirements and the consequences and enforcement for non-compliance, your secondary packaging works to protect more than the contents—it also works to protect your brand.

Overt paperboard packaging security features are visible to users, and usually require specialized equipment and complex technology, rendering them more costly to knockoff. Specialty coatings, such as watermarks, provide unique graphic elements to lend authenticity when embedded into a design. Other overt features, such as 'soft touch', cold foil or hot stamped foil deliver tactile and visual protection. In addition to these specialized print technologies, embossing/debossing features and die cutting techniques may be utilized for increased security.

Barcodes support traceability, automatization, theft prevention or counterfeit protection. Widely used, the different arrangement of bars and gaps result in the coding of data. Linear barcodes display a pattern of parallel spaces and bars, while two-dimensional barcodes, such as QR (quick response) codes offer more memory capacity, thanks to an array or a matrix of dots and spaces.⁷

For continued protection in the realm of theft prevention, Sensormatic Solutions by Johnson Controls and Checkpoint are examples of brands that offer product and package tagging. Sensormatic is built around an AM (Acousto Magnetic) frequency, while Checkpoint[®], more commonly used by pharmacies, utilizes RF (radio frequency).

Deepen your defense with covert security features.

When considering covert security features, you'll find several security inks from which to choose. Photochromic ink is light reactive fluorescent ink, with prompt reversible color shift when exposed to UV light.

Thermochromic ink is heat sensitive ink that exhibits a distinct color change when subjected to a change in temperature. Though covert, temperature-sensitive brand elements are simple and inexpensive to incorporate into a packaging design and lend authenticity for consumers.

Invisible fluorescents are colorless inks which fluoresce a visible color under UV light. Often used with currency, this covert security technique presents a challenge to counterfeiters with its uniqueness.

A designated target area coated with a coin reactive ink provides instant verification by coin or other metal objects via a chemical reaction that reveals an image. Or you may also consider invisible ink that becomes evident when touched with a special pen. Similar to coin-reactive, this ink requires a unique felt-tip pen for message reveal.

Micro-security printing, invisible to the naked eye, uses microscopic text to represent graphics such as lines or borders as a simple, cost-effective method for fraud prevention. Microprint is viewable only through a micro-scanner and is extremely difficult to copy.

You may also choose to embed RFID tags into a product or label to covertly track its whereabouts, lot code, etc. An RFID system has three components: the product tag formed by a microchip connected to a tiny antenna; a reader that emits radio signals and receives answers from the tag in return; and a middleware that bridges the RFID hardware and enterprise applications.⁸

By combining specialty features in your product protection strategy, your customized paperboard packaging design is more difficult to copy, while maintaining brand security.



What's the bottom line?

The impact of counterfeits on legitimate business is significant and wide-ranging, from lost sales, cost of anticounterfeit measures, reputation management and potential litigation of counterfeiters and possible victims. The challenges have made their way to the pages of 2019 annual reports from Pfizer, Novartis, Roche Group and Merck, among others.⁹

Producers must weigh the cost to implement anti-counterfeit tactics against impact to a firm's reputation when safety and quality are questioned, on top of the prospect of liability for victims of fake drugs bearing your product name. Be sure your brand's product authentication strategy is in order.

Ultimately, serialization, DSCSA requirements, and anti-counterfeit packaging strategies have the common goal to protect patients through a safer drug supply chain.

About Colbert Packaging

Each day, for 60 years and counting, Colbert Packaging is committed to producing safe, smart, and sustainable packaging for customers who include some of the biggest names in the pharmaceutical, healthcare and consumer goods markets. Colbert's Kenosha, Wisconsin, facility produces offset and flexographic printed folding cartons, pressure-sensitive roll labels and package inserts; the Elkhart, Indiana, operation includes folding carton production and paper tray forming. Learn more at www.colbertpkg.com.

- 1. KPMG report. (2017) 2017 Serialization and traceability trends (kpmg.us)
- 2. OECD / EUIPO, Dangerous Fakes: Trade in Counterfeit Goods that Pose Health, Safety and Environmental Risks (March 2022), https://read. oecd-ilibrary.org/governance/dangerous-fakes_117e352b-en#page1
- 3. The DSCSA Readiness Efforts for 2023 Virtual Public Meeting. (December, 2022) https://www.fda.gov/media/164085/download
- 4. Foundational blueprint for 2023 interoperability. Partnership for DSCSA Governance (PDG). https://dscsagovernance.org/blueprint/
- 5. OECD/EUIPO Trends in Trade in Counterfeit and Pirated Goods, Illicit Trade, OECD Publishing, Paris, 2019. https://doi.org/10.1787/g2g9f533en
- 6. Behner P, Hecht Dr. ML, Wahl Dr. F, Price Waterhouse Cooper, PwC Strategy& Report: Fighting Counterfeit Pharmaceuticals & New Defenses for an Underestimated—and Growing—Menace. 2017.
- 7. Ghanni M., Cozzoline C.A., Castelli G., Farris S. An overview of the intelligent packaging technologies in the food sector. Trends Food Sci. Technol. 2016;51:1-11. Doi: 10.1016/j.tifs.2016.02.008. [CrossRef] [Google Scholar]1750-3841.2009.01323.x. [PubMed] [CrossRef] [Google Scholar]
- 8. Kumar P., Reinitz H.W., Simunovic J., Sandeep K.P., Franzon P.D. Overview of RFID technology and its applications in the food industry. J. Food Sci. 2009;74;R101-R106. Doi:10.1111/j.
- 9. Organisation for Economic Cooperation and Development (OECD) Library; Impact of Counterfeit Medicines; Trade in Counterfeit Pharmaceutical Products; https://www.oecd-ilibrary.org/sites/ad927008-en/index.html?itemId=/content/component/ad927008-en#sectiond1e4649

