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In summary, the BoxPicker system addresses and solves many of the storage and retrieval challenges for hospitals working to achieve and maintain compliance with the operational and facility design requirements of USP (797). In a properly designed and certified sterile compounding facility, the BoxPicker has a positive impact on the environmental state of control while providing access to a wide variety of supplies and medications. Because of its single-loading/unloading bins and electronic tracking capability, the system assures greater security, safety and efficiency. Its dual workstation design enables greater productivity for the central pharmacy as well. This type of solution is unique in the marketplace, but its versatility and its focus on patient safety make it worthy of review for any hospital addressing the facility design requirements of USP Chapter (797).

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BoxPicker is an automated high-density storage and retrieval system for controlled and verified dispensing of medications and supplies. Swisslog’s BoxPicker unit is installed in the pharmacy’s ante room (see figure 1), providing personnel working within the cleanroom access to medications and supplies through secure access drawers which automatically open when specific items are requested through the system. As such, the system is completely enclosed and flush with the ante room wall to ensure proper ISO compliance. The normal over-pressurization of the ante room relative to the surrounding support areas prevents transfer of particulate contamination into the cleanroom space.

The system performs the same functions as a vertical carousel but its picking speed is three times faster, greatly enhancing hourly throughput and production. Instead of providing users rotating rows of medication bins driven by a chain and wheel, typical of vertical carousels, the BoxPicker operates via an automated storage and retrieval robot with a mechanism that stores and retrieves individual bins in specific internal rack locations. Another improvement over a carousel storage approach is the BoxPicker’s expandability. The system’s standard design consists of three storage modules each capable of storing 240 bins. Just as hospital pharmacy layouts vary, this automated system can be expanded to meet the unique storage and retrieval demands of each specific hospital through customized configuration. Its high-density design enables 687 bins to be stored in less than 75 square feet of space.
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Hospitals that incorporate ISO Class 5 primary engineering controls (e.g., laminar airflow work stations) for compounding sterile preparations within ISO Class 7 buffer areas typically have storage shelves with casters for easy removal for cleaning. As such, these storage shelves must be constantly re-stocked from the pharmacy’s central inventory supply. Having supplies and medications readily available and accessible for use without having to de-garb and re-garb to retrieve additional supplies improves operational efficiency and improves ongoing employee compliance with required garbing practices.

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For the technical information regarding USP Chapter (797) and the performance of the Swisslog device contained in this document has been reviewed by Eric Kastango and Jim Wagner based on their expertise and professional field observations.

Eric Kastango, MBA, RPh, FASHP
President and CEO
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August 2011

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In recent years, health-system pharmacies have been developing strategies to comply with U.S. Pharmacopeia (USP) Chapter (797), a set of standards for sterile pharmacy compounding which became official on January 1, 2004 (and was revised in June 2008). This chapter is considered to be the United States’ standard of practice for sterile compounding by the Centers for Medicare and Medicaid Services, state departments of health, and many state boards of pharmacy.

The intent of the chapter is to prevent patient harm and death from environmental contamination, medication errors in the strength, and improve staff safety and efficiency. This paper will focus on the physical requirements within the chapter's requirements must address not only the many operational, organizational and procedural requirements, but also architectural, environmental and facility standards. Detailed information on the specific requirements of USP Chapter (797) can be found at www.usp.org.

The challenge of compliance is felt across many health-system organizations as the teams assigned to implement the chapter’s requirements must address not only the many operational, organizational and procedural requirements, but also architectural, environmental and facility standards. Detailed information on the specific requirements of USP Chapter (797) can be found at www.usp.org.

BoxPicker—Ideal Storage/Retrieval Solution for Clean Room Applications

An ideal cleanroom storage solution is to incorporate an automated storage and retrieval system that serves the main pharmacy operation as its primary storage and bulk medication warehouse, while at the same time providing secure access to all supplies and medications needed within the sterile compounding suite. Such a solution is available through Swisslog, a global manufacturer and provider of advanced pharmacy automation systems. The company manufactures an automated high-density storage and retrieval system for controlled and verified dispensing of medications and supplies. Swisslog’s BoxPicker unit is recessed into the pharmacy’s ante room (see figure 1), providing personnel working within the cleanroom access to medications and supplies through secure access drawers which automatically open when specific items are requested through the system. As such, the system is completely enclosed and flush with the ante room wall to ensure proper ISO compliance. The BoxPicker design has a major impact on cleanroom cleanliness by preventing particulate contamination into the cleanroom space. The ante room wall to ensure proper ISO compliance. Such a solution is available through Swisslog, a global manufacturer and provider of advanced pharmacy automation systems.

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When the operator fills a bin with medications or supplies, the BoxPicker automatically stores it on shelving inside a secure enclosure. All transactions begin and end through a locked drawer. Information on the contents of each bin is entered at a workstation using a keyboard or a barcode scanner. A drawer is unlocked electronically, it is released by the system one bin (or one type of item) at a time. Single-drawer dispensing is ideal for containment of controlled substances and other medications or supplies that require secure storage. Due to its secure-access feature, the system is also ideal for providing 24-hour on-demand retrieval.

The BoxPicker system is superior to conventional shelving because the product is identified and verified electronically, providing inventory tracking, access and repositioning. It also provides for greater safety and security because, not only is the product tracked electronically, it is released by the system one bin (or one type of item) at a time. Single-drawer dispensing is ideal for containment of controlled substances and other medications or supplies that require secure storage. Due to its secure-access feature, the system is also ideal for providing 24-hour on-demand retrieval.

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Hospital Pharmacy Automation: Drug Storage and Retrieval

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