VALUE ADD

Extractables and leachables testing: Choose the right partner laboratory

Joseph St Laurent,President, CSO,Chemic Laboratories, talks about the need to engage with a strategic partner laboratory to assist in execution and reporting of E/L results

DRUG DELIVERY and manufacturing of small molecule and biopharmaceutical drugs routinely utilises polymer-based materials and devices. Despite a multitude of advantages, these plastic and elastomeric assemblies also attract concerns about chemical compounds that may migrate into finished products resulting in a direct impact on product quality and/or safety. Evaluation of such extractables and leachables compounds and their potential safety impact remains a challenge to many suppliers, pharmaceutical companies and regulators. Therefore, a need to engage with a strategic partner laboratory to assist in the experimental design, execution and reporting of E/L results is prudent.

Chemic Laboratories, located in Canton, Massachusetts, USA was established in 1998, and is a recognised leader offering contract services to the global pharma, medical device, and biotech industries.

Chemic Labs has a proven history of providing our clients with a wide array of analytical and manufacturing resources that allow them to achieve their goals successfully. Only the most advanced technology is utilised to produce precise and accurate metrics allowing our clients to make scientifically sound decisions about their programmes while moving toward regulatory approval.

Our extractables and leachables analysis, and container closure testing capabilities, are key components of the extensive contract chemistry services offered. Numerous Regulatory Guidance documents (the United States Pharmacopeia Convention (USP) <661>, <1663>, <1664>, ISO 10993, ICH-Q4b), and Industry/Trade association white papers focussed on extractables and leachables are being referenced by Asian regulators and multinational pharmaceutical and medical device corporations, requiring engagement of a subject matter expert (SME) laboratory.

Furthermore, with the maintenance of the FDA-SFDA China, Agreement on the Safety of Drugs and Medical Devices, an atmosphere of harmonisation of scientific methods and analytical procedures is being encouraged. Although details of a particular study design may be debated, all agree that the assessment of device extractables and the corresponding relevant product and patient risk must be assessed. It is these extractables which can lead to the adulteration of drug product with corresponding leachables that must be controlled.

Chemic Laboratories maintains expertise in designing and executing controlled extraction studies (CES) in line with PQRI guidance documents, USP <1663> and ISO 10993 recommendations, short term (less than 30 days) migration studies assessing the mobility of chemical species from secondary and tertiary containers, labels and inks and long term (12-36 months) cGMP leachable studies conducted at controlled ambient and accelerated temperature and humidity conditions. These investigations assess the presence of target analytes identified in the extractable programs and are validated in the bulk drug product.

Additionally, related or new chemical species are taken into consideration. Expert study design is completed to support OINDPs (Orally Inhaled & Nasal Drug Product), PMDIs (Pressurized Metered Dose Inhalers), DPI (Dry Powder Inhalers), Syringes, Single Use Systems (bags, tubing, connectors and filters), vials, stoppers, implantable devices and infusion pumps.

Agency acceptable data is developed and validated using in-house methods utilising multiple state-of-the-art technologies (e.g., HPLC, UPLC, GC, GC-MS, GC-MS-MS, DAD, RI, Conductivity, GPC/SEC, Fluorescence, Headspace GC, LC-MS, LC-MS-MS, and Q-TOF) allowing our sponsor clients the sufficient data to make necessary risk based decisions and move toward a successful regulatory submission.

Additionally, Chemic Laboratories maintains strategic alliances with select companies globally. Recently Chemic Laboratories has entered into a renewable corporation agreement with Arihant Innochem, India. This relationship allows Chemic Laboratories to offer our expert services to India based pharmaceutical and medical device companies whose focus is complex and differentiated products in the generic market space.

References

Weibing Ding, Determination of Extractables and Leachables from Single-Use Systems, Chemie Ingenieur Technik, (2012)

D.L. Norwood. Understanding the challenges of extractables and leachables for the pharmaceutical industry—safety and regulatory environment for pharmaceuticals. Am. Pharm. Rev. 10(2):32–39 (2007)

FDA-SFDA China, Agreement on the Safety of Drugs and Medical Devices https://www.fda.gov/internationalprograms/agreements/memorandaofunderstanding/ucm107512.htm. 12/11/2007

Bestwick D, Colton R. Extractables and Leachables from Single-Use Disposables. Bioprocess Valid. 7(3) 2010: S88–S94

Lannon K, et.al. Quantitative Risk Assessment of Bioaccumulation Attributable to Extractables and Leachables in Cellular Immunotherapy Bio-manufacturing. BioProcess Int. 13(10) 2015: S28 –S37.

Peri P., ONDQA FDA. Regulatory Perspectives on Extractables and Leachables, PQRI Workshop on Thresholds and Best Practices for Parenteral and Ophthalmic Drug Products (PODP) Bethesda, MD. Feb 2011

Academy, E. (2015, November 04). New USP General Chapters on Extractables and Leachables: <1663>, <1664>. Retrieved January 17, 2018, from https://www.gmp-compliance.org/gmp-news/new-usp-general-chapters-on-extractables-and-leachables-1663-1664.

PQRI -PODP Working Group Recommendations: Parental Drug Products (PDP) Ophthalmic Drug Products (ODP) 3rd PQRI/FDA Conference on Advancing Product Quality Washington DC, 22 March 2017