

The Next Generation—Self-Contained Biological Sampling Kits (BiSKit)

ECBC improves biological contaminant sampling techniques developing the portable, user-friendly biological sampling kit, commonly known as the BiSKit.

Prior to September 11, 2001, ECBC designed and produced an advanced portable and disposable biological sampling kit (BiSKit) that permits inspectors and forensic evidence specialists to collect biological contaminants from large surfaces while wearing cumbersome protective clothing. Previously, emergency responders were limited to sampling applications that proved inadequate in the field and consequently extended sample processing and identification timeframes.



The BiSKit is an improvement upon two sampling techniques—swab collection and sponge-based sampling. Challenges presented by the two techniques were that the swab method was incapable of sampling areas larger than a slice of bread while the sponge-based method, known as a swipe kit, comprised 11 pieces and was difficult to use wearing bulky mission oriented protective posture clothing. Further, it was impossible to take multiple samples in quick succession using the swipe kit.

Well received by emergency responders, the BiSKit is a single-use kit made of a specially designed two-piece plastic container with a sampling sponge fastened to the lid and a dropper attachment.

A small vial containing sterile buffer solution attaches to the unit bottom piece.

To use the kit, the vial of sterile buffer is screwed into the sleeve, then, by inverting the unit, the liquid drains from the solution bottle and hydrates the sponge. Once the sponge has been wet, the lid of the BiSKit can be unscrewed and the sponge can be swiped across a surface for sampling. Once sampling is complete, the lid is screwed back on, making an airtight seal and the wetted sponge is compressed against a mesh grating causing the liquid and the material collected on the sponge to be dispensed into the collection bottle.

Once sample material has been delivered to a laboratory for analysis, the dropper attachment is affixed to the bottle and droplets of the sample solution can be placed on hand-held assays or to other types of immunoassays or a quantitative polymerase chain reaction amplification assay.

Testing has proven that the BiSKit can effectively and safely collect bacteria, virus, and toxin material for later analysis and archiving. The BiSKit allows multiple samples to be taken in quick succession with minimal hazardous exposure to the operator and can be used to swab wet or dry surfaces. It minimizes personnel cross-contamination, can be transported following sampling, and will safely capture and preserve a “hot” vial sample.

ECBC rapidly completed the BiSKit design and tooling immediately following September 11. It successfully produced 1,000 BiSKit units on-site at its Edgewood facility, manufacturing enough kits to verify production capabilities.

ECBC designers submitted the BiSKit for a patent and encouraged potential vendors to pursue licensing agreements for commercial production in support of the first responder community. The agency remains committed to producing limited quantities until it is commercially available, and continues to improve upon the item making it safer and more user-friendly.