

Portfolio : Pathogen Detector

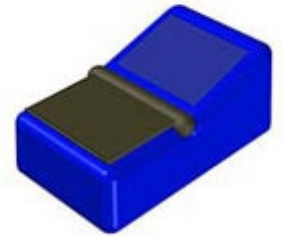
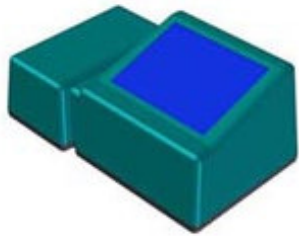


Business Need

Solid Advantage's client, a biotech innovator, identified a market opportunity for a detection system that could rapidly assay foodborne pathogens at food processing labs. Existing systems took 72 hours. Pathogen detection in 12 hours was key. An instrument that could detect specific bacteria in a concentrated culture would be critical to a rapid testing system.

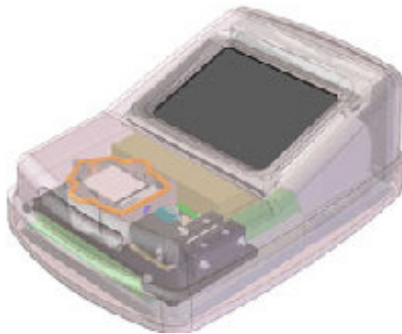
Solution Concept

A crude prototype existed. We created multiple options for the instrument's look, feel, and function, based on client inputs and projected user experience. Then we collaborated to realize the selected approach, and created a total mechanical re-definition.

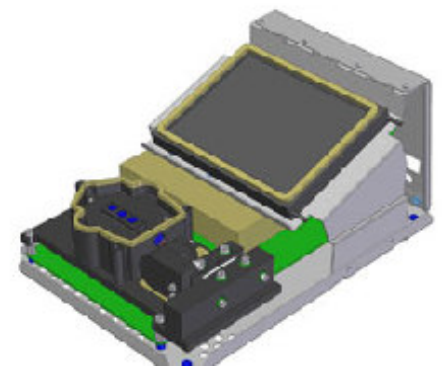


The detection instrument would accept samples in disposable waveguide cartridges, and through evanescent-field laser technology, perform assays using electronic fluorescence measurements. Manual loading would be fast and easy, allowing a high volume of tests in a day. The instrument would require minimal benchtop area, be easy to clean but moisture-sealed, inexpensive, and fit for continuous duty.

Proposed Device



The selected concept packaged laser optics, electronics, and a touchscreen, inside an internal frame. A removeable outer cover allowed access to a complete, functioning instrument. [side view of instrument chassis nearby] Electronic and power connections were on a rear panel. Sourcing issues required accomodation of



multiple display shapes. The cartridge was inserted manually into a covered well, so that assays could run in darkness, and laser light could not escape. Repeatable and accurate cartridge positioning was enabled by nesting the injection-molded cartridge on tooling balls. The lid was hinged on plungers for easy removal, and retained by magnets. This design accommodated the desired operational ease and speed, ruggedness, and serviceability. Patents were registered on this device.

Benefits

We collaborated with the client's team to complete the selected design. Solid Advantage produced a full definition of the physical product, ready to manufacture. This instrument was paired with a cell concentrator, in a rapid detection system that worked very well. Our client was then poised to exploit their targeted market opportunity. Solid Advantage industrial designs and product development were integral to this achievement. Several patents were registered. We were also engaged to collaborate on the cell concentrator, described in another case study on this site.

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