Light. Insight. *Life*.

Volpi rescues delayed project to help launch OrthoClinical's core XT line

CASE STUDY

Client:
Ortho Clinical Diagnostics

Website:
orthoclinicaldiagnostics.com

Industry:
In Vitro Diagnostics

Solution/Application:
Clinical Chemistry

After significant delays in their instrument development project due to issues with their optics designs, Ortho engaged Volpi on a detection solution aimed at boosting sample throughput while optimizing cost-per-test.

Client Objective

OrthoClinical was already two years behind schedule in launching its critical XT instrument line due to issues working with another optoelectronics partner. It desperately needed to get the launch back on track and chose Volpi to take over the project and drive it to completion.

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Approach

We began by facilitating a design review workshop of their existing breadboard design where we were quickly able to pinpoint flaws in it's design.

Our engineers then worked to improve the breadboard design and we developed a fully functional prototype which fulfilled all of OrthoClinical's specifications within just 4 months.

During development, Volpi's key engineers worked on the project, working with frequent change requests and improvement ideas from Ortho. To ensure that the volume of these changes didn't delay the project further, we implemented a transparent change request process.

Volpi vastly improved the existing reflector prototype design's illumination homogeneity and stability, enabling the simultaneous measurement of two spots per chip with a digital camera.

This effort resulted in what Ortho now calls "Digital Chemistry" – a technology that results in an exponential improvement of their dry chemistry technology related to sample throughput per instrument, *which can be doubled on the same instrument footprint*.

The fully tested reflectometer project, developed and documented in compliance with ISO 13485, was successfully transferred from Volpi in Switzerland to our US operation for successful lean manufacturing, with material and process cost reductions driven by Volpi and vetted by Ortho's value engineering team.

Results

The digital reflectometer developed by Volpi is the heart of the new generation of Ortho's instruments for clinical chemistry, its XT line (VITROS XT 7600, VITROS XT 3400), *which provides **double the sample throughput** compared to the previous generation instrument*.

- Enhanced illumination homogeneity, allowing concurrent measurement of two spots
- TDI imaging system with high-speed filter wheel
- Three times stronger irradiance
- Highly stabilized illumination: CV << 0.015 %
- All-LED light engine from UV to NIR
  - LED life-time > 6 years

With two spots per chip measured simultaneously, and each of the spots being priced as before (one per slide), Ortho has increased its margins on the instrument considerably.

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