



MEDICAL - ANALYSIS

BLOOD DIAGNOSTIC INSTRUMENT

Vee guide technology keeps critical diagnostic equipment running smoothly and reliably.



SMOOTH MOTION



COMPACT



EASE OF ASSEMBLY



LOW NOISE

T2 Biosystems (Lexington, MA) manufactures diagnostic platforms that are designed to provide faster, easier, and more accurate results than traditional methodologies.

Their blood tests provide actionable results in just 3 to 5 hours with no up-front sample preparation (versus 1 to 5 days with a blood culture).

T2 Biosystems designed their T2Dx instrument for ease-of-use and with the goal of minimizing hands-on time with the samples. The user must snap a sample tube and reagent tray onto a cartridge, which is then inserted into the instrument via a slide.

In all, the instrument has 7 slide modules which can be loaded individually - no batching required.

CHALLENGE

GUIDING SMOOTH SLIDE MOTION IN A COMPACT, EASILY ASSEMBLABLE DESIGN

Operators expect smooth and reliable motion for each one of the seven slide assemblies; without functioning slides, the samples cannot be inserted into the equipment for diagnostic testing.

In addition to the expected reliability and ease-of-use, T2 Biosystems required that the slides' motion elements have a low profile and be easy to assemble.

Initially, the motion system used a low-profile polymer sliding element bearings. However, this did not provide smooth, low-friction motion. Moreover, the sliding element bearings provided little misalignment tolerance, making installation more difficult.

T2 Biosystems required a new, easy-to-assemble motion system to provide the reliably smooth motion.

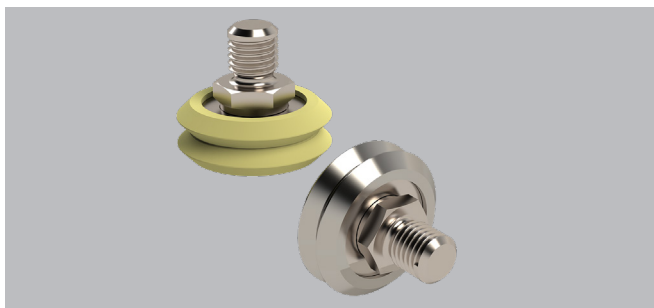


FIGURE 1: *Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris nisi ut aliquip ex ea commodo consequat.*

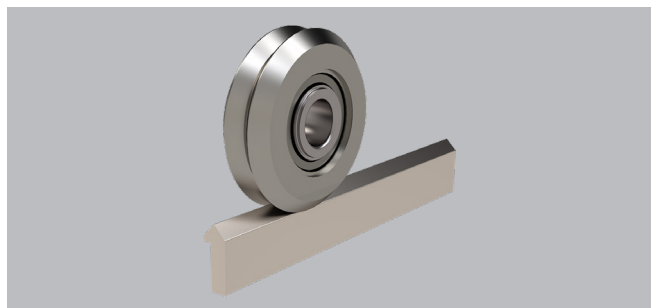


FIGURE 2: *Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris nisi ut aliquip ex ea commodo consequat.*

SOLUTION

SMOOTH-RUNNING DUALVEE MOTION TECHNOLOGY®

To replace the polymer sliding element bearings, T2 Biosystems went with four DualVee guide wheels per sliding drawer. For this lightweight slide application, the smallest guide wheel (size 0) was sufficient and kept the motion system compact.

The 90° vee grooves of the guide wheels allow them to interface with the sheet metal fabricated slide, which has portions bent at 90° angles. This setup eliminates the need for additional components. DualVee guide wheels' integrated mounting studs also contribute to the ease of assembly of the motion system.

Bishop-Wisecarver's application engineers lent their expert support to the motion system design, allowing T2 Biosystems to remain focused on their unique core technology.

CHALLENGE SOLVED

RELIABLY SMOOTH MOTION IN A LOW PROFILE

The DualVee guide wheels offer smooth, low-friction, and binding-free motion.

Moreover, the ability for the stud-mounted guide wheels to run directly on the sheet metal reduces complexity and made the system easier to assemble.

The size 0 wheel option provides a compact profile without the need for a custom solution.

QUANTIFIABLE RESULTS

MOVING FROM PROTOTYPE TO PRODUCTION WITH SUPPLIER SUPPORT

The system operates reliably and no longer experiences the unexpected alignment issues of the earlier prototype.

As they moved from prototype to full production, T2 Biosystems appreciated the value and service extended by Bishop-Wisecarver.