

# Custom Linear Motor Stage Designs: Success Story from Parker

Parker provides engineering designs to customers requiring custom linear motor stage solutions with all critical specs considered for the application. Working with the customer, we develop motion and control solutions that seamlessly integrate to your finished products. Here's an example of Parker working with a customer to find a custom solution when standard products would not work.

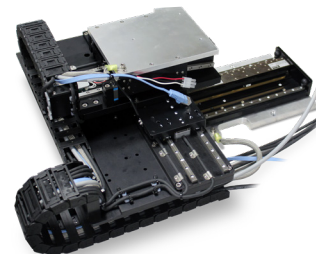
CUSTOM  
DESIGNS

## CUSTOM MOTION SOLUTIONS: SUCCESS STORY #4

**Application:** Life Science / Cell analysis with Z axis focusing by motion of the platform instead of an optic  
Suitable for applications needing precision metrology with small space availability for Z axis

**Standard solution:** Did not meet customer requirements - profiles too large and could not meet precision requirements with screw-driven Z wedge

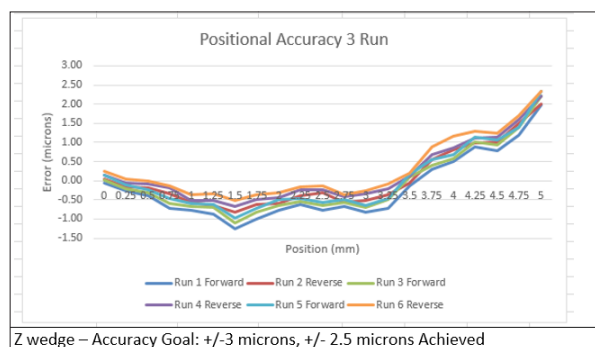
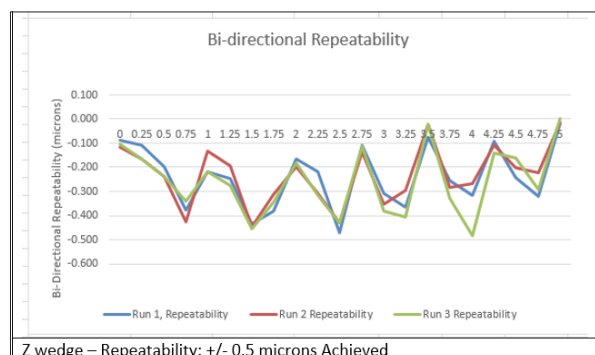
**Custom solution:** Provided optimal height, size, accuracy, and repeatability outcomes that the customer needed.



Application Requirements	Design Outcome Z Wedge
Repeatability of +/- 3.0 $\mu\text{m}$ over total travel	+/- 0.5 $\mu\text{m}$
Low motion drift required over temperature changes	Low position drift over time
Low profile/special form factor required for Z axis	Designed custom linear motor driven Z wedge to meet customer's form factor and specification requirements
Complete cable management	Achieved
Complete drop-in XYZ motion system	Minimum set-up for customer: assembly of axes and programming to customer controller completed by Parker prior to shipping

### Design Benefits

- High stiffness machined parts
- Custom linear motor Z wedge, counterbalance not required
- 3-axis repeatability in all directions



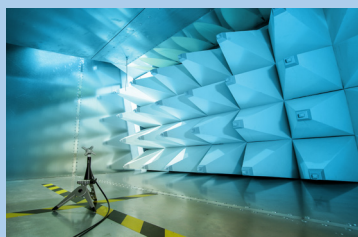
Performance graphs for custom linear motor Z wedge.

## Custom Linear Motor Stage Options Parker Provides

Parker offers product and service unrivalled in the electromechanical field. Contact our application engineering department early in your design cycle to discuss your requirements. We'll help you find the right solution and help shorten your design and product cycles.



Precision Metrology



EMI Testing



Clean Room Testing

## Partner with Parker for Your Custom Linear Motor Stage Requirements

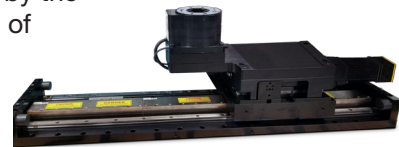
Key applications across various markets all require certain types of precision specifications to obtain the desired results. While there are some variances, the types of applications can be classified into categories. No matter the type, Parker has the ability to provide industry leading specifications required by the customer.

Parker engineering designs custom linear motor stage solutions with all critical specs considered for the application, such as those listed below.

### STATIC METROLOGY

Static Metrology is when the sample is not in motion while being measured by the metrology instrument. Key factors for these applications are precise control of settling time and stability. Parker has designed custom linear stages to specifications meeting these requirements including:

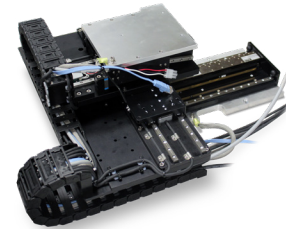
- Stability to sub 100nm
- Move and settling times in under 100msec
- Sub-micron repeatability (500nm)



### DYNAMIC METROLOGY

Dynamic Metrology is when the sample is in motion while being measured by the metrology instrument. Key factors for these applications are precise control of velocity and the stage's profile (flatness, stiffness, etc). Parker has designed custom linear stages to specifications meeting these requirements including:

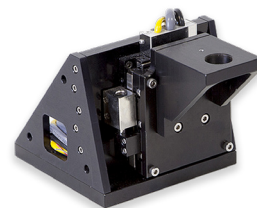
- Sub 20 arc-sec Abbe Errors (roll, pitch, yaw)
- Straightness & Flatness (+/- 3 microns)
- Constant Velocity to meet application needs



### FOCUSING

The final type are applications requiring a motion of axis for focusing on the sample being measured. Usually, this axis has a vertical orientation. Key factors for these applications are having high resolution and stability. Parker has designed custom linear stages to specifications meeting these requirements including:

- Resolution down to 50nm
- Stability to sub 100nm
- Move and settling times in under 100msec



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Life/Reliability Testing



Stage/System Burn-in



Test Stand Development