

Custom Linear Motor Stage Designs: Success Story from Parker

CUSTOM
DESIGNS

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 MOTION SOLUTIONS: SUCCESS STORY #3

Application: Consumer Electronics / Semiconductor - inspection and testing
Suitable for laser line scanning applications with small space availability

Standard solution: Good choice for repeatability, flatness, and straightness

Custom solution: Provided repeatability, flatness, and straightness, plus the optimal power and low profile that the customer needed.

Application Requirements

XY travel of 270 x 75 mm;
customer needs a small
form factor for low profile

System Repeatability of
+/- 1.0 μm

System Accuracy of
+/- 16.0 μm

Flatness of +/- 15.0 μm
and straightness of +/- 5.0
 μm over travel

Multi-axis mapping critical
customer element

Design Outcome

Design met
the low profile
requirements with
needed precision
specifications

1.0 μm

+/- 4.0 μm

Flatness and
straightness of +/-
5.0 μm over travel

XY Mapping to
achieve accuracy
specification

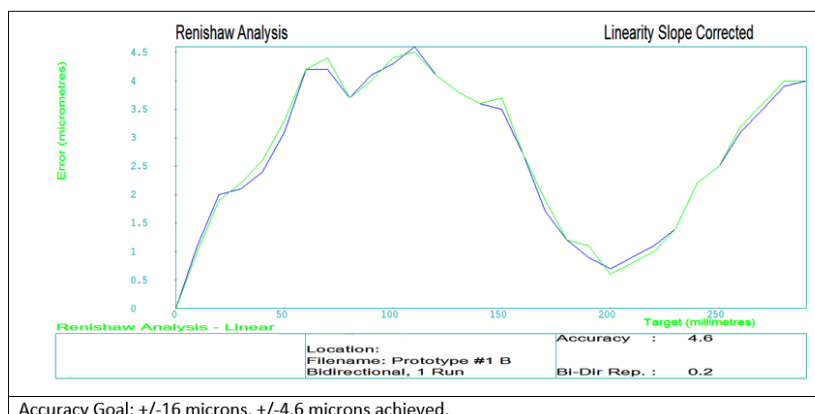
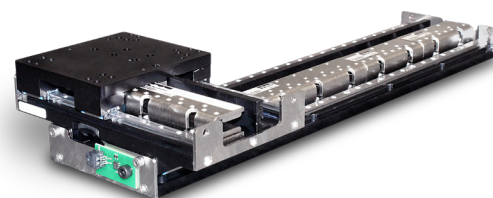
Design Benefits

High stiffness machined parts

Monolithic design delivers lower form factor

High repeatability – 1.0 μm

Strict orthogonality requirements



Accuracy Goal: +/-16 microns, +/-4.6 microns achieved.

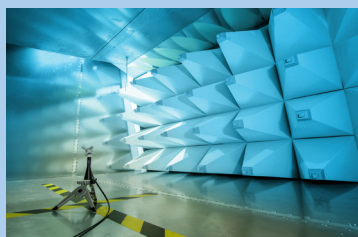
Accuracy performance over travel length for miniature, custom XY linear motor stage.

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

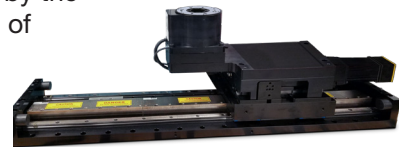
Key applications across various markets all require certain types of precision specifications to obtain the desired results. While there are some variances, the types of applications can be classified into categories. No matter the type, Parker has the ability to provide industry leading specifications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

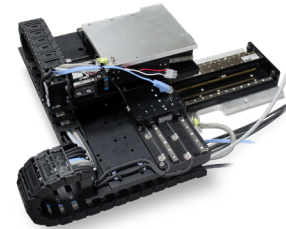
- Stability to sub 100nm
- Move and settling times in under 100msec
- Sub-micron repeatability (500nm)



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:

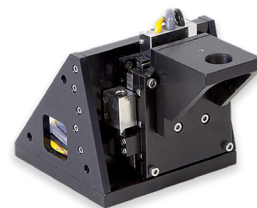
- Sub 20 arc-sec Abbe Errors (roll, pitch, yaw)
- Straightness & Flatness (+/- 3 microns)
- Constant Velocity to meet application needs



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

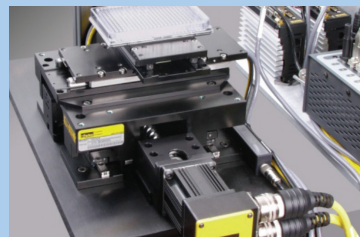


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Life/Reliability Testing



Stage/System Burn-in



Test Stand Development