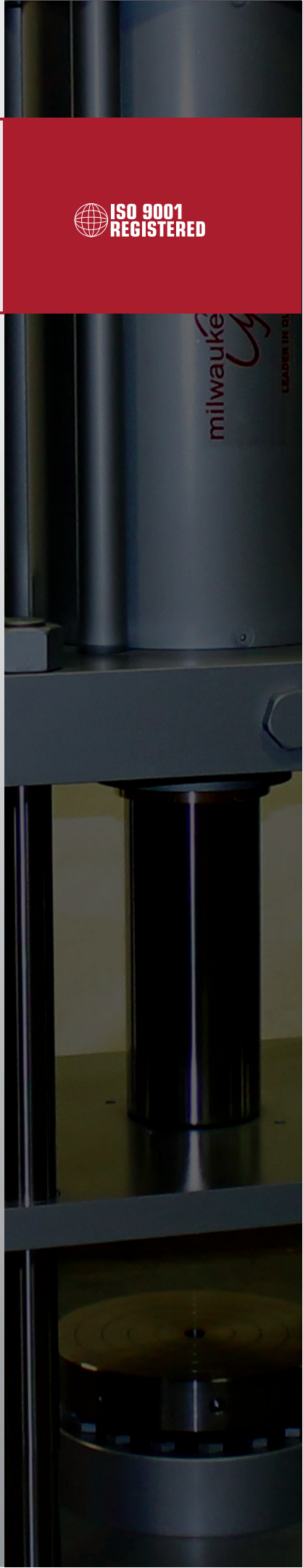
milwaukee Cylinder

Specials are Our Standard

ISO 9001 REGISTERED



Custom-Engineered

Measurement and Automation Solutions

There are many test and automation applications where a universal machine cannot properly emulate the conditions a product is subjected to when put into service. This is most often because universal testing machines are–by definition–generic.

At **Milwaukee Cylinder,** our Engineering Team develops **custom solutions** that are **specifically tailored to your application.** Expert engineering and metrology diligence are combined with the world's best sensors and controls to deliver industry-beating **accuracy, repeatability, reproducibility and throughput.**

When a one-size-fits-all compromise simply will not do, customers turn to Milwaukee Cylinder for Custom-Engineered Testing Solutions.

Specifications

Testing Types
Force vs Displacement vs Time • Stress vs Strain • Creep/Relaxation (Force/Displacement Hold) • Dynamic/High-Cycle/Fatigue • Ultimate Tensile Strength • Force at Rupture • Flexure/Shear • Material Property Characterization

Automation Controls	
Max Axis Count	32
Loop Closure Rate	4,000 Hz per Axis

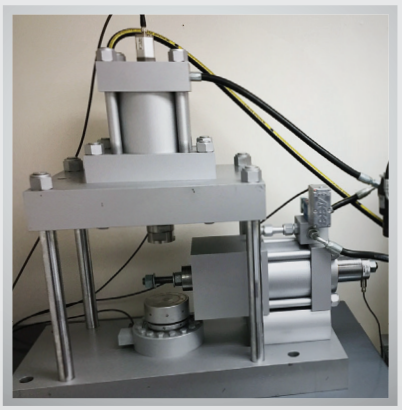
Force	
Capacity Range	±(300 to 2,000,000) lbf
Combined Error	±0.1% of System Capacity
Resolution	1:200,000 of System Capacity

Displacement	
Maximum Stroke	300 in
Combined Error	±5/10,000 in
Resolution	5/100,000 in

Velocity	
Global Maximum	±20 in/s
Minimum (per valve)	±0.01% of Valve Max
Combined Error	±0.1% of Target Value

Coefficient of Friction Test Machine

Complies with *Specification for Structural Joints Using High-Strength Bolts*



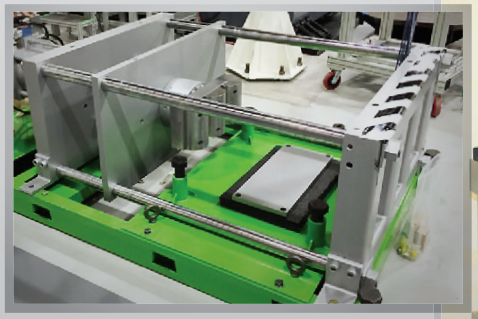
Method: Painted sample is pinched and held with 49,000lbf ±1%; a vertical preload of 1,000lbf is then applied creating the vertical displacement datum; vertical load is increased at 25,000lbf/min until a slip occurs.

Test system automatically captures the peak force, force at slip, displacement at slip, calculates the coefficient of friction, and graphs $Force_{Horizontal}$ vs $Force_{Vertical}$ vs $Displacement_{Vertical}$ vs Time.

Performance Specifications (Capacity x Resolution ± Error)	
Horizontal Force	50,000 x 0.2 ± 125 lbf
Vertical Force	100,000 x 0.5 ± 50 lbf
Vertical Displacement	10 x 5/100,000 ± 5/10,000

Compressive Rupture Testing Machines

Rupture testing is executed by compressing a sample at a specified displacement rate or load rate until it catastrophically fails. Test results typically include: peak force/stress, displacement/strain at peak, stiffness/modulus.



Horizontal Test Machine

Complies with SAE J2464, *Electric Vehicle Rechargeable Energy Storage System (RESS) Safety and Abuse Testing*

Performance Specifications (Capacity x Resolution ± Error)	
Force	150,000 x 1 ± 100 lbf
Displacement	12 x 5/100,000 ± 5/10,000

Vertical Test Machine

Machine designed specifically around customer samples/parts

Performance Specifications (Capacity x Resolution ± Error)	
Force	150,000 x 1 ± 100 lbf
Displacement	18 x 5/100,000 ± 5/10,000

Fatigue-Rated Test Cylinders

Retrofit/upgrade actuators for existing test machines.
Cylinders and sensors are rated for up to 100,000,000 fully-reversed cycles.

400,000 lbf Capacity Cylinder

Large bore and stroke combined with dual servo valves give this cylinder impressive capability.

Performance Specifications (Capacity ± Error)	
Force Performance	400,000 ± 250 lbf

1,000,000 lbf Capacity Cylinder

One of the largest of its kind ever created, a steel behemoth

Performance Specifications (Capacity ± Error)	
Force Performance	1,000,000 ± 800 lbf