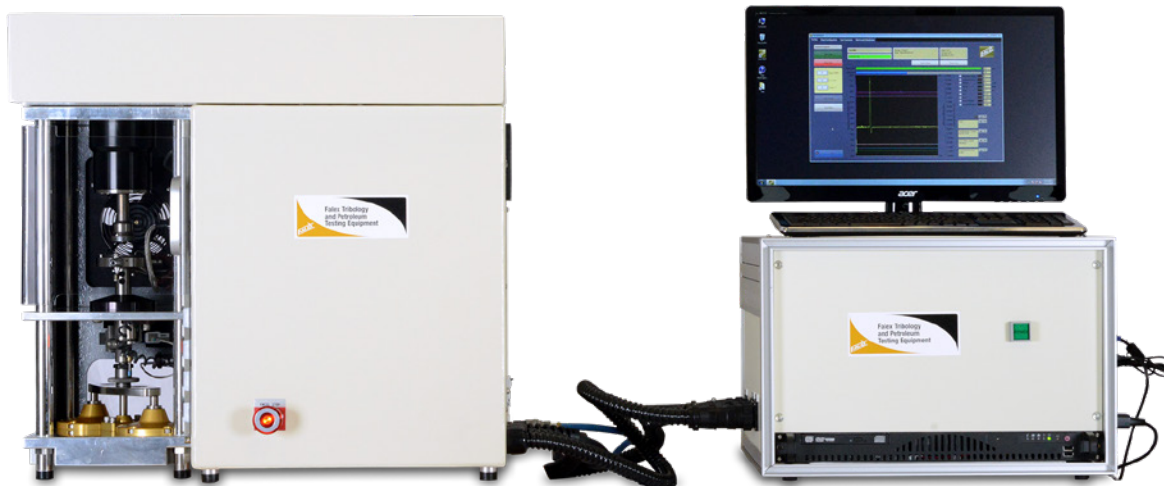


## MULTISPECIMEN TEST MACHINE



The Falex MultiSpecimen Test Machine is a versatile system for the evaluation of friction, wear, and abrasion characteristics of materials, coatings, and lubricants. This single system accommodates an ever increasing number of test geometries and conditions. The FALEX MultiSpecimen allows investigations into a wide variety of materials, coatings and lubricants for wear rates, PV limits and determinations of static and dynamic coefficients of friction.

The flexibility of controlled contact geometries, specimen materials, speed, pressures, temperatures and motion makes it one test apparatus to meet many commercial and military test specifications and simulate the broadest range of field applications.

#### Applications:

- » Research & Development
- » Quality Control
- » Product Qualification
- » Performance Characteristics
- » Material Evaluation
- » Polymers
- » Lubricants
- » Coatings
- » Surface Treatments
- » Dry Films
- » Materials

#### Standard Test Methods

- |            |  |
|------------|--|
| ASTM D3702 | Standard Test for Wear Rate and Coefficient of Friction in Self-Lubricated Rubbing Contact Using a Thrust washer Testing Machine         |
| ASTM D2266 | Standard Test Method for Wear Preventive Characteristics of Lubricating Grease (Four Ball Method)  |
| ASTM D4172 | Standard Test Method for Wear Preventive Characteristics of Lubricating Fluids (Four Ball Method)  |
| ASTM D5183 | Standard Test Method for Coefficient of Friction Using a Four Ball Wear Test Machine   |
| ASTM G99   | Standard Test Method for Wear Testing with a Pin on Disk Apparatus   |
| Proposed   | Standard Test Method for Predicting Coefficient of Friction and Wear Properties of Hydraulic Fluids Using a Cyclic Stress Vane Apparatus |

## Specifications & Features

| <b>Drive System (30-3600 RPM Standard)</b> | <p>Computer controlled servo motor (equivalent to 2 Hp) with <math>\pm 0.5\%</math> accuracy (full scale) configured for 220 V, Single Phase, 50 or 60 cycle operation.</p> <p>The motor drives the upper vertical shaft while the lower vertical shaft is held stationary by the Torque Measurement System.</p>  |                               |                               |      |     |    |      |    |      |
|--|---|-------------------------------|-------------------------------|------|-----|----|------|----|------|
| <b>Drive System (options)</b>              | <p>Optional pulley configurations are available for speed ranges 15 to 1800 rpm and 60 to 7200 rpm.</p> <p>An optional 10,000 to 1 gear reducer is available for the operation of Stick/Slip and Static Torque and COF determinations. Programmable speed control to as low as 0.01 rpm.</p> <p>The optional Reversible Drive SoftWEAR™ provides Oscillatory Motion Control from 5° to 720° (angle of motion dependent on test speeds and loads).</p> <table border="0" style="margin-left: 20px;"> <thead> <tr> <th style="text-align: left;"><u>Degrees of Oscillation</u></th> <th style="text-align: left;"><u>Cycles per Minute, max</u></th> </tr> </thead> <tbody> <tr> <td>720°</td> <td>150</td> </tr> <tr> <td>5°</td> <td>1150</td> </tr> <tr> <td>2°</td> <td>1600</td> </tr> </tbody> </table> | <u>Degrees of Oscillation</u> | <u>Cycles per Minute, max</u> | 720° | 150 | 5° | 1150 | 2° | 1600 |
| <u>Degrees of Oscillation</u>              | <u>Cycles per Minute, max</u>   |                               |                               |      |     |    |      |    |      |
| 720°                                       | 150   |                               |                               |      |     |    |      |    |      |
| 5°   | 1150  |                               |                               |      |     |    |      |    |      |
| 2°   | 1600  |                               |                               |      |     |    |      |    |      |
| <b>Environments</b>                        | <p>Standard Systems provide fluid and test specimen initial temperature set point (ambient to 150°C) using liquid or dry environments.</p> <p>Optional Systems for temperature regulation (-30°C to 200°C), purged and pressurized/controlled atmospheres, humidity measurement and control, and test fluid recirculation.</p>  |                               |                               |      |     |    |      |    |      |
| <b>Temperature Control</b>                 | <p>Standard Systems provide test table heaters (ambient to 150°C) for liquid and dry test environments.</p> <p>Programmable MultiSpecimen</p> <p>Automated Test Temperature System with computer control.</p> <p>User defined parameters for test temperature ramping rates, soaking times, and test cycle control. User programmable test alarms and abort levels.</p> <p>Optional Accessories expand operating temperatures from -30°C to 200°C with Heater Cups and Heating and/or Cooling Recirculating systems.</p>  |                               |                               |      |     |    |      |    |      |
| <b>Friction Measurement</b>                | <p>The lower shaft transmits a signal through a load cell for determining torque. The Standard System includes a 0 to 100 lb Load Cell. The Falex SoftWEAR™ records and displays the test torque data and calculates a real-time Coefficient of Friction. User programmable test alarms and abort levels.</p> <p>An Optional Low Range Load Cell (0 to 10 lbs) is available for low range test torque measurements.</p>   |                               |                               |      |     |    |      |    |      |
| <b>Wear Measurement</b>                    | <p>Dynamic Digital Wear Measurement System records and displays the real-time test system wear displacement. User programmable test alarms and abort levels.</p>  |                               |                               |      |     |    |      |    |      |
| <b>Test Duration</b>                       | <p>Standard Systems include user defined alarms and abort levels for test time (H:MM:SS) and test cycles (shaft revolutions).</p>   |                               |                               |      |     |    |      |    |      |
| <b>Utility Requirements</b>                | <p>Power: 220 Volts, 60 cycle or optional 50 cycle, single phase.</p> <p>Pneumatics: 80 psig clean, dry air required for pneumatic load systems.</p>  |                               |                               |      |     |    |      |    |      |
| <b>Space Requirements</b>                  | <p>Bench-top: 72 in. (L) x 28 in. (D) x 36 in. (H)<br/>2 m (L) x 0.7 m (D) x 1 m (H)</p>  |                               |                               |      |     |    |      |    |      |

## Ordering Information

### Part Number Description

#### Options

|             |   |
|-------------|---|
| 100-200-049 | Reversible Drive Motor System                   |
| 100-109-070 | Test Vibration Sensor and Display System        |
| 006-200-020 | Test Chamber Humidity Sensor and Display System |

#### Accessories

|             |   |
|-------------|---|
| 006-104-004 | High Speed Option (4:1 Pulleys 7200 rpm max. - 1:4 Pulleys 450 rpm max.)  |
| 006-106-001 | Heated Reservoir Test Cup Assembly  |
| 006-108-052 | Conductive Air Cooling Reservoir Assembly   |
| 006-108-024 | Low Temperature Chamber (Dry Ice)   |
| 006-200-017 | Low Temperature Chamber For Use With Cooler   |
| 006-105-071 | Standard Test Reservoir, 100 ml   |
| 006-007-040 | Test Reservoir, 25 ml   |
| 006-109-001 | Low Range Torque Strain Gage Assembly   |
| 100-200-057 | High Precision Scar Measurement System<br>Includes binocular microscope with X-Y base and digital display of measurement accurate to 0.001 mm. System includes ball cup stand which allows reading of the ball scars without removal from ball cup.   |
| 100-200-056 | Digital Scar Measurement System with CCD Camera<br>Includes a CCD camera and digital display of ball scar and measurement resolution to 0.001 mm. System includes ball cup stand and CCD camera with USB port for recording scar diameters to Falex computerized data acquisition system or host computer. Allows for reading ball scar without removal from ball cup. Optional Stands for other specimens available. |

#### Test Adapters

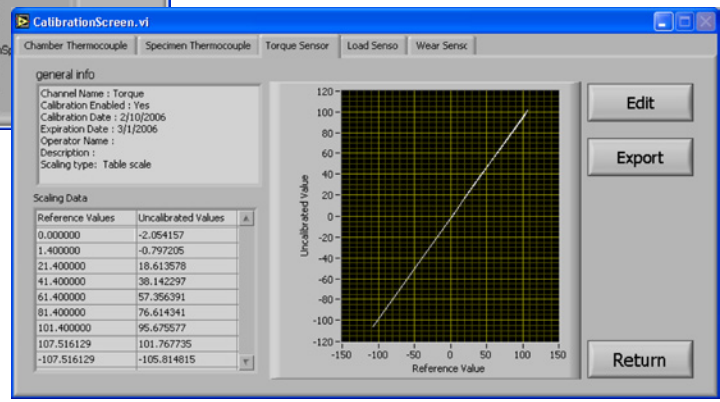
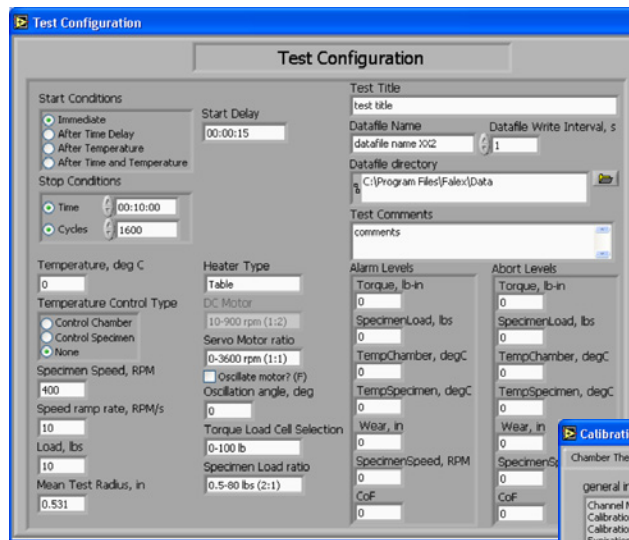
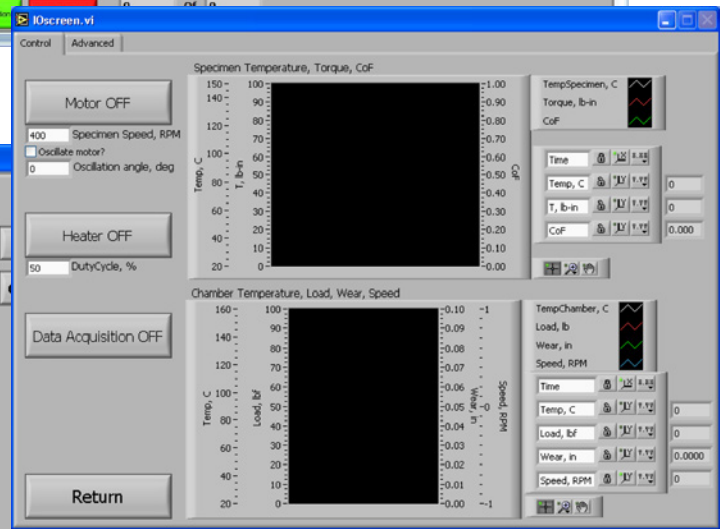
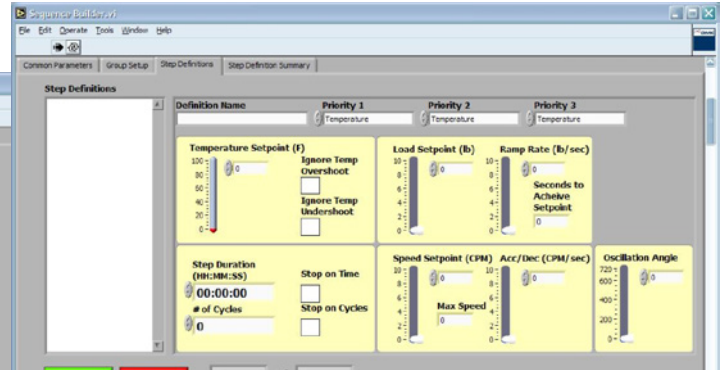
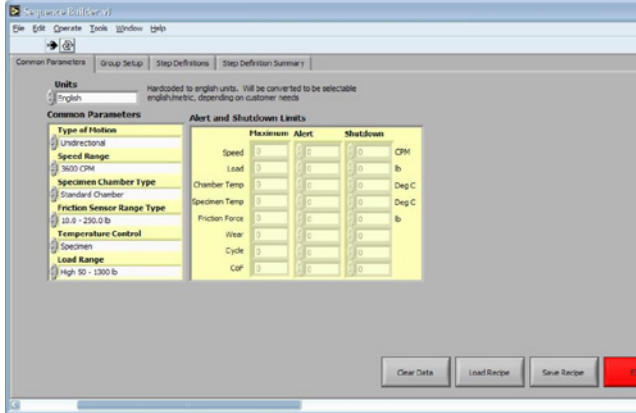
|             |   |
|-------------|---|
| 006-108-004 | Gear Lubricant Test Assembly              |
| 006-108-021 | Walking Cam Lubricant Test Assembly       |
| 006-108-003 | Pump Rotor Vane                           |
| 006-108-028 | Cyclic Contact Stress Vane Test System    |
| 006-108-015 | Stick-Slip Test Assembly                  |
| 006-108-007 | Thrust Washer, Small                      |
| 006-108-006 | Thrust Washer, Large                      |
| 006-099-112 | Special Small Thrust Washer Clamp         |
| 006-099-200 | Special Large Thrust Washer Clamp         |
| 006-108-005 | Single Pin-On-Disk Test Adapter           |
| 006-108-008 | Three Pin-On-Disk Test Adapter            |
| 006-108-019 | Single Ball-On-Disk Adapter               |
| 006-108-018 | Three Ball-On-Disk Test Adapter, Small    |
| 006-108-017 | Three Ball-On-Disk Test Adapter, Large    |
| 006-500-201 | Upper Disk For Three Ball Micro Film Test |
| 006-500-202 | Lower Disk For Three Ball Micro Film Test |

### Part Number Description

#### Test Specimens

| Standard Specimens - Thrust Washer Configuration |   | UOM     |
|--|---|---------|
| 006-560-041                                      | Small Rotating Upper Specimen<br>1018 Steel, Rc 15-25, 14-18 rms                                    | 25/Box  |
| 006-560-061                                      | Large Rotating Upper Specimen<br>1018 Steel, Rc 15-25, 14-18 rms                                    | 25/Box  |
| 006-560-001                                      | Small Stationary Lower Specimen<br>1018 Steel, Rc 15-25, 14-18 rms                                  | 25/Box  |
| 006-560-021                                      | Large Stationary Lower Specimen<br>1018 Steel, Rc 15-25, 14-18 rms                                  | 15/Box  |
| Standard Specimens - Pin-On-Disk Configuration   |   | UOM     |
| 006-560-131                                      | Upper Rotating Pin<br>440C Stainless Steel, Rc 55-58  | 100/Box |
| Standard Specimens - Vane Pump Configuration     |   | UOM     |
| 006-500-191                                      | Upper Rotating Vane (3 Per Test), M-2<br>Steel, Rc 58-62, 6-12 rms, 0.590 in. radius                | 100/Box |
| 006-500-014                                      | High Stress Upper Rotating Vane<br>(3 Per Test), M-2 Steel, Rc 58-62,<br>6-12 rms, 0.250 in. radius | 100/Box |
| 006-560-182                                      | Stationary Lower Specimen<br>52100 Steel, Rc 58-62, 9-15 rms  | 25/Box  |
| 006-500-015                                      | Cyclic Stress Lower Specimen<br>52100 Steel, Rc 60-63, 9-15 rms                                     | 25/Box  |
| Standard Specimens Gear Cam and Walking Cam Test |   | UOM     |
| 006-500-173                                      | Upper Specimen Roller (2 Per Test)<br>8620 Steel, Rc 55-58, 24-30 rms                               | 100/Box |
| 006-500-174                                      | Upper Specimen Roller (2 Per Test)<br>8620 Steel, Rc 50-54, 24-30 rms                               | 100/Box |
| 006-560-151                                      | Lower Specimen Gear<br>8620 Steel, Rc 55-58, 24-30 rms  | 25/Box  |
| 006-500-006                                      | Lower Specimen Walking Cam<br>400 C Stainless Steel, Rc 55-58,<br>24-30 rms                         | 25/Box  |
| Standard Specimens - Oscillating Roll/Slide      |   | UOM     |
| 006-505-004                                      | Test Specimen Insert (4 Required Per Test)<br>440C Stainless Steel, Rc 55-58, 14-18 rms             | 48/Box  |

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