



**APPLIED TEST
SYSTEMS, INC.**

***Product
Bulletin***

THE MARK OF RELIABILITY

Series

2300/2400/2500

Lever Arm

Creep Testing Systems



**Superior Design for
Rock-Solid Test Results**

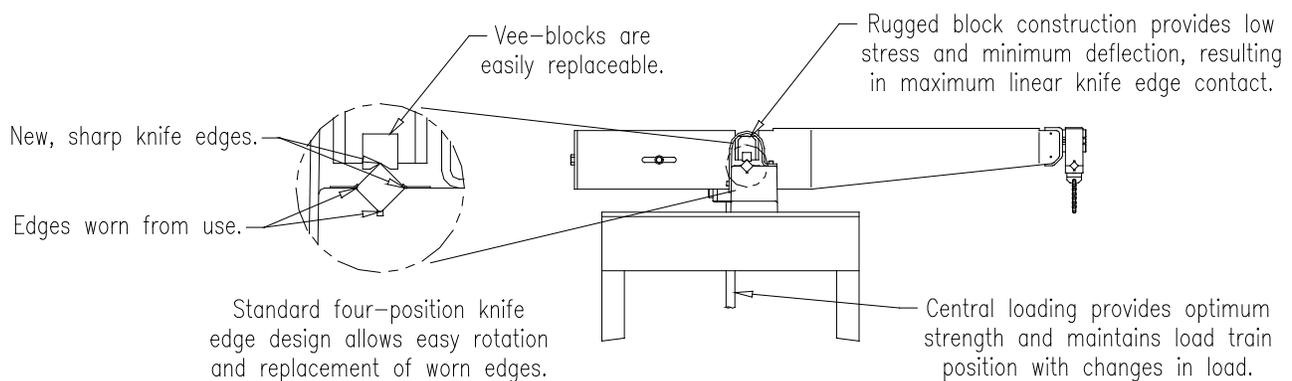
Introduction

ATS Series 2300/2400/2500 Lever Arm Creep Testing Systems make up one of the most thoroughly well-designed and versatile lines of creep and stress rupture test frames available in today's market. Through decades of hard use, these rugged systems have stood the test of time the world over and have proven themselves by their unfailing accuracy and reliability. Integrated with the powerful WinCCS II computer control and data acquisition software package, these frames can meet virtually all of your creep testing requirements, both now and in the future. (See *Bulletin 2020* for more information on the many capabilities of WinCCS II.)

ATS Series 2300/2400/2500 Creep Test Systems are precision knife-edge lever arm testers that incorporate a number of enhanced design features, making them far superior to those of our competitors. Some of these features include:

- Wide-frame construction, which allows for a variety of environmental chambers, fixtures, and other accessories, while maintaining compact overall dimensions
- Convenient side operation, providing more efficient use of laboratory space
- Counterbalanced lever arm with precision ratio adjustment and four-position rotatable hardened knife edges
- Precision drawhead guide assembly, providing automatic beam leveling, "weightless" specimen loading, hot-step loading, stress relaxation, constant stress, and more via WinCCS II software
- Durable vibration isolator mounts to prevent disturbance to other sensitive equipment upon specimen breakage
- On-center loading at high load ratio, providing optimum strength and minimum deflection
- Rugged vee-block supports for maximum linear knife-edge contact
- Knife edges of high-strength tool steel, designed for easy replacement of worn edges

Unique lever arm design permits the construction of high load ratios, e.g., 50:1, with standard arm and machine dimensions

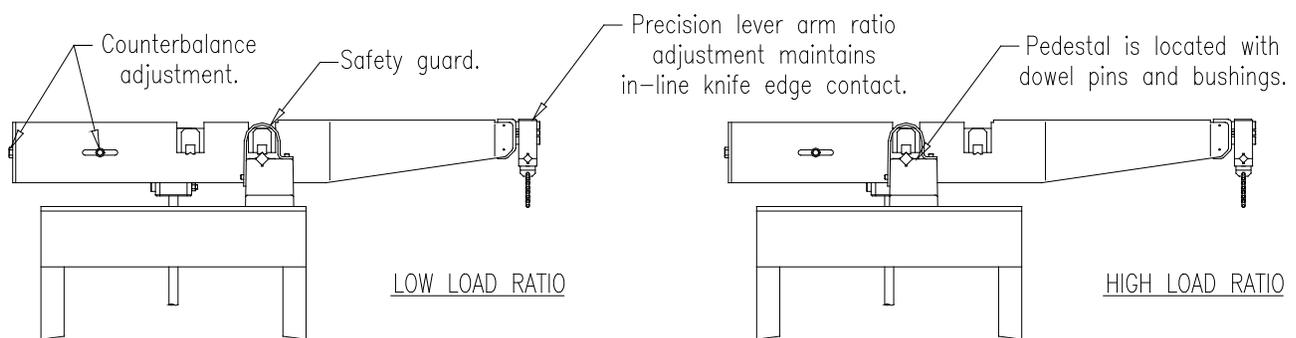


Standard Lever Arm Design Features

Features

In addition to standard single-ratio lever arms, dual-ratio arms are available for use with all ATS lever arm testers. Again, a number of high-quality design features optimize these systems for both efficiency and accuracy in testing:

- Knife-edge pedestal is precisely located using dowel pins and bushings and is easily relocated from one load ratio to another
- ATS lever arm design provides precision lever arm adjustment with straight-line travel, maintaining in-line knife-edge action and optimum loading accuracy
- In-line counterbalance adjustment provides simple balancing operation after ratio change



Dual-Ratio Lever Arm Design Features

Load Frames: ATS currently offers six models of standard lever arm testers. Five of these (Models 2320, 2330, 2410, 2430, and 2510 Lever Arm Creep Testers) are designed for creep and stress rupture testing in tension or compression (using appropriate fixtures) in capacities up to 50,000 lbf. (222.4kN). The remaining system (Model 2390 Compression Creep Tester) is specifically designed for high or low-temperature compression creep testing in capacities up to 6,000 lbf. (26.6kN). These frames and their specifications are detailed on the following pages.

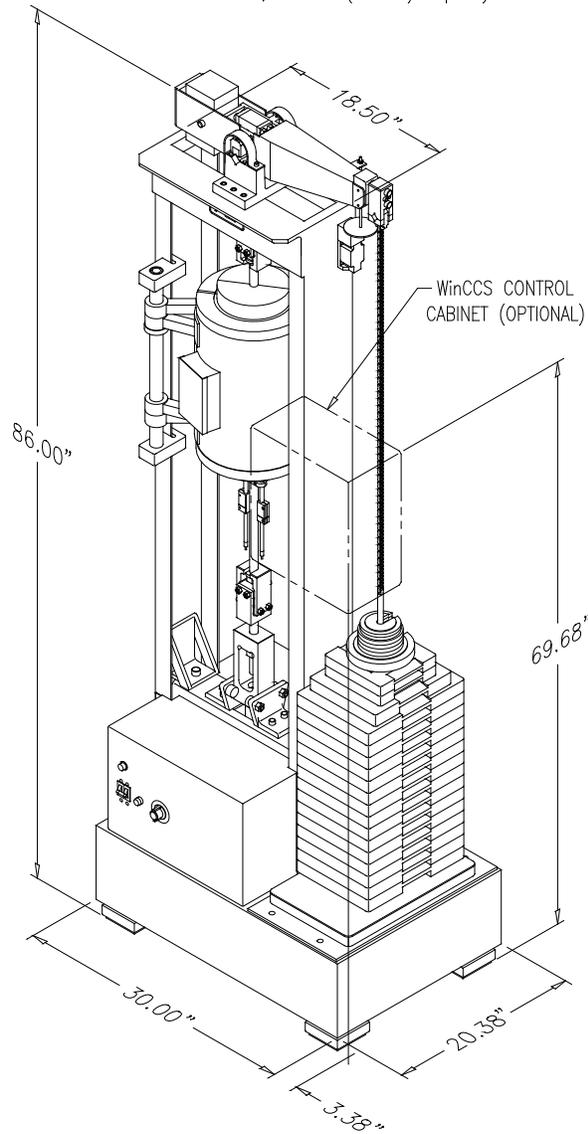
Also included in this bulletin you will find a number of other ATS lever arm test frames, including Series 2200 Lever Arm Testers, Series 2700 Stress Relaxation Testers, and Series 2800 Constant Stress Testers. These frames are now mostly outdated or have become obsolete due to the capabilities of WinCCS II, but they have been included for anyone who may wish to make use of these frames or who may have in mind a special setup which may be similar to one of these designs. As always, ATS welcomes your custom design inquiries.

Load Frames

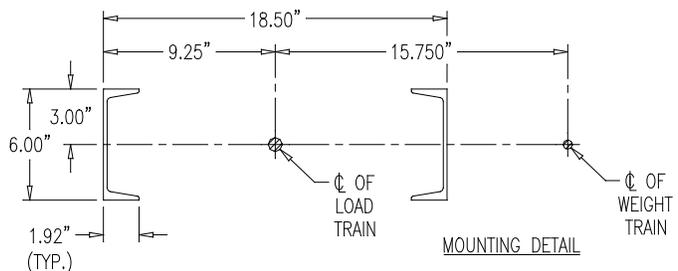
All models of ATS Lever Arm Creep Test Systems are greatly enhanced by our complete line of optional accessories and frame configurations. Available features and components include:

- Custom frame widths, column spacing, and frame heights to suit any test setup
- Single or dual-ratio lever arms
- Manual or electric weight elevators with solid-state position control
- Manual or automatic multi-function drawhead drive system
- Advanced computer control and data acquisition via exclusive WinCCS II software
- Stress relaxation test module
- Constant stress test module
- Cyclic load test module
- Automatic “weightless” and computerized hot-step loading
- Furnaces, ovens/cooling chambers and controls
- Extensometers, including mechanical and non-contacting laser
- Displacement transducers and controls
- Alignment couplings
- Quick-change couplings
- Couplings for threaded or button-head specimens
- Compression test fixtures
- Specimen grips, pull rods, and adapters
- Calibrated load weights
- Controlled-atmosphere retorts

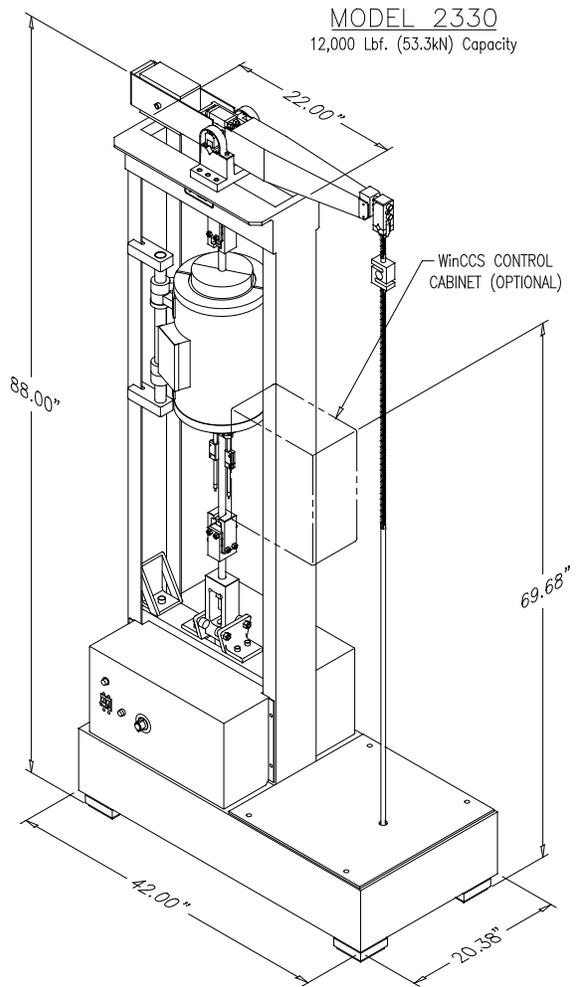
MODEL 2320
10,000 Lbf. (44.4kN) Capacity



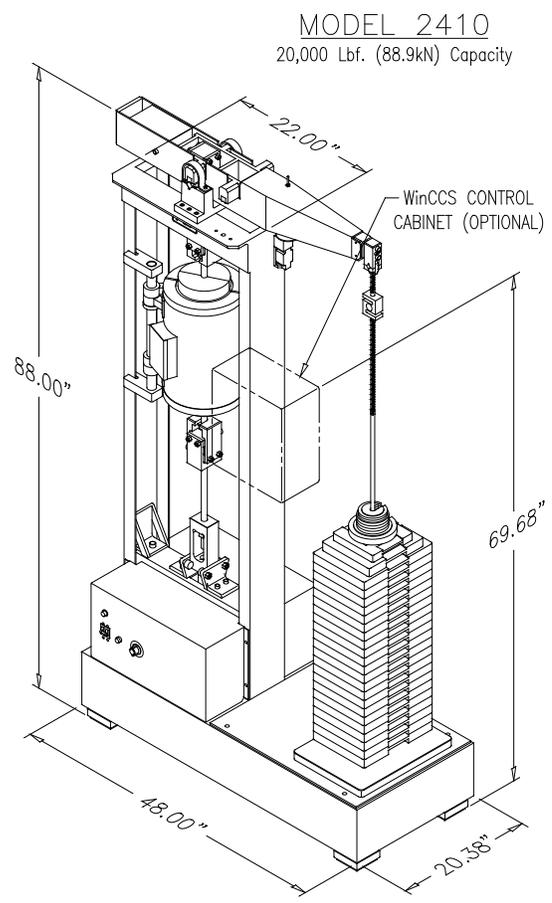
Model 2320 Lever Arm Test System shown in a typical creep testing setup, including single-ratio lever arm, calibrated load weights, alignment couplings, split tube furnace, averaging extensometer, and automatic beam-leveling drawhead.



Load Frames



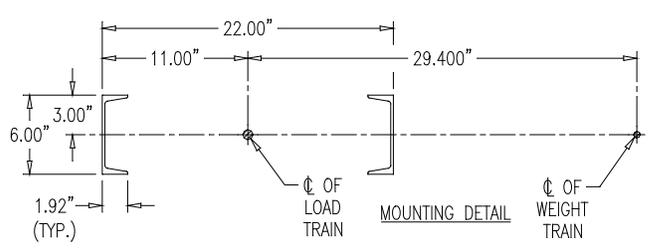
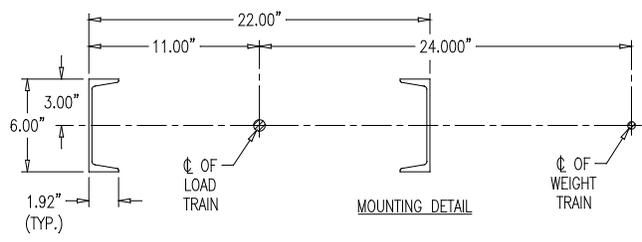
MODEL 2330
12,000 Lbf. (53.3kN) Capacity



MODEL 2410
20,000 Lbf. (88.9kN) Capacity

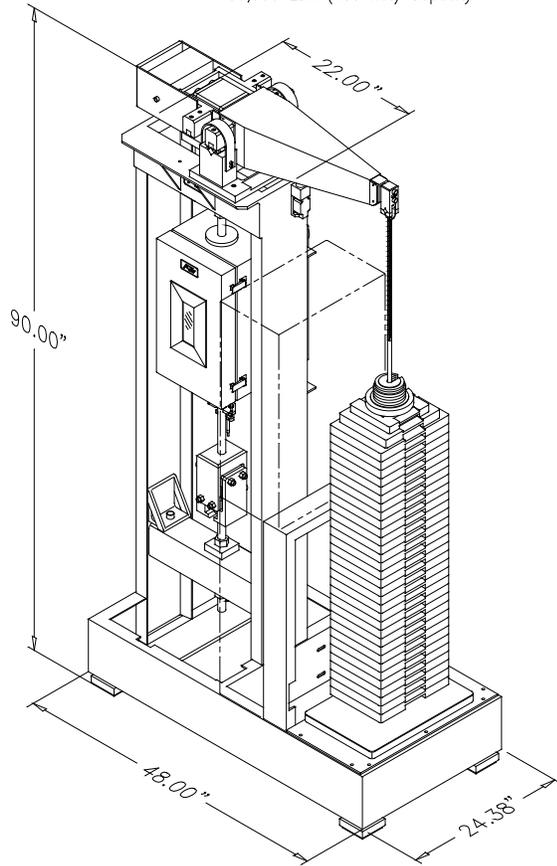
Model 2330 Lever Arm Test System shown in a typical creep testing setup, including single-ratio lever arm, alignment couplings, split tube furnace, averaging extensometer, automatic drawhead drive system, and automatic (weightless) loading via WinCCS software and drawhead drive.

Model 2410 Lever Arm Test System shown in a typical creep testing setup, including dual-ratio lever arm, calibrated load weights, alignment couplings, split tube furnace, automatic beam-leveling drawhead, and computerized hot step loading via WinCCS software.

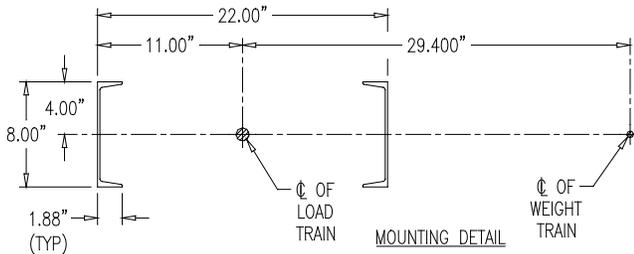


Load Frames

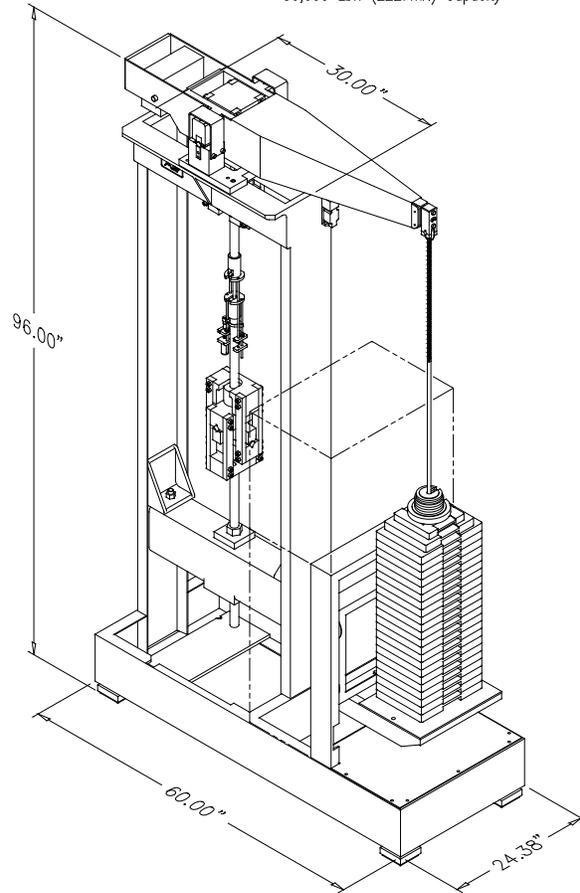
MODEL 2430
30,000 Lbf. (133.4kN) Capacity



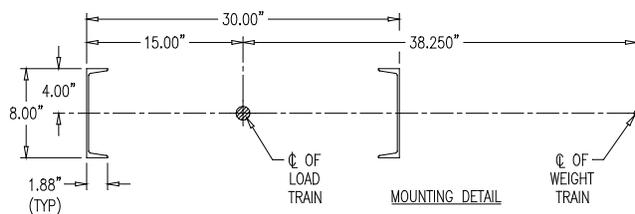
Model 2430 Lever Arm Test System shown in a typical creep testing setup, including dual-ratio lever arm, calibrated load weights, alignment couplings, environmental chamber, and manual control station.



MODEL 2510
50,000 Lbf. (222.4kN) Capacity



Model 2510 Lever Arm Test System shown in a typical creep testing setup, including single-ratio lever arm, calibrated load weights, alignment couplings, custom metals testing extensometer, electric weight elevator, and manual control station.



Specifications

Tension/Compression Frames

Model	2320	2330	2410	2430	2510
Capacity	10,000 lbf. (44.4kN)	12,000 lbf. (53.3kN)	20,000 lbf. (88.9kN)	30,000 lbf. (133.4kN)	50,000 lbf. (222.4kN)
Column Width*	18.50 in. (470mm)	22.00 in. (558mm)	22.00 in. (558mm)	22.00 in. (558mm)	30.00 in. (762mm)
Lever Arm Ratios*	10:1,5:1	20:1,16:1,	20:1,3:1	30:1,3:1 10:1,5:1, 3:1	50:1,5:1
Optional Drawhead Drive	Speed: 0.1-1.2 in./min (2.5-30.5mm/min) Travel: 5 in. (127mm)				
Load Accuracy	±0.5% (with certificate of calibration)				
Power Requirements	115 or 230 VAC, 50/60 Hz				

Compression-Only Frame

Model	2390
Capacity	6,000 lbf. (26.6kN)
Column Width*	25.00 in. (635mm)
Lever Arm Ratios*	10:1,3:1
Load Accuracy	±1.0% (with certificate of calibration)
Power Requirements	115 or 230 VAC, 50/60 Hz

Load Weights

Standard Calibration	National Bureau of Standards, Class "T"	
Available Sizes (English Units)	0.1 ±0.00013 lb.	0.2 ±0.00018 lb.
	0.5 ±0.00033 lb.	1.0 ±0.00059 lb.
	5.0 ±0.00178 lb.	10.0 ±0.00286 lb.
	20.0 ±0.0044 lb.	30.0 ±0.0055 lb.
	40.0 ±0.0066 lb.	
Available Sizes (Metric Units)	0.5 ±0.0005 N	1.0 ±0.0008 N
	2.5 ±0.0014 N	5.0 ±0.0026 N
	10.0 ±0.0048 N	25.0 ±0.0075 N
	50.0 ±0.012 N	100.0 ±0.019 N
	150.0 ±0.024 N	200.0 ±0.029 N

* Custom frames with varying column widths and lever arm ratios are designed and built to order.

Specifications subject to change without notice

Other Products

As explained previously, the load frames shown on this and the following pages are no longer considered “standard” ATS equipment. However, they are being displayed because they are still available to any who may have specialized needs or who are looking for a custom test setup.

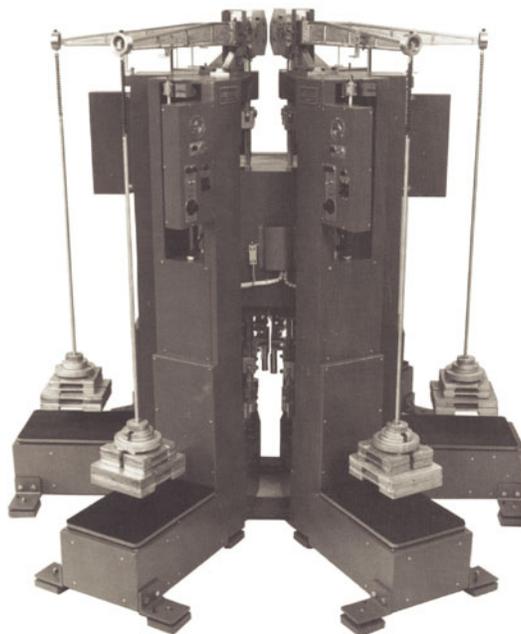
The three lever arm testers shown on this page, Models 2220, 2240, and 2450, were the predecessors to the more advanced machines that ATS currently specializes in.

You will notice that these frames feature a front-to-back testing setup, as opposed to the convenient side operation of our more modern lever arm testers. This previous configuration required that there be access to the rear of the machine for loading of weights. The newer design conserves valuable laboratory space by allowing frames to be placed side-by-side or back-to-back, since all test setup and weight loading can be done from one side of the machine.

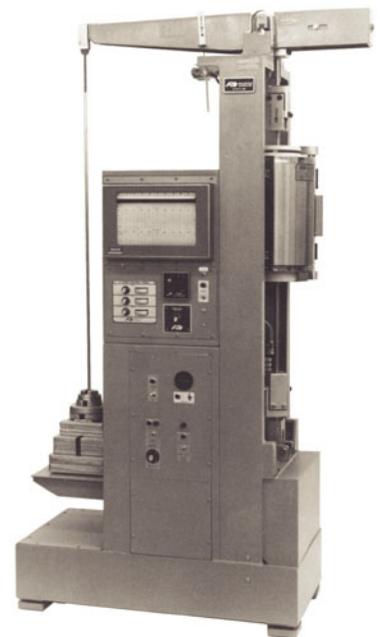
The only real advantage to the old-style machines was that multiple frames could share a single environmental chamber, as shown in the center photograph below..



Model 2220
Capacity: 2,000 lbf.
Ratios: 10:1, 5:1, 3:1



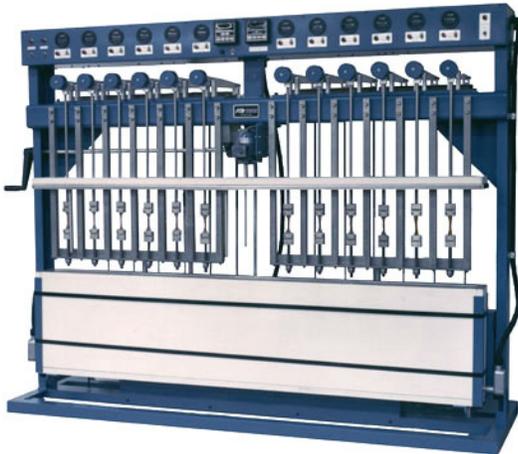
Model 2240
Capacity: 8,000 lbf.
Ratios: 20:1, 16:1, 10:1, 5:1, 3:1



Model 2450
Capacity: 20,000 lbf.
Ratios: 20:1, 3:1

Other Products

The three test frames shown on this and the following page, Models 2210, 2370, and 2750, are systems that were initially designed to meet custom test specifications. These specifications are mostly obsolete now, but the machines shown give some idea of the custom design experience and capabilities of Applied Test Systems.



◀ **Model 2210**

This multiple-station lever arm test system was designed for environmental stress rupture testing of materials per ASTM specification D2552. It featured a 12-station layout with a recirculating heated bath for uniform specimen temperature. The stainless steel tank could be raised and lowered via a manual or electric lift system. Available options make this machine suitable for a variety of other environmental stress rupture test applications.

Model 2370 ▶

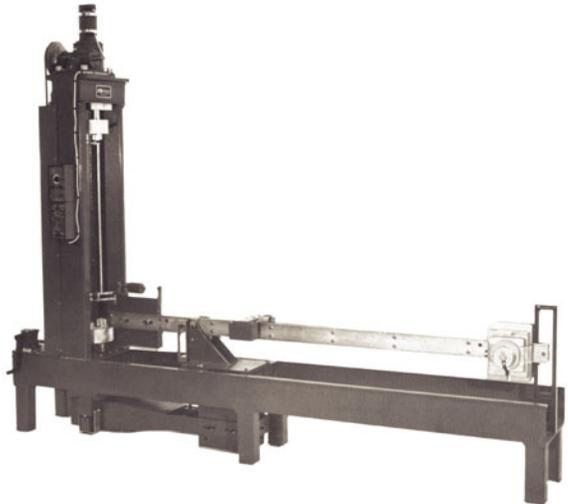
This tester was designed to perform creep/dynamic fatigue testing of ceramic materials at elevated temperatures. The system included a controlled rate load to failure sequence at the end of a test, up to 1 kN/sec. A custom ATS Series 3330 High Temperature Split Tube Furnace provided testing temperatures up to 2912°F (1600°C). This frame was designed with all of the features of the standard Models 2300/2400/2500 Lever Arm Creep Test Systems. Available accessories include automatic weight elevators, multi-function drawhead drive, calibrated load weights, load cells, non-contacting laser extensometers, mechanical side-entry extensometers, alignment couplings, collet-type buttonhead couplings, a direct load test kit, compression test fixtures, and computer control and data acquisition using the versatile WinCCS II software.



Other Products

Model 2750 ▶

The dual-purpose Model 2750 Stress Relaxation Creep Test System was designed to test steel wire, strand, etc., to BS 2691, BS 3617, and comparable U.S. specifications. It featured a counterbalanced graduated load beam and compound lever system, providing lever arm ratios up to 250:1, with a load capacity of 50,000 lbf. Special accessories designed for use with this system included extensometers with up to 40 in. gage length and heavy duty wire/cable specimen



The two machines shown below, the Model 2710 Stress Relaxation Creep Test System and Series 2800 Constant Stress Creep Test Systems, have been made obsolete by the advanced features of the exclusive WinCCS II software package offered by ATS. This powerful tool enables our standard Series 2300/2400/2500 frames to handle both stress relaxation and constant stress, as well as “weightless” loading, automatic hot-step loading, and more.



Model 2710
Capacity: 20,000 lbf.
Ratios: 20:1, 3:1



Series 2800
Capacity: 10,000 lbf.

Custom Equipment

Applied Test Systems, Inc. has an excellent reputation in the materials testing industry as a leading supplier of custom equipment. We welcome all inquiries into any system or setup you may have in mind. Below are just a few examples of how we can put our decades of experience to work for you.



Special Series 2330 Lever Arm Creep Tester designed for tensile testing of ceramic specimens. Features include a high-temperature furnace and integrated slide table for use with non-contacting laser extensometer.



Series 2390 Compression Creep Tester modified for high-temperature flexural static fatigue testing of continuous fiber-reinforced ceramic composites (CFCCs) in a controlled-atmosphere environment.



**Calibration Laboratory
Certificate No. 2132.01**
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of the products calibrated.*



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