



**APPLIED TEST
SYSTEMS, INC.**

***Product
Bulletin***

THE MARK OF RELIABILITY

Series 1800

Pressure/Pipe Testing Systems



**Continuous and Short-Term
Hydrostatic Pressure Testing
per ASTM D1598 and D1599**

Introduction

Applied Test Systems, Inc. (ATS) produced its first custom hydraulic pressure tester in the year 1968. Based on this initial product, and with ongoing guidance from members of ASTM International Technical Committee F-17, a full line of quality high-pressure testing systems, fixtures, and accessories has been developed and is continually being improved. The primary focus in ATS pressure testing has been ASTM designations D1598 and D1599, and our two standard lines of products have been thoroughly developed to suit testing according to these guidelines.

ASTM specification D1598 outlines the standard test method for determining time-to-failure of plastic pipe under constant internal pressure while in a controlled environment. Pipe samples submitted to this long-term test may demonstrate signs of weakness such as ballooning, seepage or “weeping” (fluid loss through microscopic cracks which often stops after a reduction in pressure), creep or deformation, and pipe rupture. Testing according to this standard is accomplished using an ATS Series 1815 Hydrostatic Pressure Tester and a Series 1816 Conditioning Test Bath. See pages 3 and 4 of this bulletin for further details.



Polyethylene pipe sample after long-term hydrostatic testing, with localized ballooning and rupture

A very different type of test is described by ASTM standard D1599. This specification is used to determine the short-term burst pressure of plastic pipe, tubing, and fittings. Testing is performed by continuously increasing the internal hydraulic pressure on a sample, causing rupture to occur within a time frame of 60 to 70 seconds. For



PVC pipe specimen destroyed during a short-term hydrostatic burst testing operation.

testing according to this requirement, an ATS Series 1835 Hydrostatic Burst Tester is used in conjunction with either a fully-featured Series 1840/1840T Burst Test Fixture or an economical Horizontal Burst Enclosure. See pages 5 through 7 of this bulletin for further details.

In addition to our standard products, ATS has extensive experience in custom hydraulic testing applications. Individual systems have been supplied for testing at pressures of up to 60,000 psi (414 MPa), at temperatures ranging from cryogenic to 1000°F (538°C), and for cyclic pressure testing at rates of up to 120 cycles per minute. Custom testing applications have included plastic and metal pipe and fittings, nuclear reactor components, hose and hose fittings, automotive coolant hose, high-pressure valves, and more. Whatever your testing needs may be, ATS provides you with both the experience and the expertise to suit any application.

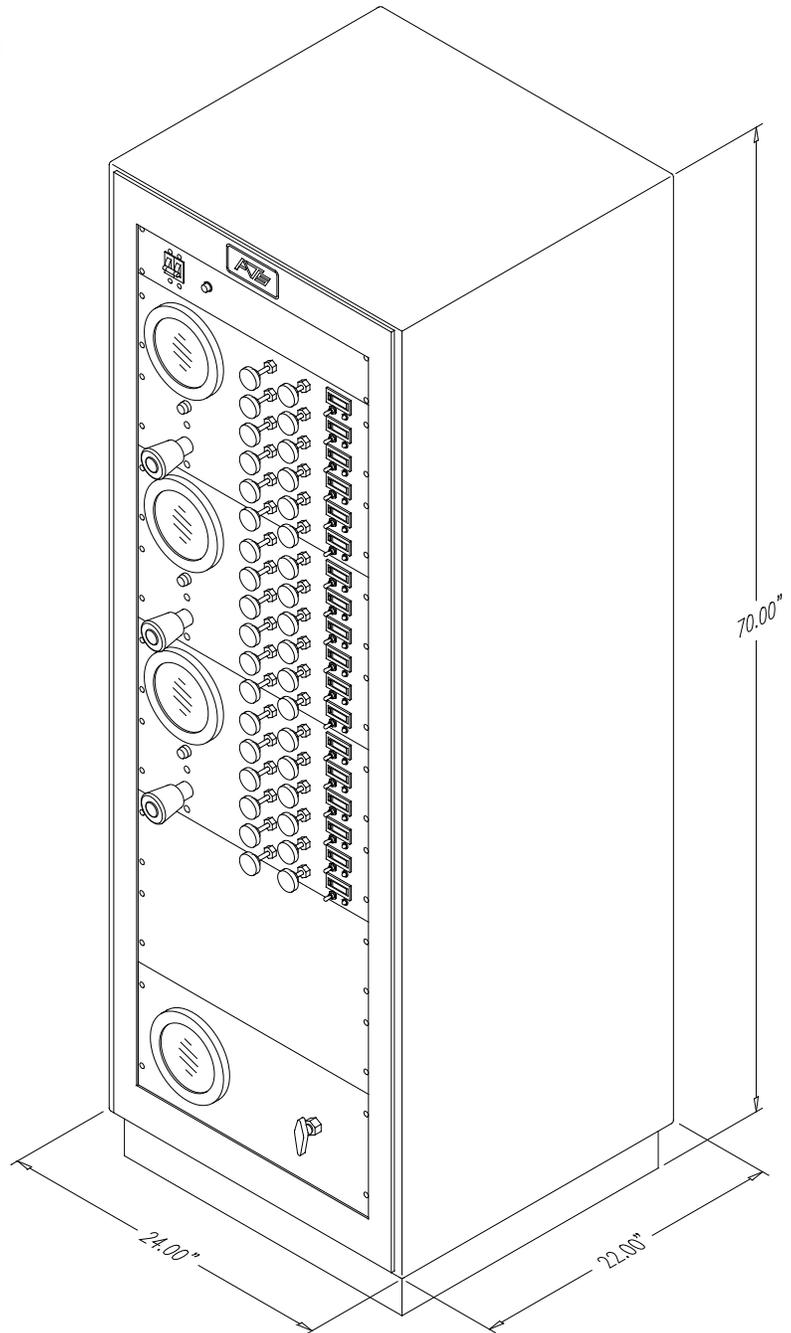
Features

Series 1815

Hydrostatic Pressure Tester

- For long-term hydrostatic testing according to ASTM D1598 and similar standards
- System designed to hold manifold pressure even in the event of supply-pressure loss
- Modular construction allows for nearly any configuration; upgrades and expansions may be added as needed
- Automatic flow limiters, one per testing station, cut off pressure when samples leak or rupture
- Each station includes pressure switch, electric time meter, and toggle switch with indicator
- High-pressure supply system can be integrated with testing system (requires 50 psi low-volume air supply)
- Standard designs available for testing at 500, 750, 1500, 2500, and 3000 psi.
- Available accessory equipment includes hoses with quick-connect couplings, specimen end caps, purge valves, test chambers (ovens and test baths), extensometers (diametral, circumferential, axial), circumference tapes, recording systems, cyclic testing systems, computer control options, and more
- **Power requirements:** 115/230 VAC, 1 Ph, 50/60 Hz

SERIES 1815
Hydrostatic Pressure Tester



(Note: Overall dimensions may vary depending on system configuration.)

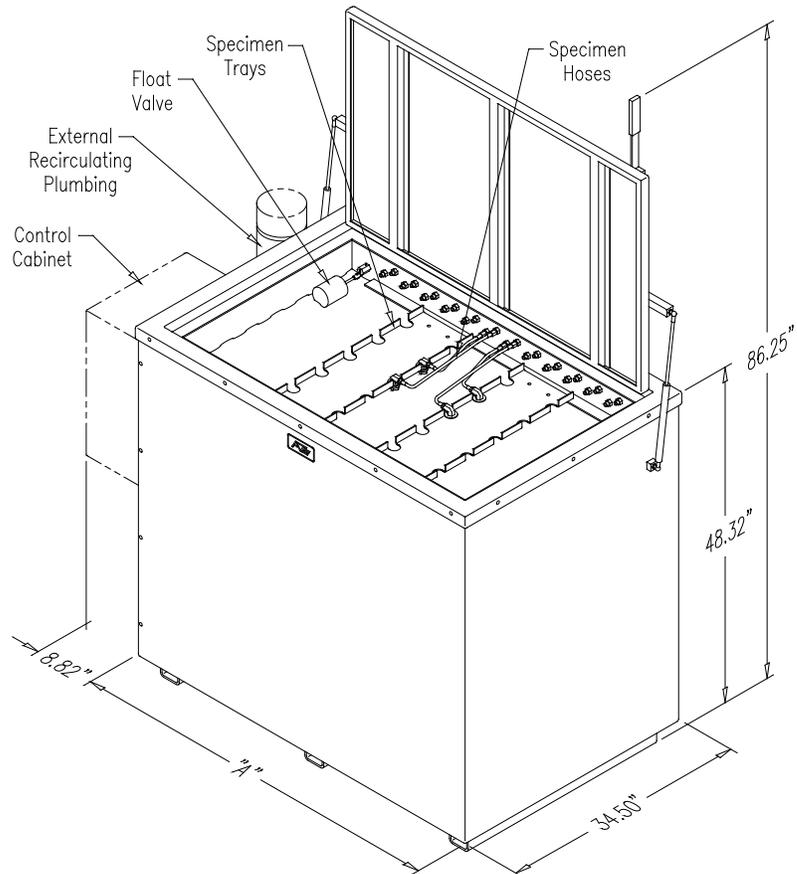
Above: Series 1815 Hydrostatic Pressure Tester in an 18-station layout (three manifolds with six stations each) and integrated pressure supply system.

Features

Series 1816 Conditioning Test Bath

- For use in conjunction with ATS Series 1815 Hydrostatic Pressure Tester
- Designed for immersion of multiple pipe specimens in a uniform environment
- Sturdy double-wall construction with fiberglass insulation and stainless steel tank
- Hinged, drip-resistant top cover with counterbalancing gas springs
- Pressure supply hose and quick-connect coupling for each specimen
- Adjustable, corrosion-resistant specimen support brackets
- Automatic water level control
- Precision temperature control and uniformity ($\pm 2^{\circ}\text{F}$ within specimen testing volume)
- Temperature range: 50°F to 194°F (10°C to 90°C)
- Optional accessory equipment includes recirculating pump, an efficient heating and/or cooling system, specimen end closures, purge valves, specimen mounting brackets, programmable temperature controllers, and more
- Four standard sizes (shown at right); custom configurations designed and built-to-order
- **Power requirements:** 230 VAC, 1 Ph, 50/60 Hz

SERIES 1816
Conditioning Test Bath



Above: Series 1816 Test Bath in a 24-station layout with recirculating heat/cool system.

Nominal Tank Size (W x D x H)	"A"	Tank Capacity (gallons)	Maximum Specimens
48" x 30" x 42"	52.50"	224	24
60" x 30" x 42"	64.50"	280	32
72" x 30" x 42"	76.50"	336	40
96" x 30" x 42"	100.50"	448	54

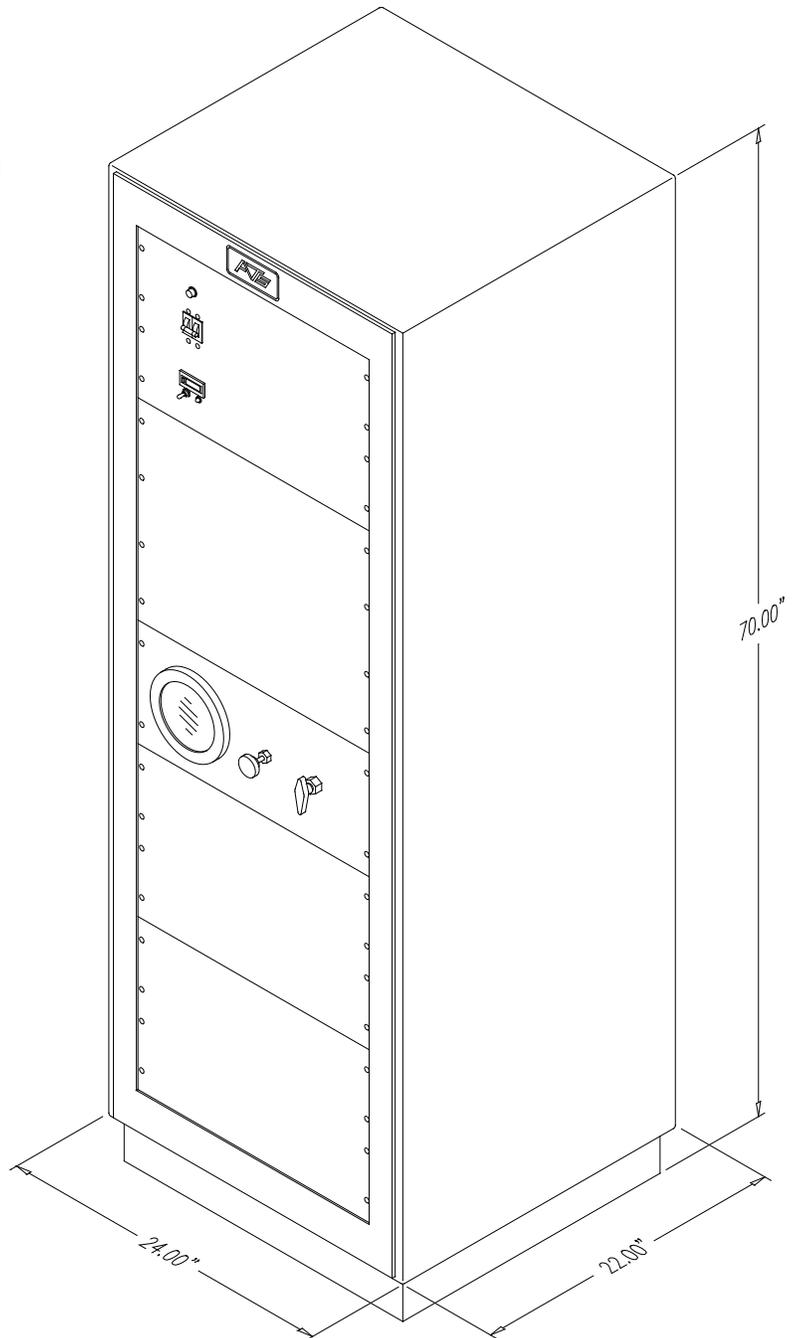
Note: Nominal water depth is 36.00".
(Standard sizes shown. Custom sizes available)

Features

Series 1835 **Hydrostatic Burst Tester**

SERIES 1835
Hydrostatic Burst Tester

- Designed for short-term hydrostatic burst testing per ASTM D1599 and similar standards
- Fully-adjustable pressurizing rate control with motorized regulator (ramp rate within $\pm 5\%$ linearity)
- Low-volume, high-volume, and extra-high-volume systems available for bursting nearly any size pipe, tubing, or hose; additional capacity can be installed later as needed
- Standard systems designed for testing plastic pipe up to 24 in., and at pressures up to 3000 psi
- Water filter, air filter, and pump lubricator protect the system and reduce maintenance
- Available accessory equipment includes digital pressure transducer with peak pressure recall, burst testing enclosures, specimen end caps, purge valves, connecting hoses with quick-connect couplings, recording systems, computer control options, and more.
- Custom high-pressure burst testing systems for metal tubing and pipe, using oil, gas, or other fluids, are designed and built-to-order
- **Power requirements:** 115/230 VAC, 1 Ph, 50/60 Hz
- **Compressed air requirements:** 22 SCFM @ 80 psi



(Note: Overall dimensions may vary depending on system configuration.)

Above: Single-station Series 1835 Hydrostatic Burst Tester with pressure supply system and computer control.

Features

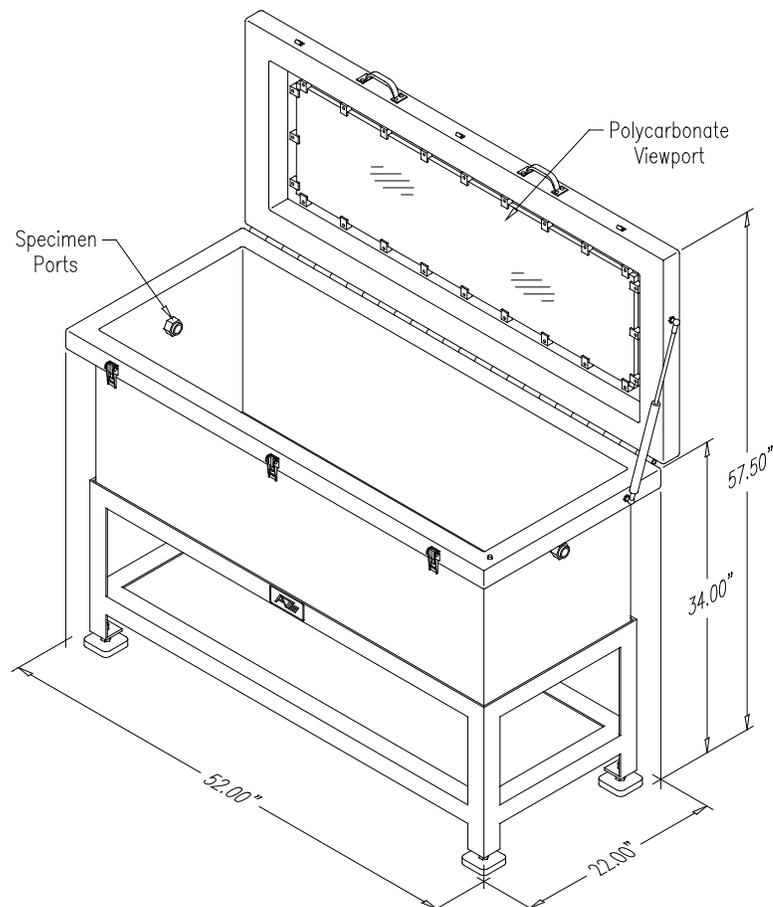
Burst Testing Enclosures

ATS manufactures three standard models of Burst Testing Enclosures for use with our Series 1835 Hydrostatic Burst Test Systems. These rugged fixtures are designed for fast, reliable burst testing of PVC, PE, and other pipe samples while protecting operators (and laboratories) from water and flying pipe fragments upon specimen failure. The economical Horizontal Burst Enclosure shown below is intended to be used in conjunction with our patented Series 6010 Pipe End Caps. (See page 9 for further details.) The Series 1840 and 1840T Burst Test Fixtures (shown on the following page) are more advanced systems which feature a motorized crosshead and interchangeable end platens for easy testing of a wide range of pipe sizes. All ATS burst enclosures feature heavy-duty doors with quick-acting latches, specimen inlet/outlet and drainage ports, and high-strength polycarbonate viewing windows for observation during the testing process.

Horizontal Burst Enclosure ►

- Economical, low-cost design for performing burst tests on limited laboratory budgets
- Stainless steel construction with water inlet/outlet ports and drainage port
- Sturdy structural steel frame with leveling feet
- Heavy-gage stainless steel lid with counterbalancing gas spring
- High-strength polycarbonate viewing window allows observation of the testing process while protecting operators
- Generally used with ATS Series 6010 Pipe End Caps
- Safety interlock switch can be incorporated to dump pressure if lid is opened during testing
- Custom chamber sizes are available for testing large-diameter pipe samples

Horizontal Burst Enclosure
For use with Series 1835 Burst Tester



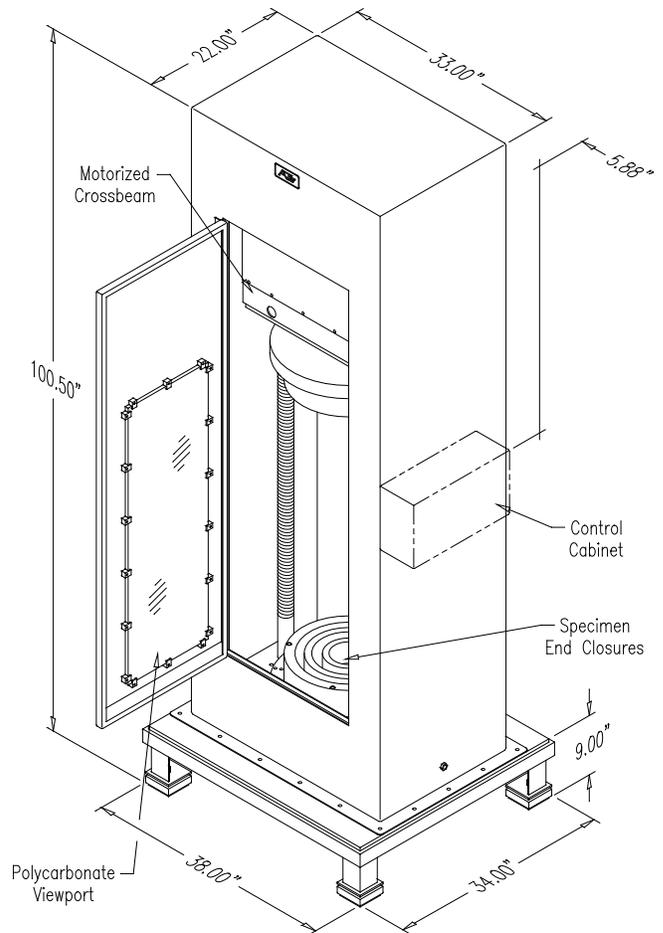
Note: Nominal internal chamber size is 48.00" wide by 18.00" deep by 18.00" high. (Custom sizes available.)

Features

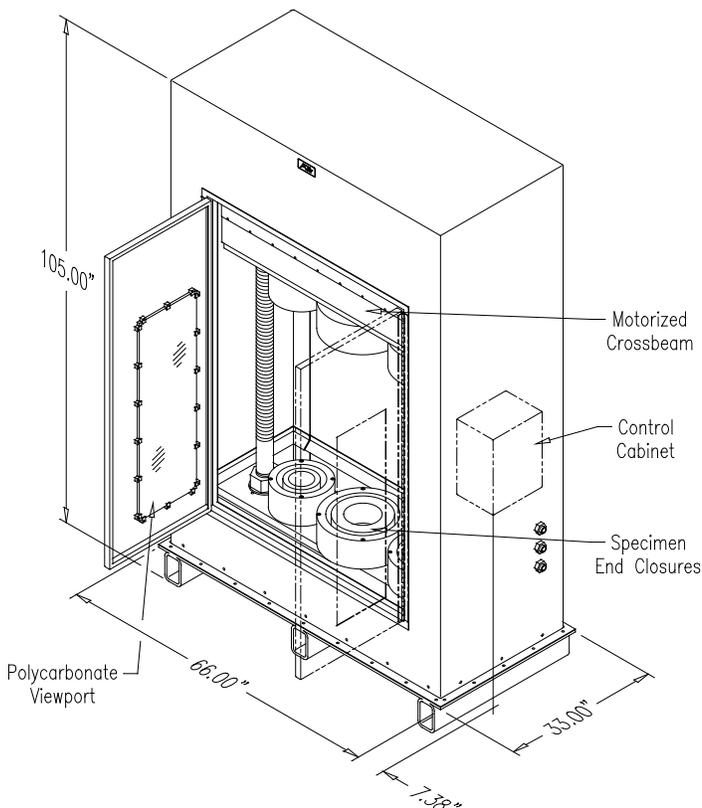
Series 1840 ▶ Single-Station Burst Test Fixture

- Motor-driven crosshead facilitates changing of specimens and allows testing of various lengths of pipe
- Structural steel frame construction with heavy-duty steel drive screws
- Heavy-gage door with polycarbonate viewing window
- Interchangeable end closures, constructed of durable, lightweight hard-coated aluminum, are easy to change and suit multiple sizes of pipe
- Standard model allows for testing pipe samples up to 12 in. diameter
- **Power requirements:** 115/230 VAC, 1 Ph, 50/60 Hz

SERIES 1840
Single-Station Burst Test Fixture



SERIES 1840T
Three-Station Burst Test Fixture



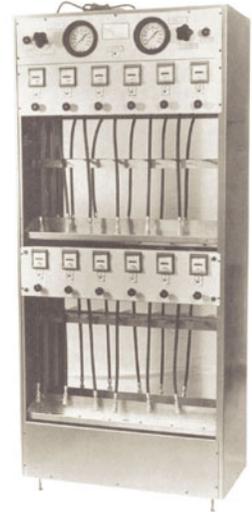
◀ Series 1840T Three-Station Burst Test Fixture

- Three-station design conserves valuable time by eliminating the need to change platens when testing different sizes of pipe
- Safety interlock switch dumps system pressure if doors are opened
- Damage-resistant internal light fixtures facilitate viewing during testing
- Standard model allows for testing pipe samples up to 12 in. diameter
- **Power requirements:** 115/230 VAC, 1 Ph, 50/60 Hz

Other Products

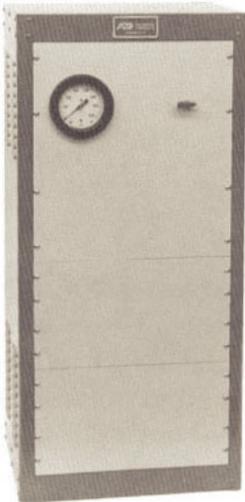
Series 1810 Hydrostatic Pressure Tester ▶

Designed for hydrostatic testing of small (up to 1 1/2 in. plastic pipe, up to 20 in. long) pipe samples, this system combines the testing capabilities of the Series 1815 Hydrostatic Pressure Tester with an integral testing enclosure which houses up to 24 specimens. Each testing station includes shutoff valve, automatic flow-limiting valve with manual bypass, high-pressure hose with quick-connect coupling, pressure switch, electric time meter with pushbutton reset, and electrical switch with indicating lamp. System features heavy-gage steel construction with adjustable specimen mounting racks and drainage basins. A separate high-pressure supply is required to operate this system.



◀ **Series 1820 Pressure Supply Systems**

These systems, which are generally integrated into our Series 1815 and Series 1835 hydrostatic testers, are also available as stand-alone high-pressure supply units. A complete systems includes an air-driven hydraulic pump with regulator, relief valve, accumulator, pressure gauge, and control valves, as well as water and air filters for system protection. Pressure gauges feature large, easy-to-read 4 1/2 in. diameter dials with $\pm 1/2\%$ accuracy. Systems are available for oil or water service at pressures up to 3000 psi (20.6 MPa). Available accessory equipment includes dual-range gauges, pressure transducers, digital panel meters, recording systems, and more.



Series 1860 Cyclic Pressure Tester ▶

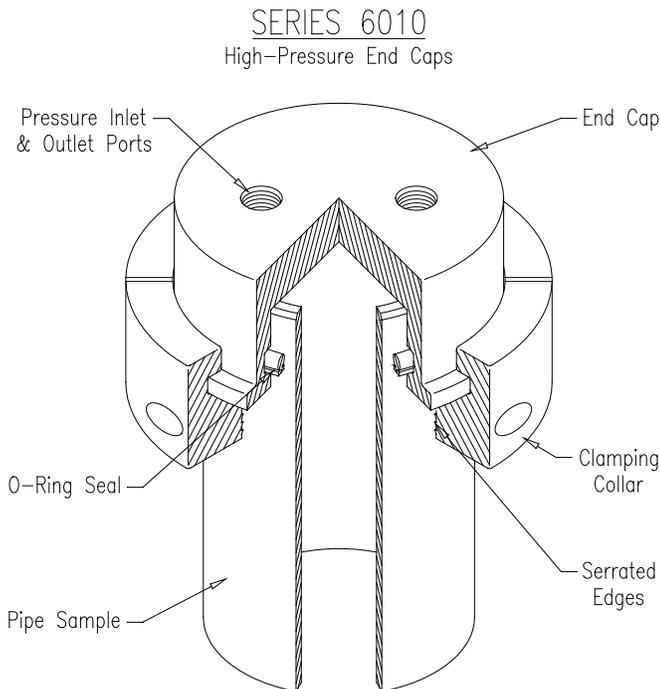
This system is designed to test pipe, hose, tubing, and fittings by providing abrupt hydraulic pressure changes. Control valves, pressure gauges, flow limiters, and supply manifold permit testing of up to six specimens simultaneously. A test chamber and water reservoir control test temperatures up to 200°F (93°C). Long-life pressure transducers are rated for over 10 million cycles. System is furnished with loop supply valve, indicating lamp, specimen leak detector with automatic shutoff, and cycle counter with reset.



Other Products

Series 6010 Pipe End Caps ▼

ATS Series 6010 Pipe End Caps provide an economical, **patented** method for pressurizing pipe samples during both long-term hydrostatic and short-term burst testing procedures. End caps are lightweight, easy to assemble and disassemble, and are available in a vast array of sizes. A unique chamfer tool quickly and easily removes sharp corners from the edges of pipe samples, which permits the end caps to slide and freely and prevents damage to the end cap seals. Custom end caps are available. *U.S. Patent No. 5,850,854.*



Pipe Size	Max. Pressure
1/2" IPS	5,000 psi
3/4" IPS	4,000 psi
1" IPS	3,500 psi
1 1/4" IPS	2,850 psi
1 1/2" IPS	2,600 psi
2" IPS	2,300 psi
2 1/2" IPS	2,250 psi
3" IPS	2,200 psi
4" IPS	2,050 psi
6" IPS	1,800 psi
8" IPS	1,760 psi
10" IPS	1,750 psi
12" IPS	1,640 psi

Note: In addition to IPS (iron pipe size) shown above, ATS Series 6010 High-Pressure End Caps are also available in CTS (copper tubing size), CIOD (cast iron outside diameter), DIPS (ductile iron pipe size), and metric sizes. Custom end caps are built-to-order to other sizes and specifications.

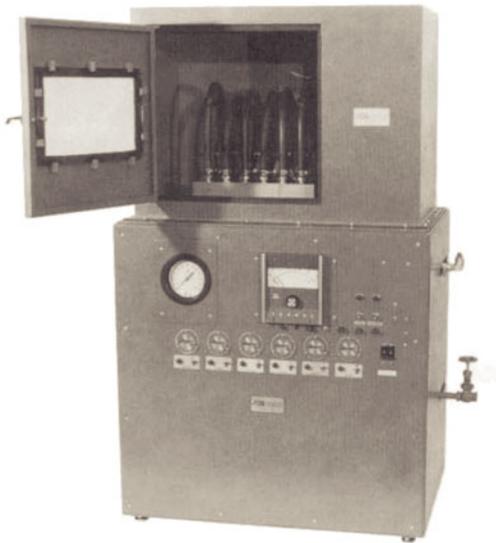


◀ Mechanical Pipe Testing

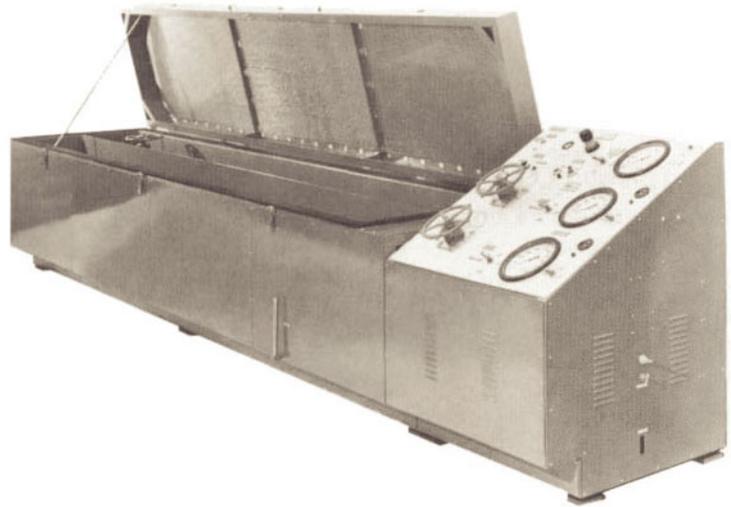
During the past four decades, ATS has successfully developed numerous systems and accessories to solve many materials testing problems. Along with pressure testing systems, ATS manufactures precise and reliable universal testing machines, creep testing frames, and laboratory furnaces and ovens, which all serve useful purposes in testing pipe and tubing made from various materials. The example shown at the left is a UTM fixture designed for mechanical tension testing of pipe samples. Contact ATS to discuss custom solutions to your unique pipe testing needs.

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.



Coolant-circulating pressure system for testing automobile coolant hose using ethylene glycol solution at 270°F.



Custom hydraulic hose test system for long-term hydrostatic pressure testing to 6,000.



Calibration Laboratory
Certificate No. 2132.01
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