



A6 Series Lever Arm Creep Testing Machines



Features:

- Wide-frame construction
- Easy operation
- Four-position hardened knife edges
- Precision drawhead guide assembly
- Automatic beam leveling
- Weightless specimen loading
- Durable vibration isolator
- Vee-block supports
- Tool steel knife edges, easy replacement
- Hot-step loading, stress relaxation, constant stress, and more via A6-DAS frame control data logging system with A6-AP Win application software
- Option Weightless Loading Module

Applications:

- Creep tests
- Creep rupture tests
- Stress rupture tests
- Stress relaxation tests
- Constant stress tests
- Creep crack tests
- ISO 204:1997, ASTM E 139-06
- Definition of individual step less sequences of temperature
- Ambient or elevated temperature
- For long term tests (reaching more than 10.000hrs)
- Machine test and laboratory

Description:

A6 Series Lever Arm Creep Testing Machines is made up of modern creep and stress rupture test frames. After decades of hard work, these sturdy and durable systems have been tested by our clients, their consistent accuracy and reliability have been consistently confirmed by researchers and users.

The powerful standalone A6-DAS frame control data logger system and A6-AP Win application software, are frames that meet virtually all of creep testing requirements, both now and in the future.

A6 Series Creep Test Frame system is fully developed and designed by AI and third parties engineering team. From mechanical hardware to measuring tools and electronic equipment, controllers and software, we possess and pride ourselves of having high reputation on the performance accuracy of the equipment and can support customers with various testing requirements. Existing AI own and third parties equipment upgrade and modifications are also highly accepted by our customers. For more information and many other capabilities, please refer to the details on A6-DAS frame control data logger system.

A6 Series Creep Test Frame are servo control precision knife-edge lever arm testers with optional advanced Weightless Loading Module, SSRT Module, UTM Module, etc that can incorporate many of advanced design features.



A6 Series Lever Arm Creep Testing Machines

Specification: A6 Load Lever Arm Load Frames

All A6 Lever Arm Creep Test Systems are enhanced by a wide range of optional accessories and frame configurations. These features and components include:

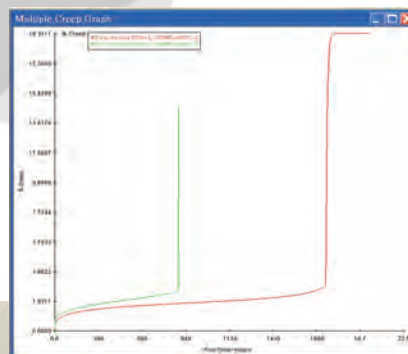
- Frame accessories: Load Train Compartments with Alignment Couplings, Adaptors, Specimen Grip, Compression Test Fixtures, etc.
- Environmental Test Equipment: Furnaces, Ovens/Cooling Chambers, Retorts.
- Instrument accessories: Extensometer Frames, Displacement Sensors, Signal Conditioner, etc.
- Test Control modules: Weightless Loading Module, Stress Relaxation Module, Constant Stress Module, etc.

| | | | | |
|---|---|---------------|---------------|---------------|
| | A6 Creep Testing Machine Frame | | | |
| Model | A6-30M | A6-50M | A6-100M | A6-200M |
| Capacity | 30kN | 50kN | 100kN | 200kN |
| *Lever Arm Ratios | 30:1 | 50:1 | 100:1 | 100:1 |
| *Colum Width | 480 mm | 560 mm | 560 mm | 770 mm |
| Approximate Dimension W x D x H (mm) | 900x520x2150 | 1170x520x2250 | 1250x620x2300 | 1550x620x2450 |
| Drawhead Drive Speed | 2.5-30.5 mm/min, Travel: 130 mm | | | |
| Load Accuracy | 0.5% (down to 1% of Capacity, with certificate of calibration) | | | |
| Power Requirements | 115 or 230 Vac, 50/60 Hz | | | |
| *Custom frames with varying size, draw head and arm ratios ect's are provides. | | | | |
| **AI also provide many kind Direct Load Testing, If any needed contact with us. | | | | |

• Calibrated load weights

Available Sizes (Metric Units, kgw or N)

| | |
|------------------|-----------------|
| 0.5 ± 0.0005 N, | 25.0 ± 0.0075 N |
| 1.0 ± 0.0008 N, | 50.0 ± 0.012 N |
| 2.5 ± 0.0014 N, | 100.0 ± 0.019 N |
| 5.0 ± 0.0026 N, | 150.0 ± 0.024 N |
| 10.0 ± 0.0048 N, | 200.0 ± 0.029 N |



PD controller

Loading unit: 1 2 3 4

Status: ☐ On ☐ Off

Current, A: Spec. width, W, mm:

Settling time, s: Lead spacing, Y₀, mm:

Measurement type: Initial crack 1, a_i, mm:

Interval, min: Initial crack 2, a_i, mm:

☐ None ☐ Spec. 1 ☐ Ref. 1 ☐ Spec. 2 ☐ Ref. 2

☐ Positive ☐ Negative

Initial:

Measured current 1, A: Measured current 2, A:

Calculated crack 1, mm: Calculated crack 2, mm:

Save default Load default Apply Single sweep Start Hide



A6 Series Lever Arm Creep Testing Machines

Specification:

A6 Load Train Accessories

A6 Lever Arm Creep Test Systems has a wide range of selective components, frame accessories and frame configurations, these accessories are precision-machined to meet toughest international standards.

Load Train Components include:

- **Couplings (Alignment)**
 - Quick-Change Coupling
 - Spherical Bearing Coupling
 - Quick-Change Spherical Bearing Coupling
 - Double Knife-Edge Alignment Couplings
 - Electrical Isolation Alignment Couplings
 - High-Temperature Alignment Couplings
- **Adaptors**
 - Pull Rods
 - Threaded Adaptors
 - Studs
- **Specimen Grips**
 - Threaded Couplings (Rod Specimen)
 - Button-head Couplings (Rod Specimen)
 - Clevis Couplings (Sheet/Rectangular Specimen)
 - Wedge Couplings (Sheet/Rectangular Specimen)
 - Compact Tension Test Clevis (CT Specimen) ASTM E399
- **Compression Test Fixtures**
 - 3 point bend test fixtures
 - 4 point bend test fixtures
 - Ring on Ring bend test fixtures
- **High-Temperature Components Materials:**
 - 17-4 PH Stainless Steel
 - High temperature Alloys, 713C, MAR-M246, Inco 718, etc.
- **Weight elevators**
 - Motor Drive, Air/Hydraulic drive
 - Manual lead screw drive





A6 Series Lever Arm Creep Testing Machines

Specification:

Extensometer frames / Displacements Sensors / Sensor Conditioners

All designs and manufactures standard as well as custom-made extensometer frames for a wide choice of creep hot tensile/compression test applications.

- Creep Testing Extensometer Frame
(Maximum Temperature: 1100°C)
 - T112 Extensometer Frame
Interchangeable specimen inserts
Four-rod construction
 - T114 Extensometer Frame
Cone pointed set screws for specimen attachment
Four-rod construction
 - T121 Extensometer Frame
Interchangeable specimen inserts or cone pointed set screws
Dual Rod in tube construction
- Creep Testing Averaging Extensometer Frame
(Maximum Temperature: 1100°C)
 - T124 Averaging Extensometer Frame
Interchangeable specimen inserts
Dual rod in tube construction
Dual gauging platforms that provide adjustable gauge lengths
12 to 100 mm
 - T128 Averaging Extensometer Frame
Interchangeable specimen inserts
Six rod construction
Dual gauging platforms that provide adjustable gauge lengths
12 to 100 mm
- CT Crack Length Testing Extensometer Frame
(Maximum Temperature: 1100°C)
 - T122 CTT Extensometer Frame
Crossheads designed to attach to CTT Specimen groove
Single rod in tube construction
- Tensile testing Testing Extensometer Frame
(Maximum Temperature: 1100°C)
 - T112-T Extensometer
Interchangeable specimen inserts
Four-rod construction
- Test on Retort Testing Extensometer Frame
(Maximum Temperature: 1100°C)
 - T115 Extensometer
Designed for high temperature creep testing within Retort
Interchangeable specimen inserts
Four-rod construction
- Plastic Creep Testing Testing Extensometer Frame
(Maximum Temperature: 425°C)
 - T311 Extensometer
Designed for creep testing of plastic and similar materials
Dual Rod in tube construction

- Testing and Alignment Checking Frame (Room Temp.)
- T116 Creep Testing and Alignment Checking Extensometer

All Extensometer Frame Gauging (Sensors) Platforms designed for various types of displacement transducers or clip on extensometer.

- Displacement Sensors
Force Displacement Sensor , LVDT, Digital Encoder, SLVC, Digital Dial Gage, Analog Dial Gage, Axial Extensometer (Tensile testing) etc..
Crack measurement instrument, DC/AC PD
- Displacement Sensors Signal Conditioner
All kind of displacement sensor conditioner modules for data logger system.



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Material Creep Test Equipment



A6 Series Lever Arm Creep Testing Machines

Specification: A6-DAS frame control data logger system and A6-AP Win application

A6-DAS frame control data logger system and A6-AP Win application software, are frames that meets virtually all of creep test requirements, both now and future.

A6-DAS frame control data logger system consists an embedded controller, a touch-screen display, a precision measurement unit, and a temperature control unit.

Each creep machine has an independent control unit and recording unit. It can be completely offline upon set up and operated by the touch screen display.

The A6-DAS frame control data logger system is an integrated system designed to replace cumbersome, time consuming and error-prone manual operating procedure, control equipment set-up, and data collection methods on test equipment adjustment controls inherent in long-term tests.

A6-DAS is equipped with modern touch-based embedded and decentralized control systems. It has complete testing machine control and data acquisition functions with real-time drawing functions.

The LCD touch panel displays essential test information and operator instructions, and are equipped with controls for frame, temperature controller, data logger, weight elevator operation, etc.

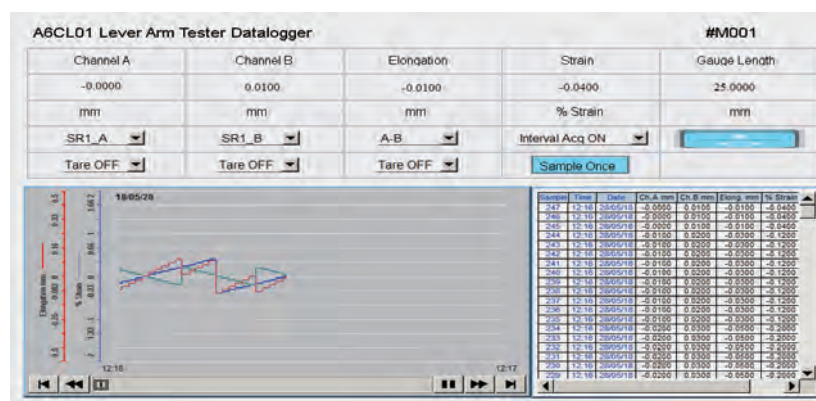
It's high capacity 128GB FLASH MEMORY is completely designed for various types of long time mechanical tests. This feature has standalone independent embedded control and data recorder. The recording device is designed to adapt to various conditions such as power interruptions encountered during long-term tests. It has the best security on long-term reliability and accuracy.

The A6-DAS has network TCP/IP communication capabilities. It can be link to hundreds of testing machines with the network system, and monitoring the status of each test at the remote site. Optional camera can also be installed to monitor overall machines performance. While with the use of TCP/IP, the whole test monitoring, including weight elevator; temperature control; accessories calibration; data acquisition control; etc. can be done remotely.

A6-DAS with A6-AP software can be use to perform post and aft analysis functions such as measurement, recording and curve mapping.

The A6-AP software package operates on a PC compatible computer running on Windows™ NT, Win7 operating system.

The A6-DAS consoles also provide TCP/IP reliable interface between frame hardware, accessories, and the host computer.





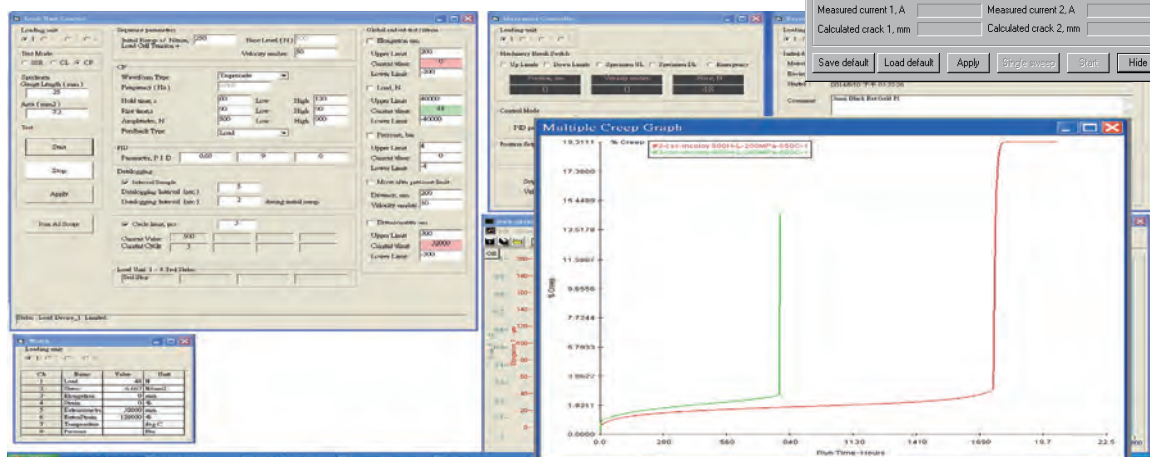
A6 Series Lever Arm Creep Testing Machines

Specification: A6-DAS frame control data logger system and A6-AP Win application

- A6-DAS frame control data logger
 - A6-DAS (Standard Interfaces/Controls)
 - User Interface
 - 7" or 10" color LCD Touch Panel
 - HD 128GB FLASH
 - TCP/IP
 - Frame Controls
 - Automatic inch-down or drawhead control
 - Specimen break detection.
 - Elevator control
 - Extensometer (Displacements)
 - Adaptor to LVDT, SLVC, Laser, custom extensometers
 - Can be both channels from averaging extensometers
 - Furnace temperature control
 - 4 thermocouple input channels
 - One, two, or three zone furnace temperature control
 - Furnace power control
 - PID power control system
 - High-resolution thermocouple A/D
 - Multi-zone PID algorithms for precise temperature control.
 - High-level inputs
 - 4 input channels
 - Extensometer, temperature transmitter, etc.
 - Alarm
 - Furnace control
 - Automatic shutdown
 - Data log for all input channels
 - A6-DAS (Optional Instrument/Controls)
 - Single or dual-channel extensometer signal conditioning :
 - Force linear displacement sensors, LVDT, or SLVC extensometer signal conditioning,
 - Custom extensometer amplifier configurations
 - Hot step loading modular
 - Automatic load control modular
 - Weightless testing modular
 - PDAP AC/DC Potential Drop Measuring Software
 - Custom Instrument/Controls
- A6-AP Win application software
 - Test Specifications
 - Test editor for creating and modifying procedures
 - ASTM standards E4, E8, E83, E139, E292, and ISO
 - Instrument Calibration
 - Extensometer calibration to ASTM E83
 - Thermocouple calibration correction.
 - Data Logger
 - Identification frame serial number maintains
 - Export all data associated with each trial
 - Instant access and reporting
 - Data is ASC II (*.csv)
 - Graphs/Plot
 - Creep, creep modulus, creep rate
 - Cold load, hot load; temperature
 - Multiple-specimen
 - Reports
 - Short/long form, Events
 - Calibration data for extensometers and thermocouples
 - Cold load, Hot load
 - Test specification
 - Creep data
 - System setups
 - Security
 - Multi-level password protection determines each user's privileges

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Material Creep Test Equipment

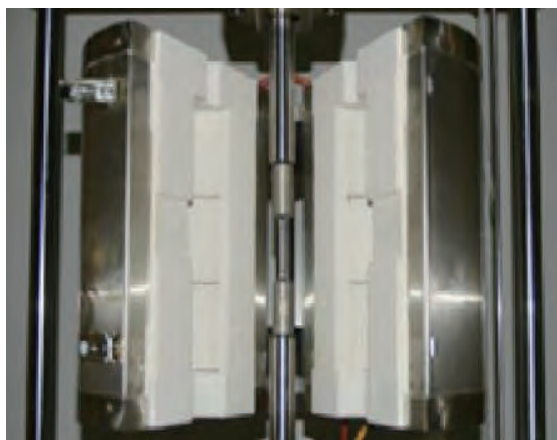




High Temperature Split Tube Furnace

Features:

- Machine Test and Laboratory
- Faster heat up
- Longer element life
- Lower shell temperatures
- Complete line of accessory
- Low watt-density heating elements
- Low K-factor vacuum-cast ceramic fiber insulation
- Wide variety of diameters, lengths, sizes, and configurations
- Easy replacement of failed elements
- Precise, Efficient, and Reliable
- Made to Customer Specifications
- Saving you time and money
- Heating elements Nichrome: 1850° F (1000° C)
- Optional elements Kanthal A1: 2200° F (1200° C)



Applications:

- General laboratory
- Machine Test
- Use for testing to ASTM standards
- Universal testing machines
- Creep/stress rupture test
- Stress corrosion cracking test
- High strain rate material test
- Bend fatigue test machines



Description:

Advance Instrument Inc. (AI) Series 4110 Tube and 4210 Split Tube Furnaces have been carefully designed and refined over many years to make them one of the most reliable and efficient laboratory furnaces available on the market today.

Standard construction features include low K-factor vacuum cast ceramic fiber insulation for superior energy retention and rigid structure, stainless steel shell and end flanges for both durability and appearance, and laboratory-replaceable heating elements manufactured under strict quality-controlled conditions in our own factory.

All Series 4110/4210 furnaces are built-to-order to your specific requirements, with a wide selection of available diameters, lengths, mounting arrangements, and accessory equipment, in a variety of configurations, including isothermal, gradient, adiabatic, and others.

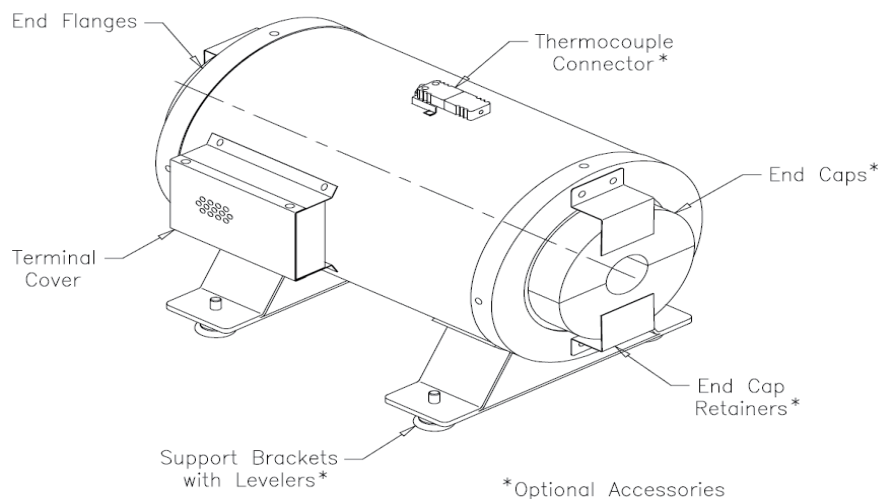
Available options and accessories include heat-equalizing liners, extensometer slots and mounting flats, thermocouples, end caps, view ports, gas ports, cast bronze or brass heating elements, retorts, and more.



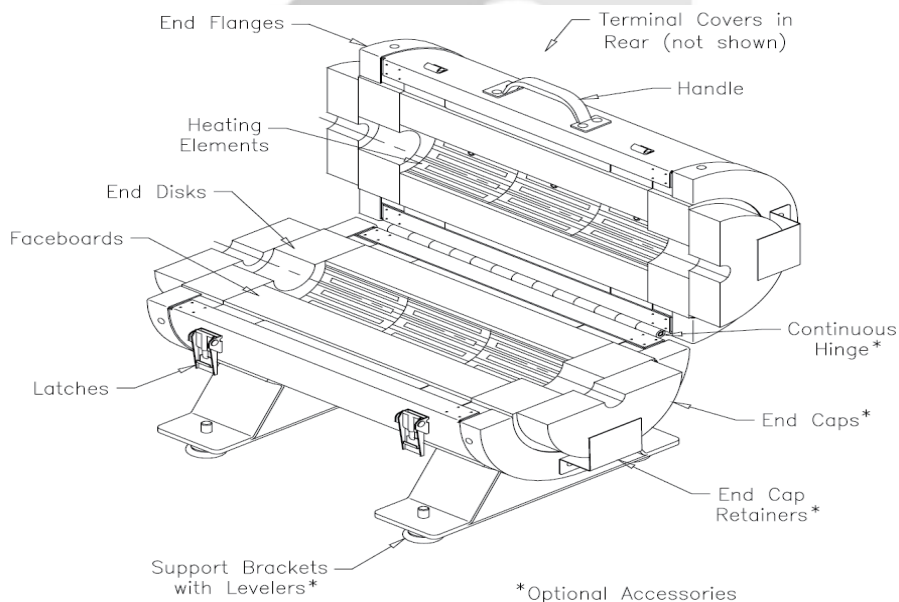
High Temperature Split Tube Furnace

Specification:

Series 4110/4210 Furnace



Series 4110 Tube Furnace 1100° C Maximum



Series 4210 Split Tube Furnace 1200° C Maximum

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Material Creep Test Equipment



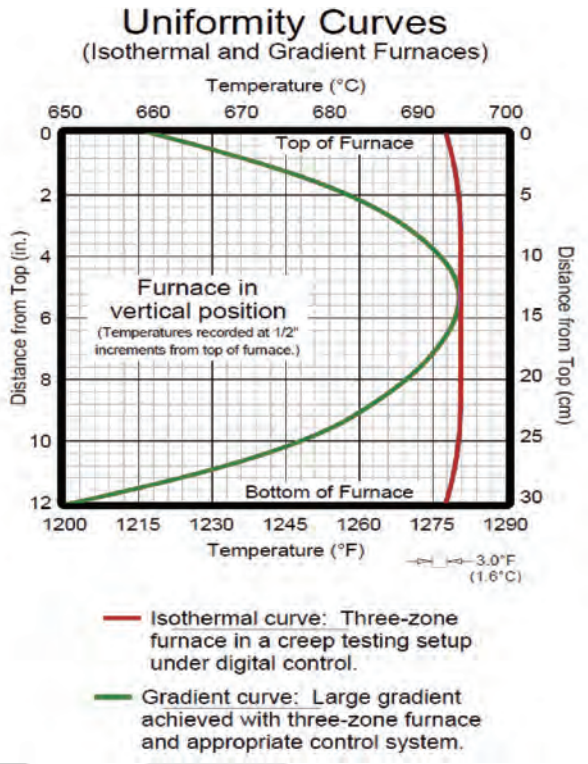
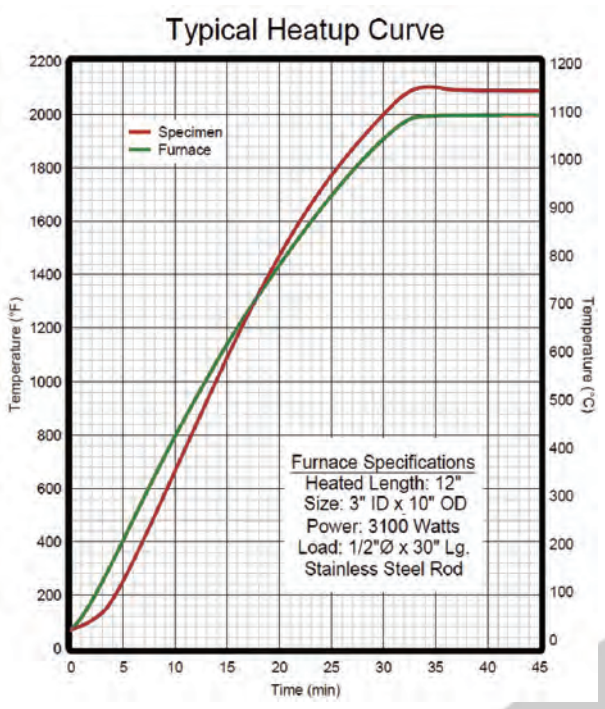
High Temperature Split Tube Furnace

Specification: Series 4110/4210 Furnace

- Creep Testing Furnaces For the ultimate in precise temperature control and uniformity, All furnaces can be combined with our exclusive computer creep system.
This industry-leading hardware/software package automates every aspect of the creep testing process, including control, data acquisition, archiving, analysis, report generation, and much more.

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Material Creep Test Equipment



Other sizes supplied on request Length & zone construction made to order Heating elements and temperature range:
Nichrome: 1850° F (1000° C)
Kanthal A1: 2200° F (1200° C)



| Typical 4110/4210 Furnace Sizes | | |
|------------------------------------|-------------------------------------|-------------------------------------|
| For service to 1650° F (900° C) | For service to 2000° F (1100° C) | For service to 2200° F (1200° C) |
| "ID" x "OD" | "ID" x "OD" | "ID" x "OD" |
| 19.1mm x 152.4mm | 19.1mm x 203.2mm | 19.1mm x 254.0mm |
| 25.4mm x 152.4mm | 25.4mm x 203.2mm | 25.4mm x 254.0mm |
| 31.8mm x 152.4mm | 31.8mm x 203.2mm | 31.8mm x 254.0mm |
| 41.1mm x 203.2mm | 41.1mm x 254.0mm | 41.1mm x 304.8mm |
| 50.8mm x 203.2mm | 50.8mm x 254.0mm | 50.8mm x 304.8mm |
| 60.5mm x 203.2mm | 60.5mm x 254.0mm | 60.5mm x 304.8mm |
| 76.2mm x 203.2mm | 76.2mm x 254.0mm | 76.2mm x 304.8mm |
| 95.3mm x 254.0mm | 95.3mm x 304.8mm | 95.3mm x 355.6mm |
| 127.0mm x 254.0mm | 127.0mm x 304.8mm | 127.0mm x 355.6mm |
| 139.7mm x 304.8mm | 139.7mm x 355.6mm | 139.7mm x 406.4mm |
| 152.4mm x 304.8mm | 152.4mm x 355.6mm | 152.4mm x 406.4mm |
| 177.8mm x 304.8mm | 177.8mm x 355.6mm | 177.8mm x 406.4mm |
| 209.6mm x 406.4mm | 209.6mm x 457.2mm | 209.6mm x 508.0mm |
| 304.8mm x 508.0mm | 304.8mm x 558.8mm | 304.8mm x 609.6mm |



High Temperature Split Tube Furnace

Accessories : End Caps & Port Plugs, Temperature Sensors

- End Caps & Port Plugs

AI furnaces are commonly supplied with removable and replaceable ends caps or port plugs.

These relatively inexpensive accessory items extend furnace life by absorbing "wear and tear" caused by the movement of fixtures, reactors, pull rods, etc., thereby preventing damage to the furnace insulation, which is considerably more expensive and time-consuming to replace.

AI end caps and port plugs are also useful in situations where a number of different-sized bore diameters are required.

They can be easily interchanged, allowing a variety of possible configurations for a single furnace.

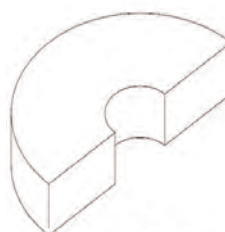


Fig. 1: End Caps



Fig. 2: Port Plugs

- Temperature Sensors

Furnaces from AI can be equipped with a number of different thermocouple types in a variety of mounting configurations.

Thermocouple connectors feature standard ANSI color coding and are available in types J, K, B, R, S, and Platinel-II.

Common mounting configurations include single connector with mounting bracket, duplex connector with mounting bracket, spring loaded for constant contact with a reactor or other vessel, and sealed for use in controlled-atmosphere furnaces, retort

| T/C Type | Alloy Combination (+/-) | Max. Temperature | Limits of Error | Comments |
|-------------|------------------------------------|------------------|------------------|---|
| ANSI "J" | Fe/Cu-45% Ni | 1100°F (590°C) | 2.2°C or 0.75% | Reducing, vacuum, inert. Limited use in oxidizing at high temperatures. Not recommended for low temperatures. |
| ANSI "K" | Ni-10% Cr/ Ni-2% Al-2% Mn-1% Si | 2200°F (1200°C) | 2.2°C or 0.75% | Clean oxidizing and inert. Limited use in vacuum or reducing. Wide temperature range. Most popular calibration. |
| ANSI "B" | Pt-30% Rh/Pt-6% Rh | 3272°F (1800°C) | 0.5% above 800°C | Oxidizing or inert. Do not use in metal tubes. Beware of contamination. High temperature. Common use in glass industry. |
| ANSI "R" | Pt-13% Rh/Pt | 2700°F (1480°C) | 1.5°C or 0.25% | Oxidizing or inert. Do not use in metal tubes. Beware of contamination. Precision high temperature. |
| ANSI "S" | Pt-10% Rh/Pt | 2700°F (1480°C) | 1.5°C or 0.25% | Oxidizing or inert. Do not use in metal tubes. Beware of contamination. Precision high temperature. |
| Platinel-II | Platinel-II/Platinel-II | 2200°F (1200°C) | 1.0% | More stable but more expensive substitute for type "K" thermocouples. |

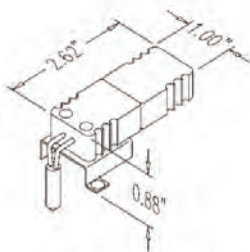


Fig. 3: Single Bracket

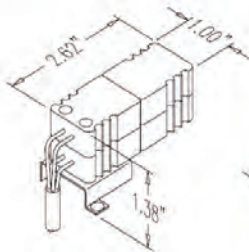


Fig. 4: Duplex Bracket

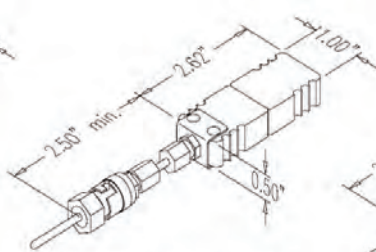


Fig. 5: Spring-Loaded

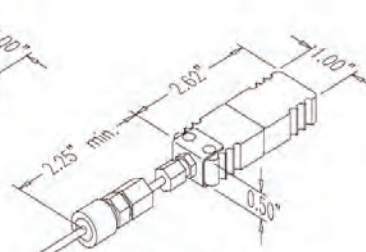


Fig. 6: Sealed



High Temperature Split Tube Furnace

Accessories :

Extensometer Flats & Slots, High Temperature Sample Supports, Zone Dividers

• Extensometer Flats & Slots

When performing creep, stress-rupture, and other tests, it is often necessary to have one or more precision extensometers in place to record dimensional changes that occur in a specimen throughout the process.

While some extensometers are designed to hang vertically from a specimen to take these measurements, many are intended to contact a specimen from one side, requiring a specially-configured furnace to provide clearance for the extensometer and, in some cases, to also provide support for it.

AI has extensive experience in designing such furnaces to suit extensometers from nearly every major supplier. When ordering, please have the information shown in Figure 1 (right) available:

- a) distance from surface of fl at to center of furnace;
- b) height of fl at;
- c) size (width & height) of access slot;
- d) sizes & locations (if necessary) of tapped holes for mounting of the extensometer. If available, please also provide the manufacturer and model number of the extensometer being used.

• High Temperature Sample Supports

For laboratory tests or industrial procedures that do not involve test frames, it is often necessary to have some method of providing support for samples or products that must be heated. AI meets this need with custom sample supports, specimen holders, and high-temperature pallets made from stainless steel or Inconel for use with fork trucks.

• Zone Dividers

Some heating applications involving gasses, liquids, or other substances require a sharp temperature gradient between furnace heating zones.

In such cases, AI furnaces can be constructed with insulating zone dividers to accommodate the required temperature difference

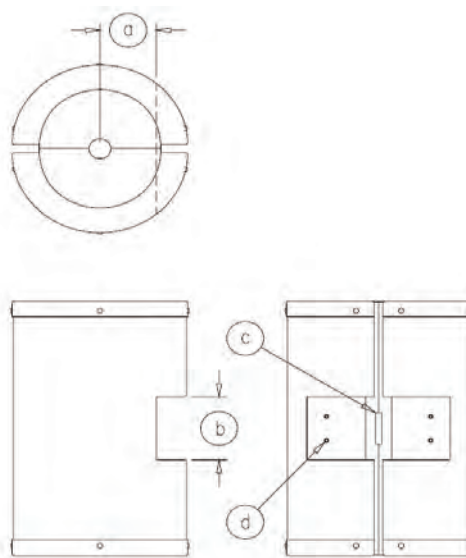


Fig. 1:
Split tube furnace constructed
for extensometer mounting

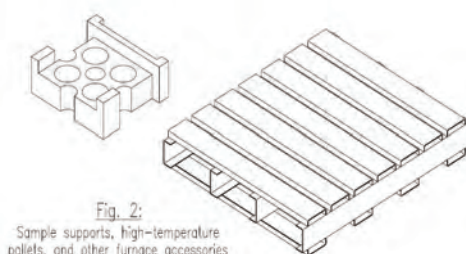


Fig. 2:
Sample supports, high-temperature
pallets, and other furnace accessories
suitable for any configuration.

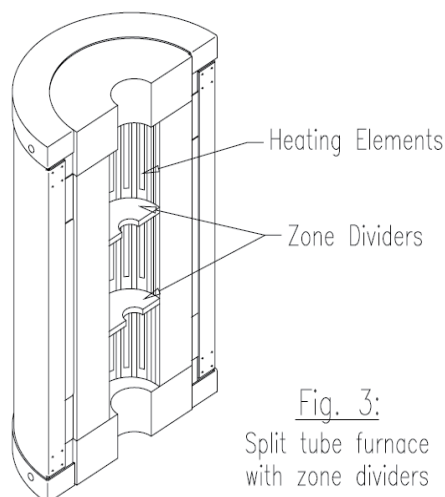


Fig. 3:
Split tube furnace
with zone dividers



High Temperature Split Tube Furnace

Accessories : Element Protection Shields, Sealed Terminal Covers, Perforated Heat Shields, Heat Equalizing Blocks, Access Ports

- **Element Protection Shields**

Upon breakage, some specimens or samples can create flying debris inside a furnace chamber. Other processes involve reactor vessels with high-pressure liquids or gasses, creating the possibility of pipe rupture.

In such cases, internal element protection shields are recommended to prevent damage to furnace heating elements.

AI tube and split tube furnaces can be supplied with either solid or perforated sheet metal shields, or they can be constructed with embedded ceramic tubes. Contact AI to discuss the best option for your application.

- **Sealed Terminal Covers**

When heating processes are being conducted in hazardous or corrosive environments, or where required by safety codes, AI furnaces can be supplied with sealed terminal covers. Sealed covers feature high-temperature silicone rubber gaskets and are supplied in either cast aluminum or formed stainless steel, depending upon the size, type, and power rating of the furnace.

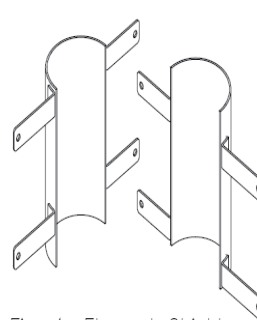


Fig. 1: Element Shields
(for split tube furnaces)

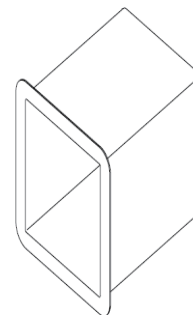


Fig. 2: Protective Liner

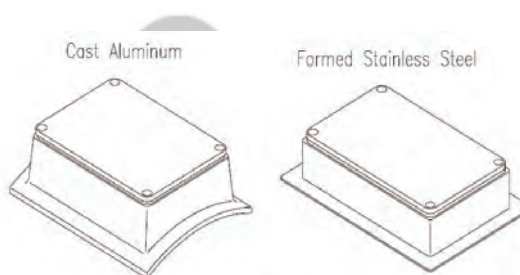


Fig. 3: Sealed Terminal Covers

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Material Creep Test Equipment



High Temperature Split Tube Furnace

Accessories : Element Protection Shields, Sealed Terminal Covers, Perforated Heat Shields, Heat Equalizing Blocks, Access Ports

- Perforated Heat Shields

AI furnaces are designed for maximum efficiency and low external shell temperatures.

However, those who have experience working with high-temperature equipment know that any furnace will be relatively hot on the outside during operation and that appropriate safety precautions must be taken.

While this situation is acceptable in most laboratory environments, many manufacturing facilities that use AI equipment must meet stringent safety requirements for the protection of their workers.

To satisfy this need, AI furnaces can be supplied with external perforated sheet metal screens, which significantly reduce an operator's exposure to hot surfaces on the furnace shell.

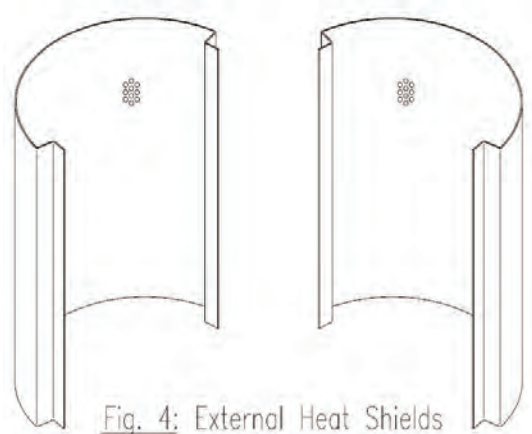


Fig. 4: External Heat Shields
Available for tube or box furnaces,
solid or split, in a variety of configurations.



High Temperature Split Tube Furnace

Accessories : Element Protection Shields, Sealed Terminal Covers, Perforated Heat Shields, Heat Equalizing Blocks, Access Ports

- Heat Equalizing Blocks

Some applications require extreme temperature stability. Achieving this goal requires the addition of a stabilizing thermal mass, or core, to the inside of a heat zone.

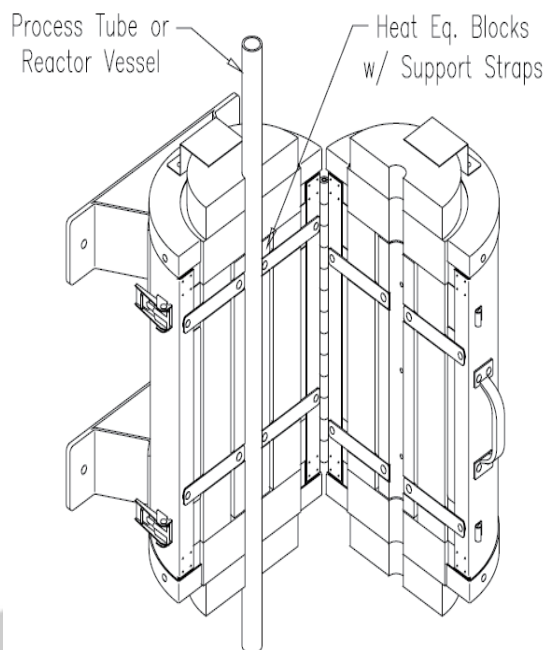
AI furnaces can meet this need with the addition of heat equalizing blocks to help ensure that maximum temperature uniformity is maintained, either in a single furnace zone or along the entire length of a furnace. Though virtually any metal can serve as a core material, the most common alloy used in AI furnaces is AMPCO-18 cast aluminumbronze, chosen for its relatively high operating temperature (1100 ° F/600 ° C maximum) and its excellent thermal conductivity. Other materials that have been or could be used depending upon the process involved include stainless steel, aluminum, copper, nickel alloys such as Inconel, and others.

Common applications for heat-equalizing blocks include petrochemicals research, pilot plant development, gas and liquid pyrolysis, calibration, viscosity testing, and crystal growth. Custom blocks can be designed for use with any AI furnace and can include such additional features as thermocouple ports, cooling ports, removable blocks with lifting handles, etc.

- Access Ports

Because all AI furnaces are built-to-order, nearly any variety or type of access port can be placed wherever necessary to suit your requirements.

Types of ports include gas inlets and outlets, purging ports, cooling and vent ports, thermocouple ports and thermowells, load train ports, metal-lined ports, or whatever else your specifications demand.



3-2

Material Creep Test Equipment



High Temperature Split Tube Furnace

Mounting: Test Frame Mounting Assemblies, Structural Frames, Vertical Support Columns, UTM Baseplate

- Test Frame Mounting Assemblies

AI offers a number of standard test frame mounting assemblies, as shown on the following pages.

Mounting assemblies are suitable for use with tube, split tube, and split box furnaces and can be reversed for either left-hand or right-hand operation.

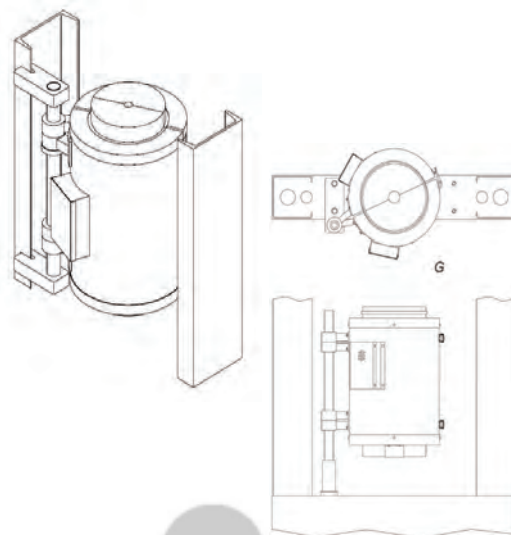
The accompanying diagrams demonstrate two-column test machines, but each assembly can easily be adapted to fit four, six, or any number of test frame support beams or columns.

As always, custom mounting inquiries are welcome.

- UTM Baseplate

Many universal testing machines do not provide a suitable means of mounting a furnace.

In such cases, a miniature baseplate with furnace bar can be mounted to the lower crosshead of the machine, as shown in figure G.



G) UTM Baseplate Mounting Assembly:

Shown is a single pivot mounting assembly with a baseplate bracket. Any of the mounting assemblies on this page can be accommodated in this way.



High Temperature Split Tube Furnace

Mounting: Test Frame Mounting Assemblies, Structural Frames, Vertical Support Columns, UTM Baseplate

- Structural Frames

Many systems, including creep testing frames, industrial support structures, and “homemade” laboratory test frames, use structural steel beams in their design.

AI produces a wide array of structural frame clamps, furnace bar brackets, and mounting brackets to fit such configurations.

These components form the basis for mounting assemblies A, B, and C, shown at left.

A) Single Pivot Mounting Assembly:

This is the simplest and least expensive option for vertical mounting of a furnace on a structural frame.

B) Double Pivot Mounting Assembly:

Offering more versatility than a single pivot mounting assembly, this option allows some adjustment in the location of the furnace centerline, and it allows the furnace to easily swing out of the way when not in use.

C) Dual Double Pivot Mounting Assembly:

With both furnace halves able to move freely, this mounting assembly offers maximum versatility in setting up load train components and tests.

This configuration is also sometimes the only suitable option in restricted-space situations.

- Vertical Support Columns

Universal testing machines, fatigue testers, and other systems often feature vertical columns in their design.

AI produces mounting assemblies for these machines which are similar to the structural frame mounting options on the preceding page.

Vertical-column mounting assemblies are shown at left in figures D, E, and F.

D) Single Pivot Mounting Assembly:

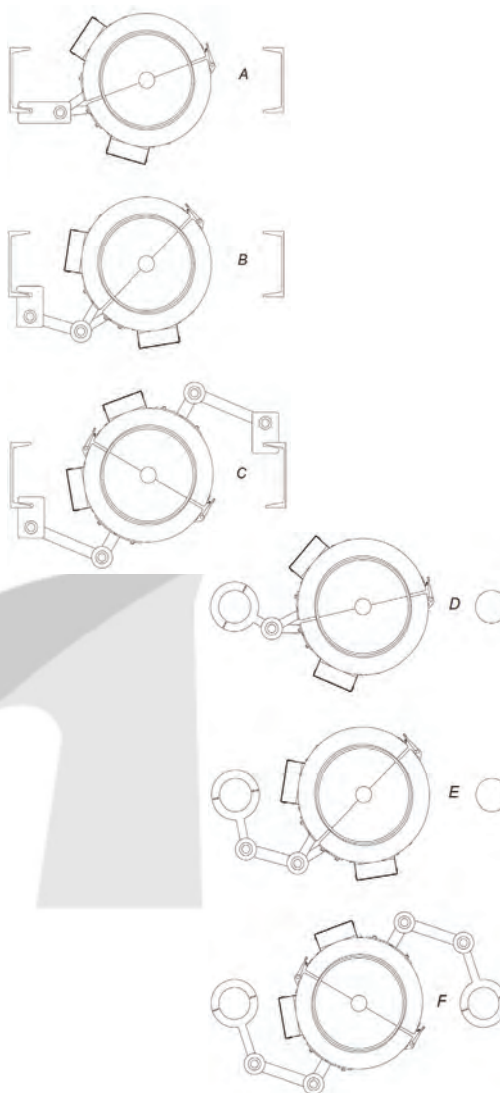
Similar to figure A on the previous page.

E) Double Pivot Mounting Assembly:

Similar to figure B on the previous page.

F) Dual Double Pivot Mounting Assembly:

Similar to figure C on the previous page.





High Temperature Split Tube Furnace

Accessories : Temperature Control Systems

- Complete Temperature Control Systems:

Shown above are examples of complete single and multi-zone furnace temperature control systems. Available features include cabinets with rack-mount panels, transformers, SCR units, gas/cooling supply systems, and other options.



Whatever your specific application may be, AI has the knowledge and experience to build a control system to suit all of your needs.

PC software for computerized configuration.

- Temperature Control Systems

It is obvious that a furnace can only be as precise as its control system.

Since the beginning, therefore, AI has placed great emphasis on providing complete, accurate temperature control systems using only the highest-quality components.

AI currently specializes in control systems using the three units shown below, which have been selected for their accuracy, versatility, and reliability.



Custom control systems are also available using any major-brand temperature controller, including Honeywell, Watlow, SHIMAX, OMRON, and others. Consult an AI sales engineer to discuss your ideal temperature control system.

- SHIMAX MAP6A / MAC6A Series Digital Controller (96 x 96 mm)

- High Accuracy 0.1%Fs + 1 digit.
- Program MAX 96steps 8patterns. (MAP6A)
- MAX 4zone PID control.
- Universal input. (Thermo couple RTD, DC voltage, DC current)
- Sampling Period 50msec, 166.7msec, 250msec, 500msec.
- PV-SV multi points compensation. (MAX11 points)
- Space-saving Design : Panel depth 65 mm



CE



High Temperature Split Tube Furnace

Accessories : Temperature Control Systems

- OMRON E5CN-H (48 x 48 mm)
Advanced Digital Temperature Controller
A New High-performance Controller: High Resolution, High Speed, and High Input Accuracy.
Logic Operations and Preventive Maintenance Function.
- High-resolution display with 5 digits/0.01° C display in a compact Controller (48 x 48 mm).
- High-speed sampling cycle of 60 ms.
- High Accuracy Thermocouple/Pt input: $\pm 0.1\%$ of PV, Analog input: $\pm 0.1\%$ FS
- Universal inputs on all models (thermocouple, PT, or analog input) to handle various sensors with one Controller.
- A PV/SV-status display function can be set to automatically alternate between displaying the status of the Temperature Controller (auto/ manual, RUN/ STOP, and alarms) and the PV or SV.
- Flexible contact outputs with logic operations (AND, OR, and delays) set from the Support Software (CX-Thermo Ver. 4.0)
- Preventive maintenance for relays in the Temperature Controller using a Control Output ON/OFF Counter.



3-2

Material Creep Test Equipment