专业工程试验与测试解决方案提供商

国机集团 SINOMACH

SINOTEST 中机试验

中国高端试验装备技术引领者

高温真空（充气）环境试验装置

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COMPANY PROFILE /公司介绍

SINOTEST EQUIPMENT CO., LTD. (short name: SINOTEST) was founded in 1959 (original name: Changchun Research Institute for Testing Machines of the Ministry of Machine Building Industry; former name: Changchun Research Institute for Mechanical Science Co., Ltd.). SINOTEST is a subsidiary of SINOMACH GROUP, one of the world's top 500 large state-owned enterprises. It is the support unit of the national testing machine quality supervision & inspection center and the national testing machine standardization committee. The national testing machine industry association and the association Secretariat are all located in SINOTEST. SINOTEST is known as the "cradle of China's testing machine technology". It is a high-tech enterprise with perfect innovation ability in China's test equipment industry.

SINOTEST is a state-level scientific and technological innovation enterprise mainly engaged in R & D and manufacturing of "test equipment". At present, the company has 120 patents, including 61 invention patents, 30 software copyrights and 29 utility models. The companypresided over the formulation of 30 national standards and 42 industrial standards. SINOTEST has undertaken 4 national major scientific instrument projects. 3 of them have been accepted by the state. Currently, the project of "high temperature and high frequency in situ testing technology and application" is passing the acceptance of scientific research achievements. SINOTEST has kept continuously innovating. It has a number of international cutting-edge core technologies in the test equipment industry, and has solved a number of national "neck sticking" technical problems, including hydrostatic support technology, measurement and sensing technology, etc. A batch of key technology has been in an advanced position in the world.

Now, SINOTEST has formed an industrial layout of one center and two bases, with R & D center located in Beijing and manufacturing bases located in Changchun and Wuxi. SINOTEST focuses on the field of high-end equipment manufacturing, leads the development of China's test equipment technology and industry, and makes unremitting efforts for the rise of national industry!

Core value:

Integrity, innovation, passion, joint efforts and win-win cooperation

With 60 years of material testing experience, SINOTEST provides professional material testing solutions for users with rich technology accumulation and strong innovation ability.

企业资质

高新技术企业

创新型科技企业

ISO9001质量管理体系

德国莱茵认证

欧盟CE认证

安全生产标准化认证

知识产权管理体系认证

军工保密资质认证

行业资质

国家试验机质量监督检验中心

全国试验机标准化技术委员会

全国校直机标准化组

国家试验机行业协会秘书处

国家试验机行业学会秘书处

编辑出版行业科技期刊《工程与试验》

研发检测机构

院士工作站、博士后科研工作站

机械工业材料测试仪器工程研究中心

机械工业校直设备工程研究中心

吉林省材料试验机科技创新中心

吉林省校直装备工程中心

吉林省检测技术公共服务中心

学历授予及培训

机械工程与设计硕士点

吉林大学研究生培养基地

从标准化试验设备到满足用户特殊需求的定制试验系统及系列化测试解决方案，打造和树立国内一流、国际上有影响力的高端品牌。

CONSPECTUS
概述

Through decades of efforts, our company's vacuum furnace technology has matured. Our technology has reached the world leadership level，and it has been widely used in various fields. We have provided a number of test schemes for our clients.

The ultra-high temperature vacuum (inflation) test device is a comprehensive technology integrating machinery, materials, thermal engineering, vacuum, measurement, automatic control and computer. High temperature vacuum (inflatable) environmental test device can be divided into 1000℃, 2000℃ and over 2000℃. The test device can achieve different experimental temperatures, with good isotropical, temperature fluctuation and temperature gradient. In vacuum conditions, the low temperature equipment can meet the requirements of the national standard.

Test machine in High-temperature and vacuum (aerate) environment can be divided into three categories from the heating mode：Radiation heating、Power-on heating、Induction heating. Radiation heating can be divided into: Graphite heating、Metal heating and Resistance wire heating. They have different characteristics. Radiation heating have a good temperature uniformity, and Power-on heating and Induction heating are fast. Users can customize different products according to their needs.

Test machine in High-temperature and vacuum(aerate) environment has reasonable construction, used stainless steel double layer water cooled structure.This design ensures the stability and safety of the equipment work. The tensile travel of the experimental device is not less than 50mm.

Induction heating and Radiation heating using intelligent temperature control meter, can perform 0.1 level AI adjustment,they all use advanced control algorithms.For example,control algorithm fuzzy logic PID regulation and parameter self-tuning function. The device can customize a set of control parameters with fast response speed and small overshoot according to the real-time temperature data collected by the thermocouple or infrared high temperature meter to control the conduction range of the silicon controllable conduction angle. Intelligent thermostat required for power-on heating adopts independent developed multi-channel temperature controller. It includes the advanced control algorithm of fuzzy logic PID regulation and parameter self-tuning function，so it enough to control temperature. For exampl, control the conduction range of the switch DC power suppl. The temperature acquisition unit adopts the imported high-precision non-contact photoelectric colorimeter. The heating speed can be reached 10℃-100℃.

The electronic control system of the equipment realizes the expected control process and the alarm prompt. The system can monitor the heating current voltage of heating system, voltage phase sequence of mechanical pump, current of diffusion pump, water pressure and water temperature of Cold-water circulation system,vacuum degree of the environmental devices, and provide over-limit alarm to ensure the stable operation of the control system.

Device test software can perform almost all data operations in one data processing interface.Include,marking and deletion of invalid data, statistics, printing, import, export, viewing results or tracking of original data, graphic superposition, marking and zoom, manual modification of characteristic data, free transformation of coordinate system channels and units, temperature acquisition and control, etc.

Deformation is measured in three different ways, first is measurement value of high-temperature resistant differential transformer, 1μm resolution ratio, 0.5% precision (use of Long-time Creep); twice is side insert extensometer, 1μm resolution ratio, 0.5% precision (use of Stretch or Creep fatigue); third is non-contact deformation measurement, 20-50 microstrain precision, have a powerful features, less impact on the test samples, small applications in high-end areas(use of power-on or inductive heating).

Two-stage vacuum extraction structure is adopted, Minimum minimum can to 6×10-4 Pa.The inflation interface is reserved, users can depend on the demand, into inert gases to protect of the test samples.

Special environmental test device, respectively H2S、atmosphere、H2、O2、H2S.

SINOTEST

HISTORICAL
HONOR /历史荣誉

Through 60 years of technical precipitation and research and exploration, SINOTEST has achieved the technological leader and flow innovation ability in the field of high-temperature vacuum (inflatable) environmental devices.

60年 技术沉淀 研究探索

- **1976** China's first-ever Test machine in High-temperature and vacuum(aerate) environment suit was developed
- **1978** High-temperature vacuum creep testing machine had The National Science and Technology Congress Scientific and Technological Achievements Award
- **1981** High-temperature vacuum short-time creep test machine had Third prize of major scientific and technological achievements in the instrument and instrument industry
- **1996** Vacuum High Temperature furnace had Third prize of Science and Technology Progress of Machinery Department
- **2006** 2500℃ Mechanical performance device of ultra-high temperature materials is listed as a special project funded by the Ministry of Science and Technology
- **2010** 2200℃ Ultra-high temperature environment simulation test system had China Instrument Society of Science and Technology Innovation Award
- **2010** 2200℃ Ultra-high temperature environment simulation test system had Third prize of Science and Technology of China Machinery Industry Group.
- **2018** 'Research、development and application of safety performance tester for extreme environmental pressure-bearing equipment' had "China Machinery Industry Group Science and Technology Award" - - first prize
- **2020** 'Research、development and application of safety performance tester for extreme environmental pressure-bearing equipment' had "Anhui Provincial Science and Technology Award" - - first prize

APPLICATION
FIELD／应用领域

In the material mechanical properties test，Ultra-high temperature and special environment simulation test system as High-temperature vacuum(inflatable and other environment) test device always use at Defense Military, Aerospace, Modern Space Technology, Fusion reactor engineering and New Materials Research Departments.

In the mechanical performance test of materials, the ultra-high temperature and special environmental simulation test system, namely the high temperature vacuum (inflation and other environment) test device, is mainly used in the national defense and military industry, aerospace, modern space technology, nuclear fusion reactor engineering and new material research departments.

DEVELOPMENT
HISTORY／发展历程

Since SINOTEST established, we have produced High and low temperature tester, High and low temperature hardness meter, High and low temperature impact test machine, High and low temperature pull.We have a brilliant history in development of the high and low-temperature test machine.

1969

Our company used ten-years to development of High temperature vacuum (inflatable) test device. At 1984 the first High-temperature vacuum (inflatable) test device officially out into use.

After Chinese economic reform

Our institute successfully developed 2000℃ Vacuum (inflatable) hot pressure sintering furnace, 2000℃ High temperature vacuum elastic mode is a detector, 2500℃ Thermal expansion measuring device, Low-temperature (liquid hydrogen) electronic tensile testing machine,etc.

2000~2012

Our insitute's vacuum machine gradually improvement after continuous improvement，have a fast develop with technological progress. We have been equipped with many high temperature vacuum (inflatable) test devices of 2000℃ and above with Electronic universal testing machine, electrohydraulic servo tester and electronic creep tester. We have provided high-quality equipment to many Institutions and scientific research institutes. For example,Beijing Iron and Steel Research Institute、First Space Courtyard-703 Institute、Third Space Courtyard-306 Institute、Forth Space Courtyard-41Institute、Chinese Academy of Sciences-Shenyang Metal Institute、Harbin Institute of Technology-Shenzhen Graduate School、Northwestern Polytechnical University 、Chinese Academy of Sciences-Shanghai Silicate Research Institute、Shanghai Baoshan Iron and Steel Group、Nuclear Energy Institute of Nuclear Power Institute,etc.

2013

We made Stretch, compress, and bend3000℃ Power-on Heating High Temperature Vacuum (Inflatable) Electronic Universal Test Device for Harbin Institute of Technology .

2014

National development of major scientific instruments and equipment special projects"Research and development and application of safety performance tester for extreme environmental pressure-bearing equipment(2012YQ220233)";Chengdu Nuclear Power Research Institute UO2 ceramic material 900℃ (Vacuum three-point bending test device).

2015

Beijing Third Space Courtyard-306 Institute, 2500℃ Radiation heating high temperature vacuum (inflatable) tensile mechanical properties test device.

East China University Of Science，1000℃ creep fatigue test device in different oxygen partial pressure environments.

2016

Xi'an Jiao Tong University, 2000℃ Creep Test Device; Harbin Institute of Technology, 2500℃ high temperature vacuum (inflatable) special test device; Aerospace Seiko, 2000℃ High Temperature Vacuum (inflatable) fatigue test device; Hefei General Hospital,Hydrogen environmental test device with high temperature and high pressure with window,Environmental test system which near-service in Beijing Science and Technology University.

2017

East China Institute of Technology 1000℃ vacuum multi-head creep experimental system, Tianjin a 2000℃ high temperature vacuum (inflatable) mechanical performance test device (side plug extension meter directly measured deformation).

2018

500℃ thermal mechanical fatigue test device for Hefei General Institute, 2200℃ gas residual fission test device for CNNC, 2000℃ high temperature vacuum (inflatable) mechanical performance test device (with automatic fixed extensometer) for 159 Plant of Third Aerospace Institute, 2200℃ dual-axis test device for Jilin University.

2019

National major scientific instruments and equipment development special "research and development and application of high temperature and high frequency in situ tester" (2018YFF01012403), national power investment 600℃ high temperature and high pressure vacuum double-axis creep test device, 1600℃ atmospheric high temperature compression creep for Wuhan University of Science and Technology, 750℃ high temperature water vapor lasting test device for Xi'an Thermal Engineering Institute,3000℃ component comprehensive mechanical test device for 41 Space chambers.

2020

First Space Courtyard-703 Institute,3000℃ High and low-temperature energization and thermodynamic test device, 2200℃ Multi-coupled environmental test device, 2500℃ Vacuum (inflatable) electronic fatigue test device, Zhejiang University 1800℃ Vacuum (inflatable) creep test device; China Building Materials Institute 2000℃ Vacuum (inflatable) electronic universal test device; Sixth Space Courtyard-41 Institute 3000℃ High-and low-temperature test installation; Beijing Science and Technology University Subcritical water environment test device (slow tensile and microdynamic wear test device).

1000℃ high temperature

vacuum (air filled) environmental test device

1000℃高温真空（充气）环境试验装置

01 概 况 Overview

The heating device is heated by two sections of resistance radiation,it can realize 300-1000℃ experimental temperature, and have a good isotropical, temperature volatility and temperature gradient. In vacuum ,it can received GB.

Use Level 0.1 AI Intelligent adjustment to control Intelligent temperature control table, have a small overshoot controlling parameter, also can control hcap of silcontrollable conduction angle,average heating speed 3℃/min-50℃/min. Customers have the option to install 1000℃ High-temperature Tensile Creep Test Fixture And Deformation Measuring Device, High temperature tensile creep test clamp of 1000℃ plate specimen and deformation measurement test drive, high temperature tension pressure creep fatigue test for 1000℃ round specimen, three-point bending test of 900 C: high-temperature clamp and deflection measuring device. Round test sample specification:φ5X25mm, φ6X25mm, φ8X25mm, φ10X25mm. Plate test sample specification: 2X6X25mm and 3X6X25mm.

Deformation measurement can be measured in two ways, one is the double-sided measurement average of high temperature resistance difference transformer, range 0-10mm, resolution 1 μm, precision 0.5% (long creep use); the other is side plug extension, scale distance 25mm, range ± 5mm, resolution 1 μm, precision 0.5% (tensile or creep fatigue use).

02 特 点 Features

- Stable work for a long time, and have a long time dynamic calibration function;
- Different host machines can be selected to complete the tensile creep, persistence, relaxation, compression and shear fatigue test and pull-tension fatigue test;
- The deformation measurement uses two high-temperature vacuum differential transformers to measure the mean value;
- Deformation measurement can also be selected by high temperature vacuum water cooling side plug extension meter to measure the sample deformation;
- Vacuum and charging protective gas environment test to prevent oxidation of the test sample;
- Thermocouples have direct temperature control, good temperature uniformity and small fluctuation degree;
- The high temperature vacuum (aerify) environmental device adopts stainless steel double-layer water cooling structure to ensure the stability and safety of the equipment during the test;
- Three-point bending mechanical performance test of small force value bending metal and ceramic materials can be selected, the design concept of high precision and small load, and the test force range is 1N-200N;

1000℃ radiative heating high temperature vacuum (aerify) ambient tensile creep mechanical properties test device

1000℃ radiative heating high temperature vacuum (aerify) ambient tensile mechanical properties test device

1000℃ radiative heating high temperature vacuum (aerify) environment pull compression creep fatigue mechanical performance test device

1000℃ radiation heating high-temperature vacuum (aerify) environment three-point bending mechanical performance test device

2000℃ high temperature

vacuum (air filled) environmental test device

2000℃高温真空（充气）环境试验装置

01 概 况 Overview

The heating device adopts single-segment metal radiation heating, which can achieve 800℃ -2000℃ experimental temperature.

The intelligent temperature control meter adopts the imported 0.1 level AI adjustment, and the temperature collection adopts the importer precision non-contact photoelectric chromatometer and thermocouple. The dual channel can be switched without disturbance, and the average heating speed is 3 ℃/min-50 ℃/min.

Fixture type: 1600℃ metal round specimen tensile test high temperature fixture, 1600℃ metal plate tensile test, 2000℃ composite plate specimen tensile test high temperature fixture; 1600℃ metal round specimen pull-tension fatigue test high temperature fixture, 1600℃ metal plate pull-tension fatigue test high temperature fixture, 2000℃ composite plate pull-tension fatigue test high temperature fixture, 1600℃ metal three-point bending fixture and deflection measurement device, 2000℃ three-point bending fixture and deflection measurement device.

Specimen specifications: round specimen φ5X25mm, plate specimen 4X6X25mm, compress specimen φ10X20mm, bend specimen 4X6X25mm.

Deformation measurement can be measured in two ways, one is by double-sided measurement average of high temperature resistance difference transformer, range 0-10mm, resolution 1 μm, precision 0.5% (long creep use); the other is side plug extension, scale distance 25mm, range ± 5mm, resolution 1 μm, precision 0.5% (tensile or creep fatigue use).

02 特 点 Features

- Stable work for a long time, and have a long time dynamic calibration function;
- Different host machines can complete the tensile creep, persistence, relaxation and pull-pull creep fatigue test, high temperature tensile bending, compression shear test, and pull-pull fatigue test;
- The deformation measurement adopts two high-temperature vacuum differential transformers to measure the average value;
- Vacuum and charging protective gas environment test to prevent oxidation of the test sample;
- Photocolorometer directly controls temperature, high temperature with good uniformity and small fluctuation;
- Heating voltage is less than the safe voltage, heating speed depends, high temperature stable speed is fast;
- The high temperature vacuum (aerify) environmental device adopts stainless steel double-layer water cooling structure to ensure the stability and safety of the equipment during the test.

2000℃ radiative heating high temperature vacuum (aerify) emvironment tensile creep mechanical properties test device

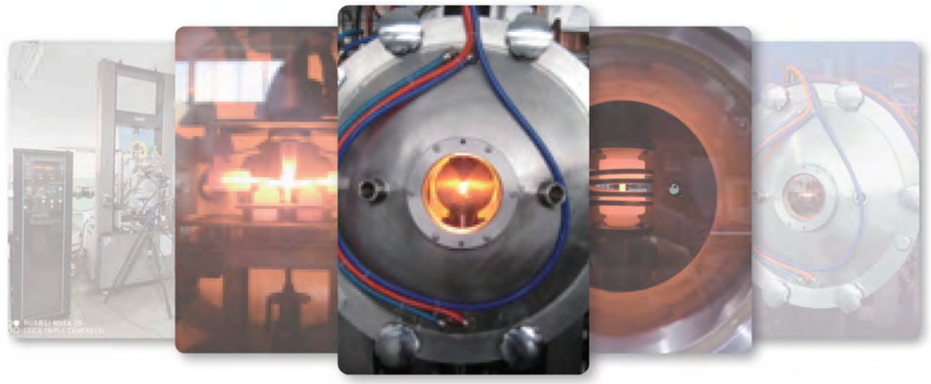
2000℃ radiation heating high temperature vacuum (aerify) emvironment tensile mechanical performance test device

2000℃ radiative heating high temperature vacuum (aerify) environmental creep fatigue mechanical properties test device

Ultra-high temperature

vacuum (air filled) environment test device above 2000℃

2000℃以上超高温真空（充气）环境试验装置



2500℃高温真空（充气）环境试验装置

2500℃ high temperature vacuum (air filled) environmental test device

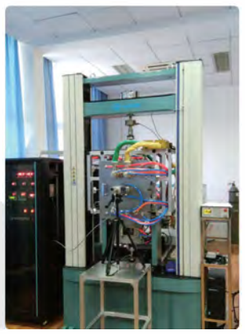
01 概 况 Overview

The heating unit is heated by single section graphite radiation and can achieve 900℃-2300℃ experimental temperature and heating capacity of 2500℃.
Induction heating and Radiation heating using intelligent temperature control meter, can perform 0.1 level AI adjustment,they all use advanced control algorithms.For example,control algorithm fuzzy logic PID regulation and parameter self-tuning function. The device can customize a set of control parameters with fast response speed and small overshoot according to the real-time temperature data collected by the thermocouple or infrared high temperature meter to control the conduction range of the silicon controllable conduction angle. Intelligent thermostat required for power-on heating adopts independent developed multi-channel temperature controller. It includes the advanced control algorithm of fuzzy logic PID regulation and parameter self-tuning function， so it enough to control temperature. For exampl, control the conduction range of the switch DC power suppl. The temperature acquisition unit adopts the imported high-precision non-contact photoelectric colorimeter. The heating speed can be reached 3℃-50℃.
Deformation measurement is measured by double average measurement of high temperature resistant differential transformer.Range 0-10 mm, resolution 0.1μm, precision 0.5%.

02 特 点 Features

- Stable work for a long time, and have a long time dynamic calibration function;
- Different host machines can be selected to complete the tensile creep, persistence, relaxation, and pull-pull creep fatigue test, and to complete the tensile, compression, bending and other tests in the ultra-high temperature environment;
- Deformation measurement is measured by double average measurement of high temperature resistant differential transformer.
- Vacuum and charging protective gas environment test to prevent oxidation of the test sample;
- Photocolorometer directly controls temperature, high temperature with good uniformity and small fluctuation;
- Heating voltage is less than the safe voltage, heating speed depends, high temperature stable speed is fast;
- The high temperature vacuum (aerify) environmental device adopts stainless steel double-layer water cooling structure to ensure the stability and safety of the equipment during the test.

2500℃ Graphite radiation heating of high temperature vacuum (aerify) environment tensile creep mechanical properties test device



3000℃真空（充气）环境试验装置

3000℃ vacuum (air filled) environmental test device

01 概 况 Overview

The heating device adopts three electric heating to achieve 600℃-3000℃ experimental temperature. It has good soaking zone , temperature fluctuation, and temperature gradient.
The Intelligent thermostat controller adopts a multi-channel temperature controller with high-precision and rapid response,advanced control algorithm including fuzzy logic PID regulation and parameter self-tuning function, which can control various temperature indicators, control the conduction range of DC power supply on the switch. Imported high precision noncontact photocolorometer with average heating speed of 10℃ / s-100℃ / s.
The grip have the following types:High temperature grip and deformation measuring device for 2800℃ round specimen, High temperature grip and deformation measuring device for tensile test of 2800℃ plate, High temperature grip and deformation measuring device for 2800℃ round sample compression test, 2800℃rectangular sample compression test high temperature clamp and deformation measuring device, High temperature grip and deformation device for three-point bending test of 2800℃ rectangular specimen.
Deformation measurement stretching and compression are measured by high-temperature extenometer, range ± 3 mm, resolution 0.1 μm, precision 0.5%; the high temperature-resistant differential transformer is used for the deflection measurement of the high-point bending test, range 0-10 mm, resolution 0.1 μm, precision 0.5%, or can use high temperature resistant non-contact measurement deformation.

02 特 点 Features

Can complete the stretching, compression, bending and other tests in an ultra-high temperature environment

The deflection measurement of the three-point bending test is measured by the high-temperature resistant differential transformer;

Photocolorometer directly controls temperature, high temperature with good uniformity and small fluctuation;

The high temperature vacuum (aerify) environmental device adopts stainless steel double-layer water cooling structure to ensure the stability and safety of the equipment during the test.

The deformation measurement adopts two high temperature vacuum extenometer to measure the average value;

Vacuum and charging protective gas environment test to prevent oxidation of the test sample;

Heating voltage is less than the safe voltage, heating speed depends, high temperature stable speed is fast;

Test environments with different oxygen concentrations are achieved

3000 C Energized heating high temperature vacuum (aerify) environment tensile mechanical performance test device

Special environmental

test device

特殊环境试验装置

2200℃多参数耦合力学性能试验装置

2200℃ Multi-parameter coupling mechanical performance test device

01 概 况 Overview

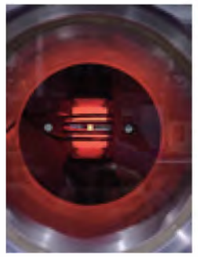
The heating device adopts medium frequency induction heating, which can achieve 800℃ -2200℃ experimental temperature, with good soaking zone, temperature fluctuation and temperature gradient.

The intelligent temperature control table adopts 0.1 level AI adjustment with average heating speed of 3℃/ s-50℃/ s. Deformation measurement adopts high-temperature resistance extensor, ± 5 mm, resolution 1 μm, precision 0.5%, and also can use high-temperature non-contact measurement.

02 特 点 Features

- The cavity body can achieve the multi-gas atmosphere state, adjust the gas mixing proportion, and simulate the oxygen concentration at different elevations;
- Stable work for a long time, and have a long time dynamic calibration function;
- Can complete the tensile creep, lasting, relaxation, pull-pull creep fatigue and strain-pressure creep fatigue test;
- Deformation measurement adopts a high-temperature vacuum water-cooled side transductor to measure the deformation;
- Photometer directly controls temperature, fast heating speed, long hest insulation time and small volatility;
- The high temperature vacuum (aerify) environmental device adopts stainless steel double-layer water cooling structure to ensure the stability and safety of the equipment during the test.

2200℃ Mechanical performance test device for multi-parameter coupling



1500℃感应加热高温真空（充气）环境试验装置

1500℃ induction heating high temperature vacuum (air filled) environmental test device

01 概 况 Overview

The heating device adopts medium frequency induction heating, which can achieve 800℃ -1500℃ experimental temperature, with good soaking zone, temperature fluctuation and temperature gradient.

Intelligent temperature control table adopts the 0.1 level AI adjustment,advanced control algorithm including fuzzy logic PIO regulation and parameter self-tuning function.It can set a set of control parameters with fast response and small overtuning according to the real-time temperature data collected by the thermocouple.

Deformation measurement adopts high-temperature extensometer, ± 5mm, resolution 1 μm, precision 0.5%, and high-temperature non-contact measurement.

02 特 点 Features

- Stable work for a long time, and have a long time dynamic calibration function;
- Can complete the tensile creep, lasting, relaxation, pull-pull creep fatigue and strain-pressure creep fatigue test;
- Deformation measurement adopts high temperature water cooling side plug extensometer to measure deformation;
- Vacuum and charging protective gas environment test to prevent oxidation of the test sample;
- Photometer directly controls temperature, fast heating speed, long hest insulation time and small volatility;
- The high temperature vacuum (aerify) environmental device adopts stainless steel double-layer water cooling structure to ensure the stability and safety of the equipment during the test.

1500℃ induction heated high temperature vacuum (aerify) environment pull and pressure creep fatigue mechanical performance test device

1600℃辐射加热高温大气环境实验装置

1600℃ radiation heating high temperature atmospheric environment experimental device

01 概 况 Overview

The heating device is heated by silicon molybdenum rod with achieve experimental temperature of 800 ℃ - 1600℃

The intelligent temperature control meter is adjusted by the 0.1 level AI regulate, and the average heating speed is 3℃/min-15℃/min.

Deformation measurement stretching and compression by high temperature extenometer, with range ± 5mm, resolution 1 μm, accuracy of 0.5%.

1600℃ radiation heating heated high temperature atmospheric environment pull and pressure creep fatigue mechanical performance test device

02 特 点 Features

- Stable work for a long time, and have a long time dynamic calibration function;
- Can complete the tensile creep, lasting, relaxation, pull-pull creep fatigue and strain-pressure creep fatigue test;
- Deformation measurement adopts high temperature water cooling side plug extensometer to measure deformation;
- Small stove can be selected to achieve cold end grip;
- Thermocouple directly controls the temperature, with slow heating speed, short insulation time and small fluctuation.

1300°C热机械疲劳试验装置

1300°C thermo-mechanical fatigue test device

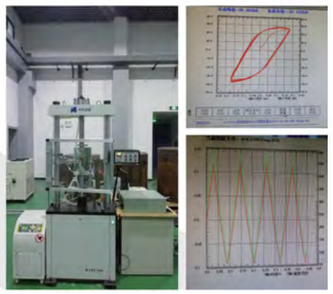
01 概 况 Overview

The heating device adopts medium frequency induction heating, which can achieve 800℃ -1300℃ experimental temperature, with good soaking zone, temperature fluctuation and temperature gradient. Intelligent temperature control table adopts level 0.1 AI regulate, with an average heating speed of 1℃/s - 3℃/s.
Deformation measurement adopts high-temperature extensometer, ± 5 mm, resolution 1 μm, precision 0.5%, and high-temperature resistance non-contact measurement.

02 特 点 Features

- Stable work for a long time, and have a long time dynamic calibration function;
- Temperature cycle cycles are possible, as well as temperature periodic mutations.
- Can complete the temperature creep, lasting test and conventional pull-pull creep fatigue and strain pressure creep fatigue test;
- Deformation measurement adopts high temperature water cooling side plug extensometer to measure deformation;
- Photometer directly controls temperature, fast heating speed, long insulation time and small fluctuation;

1300℃ poikilothermia temperature creep fatigue test device



600°C双轴蠕变试验系统

600°C Biaxial Creep Test System

01 概 况 Overview

Side plug extension is used for deformation measurement, with range of 25mm or 50mm, ± 5mm, resolution 1 μm, precision of 0.5%.

The intelligent temperature control meter adopts level 0.1 AI regulate, with an average heating speed of 3℃/min - 50℃/min.

The 900℃ tube sample high temperature fixture for axial and radial loading.

Side plug extension is used for deformation measurement, with range of 25mm or 50mm, ± 5mm, resolution 1 μm, precision of 0.5%.

600℃ biaxial creep test device

02 特 点 Features

- Both axial loading and pressure loading in the sample tube can be carried out simultaneously;
- Axial deformation measurement using high-temperature water cooling side extension extensometer to measure deformation, radial deformation is measured by optical video extension meter;
- Vacuum and charging protective gas environment test to prevent oxidation of the test sample.
- Thermocouples have direct temperature control, good temperature uniformity and small fluctuation degree;
- The high temperature vacuum (aerify) environmental device adopts stainless steel double-layer water cooling structure to ensure the stability and safety of the equipment during the test.

750°C加热高温过热水蒸气环境实验装置

750°C heating high temperature superheated steam environment experiment device

01 概 况 Overview

The heating device adopts medium-frequency induction heating or atmospheric furnace radiation heating, which can achieve 300℃ -750℃ experimental temperature, with good uniform tropical, temperature fluctuation and temperature gradient in the constant pressure environment of water vapor.

The intelligent temperature control meter is adjusted 0.1 AI regulate, serial controlled radiation heating, stable temperature control, and the average heating speed of induction heating is 3℃ / s-15℃ / s, the average heating speed of radiation heating is 3℃ / min-15℃ / min.

Deformation measurement measures sample deformation by software correction and grating indirect measurement with 0-10mm, resolution 1 μm, accuracy of 0.5%.

700℃ superheated environment mechanical high-temperature water steam tensile creep properties test device

02 特 点 Features

- Can achieve tensile, lasting, creep, pull-pull fatigue test;
- High temperature and overheated water steam environment test can be carried out;
- Inductive photoelectric colorometer directly control temperature, fast temperature up speed and small temperature fluctuation;

600°C高温高压氢气环境实验装置

600°C high temperature and high pressure hydrogen environment experiment device

01 概 况 Overview

The heating device is two resistance radiation heating, can achieve 300 C-600 C experimental temperature, with good soaking zone, temperature fluctuation and temperature gradient, in vacuum conditions, can meet the requirements of the national standard.

The intelligent temperature control table adopts 0.1 level AI adjustment with average heating speed of 3℃ / min-50℃ / min.
High temperature fixture and deformation measuring device of 600℃ round specimen, and the specification of round sample is φ5X25mm.
Deformation measurement measures sample deformation by software correction and grating indirect measurement with 0-10mm, resolution 1 μm, accuracy of 0.5%.

600℃ radiation heating high temperature high pressure hydrogen environment tensile creep mechanical properties test device

02 特 点 Features

- Stable work for a long time, and have a long time dynamic calibration function;
- Ability to complete the tensile endurance, pull-pull creep fatigue test;
- Can be tested in the high temperature and high pressure hydrogen environment;
- Thermocouples directly control temperature, fast temperature up speed and small temperature fluctuation;
- The high temperature vacuum (aerify) environmental device adopts stainless steel double-layer water cooling structure to ensure the stability and safety of the equipment during the test.

TYPICAL USERS
(PARTIAL)／典型用户（部分）

中机试验自成立以来已为广大用户提供数十台各种高温真空（充气）环境试验装置，广泛服务于国防军工、航空航天等国家重点领域。

序列	用户单位	型 号
1	上海宝钢	2000°C真空（充气）电子万能试验装置
2	西北工业大学	2000°C真空（充气）电液伺服疲劳试验装置
3	西北工业大学	2000°C真空（充气）电子蠕变松弛试验装置
4	航天一院703所	3000°C通电加热超高温力学性能试验装置
5	上海硅酸盐研究院	2000°C真空（充气）电子万能试验装置
6	上海硅酸盐研究院	2000°C真空（充气）电液伺服疲劳试验装置
7	深圳哈尔滨工业大学	2000°C真空（充气）电子万能试验装置
8	哈尔滨工业大学	3000°C通电加热超高温力学性能试验系统
9	航天一院703所	2000°C辐射式高温真空（充气）电子万能试验装置
10	中科院沈阳金属研究所	2000°C真空（充气）电子蠕变试验装置
11	中国照明技术中心	1800°C高温真空充气钨丝拉伸电子万能试验装置
12	中国原子能科学研究院	800°C高温真空电子万能试验装置（放射性材料）
13	北京钢铁研究院	2000°C高温真空（充气）电子万能试验装置
14	安泰科技股份有限公司	2000°C真空（充气）电子万能试验装置
15	中国核动力研究院一所	800°C高温真空遥控电子万能试验装置（放射性材料）
16	阿尔及利亚	800°C高温真空遥控电子万能试验装置（放射性材料）
17	四川特种材料研究院	500°C高温真空电子万能试验装置（隔离操作）
18	装置械部科研项目	2500°C高温真空（充气）研究
19	中国核动力研究设计院	2500°C高温真空退火炉
20	广州石潮高性能陶瓷公司	2000°C100吨真空热压烧结炉
21	国家科技部项目	1500°C高温真空（充气）感应加热力动蠕变试验装置
22	国家科技部项目	700°C过热水蒸气动蠕变试验装置
23	国家科技部项目	600°C氢气环境蠕变疲劳实验装置
24	国家科技部项目	1200°C超高温大气环境蠕变疲劳实验装置
25	成都核动力设计院	UO2材料900°C高温真空三点弯曲试验装置
26	上海交大	800°C 高温真空拉伸蠕变（持久）试验系统
27	航天三院306所	2500°C超高温真空（充气）电子万能试验装置
28	解放军5713工厂	1500°C高温大气电子万能试验装置
29	解放军5713工厂	1500°C高温大气持久、蠕变试验装置
30	航天一院703所	2000°C超高温真空（充气)试验装置
31	解放军5713工厂	2500°C超高温真空（充气）电子万能试验装置
32	西安交通大学	2000°C真空（充气）蠕变试验装置

序列	用户单位	型 号
33	华东理工大学	1000°C真空（充气）蠕变疲劳试验装置
34	包头中核重工	1000°C真空（充气）电子万能试验装置
35	哈尔滨汽轮装置	1500°C高温大气蠕变疲劳试验装置
36	北京科技大学	600°C氢气环境蠕变疲劳实验装置
37	北京科技大学	1300°C热疲劳动蠕变试验装置
38	北京科技大学	500°C过热水蒸气H2S蠕变试验装置
39	北京科技大学	700°C过热水蒸气蠕变试验装置
40	北京科技大学	700°C过热水蒸气烟气动蠕变试验装置
41	航天精工股份有限公司	2000°C超高温真空（充气）电子万能试验装置
42	航天精工股份有限公司	2000°C超高温真空（充气）高频试验装置
43	航天三院306所	2500°C超高温真空（充气）电子万能试验装置
44	哈尔滨工业大学	2500°C超高温真空（充气）特殊工况试验装置
45	合肥通用院	600°C带视窗氢气环境蠕变疲劳实验装置
45	中南大学	2500°C超高温真空（充气）电子万能试验装置
46	天津一重	1600°C超高温真空（充气）电子万能试验装置
47	华东理工大学	1000°C真空装置多头加载械蠕变
48	合肥通用院	500°C热装置械疲劳试验装置
49	原子能院	2200°C裂变气体测试装置
50	中南大学	2000°C真空（充气）电液伺服疲劳试验装置
51	中南大学	2000°C真空（充气）蠕变试验装置
52	哈尔滨工业大学	2200°C多耦合环境测试装置
53	航天三院159厂	2000°C超高温真空（充气）电子万能试验装置
54	浙江工业大学	750°C过热水蒸气蠕变试验装置
55	武汉科技大学	1600°C超高温压缩蠕变试验装置
56	上海大学	3000°C通电加热超高温力学性能试验装置
57	航天四院	3000°C通电加热超高温力学性能试验装置
58	包头中核重工	2500°C真空（充气）电子万能试验装置
59	天津特检院	750°C过热水蒸气烟气蠕变试验装置
60	西安热工院	750°C过热水蒸气烟气蠕变试验装置
61	吉林大学	2200°C真空（充气）双轴试验装置
62	国家发改委项目	高温高频原位疲劳测试仪
63	航天六院	3000°C通电加热超高温力学性能试验装置
64	航天一院703所	3000°C通电加热超高温力学性能试验装置
65	航天三院306所	1500°C多耦合环境测试装置
66	航天三院306所	2500°C超高温真空（充气）环境装置
67	航天三院306所	1600°C超高温硅钼棒大气环境装置
68	航天三院306所	1400°C超高温硅碳棒大气环境装置
69	航天一院703所	2200°C多耦合环境测试装置
70	航天一院703所	2500°C真空（充气）电子疲劳试验装置
71	中机检测	2000°C超高温真空（充气）电子万能试验装置
72	浙江大学	2000°C真空（充气）蠕变试验装置
73	中国建材院	2000°C超高温真空（充气）电子万能试验装置

Corporate
Culture

主要客户

- 中国航天科技集团公司
- 中国航天科工集团公司
- 中国航空工业集团有限公司
- 中国航发商用航空发动机有限责任公司
- 中国核工业集团有限公司
- 中国核动力研究设计院
- 中核北方核燃料元件有限公司
- 中国原子能科学研究院
- 中国科学院金属研究所
- 中科院上海硅酸盐研究所
- 合肥通用机械研究院
- 中国钢研科技集团有限公司
- 宝钢股份
- 哈尔滨工业大学
- 西北工业大学
- 中南大学
- 上海大学
- 西安交通大学
- 上海交通大学
- 北京科技大学
- 华东理工大学
- 中国一重
- 北京航空航天大学
- 浙江工业大学
- 浙江大学
- 中国建材院
- 国家电投中央研究院
- 吉林大学