

HST-600A 600℃ High Temperature Furnace

1. Application:

Used in GB/T4338 "High Temperature Tensile Test Method for Metal Materials", HB5195 "Metal High Temperature Tensile Test Method", GB/T2039 "Metal Tensile Creep and Durability Test Method", HB5150 "Metal High Temperature Tensile Durability Test Method" Strength inspection test in high temperature environment.

2. System composition

The electric furnace system consists of: high temperature furnace body, temperature measurement and control system, heating element, temperature measurement element, adjustable arm system, high temperature tensile fixture and connecting accessories, high deformation measurement device, water cooling circulation system, etc.

3. Structural principle and characteristics

3.1 High temperature furnace body (Domestic mechanical extension device)



3.2 High temperature furnace body (imported plug-in high temperature extensometer)



The furnace body adopts a split structure, the outer wall is made of high-quality stainless steel, and the interior is made of high-temperature resistant alumina furnace tube. The furnace tube and the furnace wall are filled with thermal insulation ceramic fiber cotton, which has good thermal insulation effect and small temperature rise on the surface of the furnace body.

There are grooves on the inner wall of the furnace tube, and the iron-chromium-aluminum resistance wire is embedded in the furnace tube according to the length of the soaking zone and the requirements of temperature gradient and fluctuation. The upper and lower holes of the furnace body are small openings, which can reduce heat loss.

The rear of the furnace body is equipped with a hinge, which is convenient for connection with the rotating support arm or column.

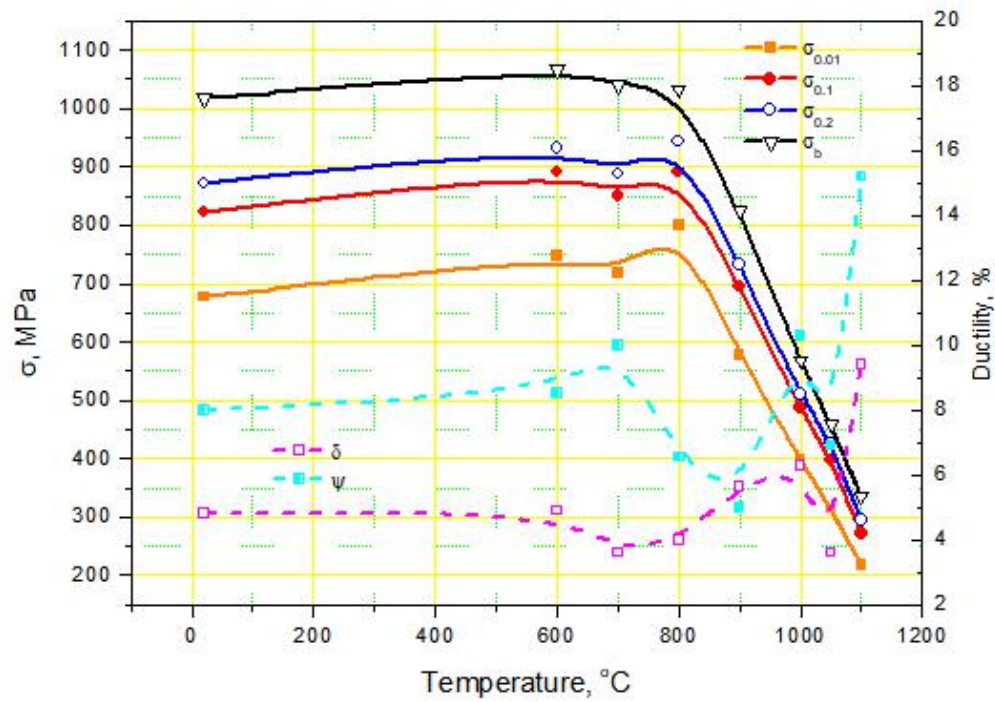
3.3 The heating element is a helical iron-chromium-aluminum resistance wire. The heating body is divided into three stages of control.

3.4 The temperature measuring element adopts NiCr-NiSi (K type) thermocouple, with three-segment measurement.

3.5 High temperature fixture and connection accessories

- According to the operating temperature requirements, the high temperature fixture and the high temperature pull rod are made of high temperature resistant alloy material of K465.
- The bar samples are connected by thread, and the samples of different specifications are equipped with one-to-one corresponding high-temperature fixtures.
- The plate sample is connected by pyramid selling, and the clamping thickness is downward compatible from the maximum specification: when clamping a sample with a small thickness, positioning pins of different specifications are added on both sides of the sample to ensure that the sample is on the tensile axis.
- High temperature tie rod and high temperature fixture: $\Phi 30\text{mm}$ (approx.)

The mechanical properties of K465 high temperature alloy material are as follows:



Note: pictures of various specifications of high temperature fixtures and high temperature tie rods

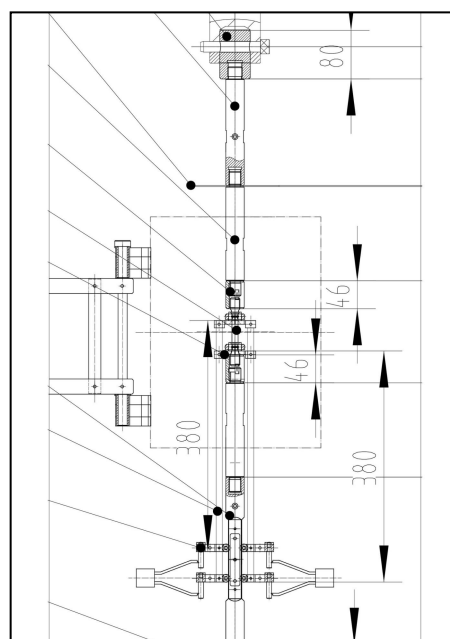


Note: overall connection picture

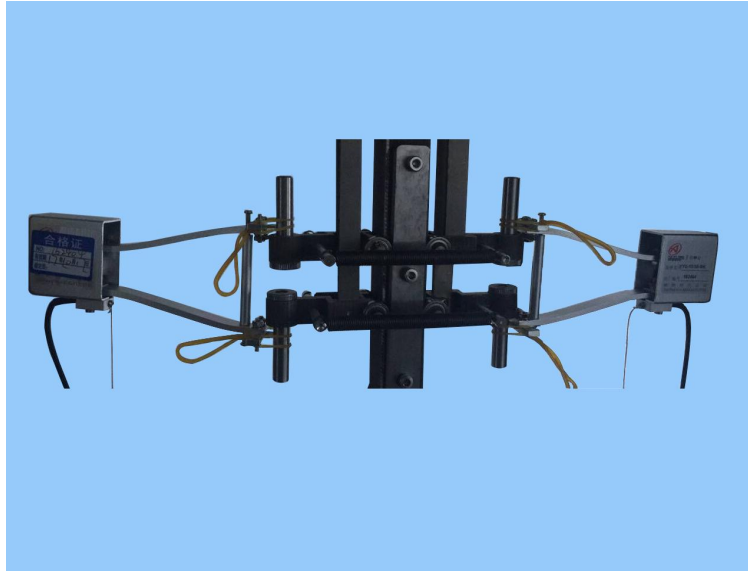
3.6 Deformation measuring device

3.6.1 Adopt bilateral measurement method.

The high-temperature deformation measurement device is designed according to the specifications and gauge length of the sample. The deformation measurement device of the rod-shaped sample needs to correspond to the test specifications one by one. The deformation measurement device of the plate sample is shared in the range of $\delta 1 \sim 4\text{mm}$, and the same in the range of $\delta 4 \sim 8\text{mm}$. set.



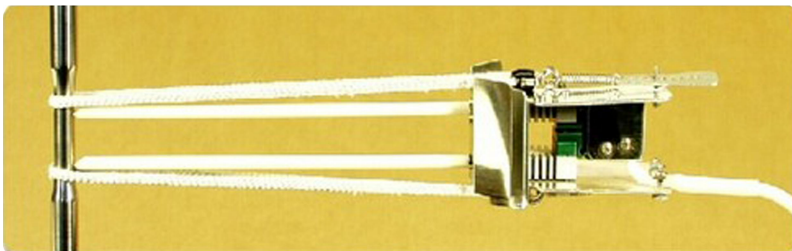
The deformation sensor adopts a strain-type average value extensometer, which directly outputs the average value of the deformation amount to the deformation measurement module. Its size is smaller than other types of sensors, and it is suitable for use in situations where the tensile test space is small



3.6.2 The high temperature deformation measurement extensometer adopts Epsilon3448 high temperature extensometer imported from the United States (optional)

High temperature extensometer gauge length: 25/50mm

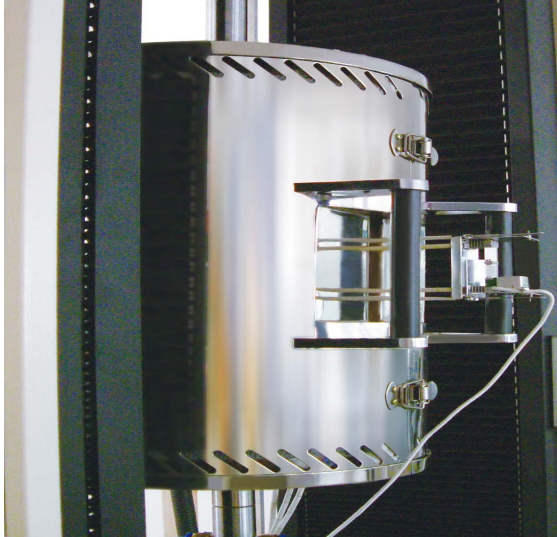
High temperature extension measuring range: 5/10mm



Used in high temperature furnace heating system, it adopts Epsilon's unique self-clamping design, can provide a variety of optional test requirements. Suitable for measuring deformation of metals, ceramics and composites at high temperatures generated by high temperature furnace heating systems.

Fasten the extensometer to the specimen with a very light flexible ceramic fiber thread so that the extensometer clamps itself to the specimen. No high temperature furnace mounting brackets are required.

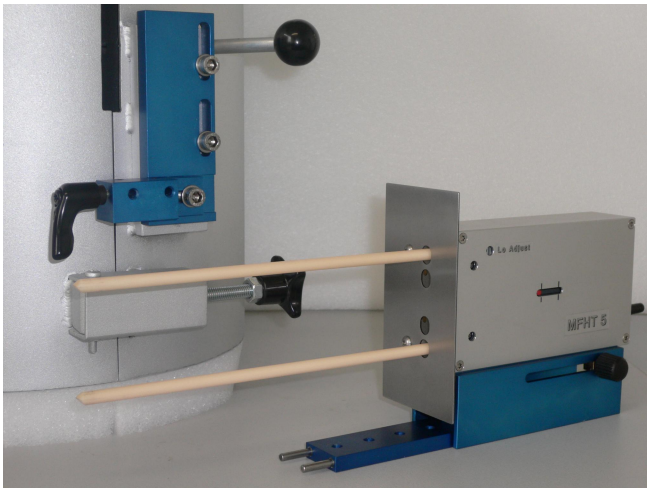
The radiant heat shield and convection cooling fins allow the extensometer to be used in environments with sample temperatures up to 600°C without cooling.



3.6.3 High temperature deformation measurement extensometer adopts German MF high temperature extensometer (optional)

High temperature extensometer gauge length: 25/50mm

High temperature extension measuring range: 5/10mm



3.7 Temperature measurement and control system:

The temperature control system is composed of temperature Measuring element (thermocouple), Xiamen Yudian 808 temperature intelligent instrument (PID adjustment, with AT function, the instrument can be equipped with 485 communication module to communicate with the computer) and so on.



4. Main feature:

- The instrument adopts advanced AI artificial intelligence adjustment algorithm, no overshoot, and has the function of self-tuning (AT).
- The instrument input adopts a digital correction system, with built-in non-linear correction tables for common thermocouples and thermal resistances, and the measurement accuracy is as high as 0.1.
- The output module adopts a single-channel phase-shift trigger output module, which has high control precision and good stability.

The temperature control part adopts the advanced EURO THERM 2604 series, which has powerful functions and the accuracy can reach 0.1 level;

The temperature control is adjusted by a continuously adjustable bidirectional thyristor unit, so that there is no overshoot and no over voltage in the whole temperature control process, thus ensuring the accurate temperature control effect;

According to the voltage and current of the company's load, RC resistance-capacitance absorption and varistor are made to protect the thyristor, which reduces the after-sales problem of thyristor damage and prolongs the service life of the temperature control system;



5. Main configuration:

No.	Name	Specification	Qty	Manufacture	Remark
1	High temperature furnace body	300~600℃, three-stage	1 set	HST	Standard
2	Thermocouple	Type K	3 pcs	HST	Standard
3	Intelligent instrument temperature control system	Xiamen Yudian	1 suit	HST	Standard
4	Upper and lower connectors		1 suit	HST	Standard
5	High temperature pull rod		1 suit	HST	Standard
6	High temperature fixture (round)	M6 bar	1 suit	HST	According to order
		M8 bar	1 suit	HST	
		M10 bar	1 suit	HST	
		M12bar	1 suit	HST	
		M16bar	1 suit	HST	
		1 ~ 4 mm plate	1 suit	HST	
		4 ~ 8 mm plate	1 suit	HST	
7	High temperature extensometer	US Epsilon3448	1 suit	USA	Optional
		German MF	1 suit	German	
		Bilateral Extensometer	1 suit	HST	Standard
8	Bilateral extension device (round)	M6 bar	1 suit	HST	According to order
		M8 bar	1 suit	HST	
		M10 bar	1 suit	HST	
		M12 bar	1 suit	HST	
		M16 bar	1 suit	HST	
		1~4mm plate	1 suit	HST	
		4~8mm plate	1 suit	HST	
9	Connecting the arm system		1 suit	HST	Standard

6. Technical Parameter

Model	HST-600A
Operating temperature	300~600℃
Long-term operating temperature	600℃
Heating element material	FeCrAl resistance wire
Heating body diameter	Φ1.2mm/ Φ1.5mm
Temperature measuring element	K thermocouple (including special compensation wire)
Number of heating body segments	3
Number of temperature measuring points	3
Temperature sensitivity	0.1℃
Temperature measurement accuracy	0.2%
Heating zone length	100mm/150mm

Temperature accuracy	Test temperature (℃)	Temperature deviation	Temperature gradient
	300-600	±3	3
Furnace inner size	Diameter* length:φ 90*300mm / φ 90*380mm		
Dimensions	Diameter* length: φ 320*380mm / φ 320*460mm		
Tensile fixture:	According to order		
Temperature measurement and control system	3 piece of smart meter (Xiamen Yudian) /1 piece of smart meter (EUROTHERM)		
Operating Voltage	380V±10%		
Mains power	Limit power 5KW when heating up		
Extension measure device	Bilateral extensometer / Epsilon3448 / MF high temperature extensometer		
Rmark: Red font is standard accessories			

19 YEARS

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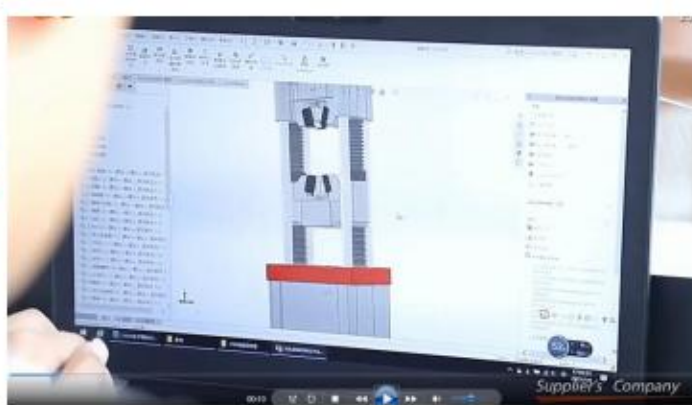
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HST GROUP Co., LTD.

NO. 4915, West Jingshi Road, Jinan 250012, PR CHINA.

Tel:+86-58056101, +86-159 1008 1986

www.hssdgroup.com - e-mail: admin@hssdtest.com

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