VERTEX

ELECTRONIC HIGH TEMPERATURE PERMANENT CREEP TESTER

FUNCTION AND PURPOSE:

Creep test machine is applicable to do creep and durable strength test in the condition of high temperature for all kinds of metal and alloys materials, to test creep limit, durable strength limit etc. of material.

APPLICATION:

This creep test machine is applicable to the field of quality measurement, aerospace, iron and steel metallurgy, machinery manufacturing, electronic appliances, automobile production, civilian nuclear energy, civil aviation, universities, research institutes, commodity inspection, arbitration and other industries.

TEST STANDARD:

JB/T9373-1999 tensile creep test machine technology specifications JJG276 high temperature creep and durable test machine

HB5151-1996 metal high temperature tensile creep test method HB5150-1996 metal high temperature tensile durable test method

ASTM E139 Standard test methods for conducting creep, creep-rupture and stress rupture test ISO 204 Metallic materials uniaxial creep testing in tension.

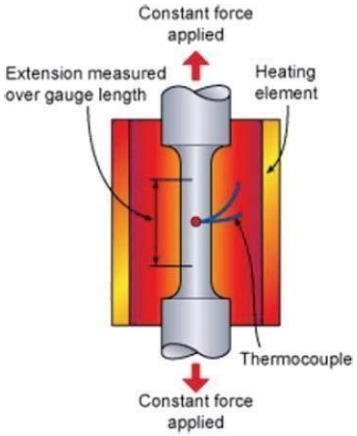
ISO/R 206 Creep stress rupture testing of steel at elevated temperature.

FEATURES:

- Advanced servo motor and ball screw actuator which assures loading conveniently and simply. It can transfer constant rate loading to constant-load or constant stain loading automatically.
- Motorized draw-head assembly automatically compensates for specimen elongation and keeps loading bar with excellent load accuracy of ±0.5% guaranteed.
- Both room temperature and elevated temperature systems are available.
- Furnace and chambers available with temperature ranges from 200 ℃ to 1000℃ in common air Environments, and 600 ℃ to 2200 ℃ available in vacuum environment.
- Numerous high temperature pull rods, specimen holders, furnace systems and extensometers available for creep and stress Relaxation applications. Many of which are also adaptable to hot tensile testing applications on universal testing machines

Why creep?

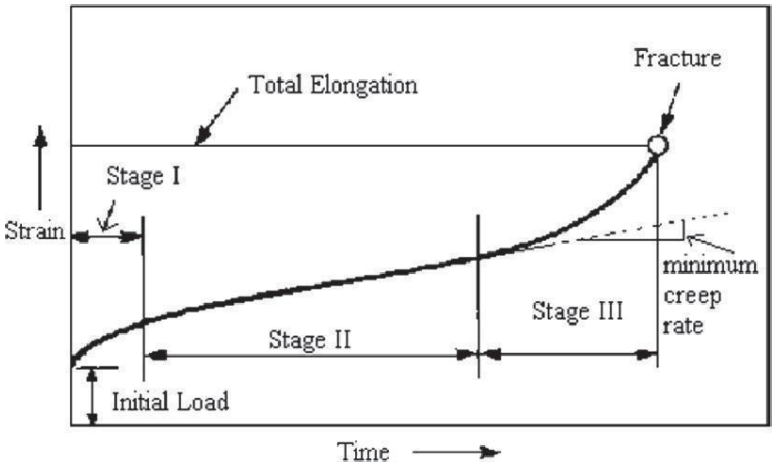
The creep and rupture strength testing machine is an important equipment to determine the characteristic of metallic materials under high temperature. The significance of this instrument is more prominent especially in selecting materials for high temperature structures, increasing the reliability in estimating the life of working components, monitoring the safety of working components as well as the research and development of new materials.



HIGH TEMPERATURE FAILURE ANALYSIS

Creep occurs under load at high temperature. Boilers, gas turbine engines, and ovens are some of the systems that have components that experience creep. An understanding of high temperature materials behavior is beneficial in evaluating failures in these types of systems.

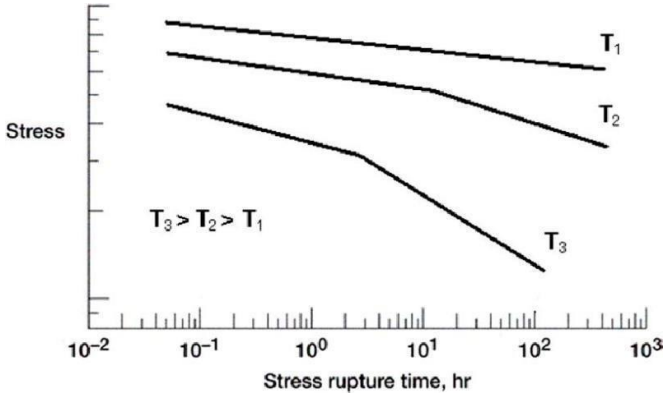
Failures involving creep are usually easy to identify due to the deformation that occurs. Failures may appear ductile or brittle. Cracking may be either trans-granular or inter-granular. While creep testing is done at constant temperature and constant load actual components may experience damage at various temperatures and loading conditions.

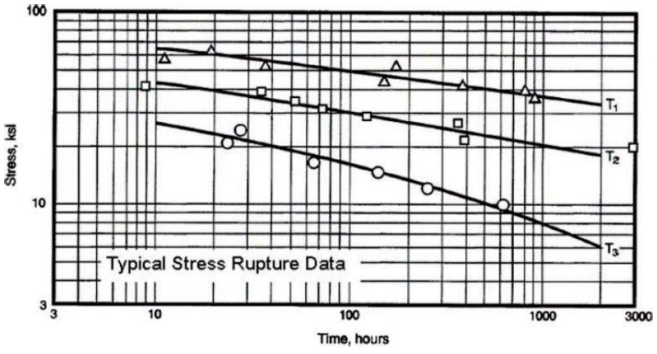


Creep of Metals

High temperature progressive deformation of a material at constant stress is called creep. High temperature is a relative term that is dependent on the materials being evaluated. A typical creep curve is shown below: In a creep test a constant load is applied to a tensile specimen maintained at a constant temperature. Strain is then measured over a period of time. The slope of the curve, identified in the above figure, is the strain rate of the test during stage II or the creep rate of the material. Primary creep, Stage I, is a period of decreasing creep rate. Primary creep is a period of primarily transient creep. During this period deformation takes place and the resistance to creep increases until stage II. Secondary creep, Stage II, is a period of roughly constant creep rate. Stage II is referred to as steady state creep. Tertiary creep, Stage III, occurs when there is a reduction in cross sectional area due to necking or effective reduction in area due to internal void formation.

Stress rupture tests are used to determine the time to cause failure. Data is plotted log-log as in the chart above. A straight line is usually obtained at each temperature. This information can then be used to extrapolate time to failure for longer times. Changes in slope of the stress rupture line are due to structural changes in the material. It is significant to be aware of these changes in material behavior, because they could result in large errors when extrapolating the data.





PARAMETERS:

Load Frame					
Model	CRT-10/20	CRT-50	CRT-100	CRT-200	CRT-300
Max. Load force(kN)	10/20	50	100	200	300
Accuracy	≤0.5％；0.5 class				
Deformation accuracy	<±0.5% of reading				
Loading Speed	0.05～50mm/min				
Voltage	220V/380V±10%； 50Hz				
Furnace					
Operating temperature	300℃～1100℃				
Effective Length constant	150mm				
Furnace inner dimensions	Φ90*380mm				
Furnace out dimensions	Φ320*460(Can be adjusted according to user needs)				
Temperature control meter	Yudina Temperature control meter				
	Electric conduction Temperature control meter				
Thermocouple	K type Even thermocouple				
	S type Even thermocouple (optional)				
High-temperature furnace temperature accuracy (℃)	Test temperature		Temperature	Temperature Gradient	
	300～600		±5	3	
	＞600～900		±4	4	
	＞900～1100		±3	5	

ACCESSORIES :

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<tr>
<td>High-temperature Pulling Rod
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<td>Round specimen with screw headΦ5 specimen（M12）
Others optional M16</td>
<td>Flat specimen with clevis couplings thickness 1mm ～3mm (optional)</td>
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<td>Pipe segment specimen with clevis couplings</td>
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EXTENSOMETER:

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<td>Axial enter structure with LVDT outside LVDT Measuring range: 1020mm LVDT accuracy: 3μm</td>
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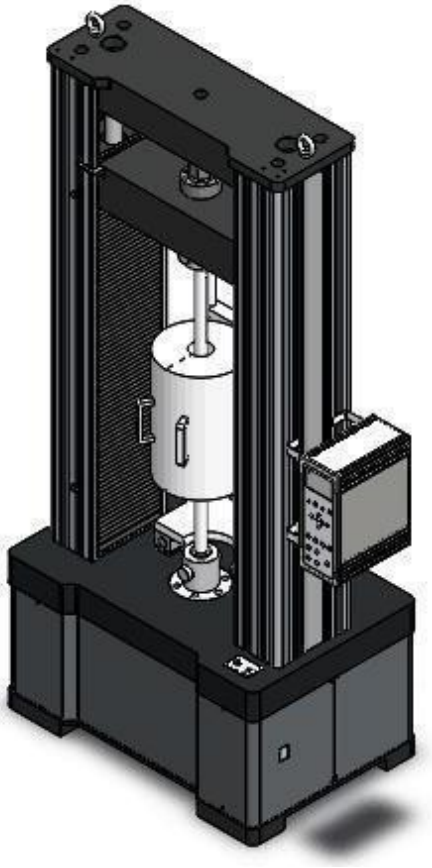

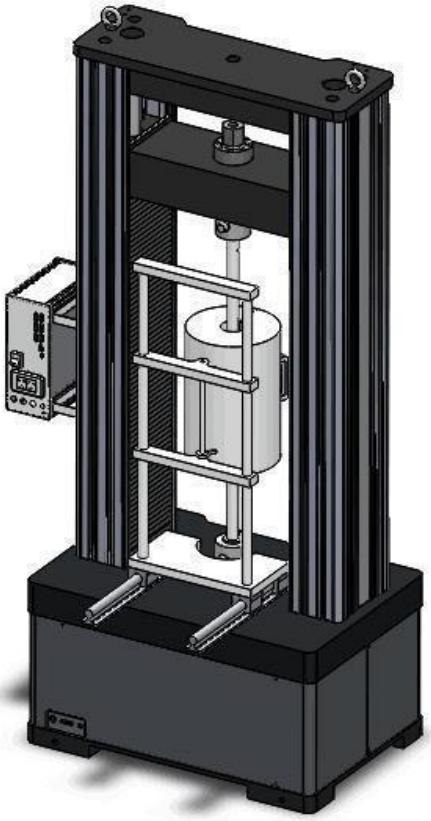

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