Thermal Analyzer Catalogue

Shuoboda Instruments (Hunan) Co., ltd

CONTENTS

Differential Scanning Calorimeter

1.DSC-100A Differential Scanning Calorimeter (DSC)

Product introduction

DSC-100A is a differential indicator with the highest precision. The sensor adopts imported material E couple with high sensitivity. The signal acquisition circuit is shielded and protected, with strong anti-interference and high baseline stability.

The differential scanning calorimeter is a touch screen type, which can perform glass transition temperature test, phase transition test, melting and enthalpy test, product stability, curing, and oxidation induction period test.

Features

- Industrial-grade 7-inch touch screen, rich in display information.
- Brand-new metal furnace body structure, with better baseline and higher accuracy. The heating adopts indirect conduction method, which has high uniformity and stability, reduces pulse radiation, and is better than traditional heating mode.
- The USB communication interface has strong versatility, reliable and uninterrupted communication, and supports self-recovery connection function.
- Automatically switch the two-channel atmosphere flow, with fast switching speed and short.
- The host computer is a three-in-one operating software, which is also suitable for the use of thermogravimetric and synchronous instruments.

- The instrument has multiple sets of thermocouples, a set of test sample temperature, and a set of test instrument internal ambient temperature.

Technical Parameters

Model	DSC-100A
Temperature range	Room temperature~600°C air cooling
Temperature resolution	0.01°C
Temperature fluctuation	±0.1°C
Temperature repeatability	±0.1°C
Heating rate	0.1 ~ 100°C/min
Data scan	Heating scan
Temperature control method	Heating, constant temperature, cooling (auto program control)
DSC range	0 ~ ±600mW
DSC Accuracy	0.001mW
Power supply	AC220V/50Hz or customized
Atmosphere control gas	Nitrogen, oxygen (automatic switching of the instrument)
Gas flow	0-300mL/min
Gas pressure	⩽5MPa
Display mode	24bit color, 7-inch LCD touch screen display
Data interface	Standard USB interface
Parameter standard	Equipped with standard materials (indium, tin), users can calibrate the temperature by themselves

2.DSC-100L Differential Scanning Calorimeter (DSC)

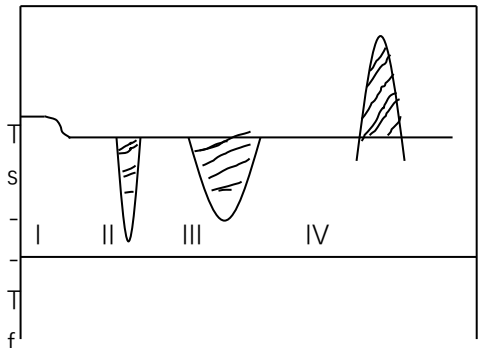
Product introduction

Differential scanning calorimetry (DSC) technology has been widely used. Differential scanning calorimetry is both a routine quality testing tool, but also a research tool. It measures temperature, heat flow relationship related to materials internal thermal transition. Our company's device is heat flux differential scanning calorimeter, with good repeatability, high accuracy characteristics, especially suitable for accurate measurement of the specific heat. The device is easy to calibrate, using a low melting point, fast and reliable, and with a wide range of applications, especially in materials research and development, performance testing and quality control. Characteristics of the material, such as the glass transition temperature, cold crystallization, phase transition, melting, crystallization, product stability, the curing/crosslinking, oxidation induction, etc. are research areas of differential scanning calorimeter.

Differential scanning calorimetry applications are: the curing reaction temperature and thermal effects of polymer materials, material phase change temperature and its thermal effects measurement, polymer materials crystallization, melting temperature and its thermal effects measurement, the glass transition temperature of the polymer material and so on. Subjects of experiment are: solid, liquid, viscous samples, except the gas.

Place the specimen and the reference material into the crucibles respectively, heating in the oven to change the temperature of the specimen and the reference material. If hot melt of the specimen as same as the reference material and the specimen has not the thermal effect, the temperature difference between the two is close to "0", then we can get a smooth curve.
As the temperature increases, the specimen produces a thermal effect, but the reference material doesn't produce the thermal effect, it makes the temperature difference between the two, it expresses as the peak in the DTA curve, the bigger temperature difference, the greater the peak, and the more the change number of temperature difference, the more the number of peaks. It is called peak exothermic which peak upward, and it is called peak endothermic which peak downward.

The picture is a typical DSC curve; it shows four types of changes.



Typical DSC Curve Temperature coefficient→

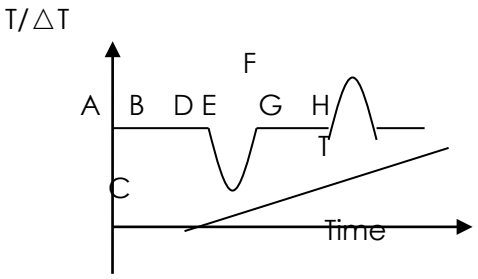
I is second order transition; it is the change of level base line.
II is the endothermic peak, it caused by the melting changes of the specimen.
III is the endothermic peak, it caused by the decomposition reaction of specimen.
IV is the exothermic peak, it caused by the crystalline phase transition of the specimen.

Experimental principle

Materials are often accompanied by thermal effects in the process of physical changes and chemical changes, exothermic and endothermic phenomena reflect the heat enthalpy of the material has changed. DTA can measure the functional relationship of temperature difference between the specimen and the reference material to temperature or time in the same heating conditions.

Differential scanning calorimetry is a technique, which in the case of process control temperature, measures the relationship of power difference and temperature between the output material and reference material. Our company's device is heating flux differential scanning calorimeter, the ordinate is heating flow difference of the sample and the reference material, in units of mw. Abscissa is the time (t) or temperature (T), from left to right for the growth (does not meet this requirement should be specified).

After putting the specimen and the reference material into crucible, according to the heating rate, if the hot melt of the reference material similar as the specimen, we can get the ideal scanning calorimetric analysis diagram.



In this picture, T reflects the temperature curve of thermocouple which sticks in the reference material; Line AH reflects the temperature difference curve between the specimen and the reference material. If the specimen without thermal effects, △T between the specimen and the

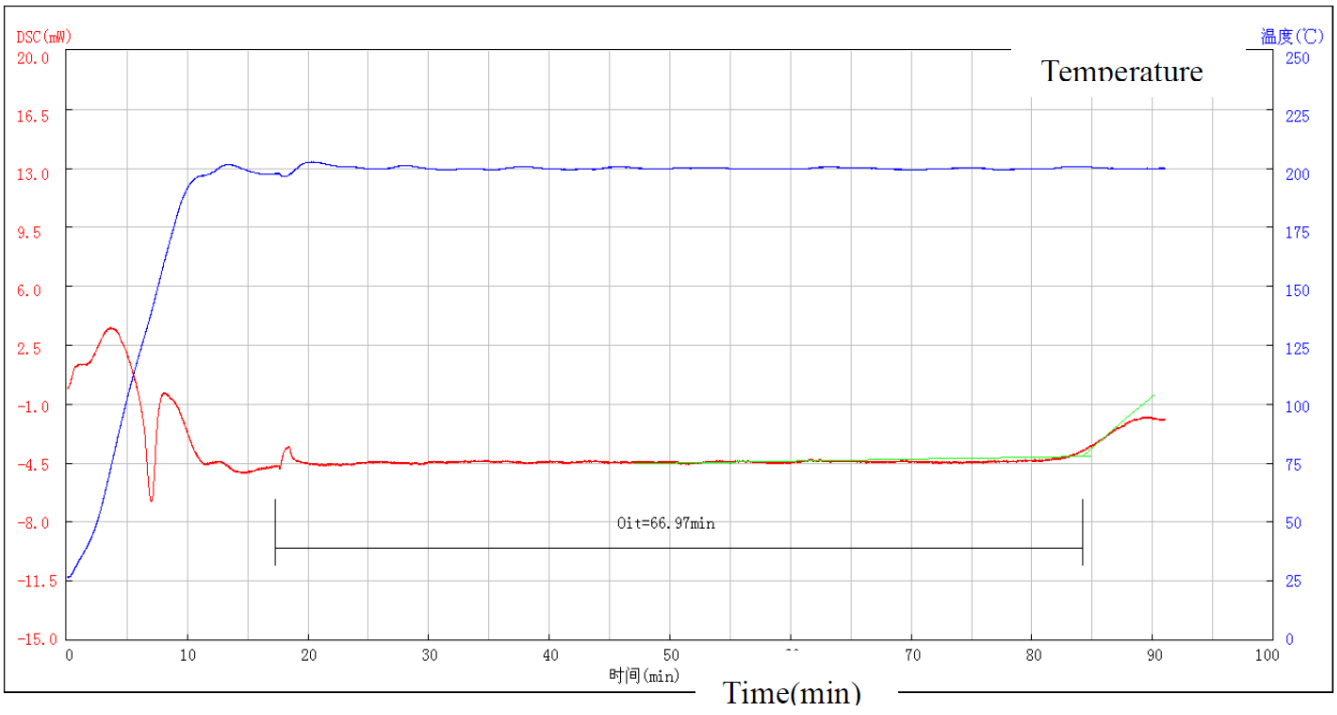
reference material is 0, line AB, DE, GH is smooth baseline in the curve. When the thermal effect occurs, if the temperature of specimen lowers than the temperature of reference material, we can get the endothermic peak like line BCD; otherwise, we can get the exothermic peak like line EFG.

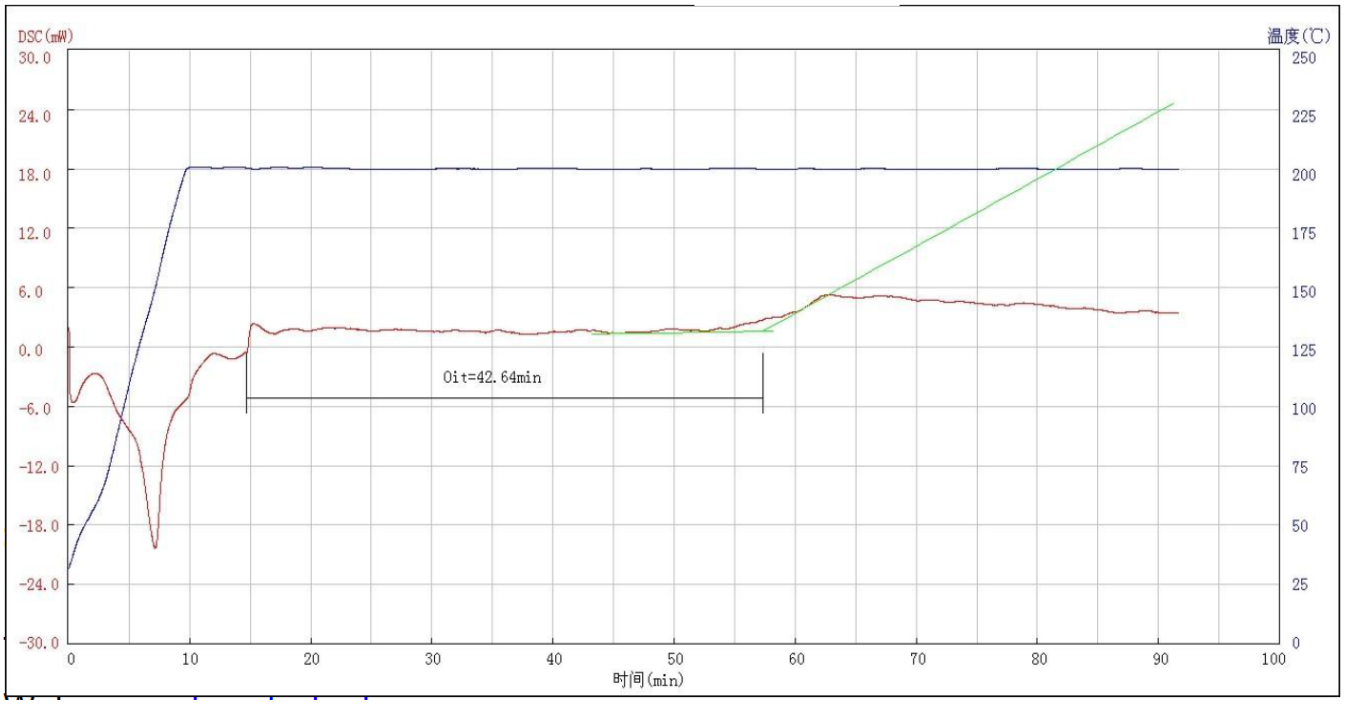
The number, position, peak area, direction, height, width, symmetry of the peaks reflects the times of physical changes and chemical changes in the measured temperature range, temperature range which changed, the size, positive and negative of thermal effect. The heights, width, symmetry of the peaks is not only relating with test conditions, but also relating with pharmacokinetics factors in the process of the specimen change, the result is much more complex than the ideal curve.

Instrument features

- New furnace structure, better resolution and baseline stability;
- Digital gas mass flow meter, precise control of the purge gas flow; Data is directly recorded in the database;
- The instrument can be bi-directional control (host control, software control); friendly interface, easy to operate.

Curve display





Technical parameters

DSC	DSC-100L Differential Scanning Calorimeter
Temperature Range	Room temperature-170 ~ 600℃
Temperature Resolution	0.001℃
Temperature Fluctuation	±0.01℃
Temperature Repeatability	±0.01℃
Heating Rate	0.1~100 ℃/min
Cooling Rate	0.1~40 ℃/min
Constant temperature time	can be set
Temperature Control Mode	PID temperature control, heating, cooling, constant temperature (full program automatic control)
Scanning method	Heating scan, cooling scan
DSC Range	0 ~ ±600mW
DSC resolution	0.01uW
DSC Sensitivity	0.001mW
Gas flow	0-300mL/min
Gas pressure	⩽5MPa
Atmosphere Control	Two-way automatic switching (instrument automatically switches)
Program control	can realize six-stage heating constant temperature control, special parameters can be customized
Display	24bit color 7-inch LCD touch-screen display
Data Interface	Standard USB interface
Parameter standards	Equipped with standard samples (indium, tin, lead), users can correct the temperature by themselves
Remark	All the technical indicators can be adjusted according to user needs.

Power supply	AC 220V/50Hz or customized

Standard accessories

ITEM NAME	QTY
Host instrument	1
Soft	1
Data Line	1
Power Line	1
Aluminum crucibles	100
Ceramic crucibles	100
Bag of pure tin grains	1
Fuse 10A	5
Operation manual	1
Warranty card	1
Certification	1

3.DSC-200Differential scanning calorimeter (DSC)

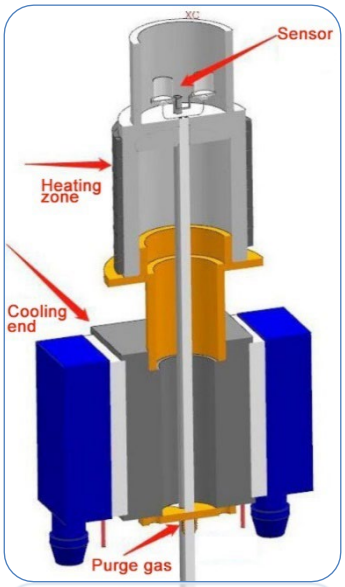
Product introduction

DSC-200 is one of the most accurate DSC series products launched by the company. The sensor is made of imported material E-pair, which has high accuracy, high sensitivity and good repeatability. The signal acquisition circuit has shielding protection, strong anti-interference, and extremely high baseline stability and repeatability.

DSC-200 differential scanning calorimeter can be used to test glass transition temperature, phase transition temperature, melting point, enthalpy value, curing temperature, product stability, oxidation induction period, etc. It is competent in the research of pipes, polymers, chemicals, food, medical treatment and many other fields, and its products serve universities, enterprises, third-party measurement and quality inspection units, with a wide range of applications to meet the testing needs of various industries.

Main Features

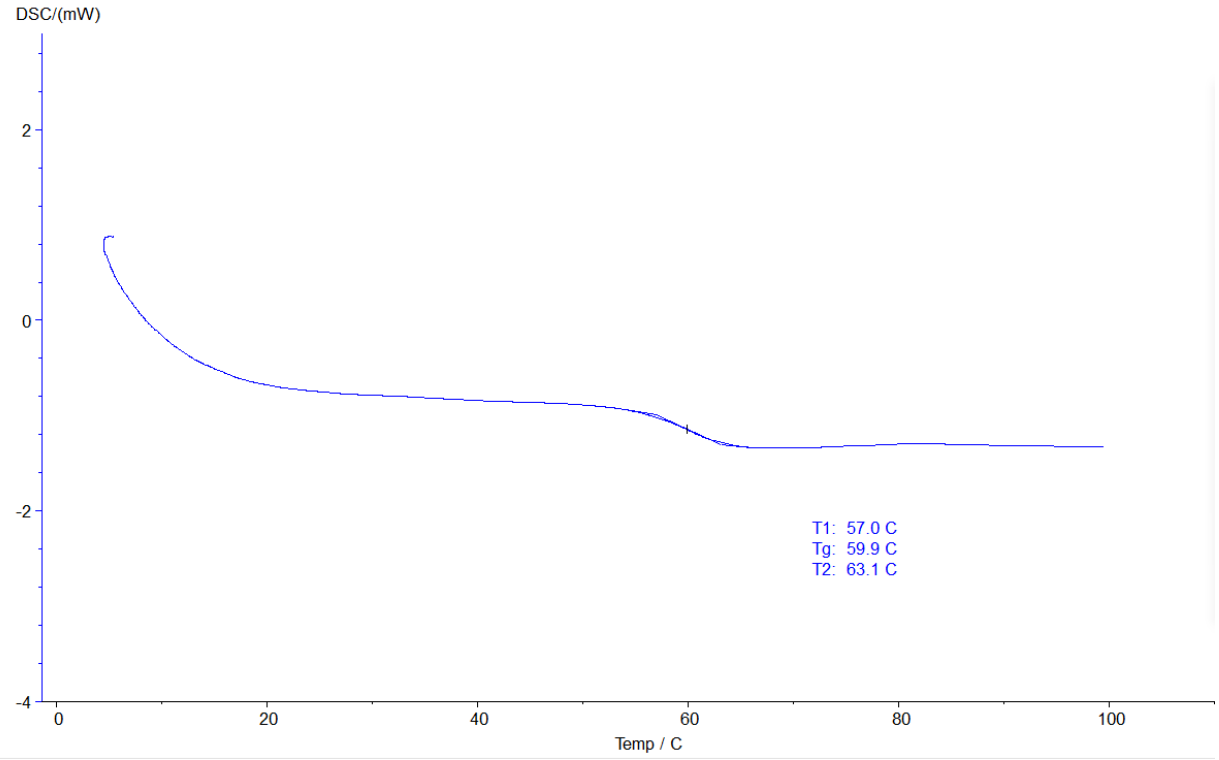
- Industrial level of the 7-inch touch screen, display rich information
- New furnace body structure, better baseline, higher accuracy. Heating adopts indirect conduction mode, high uniformity and stability, reduce pulse radiation, better than the traditional heating mode.
- USB communication interface, strong versatility, reliable communication is not interrupted, support self-recovery connection function.
- Automatic switching of two atmosphere flow rates, fast switching speed, short stability time. At the same time, increase the protective gas input.
- Software is simple and easy to operate.
- Ultra-high sensitivity, precision, 0.001 mw, 0℃.001
- Exquisite technical indicators, superior performance, high-cost performance, widely used



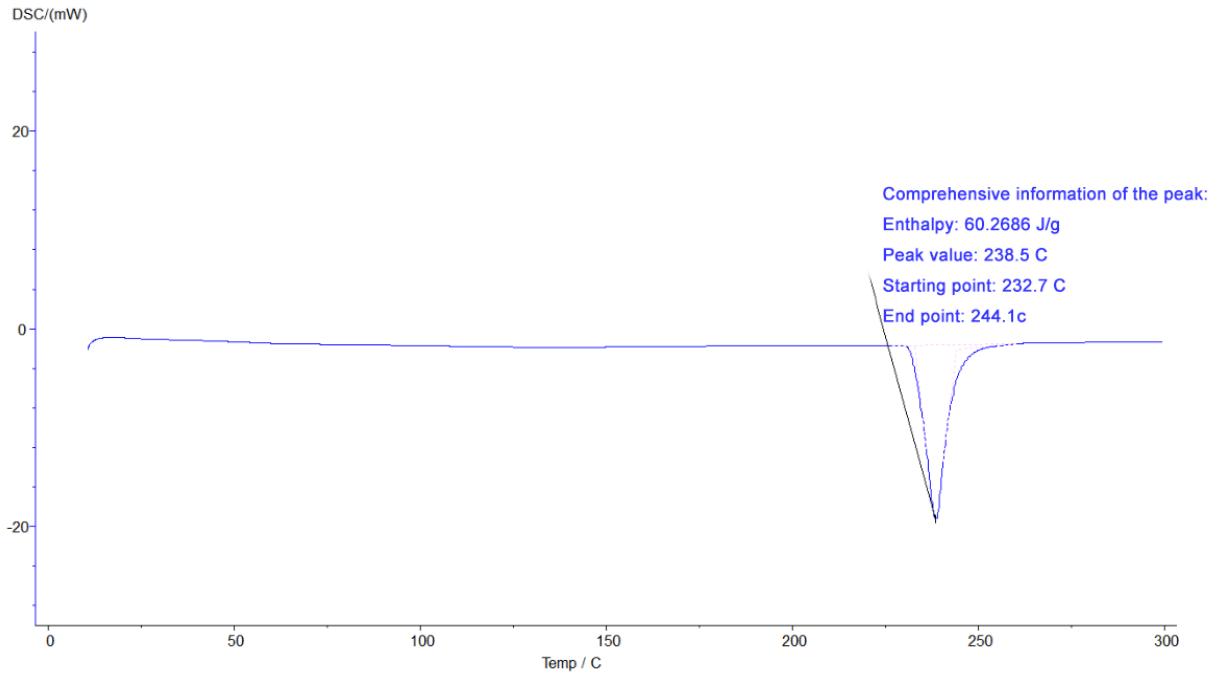
Technical parameters

MODEL	DSC-200
Temperature range	Room temperature of ~600℃
Temperature resolution	0.001℃
Temperature fluctuation	±0.001℃
Temperature repeatability	±0.01℃
Heating rate	0.1～100℃/min
The constant temperature time	Was programmed for 24h
Temperature control mode	Heating up, constant temperature, cooling (fully automatic program control)
DSC range	0～±600mW
DSC, resolution	0.01uW
DSC, sensitivity	0.001mW
Working power supply	AC220V/50Hz or customized
The atmosphere controls the gas	Ntrogen, oxygen (programmed/automatic switching)
Gas-flow rate	0-300mL/min
Gas pressure	0.2MPa
Display mode	24bit color, 7-inch LCD touchscreen display
Data interface	Standard USB interface
Parameter standard	Equipped with a standard material (indium, tin), the user can correct the temperature by himself
Optional Cooling device	Air cooling device (optional semiconductor -40~550℃, liquid nitrogen refrigeration -150~550℃)
Thermocouple	with multiple sets of thermocouples, temperature of a group of measured samples, One group to measure furnace temperature, One group measures the internal ambient temperature

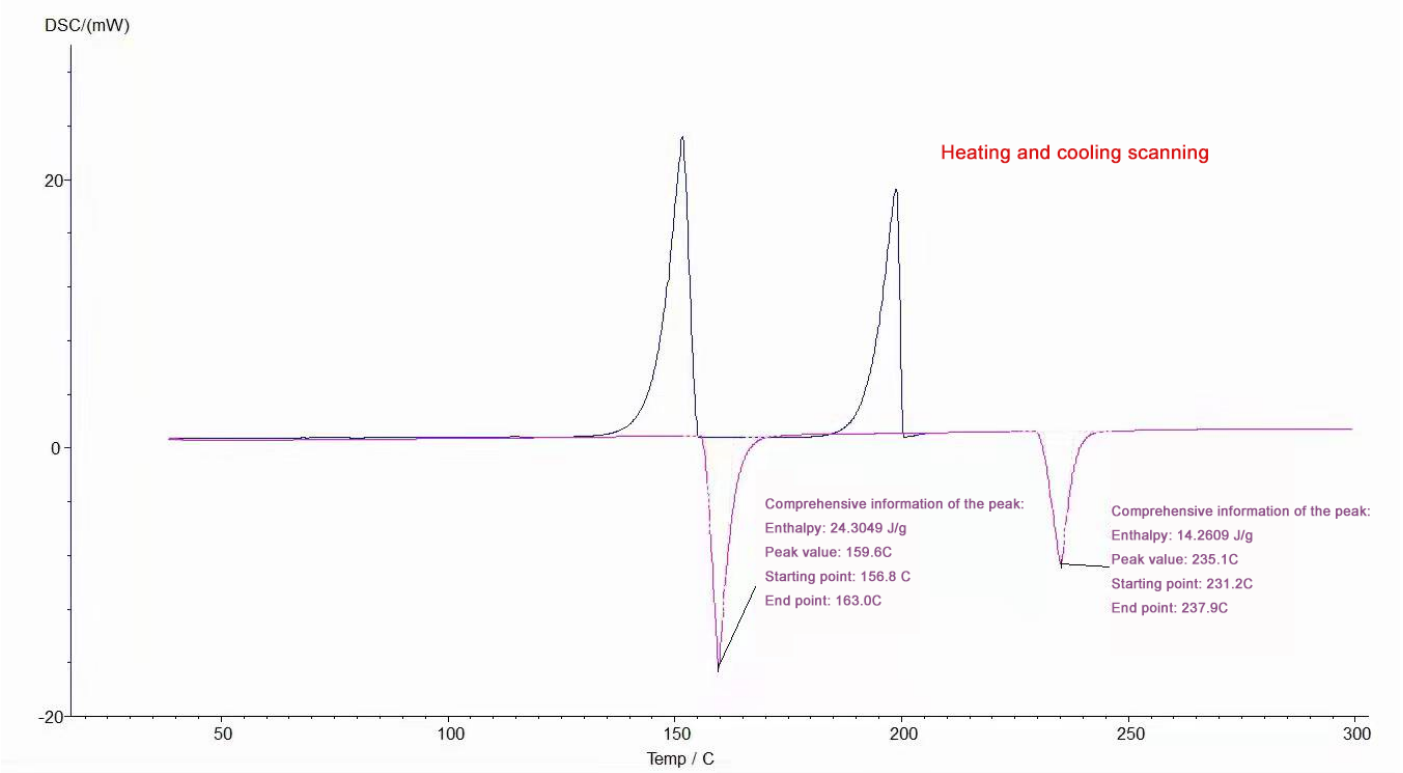
Test map: Glass transition temperature

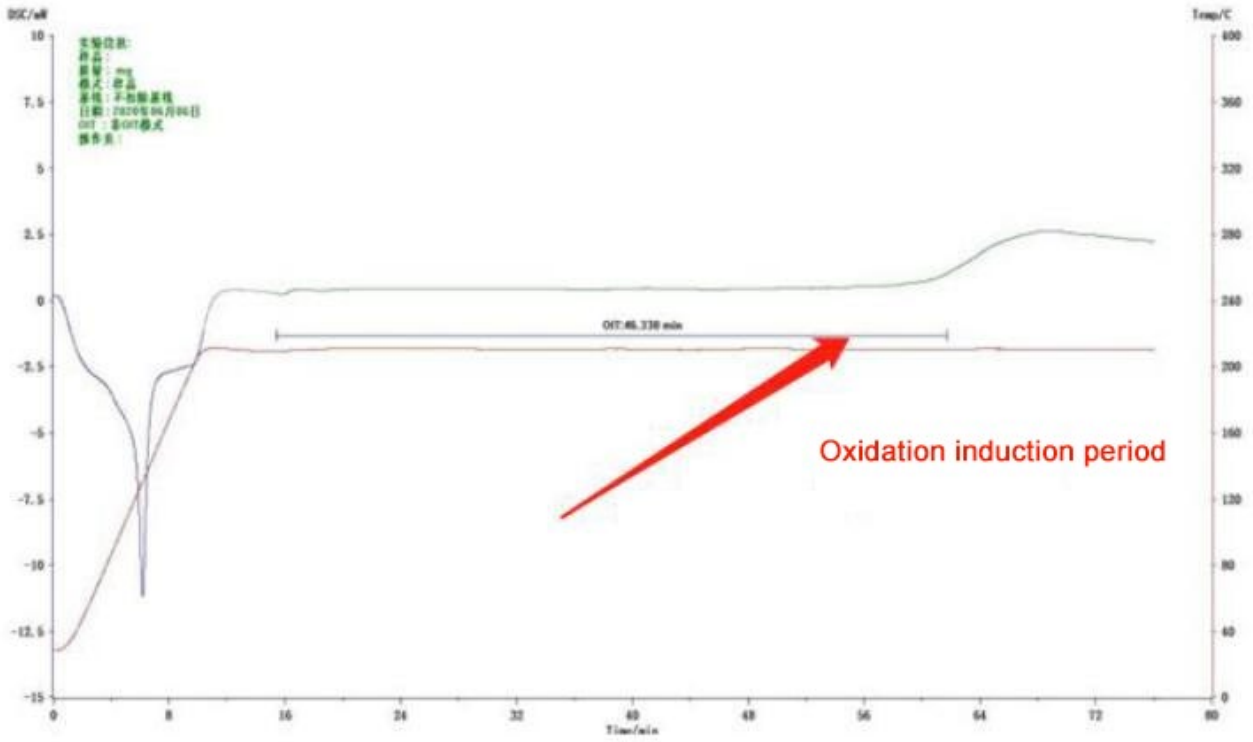


Test map: melting point and heat enthalpy



Lift temperature scan




DSC/mW
Temp/℃
OIT:46.338 min
Oxidation induction period
Time/min

4.DSC-200L Differential scanning calorimeter (DSC)

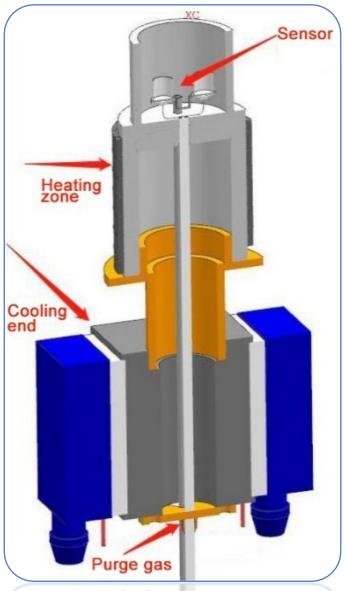
Product introduction

DSC-200L is one of the most accurate DSC series products launched by the company. The sensor is made of imported material E-pair, which has high accuracy, high sensitivity and good repeatability. The signal acquisition circuit has shielding protection, strong anti-interference, and extremely high baseline stability and repeatability.

DSC-200L differential scanning calorimeter can be used to test glass transition temperature, phase transition temperature, melting point, enthalpy value, curing temperature, product stability, oxidation induction period, etc. It is competent in the research of pipes, polymers, chemicals, food, medical treatment and many other fields, and its products serve universities, enterprises, third-party measurement and quality inspection units, with a wide range of applications to meet the testing needs of various industries.

Main Features

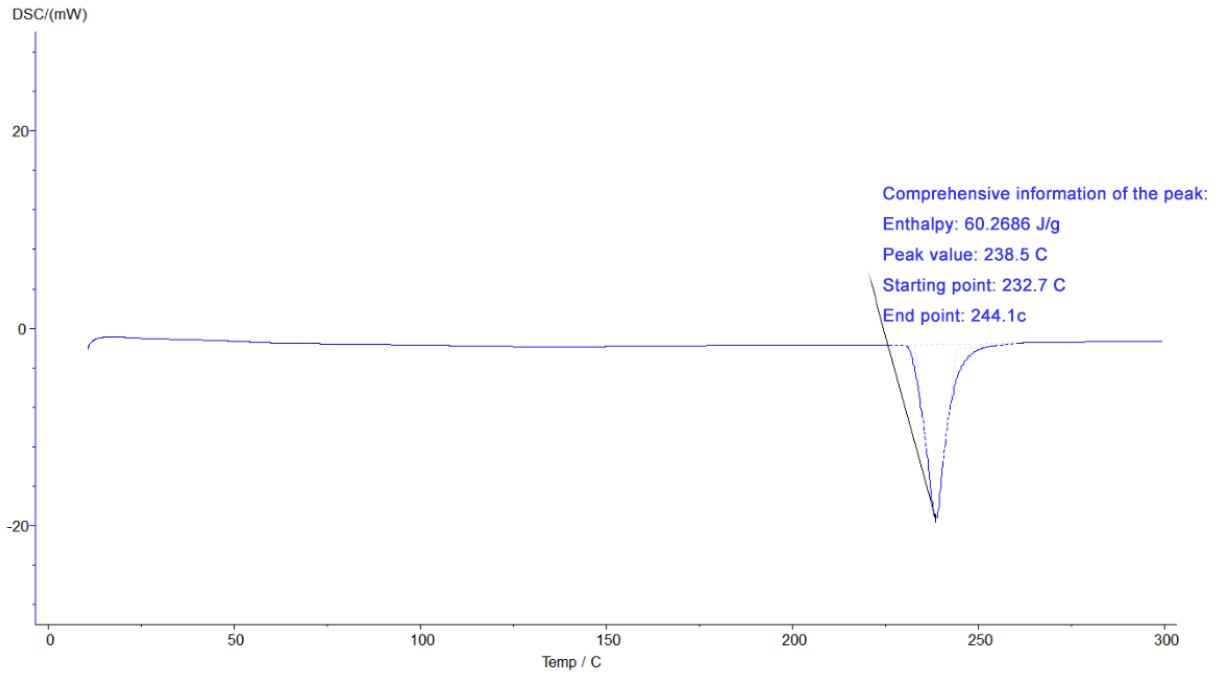
- Industrial level of the 7-inch touch screen, display rich information
- New furnace body structure, better baseline, higher accuracy. Heating adopts indirect conduction mode, high uniformity and stability, reduce pulse radiation, better than the traditional heating mode.
- USB communication interface, strong versatility, reliable communication is not interrupted, support self-recovery connection function.
- Automatic switching of two atmosphere flow rates, fast switching speed, short stability time. At the same time, increase the protective gas input.
- Software is simple and easy to operate.
- Ultra-high sensitivity, precision, 0.001 mw, 0℃.001
- Exquisite technical indicators, superior performance, high-cost performance, widely used



Technical parameters

MODEL	DSC-200L
Temperature range	0-600℃
Temperature resolution	0.001℃
Temperature fluctuation	±0.001℃
Temperature repeatability	±0.01℃
Heating rate	0.1～80℃/min
The constant temperature time	Was programmed for 24h
Temperature control mode	Heating up, constant temperature, cooling (fully automatic program control)
DSC range	0～±600mW
DSC, resolution	0.01uW
DSC, sensitivity	0.001mW
Working power supply	AC220V/50Hz or customized
The atmosphere controls the gas	Nitrogen, oxygen (programmed/automatic switching)
Gas-flow rate	0-300mL/min
Gas pressure	0.2MPa
Display mode	24bit color, 7-inch LCD touchscreen display
Data interface	Standard USB interface
Parameter standard	Equipped with a standard material (indium, tin), the user can correct the temperature by himself
Optional Cooling device	Air cooling device (optional semiconductor -40-550℃, liquid nitrogen refrigeration -150-550℃)
Thermocouple	with multiple sets of thermocouples, temperature of a group of measured samples, One group to measure furnace temperature, One group measures the internal ambient temperature

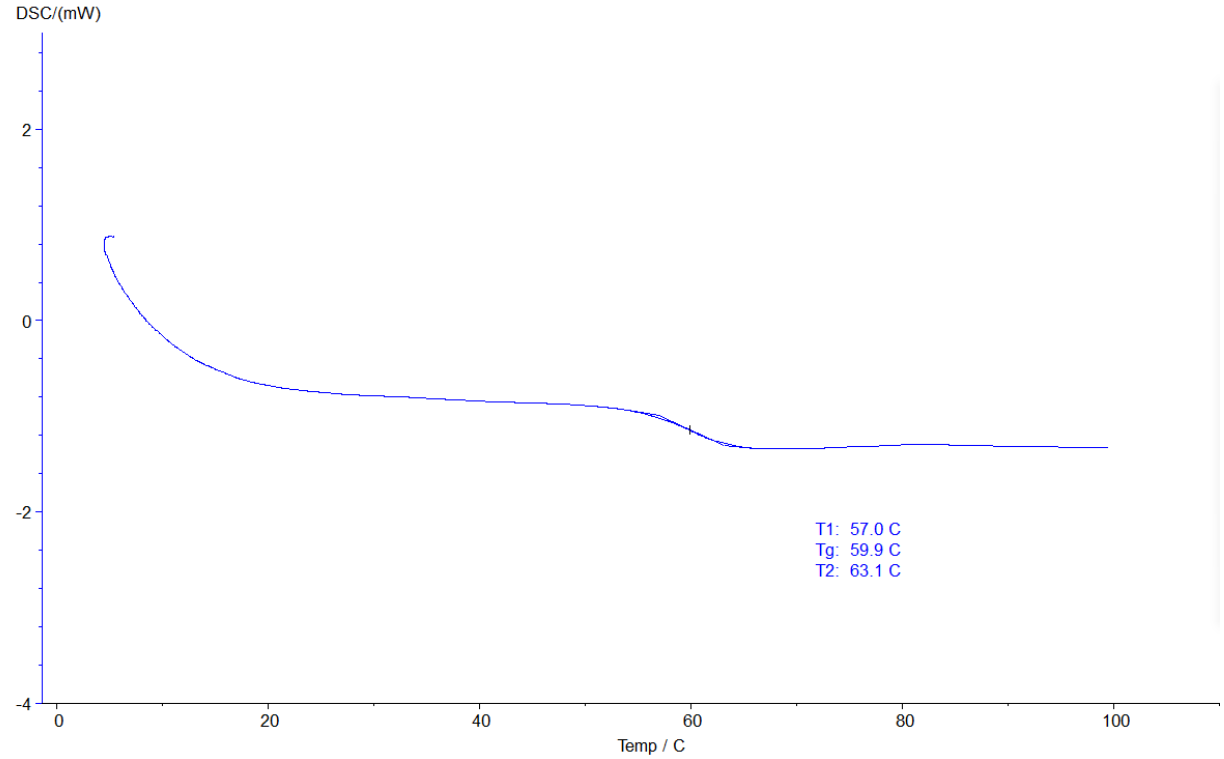
Test map: melting point and heat enthalpy



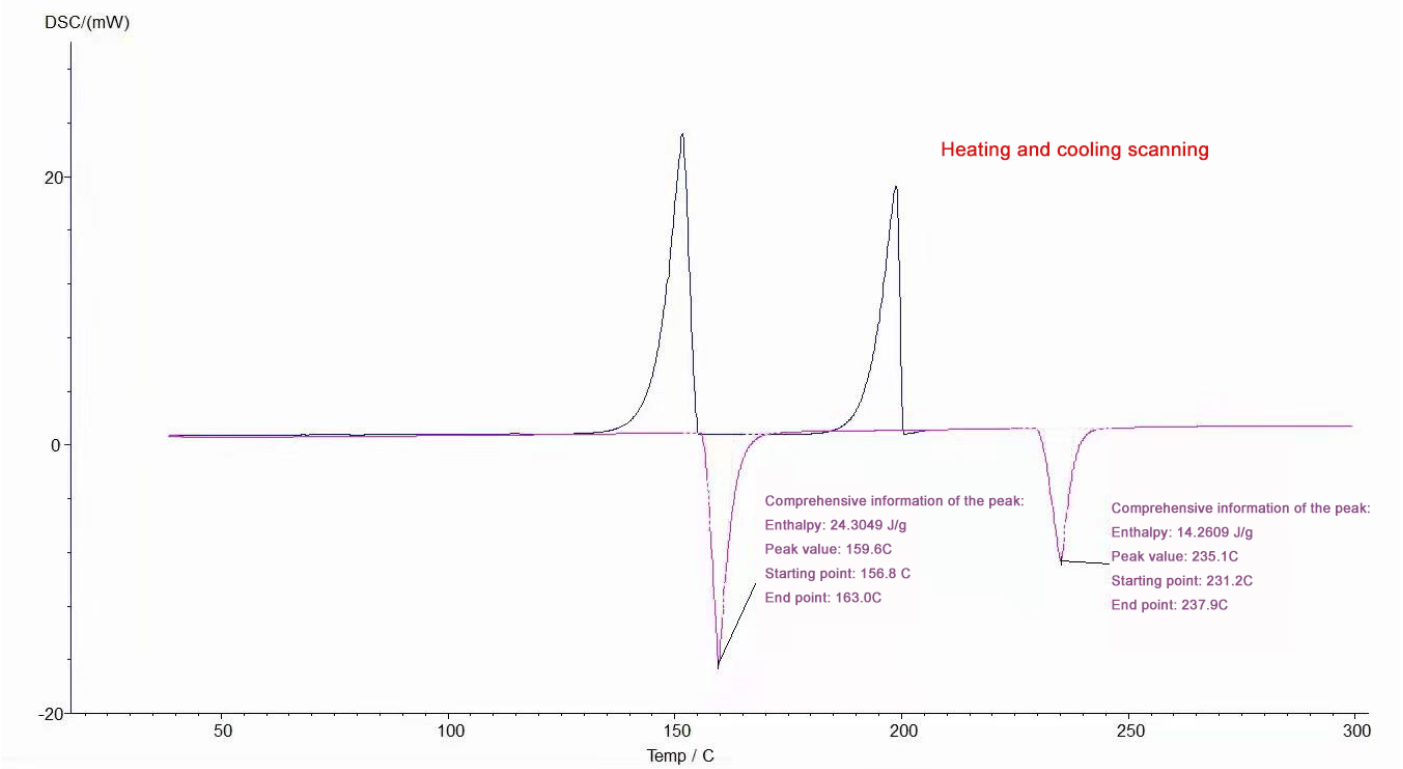
Test map: Glass transition temperature

For amorphous polymers, when the polymer changes from a high elastic state to a glass state through cooling, or from a glass state to a high elastic state through heating, the process is called the glass transition, and the

temperature at which the glass transition occurs is called the glass transition temperature. For crystalline polymers, the glass transition refers to the transition of the amorphous part from the high elastic state to the glass state (or the glass state to the high elastic state). Therefore, glass transition is a common phenomenon in polymers. However, the glass transition phenomenon is not limited to polymers, and some small molecular compounds also have glass transition.

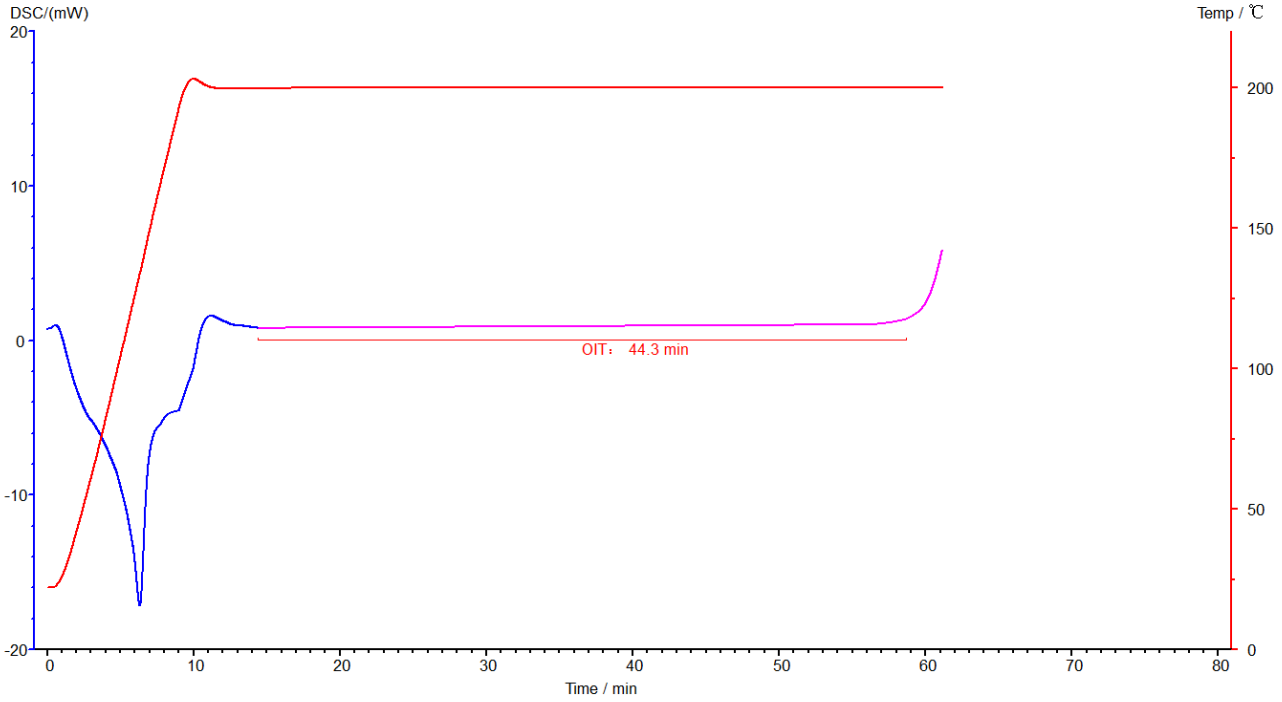


Lift temperature scan



Oxidation period test of PE, PPR and other pipes:

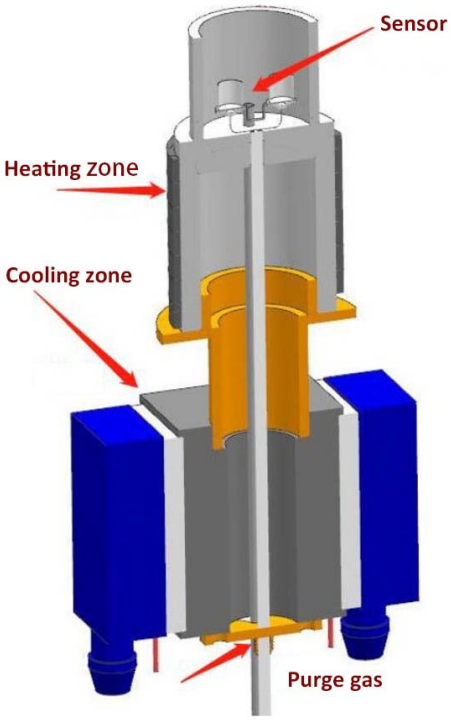
The oxidation induction time (OIT) was measured by DSC (differential scanning calorimeter). The sample is usually heated to the specified temperature and constant temperature under nitrogen atmosphere, and then switched to oxygen atmosphere. After a period of time, the material begins to oxidize and release heat. The released heat is detected by the sensor, and the induced oxidation time (OIT) is obtained through software analysis. The length of the oxidation induction time is a parameter of the oxidation decomposition resistance of the reaction material, which is still very meaningful. Usually, the parameter must be detected for buried plastic pipes.



5. DSC-300C Differential Scanning Calorimeter, with heating & cooling curve

Product Description

DSC is a differential indicator with the highest precision introduced by the company. The sensor adopts imported E couple with high sensitivity. The signal acquisition circuit is shielded and protected, with strong anti-interference and high baseline stability. The differential scanning calorimeter is a touch screen type, which can perform glass transition temperature test, phase transition test, melting and enthalpy test, product stability, oxidation induction period test. Wide range of applications



Technical features

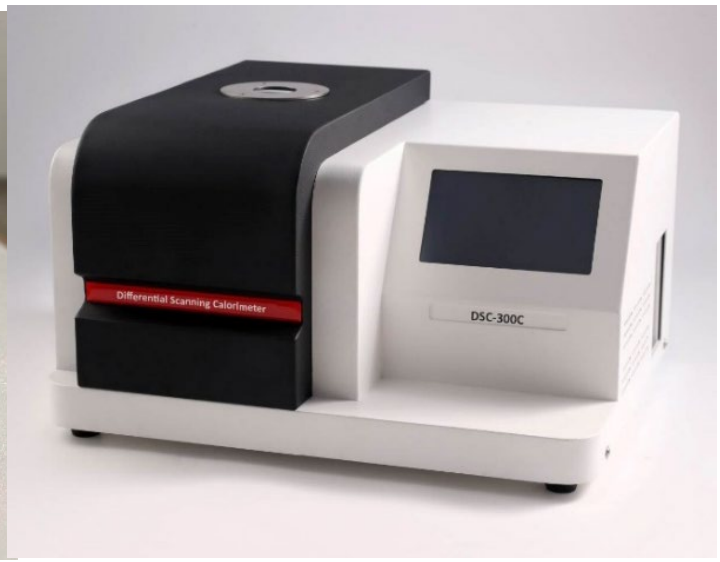
- Industrial-grade 7-inch touch screen, rich in display information.
- Brand-new metal furnace body structure, with better baseline and higher accuracy. The heating adopts indirect conduction method, which has high uniformity and stability, reduces pulse radiation, and is better than traditional heating mode.

- The USB communication interface has strong versatility, reliable and uninterrupted communication, and supports self-recovery connection function.
- Automatically switch the two-channel atmosphere flow, with fast
- switching speed and short stabilization time. At the same time, a protective gas input is added.
- The software is simple and easy to operate.

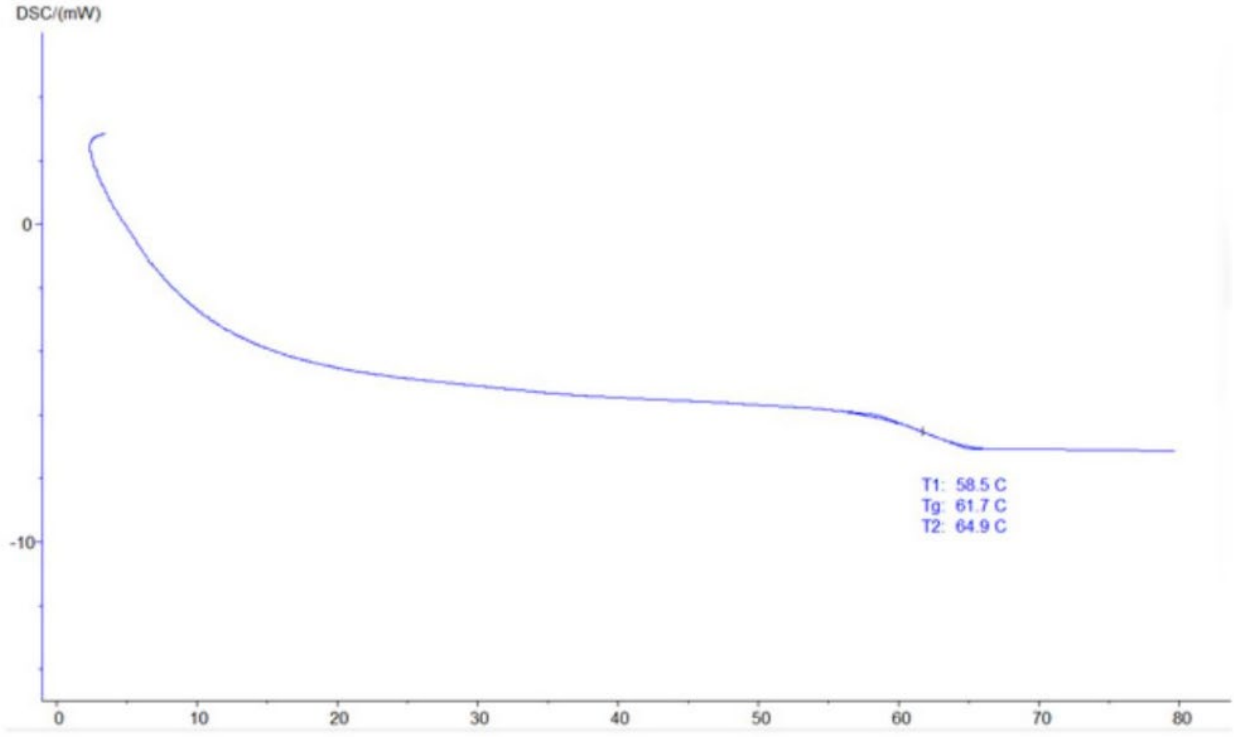
Furnace structure

Technical Parameters

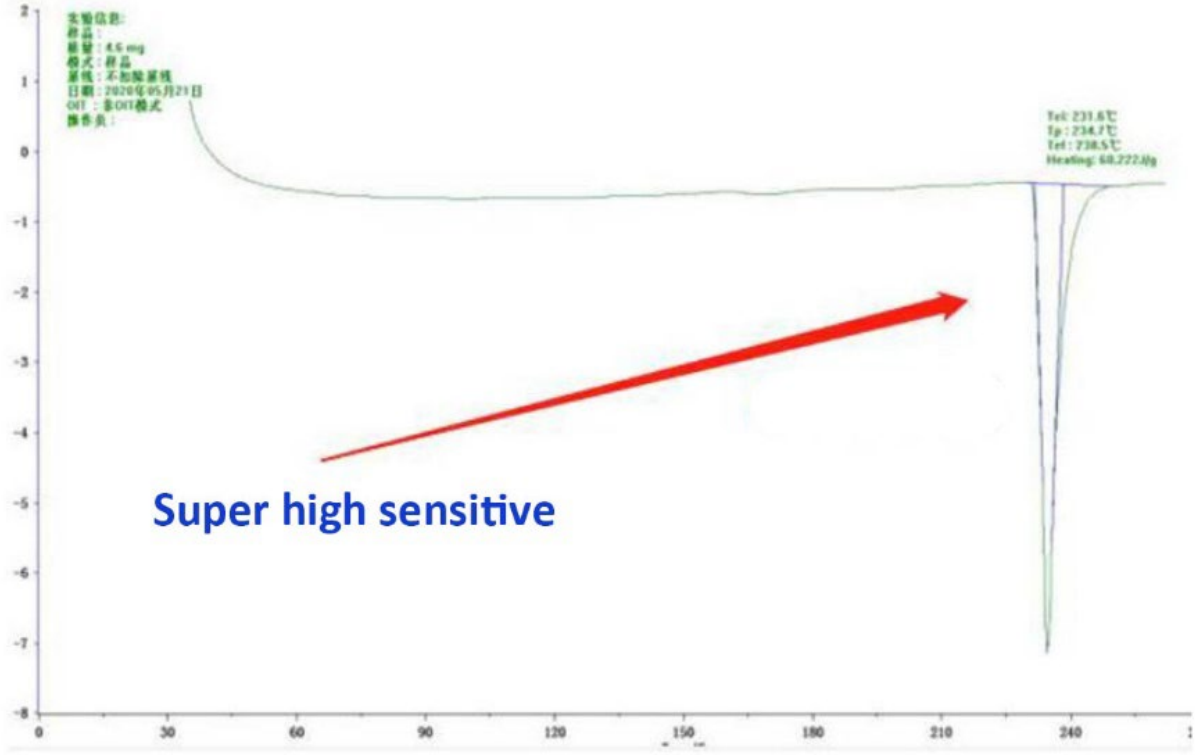
Model	DSC-300C
Temperature range	-40°C~ 600°C
Temperature resolution	0.001°C
Temperature fluctuation	±0.01°C
Temperature repeatability	±0.1°C
Heating rate	0.1 ~ 100°C/min
Cooling rate	0.1~20℃/min
Constant temperature time	program setting ≤24h
Temperature control method	Heating & cooling scan, heating, cooling, constant temperature multi-stag (automatic program control)
DSC range	0 ~ ±800mW
DSC resolution	0.01uW
DSC accuracy	0.001mW
Power supply	AC220V/50Hz or customized
Atmosphere control gas	nitrogen, oxygen (the instrument automatically switches)
Gas flow	0-300mL/min
Gas pressure	0.3MPa
Display mode	24bit color, 7-inch LCD touch screen display
Data interface	standard USB interface
Parameter standard	equipped with standard materials (indium, tin, lead), users can calibrate the temperature by themselves
Thermocouple	The instrument has multiple sets of thermocouples, one set of test sample temperature, and one set of test instrument internal ambient temperature.
Software	with automatic analysis function

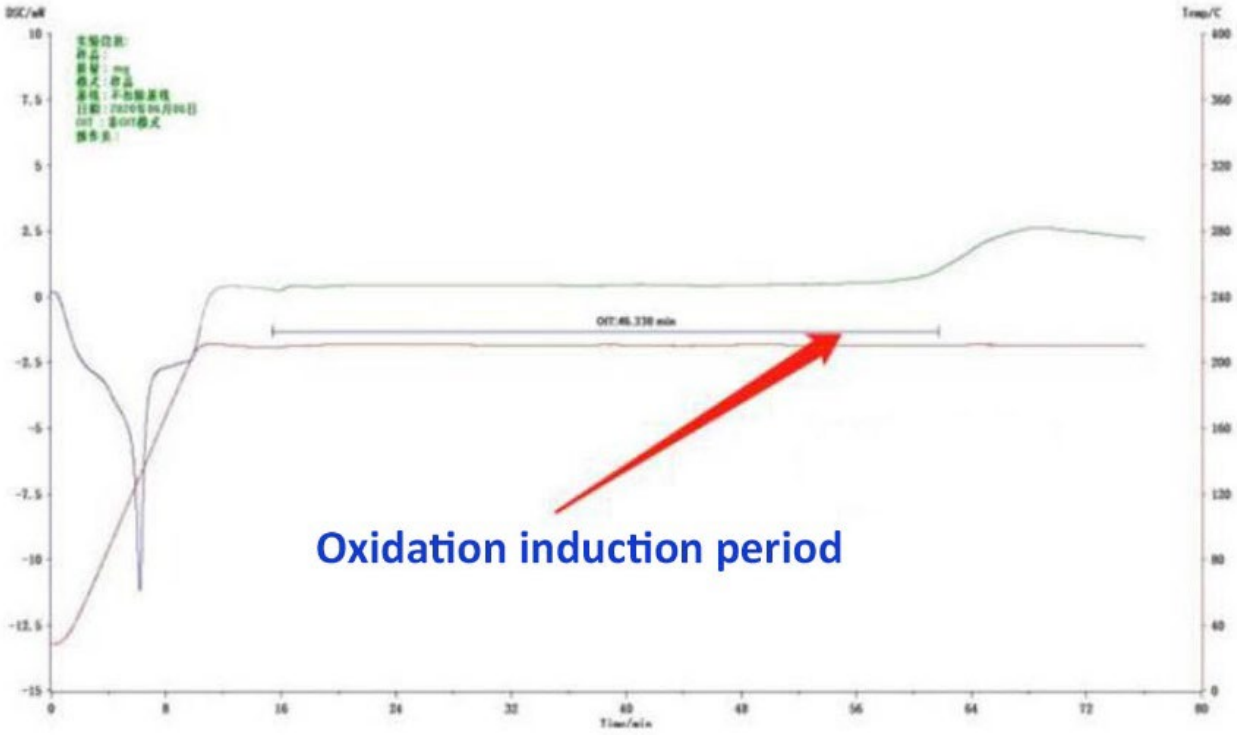


Parts of the sample test pattern



Vitrification test of resin materials





Configuration list

SN	Name of accessories	Quantity	Remarks

1	DSC-300C differential instrument	1 set	
2	Software USB flash disk	1 pc	
3	Communication data cable	2 pcs	USB data communication
4	power cord	1 pc	
5	Aluminum crucible	200 pcs	
6	Ceramic crucible	100 pcs	For testing highly corrosive samples
7	Furnace body cover	3 pcs	Multilayer insulation
8	Raw tape	1 roll	
9	Reference materials	1 for each	Indium, tin
10	10A fuse	5 pcs	
11	Sample spoon/sample pressure bar/tweezers	1 for each	
12	Dust cleaning ball	1 pc	
13	Gas pipe (including connector)	2 pcs	Φ8mm
14	Manual, warranty card and certificate	1 for each	
15	Cryogenic device	1 set	

Note: The user needs to provide a computer, which can be configured normally.

6. DSC-1000 Differential Scanning Calorimeter

Product Description

DSC is the most accurate differential display launched by the company. The sensor is made of imported materials and has high sensitivity. The signal acquisition circuit is shielded and protected, with strong anti-interference and high baseline stability.

The differential scanning calorimeter is a touch screen type and can be used for glass transition temperature testing, phase transition testing, melting and enthalpy value testing, product stability, solidification, oxidation induction period testing, and specific heat testing. Wide range of applications.

Technical features

- Industrial-grade 7-inch touch screen displays rich information.
- Brand new ceramic furnace structure, better baseline and higher accuracy. Heating adopts indirect conduction method, which has high uniformity and stability, reduces pulse radiation, and is superior to traditional heating mode.
- USB communication interface, strong versatility, reliable and uninterrupted communication, and supports self-restoring connection function.
- Automatically switch between two atmosphere flows, with fast switching speed and short stabilization time. At the same time, a protective gas input is added.
- The software is simple and easy to operate.

Technical Parameters

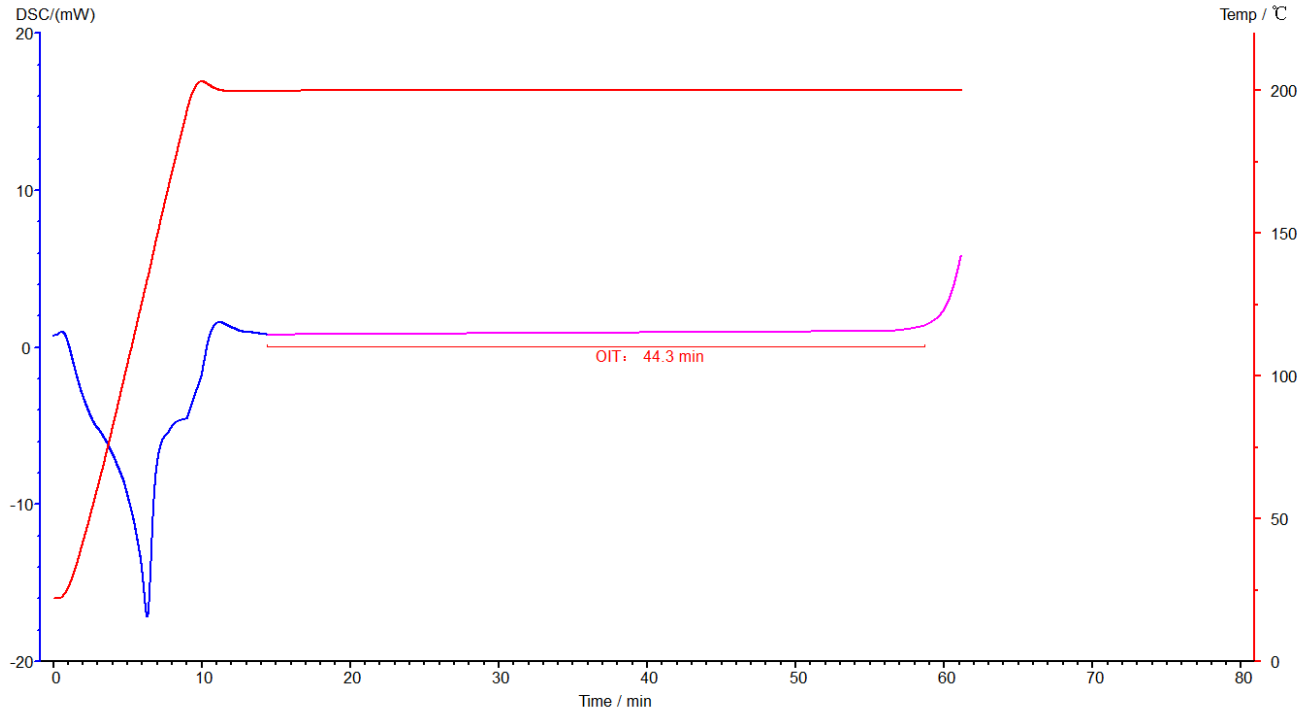
Model	DSC-1000
Temperature range	Room temperature~1000°C
Temperature resolution	0.01°C
Temperature fluctuation	±0.01°C
Temperature repeatability	±0.1°C
Heating rate	0.1 ~ 100°C/min
Curve scan	Heating scan, constant temperature scan
Constant temperature time	program setting ≤24h
Temperature control	PID temperature control, temperature rise, constant temperature

method	(fully automatic program control)
DSC range	0 ~ ±600mW
DSC resolution	0.01uW
DSC accuracy	0.001mW
Power supply	AC220V/50Hz or customized
Atmosphere control gas	nitrogen, oxygen (the instrument automatically switches)
Gas flow	0-300mL/min
Gas pressure	≤1MPa
Display mode	24bit color, 7-inch LCD touch screen display
Data interface	standard USB interface
Parameter standard	equipped with standard materials (indium, tin, lead), users can calibrate the temperature by themselves
Thermocouple	With multiple sets of thermocouples, one set of test sample temperature, and one set of test instrument internal ambient temperature.
Data interface	standard USB interface
Calibration function	With multi-point calibration function, it can meet the precise testing of medium, medium and low samples.
Software	The software can set the frequency of data collection, and can export EXECL data packets and PDF reports

Parts of the sample test pattern

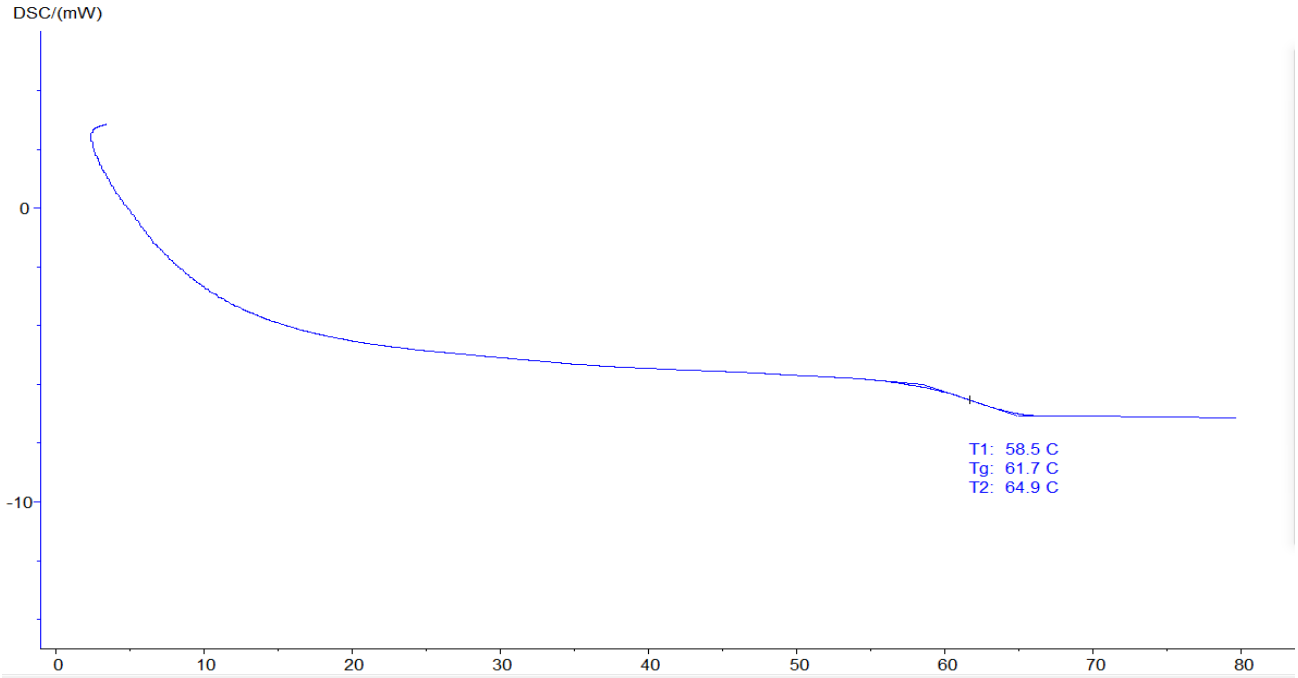
1. Oxidation period test of PE, PPR and other pipes:

Oxidation Induction Time (OIT) was measured by DSC (Differential Scanning Calorimetry). The sample is usually heated to a specified temperature and kept constant in a nitrogen atmosphere, and then switched to an oxygen atmosphere. After a period of time, the material begins to oxidize and release heat. This released heat is detected by the sensor and analyzed by the software to obtain the oxidation induction time (OIT). The length of the oxidation induction time is a parameter of the reaction material's resistance to oxidative decomposition. This parameter must be detected for buried plastic pipes.



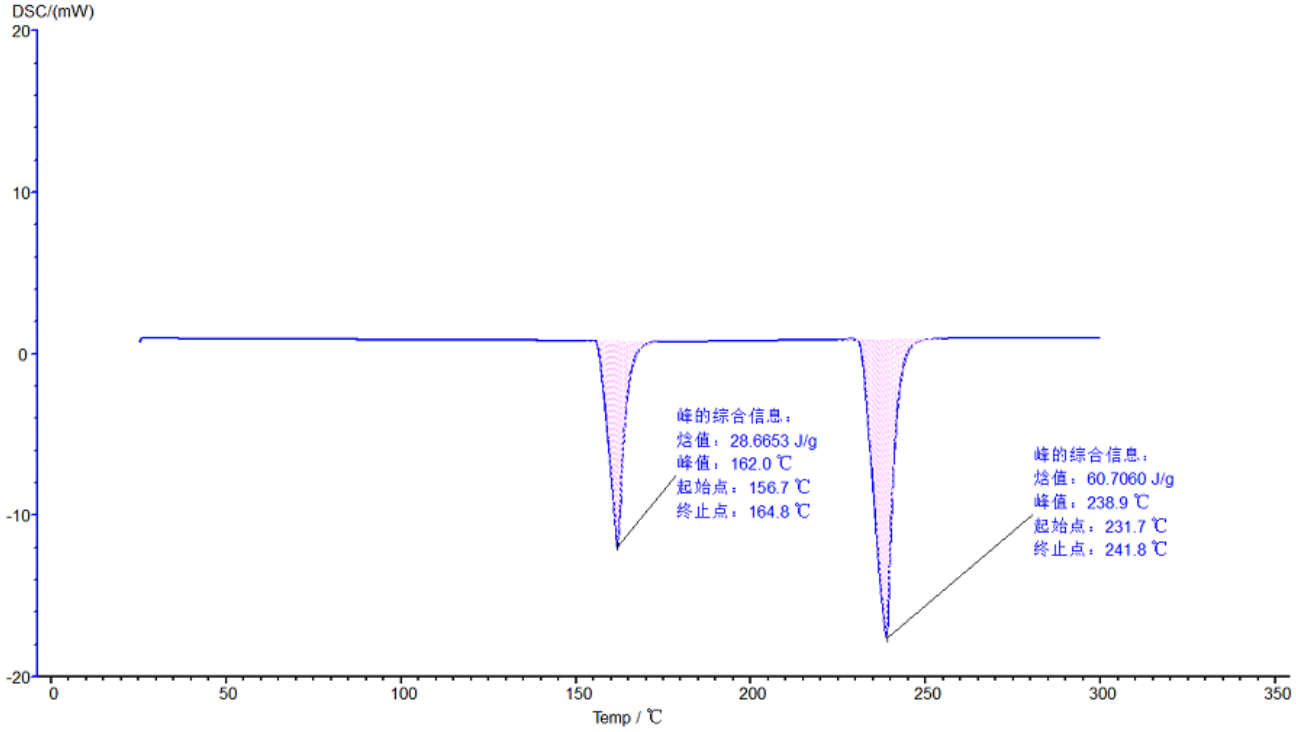
2. Vitrification test of resin and other materials:

For amorphous polymers, when the polymer changes from a high elastic state to a glass state by cooling down, or from a glass state to a high elastic state by heating up, it is called a glass transition, and the temperature at which the glass transition occurs is called a glass transition. temperature. For crystalline polymers, the glass transition refers to the transformation of the amorphous portion from a highly elastic state to a glassy state (or from a glassy state to a highly elastic state). Therefore, glass transition is a ubiquitous phenomenon in polymers. However, the glass transition phenomenon is not limited to polymers. Glass transitions also occur in some small molecule compounds.



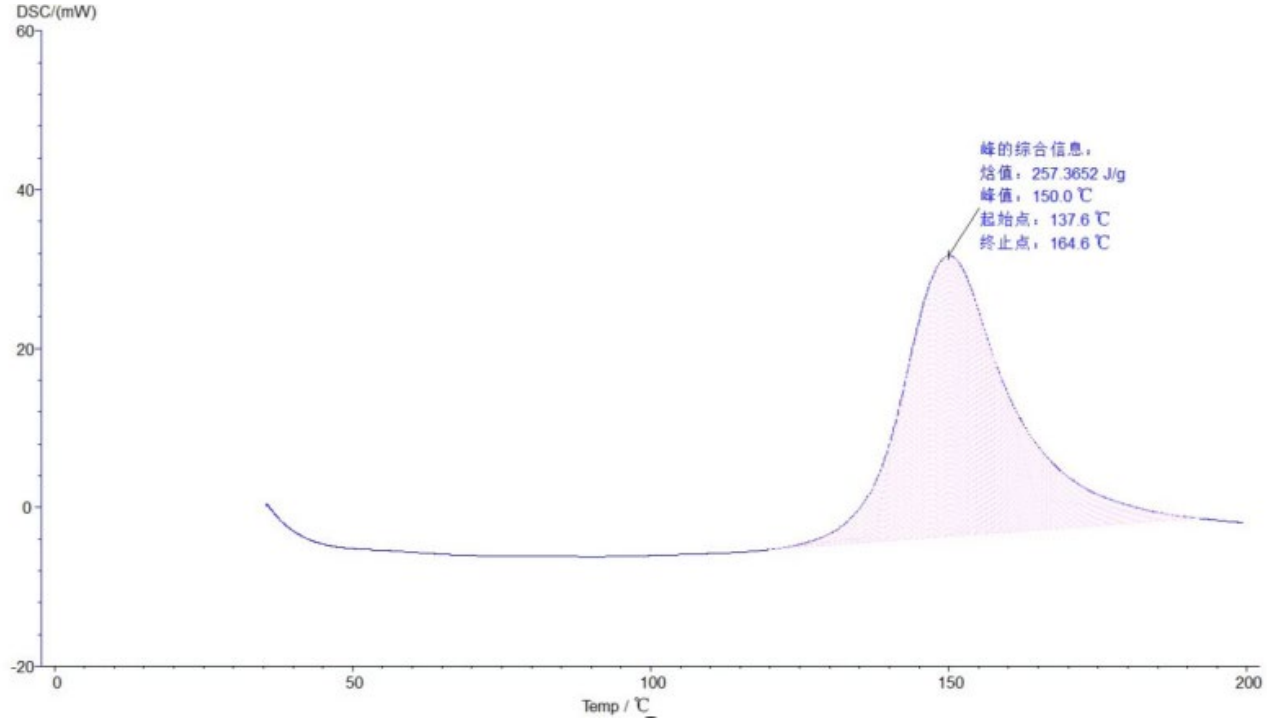
3. Material melting point, enthalpy test (thermal stability test)

The melting point is the temperature at which a solid changes its state from a solid state or melts to a liquid state, and a mixture of multiple components has multiple peaks.



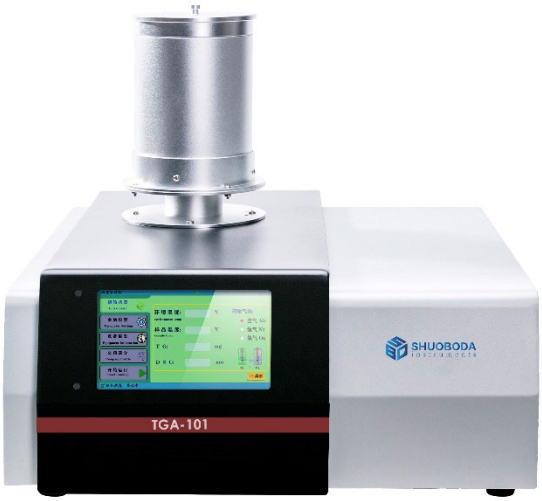
4. Curing test of glue and other materials

Refers to the process in which a substance changes from low molecular weight to high molecular weight, and the strength of the cured sample will be higher



Thermal gravimetric analyzer

1.Thermal Gravimetric Analyzer TGA



Product introduction

Thermal gravimetric analyzer (TGA) is in TG, temperature, the temperature or cooling process, observe the quality with temperature or the change of time, the purpose is to study material thermal stability and components. Widely used in plastic, rubber, coating, drugs, catalyst, inorganic materials, metal materials and composites fields of research and development, optimizing process and quality control

Measurement and research material following characteristics

Thermal stability, decomposing process, adsorption and desorption, oxidation and reduction, ingredients quantitative analysis, additives and filler influence, moisture and volatiles, reaction kinetics.

Structural advantages

- The furnace body is heated by double-row winding of precious metal nickel-chromium alloy wire, which reduces interference and is more resistant to high temperatures.

- The tray sensor is made of precious metal nickel-chromium alloy, which has the advantages of high temperature resistance, oxidation resistance, and corrosion resistance.
- The power supply, circulating heat dissipation part is separated from the host, reducing the influence of heat and vibration on the micro-thermal balance.
- It adopts an open-top structure, which is convenient to operate. It is difficult to move the furnace body up to place the sample, and it is easy to cause damage to the sample rod.
- The host uses a water area constant temperature device to isolate the thermal influence of the heating furnace body on the chassis and the micro-thermal balance.
- The furnace body can be replaced according to customer requirements

Controller and software advantages

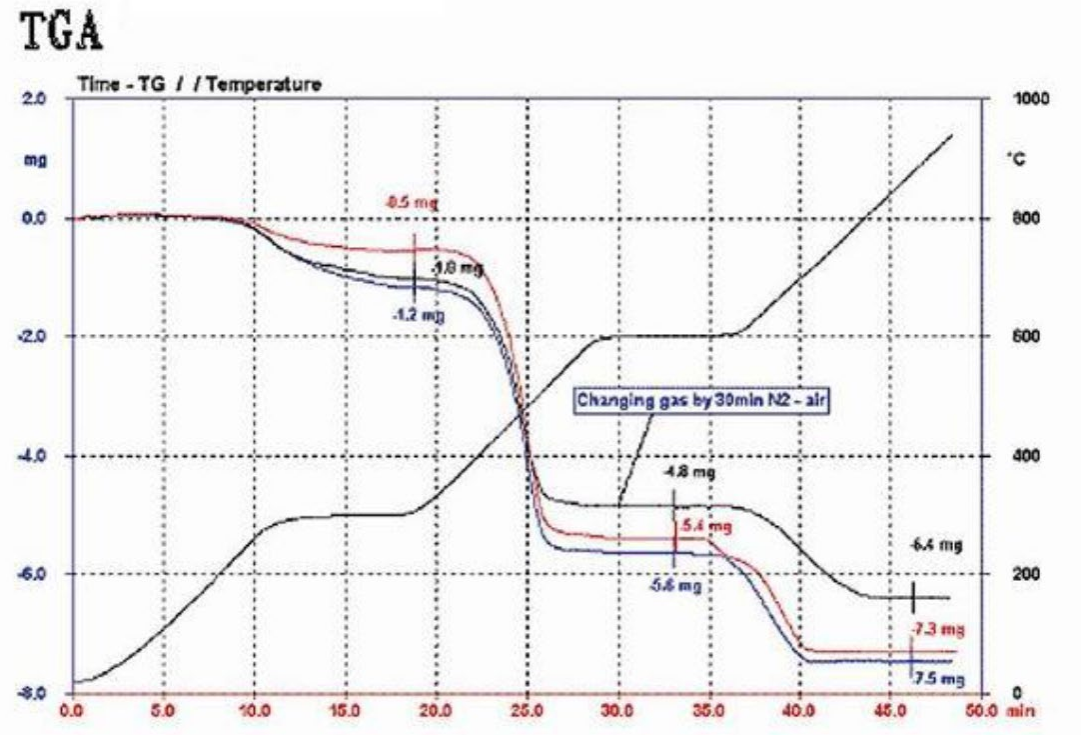
- Using imported 32bit ARM processor Cortex-M3 core, sampling speed, processing speed is faster.
- 2.24bit four-channel sampling AD collects DSC signal, TG signal and temperature T signal.
- The power supply and water circulation part are individually controlled by 8bit single-chip microcomputer to separate the host and the cooling part without interfering with each other, but the two are closely connected, and the cooling part is controlled by the host.
- The USB two-way communication is adopted between the software and the instrument to fully realize remote operation. The parameter setting of the instrument and the operation and stop of the instrument can be carried out through the computer software.
- 7-inch full color 24bit touch screen, better man-machine interface. TG calibration can be achieved on the touch screen

Technical parameters

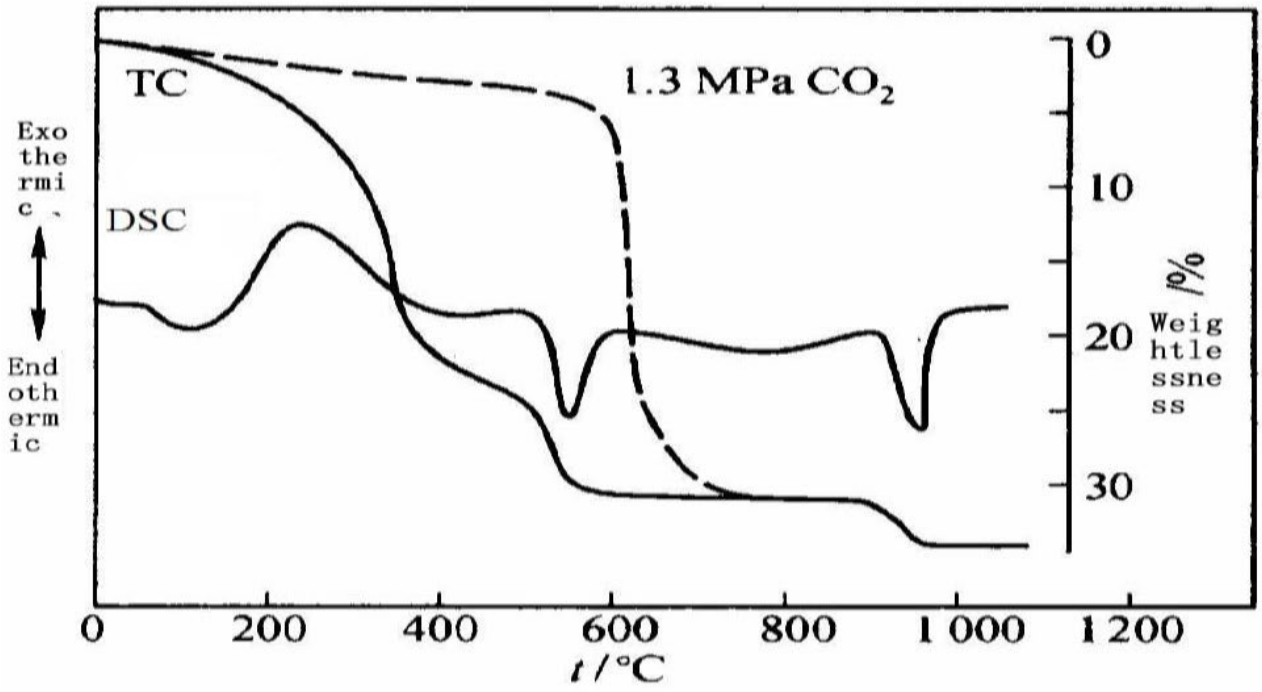
Model	TGA-101	TGA-103	TGA-105
Temperature range	RT ~1250°C	RT ~1350°C	RT ~1550°C
Temperature resolution	0.01 °C	0.01 °C	0.01 °C
Temperature fluctuation	±0.1°C	±0.1°C	±0.1°C
Heating rate	1 ~100°C / min	1 ~ 100 °C / min	1 ~ 100 °C / min
Cooling rate	1 ~ 20 °C / min (optional cooling system)	1 ~ 20 °C / min (optional cooling system)	1 ~ 20 °C / min (optional cooling system)
Temperature control mode	Heating, constant temperature and cooling		
Program control	It can set muti section heating and constant temperature and five sections at the same time		
The cooling time	15min （1000° C ~ 100° C）	15min （1000° C ~ 100° C）	15min （1000° C ~ 100° C）

Balance measuring scope	0.01mg ~ 3g (Can be extended to 30g)	0.01mg ~ 3g (Can be extended to 30g)	0.01mg ~ 3g (Can be extended to 30g)
Sensitivity	0.01mg	0.01mg	0.01mg
Constant temperature and time	0 ~ 300min (set arbitrarily)	0 ~ 300min (set arbitrarily)	0 ~ 300min (set arbitrarily)
Display	Liquid crystal display (LCD)	Liquid crystal display (LCD)	Liquid crystal display (LCD)
Atmosphere	inert, oxidizing, reducible, static and dynamic	inert, oxidizing, reducible, static and dynamic	inert, oxidizing, reducible, static and dynamic
Atmosphere device	Built-in gas flow meter, including switch two-way gas and control flow volume (Atmosphere: inert, oxidizing, reducing, static, dynamic)		
Software	Intelligent software can record TG curves, process data, and print experimental reports. TGD/TG/mass/percentage coordinates can be switched at will		
Data interface	USB interface, special software (irregularly free upgrades)		
Power	AC220V 50Hz	AC220V 50Hz	AC220V 50Hz
Dimensions	500*400*430 mm	500*400*430 mm	500*400*430 mm

Sample's relationship between the TGA, time, and temperature



Sample's relationship between thermal gravimetric (TGA), enthalpy change (DSC), time, temperature

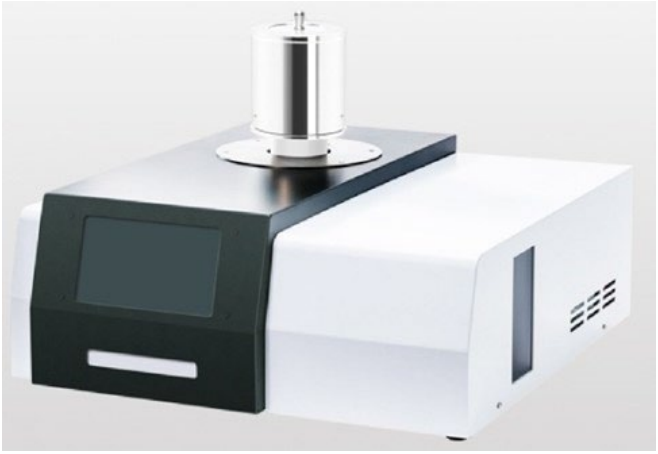
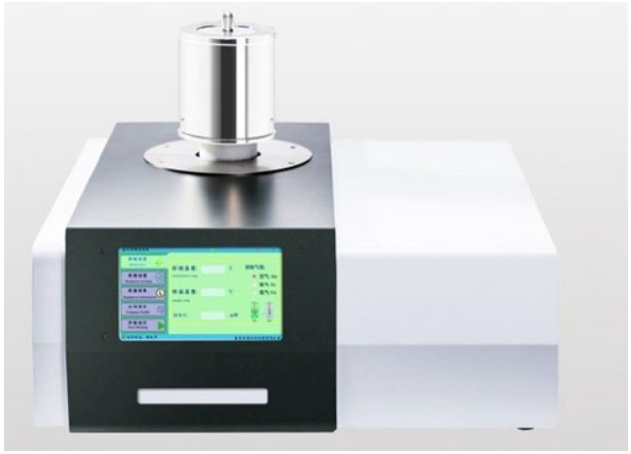


Packing List

Item name	Qty
Host	1 set
software	1 copy
power cord	1 pc
data cable	1 pc
Sample crucibles	100 pcs
10A fuse	2 pcs
manual	1 copy
Gas pipes	2 pcs
Tweezers and sample spoon	1 set

Differential thermal analyzer

1.DTA-3332 Series High temperature differential thermal analyzer

DTA3332 High temperature differential thermal analyzer has been granted the National Patent.

Product introduction

Differential thermal analysis is a technology that measures the temperature difference and temperature relationship between a substance and a reference substance under program-controlled temperature. The differential thermal analysis curve describes the relationship between the temperature (ΔT) between the sample and the reference material as a function of temperature or time.

Working principle

In DTA tests, changes in sample temperature are caused by endothermic or exothermic effects of phase transitions or reactions. Such as: phase transition, melting, transformation of crystal structure, boiling, sublimation, evaporation, dehydrogenation reaction, fragmentation or decomposition reaction, oxidation or reduction reaction, destruction of lattice structure and other chemical reactions.

Features

- The main control chip of the instrument adopts STM32 series controller, which has faster processing speed and more stable temperature control
- The instrument adopts USB two-way communication, which makes the operation more convenient.
- The instrument adopts a 7-inch 24bit full-color LCD touch screen with high display resolution and comprehensive display information
- The instrument adopts platinum rhodium alloy sensor, which is more resistant to high temperature and oxidation

- Fully automatic temperature control system, temperature rise and constant temperature can be controlled by software to improve testing efficiency.

Technical parameters

Model	DTA-3332A	DTA-3332C
Temperature range	Room temperature~1150℃	Room temperature~1500℃
Measuring range	0～±2000μV(expandable)	0～±2000μV(expandable)
DTA sensitivity	0.01μV	0.01μV
DTA accuracy	0.1μV	0.1μV
Heating rate	1～100℃/min	1~100℃/min
Temperature resolution	0.01℃	0.01℃
Temperature accuracy	±0.1℃	±0.1℃
Temperature repeatability	±0.1℃	±0.1℃
Temperature control	Heating: program control, parameter can be adjusted as required; Constant temperature: program control, constant temperature time can be set arbitrarily	
Furnace structure	The upper cover opening structure is adopted, with high precision and easy operation	
Atmosphere control	Internal program automatic control	
Data interface	Standard USB interface, supporting data cable and operating software	
Display method	24bit color, 7-inch LCD touch screen display	
Parameter standard	Equipped with standards, with one-key calibration function, users can calibrate the temperature by themselves	
Baseline adjustment	Users can adjust the baseline through the slope and intercept of the baseline	
Power supply	AC 220V 50Hz (110V 60Hz is optional)	

Synchronous thermal analyzer

1.STA-2000 & STA-3000 Synchronous thermal analyzer

Product introduction

Synchronous thermal analysis combines TGA (Thermogravimetric Analysis) with DTA (Differential Thermal Analysis) or DSC (Differential Scanning Calorimetry), in which we can get the information of TG and DTA or DSC in synchrony using the same sample during the same operation.

APPLICATION

Widely used in research and development, process optimization and quality monitoring in various fields such as plastics, rubber, coatings, pharmaceuticals, catalysts, inorganic materials, metal materials and composite materials

Measure and research the following characteristics of the materials

- DSC: Melting and crystallization, phase change, reaction temperature and heat, heat of combustion and specific heat capacity, etc.
- TG: Thermal stability, decomposition, REDOX, adsorption and adsorption, free water and gesso content, ingredients proportion computation, etc.

Structural advantages

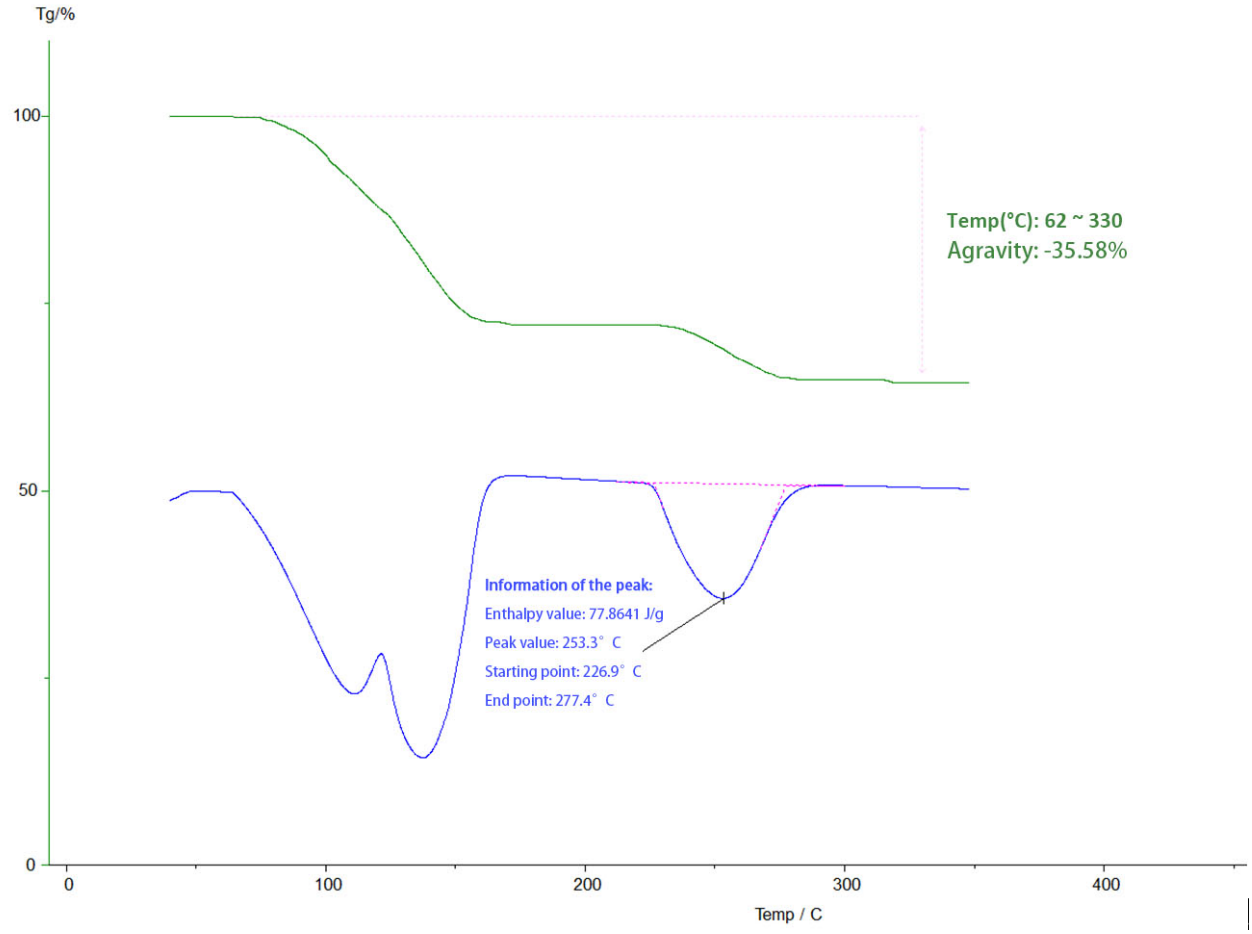
- The furnace body is heated by double-row winding of precious metal nickel-chromium alloy wire, which reduces interference and is more resistant to high temperatures.
- The tray sensor is made of precious metal nickel-chromium alloy, which has the advantages of high temperature resistance, oxidation resistance, and corrosion resistance.
- The power supply, circulating heat dissipation part is separated from the host, reducing the influence of heat and vibration on the micro-thermal balance.
- It adopts an open-top structure, which is convenient to operate. It is difficult to move the furnace body up to place the sample, and it is easy to cause damage to the sample rod.

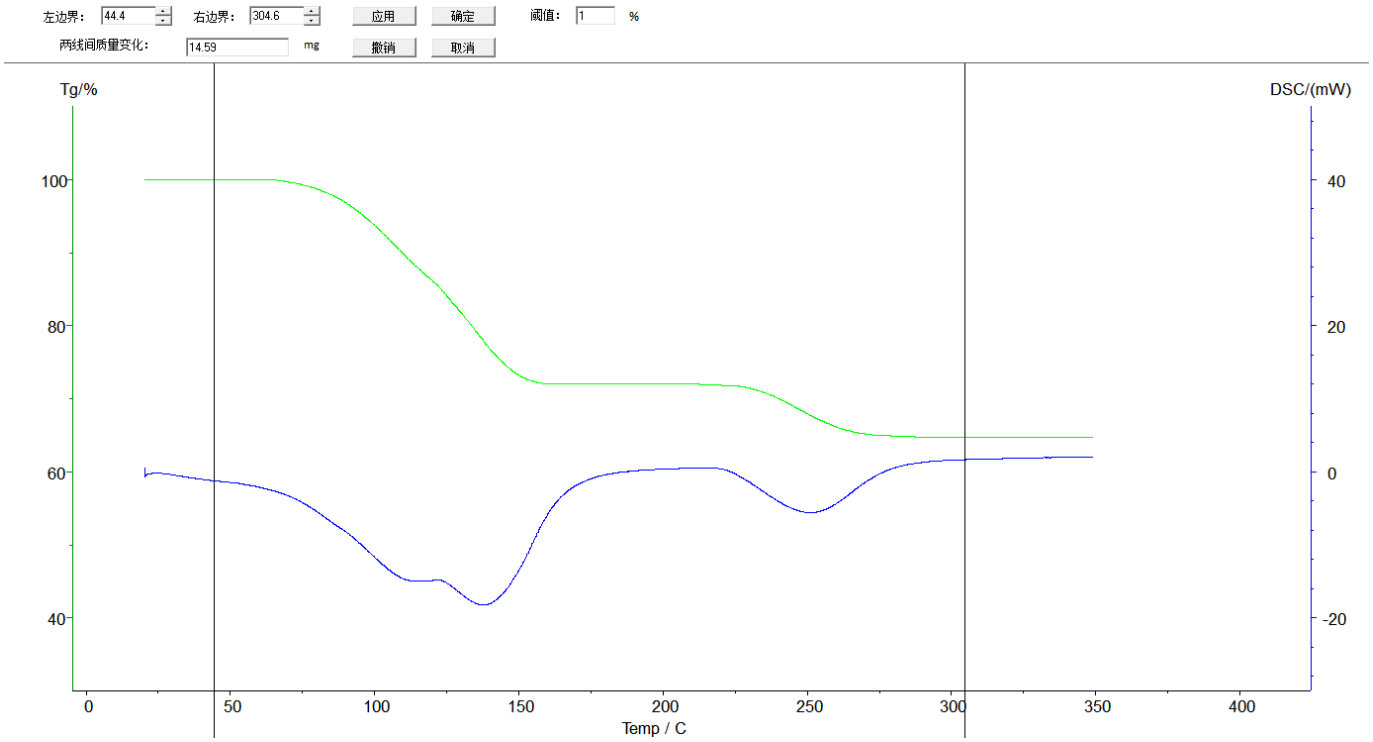
- The host adopts heat insulation device to isolate the heat influence of the heating furnace body on the chassis and the micro-thermal balance.
- The furnace body can be replaced according to customer requirements

Controller and software advantages

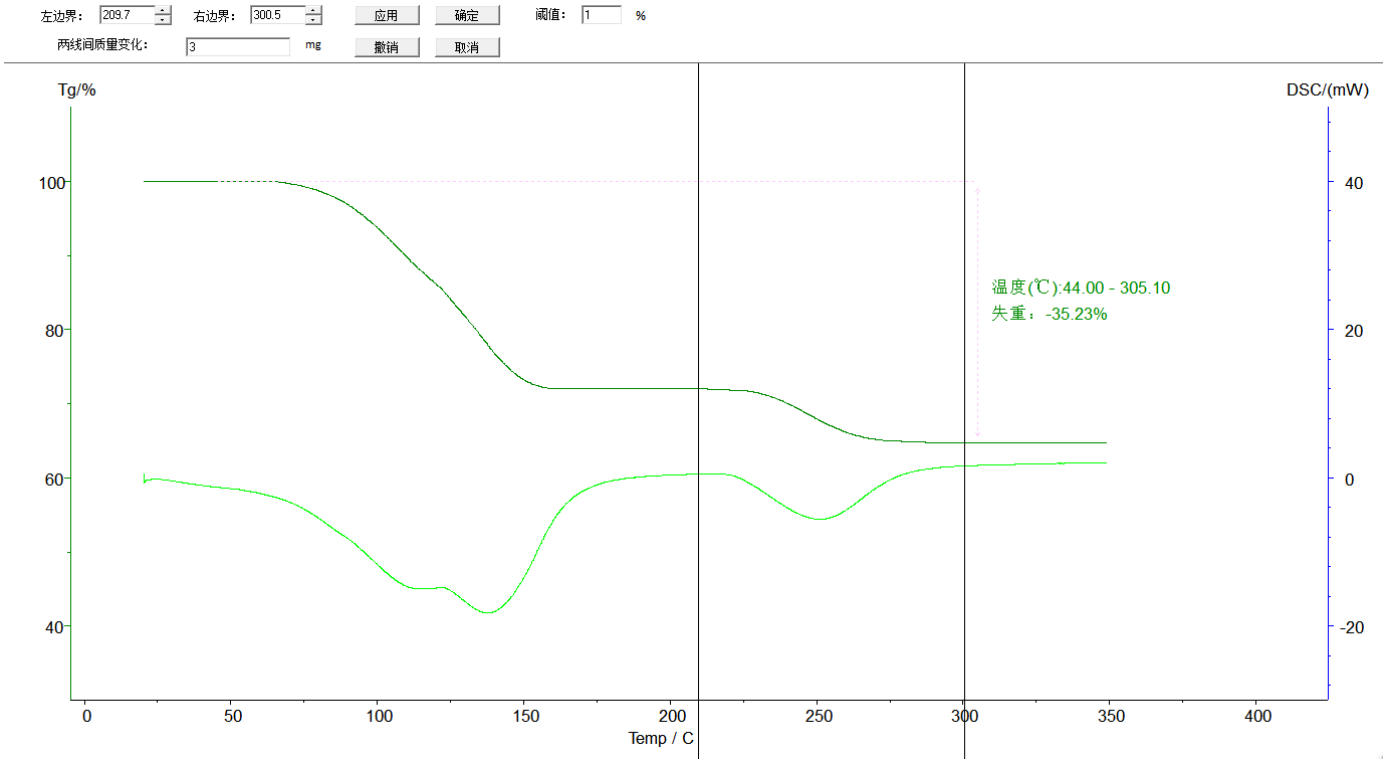
- Using imported 32bit ARM processor Cortex-M3 core, sampling speed, processing speed is faster.
- 24bit four-channel sampling AD collects DSC signal, TG signal and temperature T signal.
- The power supply and water circulation part are individually controlled by 8bit single-chip microcomputer to separate the host and the cooling part without interfering with each other, but the two are closely connected, and the cooling part is controlled by the host.
- The USB two-way communication is adopted between the software and the instrument to fully realize remote operation. The parameter setting of the instrument and the operation and stop of the instrument can be carried out through the computer software.
- 7-inch full color 24bit touch screen, better man-machine interface. TG calibration can be achieved on the touch screen

Test curves



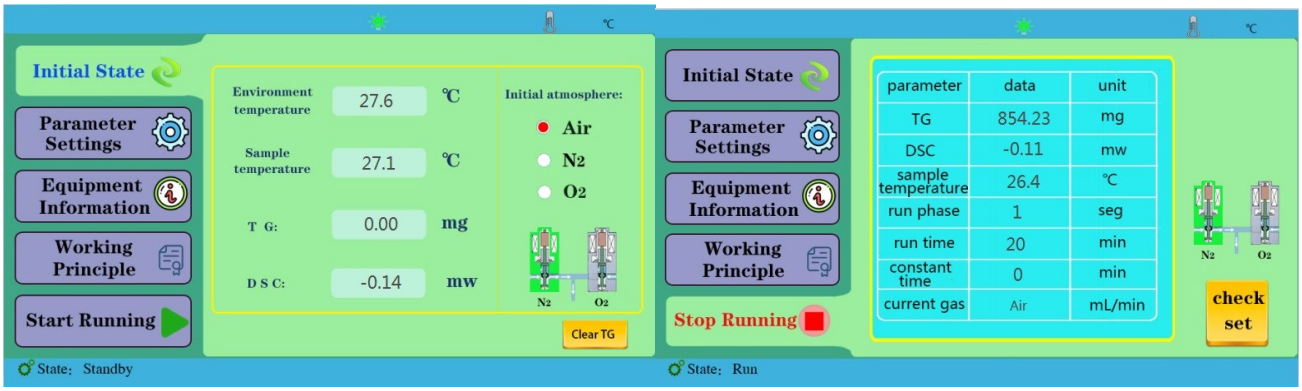


TGA CURVE



DSC CURVE

Interface



Technical parameters

Model	STA-2000	STA-3000
Temperature range	RT~1200°C	RT ~1550°C
Temperature resolution	0.01°C	0.01°C
Temperature fluctuation	±0.1°C	±0.1°C
Heating rate	0.1~100°C/min	0.1~100°C/min
Temp. control	PID algorithm control, heating, constant and cooling	PID algorithm control, heating, constant and cooling
Constant temp. time	0 ～ 300min arbitrarily set, (can be extended to 72h)	0 ～ 300min arbitrarily set, (can be extended to 72h)
Balance measuring range	0.01mg～2g, can be extended to 5g	0.01mg～2g, can be extended to 5g
TG Accuracy	0.01mg	0.01mg
TG resolution	0.1ug	0.1ug
Program control	Multi-stage heating control	Multi-stage heating control
DSC range	0～±600mW	0～±1000mW
DSC resolution	0.01mW	0.01mW
Display	24bit color, 7-inch LCD touch screen display	24bit color, 7-inch LCD touch screen display
Atmosphere device	built-in gas flow meter, including two-way gas switching and flow rate control	built-in gas flow meter, including two-way gas switching and flow rate control
Atmosphere	inert, oxidizing, reducing, static, dynamic	inert, oxidizing, reducing, static, dynamic
Software	Intelligent software can process data of TG, DTG, TG-DSC and other curves, export EXECL, PDF reports and print experimental reports	Intelligent software can process data of TG, DTG, TG-DSC and other curves, export EXECL, PDF reports and print experimental reports
Curve scan	heating scan, cooling scan	heating scan, cooling scan
Power supply	The power supply and the weighing system have an isolation shield to avoid AC interference, AC220V 50Hz	The power supply and the weighing system have an isolation shield to avoid AC interference, AC220V 50Hz
Operating software	Can be switched to differential,	Can be switched to differential,

	differential heating, thermogravimetry, and synchronous heating display	differential heating, thermogravimetry, and synchronous heating display
Crucible type	ceramic crucible, aluminum crucible	ceramic crucible, aluminum crucible
Communication interface	USB communication	USB communication

Packing list

ITEM	QTY
HOST	1 set
U disk	1 pc
data line	2 pcs
power cable	1 pc
Aluminum Crucible	200 pcs
ceramic crucible	200 pcs
ceramic cover	2 pcs
metal cover	1 pc
raw tape	1 L
Pure Tin	1 bag
10A fuse	5 pcs
Sample Spoon/Sample Press/Tweezers	1 each
ear ball	1 pc
Gas Pipe	2 roots
Counterweight	1 pc
sensor	1 pc
manual	1 pc
Warranty	1 pc
certificate	1 pc

Carbon Black Content Tester

1. CBT350 Carbon Black Content Tester

Introduction

- This instrument is suitable for the determination of carbon black content in polyethylene, polypropylene and polybutene plastics.
- The test of carbon black is obtained by the gravimetric analysis of the sample under the protection of nitrogen after high temperature decomposition.
- The instrument has the advantages of convenient use, simple operation, reliable work, accurate measurement and automatic temperature control.
- The content of carbon black is an important technical indicator in the performance of the product, and the content has a certain impact on the hardness, elasticity, wear resistance and insulation of the material.

Testing standard

- ISO 6964: Determination for the carbon black content of polyethylene pipes and fittings by calcination and pyrolysis
- IEC 60811-4-1: Common test methods for insulating and sheathing materials of electric and optical cables - Part 41:Methods specific to polyethylene and polypropylene compounds - Resistance to environmental stress cracking - Measurement of the melt flow index - Carbon black
- ASTM D1603-01
- Cable and optical cable insulation and sheath materials general test methods and other related test standards

Technical parameter

Model	CBT350
Display mode	liquid crystal display

Furnace size	Φ31×350±5mm
Heating element	high temperature alloy wire
Heating zone length	200mm
Length of constant temperature zone	150mm
Working temperature	room temperature~1050℃
Temperature control method	intelligent programmable control
Power supply	AC220V/50HZ/60HZ
Sensor sensitivity	0.1℃
Pneumatic control	two channels
Overheating protection	Yes

Packing list

Name	Quantity
Host machine	1 set
Furnace	1 set
Burning boat	10
Power Cord	1
10A fuse	5
Sensor	2
Hook	1
Crucible tongs	1
Hose	1 m, 3 m Each one
rubber stopper and glass tube	2 sets
Flow meter and regulator	

2. CBT350P Carbon Black Content Tester

Introduction

The carbon black content tester is suitable for the determination of carbon black content in polyethylene, polypropylene, polybutene plastics, cable and optical cable insulation and sheath materials, and rubber. It comply with national standards GBT 3515-2005, GBT 13021-1991, GB / T2951.41-2008, IEC60811-4-1: 2004, etc. A certain amount of sample is pyrolyzed at high temperature in a nitrogen stream, and the carbon black content is obtained by analyzing the weight of the sample after pyrolysis.

Technical Features

- With beautiful appearance and structure and is easy to operate;
- The integrated design of the heating furnace body and control system facilitates user instrument management;
- High degree of automation, just set the temperature value and heating time, and the instrument will automatically heat up to the set value;
- High temperature control accuracy, wide temperature range, and high furnace temperature uniformity;
- 8-inch LCD touch screen display, extremely friendly operation interface, can be started with one button operation;
- With constant temperature function and can set the constant temperature time, with high constant temperature accuracy;
- Can set any group of different heating time periods, and can have different heating temperatures, heating rates, and constant temperature times;
- Comprehensive parameter display, showing the set number of groups, theoretical temperature, actual temperature, and heating time (or constant temperature time);
- During the operation of the instrument, the set parameters and heating or constant temperature time can be viewed.

Technical Parameter

Model	CBT350P
Display mode	8-inch capacitive touch screen
Quartz tube size	Φ44×600±5mm
Furnace size	Φ45×300±5mm
Heating element	high temperature alloy wire
Length of heating zone	300mm
Working temperature	room temperature~1150° C
Temperature control method	Intelligent programmable control, section program can be set.
Power supply	AC220V/50HZ/60HZ
Sensor sensitivity	0.1° C
Pneumatic control	two channels, automatic program switching
Cooling method	rapid cooling (≤20min, 900° C to room temperature)
Number of test samples	Test 4 samples at a time
Data calculation	The software comes with a calculation function, one-key calculation; it can automatically calculate the carbon black content and ash content. Customized rail-type sample rack, easy to take and set out
Exhaust gas collection device	Filtering device (optional).
Customized rail-type sample rack	convenient for taking and placing samples.

Packing list

Name	Quantity
Host machine	1 set
Sample Holder	1 set
Burning boat	10 pcs
Power Cord	1 set
10A fuse	5 set
Rapid cooling device	1 set
Hook	1 set
Forceps	1 set
Hose	1 m, 3 m Each one
rubber stopper and glass tube	1 set

3. CBT350S Carbon Black Content Tester

Introduction

CBT350S carbon black content detector is a new testing instrument launched by Shuoboda. It adopts an open-top design, which is convenient for placing samples. It can measure 4 samples at a time and calculate carbon black content and ash content with one click.

Features

- The instrument adopts an open-cover design, making it convenient and quick to test samples.
- 7-inch LCD touch screen display, extremely friendly operation interface, can be started with one button operation.
- can measure 4 samples at a time, improving experimental efficiency and saving working time.
- The instrument can set any group of different heating time periods, and can have different heating temperatures, heating rates, and constant temperature times.
- One-click calculation function can quickly calculate carbon black and ash content.

Technical Parameter

Model	CBT350s
Display mode	7-inch capacitive touch screen
Quartz tube size	Φ44×600±5mm
Furnace size	Φ45×300±5mm
Heating element	high temperature alloy wire
Length of heating zone	300mm
Working temperature	room temperature~1200° C
Temperature control method	Intelligent programmable control, section program can be set.
Power supply	AC220V/50HZ/60HZ
Sensor sensitivity	0.1° C
Pneumatic control	two channels, automatic program switching
Cooling method	rapid cooling (≤20min, 900° C to room temperature)

Number of test samples	Test 4 samples at a time
Data calculation	Built-in calculation function, one-click calculation; can automatically calculate carbon black content and ash content
Exhaust gas collection device	Filtering device (optional).
Customized rail-type sample rack	convenient for taking and placing samples.
Open cover type	Rapid cooling, reducing test cooling time

Product Details

Open cover design, easy to operate

Test four samples with one click

USB interface bidirectional control

7-inch LCD touch screen display

Thermal Conductivity Meter

1.TCT-S Thermal Conductivity Tester

Product introduction

TCT-S is a transient heat source method thermal conductivity meter. It adopts a new appearance design, is simple and compact, and is equipped with a balance. It has the advantages of fast measurement speed, simple operation, and wide application range.

Transient plane heat source (TPS) thermal conductivity tester can be used to test the thermal conductivity of various types and shapes of materials. The transient plane heat source method is a new method for studying thermal conductivity performance, which brings the measurement technology to a new level. It can quickly and accurately measure the thermal conductivity when studying materials, which provides great convenience for enterprise quality monitoring, material production and laboratory research. It can be equipped with powder test containers and liquid cups.

Main test objects

Material Type: metals, ceramics, alloys, minerals, polymers, composites, paper, fabric, foam (flat surface insulating materials, sheet metal), polyurethane, phenolic, urea-formaldehyde, mineral wool (glass wool, rock wool, mineral wool), cement walls, glass reinforced composite panels CRC, cement polystyrene plates, sandwich concrete, glass and steel panels composite plates, paper honeycomb panels.

Features

- Test range is wide and the test performance is stable. It is at the priority level among similar domestic instruments;
- Direct measurement, the test time can be set about 5-160s, which can quickly and accurately measure the thermal conductivity, saving a lot of time;
- Will not be affected by contact thermal resistance like static method;
- No special sample preparation is required, and there are no special requirements for the shape of the sample. The bulk solid only needs to have a relatively smooth sample surface and meet the length and width of at least twice the diameter of the probe;
- Non-destructive testing of samples means that the samples can be reused;

- The probe is designed with a double helix structure, combined with the exclusive mathematical model, and the core algorithm is used to analyze and calculate the data collected on the probe;
- The structure design of the sample table is ingenious, easy to operate, suitable for placing samples of different thicknesses, and at the same time simple and beautiful;
- The data acquisition on the probe uses an imported data acquisition chip. The high resolution of the chip can make the test results more accurate and reliable;
- The control system of the host uses an ARM microprocessor, which has a faster calculation speed than traditional microprocessors, improves the analysis and processing capabilities of the system, and makes the calculation results more accurate;
- The instrument can be used for the determination of thermophysical parameters such as block solids, paste solids, granular solids, colloids, liquids, powders, coatings, films, and thermal insulation materials;
- Intelligent man-machine interface, color LCD screen display, touch screen control, convenient and simple operation;
- Powerful data processing capabilities. Highly automated computer data communication and report processing system

Reference standard

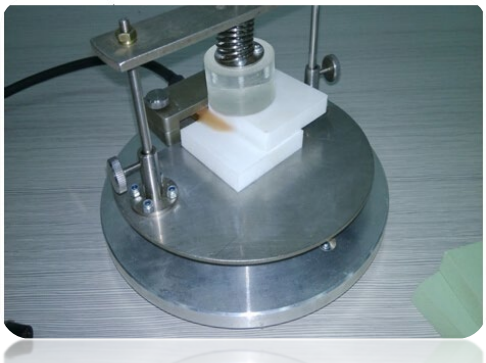
ISO22007-22008

Technical parameters

Model	TCT-S
Test range	0.0001—300W/(m*K)
Measuring temperature range	RT-130° C
Probe diameter	7.5mm (NO.1), 15mm (No. 2), 50mm (No. 3)
Accuracy	± 3%
Repeatability error	≤3%
Measuring time	5 ~ 160s
Heating rate of sample	< 15° C
Testing sample power	0~1w (NO. 1 sensor), 0~20w （No.2）
Sample size(D*H)	≥15*15*3.75mm (probe No.1) ≥30*30*7.5mm (probe No.2) ≥50*50*7.5mm (probe No.3) (Other specifications can be customized, optional)
Power	AC 220V, (110V is optional)
Work environment	0~40 ° C
Total Power	<500w

*Note: Measurement of probe No. 1 is a low-conductivity material with a thinner thickness (λ≤0.2W/(m*K)), If surface of the tested sample is smooth, flat and viscous, samples can be superimposed.*

SAMPLE TESTING



2.DCT501 Dielectric Constant Tester

Introduction

Medium loss and dielectric constant are an important physical property of materials such as metal oxide, plank, porcelain (pottery), mica, glass, plastics, etc. Through measurement, the various factors of dielectric loss and dielectric constant can be further understood, providing conditions for improving the properties of materials. The equipment is used for applied research of inorganic metal new material properties in scientific research institutions, schools, factories and other institutions.

Application range

Measure the dielectric constant and dielectric loss coefficient of insulating materials (loss tangent value)

Unique technology

- Automatically deducts residual inductance and test lead inductance. Significantly improve measurement accuracy.
- Large capacitance value is directly measured and displayed.
- Digital microscopic measuring device, direct reading.

Features:

- Large capacitance value direct measurement display function: measured value up to 25nF
- Dielectric loss coefficient: Accuracy: 1/10000 / LCD direct display
- Dielectric constant: Accuracy: one thousandth / LCD direct display
- Material test thickness: 0.1mm-10mm

Reference standard

GB/T1693-2007

Technical parameter

Model	DCT501
Signal source range DDS digital synthesis signal	10KHZ-100MHZ
Signal source frequency coverage ratio	7000: 1
Signal source frequency accuracy 6 effective digits	3×10-5 ±1 word
Sampling accuracy	12BIT high-precision AD sampling ensures the stability of Q value and the stability of low dielectric loss material testing
Q measuring range	1-1000 automatic/manual range
Q resolution	4 effective digits, resolution 0.1
Q measurement working error	<5%
Inductance measurement range 4 effective digits, resolution 0.1nH	1nH-140mH resolution 0.1nH
Inductance measurement error	<3%
Tuning capacitor	main capacitor 17-240pF (one body silver-plated molding, high precision)
Capacitor automatic search	Yes (with stepping motor)
Direct capacitance measurement range	1pF～25nF
Tuning capacitance error	±1 pF or <1%
Resolution	0.1pF
Resonance point search	automatic scanning
Q Qualified preset range	5-1000 sound and light prompt
Q range switching	automatic/manual
LCD display parameters	F, L, C, Q, Lt, Ct, Er, Tn, etc.
Residual inductance and test lead inductance	Yes
Automatic deduction function	Yes
Large capacitance value direct measurement and display function	The measured value can reach 25nF
Dielectric loss factor	accuracy 1/10000 / LCD direct display
Dielectric constant	accuracy 1/1000 / LCD direct display
Material testing thickness	0.1mm-10mm

Shuoboda Instruments (Hunan) Co., ltd
Room 317, Building 4, Longping High tech Park, Furong District, Changsha City, Hunan Province, China, 410028
Mobile/WeChat/WhatsApp: +86 17375888190
Email: shuoboda@163.com
Website: www.shuoboda.com