HITACHI
Inspire the Next

PRODUCT GUIDE / TA7000 Series

Hitachi High-Tech Science Corporation

Thermal Analyzer

TA7000 Series

DSC 7000 Series

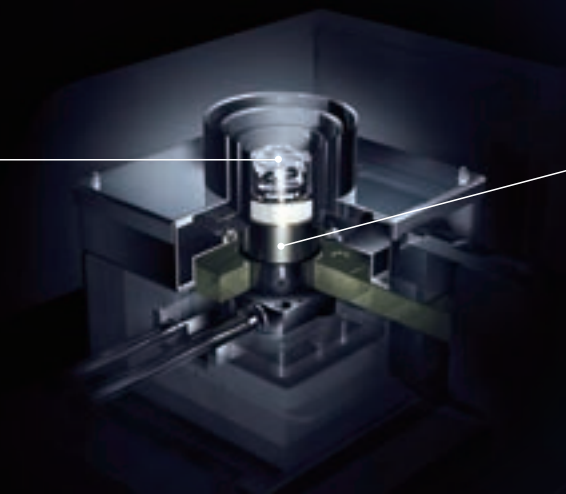
DSC7000X

High Sensitivity Differential Scanning Calorimeter

DSC7000X achieves unbeatable DSC sensitivity and repeatability
with a superior new sensor and furnace.
Hitachi High-Tech Science supplies the state of the art DSC for real experts.

New Sensor

In this newly designed sensor multiple thermocouples guarantee high sensitivity, while the centric heat-flow method provides uniform and stable heat flow to sample and reference and therefore extremely stable baselines.



New Furnace

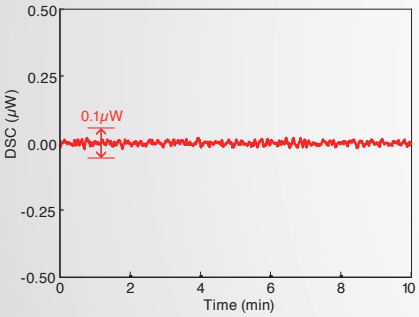
Low heat capacity and three layer insulation design optimized by advanced computer modeling minimizes Influences of external condition and therefore avoid baseline fluctuation and improves in signal to noise ratio.

DSC7000X

DSC7000X with Auto Sampler

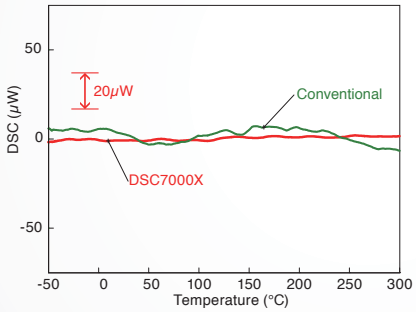
Fundamental Performance

DSC7000X improves the reliability of data with its superior sensitivity, repeatability and expandability.
The ability meet various applications such as high sensitivity measurement, direct sample observation and photochemical reactions as well as general DSC measurements makes DSC7000X the best choice for many DSC users.



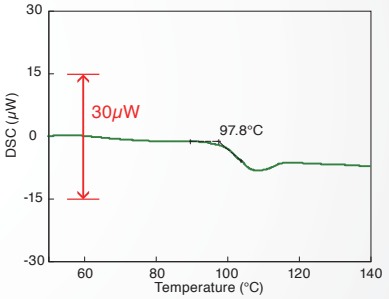
High Sensitivity: 0.1μW

Twice the sensitivity compared to our conventional model. Very small peak could be detected for analysis.



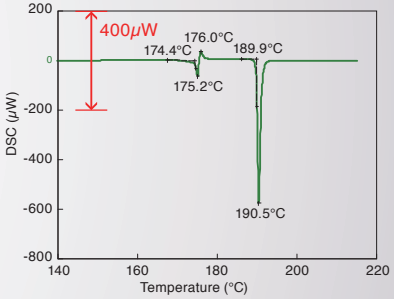
Baseline Repeatability: ±5μW

Baseline is highly stable which is four times superior to our conventional model. (Electrical Cooling Unit)



Small amount of Polystyrene (PS)

The above is a glass transition measurement of PS with the sample amount of only 0.105mg.

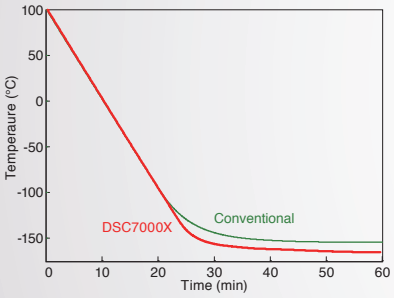


Small amount of Carbamazepine

This also shows a high sensitivity performance of DSC7000X.
The sample is only 0.03mg.

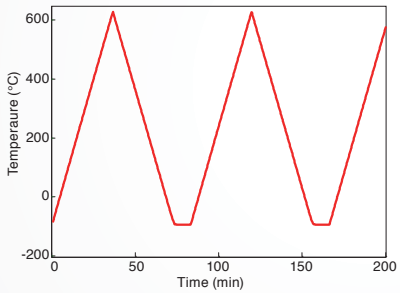
Temperature Control Performance

Dramatically improved cooling capability enables accurate temperature control down to low temperatures.
Both Auto LN_2 Gas Cooling Unit and Electrical Cooling Unit can be connected at the same time,
that eliminates troublesome cooling unit replacement.



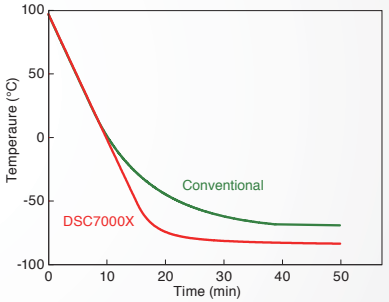
Cooling linearity: below -100℃

This shows the superior ability to control sample temperature at 10°C/min below -100°C using Auto LN_2 Gas Cooling Unit.



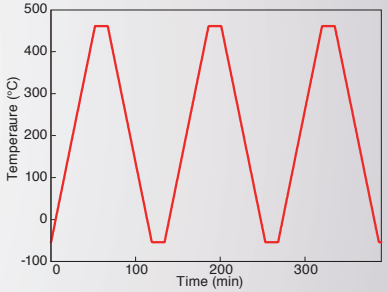
Heating / Cooling cycle

Stable sample temperature control at heating and cooling cycle at 20°C/min with Auto LN_2 Gas Cooling Unit.



Cooling linearity: below -50℃

Sample temperature curve at 10°C/min with Electrical Cooling Unit. Improved control ability keeps the linearity below -50°C.

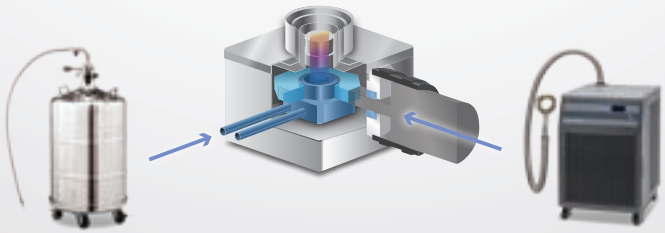


Heating / Cooling cycle

Electrical Cooling Unit enables superior temperature control at heating / cooling cycle down to below -50°C (10°C/min) .

Auto LN_2 Gas Cooling Unit

Temperature range: -150 to 725℃
Linear cooling rates below -100℃
at 10℃/min



Electrical Cooling Unit

Temperature range: -80 to 500℃
Linear cooling rates below -50℃
at 10℃/min

DSC7020

Differential Scanning Calorimeter

DSC7020 is a high-end versatile model with unique sensor that realizes high sensitivity and resolution performance. The superior basic performance together with the versatility makes DSC7020 ideal for various applications in both routine and research.

Unique Oval shaped Sensor

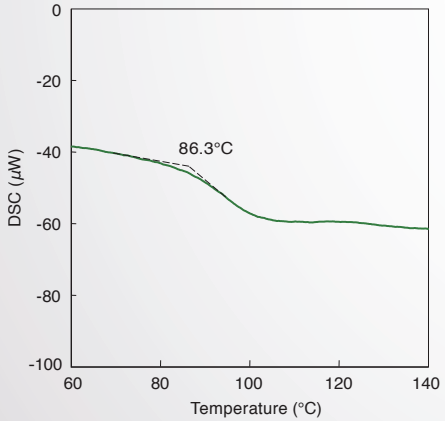
The unique oval (ellipse) shaped sensor providing a shortest thermal path between sample and reference results in reduction of thermal resistance. This allows faster thermal response and improvement in resolution accordingly. Thermal path restricted by thermal filter between the main heat sink and small heat sink lowers the noise level and improves in sensitivity.

DSC7020

DSC7020 with Auto Sampler

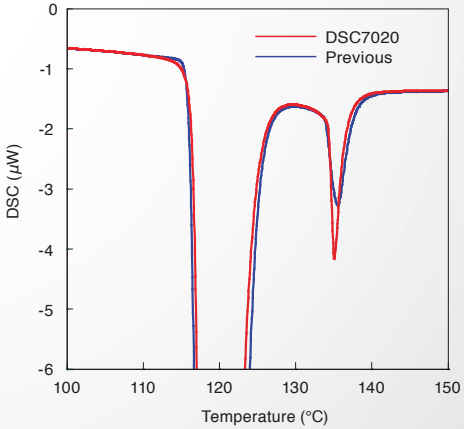
Improved Overall Performance

Unique sensor design and improved ability in heater control gives drastically improved baseline and sensitivity performance.
Lower noise level and baseline stability enable detection of week transitions with small amount of sample.
Wide measurement range and use of Hitachi High-Tech Science pressure sample pans make DSC7020 best choice in a wide application range including safety evaluations.



Small amount of Polystyrene (PS) / Sample weight: 0.18mg

Above is a T_g measurement result of PS.
Improved sensitivity of DSC7020 allows detection of T_g with only 0.18mg of sample.



High Resolution / Azoxyanisole resolution: 1.8

This is a measurement of two closely occurring transitions of azoxyanisole. It shows improved resolution of DSC7020 over our previous model (DSC6200).

Full Line Options

Cooling Unit

Forced Air Cooling Unit, Ambient to 725℃
Cooling can, -170 to 725℃ A
Auto LN_2 Gas Cooling Unit, -150 to 725℃ B
Electrical Cooling Unit, -70 to 420℃ C

A

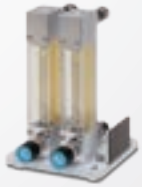
B

C

Gas Control Unit

Flow Meter D
Gas Control Unit*1 E
Mass Flow Control Unit*2 F

D



E

F

Auto Sampler Unit

UV Irradiation Unit → P14

Real View Sample Observation Unit → P34

*1 The electromagnetic valves and controller are built into the main unit.
*2 The Mass Flow Control Unit is built into the main unit.

DSC7000 Series Specifications

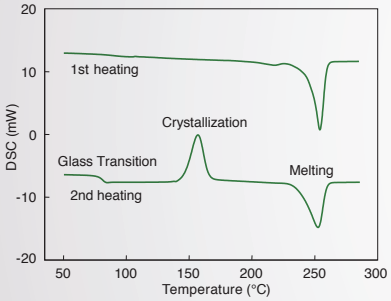
Model name		DSC7020	DSC7000X
Heat Flow Measurement Method		Heat flux	
Temperature Range		-170 to 725°C	-150 to 725°C
Temperature Precision (Indium)		±0.2°C	±0.1°C
DSC Measurement Range		±350mW	±100mW
RMS noise / Sensitivity		0.1μW / 0.2μW	0.05μW / 0.1μW
Calorimetric Repeatability (Indium)		0.3J/g	0.1J/g
Scanning Rate		0.01 to 100°C/min	
Atmosphere		Air, Inert gas flow	
Sample Pans*		• Open pans (Aluminum, Platinum, Alumina) • Low-Pressure sealed pans (Aluminum, Chromated Aluminum) • High-Pressure sealed pans (Aluminum, Silver, Stainless-steel, Gold-plated stainless-steel)	
Gas Purge Control*		• Flow Meter • Gas Control Unit • Mass Flow Control Unit	
Cooling Unit*	Cooling can	-170 to 725°C	N/A
	Forced Air Cooling Unit	Ambient to 725°C	
	Auto LN_2 Gas Cooling Unit	-150 to 725°C	
	Electrical Cooling Unit	-70 to 420°C	-80 to 500°C
Auto Sampler Unit *		Available (max. 50samples, Mechanical arm transport, Quench cooling)	
Real View Sample Observation Unit*		Available	
PDC-7 UV Irradiation Unit*		Available	

*Optional

DSC7000X System

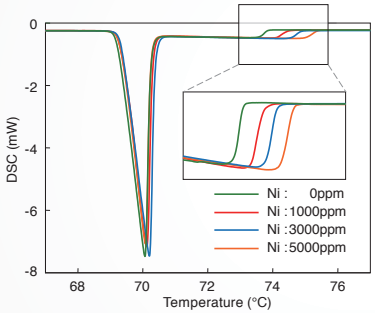
DSC7020 System

DSC Applications



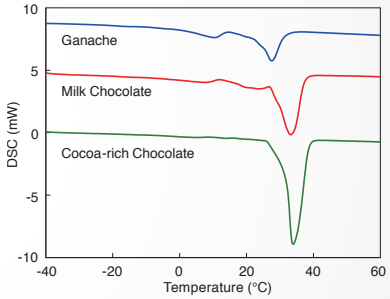
Polyethylene terephthalate (PET)

The above is a comparison of 1st and 2nd heating DSC curves of PET. In the 2nd heating (lower), *T*g and cold crystallization peak are observed since the sample was converted to amorphous after rapid cooling.



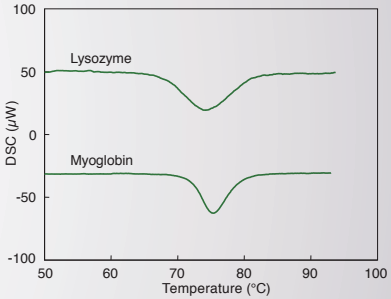
Lead-free Solder

This shows the DSC results for In35Bi2SnNi solder at different composition ratios. Unlike the eutectic melting peaks, there are differences in the solid-phase melting.



Chocolate

This is a comparison of DSC curves of three types of chocolates. The melting temperature varies according to cacao butter content.



Protein

This shows thermal denaturation measurements of 1% Lysozyme and Myoglobin solutions. DSC can be used to evaluate thermal stability of protein.

PDC-7 / PDC-7X UV Irradiation Unit

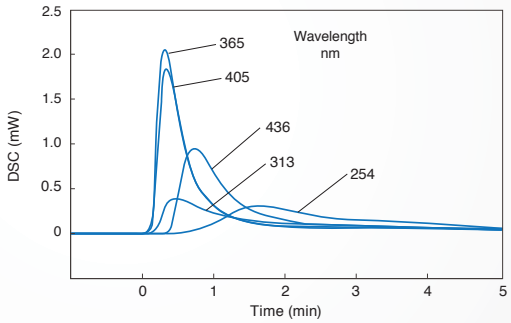
Photochemical Reaction DSC System

The photochemical reaction can be measured by both DSC7020 and DSC7000X with optional PDC UV Irradiation Unit. Reaction of photosensitive resin can be evaluated with different wavelengths and variable irradiation intensity which can be set precisely using digital UV intensity meter*.

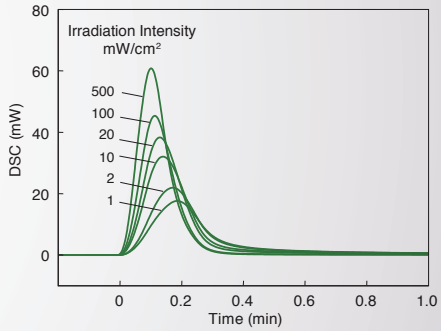
* Optional

Applications

Wavelength dependency of Photoresist



Irradiation intensity dependency of UV curing adhesive



Specifications

Model name	PDC-7 for DSC7020 PDC-7X for DSC7000X
Temperature Range	Ambient to 150°C
Light Source	Hg-Xe lamp (Quartz Type, 200W)
Light Guide	Quartz Optical Fiber (D 5mm, L 1000mm)
Irradiation Wavelength	240 to 550nm
Irradiation Range	Sample / Reference 2 branching optical fibers system, Each D 8mm or more
Wavelength-selective Filter*	254, 313, 365, 405, 436nm
Irradiation Intensity	Maximum 500mW/cm² or more
Irradiation Intensity Adjustment	0 to 100%, in 0.1% increments
Shutter Control	Can be interlocked with temperature program

*Optional

Sample Pans and Sample Sealer

Various different types of sample pans in material, shape and volume are available for DSC measurement. Depending on property of sample and measurement condition it is important to use a sample pan most suitable for the purpose of analysis. There are roughly two types of sample pan, open type and hermetically sealed type. In hermetically sealed type, there are low-pressure type and high-pressure type.

Sample sealer is used to crimp or hermetically seal sample pans before measurement. Crimping open type pan reduces internal temperature distribution for more accurate measurement. Sealing type pan prevents vaporization of water or volatilization of organic solvent. Electrical Sample Sealer can automatically crimp and seal sample pans only by pressing start button. It is especially useful in routine measurement or for auto sampler.

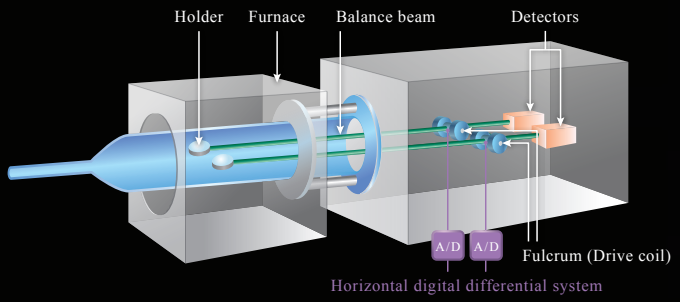

Sample Sealer


Electrical Sample Sealer

STA7000 Series

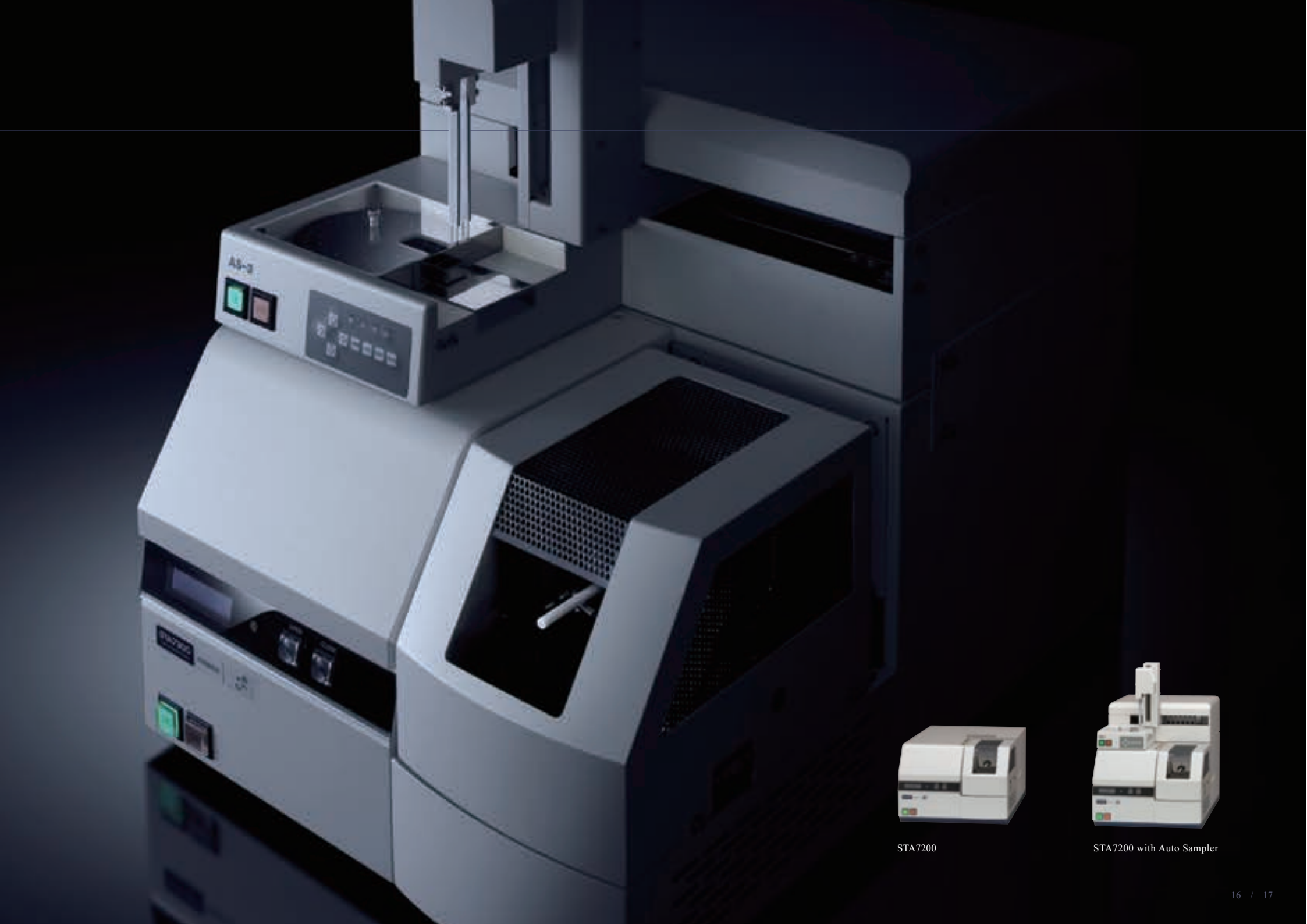
Simultaneous Thermogravimetric Analyzer

STA7000 provides simultaneous measurement of both TG and DTA/DSC with a wide temperature range.
The horizontal dual beam design ensures highly accurate and precise data enabling it to detect μg level weight change.



New Balance Control Technology – Horizontal Digital Dual Beam System –

The newly-developed “Horizontal Digital Dual Beam System” guarantees excellent baseline stability and significantly low noise level ever seen in TG/DTA/DSC simultaneous analysis. Very small weight changes can be measured and analyzed without any time consuming baseline corrections.

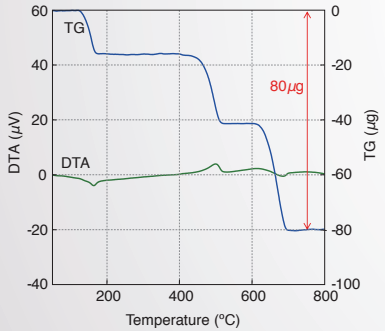


STA7200

STA7200 with Auto Sampler

Highly Precise Balance Control

The highly sophisticated digital analysis of the weight and DTA difference of the dual beam system allows it to correct any environmental influences such as furnace, detector positions and thermal expansions of the beams.

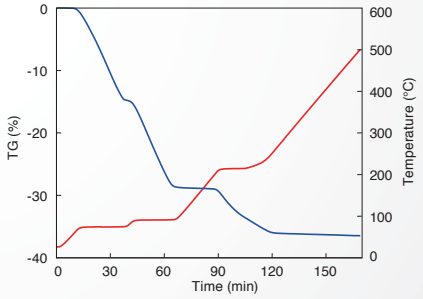


Small amount of $CaC_2O_4 \cdot H_2O$
Sample weight: 130μg

With only 0.13mg of Calcium Oxalate monohydrate, three distinct weight losses are precisely measured.

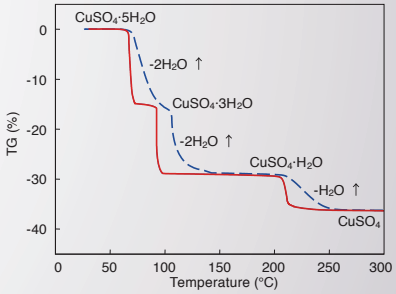
Controlled Rate Thermal Analysis (CRTA)

The CRTA is a measurement method which automatically controls heating rate according to the signal change of thermal analysis module. It is possible to separate the weight changes that occurs at very close temperature. The STA7000 series support the CRTA function as standard. The parameter can be chosen by the operator.



CRTA on $CuSO_4 \cdot 5H_2O$

Each step of multi-step dehydration are clearly distinguished, and the weight decrease rate at each step fits to the theoretical value.



Comparison of CRTA and standard method

This shows CRTA (—) more clearly isolate and detect each dehydration process than standard method (– –).

Optional Furnace tube

Vacuum Furnace Tube*1

Vacuum Furnace Tube is another optional tube specially designed for measurement under vacuum or reduced pressure. 1.3Pa can be achieved with this optional tube and external pumping system.

Corrosive Gas Furnace Tube*1 *2

Corrosive Gas Furnace Tube can be used for measurement under special atmosphere such as corrosive gases. It enables such measurement without damage of the balance mechanism.

One Touch Designed Balance Beam

The one touch type balance beam design allows users to replace the beams easily by themselves. Light weight balance beam enables STA7000 series to provide highest sensitivity and stability performance.

*1 Optional

*2 There are limitations on the types of corrosive gases that can be used with corrosive gas furnace tube.

STA7000 Series Specifications

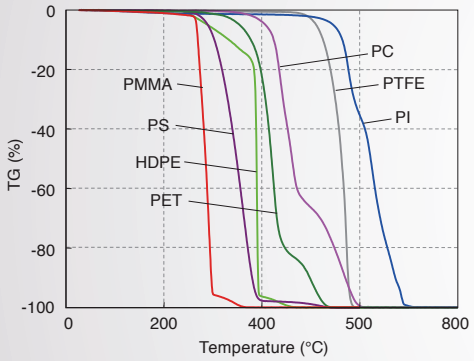
Model name	STA7200	STA7200RV	STA7300
Balance System	Horizontal Differential Type		
Temperature Range	Ambient to 1100°C	Ambient to 1000°C	Ambient to 1500°C
Scanning Rate	0.01 to 150°C/min		0.01 to 100°C/min
TG Measurement Range	±400mg		
TG RMS noise / Sensitivity	0.1μg / 0.2μg		
DTA Measurement Range	±1000μV		
DTA RMS noise / Sensitivity	0.03μV / 0.06μV		
Maximum Sample Weight	200mg		
Atmosphere	• Air, Inert gas flow • Vacuum* (to 1.3Pa)		
Purge Gas Flow Rate	0 to 1000mℓ/min		
Gas Purge Control*	• Flow Meter • Gas Control Unit • Mass Flow Control Unit		
Sample Pans*	• Open pans (Aluminum, Platinum, Alumina)		
Cooling Unit	• Auto Fan Cooling Unit • Forced Air Cooling Unit		
Auto Sampler Unit *	Available (max. 50samples, mechanical arm transport)		
Real View Sample Observation Unit*	N/A	Available	N/A

*Optional

STA7300 System

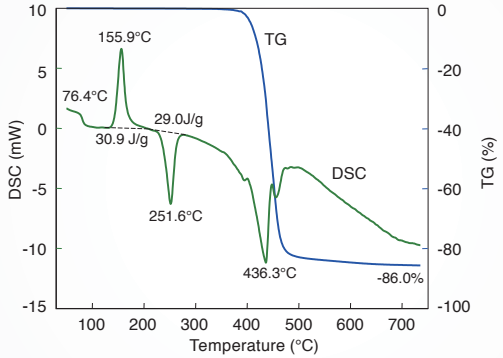
STA7200RV + RV-3TG System

STA Applications



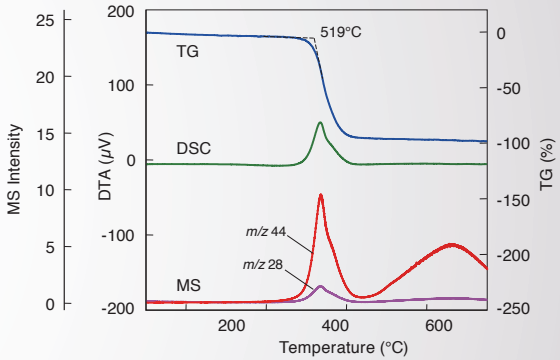
Thermal decomposition of Polymers

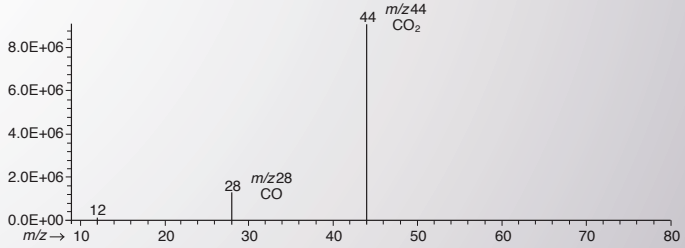
This is a comparison of TG results of various polymers. It shows that thermal decomposition behavior differs by polymer type.



TG/DSC measurement of Polyethylene terephthalate (PET)

DSC result shows the calorimetric analysis for crystallization and melting and TG result shows weight change by thermal decomposition.





TG-MS analysis of Fullerene C_{70}

Weight loss was detected by TG at around 520˚C and the evolved gas was identified by MS as CO and CO_2.

TMA7000 Series

Thermomechanical Analyzer

TMA7000 series have great flexibility with various measurement modes
to meet many different applications. With the capability of stress-strain control,
TMA7000 series provide analysis of dynamic characteristic
as well as static and dynamic viscoelastic measurement.

Designed to meet all Application needs

Wide dynamic ranges: Measurement range ±5 mm, Load range ±5.8 N, Maximum sample size; D 10 × L 25mm. Stress-Strain, Creep / Recovery, Stress-Relaxation, and DMA measurements increase the value of use above the conventional TMA measurements such as thermal expansion, glass transition and softening. The complete range of measurement probes and cooling units covers all application needs.

TMA7000 Series

Wealth of Cooling System

- LN_2 Dewar Vessel A
- Auto Fan Cooling Unit* B
- Auto LN_2 Gas Cooling Unit* C
- Electrical Cooling Unit* D

A

B

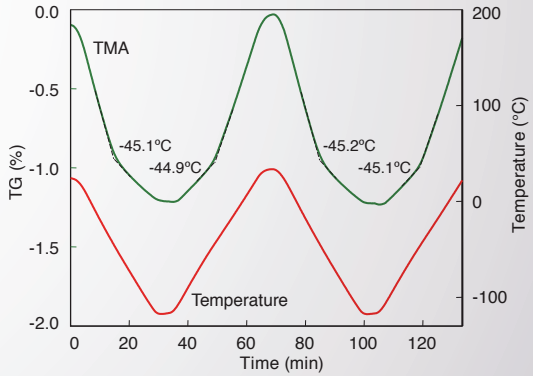
C

D

*Optional

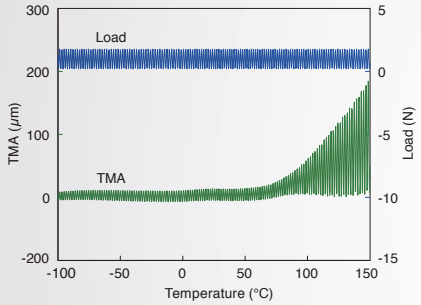
Excellent Heating and Cooling Performance

TMA7000 series provide superior temperature control performance in wide temperature range. High sensitivity measurement can be carried out even at low temperatures.

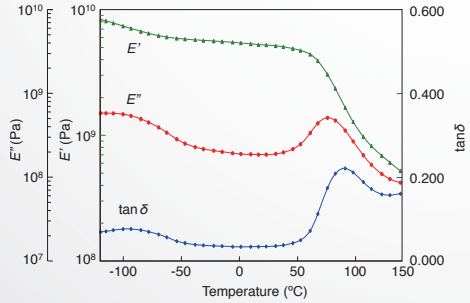


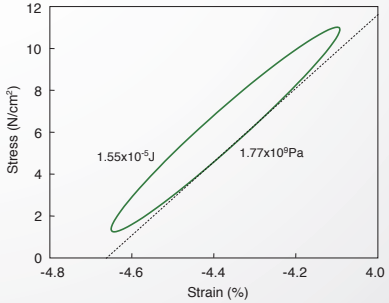
In this TMA measurement, natural rubber was cooled and heated repeatedly using Auto LN_2 Gas Cooling Unit. Its excellent temperature control performance can be seen from the data reproducibility in glass transition measurement.

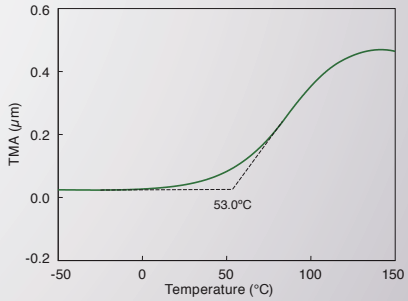
Stress-Strain Capabilities



The TMA7000 series has stress strain measurement and analysis capability. Stress-Strain characteristic, Creep/Recovery, Stress Relaxation can be measured, and furthermore, applying sinusoidal force to samples the dynamic viscoelastic behavior can be characterized.







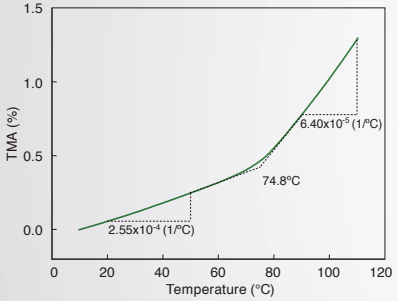
TMA7000 Series Specifications

Model name		TMA7100	TMA7300
Temperature Range		-170 to 600°C	Ambient to 1500°C
Scanning Rate		0.01 to 100°C/min	
Sample Tube		• Quartz • Metal*	• Alumina • Quartz*
Probe		• Quartz Expansion Probe • Quartz Penetration Probe* • Quartz Cone Probe* • Quartz Tension Probe* • Quartz Bending Probe* (to 500°C) • Volume Expansion Accessory* (Ambient to 200°C) • Metal Tension Probe*	• Alumina Expansion Probe • Quartz Expansion Probe* (to 1000°C) • Quartz Penetration Probe* (to 1000°C) • Quartz Cone Probe* (to 1000°C) • Quartz Tension Probe* (to 600°C) • Quartz Bending Probe* (to 500°C)
Probe Supporting Method		Cantilever	
TMA Measurement Range		±5mm	
RMS noise / Sensitivity		0.005µm / 0.01µm	
Load Range / Resolution		±5.8N / 9.8μN	±1.47N / 9.8μN
Maximum Sample Dimensions		Expansion, Penetration: D 10 × L 25mm Tension: W 5 × T 1 × L 25mm	Expansion: D 10 × L 25mm
Sample Length Measurement		Automated Measurement	
Atmosphere		• Air, Inert gas flow • Vacuum* (to 13Pa) • Swelling* (to 80°C) • Humidity control* (to 90°C, 90%RH)	• Air, Inert gas flow • Vacuum* (to 13Pa)
Stress Control Mode		• Constant Loading: ±5.8N • Constant Rate Loading: 9.8×10^{-2} to 9.8×10^{6}mN/min • Sinusoidal Loading: 0.001 to 1Hz • Combination: maximum 40 steps	
Strain Control Mode		• Constant Strain: ±5000µm • Constant Rate Strain Control: 0.01 to $10^{6}\mu$m/min • Sinusoidal Strain Control: 0.001 to 1Hz • Combination: maximum 40 steps	
Gas Purge Control*		• Flow Meter • Gas Control Unit • Mass Flow Control Unit	
Cooling Unit	LN_2 Dewar Vessel	-170 to 600°C	N/A
	Auto Fan Cooling Unit*	Ambient to 600°C	Ambient to 1500°C
	Auto LN_2 Gas Cooling Unit*	-150 to 600°C	N/A
	Electrical Cooling Unit*	-60 to 450°C	N/A

*Optional

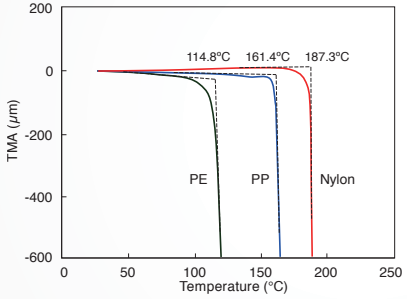
TMA7100 System

TMA Applications



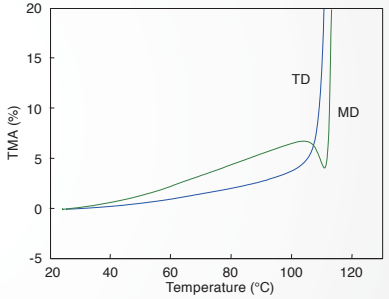
Thermal Expansion of Polyvinyl chloride (PVC)

CTE (coefficient of thermal expansion) changes at the glass transition temperature. CTE after T_g is approximately 4 times larger.



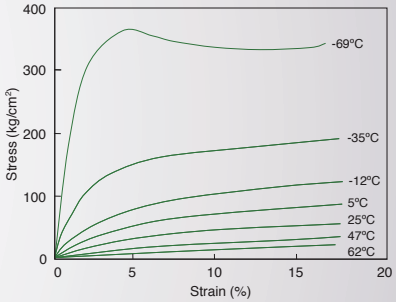
Penetration on Polymer film

Comparison of softening temperatures between different polymer films, Polyethylene, Polypropylene and Nylon evaluated by penetration measurement.



Anisotropy of Polyethylene (PE) film

In above measurements of PE film, tension force is applied in machine direction (MD) and the transverse direction (TD).



Stress-Strain characteristic of Polyethylene (PE) film

The measurements are carried out on PE film with strain control mode at different temperatures.

DMA7100

Dynamic Mechanical Analyzer

With its advanced overall performance and user-friendly design,
DMA7100 is ideal for routine and research use. Navigation guide in the software
and the simple sample clamping design allows for operation without difficulty.

Tension

Tension Spring Chuck

Dual-Cantilever Bending

3-Point Bending

Compression

Shear

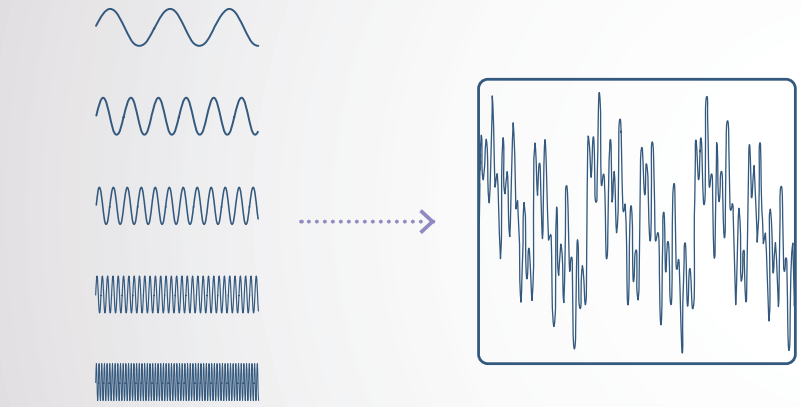
Film-Shear

Variety of Deformation Modes

As standard the DMA7100 comes with the tension attachment. To be able to measure samples with different characteristics a variety of optional attachments are available. This ranges from Dual and Single Cantilever Bending, 3-Point Bending with different active lengths, Shear and Film-Shear, to Tension and Compression. This allows characterization of all sample shapes as well a single fiber as stiff bulk samples.

DMA7100

Synthetic Oscillation Mode



Five Different Sinusoidal Wave **Synthesized Wave**

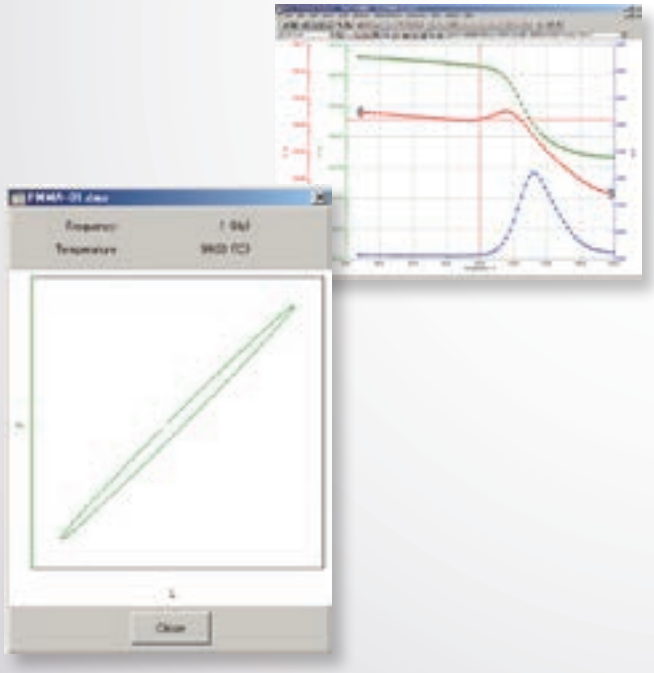
In this mode, measurement is proceeded with synthesized waveform from five different frequencies. This allows one to apply multiple frequencies on samples which undergo drastic softening in a very narrow temperature range.

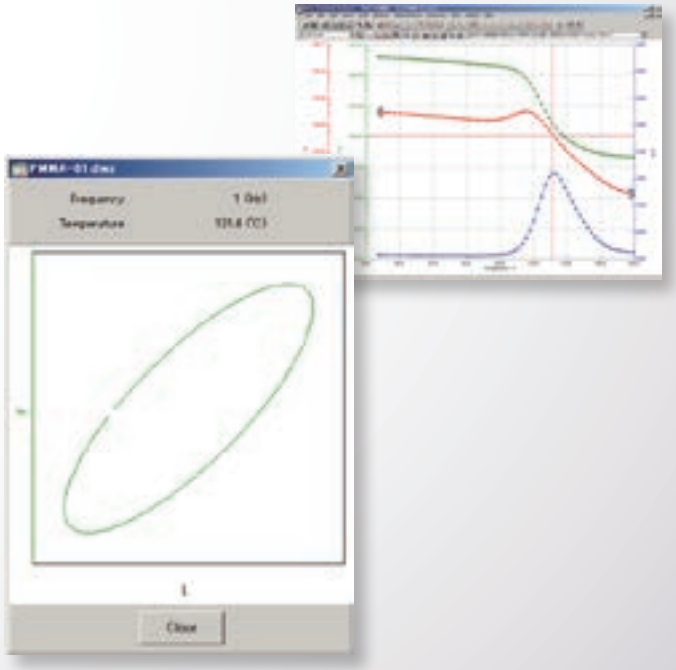
Simple Measurement Wizard

Any users who are unfamiliar with DMA can operate DMA7100 with the Simple Measurement Wizard.
It guides you with easy-to-follow navigation in every step from condition setting to measurement.

Lissajous Monitor

DMA7100 is equipped with Lissajous monitor for observing the relationship between stress and strain of the sample under measurement. With Lissajous monitor, the deformation of the sample can be verified in real time and also after measurement at every measurement point, thus reliability of data acquisition improves.

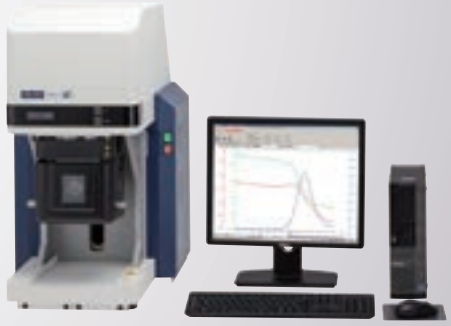




DMA7100 Specifications

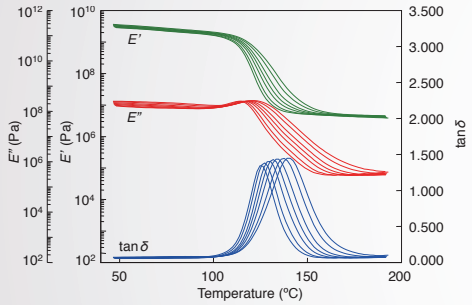
Model name		DMA7100					
Deformation Mode		Tension	Dual-Cantilever Bending	3-Point Bending	Shear	Film-Shear	Compression
Measurement Range (1Hz)		10^5 to 10^{12}Pa	10^5 to 10^{12}Pa	$10^{6.5}$ to $10^{13.5}$Pa	10^3 to 10^9Pa	10^4 to 10^{10}Pa	10^5 to 10^9Pa
Measurement Mode		• Dynamic Measurements: Sinusoidal wave oscillation mode / Synthesis wave oscillation mode • Static Measurements: Program stress control / Program strain control					
Frequency		• Sinusoidal wave oscillation: 0.01 to 200Hz, maximum 20 frequency • Synthesis wave oscillation: 5 frequency					
Force Range		• Dynamic Force: ±10N • Static Force: ±10N					
Elasticity Reproducibility		• Tension (Aluminum): 69.1Gpa ± 2Gpa (1Hz) • Bending (Steel): 192GPa ± 2Gpa (1Hz)					
tanδ Measurement Range		0.0012 to 9.9999					
tanδ Resolution / RMS noise		within 0.000001 / within 0.0001					
Temperature Range		-150 to 600°C					
Scanning Rate		0.01 to 20°C/min					
Temperature Program Mode		• Ramp Mode (maximum 100 steps) • Step Mode (minimum temperature step 0.01°C)					
Atmosphere		• Air, Inert gas flow • Swelling* (to 80°C)					
Gas Purge Control		300mℓ/min (A Gas Flow Controller is built in to the main unit as standard.)					
Cooling Unit*	Forced Air Cooling Unit	Ambient to 600°C					
	Auto LN_2 Gas Cooling Unit	-150 to 600°C					
Real View Sample Observation Unit*		Available					

*Optional



DMA7100 System

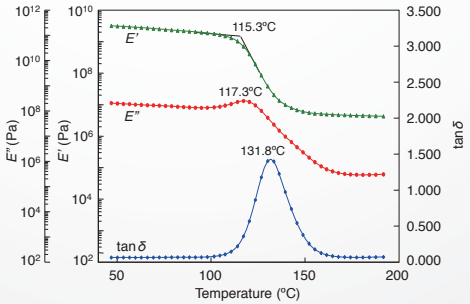
DMA Applications



Polymethylmethacrylate (PMMA)

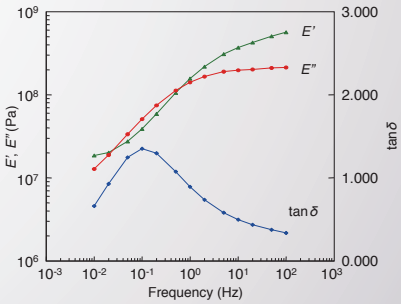
Simultaneous measurement result of temperature dispersion and frequency dispersion for PMMA.

By performing the simultaneous measurement of temperature dispersion and frequency dispersion measurement, relaxation phenomena such as glass transition, crystal relaxation, and said chain relaxation, etc., can be observed. It enables to obtain the information of molecular structure and molecular motion of polymer.



Temperature Dispersion Data

Viscoelastic property change is analyzed with respect to temperature.



Frequency Dispersion Data

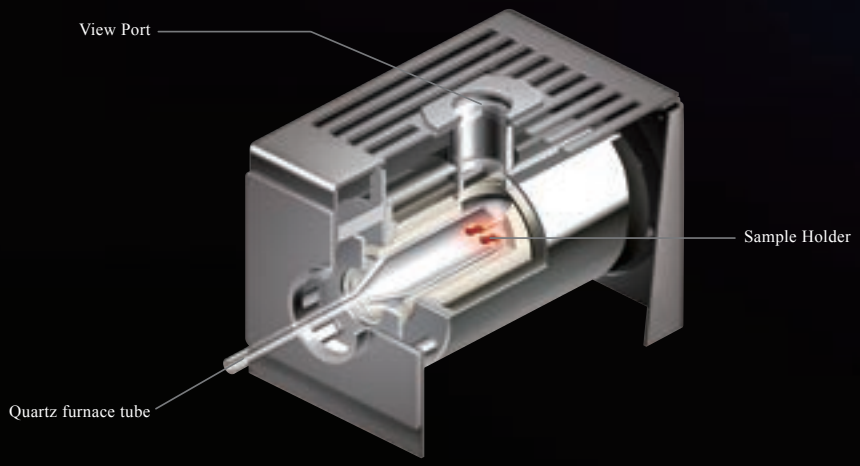
Frequency dependency of viscoelastic property at different temperature is analyzed.

Real View

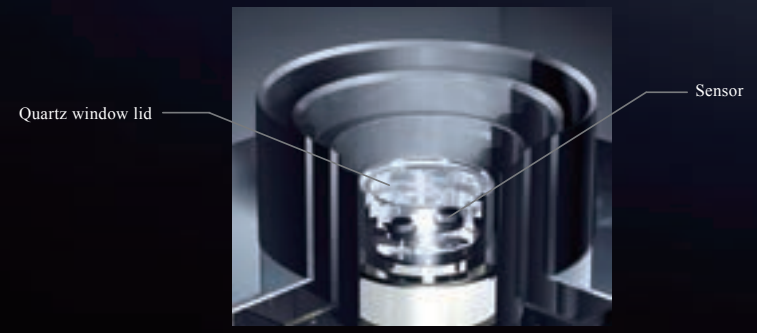
Sample Observation System

Real View Sample Observation System allows visual inspection of the samples during measurement and analysis of images after measurement. Analysis of sample property change from visual aspect such as color and shape is now available in addition to conventional thermal analysis.

STA7200RV



DSC7000X



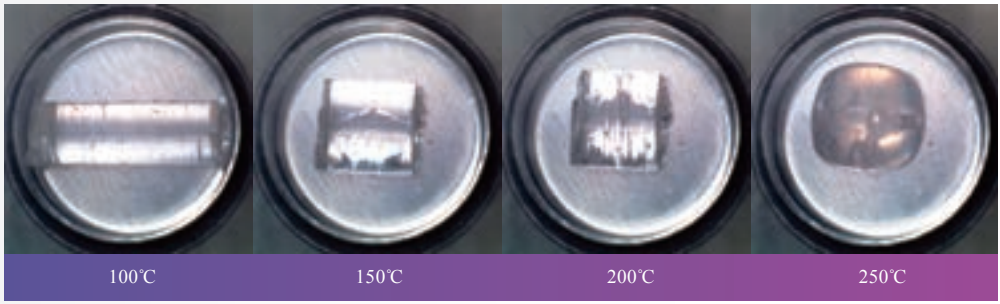
Real View DSC System

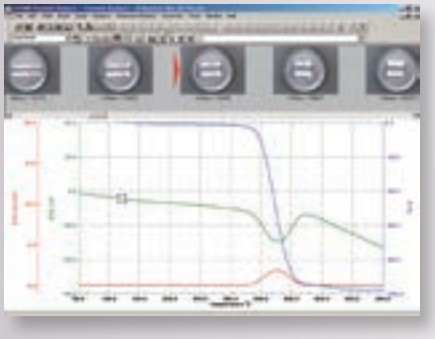
Real View STA System

Real View DMA System

Visualizing the Imaginary World

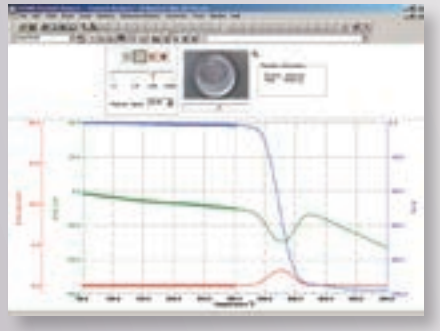
There are two different ways to display images obtained in Real View measurement. Images, DSC, TG, and DMA data are all linked and relation between state of sample and temperature can be observed clearly.





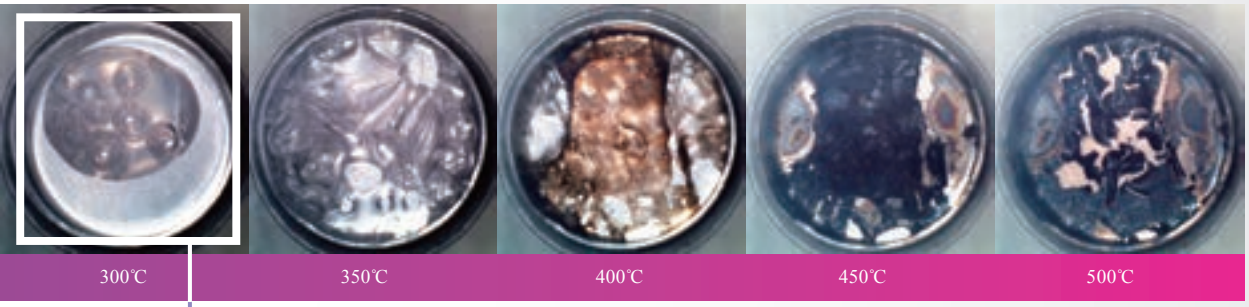
Thumbnail View

By clicking a point on data curve,
the corresponding image and some sequential images
around the selected point will be displayed.

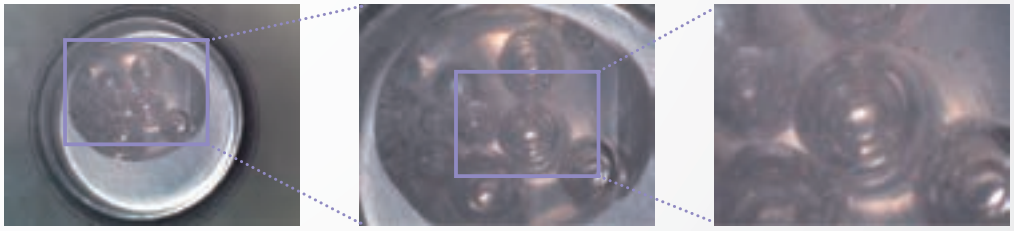


Slide Show

This mode plays a series of images to create a movie.
Subtle changes in color, shape or morphology over
time can be visually analyzed.



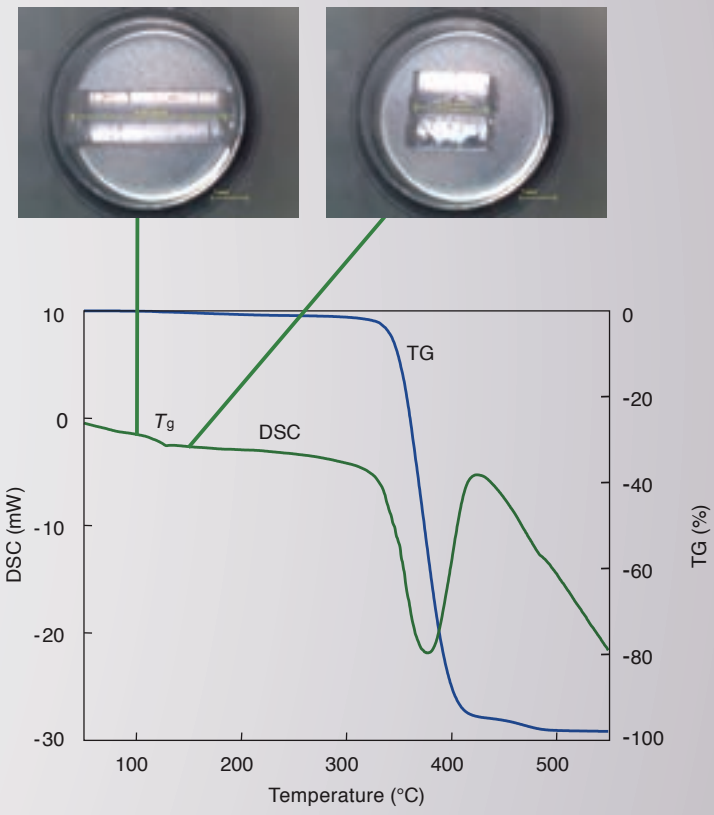
Digital Zoom Function



Digital Zoom Function may provide more information by zooming a part of an image.
5 different magnifications with maximum 5.7 times are available.

Length Measurement Function

The length of the sample before and after the shape change can be measured by Length Measurement Function.



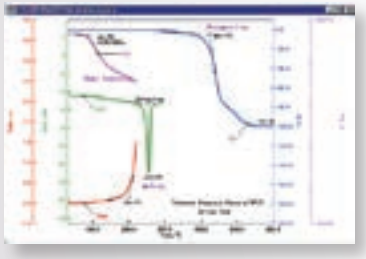
Real View TG Measurement of Plastic Optical Fiber

This is a measurement of Plastic optical fiber that is made of PMMA as the core material and Fluorine resin as the clad. Shape change caused by residual strain around the glass transition temperature, and the process of thermal decomposition from 300 to 500°C is clearly visualized.

Software Package

Innovative Technology-Multi Module Analysis

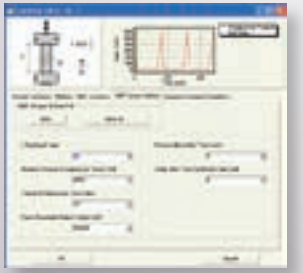
Perform simultaneous analysis of different technologies in one diagram.

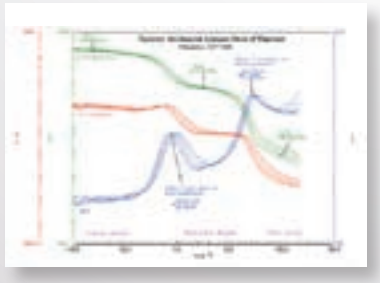


Different measurement results can be analyzed in same screen. Easy to compare the analysis results by different methods.

Customized Performance

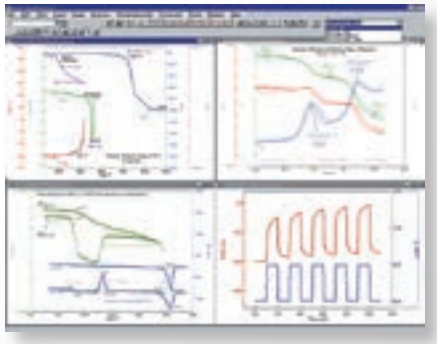
· Selection of all operation icons to your own needs.
· Arrangement of the layout according the measurement conditions.





Simplify Your Analysis

TA7000 Software is designed to work in Windows OS environment.
The analysis results are exported to Word and Excel with one click. The user is free to use other commercial software for further calculation and display.

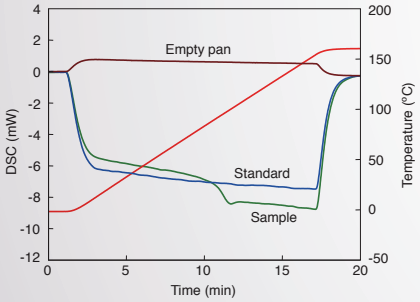


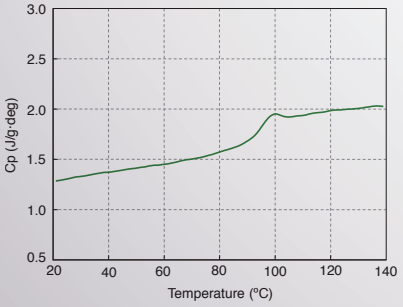
Advanced Software

Specific Heat Calculation

Calculate the specific heat capacity (Cp) from DSC measurement data.

ISO 11357-4 | ASTM E1269 | JIS K 7123

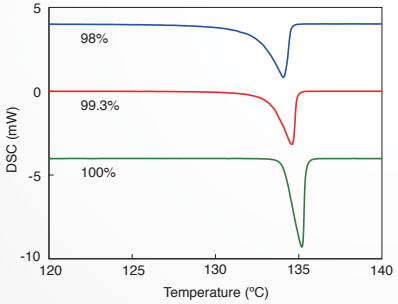


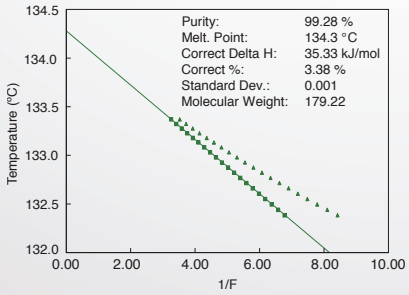


Purity Analysis

Determine the purity of a sample by evaluating its melting peak measured by DSC.

ASTM E928

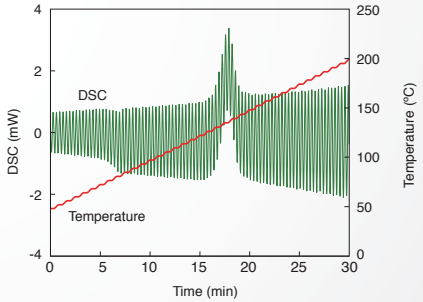


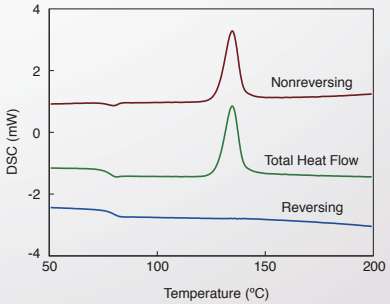


Modulated DSC Conversion

Converts the temperature modulated DSC data to the Total Heat Flow, the Reversing, and the Nonreversing Component.

ASTM E2602

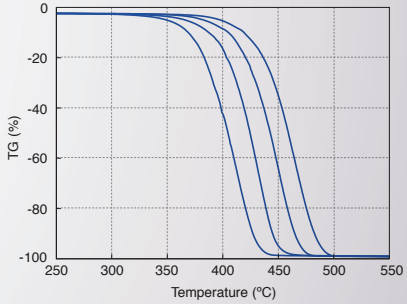


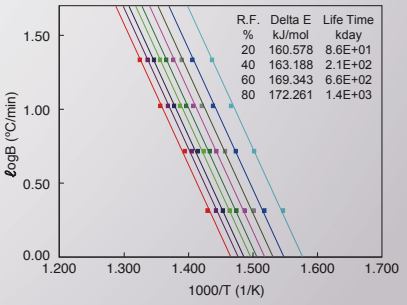


Kinetics Analysis

Calculate the activation energy (ΔEa) of chemical reactions from TG and DSC measurement data.

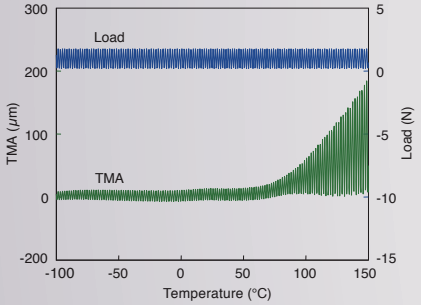
ISO 11358-2 | ASTM E1641





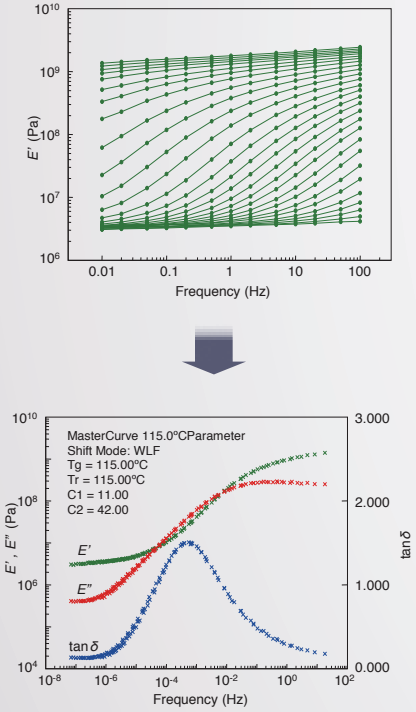
Viscoelasticity Conversion

Convert the TMA measurement data to dynamic mechanical analysis data and analyze the viscoelasticity properties.



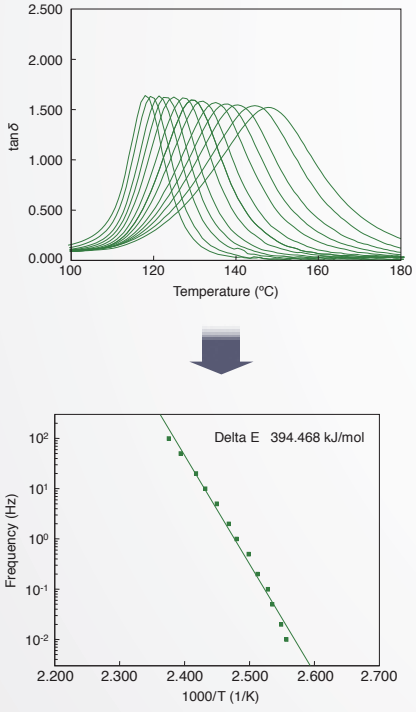
Master Curve

Generate the master curves using the Time-Temperature Superposition Principle for the estimation of mechanical properties at very high or very low frequencies.



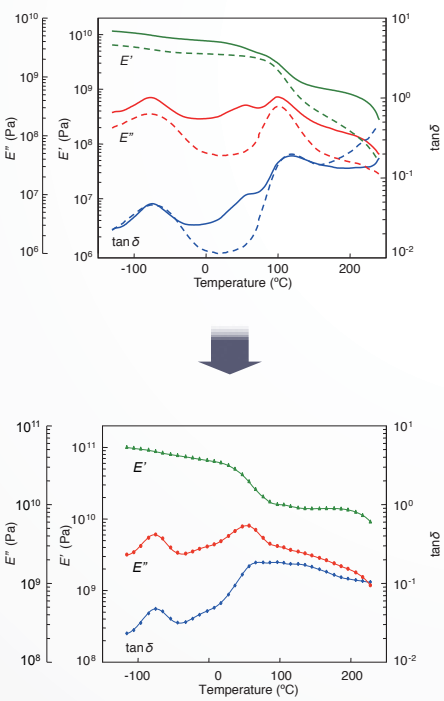
Activation Energy

Calculate the apparent activation energy from temperature and frequency dispersion measurement results.



Composition Calculation

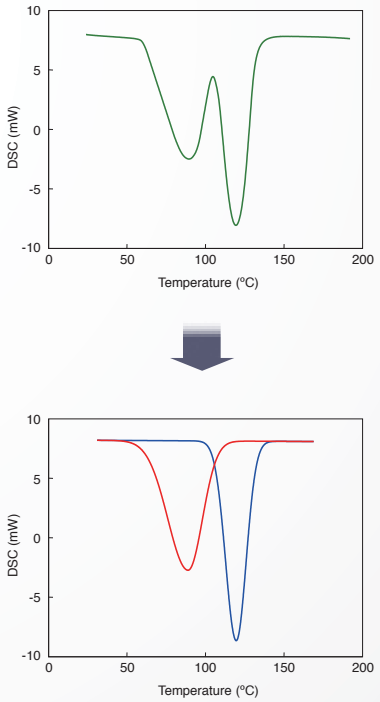
Calculate the viscoelastic properties of a coating layer from the measurement results of a sample (—) and substrate (---).



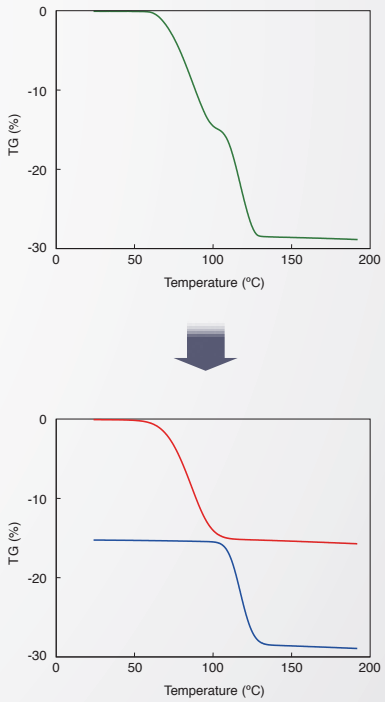
Waveform Separation Software

The Waveform Separation Software includes following three functions.
The application to the conversion to high-resolution data or an evaluation of heating rate dependence is possible.

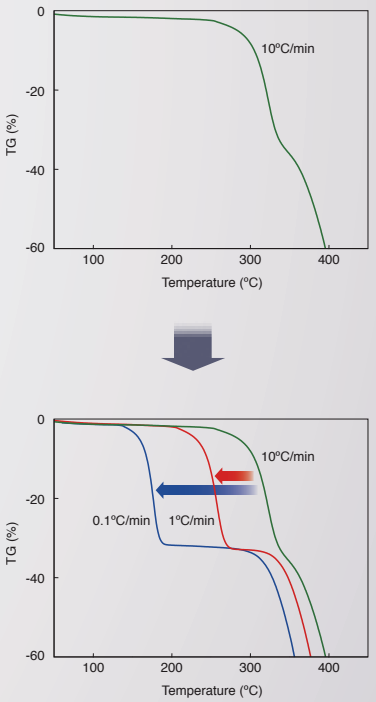
Peak Separation for DSC and DTA peak



Profile Separation for TG and TMA curve



Heating Rate Conversion Simulation for DSC and TG curve



Auto Analysis

The analysis software starts up automatically after end of a measurement and executes the data analysis, the printout of data, and save the analysis result. In the combination with the Auto Sampler Unit, the whole process can be automated from the measurements to the printout of the analysis results.

External Data Import

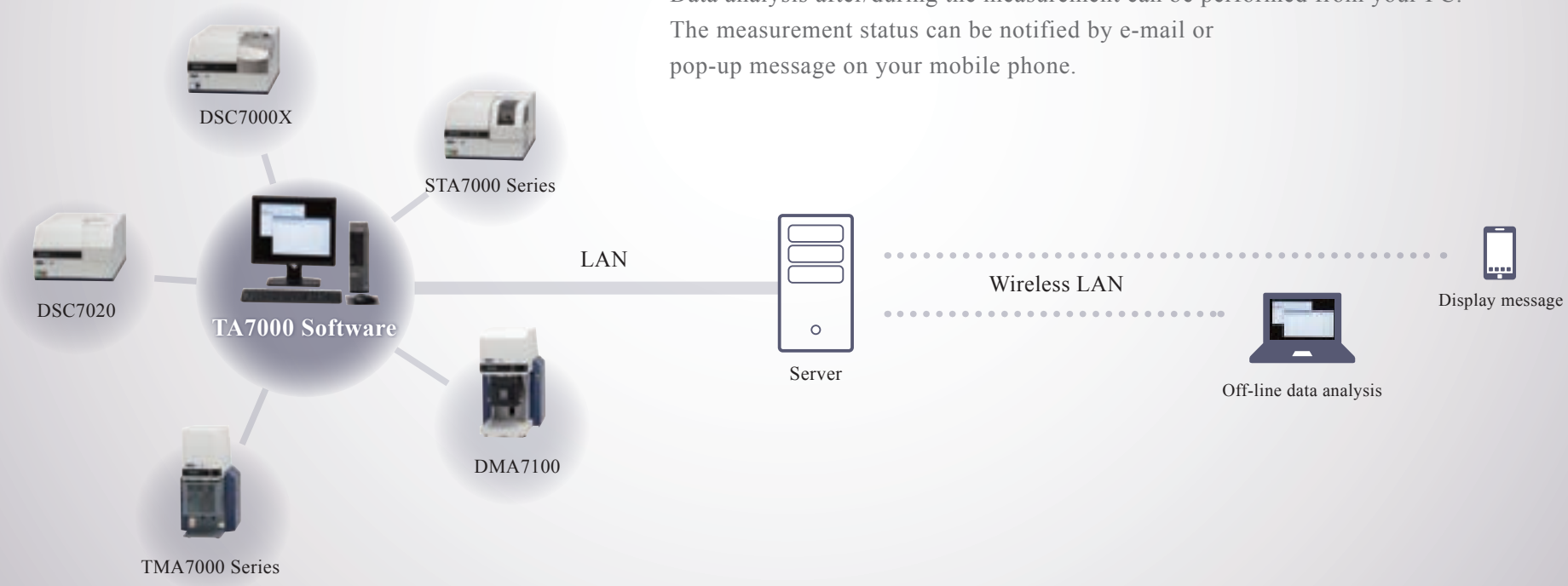
External data is imported in measurement result by text data. It is available for analysis by TA7000 software as well as thermal analysis data.

21 CFR Part11 *Optional

It supports requirements, access control, electronic signature, and audit trail, in the 21 CFR Part11 by FDA of USA.

TA7000 System Network

The TA7000 series, with extensive range of instruments for thermal analysis, delivers complete solutions for thermal property characterization.
Multiple instruments can be controlled by one PC station that is space and cost saving.
Data analysis after/during the measurement can be performed from your PC.
The measurement status can be notified by e-mail or pop-up message on your mobile phone.



Timeline

Timeline of HITACHI Thermal Analysis Products

Highly Trusted Brand with remarkable achievements

Since the first model in 1974, Hitachi High-Tech Science has been a pioneer in developing and manufacturing thermal analysis instruments. With over 40 years of experience and having operational bases worldwide, we are confident in providing state of the art instruments and solution, always as ever.

Adiabatic Scanning Calorimeter SSC510
Scanning Conduction Calorimeter SSC540
Reaction Heat Calorimeter /
Vaporization Heat Calorimeter SSC630
High Sensitive Scanning Conduction Calorimeter SSC544
Photochemical Reaction Calorimeter SSC550
SSC560 Series
560U, 560S(DSC), 560G, 560GH
560GX(TG/DTA), 560M(TMA)

SDM5600 Series
DMS120, DMS210, DES100
SSC5100 Series
DSC22, TG/DTA22
EXSTAR6000 Series
DSC6100, DSC6200, DSC6300
DSC6200R, TG/DTA6200
TG/DTA6300, TG/DTA6200R
TG/DTA6300R, TMA/SS6100
TMA/SS6200, TMA/SS6300, DMS6100

TA7000 Series
DSC7000X, DSC7020
STA7200, STA7200RV
STA7300, TMA7100
TMA7300, DMA7100

1970 · 1980 · 1990 · 2000 · 2010 · 2014

SSC580 Series
DSC10, DSC20, DTA30
TG/DTA20, TG/DTA30, TG20, TG30
TMA10, TMA20, TMA30, TMA/SS10
SSC5000 Series
DSC100, DSC200, DSC300, PDC150
TG/DTA200, TG/DTA300
TMA100, TMA300, TMA/SS100

SDM5500 Series
DMS100, DMS200
SSC5200 Series
DSC120, DSC220, DSC320, RDC220
PDC121, TG/DTA220, TG/DTA320
RTG220, TMA120, TMA320
TMA/SS120, TMA/SS150, TMA/SS350

EXSTAR7000 Series
X-DSC7000, DSC7020
TG/DTA7200, TG/DTA7300
TMA/SS7100, TMA/SS7300
DMS7100

1974 - Adiabatic Scanning Calorimeter SSC510

1982 - SSC580 Series

1986 - SSC5000 Series

1995 - EXSTAR6000 Series

2007 - EXSTAR7000 Series

2014 -TA7000 Series

Science Ring

This logo symbolizes Scientific and Analytical instruments of Hitachi High-Tech Group.
It is composed with an “S”, standing for "Science", our technology core competency, and with a ring that represents close connection we make with our customers. This “Science Ring” shows how we are committed to create new values by strengthening ties between Science and Society.

Note: To ensure safe operation, follow the instruction manual when using the instrument. / System specifications are subject to change without notice. /
The PC monitor shows composite images. / “Windows”, “Word” and “Excel” are registered trademarks or trademarks of Microsoft Corporation in the United States and other countries.

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