

NEXTA[®] DSC

Visibly better



Part of our range of
thermal analyzers

HITACHI



Differential scanning calorimetry is
an established and trusted method
for material characterization

Today's advanced material development
and quality control call for DSC instruments
with the ability to detect and resolve
thermal events in trace amounts of
material within complex compounds.

Seeing is believing

Hitachi's NEXTA® DSC range has been developed to deliver the world-class sensitivity and baseline repeatability needed to prevent important thermal events from being lost in the noise.

There are two models in the range:

The DSC600 Uncompromised DSC analysis with ultimate sensitivity and resolution making it perfect for advanced materials development and failure analysis.

The DSC200 Leading technology for routine applications without limitations and is ideal for a wide range of applications, including product shipping and receipt inspections, quality assurance and quality control.

While performance is core to the NEXTA DSC, intuitive controlling software, a dual cooling system and Hitachi's innovative Real View® option make this range a real asset to materials development labs and quality control departments in a range of industries, including electronics, automotive and aerospace, consumer goods, academia and pharmaceuticals.

World-class performance for advanced applications

World-class sensitivity

New sensor and furnace designs deliver low-noise, high-sensitivity and excellent resolution to detect the smallest thermal events that could otherwise be lost in the noise.

Superior baseline repeatability

A baseline repeatability of $\pm 5 \mu\text{W}$, thanks to innovative furnace technologies, means you get results you can trust, time after time.

Versatile and advanced

The NEXTA DSC instruments are delivered with all software modules as standard, including more advanced DSC techniques, giving excellent value for money.

Easy to use

Powerful and advanced capability, packaged with features like dual cooling and intuitive software, ensures measurements are easy to make and simple to share with others.

Safety built-in

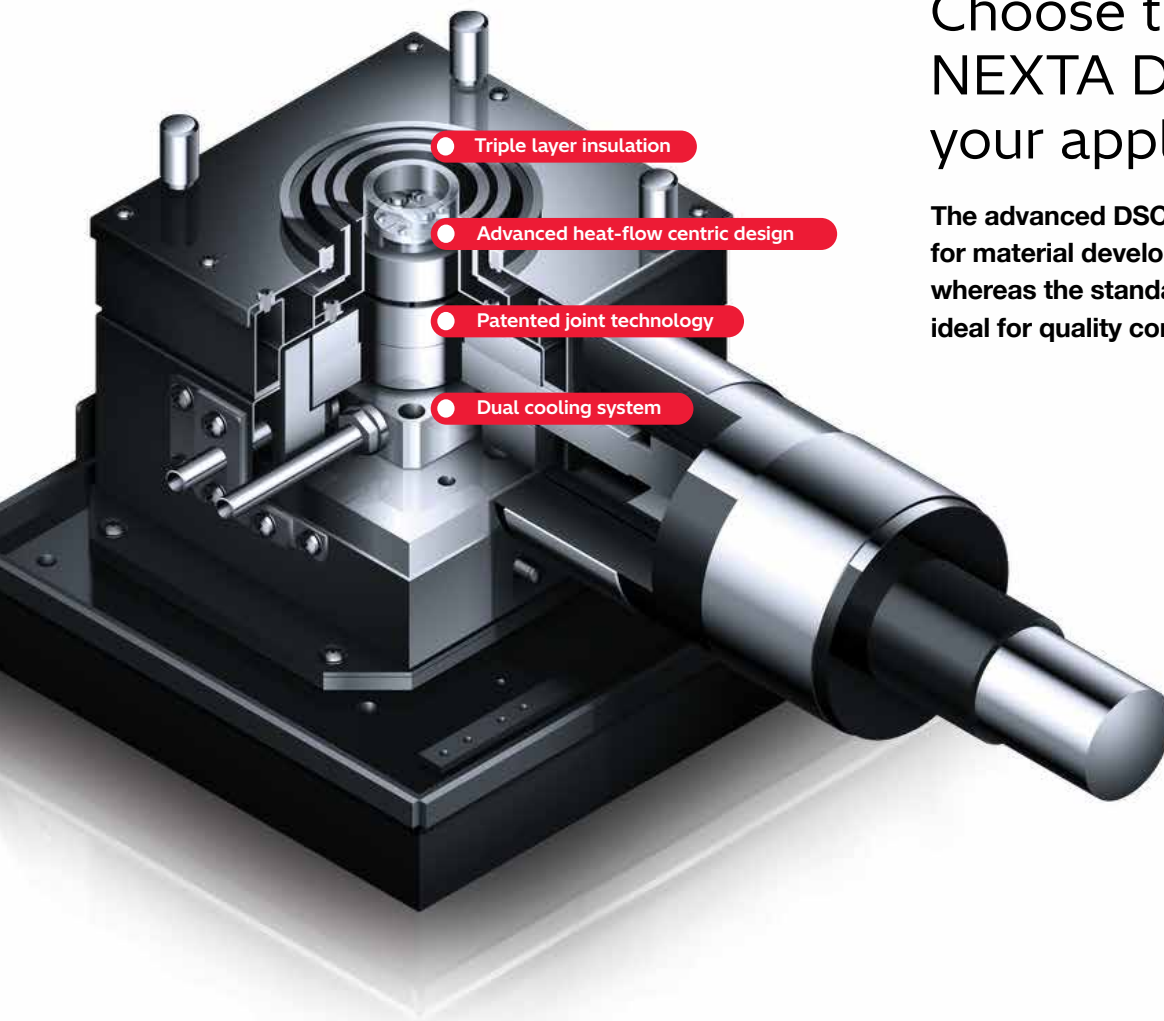
Built-in safety features, including an optional automated furnace cover with safety sensor, fans to ensure the outside doesn't get too hot and an anti-overheating mechanism, safeguard operators when using the instrument.

Application-specific options

Data analysis, record keeping, troubleshooting and reporting are all made easy with the DSC easy report creation. This both saves you time and allows you to easily share clear results that are ready to use.

Proven expertise

For over 60 years, Hitachi High-Tech has pioneered the use of high-performance and reliable analyzers for volume production use and has developed a full range of analytical instruments.



Choose the NEXTA DSC for your application

The advanced DSC600 model is designed for material development laboratories, whereas the standard DSC200 model is ideal for quality control.

DSC600 / DSC200 technical specifications

	DSC600	DSC200
Temperature range	- 150°C ~ 725°C	
DSC dynamic range	±100 mW	±200 mW
RMS noise / sensitivity	0.05 μW / 0.1 μW	0.1 μW / 0.2 μW
Time constant (resolution)	<3.0 seconds or <1.1 second with the enhanced peak function activated	<6.5 seconds or <5.0 second with the enhanced peak function activated
Baseline repeatability	±5 μW	
Programmable rate	0.01°C ~ 100°C / min	
Purge gas control	Mass flow controller, 2 purge gas lines as standard	
Cooling options	Air, electrical and liquid nitrogen cooling available. Cooling options be combined when optional dual cooling is included.	
RealView	RealView ready (-50°C ~ 300°C)	

The technology behind world-class performance

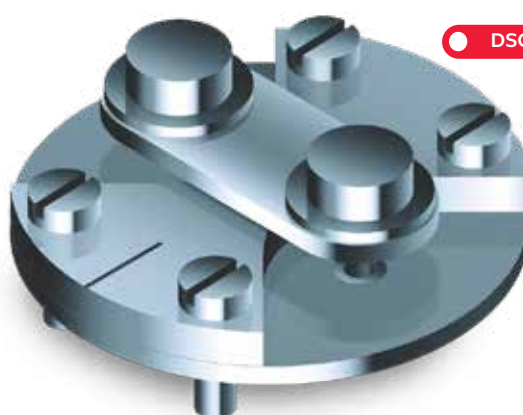
Unique sensor designs for improved baseline repeatability, sensitivity and resolution

Both sensors benefit from an advanced heat-flow-centric design, which allows for unsurpassed baseline stability and repeatability.

The DSC600 incorporates a proprietary thermopile-type sensor equipped with three thermocouples for sample and reference positions, ensuring a sensitivity of **0.1 μW or better**. With a time constant down to **one second** when the

enhanced peak function is activated, the DSC600 offers a high resolution without compromising sensitivity. This capability is particularly valuable for detecting thermal transitions at minute material levels, making the DSC600 ideal for new material development and failure analysis investigations.

The **DSC200** has a redesigned sensor with an improved holder for enhanced calorimetric and temperature precision. Delivering a sensitivity of **0.2 μW** and a time constant down to **five seconds** with the enhanced wpeak function activated, the DSC200 excels in resolving minute thermal processes within complex materials, such as polymers.



DSC600



DSC200

Innovative furnace design including dual cooling system

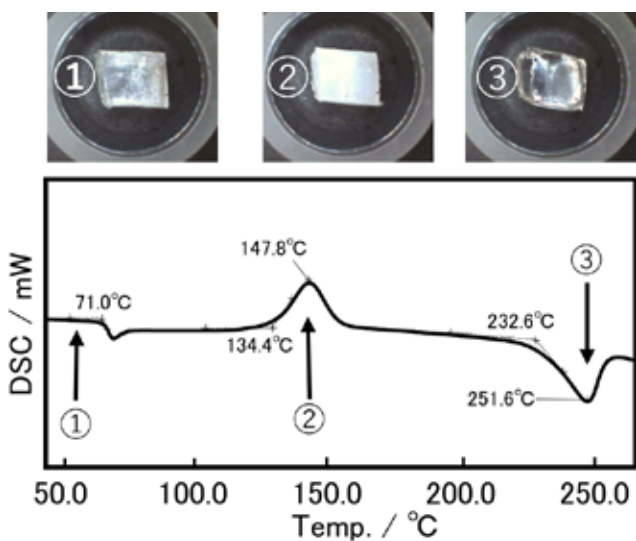
In both the NEXTA DSC600 and NEXTA DSC200, the furnace has undergone a complete redesign with low heat-capacity, and triple-layer insulation, enhancing baseline reproducibility to $\pm 5 \mu\text{W}$.

The dual cooling system eliminates the need for manual switching and facilitates a straightforward post-sale upgrade, should your requirements change. LN₂ and electrical cooling systems can be simultaneously connected, enabling seamless

transitions, especially useful for analyzing materials with phase transitions below -100°C , like rubber and elastomer. Simply select the required cooling accessory to get the required temperature range, providing you with flexibility and ease of operation.

DSC Real View[®]

for visibly better analysis



Redefine the way you conduct analyses with our advanced technology, enabling precision and real-time observation like never before.

Real View[®] provides real-time visual insight into the behavior of your sample during analysis and after. This comprehensive view allows a better understanding of your DSC results by showing you what could cause unexpected results (e.g. sample movement). It can also provide you with important information such as colour change which couldn't be measured in a standard DSC.

PET is a classic example of DSC measurement as it could exhibit three of the main transitions observed with this technique (T_g , crystallization and melting). For a non-expert, it could be hard to explain what are these three transitions. With Real View, you can clearly see and explain them. The samples shrink while going through its T_g , it becomes white during the cold-crystallisation and you can see it melt at the end.

With Real View[®], you can monitor your sample in real-time. The visual data is captioned, allowing you to replay the video post-event. The software correlates the visuals with the output trace points. Real View[®] also enables the observation and measurement of color changes in temperature-affected samples.



Precision at every layer:
Optional Real View[®]
polarized micro sample
observation unit for
NEXTA DSC Series

Versatile microscopic exploration

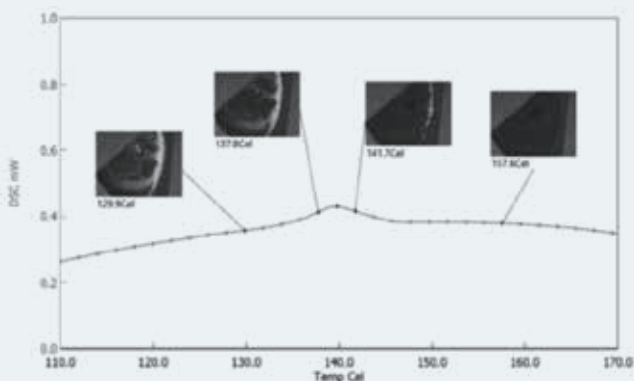
Explore sample anisotropy and crystal orientation with a 20-megapixel high-resolution camera, offering a 10-fold increase in clarity and 50-fold digital zoom compared to the standard Real View[®] system.

Controlled polarization technology enhances image contrast, enabling detailed observations of small areas, including abnormalities in multi-layer film quality.

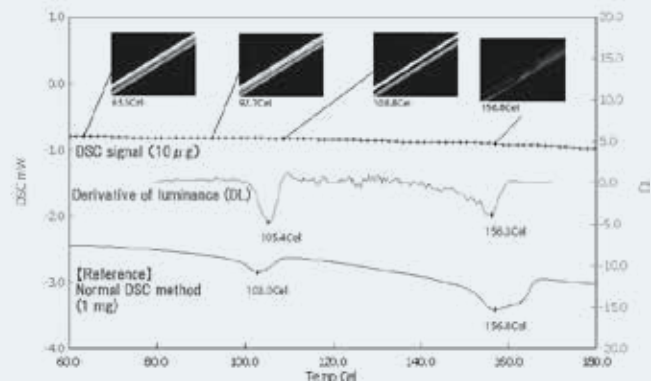
Layer-by-layer analysis

The dedicated image processing function in the camera unit ensures a seamless layer-by-layer melting point analysis of multi-layer films. Aligning with the straightforward operation of the NEXTA DSC series, this optional feature facilitates high-precision structural analysis.

Graph representing the study of crystal growth on a silicon wafer



Graph representing the melt of each layer of a polymer laminate



Powerful technology made easy-to-use with NEXTA TA software

We've developed the NEXTA TA software to accommodate different user levels. A guidance function will walk non-experts through a measurement and calibration aligned with standard test methods (such as JIS, ISO, ASTM), or your own customized test methods which can be easily programmed into the software. Take routine measurements at speed by setting up common measurement conditions in advance that users can quickly select for analysis.

However, the NEXTA DSC can be used for more advanced analysis too. This is useful for troubleshooting in production and evaluating the behavior of novel materials before they go into manufacturing.

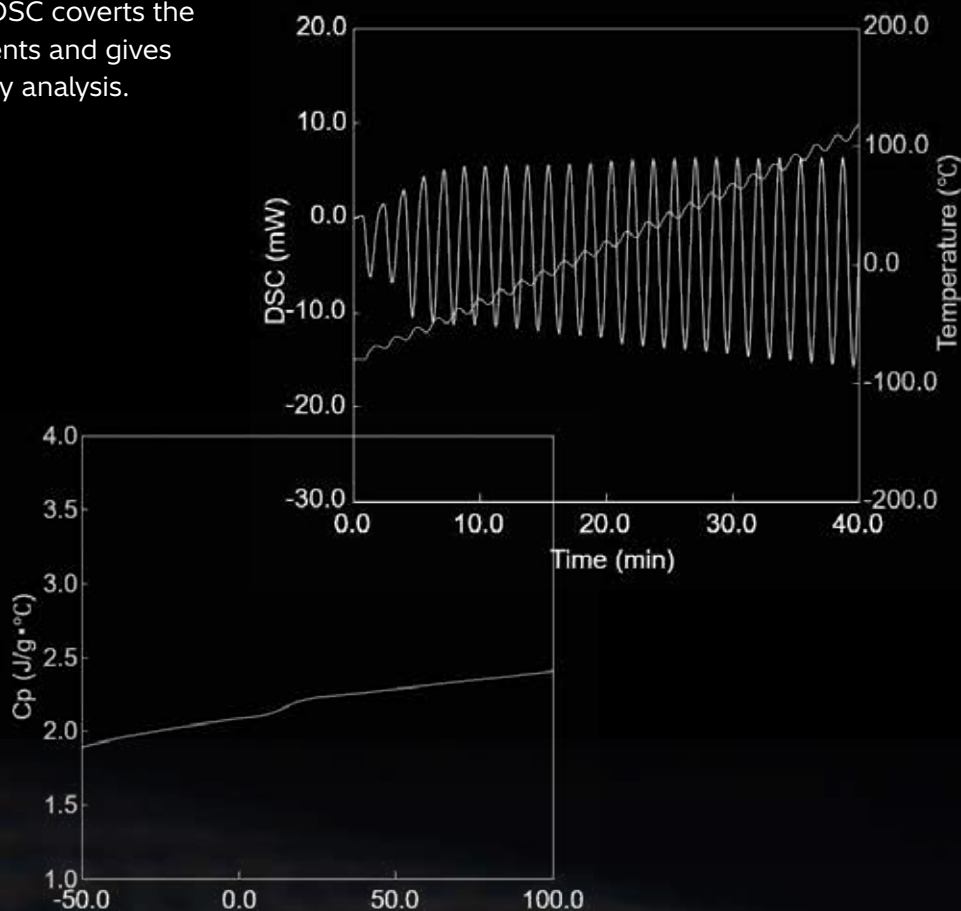
An example of this is temperature modulated DSC. This is an advanced analysis technique that applies an oscillating temperature profile where the average temperature increases over time. This simplifies specific heat capacity (Cp) determination.

The temperature modulated DSC signal contains reversing heat flow information (glass transition and melting) and non-reversing heat flow information (enthalpy relaxation, curing, evaporation, decomposition etc).

As the results separate the non-reversing and reversing types of measurement, you can easily separate overlapping thermal events, such as evaporation hiding a glass transition.

Output from modulated DSC analysis

The output from modulated DSC converts the heat flow into three components and gives accurate specific heat capacity analysis.



Available options

Optimize workflow: optional data input and output support

Improve operational workflow efficiency and data reliability with the NEXTA optional software package.

Improved reliability in quality control

Prevent human errors by automating data entry like measurement conditions.

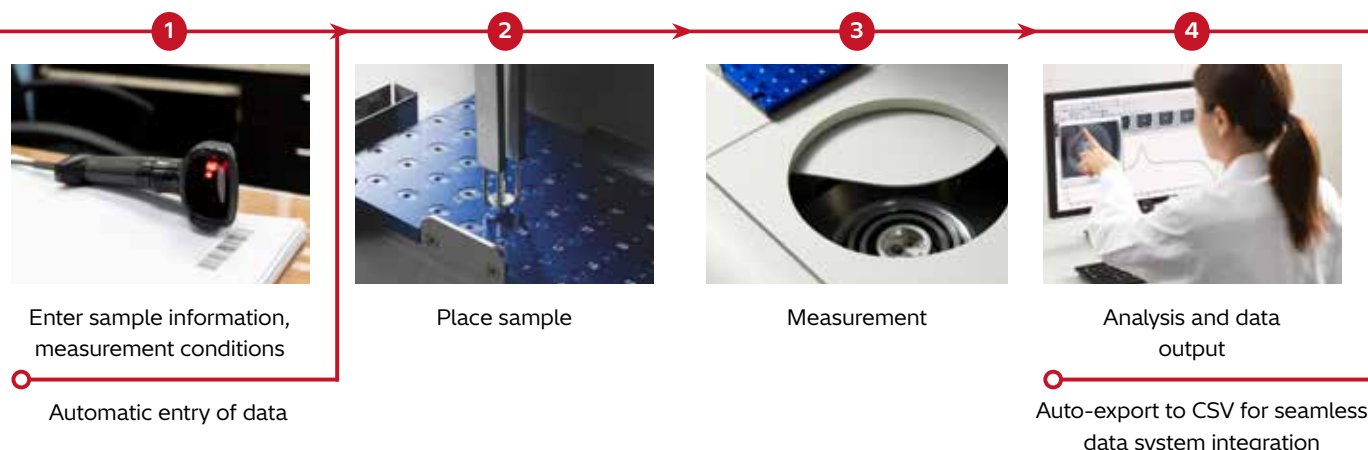
Automate Workflow

Automatic entry of measurement conditions input through barcode scanning, minimizing human error.

Efficient Data Input

Utilize the Mass Upload Template to register up to 5,000 identification codes, samples and conditions via CSV import in the NEXTA software. This feature also allows exporting analysis results with test items, lot numbers and serial numbers in CSV, Excel and text, enhancing internal management and quality control reliability.

Automate entry of measurement conditions & data output



Auto-sampler with automated safety lid

The auto-sampler option allows for automatic analysis of up to 50 samples at once. The new auto-sampler is 2.8x faster than the previous version. This is especially useful in high-throughput situations and means the operator can work on other activities while analysis is taking place. The unique four-finger holder design deftly handles your samples, moving them into position quickly and reliably. And the included automated lid will only open once the instrument has cooled sufficiently.

Sample pan sealer

There are two options for sealing your samples. There is a manual sample pan sealer and also an automated sample pan sealer that speeds up the sample pan preparation. The automated sample sealer ensures your samples are prepared correctly for analysis every time, regardless of the operator, improving the repeatability of your results.

UV curing unit

This unit allows you to easily optimize your UV curing process. Firstly, you can measure the heat generated by the exothermic UV reaction and how long the UV curing process takes under varying irradiation levels. You can then run a standard DSC scan to see how the material properties have changed after curing. With a high-output UV light source and wavelength-selective filters, this allows you to fine-tune your UV curing processes.

Understand how your materials perform with Hitachi thermal analyzers

Seeing is believing. Our analyzers give you uncompromised quality control and enable you to reach the next level in research and development

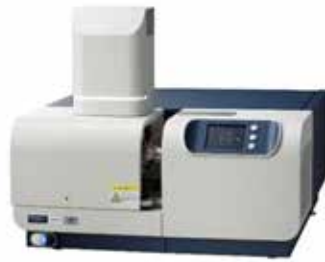
- Seeing is believing with Real View® Technology. Observe real-time thermal events with our Real View® feature for deeper insights beyond thermal analysis data.
- Durable, reliable, high-throughput instruments for lab or production.
- Intuitive software with guidance functions ensures ease of use for operators, regardless of experience, delivering reliable results.
- Minimal liquid nitrogen use reduce operating costs
- World-class baseline performance with excellent accuracy and precision, even on trace amounts.

Visibly better thermal analysis

See the full range at: hhtas.net/thermalanalysis



▶ NEXTA DSC Series



▶ NEXTA STA Series



▶ TMA 7000 Series



▶ NEXTA DMA200

Our services

Hitachi High-Tech's global network of service hubs offers a full range of technical support to keep you up and running.

- **Repair Service**
We offer a fast and efficient repair service, recertification and maintenance through our service agreements to ensure your analyzer is maintained in excellent condition and avoids any unplanned costs.
- **Global Help Desks**
Whenever you have a problem, we're ready to help.
- **Extended Warranties**
To give you extra peace of mind and avoid unplanned costs.
- **Online Diagnostics**
In-depth and rapid support via our website.
- **Training**
To help you get the most out of your analyzer and its full range of features.

Other products



We have been providing materials characterization instruments to a wide range of industries for over 60 years.

Thermal Analysis

We offer a range of other thermal analysis instruments including STA, DMA, and TMA. All of these work on the NEXTA TA software platform, allowing continuity across your analysis without extra training.

Bulk XRF

For rapid and powerful elemental analysis for a wide range of applications.

Microspot coatings XRF

For precise analysis of the smallest samples and features.

What next?

Contact one of our experts today at:
contact@hitachi-hightech.com

to discuss which analyzer within the DSC range best suits your production or research application.



More information

To find out more about the DSC range, visit hhtas.net/DSC

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