

## III Seminarium Analizy Termicznej

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# Application of the Real-Time Sample Observation Thermal Analysis

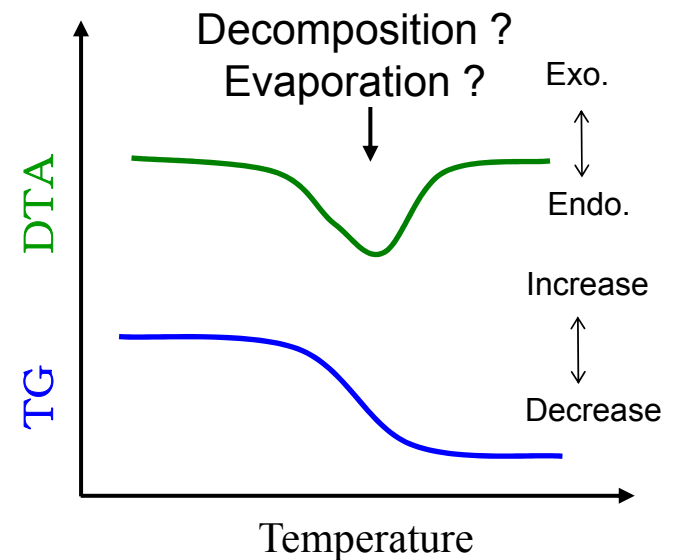
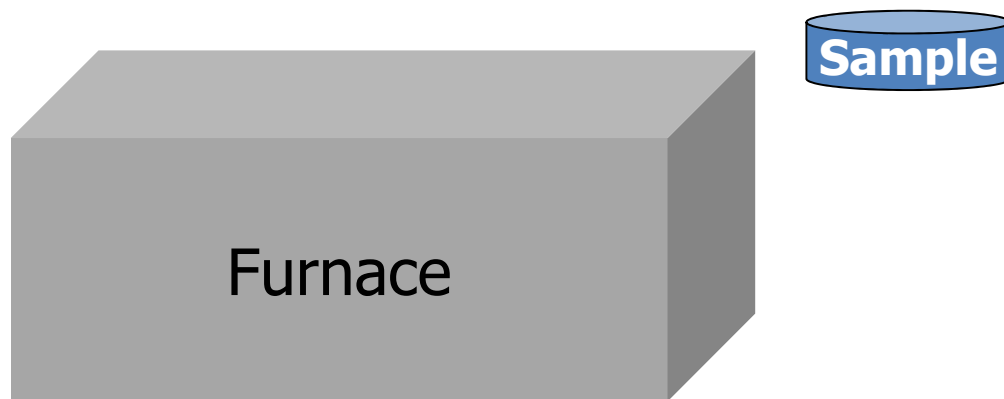
16<sup>th</sup> May 2017

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Analytical Application Engineering Department

Ⓒ **Hitachi High-Tech Science Corporation**

- In conventional TG/DTA instruments, samples cannot be viewed directly because they are obscured by the ceramic furnace, heating elements, insulation, etc.
- So, TG/DTA users are left to determine which phenomena occur by reviewing the TG and DTA curves obtained during the analysis.



We tried the development of the Thermal Analysis system which could observe a sample during the measurement.

So we completed this Real-Time Sample Observation system for DSCDSC, STSTAA, and DMADMA.



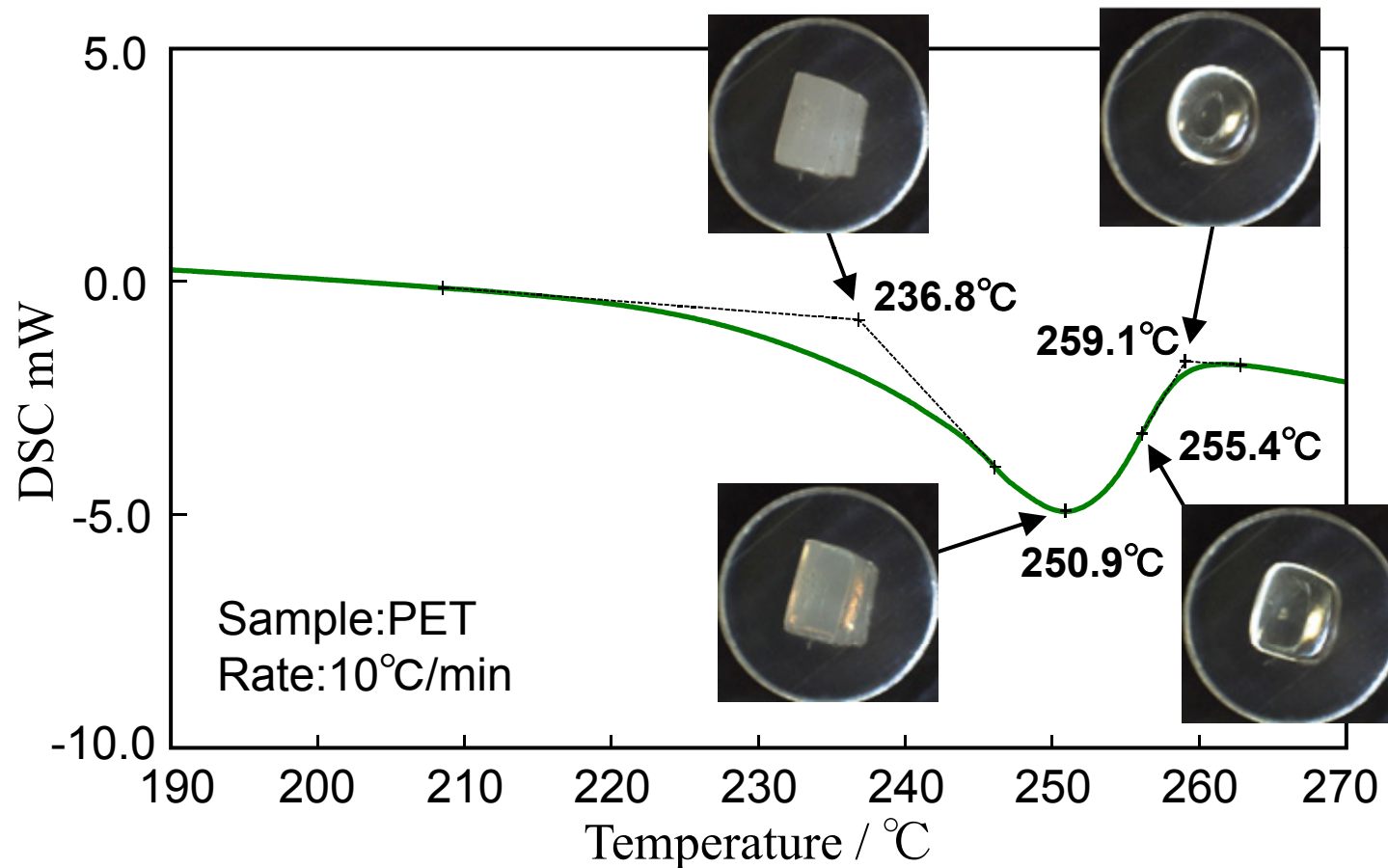
DSC System



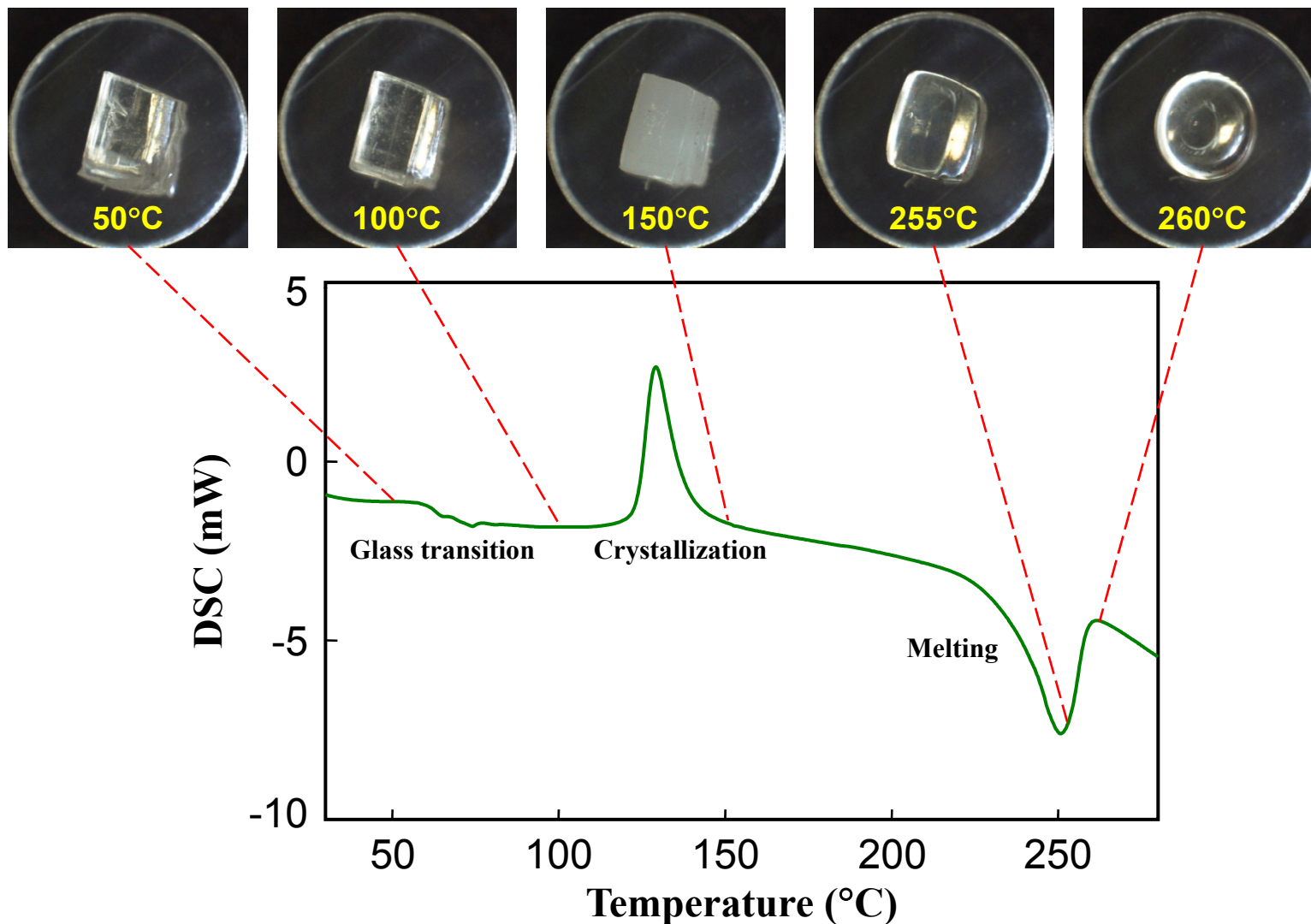
STA System



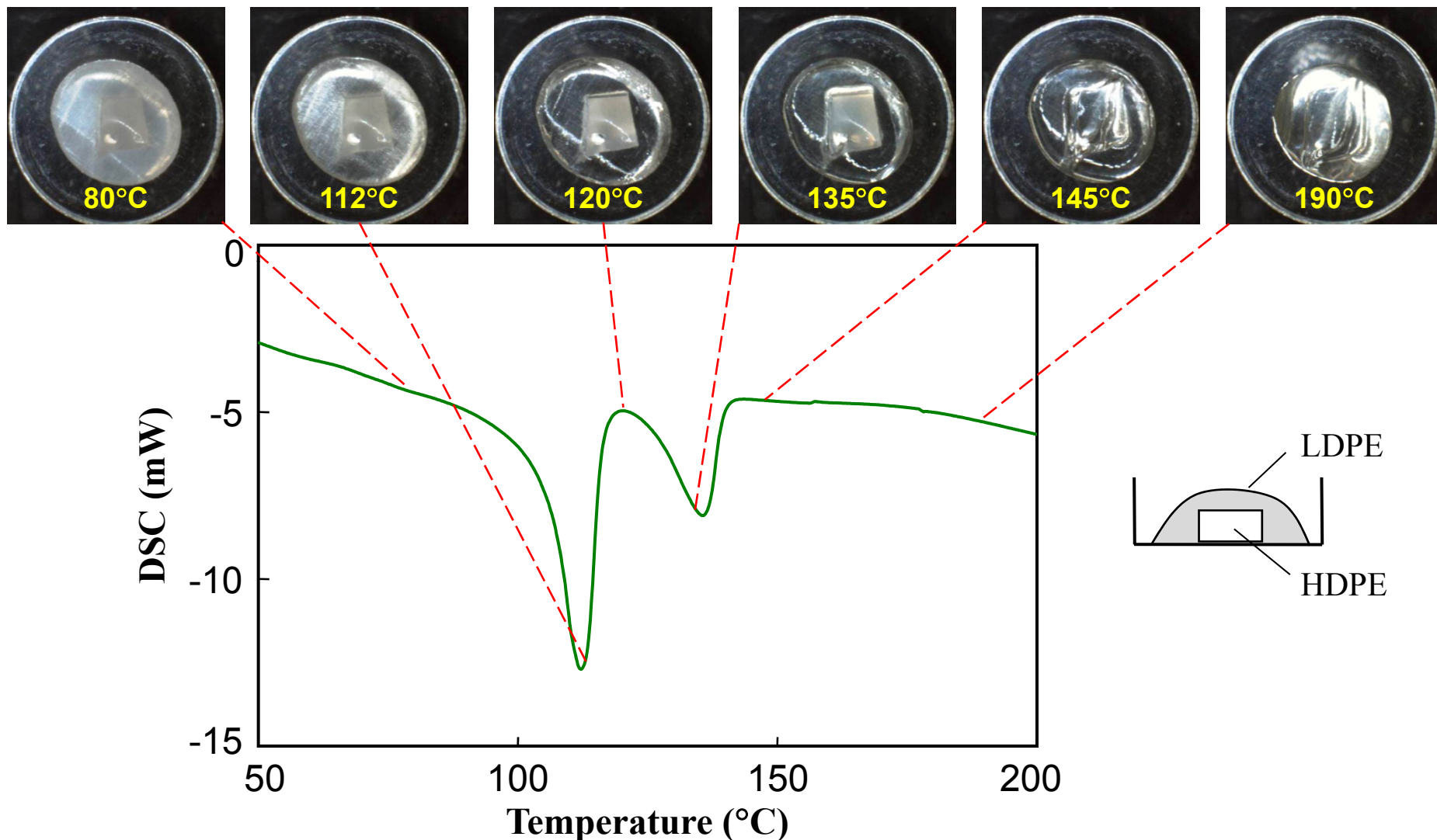
DMA System



## Real View DSC Measurement of PET

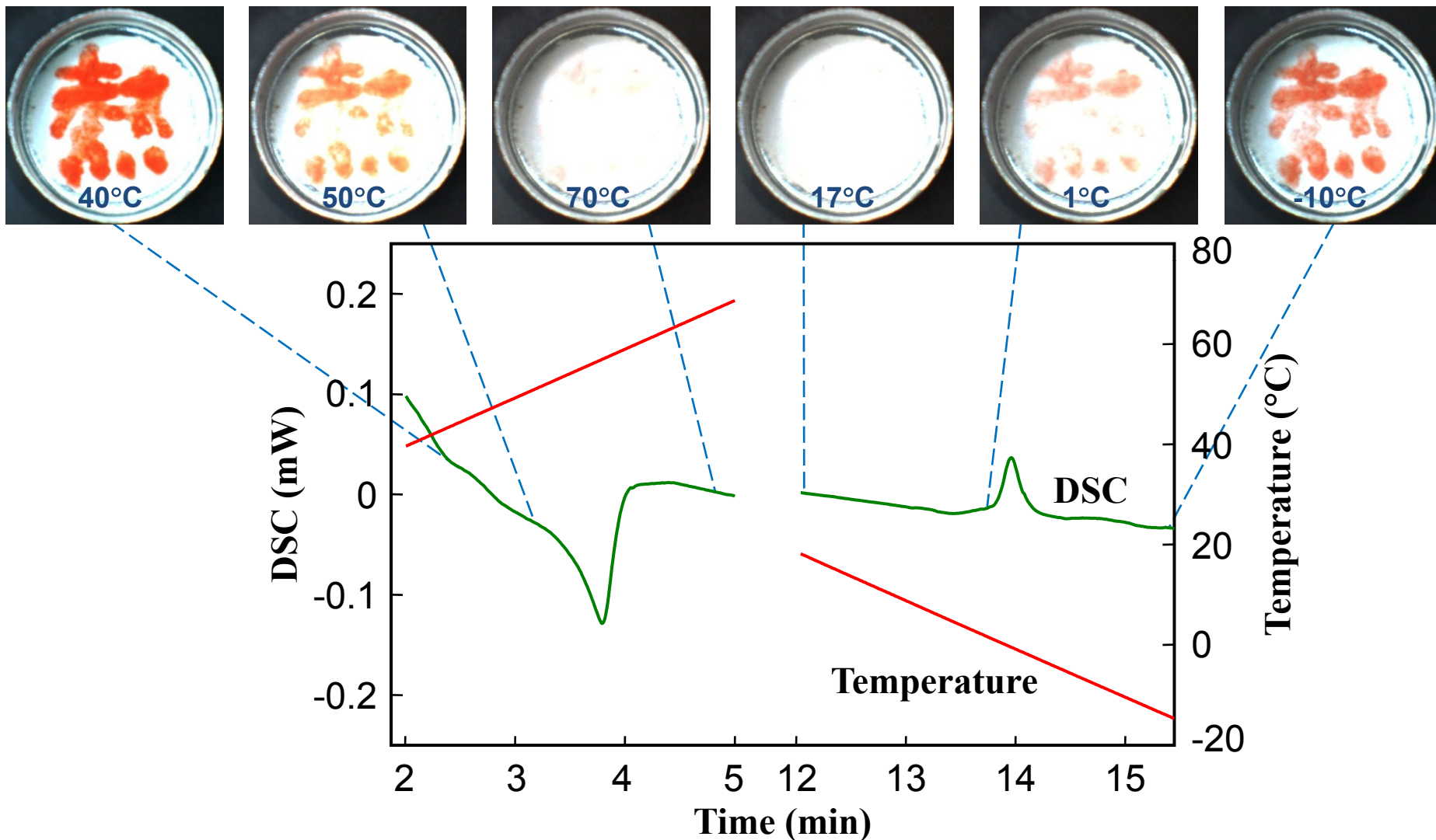


## Real View DSC Measurement of HDPE in LDPE

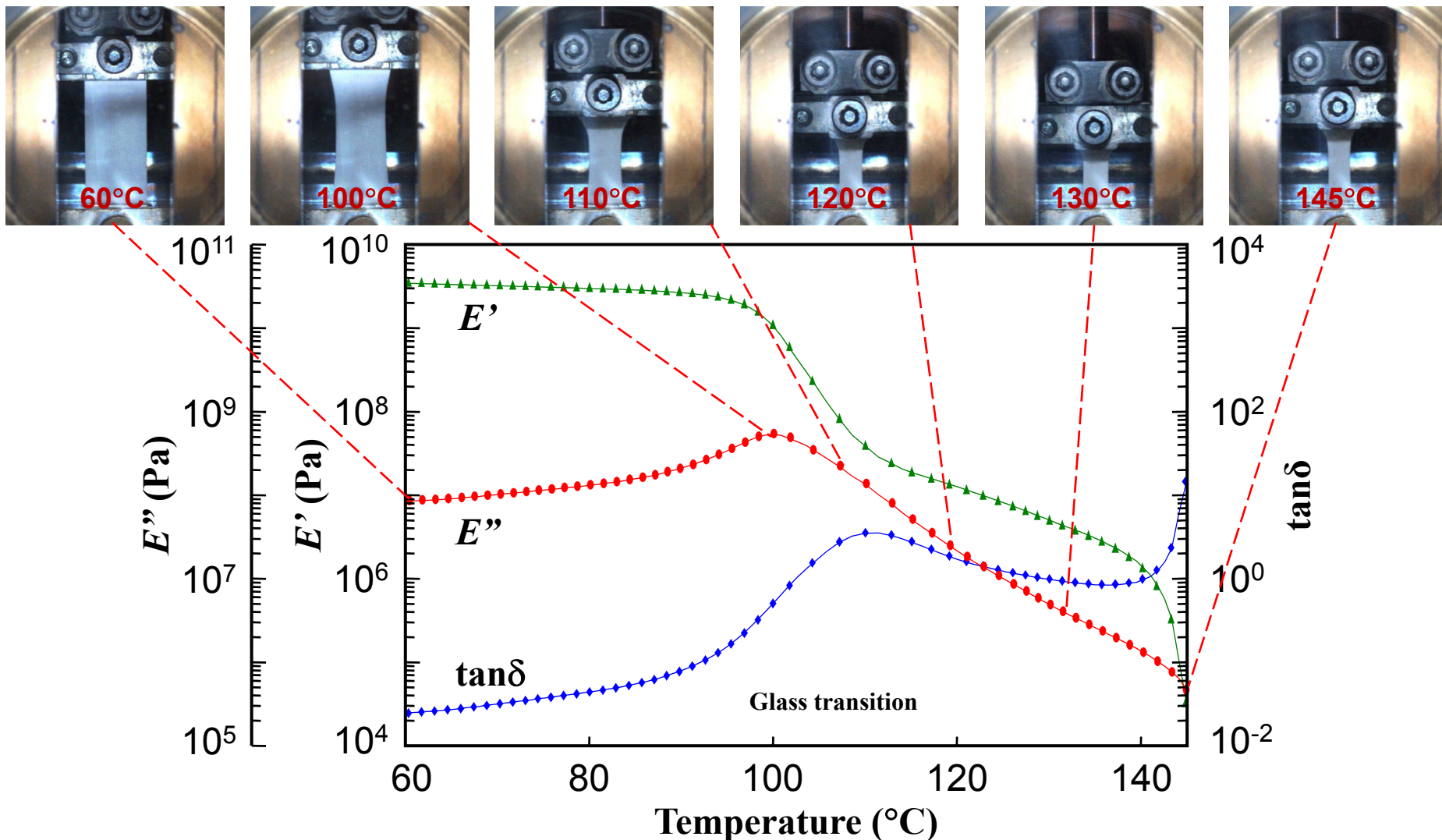




## Real View DSC Measurement of Erasable Ink



## Real View DMA Measurement of Heat Shrink Film





# Real-Time Sample Observation STA System

**HITACHI**  
Inspire the Next



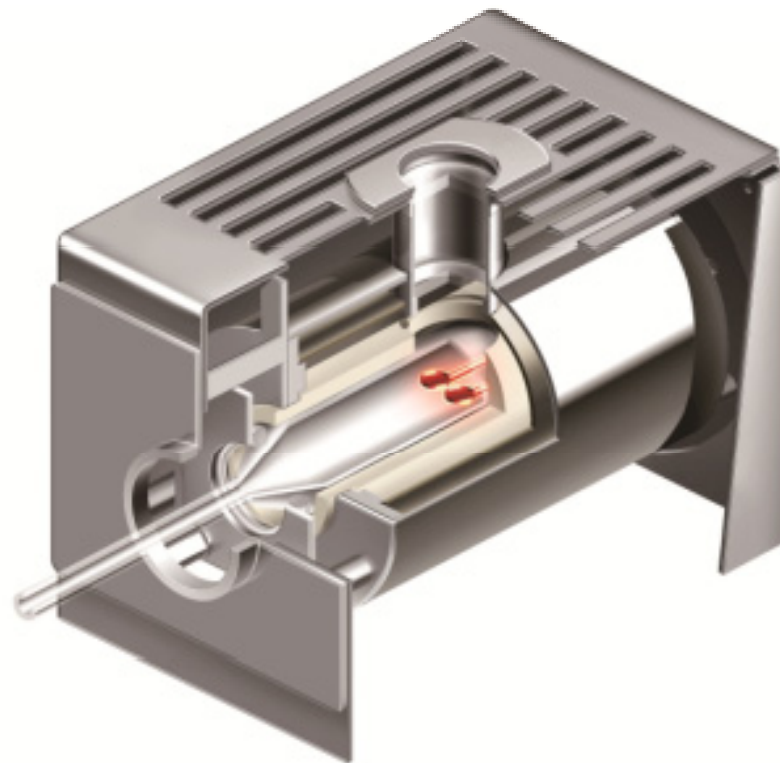
STA7200RV+RV-2TG



Top View of Furnace



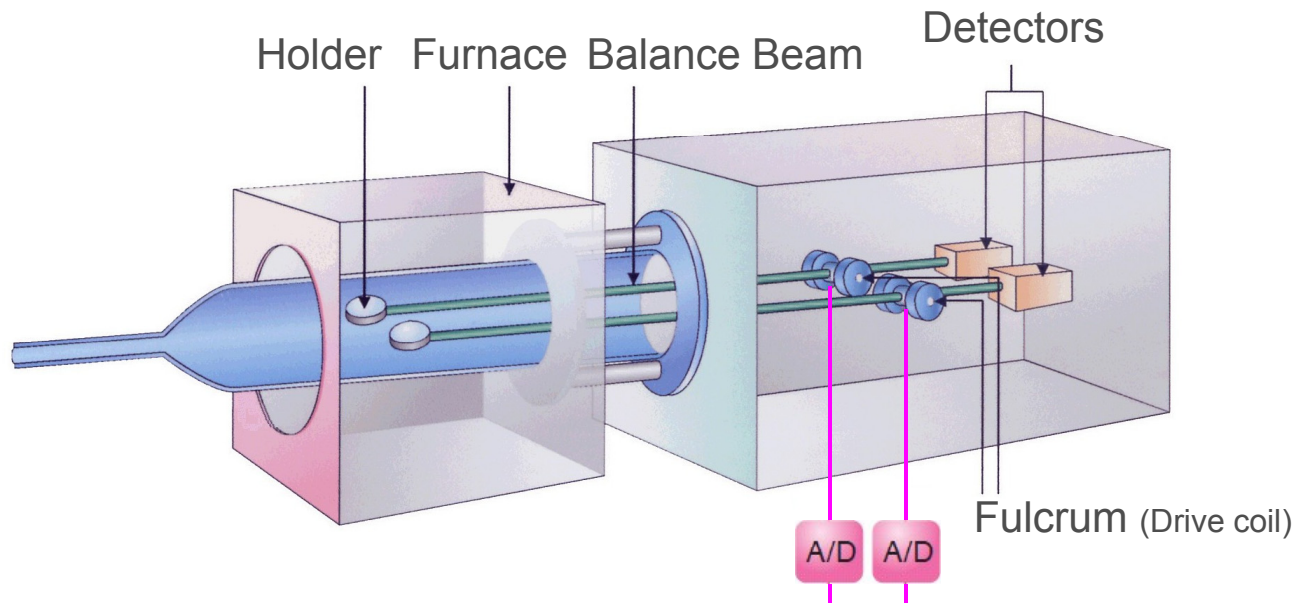
Balance Beams



Cut-away Image of Furnace

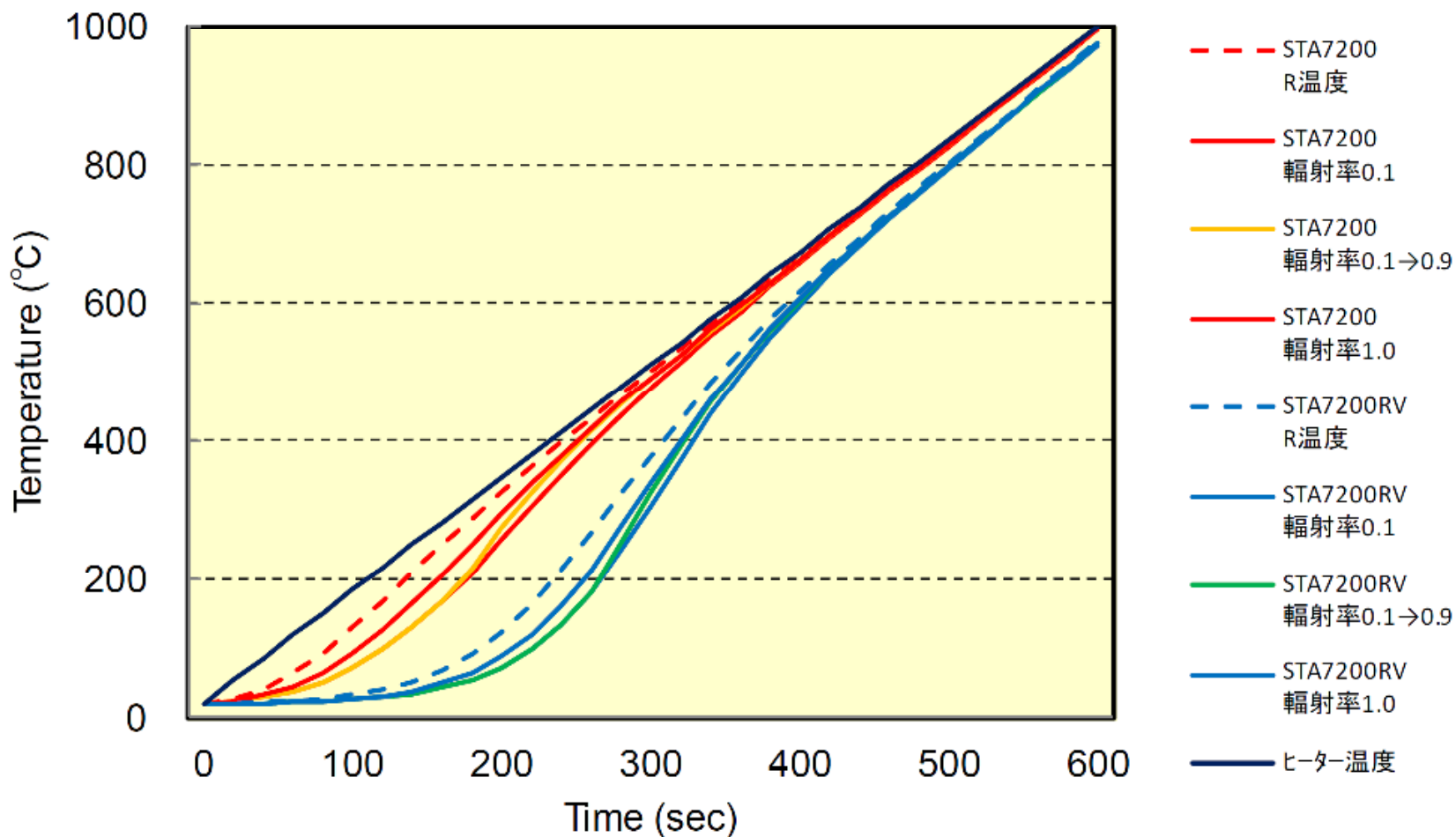
It is necessary to meet the following conditions to observe sample in the furnace during the measurement.

- Temperature up to 1000°C
- Temperature uniformity
- Maintain sensitivity and baseline stability
- Controlled performance of atmosphere (gas tightness and flow rate)

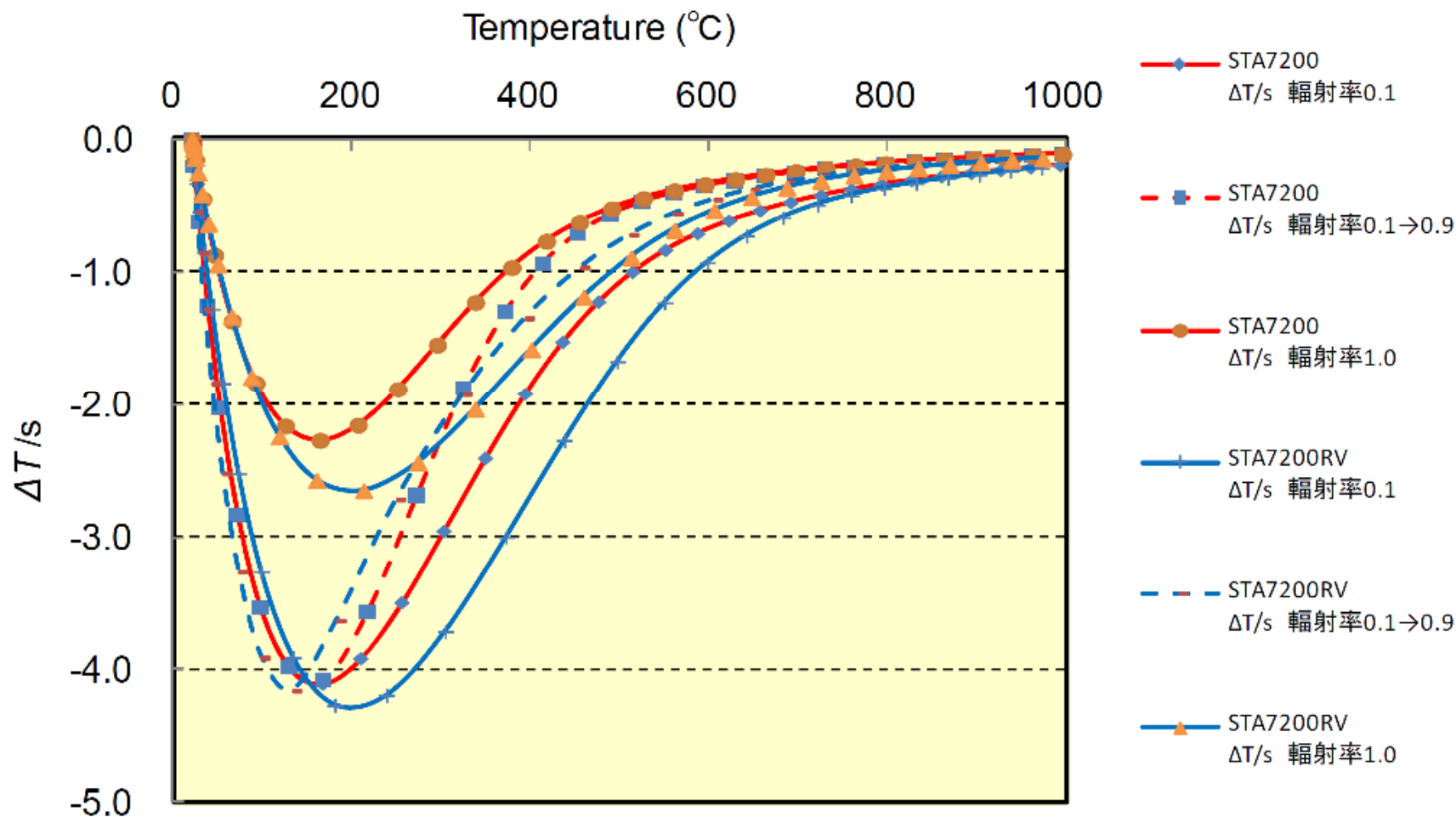


Digital Differential System

## Influence on Sample Temperature of Radiation Factor

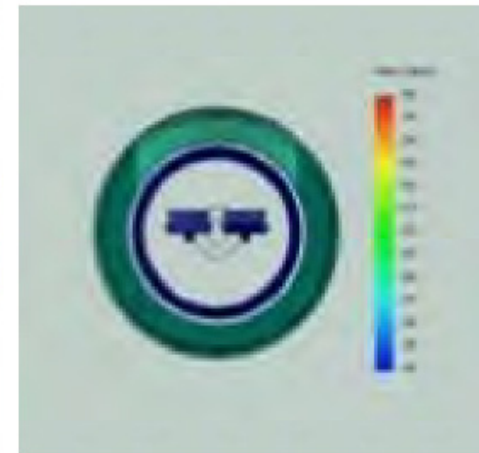
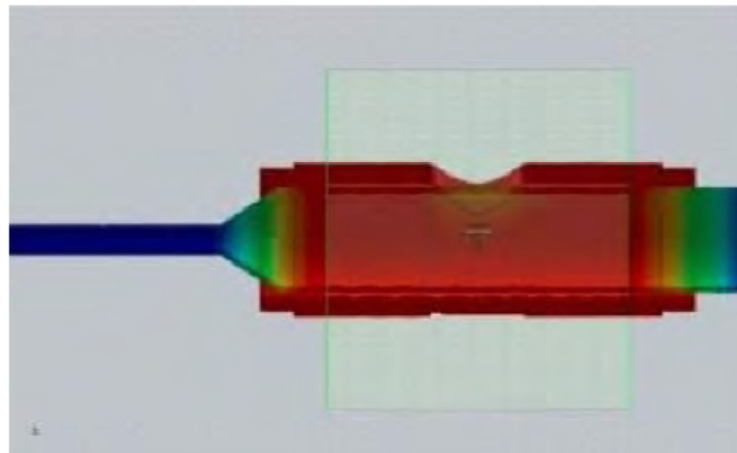
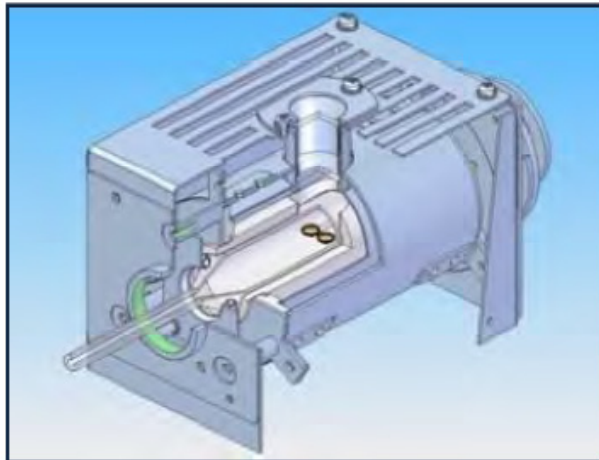
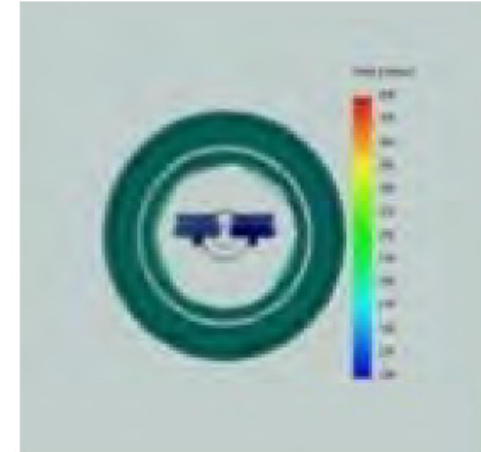
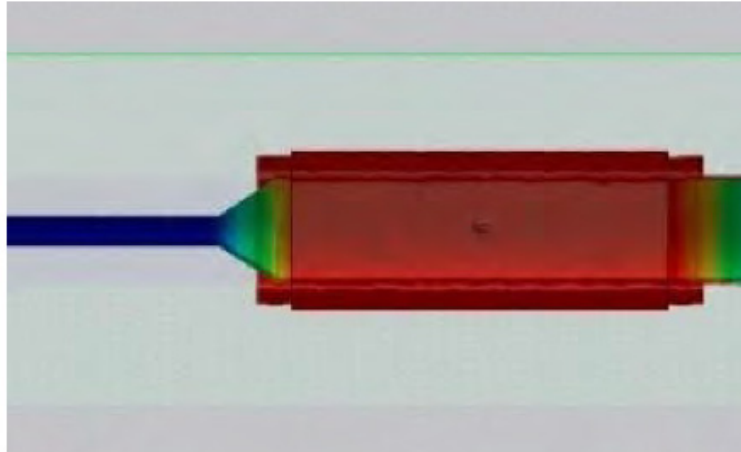
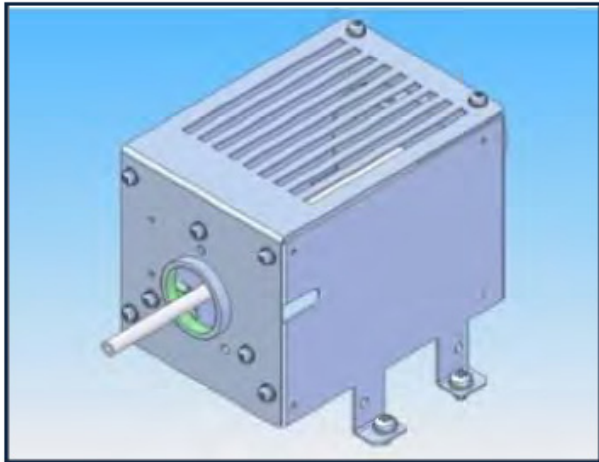


## Influence on $\Delta T/s$ of Radiation Factor



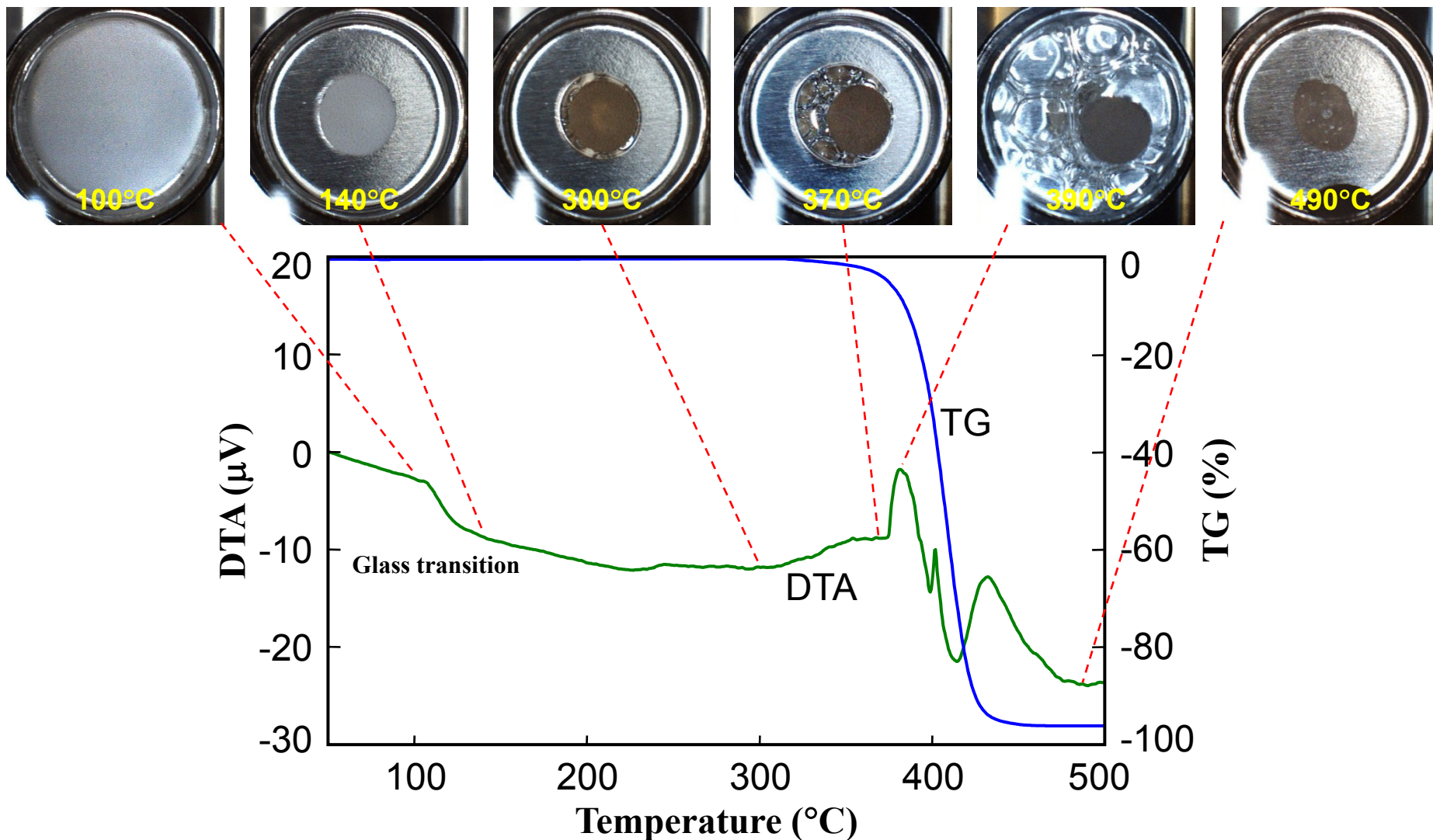


## Computer Simulation of the Radiant Heat

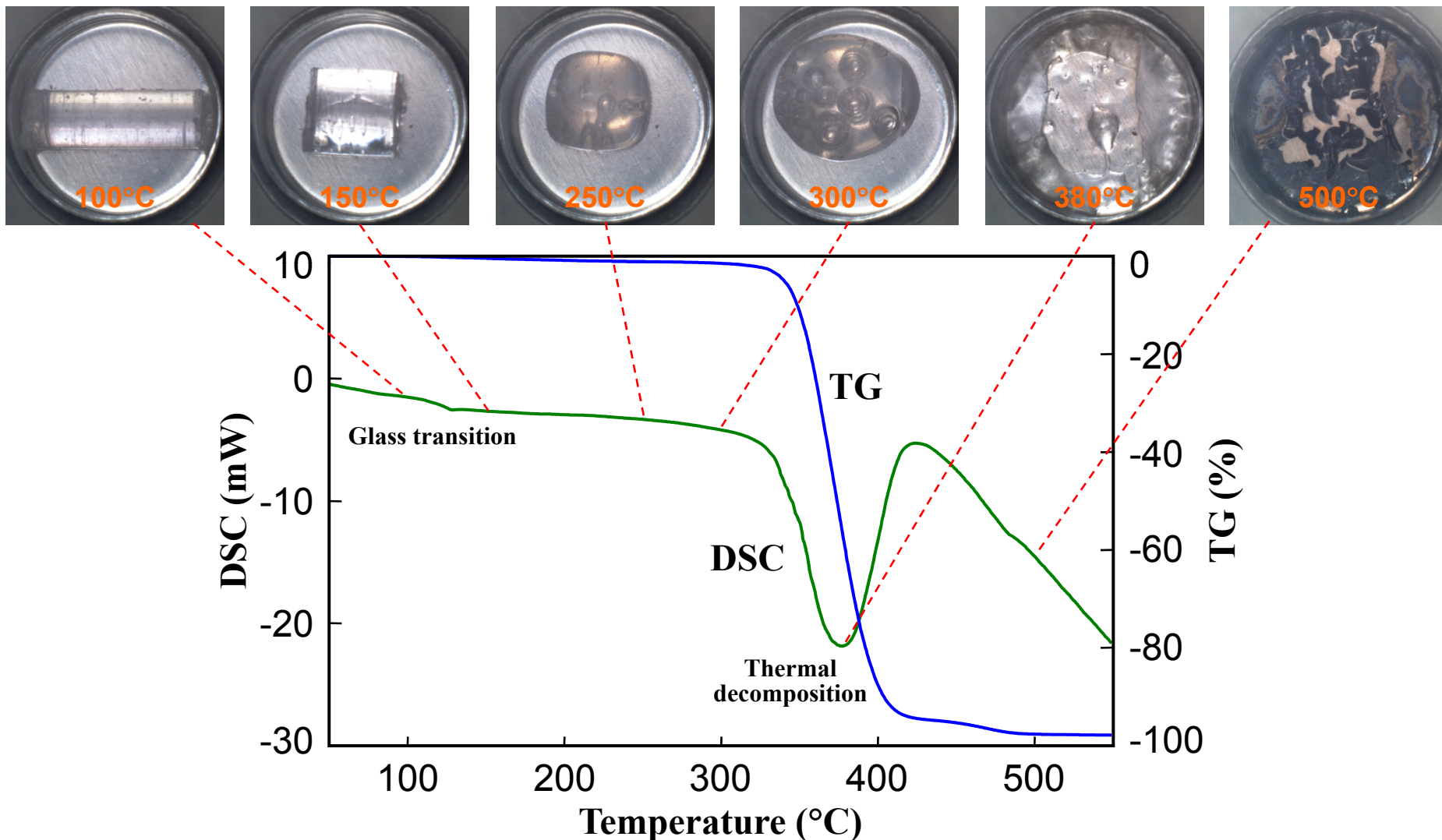




## Real View STA Measurement of Heat Shrink Film



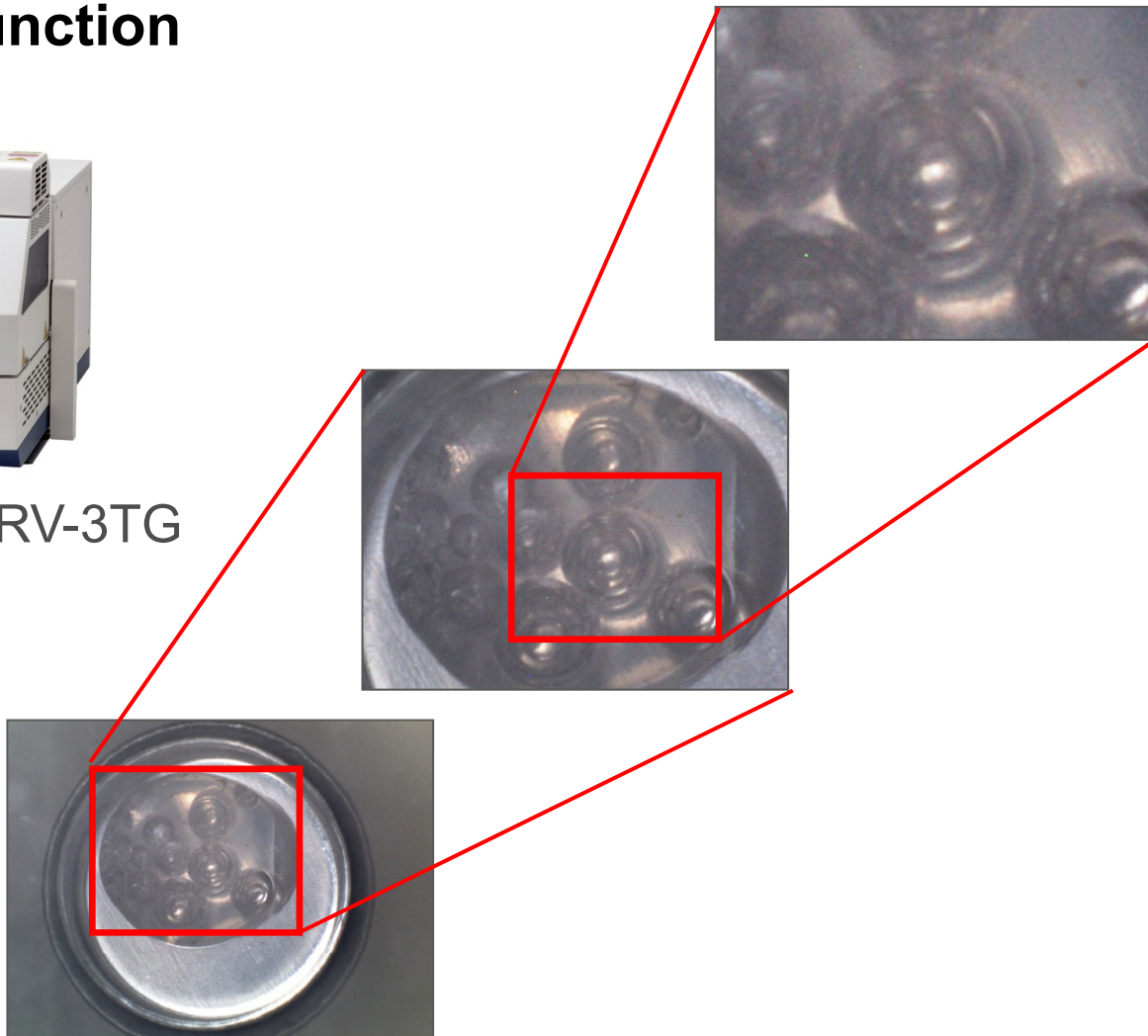
## Real View STA Measurement of Plastic Optical Fiber



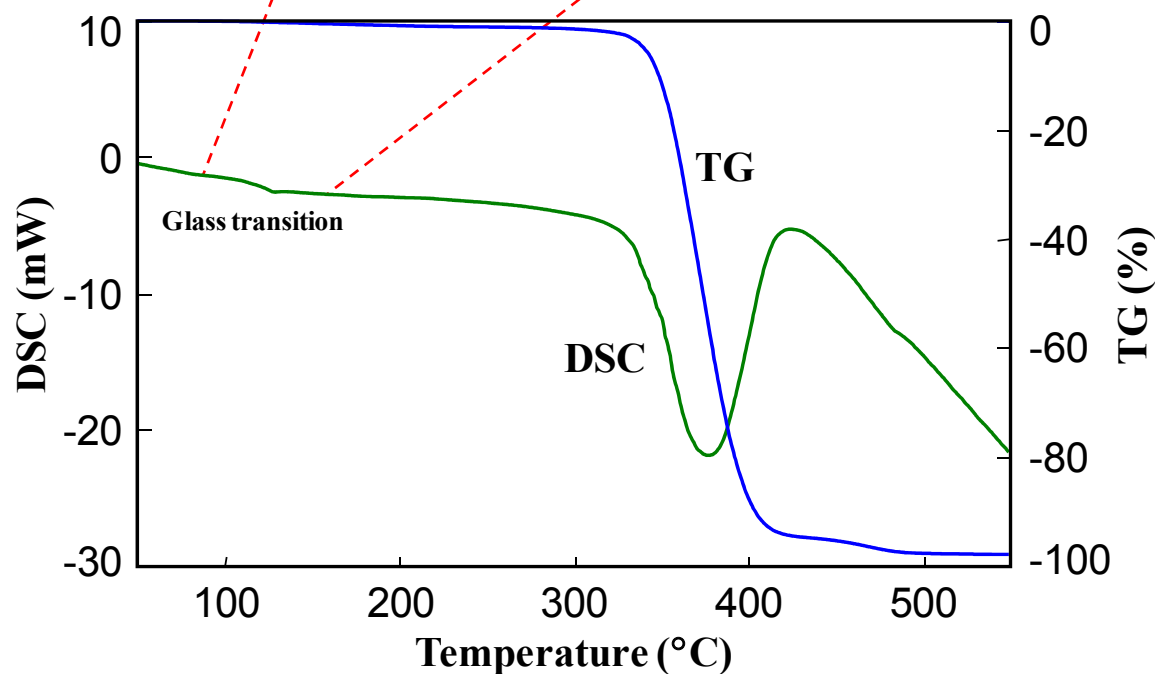
## Digital Zoom Function

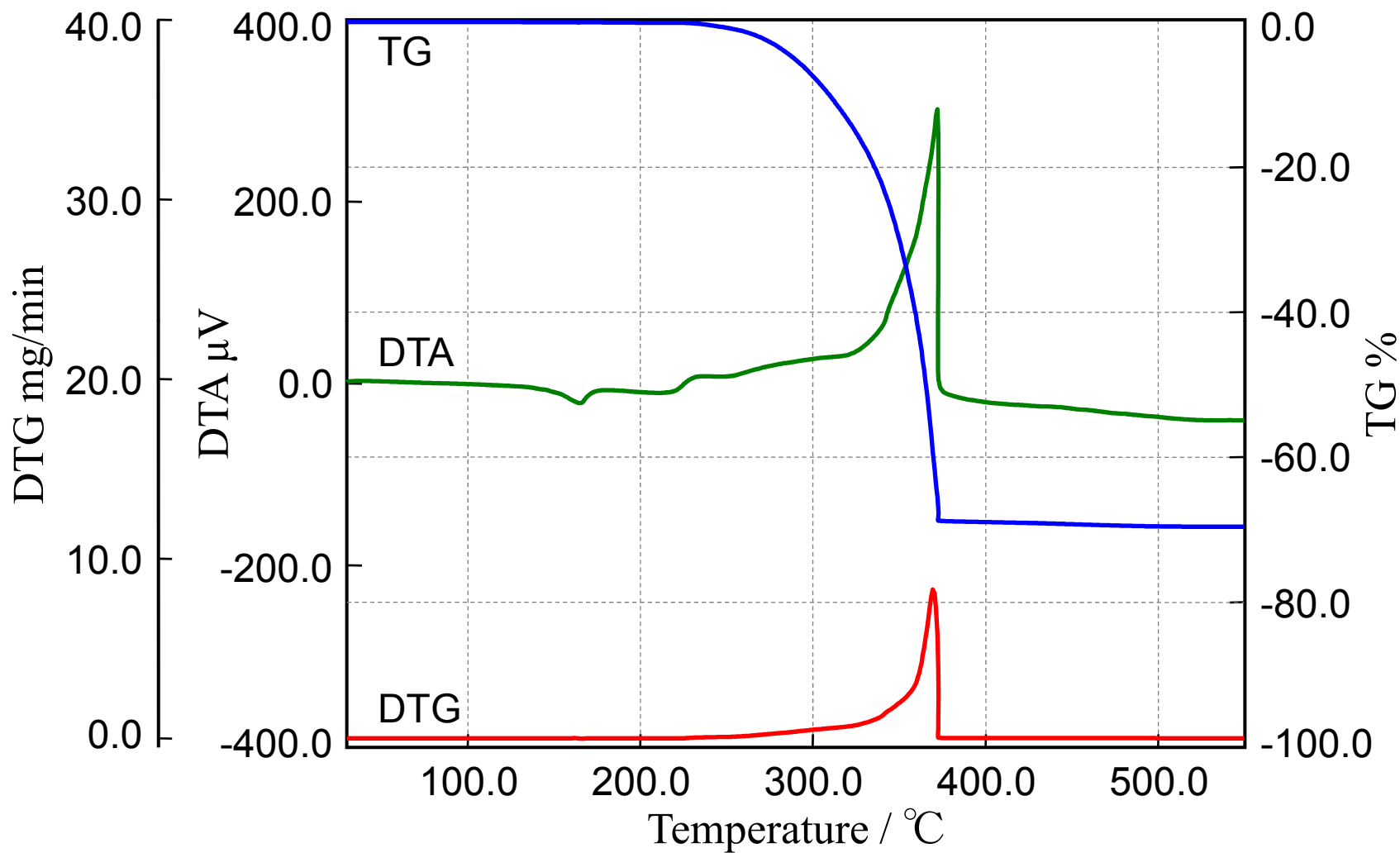


STA7200RV and RV-3TG



## Real View STA Measurement of Plastic Optical Fiber

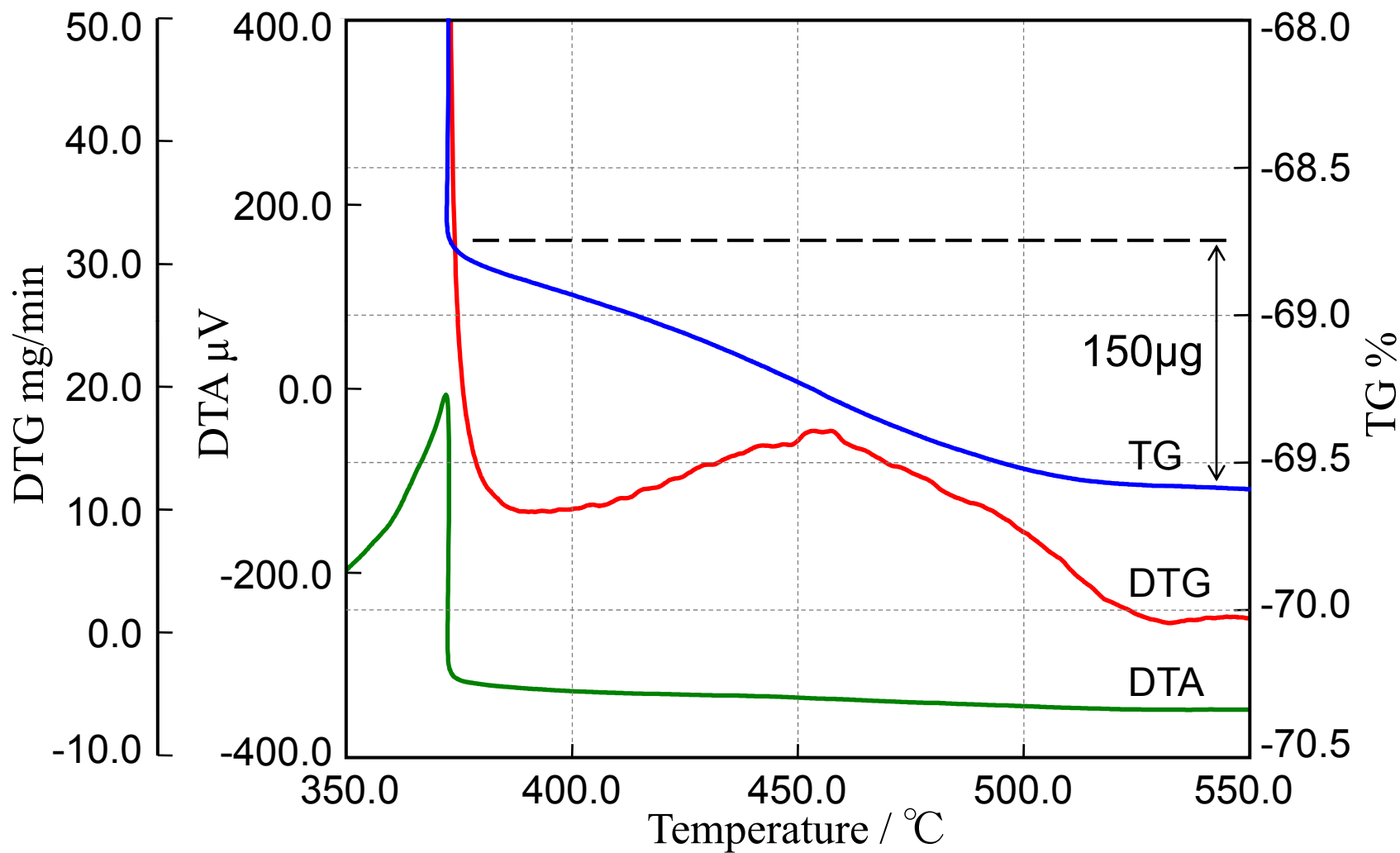




Sample: Glass Fiber Reinforced PP, Rate: 10°C/min, Gas: Air 200mℓ/min

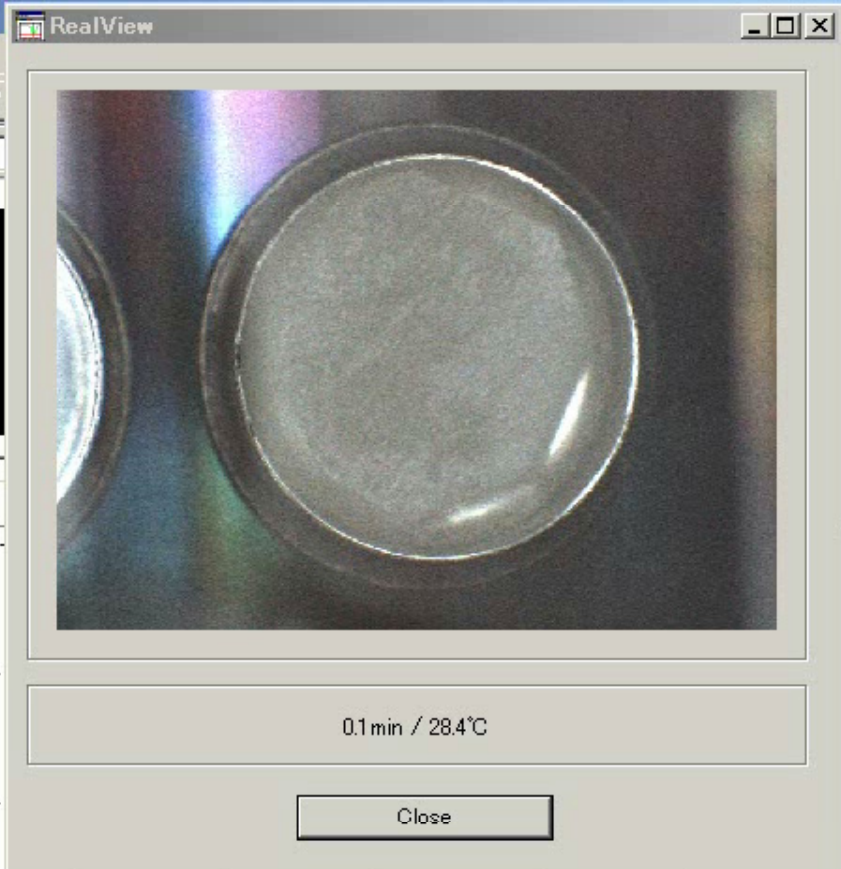
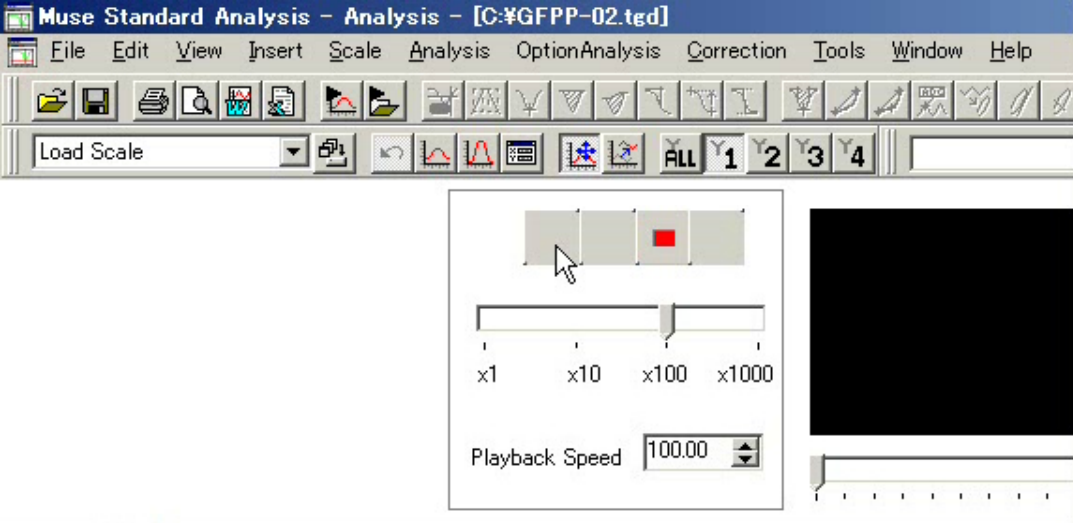


# Real-Time Sample Observing STA Measurement

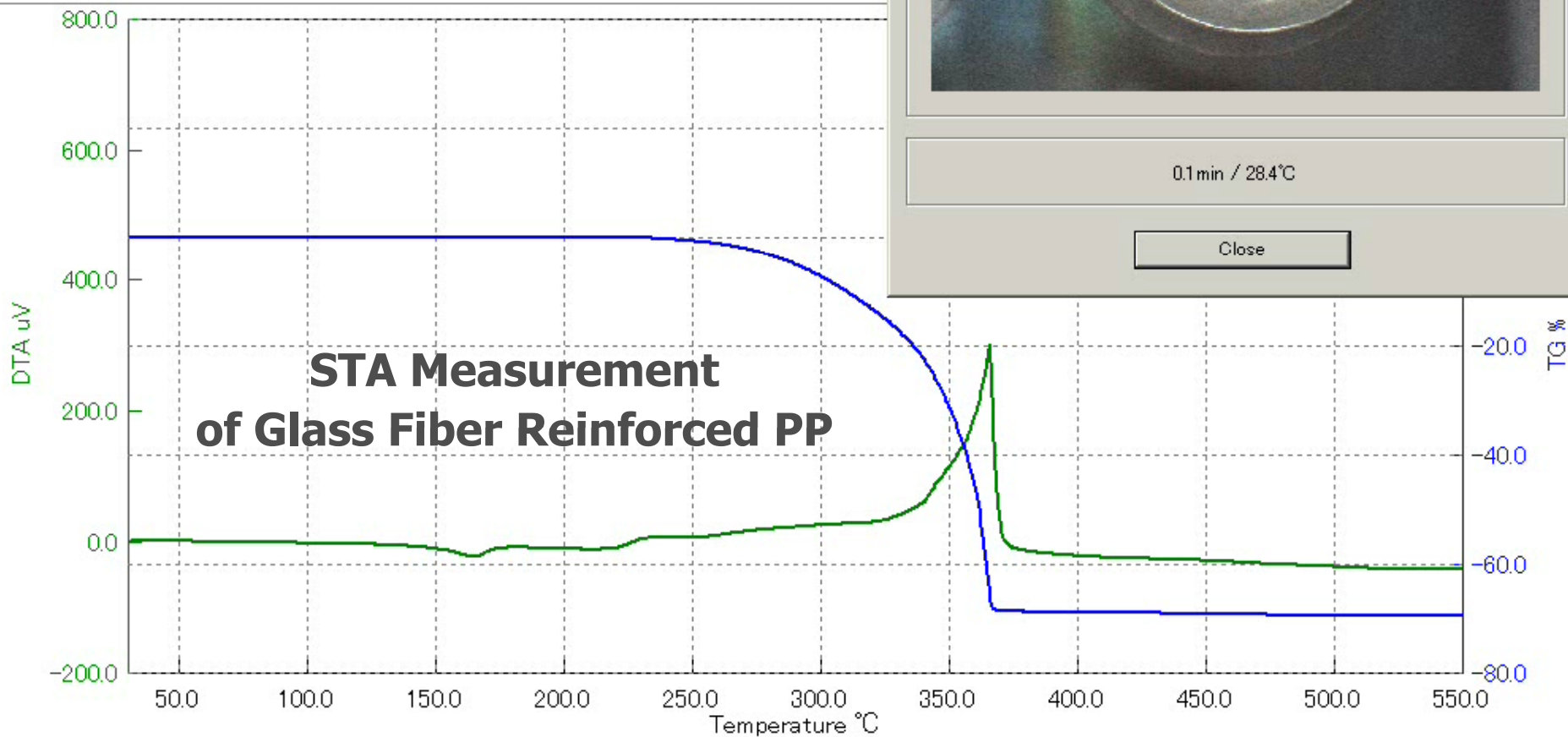


Sample: Glass Fiber Reinforced PP, Rate: 10°C/min, Gas: Air 200mℓ/min





## STA Measurement of Glass Fiber Reinforced PP



We developed the Real-Time Sample Observation system for DSC, STA, and DMA.

Particularly, the furnace of the STA system was enabled by the measurement up to 1000°C by using the computer simulation technique.

We will thereby obtain more detailed information by this systems.



DSC System



STA System



DMA System