Differential Scanning Calorimetry (DSC)

**Program**

Two types of DSC training courses are available.
The practical DSC training is mainly hands-on, and is designed for the operator of the instrument. Focus is on optimum use of the equipment; calibration and maintenance are major topics.
The theoretical DSC training is mainly lecture based, with only a brief hands-on session. It is designed to help the researcher/lab manager in choosing optimum measurement conditions and performing interpretation of the results. Moreover, a general overview of the use of DSC in multiple fields is presented.

**Practical DSC Training, 1 day**

*This training is mainly hands-on and designed for the operator to get the most out of his DSC. Equipment covered: Q2000, Q200, Q20, Q1000, Q100, Q10.*

09.15 – 09.30 Registration – coffee

09.30 – 12.30 Introduction technique and instrumentation
- Calibration & verification: Tzero, baseline, heat flow, temperature, autosampler
- Optimisation and importance of baseline
- Choice of purge gas, flow rate, pan type
- Design of experimental method
- Tips for optimum use of data analysis software

12.30 – 13.30 Lunch

13.30 – 16.30 Maintenance of the DSC:
- Cleaning a dirty furnace
- Aligning the autolid
- Replacing the autosampler gripper fingers
- Optimum use and maintenance of the cooling accessory

16.30 – … Question session
Theoretical DSC Training, 2 days

This training is mainly lecture based and designed to provide a general review on the importance of experimental parameters and different applications of the DSC. This training is to a big extent brand independent.

**Day 1**

09.15 – 09.30  Registration – coffee

09.30 – 12.00  Introduction technique and instrumentation
   - Thermodynamic principles
   - Design of experimental method
   - Calibration: theory

12.00 – 13.00  Lunch

13.00 – 16.30  Optimisation of experimental conditions (purge gas, sample preparation, choice of pan type, heating & cooling rate)

16.30 – ….  Question session

**Day 2**

09.15 – 09.30  Registration – coffee

09.30 – 12.00  Measuring conditions for typical material classes
   - The glass transition temperature
   - Melting and crystallisation

12.00 – 13.00  Lunch

13.00 – 16.30  How to measure heat capacity?
   - Hints for optimum use of data analysis software
   - Introduction to Modulated DSC

16.30 – ….  Question Session
**Practical Information**

**Location:** Application lab TA Instruments  
Brusselsesteenweg 500, 1731 Zellik (B)  
Mon Plaisir 12A, 4879 AH Etten-Leur (NL)

**Language:** The course language is English.

**Notes:** Notes are provided at the start of the day.

**Registration fee:** Registration fee per person is 900 Euro for the 2-days course and 500 Euro for the 1-day course.  
Lunch is included.  
Participation is free of charge for users who recently bought new equipment, with a maximum of 2 persons (excluding optional hotel fare). Participation is also free of charge for customers with an Academic, Premium or Lifetime Support Plan.  
Universities / schools receive 100 Euro discount on the registration fee per day.  
An invoice for course registration (if applicable) will be send after the course.

**Hotel:** Hotels located close to our office are:  
Salons Waerboom (Groot-Bijgaarden), [www.waerboom.com](http://www.waerboom.com)  
Gosset Hotel (Groot-Bijgaarden), [www.gosset.be](http://www.gosset.be)

**Info:** For all additional questions please contact Nadia Rassart  
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Registration Form

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or fax to    +32-2-7060081

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Company:

Department:

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ZIP Code:  City:

Phone:  Fax:

E-mail:

I want to register for the theoretical DSC training on

- February 9-10, 2010, in Zellik
- June 1-2, 2010, in Etten-Leur
- November 16-17, in Zellik

I want to register for the practical DSC training on

- March 30, 2010, in Zellik
- September 9, 2010, in Etten-Leur

Note that the indicated course location might be subject to changes.

Registration fee for the course:

☐ Free of charge (user of new equipment)

☐ Free of charge (academic, premium or lifetime support plan)

☐ 900 Euro (2-days course)

☐ 500 Euro (1-day course)

☐ University / school discount

As a confirmation of your registration you will receive at latest a week prior to the course a road description to our application lab.
Modulated DSC (MDSC)

Program

Two types of Modulated DSC training courses are available. The practical MDSC training is mainly hands-on, and is designed for the operator of the instrument. The theoretical MDSC training is lecture based. It is designed to help the researcher/lab manager in choosing optimum measurement conditions and performing interpretation of the results. Examples of the use of MDSC for various applications and to study different types of transitions are covered.

Practical MDSC Training

09.15 – 09.30 Registration – coffee

09.30 – 12.00 Introduction instrumentation
  MDSC calibration
  Design of an experimental method
  Sample preparation and set-up of experiments

12.00 – 13.00 Lunch

13.00 – 16.00 Interpretation of the results
  Use of data analysis software

16.00 – …. Question session

There is a fair chance for participants to measure their own samples during this hands-on training.
Theoretical MDSC Training

09.15 – 09.30  Registration – coffee

09.30 – 12.00  Advantages of MDSC in comparison with conventional DSC
   Calibration of Modulated DSC
   Optimisation of experimental conditions for MDSC (purge gas, sample preparation, choice of pan type, modulation parameters and heating rate)

12.00 – 13.00  Lunch

13.00 – 16.30  MDSC data interpretation
   - glass transition region
   - influence of experimental conditions in the melting region

   Special measuring conditions and data analysis
   - thermal conductivity
   - stepwise quasi-isothermal
   - phase angle
   - Lissajous figures

16.30 – ….  Question session
Practical Information

Location: Application lab TA Instruments
Brusselsesteenweg 500, 1731 Zellik (B)
Mon Plaisir 12A, 4879 AH Etten-Leur (NL)

Language: The course language is English.

Notes: Notes are provided at the start of the day.

Registration fee: Registration fee is 500 Euro per day per person.
Lunch is included.
Participation is free of charge for users who recently bought new equipment, with a maximum of 2 persons (excluding optional hotel fare). Participation is also free of charge for customers with an Academic, Premium or Lifetime Support Plan.
Universities / schools receive 100 Euro discount on the registration fee.
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E-mail :

I want to register for the theoretical MDSC training on March 9, 2010, in Zellik November 25, 2010 in Etten-Leur

I want to register for the practical MDSC training on May 18, 2010, in Zellik

Note that the indicated course location might be subject to changes.

Registration fee for the course:

- Free of charge (user of new equipment)
- Free of charge (academic, premium or lifetime support plan)
- 500 Euro
- 400 Euro (University / school only)

As a confirmation of your registration you will receive at latest a week prior to the course a road description to our application lab.
Thermogravimetric Analysis (TGA)

Program

Two types of TGA training courses are available. The practical TGA training is mainly hands-on, and is designed for the operator of the instrument. Focus is on optimum use of the equipment; calibration and maintenance are major topics. The theoretical TGA training is lecture based. It is designed to help the researcher / lab manager in choosing optimum measurement conditions and performing interpretation of the results. Moreover, a general overview of the use of TGA in multiple fields is presented.

Practical TGA Training

This training is mainly hands-on and designed for the operator to get the most out of his TGA. Equipment covered: Q5000IR, Q500, Q50, 2950, 2050 TGA.

09.15 – 09.30 Registration – coffee

09.30 – 12.30 Introduction technique and instrumentation
Calibration of mass, temperature, autosampler & verification
Optimisation and importance of baseline
Choice of purge gas, flow rate, pan type
Design of experimental method
Tips for optimum use of data analysis software

12.30 – 13.30 Lunch

13.30 – 16.30 Maintenance of the TGA:
Removing and cleaning a dirty furnace
Replacing the hangdown wire and hangdown loop
Replacing the thermocouple
Maintaining the heat exchanger
Installing the EGA interface

16.30 – …. Question session
Theoretical TGA Training

This training is lecture based and designed to provide a general review on the importance of experimental parameters, different applications and operating modes of the TGA. This training is to a big extent brand independent.

09.15 – 09.30 Registration – coffee

09.30 – 12.00 Introduction technique and instrumentation
   Calibration: theory
   Optimisation of experimental conditions
   Typical applications (thermal stability, compositional analysis)

12.00 – 13.00 Lunch

13.00 – 16.00 Hi-Res™ TGA:
   Introduction
   Different modes and their application domain
   Choice of parameter settings
   Applications
   Modulated™ TGA, Kinetics:
   Theory
   Choice of experimental conditions
   Applications
   TGA-EGA:
   Principle (coupling to MS, FTIR)
   Applications
   Tips for optimum use of data analysis software

16.00 – …….. Question session
**Practical Information**

**Location:**
Application lab TA Instruments
Brusselsesteenweg 500, 1731 Zellik (B)

**Language:**
The course language is English.

**Notes:**
Notes are provided at the start of the day.

**Registration fee:**
Registration fee is 500 Euro per day per person.
Lunch is included.
Participation is free of charge for users who recently bought new equipment, with a maximum of 2 persons (excluding optional hotel fare). Participation is also free of charge for customers with an Academic, Premium or Lifetime Support Plan.
Universities / schools receive 100 Euro discount on the registration fee.
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E-mail :

I want to register for the theoretical TGA training on ☐ March 31, 2010, in Zellik
I want to register for the practical TGA training on ☐ October 13, 2010, in Zellik

Note that the indicated course location might be subject to changes.

Registration fee for the course:
☐ Free of charge (user of new equipment)
☐ Free of charge (academic, premium or lifetime support plan)
☐ 500 Euro
☐ 400 Euro (University / school only)

As a confirmation of your registration you will receive at latest a week prior to the course a road description to our application lab.
Dynamic Mechanical Analysis (DMA)

**Program**

DMA Training, 2 days

*This training provides an introduction to the DMA technique and its applications. It is designed for the new operator to get the most out of his DMA. It is a combination of theory and hands-on operation. Equipment covered: Q800 and 2980 DMA.*

**Day 1**

09.15 – 09.30  Registration – coffee

09.30 – 12.00  Terminology, introduction to linear viscoelastic theory
  Instrument design
  Modes of operation and when to use them

12.00 – 13.00  Lunch

13.00 – 16.00  When to use a particular clamping configuration
  Experimental considerations

**Day 2**

09.15 – 09.30  Registration – coffee

09.30 – 12.00  Calibration: instrument and temperature
  Applications with various types of clamps

12.00 – 13.00  Lunch

13.00 – 16.00  Applications with various types of clamps (continued)
  Tips for optimum use of data analysis software

16.00 – ….  Question session
**Practical Information**

**Location:** Application lab TA Instruments  
Brusselsesteenweg 500, 1731 Zellik (B)

**Language:** The course language is English.

**Notes:** Notes are provided at the start of the day.

**Registration fee:** Registration fee is 900 Euro for the 2 days per person.  
Lunch is included. Participation is free of charge for users who recently bought new equipment, with a maximum of 2 persons (excluding optional hotel fare). Participation is also free of charge for customers with an Academic, Premium or Lifetime Support Plan. Universities / schools receive 200 Euro discount on the registration fee. An invoice for course registration (if applicable) will be send after the course.

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I want to register for the DMA training on

☐ April 21-22, 2010, in Zellik

☐ September 28-29, 2010 in Zellik

Note that the indicated course location might be subject to changes.

Registration fee for the course:

☐ Free of charge (user of new equipment)

☐ Free of charge (academic, premium or lifetime support plan)

☐ 900 Euro

☐ 700 Euro (University / school only)

As a confirmation of your registration you will receive at latest a week prior to the course a road description to our application lab.
Software Training (Universal Analysis)

Program

Software Training

This training is designed to help the operator in using the more advanced features of TA Instruments’ Universal Analysis software, including the use of Macro’s for autoanalysis of data files, creation of custom reports, and many other features. Universal Analysis software is used for analysis of DSC, MDSC, TGA, SDT, TMA and DMA data.

09.15 – 09.30 Registration – coffee

09.30 – 12.00 Instruction of UA software capabilities

12.00 – 13.00 Lunch

13.00 – 16.00 Hands-on of UA software capabilities
Practical Information

Location: Application lab TA Instruments
Brusselsesteenweg 500, 1731 Zellik (B)

Language: The course language is English.

Notes: Notes are provided at the start of the day.

Registration fee: Registration fee is 400 Euro per day per person.
Lunch is included.
Participation is free of charge for users who recently bought new equipment, with a maximum of 2 persons (excluding optional hotel fare). Participation is also free of charge for customers with an Academic, Premium or Lifetime Support Plan.
Universities / schools receive 100 Euro discount on the registration fee.
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I want to register for software training on  October 12, 2010, in Zellik

Note that the indicated course location might be subject to changes.

Registration fee for the course:

☐ Free of charge (user of new equipment)

☐ Free of charge (academic, premium or lifetime support plan)

☐ 400 Euro

☐ 300 Euro (University / school only)

As a confirmation of your registration you will receive at latest a week prior to the course a road description to our application lab.
Rheology (basic)

Program

This 2-days basic training is designed for the user to get a maximum out of his rheometer. It is a mixture between theory and practice.

Day 1

09:45 – 10:00  Registration - Coffee

10:00 – 13:00  Introduction to rheology, terminology and measuring systems

Introduction to flow

Practical Session

- Setting up an instrument
- Review of calibrations
- Flow experiments

Introduction to viscoelasticity and creep

13:00 – 14:00  Lunch

14:00 – 17:00  Practical Session

- Creep experiments

Introduction to dynamic techniques

- Linear Viscoelasticity
- Frequency sweeps

Practical Session

- Dynamic tests (part 1)
Day 2

This day is dedicated to delegates putting into practice what they have learnt. Time is also available for informal discussions regarding existing or future projects.

08:45 – 09:00  Registration - Coffee

09:00 – 13:00  Remaining dynamic techniques
   • Structure and structure recovery
   • Cures (time and temperature ramps)

**Practical session – dynamic tests (part 2)**

Informal Q&A session based on customer’s own type of samples
   • what are the tests you should use?

**Practical session**

13:00 – 14:00  Lunch

14:00 – 15:30  **Practical session**
Practical Information

Location: Application lab TA Instruments
Brusselsesteenweg 500, 1731 Zellik (B)
Mon Plaisir 12A, 4879 AH Etten-Leur (NL)

Language: The course language is English.

Notes: Notes are provided at the start of the day.

Registration fee: Registration fee is 900 Euro for the 2 days per person.
Lunch is included.
Participation is free of charge for users who recently bought new equipment, with a maximum of 2 persons (excluding optional hotel fare). Participation is also free of charge for customers with an Academic, Premium or Lifetime Support Plan.
Universities / schools receive 200 Euro discount on the registration fee.
An invoice for course registration (if applicable) will be send after the course.

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I want to register for rheology training on
☐ March 17-18, 2010, in Zellik
☐ October 12-13, 2010 in Etten-Leur

Note that the indicated course location might be subject to changes.

Registration fee for the course:

☐ Free of charge (user of new equipment)
☐ Free of charge (academic, premium or lifetime support plan)
☐ 900 Euro
☐ 700 Euro (University / school only)

As a confirmation of your registration you will receive at latest a week prior to the course a road description to our application lab.
Advanced Rheology

Program

This 2 days advanced training for users of TA AR and ARES rheometers is split into two sections: 1) Advanced rheological testing and 2) Evaluation of the test results. This training will focus on optimizing test procedures composed of transient and oscillation test modes and validating the test results. The objective is to explain how to approach non standard testing requirements, to optimize the test procedures and to understand the limitations of the instrument and test methods. This training does not include practical sessions at the instrument. The training also instructs how to use the various evaluation features of the rheology software packages such as modeling, rheological transformations, time-temperature superposition etc. to analyze the experimental results.

Day 1

09:15 – 9:30 Registration - Coffee

9:30 – 13:00 Introduction
Advanced rheological testing – part 1
- A critical review of the common test geometries. Presentation of geometries for special applications (helical ribbon, extensional test fixture,..)
- Transient tests including
  o creep recovery
  o stress and normal stress growth
  o extensional testing

13:00 – 14:00 Lunch

14:00 – 16:00 Advanced rheological testing – part 2
- Oscillation tests including
  o fast oscillation for evolving materials
  o multiwave
  o short introduction into the non-linear oscillation testing (LAOS)

  - Relating, comparing different test approaches and validating test results
    o Cox-Merz
    o Rabinowitch-Weissenberg corrections
    o Important validation parameters to verify test quality

16:00 – 17:00 Review and discussions
Day 2

08:45 – 09:00  Registration - Coffee

09:00 – 13:00  Evaluating test results - part 1
- Manipulating data
  o Smoothing - Pro and Contra
  o User defined equations, differentiation
  o Statistics
- Modelling
  o Flow models
  o Oscillation models
  o Working with models using Rheology Advantage and TA Orchestrator
- TTS
  o Shifting data versus temperature, frequency or time
  o Creating master curves

13:00 – 14:00  Lunch

14:00 – 15:00  Evaluating test results – part 2
- Transformations
  o General transformations
  o Rheological transformations
    ▪ Relaxation time spectrum
    ▪ Converting linear viscoelastic data (creep to oscillation,..)

15:00 – 16:00  Review and discussions
**Practical Information**

**Location:** Application lab TA Instruments  
Brusselsesteenweg 500, 1731 Zellik (B)

**Language:** The course language is English.

**Notes:** Notes are provided at the start of the day.

**Registration fee:** Registration fee is 900 Euro for the 2 days per person.  
Lunch is included.  
Participation is free of charge for users who recently bought new equipment, with a maximum of 2 persons (excluding optional hotel fare). Participation is also free of charge for customers with an Academic, Premium or Lifetime Support Plan.  
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E-mail :

I want to register for advanced rheology training on ☑ March 2-3, 2010, in Zellik

Note that the indicated course location might be subject to changes.

Registration fee for the course:

☐ Free of charge (user of new equipment)

☐ Free of charge (academic, premium or lifetime support plan)

☐ 900 Euro

☐ 700 Euro (University / school only)

As a confirmation of your registration you will receive at least a week prior to the course a road description to our application lab.