Thermo
ELECTRON CORPORATION

In this Issue

RheoFuture™ and AERC – supporting young scientists

After the great success of the RheoFuture™ in 2002 and the "Young Scientists Award" (www.rheofuture.de) in 2003, Thermo Electron continues with this initiative in 2003.

RheoFuture™ is proud to be the official partner of the AERC (Annual European Rheology Conference) in Portugal. At this major rheology conference, young scientists are invited to present their papers as a special "RheoFuture contribution". What does it mean?
These papers will be "normal" presentations at the conference.
Experienced scientists from the RheoFuture judging panel will be present in the auditorium to judge innovative application oriented aspects of the papers.

In 2004, Thermo Electron will organize a comprehensive international conference in Karlsruhe, Germany. All successful RheoFuture participants from Europe, USA and Asia will come together to exchange ideas and to discuss trends in material characterization.

AERC 2003
September 11-13, 2003
Guimarães - PORTUGAL

RheoFuture continues to work towards linking academia and industry through their partnership with AERC.

Following is an interview conducted by Dr. Dirk Eidam, Director of Strategic & Key Accounts, Thermo Electron Corporation and João Maia, PhD University of Minho, the organiser of AERC.

QUESTION 1: Prof. Maia, there are lots of regional and international rheology conferences every year. What is the special importance of the AERC?

AERC is a very important conference exactly because it represents the European Society of Rheology's attempt at reducing the number of Conferences each year. The general

Professor João Maia

idea is that there should be one major conference on Rheology in Europe every year, the AERC, where researchers from all fields come together – much along the lines of previous European Conferences, such as in Erlangen, in 2002, Portoroz, in 1998 and Sevilla, in 1994, among others – and several smaller, more specific conferences, dedicated to particular topics. Thus, it can be said that AERC 2003 will be the premier Rheology Conference in Europe this year.

QUESTION 2: How many participants do you expect to come?

It is still a bit early to assess that, as the deadline for submission of abstracts only ends on June, 30th. However, up to today (June 15th) we have already received slightly more than 200 abstracts. This seems to indicate that the number of participants will also be in excess of that, which, given the international economic and political situation (that already caused several conferences to be cancelled or downgraded significantly in 2003) is quite encouraging.

QUESTION 3 & 4. What will be the key trends in rheology this year, can you already foresee it? People from industry often get a "theory shock" at conferences. What do you do to address this special target group, they expect practical solutions?

From the abstracts we have already received, it is possible to detect an increasing focus on Applied Rheology, in several key areas (food, polymers, etc.). It seems as though researchers are beginning to transfer the scientific knowledge generated thus far into more practical situations. This was also reflected in the fact that we have a symposium entirely dedicated to Rheology in Materials Processing, for example, in addition to more specific symposia.

However, this is not to say that research in fields where Europe and historically led knowledge-wise are being neglected; in fact, there are a significant number of very good communications in areas such as Computational Rheology and Experimental Rheology. In conclusion, I would say that AERC 2003 will be a Conference able to suit the needs of both applied and more fundamental.

QUESTION 5. Prof. Maia, the Minho region in Portugal is said to be also attractive from the tourist point of view. What will be the highlights from the social programme?

Well, Guimarães is a UNESCO Heritage of Humankind and the whole Minho region is absolutely staggering from the tourist point-of-view. It is one of the hidden jewels of Portuguese tourism. Not only the gastronomy is excellent, but also we have 3000 years of continuous history and amazing natural beauties such as the Natural Park of Gerês. Thus, I believe Minho is ideally suited to meet the demands of each particular tourist. Obviously, the Conference had to reflect this character and we have a large number of tours available before, during and after the Conference, which, I'm sure, will be to everyone's liking. All the details regarding this and every other aspect of AERC 2003 can be found on the conference's website at www.rheology-esr.org/
We are certainly looking forward to welcoming everyone in Guimarães, next September.

Issue 8 · July 2003
HAAKE Focus

Issue 8

Thermo Electron Corporation Acquires Process Control Rheometers

Newington, NH (June 20, 2003) – Thermo Electron Corporation (NYSE: TMO) announced that it has purchased the Process Control Rheometers (PCR) product line formerly manufactured and marketed by Rheometric Scientific Instruments, Inc., from TA Instruments. PCR rheometers are used by global polymer producers in on-line process applications to produce high quality polymers at lower cost.

"Rheometry is the cornerstone of our material characterization business, and we're committed to becoming the leading global supplier of this critical materials analysis equipment," said Mark Halter, President of Thermo's Control Technologies Division. "The PCR line complements and strengthens our existing product offerings and allows us to offer the only complete line of viscometers and rheometers from laboratory to pilot plant through on-line process applications."

In addition to selling new equipment, Thermo's Control Technology Division will offer a comprehensive package of support options for PCR and ACER products already in the field. These support services are designed to maximize uptime and ensure total customer satisfaction.

About Thermo Electron Corporation
Leading the world in high-tech instruments, Thermo Electron Corporation helps life science, laboratory, and industrial customers advance scientific knowledge, enable drug discovery, improve manufacturing processes, and protect people and the environment with instruments, scientific equipment, and sample-in/knowledge-out solutions. Based in Waltham, Massachusetts, Thermo Electron has revenues of more than $2 billion, and employs approximately 11,000 people in 30 countries worldwide.
For more information, visit www.thermo.com

Thermo Electron at the ACHEMA 2003

Positive momentum for innovations, investments and international contacts

Thermo Electron actively participated at the 2003 ACHEMA exhibit, the world's biggest chemicals processing show.

During the six days of the show a total of 2117 contacts were registered on the two Thermo booths with 646 of these attributed to our Control Technologies Division (comprising Temperature Control and Material Characterization Businesses). A number of important new product developments were showcased and launched in Frankfurt. These included:

- The new HAAKE Viscotester 1 plus and 2 plus,
- The HAAKE RheoCap T100 capillary rheometer,
- a range of new accessories for the HAAKE Phoenix range of circulators to name just a few.

This event also marked the launching of our "One Thermo" brand in Europe with nine different Thermo businesses all exhibiting under the same banner and we all benefited from the increased exposure this resulted in. Whilst traffic and contact figures on our booth were slightly down on the statistics for the last ACHEMA in 2000, it was generally recognized that in the light of the current economic and political situation, this resulted in leads received being qualitatively if not quantitatively higher.

The entrance to ACHEMA

When judging the success of the ACHEMA in total, the following figures were published by the DECHEMA (trade show organizing body). 3,819 exhibitors from 48 countries presented equipment, technological competence, new developments and services for the process industries at the Frankfurt fairground in 12 exhibition groups on a net area of 138,345 m².

A total of 192,161 participants from over 100 countries used the ACHEMA to exchange experiences.

This 27th ACHEMA, the second largest in its 83-year-old history, confirmed, like no previous event, its international importance and its European significance, said the Chairman of the DECHEMA, Prof. Utz-Hellmuth Felcht. In view of the current employment situation in the process industries, the effect of the Iraq war and the uncertainty caused by SARS in the media in the run-up to the ACHEMA, these visitor figures are assessed as being above average by the exhibitors and all branch representatives.

Customer Profiles

Users of any Rheometers, Torque Rheometers or Compounders are invited to submit a story on their specific application and/or use of our instruments.

Interested? Send an email to newsletter@thermohaakecom with a brief overview.

Meeting the Requirements of 21 CFR Part 11 with RheoWin 3 –
the world's first rheometry software tool for (FDA) 21 CFR Part 11 compliance

The Electronic Records and Signature Rule, known as 21 CFR Part 11, was established by the US Food and Drug Administration (FDA) to define the requirements for using electronic records and electronic signatures as a replacement for paper record and handwritten signatures in the pharmaceuticals industry.

Although this law has been in effect since 1997, it was not until a few years ago that the FDA started to enforce it.

Compliance with 21 CFR Part 11 requires the combination of a certain functionality in electronic systems and Standard Operating Procedures (SOP); therefore the product (e.g. software) alone can not ensure compliance for a certain individual installation of that product.

With the three modules for User Management, Audit Trail and Electronic Signatures of the new HAAKE RheoWin 3 software, Thermo Electron Corporation offers 21 CFR Part 11 technical compliance for its rheometer and viscometer software.

User Management

HAAKE RheoWin 3 is equipped with a comprehensive user management system for access control. The user management system includes password controls like minimum password length, password uniqueness, password age limits, etc. Specific privileges, based on pre-defined or user-defined user groups, can be assigned to each user, exactly defining the scope of activity he or she has rights for.

Audit Trail

HAAKE RheoWin 3 automatically tracks all operator entries and actions that create, modify or delete electronic records, by maintaining a secure, computer generated, time stamped audit trail. The audit trail records the time and date of each event, along with the name of the operator involved. Changes to records (like RheoWin Job Files or Data Files) add new entries to the audit trail so that previously recorded information is not obscured. The audit trail is stored in a SQL server compatible database file.

Electronic Signatures

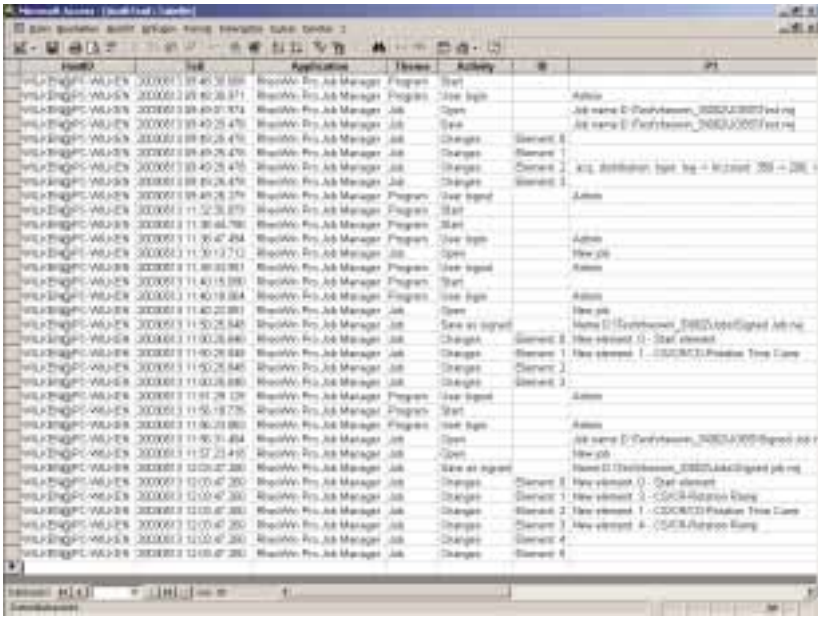
Electronic signatures can be applied to RheoWin Job and Data files. The system administrator can grant specific user groups or individual users the privilege of applying electronic signatures.

The new HAAKE RheoWin 3 software, soon to be released, incorporates 3 modules enabling it to be used in companies which use rheometers and/or viscometers in a R&D, QC or production environment where 21 CFR part 11 compliance is needed.

For more information

on RheoWin 3, it's release date and the availability of a test version please send an e-mail to

haake-21cfrpart11@thermo.com



Secure Electronic Records

In an unsecure operating system, it would be possible for a user to gain access at the operating system level and delete or corrupt RheoWin Job or Data files or even the Audit Trail which would make the system non-compliant.

As a consequence it is obligatory to run RheoWin 3 under a secure operating system such as Windows NT, 2000 or XP in order to be able to make it compliant with 21 CFR part 11.

All newsletter comments and suggestions should be sent by email to

newsletter@thermohaake.com

Vehicle for Innovation – HAAKE and NESLAB Products together for the first time

Thermo Electron Corporation now offers an even wider range of temperature control products as a result of the combination and concentration of Thermo HAAKE and Thermo NESLAB. Customers in the lab and pilot plant now have easy access to both product lines from the same source.

A newly-formed, competent sales and service team in Karlsruhe, Germany and Newington, USA is responsible worldwide for the entire product range of a market leader in temperature control technology.

The product range extends from simple immersion circulators to industrial coolers with a cooling capacity of 20 kW.

The company's ability to provide specific application solutions was greatly increased as a result of the synergies created by the merging of both ranges. The system supplier is thus even more able to provide customer-oriented application solutions. An example of this was demonstrated as a highlight at the ACHEMA 2003.

Temperature control technology from Thermo Electron with the HAAKE and NESLAB products ranges is at home in any lab or pilot plant. The product range includes immersion circulators, heating circulators, refrigerated circulators and systems for process cooling.

These liquid temperature control units cover the temperature range from -90° C to +280° C with a maximum temperature accuracy of +/-0.01 K.

Over 70 different models with reliable solutions for a wide variety of applications are available. The customer is thus supported with efficient technology and comprehensive service during every phase of their work process.

Special features include modern microprocessor technology as well as control systems such as PID, FuzzyStar with neural adaptation, plain text display (either LED or LCD), flexible interface concepts (e.g. RS232C, RS485) and an extensive range of accessories.

Bath liquids and a powerful software package are also available.

More Info? Send an email to newsletter@thermohaake.com and Quote: No: 135 for a complete catalogue.

New!

Thermo Electron HAAKE temperature control units now carry a 24-month warranty.

This initiative was launched at the ACHEMA 2003. The warranty is automatically provided without having to register specially when purchased and is provided without any other limitation.

Looking for Application Information?

Thermo provides application support worldwide. If you would like to discuss your particular application and find out where Thermo can offer technical product support contact your local distributor or Email newsletter@thermohaake.com

Trade in Your old Rheometer for a HAAKE RheoStress 600

Trade in your old HAAKE RV20, RV100 or any other brand of old rheometer (conditions apply) and replace it with the newest state of art modular R&D Rheometer – the HAAKE RheoStress 600.

The HAAKE RV20 and RV100's have been around since the 80's. They were then the best available rotational rheometer from HAAKE. This trade in offer entitles customer to again have the top of the line rheometer from HAAKE plus receive a trade in to the value of 8,000 Euro to all customers who qualify and buy a HAAKE RheoStress 600.

The offer requires that the old rheometer be returned.

Who can take part?

- All HAAKE customers with an RV20 or RV100

And all customers with:

- Rheometrics DSR, SR, RDA, RFS and similar models
- Carrimed CS, CSL, Weissenberg
- TA instruments AR, QC
- Bohlin CS, CVO, VOR
- Physica rheometers

PLEASE NOTE: This offer does not apply to all models of rheometers and does not apply to simple rotational viscometers.

How to Register For the Trade In Offer.

Prior to any agreement being reached, we will need to confirm if your current rheometer qualifies for this special trade in offer. To register, send an email to *newsletter@thermohaake.com* and provide full details on the type, brand and serial number of your existing rheometer.

We will then contact you to advise if your old rheometer qualifies and entitles you to this trade in offer.

Trends in Material Characterization

By Wolfgang Marquardt,
Thermo Electron Corporation, Karlsruhe

Introduction:

The business unit Material Characterization within Thermo Electron Corporation deals with the rheometry and instruments for the processing of e.g. powder coatings and other polymers.

Besides the "Olympic idea = faster – higher – further" some technical trends can be observed in this field:

- complete documentation of the measuring process and the results
- measurements directly in the process (on-line)
- production and characterization of small sample volumes (5 - 200g)
- extensional rheometry

The qualification according to ISO 9000 / ISO 9000:2000 requires the documentation of processes and their results in development and quality control. The quality requirements according to GMP (Good Manufacturing Practice), GLP (Good Laboratory Practice) or in general GxP were first applied in the pharmaceutical, then in the food industry and has by now reached the paint industry because the legal stipulations are very similar. However, they have so far not been enforced so strictly. What is the reason for all this?

In principle, these systems serve to protect the manufacturer with regard to product liability because they document that stipulations regarding production and control of the products have been observed. Thus, claims for compensation can be limited because all individual proofs regarding production and release of a product are available.

For the pharmaceutical industry, the FDA (Federal Drug Administration) has greatly extended the requirements on digital protocols and data files (21 CFR Part 11) by requiring a validation of the measuring means and a complete documentation of the measuring processes and results.

In 2003 the HAAKE RheoWin Software optionally offers additional modules like an extensive user administration and an "Audit Trail" in order to fulfil those requirements. Today this is an absolute must only in the pharmaceutical industry but will soon be required in other industries.

In polymer production the quality requirements increase while at the same time costs have to be reduced. Therefore, measuring tasks are transferred from the laboratories into production in order to supervise the process completely and to be able to intervene faster, if necessary. The HAAE ProFlow on-line rheometer is one of the first instruments for material characterization in production, pilot plant or even research laboratories. The measuring method is based on the principle of the high pressure capillary viscometer measuring the decrease of pressure over the length of a slit or rod capillary die at a defined flow speed. With comparative measurements and calibrations other measuring values like zero viscosity or MFI (Melt-flow Index) can be derived from this absolute measuring procedure for a certain sample group. Exchangeable dies allow the adaptation of viscosity and shear ranges to the application of a product. With a special "extension die" the extensional properties of a sample can be recorded on-line – a procedure which has just been introduced in the polymer industry.

More Info? Send an email to newsletter@thermohaake.com and Quote: No: 136 for ProFlow.

"Rapid Prototyping" cannot only be found in the mechanical development but also in the development of paints, coatings, food, pharmaceutical products and polymers. The production of new products in small volumes (grams instead of tons) saves time, cost and maintains the head start in technological know-how. The HAAKE MiniLab kneads, mixes, compounds and extrudes not only polymer mixtures but also produces new formulas with 5 to 10 g of the sample for further tests.

More Info? Send an email to newsletter@thermohaake.com and Quote: No: 137 for HAAKE MiniLab

The next step up from the 5 g capacity of the HAAKE MiniLab, the 16 mm twin screw PRISM extruders come close to small production instruments for polymers, powder coatings, food and pharmaceutical products with an output up to 5 kg/hr. They are accompanied by a full range of accessories, and are especially suitable for R & D, product development and quality control applications, as well as for colour-matching of new formulations. Larger-scale PRISM twin screw extruders and ancillaries are also available for Pilot Scale and Production applications, at outputs up to 200 kg/hr.

More Info? Send an email to newsletter@thermohaake.com and Quote: No: 138 for PRISM Compounders

Very frequently it is not enough to record the viscosity of a fluid; it needs to be tested under real application conditions in order to quantify a sample sufficiently. Extensional properties, for example, are dominant for applications like spraying of fluids (printer, spray painting, fire extinction), evaporation of solvents, dosing of adhesives in electronics (SMD technique). For those processes it is no longer sufficient to record the shear viscosity, but there, also the extensional viscosity needs to be measured in order to allow a final statement about the behaviour of the fluid. Materials, which exhibit more or less the same in shear flow properties, can behave completely different in extensional flow affecting the material's performance.

The contraction and the breaking off of a fluid thread analyzed with the HAAKE CaBER™ extensional rheometer for fluids deliver valuable information about the physical properties of a material which is not accessible with a rotational rheometer!

The HAAKE CaBER™ was developed by the Cambridge Polymer Group (CPG) based on the pioneering work of the Russian scientists Entov, Rozhkov and colleagues with regard to the "Rheometry of the breaking-off of threads".

HAAKE CaBER extensional rheometer

The HAAKE CaBER™ is an extensional rheometer, which is easy to operate and allows the investigation of polymer solvents, suspensions, melts, adhesives, emulsions, coatings, ink and other materials. It can be used as an analytical measuring instrument for research but also as a tool for the quality control. With a size of 40x34 cm the HAAKE CaBER™ is small enough to be placed in a laboratory off-take, on a laboratory table or in a production installation.

Applications are, for example, the measurement of the adhesiveness of adhesives, evaporation of solvents in paints, thread forming and running properties, break-off time of the thread and sprayability of paints. Viscoelastic properties decide about the way a paint can be sprayed, and here especially its extensional properties and its relaxation behaviour play a vital role. A very powerful example can be found at Yenny Christanti (1) who visualized this process.

First tests are made on paints used in the automotive industry (2). Here coatings are tested comparatively. It can clearly be seen that the rheological differences are not as dramatic under shearing like those of the values gained from the extensional tests. The so-called "strain hardening" changes the application properties of the acrylic paint already at extension rates of 10 s^{-1} completely. With an expected normal ratio between extensional viscosity to shear viscosity of 3 (Trouton factor) the example by Willenbacher (2) shows values of 20 to 30 for automotive paints. This means that the extensional viscosity is up to 10 times higher than normally expected. It is obvious that in this case the spraying process is dominated by the extensional viscosity.

These first examples show the potential of the new measuring method based on the extension of a substance thread.

More Info? Send an email to newsletter@thermohaake.com and Quote: No: 139 for HAAKE CaBER

Summary:

Are the trends in material characterization to be followed?

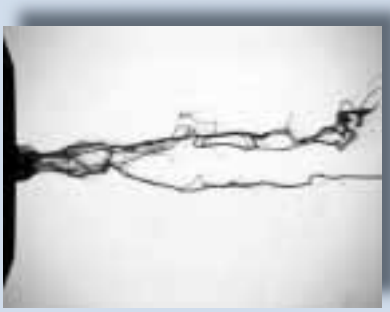
The answer is clearly yes, if the laws requires it, if it reduces cost or improves the quality, i.e. if it is unavoidable or offers clear advantages to the user. These are exactly the trends to be followed by the different Thermo business units.

References:

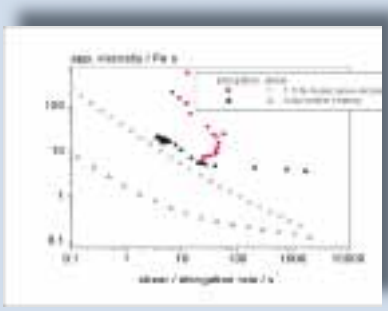
(1) Home Research Facilities Seminar Series People Educational/Outreach, *"Influence of Viscoelasticity on the Atomization of Polymer Solutions"* Yenny Christanti (Advisor: Lynn M. Walker, Dept. Chemical Engineering)

(2) *Industrial Applications of Capillary Break-up Elongational Rheometry (HAAKE CaBER™),* Speech during the European Rheology Meeting 2002, Erlangen, Norbert Willenbacher, BASF AG Ludwigshafen

Newtonian substance (1)



Viscoelastic substance (1)



Shear- and extensional viscosity of automotive paints (2)

Analyses for the Laboratory and Processing Areas

On-site Instrument Monitoring and Maintenance

Our Service Range:

- Functional testing and inspection of the instrument
- Testing and confirmation of the power output specifications
- Inspection of certain sub-components for preventative maintenance
- Usage and application consultation
- Test certification according to ISO 9000/9001

Your advantages:

- High operating safety due to regular monitoring
- Plannable maintenance costs
- Inexpensive prices for original replacement parts
- Installation of current software and firmware updates free of charge

Our offer:

- Half-yearly customer service ---> first visit is free of charge
- Yearly customer service ---> 15% discount on contract pricing for new contracts signed by November 2003

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Calibration of measuring instruments

According to ISO 9000/9001, instruments, which are involved in the QC process, must be tested to conform to nationally reproducible measuring methods at periodic intervals.

Our Service Range:

- Calibration of rotational viscometers and test measurements with DKD test liquids
- Testing of Meltflow units according to a polymer standard
- Calibration and testing of pressure and torque sensors in the PolyLab
- Calibration of the high pressure capillary rheometer and testing according to a polymer standard

Your advantages:

- Reliable test results
- Plannable calibration costs
- No investment and maintenance costs for test methods
- Reliable and competent external service

Our offer:

- 10% discount for all calibration contacts signed by November 2003

More Info? Send an email to newsletter@thermohaake.com and Quote: No: 141

Qualifying test instruments

Our Service Range:

- Installation qualification (IQ)
Documented proof that a system was installed according to written and approved specifications.
- Operational qualification (OQ)
Documented proof that a system works according to written and approved specifications within all intended operating areas.
- Performance qualification (PQ)
Documented proof that a system is capable of executing and monitoring the working processes which it should execute and monitor according to written and approved specifications in its specific system environment.
- Design qualification (DQ)
Documented proof that the suggested draft for devices, systems and instruments is adequate for the intended usage.

Your advantages:

- Competent testing of the specifications with manufactures test means
- Creation of test plans with instrument specialists

Checking and interpretation of the results

Our offer:

- Commissioning with IQ/OQ ----> 10 % discount until November 2003

More Info? Send an email to newsletter@thermohaake.com and Quote: No: 142

From The Editor

HAAKE Focus is now coming up to the end of its second year of production. The team of writers that contribute to the newsletter is growing and the plans for contents of future issues are now well established with a number of exciting and informative application based articles now scheduled.

We are pleased to advise you that starting with this issue, the theme of HAAKE Focus will now be based more on customer focused information. Therefore every issue of HAAKE Focus will now contain two application articles or abstracts.

The goal of HAAKE Focus is to provide a newsletter that is an information source to our international customers that is referred to and recognised as a valuable reference of information that covers a diverse range of application specific articles. The articles will cover a wealth of topics within the fields of materials characterisation.

Future plans to facilitate the retrieval of previous issues and specific articles or product information include the introduction of a cumulative index. This index will provide a reference of the contents by specific issue and a cross reference by application area.

We welcome your comments and suggestions on the areas and topics that are of greatest interest to your specific material characterisation areas.

All comments and suggestions should be sent by email to newsletter@thermohaake.com

New Application Articles

Following is a summary of two new application articles, which are now available on request.

HAAKE RheoSizer – Image Processing Software for HAAKE RheoScope.

The HAAKE RheoSizer software is available to extend the image processing capabilities of the HAAKE RheoScope.

The HAAKE RheoSizer software package will allow you to:

- Conduct particle and structure analysis by Fourier Transformation
- Utilise the shape detection method
- Clarify images at higher shear rate

Introduction:

Today, the complexity of the industrial fluid formulations in various fields like cosmetics, food, chemistry, oil, biomedical and pharmacy need even more specifications and therefore more control and regulations during processing.

Facing this new complexity, the existing measuring devices show limits in characterizing the microstructural properties. Nevertheless the characterization of the microstructure is essential to produce new, stable and well-performing products.

Addressing these problems, the Material Characterization division of Thermo Electron Corporation proposes technological setups with new devices for characterizing fluid formulation. One of these new measuring concepts is the HAAKE RheoScope/HAAKE RheoSizer combination; the unique coupling system to improve R&D key benchmarks: observation, quantification and understanding the dependence of microstructure on shear deformation.

The HAAKE RheoScope/HAAKE RheoSizer combination links the measured visco-elastic bulk properties with pictures of the microstructure. These pictures are then quantitatively evaluated.

HAAKE RheoScope is an optical rheometer, which means that a dynamic, universal rheometer is coupled to a digital video acquisition system controlled by the same software, HAAKE RheoWin. It can measure as a classical rheometer but also displays and saves the simultaneously recorded microstructure pictures of the sample under shear flow.

HAAKE RheoSizer is a stand-alone statistical size analyzer software, which quantitatively analyses individual microscopic pictures or sequences thereof. It is fully compatible with the HAAKE RheoWin files of HAAKE RheoScope. HAAKE RheoSizer provides two methods for analyzing particle distribution: a shape detection method for all dispersions at a low volume fraction and for some kinds of emulsions and a Fourier Transformation method for close-compacted structures and textures.

Both methods allow the user to explore a large range of different types of samples. In addition, HAAKE RheoSizer also includes the classical picture adjustment functions like thresh-holding, contrast/brightness, erode, sharp, smooth, image arithmetic, etc… (Please refer to application report V-203 for more detailed information).

In order to show the performances of both analyzing methods, the application note presents different examples for each method.

The methods that are covered are:

- The Fourier Transformation Method
- The shape detection method

All the problems of instabilities under shear flow like flocculation, sedimentation, coalescence, homogeneity, size changes, formation of structures, particle orientation etc. can also be investigated with the optical rheometer and analysis software.

Copies of these application notes are now available on request.

More Info? Send an email to newsletter@thermohaake.com and Quote: No: 143 for HAAKE RheoSizer Software

More Info? Send an email to newsletter@thermohaake.com and Quote: No: 144 for the Article – HAAKE RheoSizer – Particle and Structure Analysis ref: V-202

More Info? Send an email to newsletter@thermohaake.com and Quote: No: 145 for the Article – HAAKE RheoSizer extends analysis and shear rate range of HAAKE RheoScope V203

More Info? Send an email to newsletter@thermohaake.com and Quote: No: 146 for HAAKE RheoScope

Distribution Network.

All our distributors are listed on our website. Visit www.thermohaake.com> AboutUs>OurRepresentatives

You can Email direct or call your local supplier to discuss your application needs.

Reader Comments

Contributions to this newsletter are welcomed. Please send an Email to newsletter@thermohaake.com

Editors Note: There is no guarantee that comments or feedback received will be published. However, we will answer all communications direct.

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