Datapoint

Reporting on developments in material properties for engineering design

WEB SERVICES

DatapointLabs Tests Web Data Delivery

As part of its continuing effort to identify and apply best-in-class technologies for the benefit of its clients, DatapointLabs has selected Matereality™ Data Delivery Service (DDS), a web service for same-day delivery of test results. Matereality™ DDS permits its users to have:

- Secure, same day delivery of test results
- Fully electronic, non-pdf format
- Paperless storage of test results
- On-line archival of current and past data
- Ability to handle highly diverse material data, simple and complex
- Ability to view, print, export data using Internet Explorer or Netscape
- Powerful tools to visualize material data and examine dependencies
- Assess data variability and establish authenticity via data certificates
- Ability for clients to selectively share their data with other Matereality™ users
- Ability for companies to publish their data at the Matereality™ portal
- Option for companies to consolidate all their material data from different sources into a single material data management (MDM) system.

As of July 15th, 2003, DatapointLabs started offering clients an easy migration option to Matereality™ DDS. During a three-month transition period, test reports prepared for participating clients will be delivered via Matereality™ DDS as well as the standard FEDEX shipping for the same low price. After October 15th, clients can specify Matereality™ DDS as their preferred data delivery method.

DatapointLabs clients who wish to receive test results via Matereality™ DDS during the trial period must set up an account by regis-

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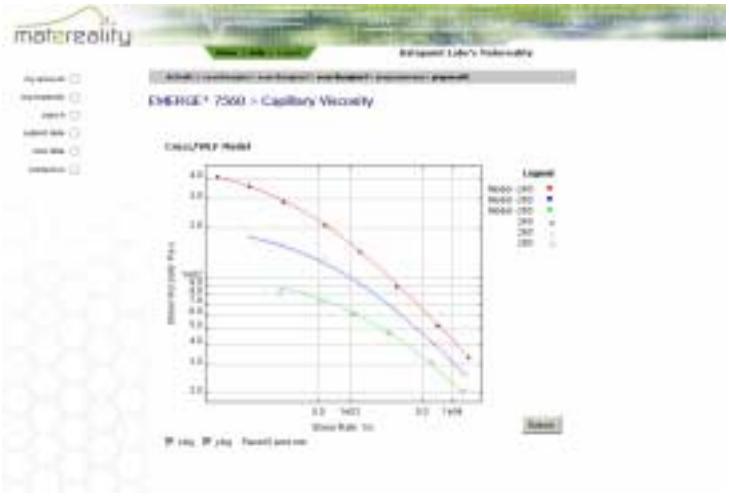

Fig 1. Matereality DDS can store and deliver data of high complexity, as this viscosity data for EMERGE* 7560. *Trademark of the Dow Chemical Company)

FOCUS:

Technology Integration

As virtual product development (VPD) grows and matures, the emphasis shifts to the integration of associated elements to speed up, ease the implementation, and integrate the technology. With the growing use of diverse materials, one area of PLM integration is that of material properties data management. Part One of a two-part article (previous Datapoint issue) had presented a wish list voiced by our clients, and an overview of existing technologies. A complete solution, developed in collaboration with DatapointLabs is now available at www.matereality.com.

Additionally, we present a review of Hubert Lobo and Jose Bonilla's "Handbook of Plastics Analysis". New web-based data delivery services represent the cutting edge in material data handling. Foam testing comes of age at DatapointLabs with new techniques and methodologies.

FOAM PROPERTIES

New Capabilities Widen Expertise

DatapointLabs has successfully developed a core competency in the measurement of properties of foam materials. In a series of initiatives, methodologies have been created and validated to make quantitative tensile, compressive and Poisson's Ratio measurements.

The high speed compressive test method was refined to extract rate dependent stress-strain behavior.

A new technique was developed to measure bulk compressibility of foams using a confined compression method.

Such data have been primarily applied to the modeling and simulation of foam behavior in structural and impact simulation areas. The techniques have been applied to porous, crushable and elastomeric foams. Good success has been reported by clients.

WEB SERVICES CONTD.

Web-Data Delivery Service

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tering at www.matereality.com. Access to Matereality remains free to DatapointLabs clients during the trial three month period.

All accounts will be created within the DatapointLabs Domain and will share its default data access policies as follows:

Private: only users designated by the account owner can view the test results.

Visible: Matereality users can see that data exists, but must request permission to access and view test results.

Clients will have full control to set the access permissions for their data. They can at will change the visibility status of their data to Public (visible and accessible to all) or Hidden (Private and invisible to all), depending on their business needs.

Clients may also elect to have their own Matereality™ Domain for complete MDM (see page 3 for more details). In this case, DatapointLabs will deliver the data directly into the Client's MDM Domain.

QUALITY SYSTEM

Accreditation to ISO/IEC 17025

DatapointLabs has successfully renewed its accreditation with the American Association of Laboratories Accreditation (A2LA) to the new ISO/IEC 17025 for all the tests listed in its new scope which can be viewed at: www.datapointlabs.com/qualitysystem.asp

"A significant effort was devoted to the development of uncertainty budgets. This adds a whole new level of confidence to the reliability of the test data generated by our laboratories" says Hubert Lobo, Company President.

The re-accreditation is valid through February 2005. In addition to maintaining and renewing the accreditation status, DatapointLabs has an ongoing effort to add new tests to its A2LA Scope of Accreditation. The latest addition is:

ISO 37 Rubber-Determination of Tensile Stress Strain Properties

-Craig Montoya, Quality Manager

NEW *TESTPAK*S

Foam Models for DYTRAN & LS-Dyna

Working with MSC.Software, DatapointLabs has successfully developed the capability to model foams in the MSC.Dytran product.

At this time, the Foam2 Model for isotropic elastic foams with user specified hysteresis response is available as a *TestPak*. This enhancement is judged to be important in the modeling impact and recovery of foams that suffer damage.

The LS-Dyna MAT63 Crushable Foam Model is now available along with rate dependencies to accommodate impact situations.

EVENTS CALENDAR

Upcoming Events

ISO TC 61, Maastricht, Netherlands, Sept. 28-30, 2003.

MSC.Software's Virtual Product Development Conference , Dearborn, MI, Oct.13-15, 2003.

ASM Materials Solutions Conference Pittsburgh, PA, Oct.13-15, 2003.

EuroPAM, Mainz, Germany, Oct. 16-17, 2003

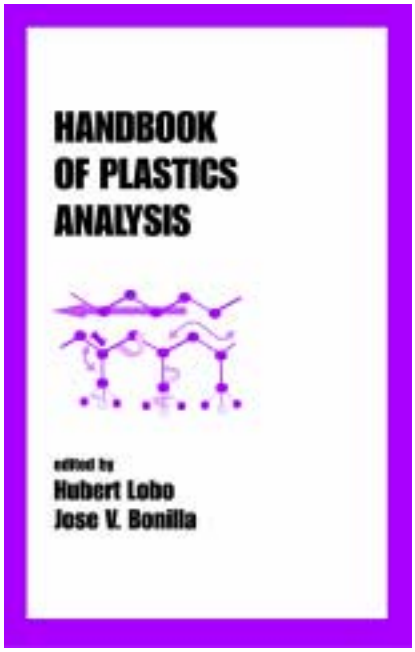
TestingExpo2003 NA, Novi, MI, Oct. 29-31

CAD-FEM Users' Meeting, Potsdam, Germany, Nov. 12-14, 2003

BOOK REVIEW

Handbook of Plastics Analysis

The definitive desktop companion for anyone engaged in the testing and analysis of plastics or in the use of properties developed from polymer analysis.



ISBN: 8-8247-0708-7

Publisher: Marcel Dekker, Inc.

270 Madison Ave, New York, NY 10016

Phone: 212-696-9000

Assurance of quality in raw materials, control over production, and a basic understanding of criteria for performance all require a sure and complete knowledge of analytical methods for plastics. The present volume organizes the vast world of plastics analysis into a relatively compact form. A plastics engineer will find familiar territory in such subjects as rheometry, differential scanning calorimetry, and measurement of thermal properties. Polymer physicists and chemists will be at home with spectroscopic analyses, liquid chromatography, and nuclear magnetic resonance. All these topics and many more are covered in twelve chapters written by an impressive array of experts drawn from industry and academia.

Perhaps the main message to be taken from this work is that the day of laboratory tinkerers and home-built machines seems to have come to an end. There was a time when reasonable shop facilities and a few inexpensive instruments would suffice to answer most questions for the plastics producer, supplier or customer. As described in this book, accurate, meaningful measurements of properties today invariably call for great precision in machinery as well as sophisticated computing and interpretation, none of which comes cheap.

In research as in production, time and equipment represent precious components of any budget. Unneeded or redundant analyses can be avoided when the whole world of analysis is surveyed. A thorough understanding of the limits and possibilities of each of the methods described here will allow the user to get the maximum return on investment whether it is in computers, instruments, analytical services, or laboratory time.

-Ferdinand Rodriguez is Professor Emeritus, School of Chemical and Biomolecular Engineering, Cornell University

DATA MANAGEMENT

Material Data Management Goes Beyond Material Selection -Part 2

With a multitude of modern materials in use today, users of material properties across OEMs, Tier 1-n suppliers, aerospace, defense, resin manufacturers and high technology industries are all facing the technological challenge to store, manage and seamlessly exchange diverse material property data. Existing technologies that have been used to handle material properties were originally created to serve as material selection tools. They were populated as large repositories of comparative material properties. Some of these are now being adapted as material data management (MDM) systems, but lack capabilities for storage and management of diverse representative properties of interest for virtual product development (VPD).

Part 1 of this article (previous issue), highlighted the needs of the VPD community with regard to "materials issues". It showed that storage and representation of multipoint and interdependent material behavioral characteristics of interest for VPD demands a system that can handle diverse collections of traceable, application-specific properties ranging from simple linear to complex nonlinear data. Data may need to be public or private depending on the business needs of the owner. This follow up article introduces a new technology, Matereality™ that has been developed to meet these needs.

Matereality™ accommodates a variety of materials, including plastics, rubber, foams and metals. It stores raw data, as well as properties derived from the measurements. Matereality™ allows diverse output formats ranging from plots and numerical data to CAE material model parameters enabling the material data to be used in the appropriate format, wherever in the product life cycle the need may be. Further, Matereality™ allows traceability of data to its original source including test details, creating a single paperless electronic repository which acts as a definitive storage for all material property data.

Matereality™ is designed for companies that work with a variety of materials and seek to securely store and share their material data across a distributed development platform of internal users and external collaborators. Material suppliers can publish or selectively distribute their data instantly across the globe. Submission of materials to client companies for certification by large OEMs becomes automatic and effortless. CAE companies can leverage Matereality™ to pipe-in application-appropriate data models seamlessly, enhancing ease of use and design confidence. Material testing companies such as DatapointLabs have begun using Matereality™ Data Delivery Service. Matereality™ is thus pre-populated with highly relevant material properties, providing immediate and valuable content for VPD.

www.matereality.com

- contains relevant material data
- handles highly diverse properties, single-point and complex
- organizes public and private data in a single, secure web-based system
- "data-set specific" and "user-specific" controls for access and sharing
- diverse output formats including CAE material model parameters
- ensures fidelity of data usage across developmental platforms
- traceable, means to assess reliability and quality of data
- eliminates data-mining efforts through multiple databases
- scalable, from single user access to enterprise solutions

-Renu Gandhi.

Part 1 of this article featured in Datapoint Winter 2003 issue. It can be accessed at www.datapointlabs.com/newsletter

Typical properties within the MDM:

- ☐ Thermal Conductivity
- ☐ Capillary Viscosity
- ☐ Compressive Fatigue
- ☐ Flexural Fatigue
- ☐ Specific Heat
- ☐ Melt Density
- ☐ No-Flow Temperature
- ☐ Tensile Properties
- ☐ Pressure-Volume-Temperature
- ☐ Coefficient of Linear Thermal Expansion
- ☐ Melt Rheology by DMA
- ☐ Heat Deflection Temperature
- ☐ Hyperelastic Properties
- ☐ Coefficient of Friction
- ☐ Instrumented Dart Impact
- ☐ Flexural Properties
- ☐ Thermal Analysis
- ☐ Melt Elasticity
- ☐ Dynamic Mechanical Properties in Torsion
- ☐ Compressive Properties
- ☐ Solid Density

Fig 2. The Matereality Material Data Management Portal