# 2014 HPC Spring Meeting

**Friday, April 11, 2014**  
Sabbatini Lounge, 2nd Floor of Thomas Center, Christian Brothers University  
650 East Parkway South, Memphis, TN 38104

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<th>Time</th>
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| 8:00 a.m. – 8:45 a.m. | • Check-in/Continental Breakfast  
                   • Poster Session                                                             |
| 8:45 a.m. – 10:15 a.m. | • **Transforming R&D with PLM (Product Lifecycle Management)**  
                        *Tom Hartman, Managing Director, Accenture*                                   |
| 10:15 a.m. – 10:30 a.m. | • Coffee Break                                                              |
| 10:30 a.m. – 12:00 noon | • **Medical Device Regulations**  
                       *Patti Lehigh, Merck Consumer Care*                                           |
|                | • **Packaging is Engineering!**, Siripong Malasri, Christian Brothers University |
| 12:00 noon – 1:30 p.m. | • Lunch & Lab Open House  
                        (In St. Benilde Hall)                                                       |
| 1:30 p.m. – 3:00 p.m. | • **Recognition of the 2014 HPC Scholarship Recipient**                      |
|                | • **Consortium Research Project Report**                                     |
|                |   o **Wooden Pallet Temperature Estimation**, Ali Pourhashemi and Siripong Malasri, CBU |
|                |   o **Preliminary Results of Wooden Pallet Transmissibility & Tote Cushion Studies**, Siripong Malasri, Michael Kist, and Ryne Stevens, CBU |
| 3:00 p.m. – 3:15 p.m. | • Coffee Break                                                              |
| 3:15 p.m. – 4:15 p.m. | • **Discussion of R&D Projects for the 2014-15 Cycle**                      |
|                |   Consortium Representatives & CBU Faculty/Staff                            |

## Corporate Sponsors

- [Accenture](http://www.accenture.com)  
- [Merck Consumer Care](http://www.merck.com)

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**Members**  
*FedEx, Medtronic, Merck Consumer Care, MicroPort Orthopedics, New-Tech Packaging, Olympus Surgical Technologies America, Plastic Ingenuity, Smith & Nephew, The Pallet Factory, Wright Medical, WS Packaging*

Campus Map: [http://www.cbu.edu/about/campusmap.html](http://www.cbu.edu/about/campusmap.html)
Registration

Registration Deadline: Tuesday, April 8, 2014, 12:00 noon

Registration Fees (including a copy of meeting proceedings and meals/drinks):

- Members of the Healthcare Packaging Consortium: FREE
- Regular Registration Fee: $250/person
- CBU Alumni: $200/person
- CBU Faculty/Staff/Students: FREE

Check Payment

Mail this form with a check payable to Christian Brothers University to:

2014 HPC Spring Meeting
C/o Dr. Pong Malasri
Christian Brothers University
650 East Parkway South
Memphis, TN 38104

NAME __________________________________________________________________ (First)                                  (Middle Initial)                            (Last)
Company __________________________________________________________________________________________________________
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Phone __________________________________________________________________________________________________________
Amount enclosed ________________________
(Please circle one of the registration fee above.)

Credit Card Payment

You can register and pay by credit card online at: https://luna.cbu.edu/innovation/
Please enter “2014 HPC Spring Meeting” under “Seminar Conference Name”.

Members
FedEx, Medtronic, Merck Consumer Care, MicroPort Orthopedics, New-Tech Packaging, Olympus Surgical Technologies America, Plastic Ingenuity, Smith & Nephew, The Pallet Factory, Wright Medical, WS Packaging
## Registered Participants

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Transforming R&D with PLM (Product Lifecycle Management)

Tom Hartmann¹

Abstract: Global 1000 companies spend over $450B on R&D, however despite the spending, most companies find executing the Innovation and Product Development process a challenge. Very few companies truly manage product development as an integrated business discipline. A holistic PLM solution can improve a company’s R&D performance - BOTH in revenue and cost.

Keywords: R&D; Product Lifecycle Management; Innovation; Product Development Process

Presenter:

Tom Hartmann – Mr. Hartmann is a Managing Director who leads Accenture’s North America Technology – Product Lifecycle Management (PLM) practice. He provides business transformation and advisory experience to clients. He has worked with Fortune 500, as well as with small startup companies. Mr. Hartmann is focused on helping clients achieve their Supply Chain business strategy and driving measurable business results.

He has profound experience with: PLM Transformation Planning and Implementation, Program Management, Organization Change Management, Process Design, Business Case Development, and Six Sigma Projects. In his 17-year career with Accenture, Mr. Hartmann has built a reputation for his strong work ethic, consensus building and business results work style, and exceptional ability to build and maintain client relationships.

Mr. Hartmann’s past clients include: Merck, Procter & Gamble, Unilever, Metso, Sun Microsystems, Panasonic, Hewlett-Packard, Motorola, Boston Scientific, RR Donnelley, Raytheon, Exostar, and Siemens. He joined Accenture in 1996 and became a Managing Director in 2013. He attended University of Illinois in Champaign where he received a Bachelor of Science degree in Finance and received his Professional Pilot Certification.

Outside of work, Tom enjoys travelling, scuba diving, running, and spending time with family and friends. Tom lives in downtown Chicago with his wife Kimberly and son Liam.

¹ Accenture, 161 North Clark, Chicago, IL 60601, thomas.j.hartmann@accenture.com
Medical Device Regulations

Patti Lehigh

Abstract: In this presentation, Dr. Lehigh will cover:

- Definitions of medical device in the US and EU
- Regulatory authority, regulations, classification - US
- Regulatory authority, regulations, classification – EU
- Combination products
- Unique device identifier

Keywords: Medical device; regulations; unique device identifier

Presenter:

Patti Lehigh – Dr. Lehigh, PhD in Food Science from Louisiana State University, is Associate Principal Scientist – Medical Devices at Merck Consumer Care. She joined Schering-Plough in 2005, which has become Merck Consumer Care. She is a member of Society of Sensory Professionals, Institute of Food Technologies, and American Association for Persons with Disabilities. She has served as a board member for the Dyslexia Foundation of Memphis since 2004.

1 Merck Consumer Care, 3030 Jackson Ave, Memphis, TN 38112, patti.lehigh@merck.com
Packaging Is Engineering!

Siripong Malasri

**Abstract:** Abstract: Packaging is an interdisciplinary field in which scientific and engineering principles are applied to develop and produce packages. These packages serve to contain, protect and preserve, transport, inform, and sell a product. Packaging engineering includes the study of products, packages, materials, containers, structures, methods, machinery, and transportation. In this presentation, Dr. Siripong Malasri will discuss some research projects performed at CBU’s Healthcare Packaging Consortium, a research entity established in 2010 between CBU and various companies. He will show how various engineering principles from mechanics, heat transfer, instrumentation, artificial intelligence, and signal processing were utilized. Specialized testing equipment not commonly found in a typical engineering lab will also be discussed, including drop tester, vibration table, temperature/humidity chamber, compression table, and altitude chamber. These pieces of equipment are part of the CBU ISTA Certified Packaging Lab, a commercial lab that provides testing services to regional customers.

**Keywords:** Packaging; Engineering

**Presenter:**

Siripong Malasri – Dr. Malasri is Professor of Civil Engineering at Christian Brothers University, where he also serves as the Packaging Department Chair and Healthcare Packaging Consortium Director. He is a registered professional engineer in the State of Tennessee and is an ISTA certified packaging laboratory technologist. He has authored various publications related to artificial intelligence, optimization, and most recently transport packaging. Currently he serves as Editor-in-Chief for the *International Journal of Advanced Packaging Technology*. Dr. Malasri is a member of NSPE, IoPP, and TAPPI.

1 Packaging Department, Christian Brothers University, 650 East Parkway South, Memphis, TN 38104, pong@cbu.edu
CBU Packaging Lab Open House

Abstract: Christian Brothers University acquired several pieces of packaging test equipment during 2003 – 2005 under a $3M grant from the Assisi Foundation of Memphis for CBU engineering lab renovation. The major pieces from this grant include a 175-lb drop tester, 75-lb random vibration table, shock machine, altitude chamber, and temperature/humidity chamber. FedEx later donated a 5000-lb compression table, 500-lb drop tester, and 500-lb incline impact tester. Recently, the lab acquired an 800-lb random vibration table from Michigan State University.

CBU Packaging Lab has become an ISTA Certified Packaging Lab since October of 2009. Currently, the lab is certified for the following ISTA test protocols: 1A, 1B, 1C, 1D, 1G, 1H, 2A, 2B, 2C, 3A, 3F, 6-FEDEX-A, and 6-FEDEX-B. Larry Rutledge (former FedEx Packaging Lab Manager) is the CBU ISTA Test Lab Manager. In addition to Mr. Rutledge, CBU lab has two ISTA CPLPs and six ISTA student members. Besides commercial testing, the lab has been used extensively on various R&D projects assigned from the Healthcare Packaging Consortium.

In addition to the transport packaging test equipment mentioned above, CBU lab has several other various packaging-related lab equipment, including Mullen tester, ECT crusher, peel tester, cutting table, thermoformer, band sealers, and CNC machines.

Keywords: Packaging Test Equipment; ISTA Certified Packaging Lab

Tour Guides:
Bob Moats – Lab Technician & ISTA Certified Lab Technician
Henry Rhodes – Lab Technician
Asit Ray – Professor of Chemical Engineering & Packaging Engineering Certificate Coordinator
Pong Malasri – Healthcare Packaging Consortium Director & ISTA Certified Lab Technologist
CBU Certified Packaging Lab

FIND A LAB

Christian Brothers University
656 East Parkway South
Memphis, TN 38114
USA

Phone: 901-321-3405
Fax: 901-321-3402
Website: http://www.cbu.edu/packaging

Laboratory Classification: COMMERCIAL

Protocols: 1A, 1B, 1C, 1D, 1E, 2A, 2B, 2C, 3A, 3F, 6-FEDEX-A, 6-FEDEX-B

Lansmont PDT-56ED Drop Tester
(175-lb capacity)

L.A.B. AD-500 Drop Tester
(500-lb capacity)

CBU Packaging – www.cbu.edu/packaging
Lansmont Model 1000 Vibration Test System
(75-lb capacity)

Lansmont ELVIS TS-122
(800-lb capacity)

Lansmont Shock Tester Model 65/81
(500-lb capacity)

L.A.B. Incline Impact Tester
(500-lb capacity)

CSZ Temperature & Humidity Chamber Model ZP-32
(-49F to +374F, 10% to 98% RH, 38”x38”x38” chamber size)

Envirotomics Altitude Chamber Model EA8-2-3-AC
(-90F to +350F, Up to 100000 ft altitude, 24”x24”x24” chamber size)
Modified Gaynes Compression Table (5000-lb capacity)

Bel-O-Vac Vacuum model BV-1815 Thermoformer (15”X 2”X 2”, 8 to 12 parts/minute)

Edge Crush Tester

Mullen Tester

Kongsberg XL22 Sample Table

Hounsfield Materials Tester Model H5KS (Load capacity is 5kN with a speed range from 0.01 to 1000 mm/min)
Dimension 3D Printer
(Maximum container dimensions are 8” x 8” x 10”)

MTS 810 Material Test System
(22000-lb capacity)

Fadal VMC-15 CNC Vertical Machine
(5-axis capability, max 7500 rpm, 20”x16”x16” work area, and 21 tool stations)

Romi M-17 CNE Lathe Machine

Toshiba EC45N Injection Molding Machine
The 2014 Annual HPC Scholarship Recipient

Mallory Harvey
Civil Engineering Major & Packaging Minor

INvolvements with HPC R&D Projects:

- May 2012-Current: Lab/Research Assistant
  - Assist with various research projects assigned by members of the consortium
  - Provide insight for various published papers
  - Operate packaging testing equipment

Presentations Related to Packaging:

- August 20, 2013
  - Gave a presentation, “Distribution Hazards & ISTA Pre-shipment Testing”, for professionals at the TAPPI Extrusion Coating Course, Memphis, TN

Publications Related to Packaging:


INTERNSHIP EXPERIENCE:

• June 2013-Current: Process Engineering Intern at Microport formerly Wright Medical Technologies.
• March 2012-June 2013: CAD Intern at the Memphis Shelby County Airport

OTHER INFORMATION:

• September 2013-Current
  o Technical Assistant for the International Journal of Advanced Packaging Technology
• 2014
  o President of Christian Brothers University’s TAPPI Student section
  o Vice President of Society of Women Engineers at Christian Brothers University
• 2013
  o Vice President of Christian Brothers University TAPPI Student section
  o Vice President of Society of Women Engineers at Christian Brothers University
Wooden Pallet Temperature Estimation

Ali Pourhashemi1 and Siripong Malasri2

Abstract: Monitoring temperature inside a pallet specimen during a test can be challenging. In this study two methods were used to estimate temperature in a pallet stringer at the time of testing. The first method is based on the initial temperature when it was removed from a temperature chamber and the second method is based on the duration when it was removed from a chamber to the time it was tested. In the first method, several cooling down and warming up temperature profiles were collected. Part of the data was used to train an artificial neural network while another part was used for validation. The developed network was able to recognize how temperature changes with time. It can be used to estimate the temperature when the specimen is tested. In the second method, an analytical equation was developed from heat transfer principles. The equation allows temperature estimation for specimens with different thickness and species. The neural network or analytical equation allows other researchers to estimate the temperature without having to collect temperature data.

Keywords: Wooden Pallets; Temperature Estimation; Artificial Neural Network; Heat Transfer Model

Presenters:

Ali Pourhashemi – Dr. Pourhashemi is Professor of Chemical Engineering at CBU. He earned his Ph.D. from the University of Maryland at College Park. He has authored and co-authored various publications in the areas of fluid mechanics, heat/mass transfer, and instrumentation. Dr. Pourhashemi is a member of the American Institute of Chemical Engineers.

Siripong Malasri – Dr. Malasri is Professor of Civil Engineering at Christian Brothers University, where he also serves as the Packaging Department Chair and Healthcare Packaging Consortium Director. He is a registered professional engineer in the State of Tennessee and is an ISTA certified packaging laboratory technologist. He has authored various publications related to artificial intelligence, optimization, and most recently transport packaging. Currently he serves as Editor-in-Chief for the International Journal of Advanced Packaging Technology. Dr. Malasri is a member of NSPE, IoPP, and TAPPI.

1 Chemical & Biochemical Engineering Department, Christian Brothers University, 650 East Parkway South, Memphis, TN 38104, apourhas@cbu.edu

2 Packaging Department, Christian Brothers University, 650 East Parkway South, Memphis, TN 38104, pong@cbu.edu

2014 HPC Spring Meeting, April 11, 2014, Memphis, Tennessee, USA
Preliminary Results of Wooden Pallet Transmissibility & Tote Cushion Studies

Siripong Malasri¹, Michael Kist², and Ryne Stevens³

Abstract: Preliminary results of two on-going projects will be presented.

- The first project concerns a pallet transmissibility study. A wooden pallet went through various vibration tests using ASTM 4169 rail simulation with different weights on it. For each weight, two vibration tests were made; one with the pallet fixed to the vibration table while another was not fixed. Transmissibility graphs were compared.

- The second project is a plastic tote cushion study. In this study, rice hulls were used as cushioning material. Its impact absorption property was compared with traditional cushioning materials.

Keywords: Wooden Pallets; Vibration Test; Transmissibility; Plastic Totes; Cushioning; Rice Hulls; Sustainability

Presenters:

Siripong Malasri – Dr. Malasri is Professor of Civil Engineering at Christian Brothers University, where he also serves as the Packaging Department Chair and Healthcare Packaging Consortium Director. He is a registered professional engineer in the State of Tennessee and is an ISTA certified packaging laboratory technologist. He has authored various publications related to artificial intelligence, optimization, and most recently transport packaging. Currently he serves as Editor-in-Chief for the International Journal of Advanced Packaging Technology. Dr. Malasri is a member of NSPE, IoPP, and TAPPI.

Michael Kist – Mr. Kist is a mechanical engineering student with packaging engineering certificate.

Ryne Stevens – Mr. Stevens is an engineering management major with packaging concentration.

¹ Packaging Department, Christian Brothers University, 650 East Parkway South, Memphis, TN 38104, pong@cbu.edu
² Mechanical Engineering Department, Christian Brothers University, 650 East Parkway South, Memphis, TN 38104, mkist@cbu.edu
³ Packaging Department, Christian Brothers University, 650 East Parkway South, Memphis, TN 38104, rsteven5@cbu.edu