

# EXHIBIT 1: SHER PAUL SINGH

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## EDUCATION

Ph.D. Michigan State University, East Lansing, MI, 1987  
Agricultural Engineering, Dissertation: *Accelerated Settling of Particles in a Herschel Bulkley Fluid Due to Vibration.*

M.S. Michigan State University, East Lansing, MI, 1983  
Packaging, Thesis: *Effect of Multiple Drops on Damage Boundary Curves*

B.S. Punjab University, Chandigarh, India, 1982  
Mechanical Engineering (Honors)

**Academic Honors:**

- \* Established University Record in Mathematics, 1978.
- \* Received University Merit Scholarship and Dean's List, 1978-1982.
- \* Graduated with highest honors, Punjab University, 1982.

## PROFESSIONAL POSITIONS HELD AND HONORS RECEIVED

Board of Directors, International Association of Packaging Research Institutes  
Scientific Advisory Committee, World Food Logistics Organization  
Board of Directors, ISTA Global Board, International Safe Transit Association  
Advisory Board, National Institute of Packaging Handling and Logistics Engineers  
Past Chair, ASTM D10-Packaging, Division 1, American Society of Testing and Materials International

- \* **David LeButt Award, ISTA, 2014**
- \* **Inductee, Military Packaging Hall of Fame, 2010**
- \* **IOPP Fellow, Institute of Packaging Professionals, 2009**
- \* **Lifetime Certified Packaging Professional, 2008**
- \* **Award of Merit and Fellow, ASTM International, 2007**
- \* **Logistics Achievement Award, National Institute of Packaging and Handling Engineers, 2006.**
- \* **Outstanding Mentor Award, Post-Baccalaureate Achievement Program, 1997.**
- \* **Leadership Fellow, Michigan State University, 1996-1997.**
- \* **Recipient of the Bronze Star in the 1990 Ameristar Packaging Competition.**

## PROFESSIONAL EXPERIENCE

01/2012 - to-date **PROFESSOR EMERITUS**, CANR, Michigan State University, East Lansing, MI.  
2012 – to-date **ADJUNCT PROFESSOR**, Kasetsart University, Thailand.  
05/2006 – to-date **PRESIDENT**, Packaging Forensics Assoc. Inc., East Lansing, MI.  
07/2000 – 2011 **PROFESSOR**, School of Packaging, Michigan State University, East Lansing, MI.  
06/1990 – 2010 **DIRECTOR**, Consortium of Distribution Packaging Research, School of Packaging, Michigan State University, East Lansing, MI.  
07/1993 - 07/2000 **ASSOCIATE PROFESSOR**, School of Packaging, Michigan State University, East Lansing, MI.  
1988 – to-date **PRESIDENT**, Packaging Res. Assoc. Inc. & Andeva Pkg. Mgt., East Lansing, MI.  
05/1987 - 06/1993 **ASSISTANT PROFESSOR**, School of Packaging, Michigan State University, East Lansing, MI.  
05/1985 - 03/1987 **INSTRUCTOR**, School of Packaging, Michigan State University, East Lansing, MI.

**TEACHING:** Teaching and course development in undergraduate courses covering packaging dynamics, machinery, robotics, materials and systems. Graduate course teaching and developing in dynamics and packaging systems.

**RESEARCH:** Proposal and budget preparation for projects related to product protection, cushion design, environmental measurement of dynamic forces and simulation, packaging machinery and systems interaction, high speed motion analysis and robotics. Management of shock and vibration testing laboratory. Planning and management of various jointly industry funded research projects in Distribution Packaging.

**INTERNATIONAL PROGRAMS:** Teaching overseas packaging courses. Provide technical guidance and consultancy in international packaging operations of various companies, universities and institutes.

**CONSULTING:** Performed over 500 major studies and research projects on packaging, transportation, logistics and material handling for federal agencies and global corporations.

06/1984 - 03/1985      **ASSOCIATE ENGINEER**, International Business Machines, Rochester, MN. Responsibilities included feasibility analysis for automated equipment. Involved with AGVS systems leading to just-in-time delivery of parts. Modeling and simulation of packaging lines. Fragility analysis of direct access storage devices and computer packaging design.

01/1984 - 06/1984  
06/1982 - 06/1983      **TEACHING ASSISTANT**, School of Packaging, East Lansing, MI. Duties included co-teaching courses and laboratory work to packaging students in materials and systems, shock, vibration and compression, and microcomputer applications.

09/1983 - 12/1983      **ASSOCIATE IN**, Department of Mechanical Engineering, University of California, Davis, CA. Assisted in teaching the use of Finite Element Methods.

**COMPANIES CONSULTED INCLUDE:**

Dr. Singh has served as a consultant to over a thousand domestic and international companies. Projects include developing packaging line systems, package design for product protection, evaluate package specifications, automation for packaging, expert witness, packaging forensics, and education. For more details see [www.packagingpatentsexpert.com](http://www.packagingpatentsexpert.com) and [www.cargosecurementexpert.com](http://www.cargosecurementexpert.com)

Consulting services provided to automotive, consumer products, cosmetics, electronic, food, furniture and appliances, logistics and transportation , medical and pharmaceutical, packaging materials and systems, robotics and automation, and retail industries.

A brief list is offered below. For more details visit [www.andevapkg.com](http://www.andevapkg.com) where Dr. Singh has served as President of Andeva Packaging Management, Inc. and Packaging Research Associates, Inc. for over twenty years with over 500 research and consulting studies done for major corporations and federal agencies.

Abbott Laboratories	Clorox Company
Abercrombie & Fitch	Coca Cola Company
ABF Freightways	Colgate Palmolive
Abitibi Price	Colombo Frozen Yogurt
AC Delco	Columbia House
Allianz Global Risks	Con Agra Foods
American Honda	Consolidated Freightways
Amoco Corporation	Coors Brewing Company
Amway Corporation	Corning
Amcor	Costco
Amgen	Crawford & Co.
Anchor Glass	CSX Transportation
Anheuser Busch	Del Monte Corporation
Appleton Papers	Deneb Robotics
Arch Chemical	Dey Pharmaceutical
Arco Chemical	Dixie Container Co.
Avon Company	Dole
Ball Corporation	Dow Chemical Company
Beatrice/Hunt-Wesson	Driscoll Strawberries
Becton Dickinson Company	Dupont
Benckiser Consumer Products	Eastman Kodak Company
Buckhorn	Ethan Allen
CALTRANS	Faygo
CHEP-USA	Ford Motor Company
Campbell Soup	Frito Lay, Inc.
Chivas Brothers	GE Plastics
Chevron	General Electric Company
Chiquita Brands	General Foods
Circuit City	General Mills

General Motors	Pine Bluff Arsenal
Georgia Pacific	Pillsbury Co.
Gerber Foods	Pioneer Hi-Bred
Haworth	PPG Industries
Hawthorne Ammunition Depot	Procter & Gamble
Herman Miller	Purepak
Home Depot	Purepak-Elopak
Honeywell Company	QVC Inc
Iams Company	R J Reynolds
IBM Corporation	Revlon
Idexx Pharmaceutical	Rite-Aid
Inland Container	Royal & Sunalliance
International Honeycomb	Sam's Club
International Paper Company	Sasib Packaging
James River Corporation	Sealed Air Corporation
Johnson Controls	Siemens
K Mart Company	Simmons Mattress Company
Kellogg's Company	Solo Cup Company
Komatsu Corporation	Sonoco
Kraft, Inc.	St. Gobain (Certain Teed)
Kroger	Stanley II Co.
Lansmont Corp.	Starbucks Corporatrion
Laserfile Compact Disc	Smurfit-Stone Container Corporation
Libbey Glass	Steris Medical Device
Libbey Owen Ford Glass	Strohs Brewing Company
Lindt & Sprungli	Subway
Magna	Target
Markel Southwest Underwriters	Tenneco
Mars Inc.	Textron
Masterfoods Inc.	Tetra Pak
Maytag/Jenn-Air	The Travelers
McDonalds	Trienda Corporation
Mead Corporation	Tuscarora Plastics
Medtrica Medical Device	Uncle Ben's Inc.
Meijer's Corporation	Unisys
Menasha Corporation	United Parcel Service
Menasha Paper	United States Dept. of Agriculture
Merck Pharmaceutical	United States Dept. of Transportation (FAA)
Merillat Cabinets	United States Navy
Michigan Dept. of Lottery	United States Marine Corps
Michigan Millers	United States Postal Service
Michigan National Bank	US Insurance Co.
Miller Brewing Company	US Steel
Mitsubishi	US Surgical
Mitsui Sumitomo Insurance	Uncle Bens
Neogen	Wal-Mart Stores Inc.
Nestle	Winco Foods
North American Van Lines	Weyerhaeuser Company
Orbis Menasha	Wood Mode
Ortho Pharmaceutical	World Bank (United Nations)
Owens Corning	Wyeth-Ayerst Laboratories
Owens Illinois	Xerox
Packaging Corporation of America	Yazaki Corporation
Pepsi Bottling Group	Yellow Freight System
Phillips Electronics	Zenith Data Systems
Picatinny Arsenal	Zenith Electronics

## **EXPERT WITNESS:**

In addition served as a consultant to various law firms, corporations, and the U.S. Department of Justice, providing expert opinion and testimony in the areas of packaging machinery, damage and injury during transportation, patent infringement, design and evaluation of packages. Provided expert opinion in over three hundred cases.

Dr. Singh is President of Packaging Forensic Analysis, Inc. For more details see [www.packlawusa.com](http://www.packlawusa.com)

## **PEER REVIEWED PUBLICATIONS IN TECHNICAL JOURNALS:**

Singh, S. P., J. Antle, J. Singh, E. Topper and G. Grewal, "*Load Securement and Packaging Methods to Reduce Risk of Damage and Personal Injury for Cargo Freight in Truck, Container and Intermodal Shipments*" Journal of Applied Packaging Research, 2014.

Kurniawan MP, Chonhenchob V, Singh SP, Sittipod S. Measurement and analysis of vibration levels in 2 and 3 wheel delivery vehicles in South East Asia. Packaging Technology and Science 2014 (under review)

Rungkan B, Chonhenchob V, Siddiq M, Singh SP. Controlled release of mangiferin using ethylene vinyl acetate matrix for antioxidant packaging. Packaging Technology and Science 2014 (under review)

Leelaphiwat P, Chonhenchob V, Singh SP, Krueenate J, Wichai U, Ong PKC. Transport coefficients of eucalyptol through various polymeric films. Packaging Technology and Science 2012; 25(3) pp. 161–172 (DOI: 10.1002/pts.967).

Boonruang K, Chonhenchob V, Singh SP, Chinsirikul W, Fuongfuchat A. Comparison of various packaging films for mango export. Packaging Technology and Science 2012; 25(2) pp. 107–118 (DOI: 10.1002/pts.954).

Chonhenchob, V., Singh, S. P., Singh, J. J., Stallings, J. and Grewal, G. "*Measurement and Analysis of Vehicle Vibration for Delivering Packages in Small-Sized and Medium-Sized Trucks and Automobiles.*" Journal of Packaging Technology & Science; Vol. 25, pp. 31-38, 2012

Singh, S. P., Singh, J., Saha, K., and Chonhenchob, V. "*Effect of Lateral Box Offset and Pallet Overhang on Compression Strength of Stacked Fiberboard Boxes and Impact on Stability*". Journal of Applied Packaging Research, Vol. 6, No. 3, pp. 129-148, July 2012

Singh, S. P., Singh, J., Grewal, G. S., Chonhenchob, V. "*Analyzing Color on Printed Packaging to Evaluate Brand Logo Integrity and Impact on Marketing.*" Universal Journal of Marketing and Business Research, Vol. 1, Issue 3, August 2012

Singh, S. P., Singh, J., Saha, K., Church, E. "*Measurement and Analysis of Vibration and Temperature Levels in Global Refrigerated Intermodal Container Shipments from South to North America along Atlantic Ocean.*" Journal of Applied Packaging Research, Vol. 6, No. 1, pp. 37-54, January 2012

Christopher Fung, Eric Olsen, Jay Singh, and Paul Singh. "*Mapping Quality in Extended Value Streams Using Data Recorders.*" Journal of Packaging Technology & Science, Accepted for Publication 2012

Saha, K, Singh, S. P., Singh, J. "*Sensory Evaluation of Fresh Cut Mangos Packaged in Rigid Containers Subjected to Mechanical Abuse by Transport Vibration.*" Journal of Applied Packaging Research, Vol. 5, No. 3, pp. 181-195, July 2011

Singh, S. P., Singh, J. and Saha, K. "*Effect of Palletized Box Offset on Compression Strength of Unitized and Stacked Empty Corrugated Fiberboard Boxes*". Journal of Applied Packaging Research, Vol. 5, No. 3, pp. 157-168, July 2011

Singh, J., Singh, S. P. and Saha, K. "*Effect of Horizontal Offset on Vertical Compression Strength of Stacked Corrugated Fiberboard Boxes*". Journal of Applied Packaging Research, Vol. 5, No. 3, pp. 131-144, July 2011

Singh, S. P., Saha, K., Singh, J. and Sandhu, A. P. S. "Measurement and Analysis of Vibration and Temperature Levels in Global Intermodal Container Shipments on Truck, Rail and Ship". Journal of Packaging Technology & Science; Vol. 25, pp. 149–160, 2012

Spink, J., Singh, J. and Singh, P. "Review of Package Warning Labels and Their Effect on Consumer Behavior with Insights to Future Anti-Counterfeit Label and Communication Systems," Journal of Packaging Technology & Science; 24: 469–484, 2011

Topper, E., Singh, S. P. and Singh, J. "Packaging Requirements for Less-Than-Truckload Shipments to Reduce Damage – Machinery and Machine Parts, Doors and Windows and Miscellaneous Items". Journal of Applied Packaging Research, Vol. 5, No. 2, pp. 93-106, April 2011

Topper, E., Singh, S. P. and Singh, J. "Packaging Requirements for Less-Than-Truckload Shipments to Reduce Damage – Furniture, Appliances and Boxed Freight". Journal of Applied Packaging Research, Vol. 5, No. 1, pp. 43-56, January 2011

Singh, J., Krasowski, A., Singh, S.P. "Life Cycle Inventory of HDPE Bottle Based Liquid Milk Packaging Systems" Journal of Packaging Technology and Science, Vol. 24, Issue 1, pp.49-60, January/February 2011

Singh, J., Ignatova, L., Olsen, E. and Singh, P. "Evaluation of the Stress-Energy Methodology to Predict Transmitted Shock through Expanded Foam Cushions," Journal of Testing and Evaluation, Volume 38, Issue 6, November 2010

Stallings, J., Singh, J., Singh, S. P. "Measurement and Analysis of Vehicle Vibration for Parcel Delivery Vehicles in Single Parcel Shipments," Journal of Applied Packaging Research, Vol. 4, No. 2, April 2010

Saha, K., Singh, J., Singh, S. P. "Measurement, Analysis and Comparison of Drops Experienced by Packages in Inter-State and Intra-State Next Day Shipments in United States," Journal of Applied Packaging Research, Vol. 4, No. 2, April 2010

Topper, E., Singh, S. P., Singh, J. "Packaging Requirements for Less-Than-Truckload Shipments to Reduce Damage - Paint, Televisions, and Copiers," Journal of Applied Packaging Research, Vol. 4, No. 2, April 2010

Singh, J., Singh, S. P., Desautels, K., Saha, K. and Olsen, E. "An Evaluation of the Ability of RFID Tags to Withstand Distribution of Fresh Produce in the RPC Pooling System," Journal of Packaging Technology and Science, Volume 23, Issue 4, pages 217–226, June/July 2010

Leelaphiwat P, Chonhenchob V, Singh SP, Krueenate J, Wichai U, Ong PKC. Transport coefficients of eucalyptol through various polymeric films. Packaging Technology and Science 2012; 25(3) pp. 161 – 172 (DOI: 10.1002/pts.967).

Boonruang K, Chonhenchob V, Singh SP, Chinsirikul W, Fuongfuchat A. Comparison of various packaging films for mango export. Packaging Technology and Science 2012; 25(2) pp. 107 – 118 (DOI: 10.1002/pts.954).

Chonhenchob V, Singh SP, Singh J, Stallings, J, Grewal, G. Measurement and analysis of vehicle vibration for delivering packages in small and medium sized trucks and automobiles. Packaging Technology and Science 2012; 25(1) pp. 31 – 38 (DOI: 10.1002/pts.955).

Chonhenchob V, Kamhangwong D, Krueenate J, Khongrat K, Tangchantra N, Wichai U, Singh SP. 2011. Preharvest bagging with wavelength-selective materials enhances development and quality of mango (*Mangifera indica* L.) cv. Nam Dok Mai #4. *Journal of the Science of Food and Agriculture* **2011**; **91(4)** pp. 664–671

Chonhenchob V, Singh SP, Singh J, Sittipod S, Swasdee D, Pratheepthinthong S. Measurement and analysis of truck and rail vibration levels in Thailand. *Packaging Technology and Science* **2010**; **23(2)** pp. 91-100.

Chonhenchob V, Sittipod S, Swasdee D, Rachtanapun P, Singh SP, Singh J. Effect of truck vibration during transport on damage to fresh produce shipments in Thailand. *Journal of Applied Packaging Research*. **2009**; **3(1)** pp. 27-38.

Chonhenchob V, Kamhangwong D, Singh SP. Comparison of reusable and single-use plastic and paper shipping containers for distribution of fresh pineapples. *Packaging Technology and Science* **2008**; **21(2)** pp. 73-83

Chonhenchob V, Chantarasomboon Y, Singh SP. Quality changes of treated fresh-cut tropical fruits in rigid modified atmosphere packaging containers. *Packaging Technology and Science* **2007**; **20(1)** pp. 27-37.

Singh, J, Karsowski, A, Singh, S. Paul. 2010. "Life Cycle Inventory of HDPE Bottle Based Liquid Milk Packaging Systems". *Journal of Packaging Technology and Science*.

Singh, J, Ignatova, L, Olson, E, Singh, Sher Paul. 2010. "Evaluation of the Stress-Energy Methodology to Predict Transmitted Shock through Expanded Foam Cushions". *Journal of Testing and Evaluation*.

Singh, J, Singh, Sher Paul, Desautels, K, Saha, K, Olsen, E. 2010. "An Evaluation of the ability of RFID tags to withstand distribution of fresh produce in the RPC pooling system". *Packaging Technology and Science* Vol. 23, Issue 4, pp 217-226.

Stallings, J, Singh, J, Singh, Sher Paul. 2010. "Measurement and Analysis of Vehicle Vibration for Parcel Delivery Vehicles in Single Parcel Shipments". *Journal of Applied Packaging Research*, Vol. 4, No. 2.

Saha, K, Singh, J, Singh, Sher Paul. 2010. "Measurement, Analysis and Comparison of Drops Experienced by Packages in Inter-State and Intra-State Next Day Shipments in United States. *Journal of Applied Packaging Research*, Vol. 4, No. 2.

Topper, E, Singh, Sher Paul, Singh, J. 2010. "Packaging Requirements for Less-Than-Truckload Shipments to Reduce Damage - Paint, Televisions and Copiers". *Journal of Applied Packaging Research*, Vol. 4, No. 2.

Chonhenchob, Vanee, Singh, Sher Paul, Singh, Jay Jagjit, Sittipod, Sukasem, Swasdee, Dathpan, Pratheepthinthong, Supoj. 2010. "Measurement and Analysis of Truck and Rail Vibration levels in Thailand". *Packaging Technology and Science* Vol. 23, Issue 2, pp:91-100.

Singh, Sher Paul, Singh, J, Stallings, J, Burgess, Gary, Saha, K. 2010. "Measurement and analysis of temperature and pressure in high altitude air shipments". *Packaging Technology and Science* Volume 23, Issue 1, pp 35-46.

Terdwongworakul, A, Jarimopas, B, Chaiyapong, S, Singh, Sher Paul, Singh, J. 2010. "Determination of Physical, Acoustical, Mechanical and Chemical Properties of Fresh Young Coconut Fruit for Maturity Separation". *Journal of Testing and Evaluation*, Vol 38, No.1.

Singh, Sher Paul, Singh, J, Chiang, K C., Saha, K. 2010. "Measurement and analysis of 'small' packages in next day air shipments". *Packaging Technology and Science* Volume 23, Issue 1, pp 1-9.

Jarimopas, B, Rachanukroa, D, Singh, Sher Paul. 2009. "Development of a new retail packaging for sweet tamarind". *International Journal of Postharvest Technology and Innovation*, 1(4), 416-429.

Jarimopas, B, Pushpariksha, P, Singh, Sher Paul. 2009. "Post-Harvest Damage and Performance Comparison of Sweet Tamarind Packaging". *International Journal of Food Properties*, 12(2), 414-426.

Jarimopas, Bundit, Puspariksha, Phanida, Singh, Sher Paul. 2009. "Postharvest Damage of Mangosteen and Quality Grading Using Mechanical and Optical Properties as Indicator". *International Journal of Food Properties*, 12: 414-426.

- Singh, Sher Paul, Singh, J, Kittipinyovath, Pakapol. 2009. "Measurement and Analysis of shocks to products packaged in pails in single parcel ground shipments". *Packaging Technology and Science* Volume 22, Issue 7, pp 397-414.
- Singh, J, Attema, A, Singh, Sher Paul, Vorst, K. 2009. "Comparison of Manufacturer's Joint Fastening Techniques for Corrugated Boxes and their Effect on Box Strength". *Journal of Applied Packaging Research*, Vol. 3, No. 4.
- Madival, Santosh, Auras, Rafael, Singh, Sher Paul, Narayan, Ramani. 2009. Assessment of the Environmental Profile of PLA, PET and PS Clamshell Containers using LCA Methodology. *Journal of Cleaner Production* 17 1183. doi:10.1016/j.jclepro.2009.03.015.
- Singh, Sher Paul, Singh, J, Paek, Y. 2009. "New Pressure Sensitive Device to Measure and Predict Drops". *Journal of Applied Packaging Research*, Vol. 3, No. 3.
- Saha, K, Singh, Sher Paul. 2009. "Effect of Transport Vibration on Quality of Minimally Processed and packaged fresh cut cantaloupe". *Journal of Applied Packaging Research*, Vol. 3, Issue 1, pp. 15-26.
- Singh, J, Singh, Sher Paul, Voss, T, Saha, K. 2009. "A study of the effect of pictorial markings and warning labels on handling of packages in the DHL single parcel environment". *Packaging technology and Science* Volume 22, Issue1, pp. 1-8.
- Chonhenchob, V, Sittipod, S, Swasdee, D, Rachtanapun, P, Singh, Sher Paul, Singh, J. 2009. "Effect of Truck Vibration during Transport on Damage to Fresh Produce Shipments in Thailand". *Journal of Applied Packaging Research*, Vol. 3, No. 1.
- Singh, Sher Paul, Joneson, E, Singh, J, Grewal, G. 2008. "Dynamic Analysis of Less-Than-Truckload Shipments and Test Methods to Simulate this Environment". *Packaging Technology and Science*, Vol. 21, Issue 8, 453-456.
- Garcia-Romeu-Martinez, Manuel-Alfredo, Singh, Sher Paul, Cloquell-Ballester, Vicente-Agustin. 2008. "Measurement and Analysis of Vibration Levels for Truck Transportation in Spain as a Function of Payload, Suspension and Speed". *Packaging Technology and Science*, Vol. 21, Issue 8, 439-451.
- Jarimopas, B, Pushpaiksha, P, Singh, Sher Paul, Singh, J. 2008. "Mechanical and Light Properties of Mangosteen fruit as related to Post Harvest Quality". *Journal of Testing and Evaluation*, 36(2), 191-197.
- Rissi, Giovanni Otavio, Singh, Sher Paul, Burgess, Gary, Singh, J. 2008. "Measurement and Analysis of Truck Transport Environment in Brazil". *Packaging Technology and Science*, Vol. 21, Issue 4, 1-8.
- Singh, J, Manley, J, Wallace, F, Olsen, E, Singh, Sher Paul. 2008. "The Effect of Ventilation and Hand Holes on Loss of Compression Strength Boxes". *Journal of Applied Packaging Research*, Vol. 2, No. 4.
- Chonhenchob, Vanee, Kamhongwong, Damrongpol, Singh, Sher Paul. 2008. "Comparison of Reusable and Single-Use Plastic and Paper Shipping Containers for Distribution of Fresh Pineapples". *Packaging Technology and Science*, Vol. 21, Issue 2, 73-83.
- Singh, J, Holtz, R, Singh, Sher Paul, Saha, K. 2008. "Effect of Unitization and Product Types on Readability of Tagged Packages of Consumer Goods". *Journal of Applied Packaging Research*, Vol. 2, No. 3.
- Singh, Sher Paul, McCartney, M, Singh, J, Clarke, R. 2008. "RFID Research and Testing for Packages of Apparel, Consumer Goods and Fresh Produce in the Retail Distribution Environment". *Packaging Technology and Science*, Vol. 21, Issue 2, 91-102.

Singh, Sher Paul, Burgess, Gary, Singh, J. 2008. "Performance Comparison of Thermal Insulated Packaging Boxes, Bags and Refrigerants for Single Parcel Shipments". *Packaging Technology and Science*, Vol. 21, Issue 1, 25-35.

Jarimopas, Bundit, Rachanukroa, Dolhathai, Singh, Sher Paul, Sothornvit, Rungsinee. 2008. "Post-harvest damage and performance comparison of sweet tamarind packaging". *Journal of Food Engineering* 88 (2008) 193–201.

Garcia-Romeu-Martinez, Manuel-Alfredo, Singh, Sher Paul, Cloquell-Ballester, Vicente-Agustin, Saha, Koushik. 2007. "Measurement and Analysis of International Air Parcel Shipping Environment for DHL and FedEx Between Europe and United States". *Packaging Technology and Science*, Vol. 20, Issue 6, 421-429.

Singh, Sher Paul, Sandhu, A. P. S, Singh, J, Joneson, E. 2007. "Measurement and Analysis of Truck and Rail Shipping Environment in India". *Packaging Technology and Science*, Vol. 20, Issue 6, 381-392.

Kale, Gaurav, Auras, Rafael, Singh, Sher Paul, Narayan, Ramani. 2007. Biodegradability of Polylactide Bottles in Real and Simulated Conditions. *Polymer Testing* 26 (8): 1049-1061. doi:10.1016/j.polymertesting.2007.07.006.

Jarimopas, B, Singh, Sher Paul, Sayasoonthorn, S, Singh, J. 2007. "Comparison of Package Cushioning Materials to Protect Post-Harvest Impact Damage to Apples". *Packaging Technology and Science*, 20(5), 315-324.

Jarimopas, B, Sayasoonthorn, S, Singh, Sher Paul, Singh, J. 2007. "Test Method to Evaluate Bruising During Impacts to Apples and Compare Cushioning Materials". *Journal of Testing and Evaluation*, 35(3), 321-326.

Singh, Sher Paul, Burgess, Gary, Kremer, Matt, Lockhart, Hugh. 2007. "Effect of Reduced Pressure, Vibration and Orientation to Simulate High Altitude Testing of Liquid Pharmaceutical Glass and Plastic Bottles". *Packaging Technology and Science*, Vol. 20, Issue 5, 359-368.

Kale, Gaurav, Auras, Rafael, Singh, Sher Paul. 2007. "Ambient Exposure Conditions". *Packaging Technology and Science*, Vol. 20, Issue 1, 49-70.

Chonhenchob, Vanee, Chantarasomboon, Yada, Singh, Sher Paul. 2007. "Quality Changes of Treated Fresh-Cut Tropical Fruits in Rigid Modified Atmosphere Packaging Containers". *Packaging Technology and Science*, Vol. 20, No. 1, 27-37.

Singh, Sher Paul, Jarimopas, B, Saengnil, W. 2006. "Measurement and Analysis of Vibration Levels in Commercial Truck Shipments in Thailand and its Impact on Packaged Produce". *Journal of Testing and Evaluation*, 34(2), 104-110.

Kale, Gaurav, Auras, Rafael, Singh, Sher Paul. 2006. Comparison of the Degradability of Poly(lactide) Packages in Composting and Ambient Exposure Conditions. *Packaging Technology and Science* 40 49-70.

Kale, Gaurav, Auras, Rafael, Singh, Sher Paul. 2006. Degradation of Commercial Biodegradable Packages under Real Composting and Ambient Exposure Conditions. *Journal of Polymers and the Environment* 14 (3): 317-334. 10.1007/s10924-006-0015-6.

Auras, Rafael, Singh, Sher Paul, Singh, Jay. 2006. Performance Evaluation of PLA against Existing PET and PS Containers. *Journal of Testing and Evaluation* 34 (6): 530-536. DOI:10.1520/JTE100041.

Singh, S. P., G. Burgess, J. Singh and M. Kremer, "Measurement and Analysis of Next Day Air Shipping Environment for Mid Sized and Light Weight Packages for DHL, FedEx and USPS", *Journal of Packaging*



Technology and Science, John Wiley and Sons, Vol. 19, 2006.

Singh, S. P., G. Burgess, H. Lockhart and O. Boata, "Effect of Reduced Pressure and Vibration on Haz-Mat Packages for Liquids", *Packaging Technology and Science*, John Wiley and Sons, Vol. 19, 2006.

Singh, S. P., V. Chonhenchob, and J. Singh, "Life Cycle Inventory and Analysis of Re-Usable Plastic Containers and Display Ready Corrugated Containers Used for Packaging Fresh Fruits and Vegetables", *Journal of Packaging Technology and Science*, John Wiley and Sons, Vol. 19, 2006.

Chonhenchob, V., Y. Chantarasomboon, and S. P. Singh, "Quality Changes of Treated Fresh Cut Tropical Fruits in Rigid Modified Atmosphere Packaging Containers", *Journal of Packaging Technology and Science*, John Wiley and Sons, Vol. 19, 2006.

Singh, J., S. P. Singh, and G. Burgess, "Measurement and Analysis of US Truck Vibration for Leaf Spring and Air Ride Suspensions and development of Tests to Simulate these Conditions", Vol. 19, 2006.

Auras, R., S. P. Singh and J. Singh, "Performance Evaluation of PLA against Existing PET and PS Containers", *Journal of Testing and Evaluation*, Vol. 34, No. 6, American Society for Testing and Materials, 2006.

Rhim, J. W., A. K. Mohanty, S. P. Singh, and P. K. W. Ng, "Preparation and Properties of Biodegradable Multilayer Films Based on Soy Protein Isolate and Polylactide", *Industrial & Engineering Chemistry Research*, 45, 3059-3066 (2006).

Rhim, J.W., A.K. Mohanty, S. P. Singh, and P. K. W. Ng "Effect of Processing Methods on Performance of Polylactide (PLA) Films: Thermo-compression vs. Solvent Casting Methods", *Journal of Applied Polymer Science*, (In press, 2006)

Auras, R., S. P. Singh and J. Singh, "Evaluation of Oriented PLA Polymer v/s Existing PET and OPS for Frozen Food Service Containers", *Journal of Packaging Technology and Science*, John Wiley and Sons, Vol. 18, 207-216, 2005.

Singh, S. P., G. Burgess, and J. Singh, "A New Test Method and Pictorial Markings for Packages Containing Liquid Dangerous Goods in High Altitude Shipments" *Journal of Testing and Evaluation*, Vol. 32, No. 5, American Society for Testing and Materials, 2004.

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Singh, P., Logistical Packaging Challenges for E-Commerce of Fresh Produce, Proceedings of Packaging Clean and Green Conference, Australian Institute of Packaging, Melbourne, Australia, March 2002.

Singh, J, Singh, P., and Burgess, G., Package Performance for Hazardous Materials in High Altitude Shipments, WorldPak 2002, International Packaging Conference Proceedings, ISBN 1-158716-1540, CRC Press, June 2002.

Singh, P., and Singh, J., E- Commerce Distribution of Fresh Produce and Flowers, WorldPak 2002, International Packaging Conference Proceedings, ISBN 1-158716-1540, CRC Press, June 2002.

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Effect of Low Pressure and Vibration on Leaks in Haz Mat Packages, Dangerous Goods Conference 2001, IATA, International Aviation Transport Authority, Atlanta, Feb, 2001.

Logistical Challenges for E-Commerce Packages, 12th IAPRI International Conference, Warsaw, Poland,

June, 2001.

Corrugated Packaging Specifications - Challenges of Real Life Shipments, International Conference on Creep and Fatigue Effects on Corrugated Board, Melbourne, Australia, 2001.

Packaging Specifications for Heavy Packages in UPS Shipping Environment, Dimension 01, Orlando, International Safe Transit Association, 2001.

Measurement of the UPS Ground Shipping Environment for Large and Heavy Packages, ISTACON 2000, Orlando, 2000.

Distribution Challenges for E-Commerce Shipments, Packaging for E-Commerce, San Francisco, 2000.

Reusable Plastic Containers for Fresh Produce, TRANSPAK 2000, Institute of Packaging Professionals, Austin, Feb, 2000.

Design Requirements for RPC's for Fresh Produce, UNITED 2000, United Fresh Fruit and Vegetable Conference, Phoenix, Feb, 2000.

Stability of Stacked Pallet Loads, 11th International IAPRI Conference on Packaging, Singapore, July, 1999.

Packaging Education: Training Professionals for the XXI Century, International Packaging Seminar, Sao Paulo, Brazil, 1999.

Development of a New Test Method to Test Reusable Intermediate Bulk Containers, ISTACON'99, Orlando, April, 1999.

Loss of Compression Strength in Corrugated Containers due to Misalignment and Humidity, 4th Symposium on Creep and Cyclic Humidity, Grenoble, France, March, 1999.

A System Analysis of Various IBC Types, IBC-USA 99, New Orleans, April, 1999.

Stability of Stacked Pallet Loads, TRANSPAK 99, Institute of Packaging Professionals, Orlando, Feb, 1999.

How to Protect Material for Shipment, PROMAT 99, Material Handling Institute, Chicago, Feb, 1999.

Returnable Containers for Fresh Produce, UNITED 99, United Fresh Fruit and Vegetable Growers, San Diego, Feb, 1999

Best Practice Packaging for Physical Protection, Creating and Developing Innovative Packaging, MSU Seminar, Phoenix, January, 1999.

Effect of Labeling on Package Drop Orientation, Proceedings of the 19th IAPRI International Packaging Symposium, Rochester, 1998.

Comparison of Expanded Polystyrene and Other Cushioning Materials for Environmental and Protection Capabilities, Proceedings of the Foamed Polystyrene Alliance Conference, New Orleans, February, 1997.

Life Cycle Testing of Plastic and Presswood Pallets for the United States Postal Service, 10th IAPRI World Conference on Packaging, Melbourne, Australia, 1997.

Comparison of Reusable Plastic and Paper Corrugated for Packaging, 10th IAPRI World Conference on Packaging, Melbourne, Australia, 1997.

Comparison of Plastic and Wood Pallets, Transpack 97, Institute of Packaging Professionals, Herndon, VA, 1997.

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Development of Ph.D. Program in Packaging, Proceedings of the 18th IAPRI Symposium, Helsinki, Finland, 1996.

Effect of Recycled Content on Corrugated Board Properties and Box Compression Strength, Proceedings of the 18th IAPRI Symposium, Helsinki, Finland, 1996.

Future Trends in Export Packaging Requirements, Proceedings of the International Conference on Packaging and Globalization, Bombay, India, 1996.

Source Reduction in Packaging for Electronic Industry, Singapore Institute of Standards and Industrial Research, Technical Seminar Proceedings, Singapore, July, 1995.

Use of Computer Aided Multimedia in Teaching Packaging Processes at the University Level, Proceedings of the 9th IAPRI Conference, Brussels, Belgium, 1995.

Role of Dynamic Testing for Reusable/Returnable Containers and Racks for the Automotive/Manufacturing Industry, Proceedings of the 9th IAPRI Conference, Brussels, Belgium, 1995.

Source Reduction Through the Use of Steel Racks for Part Shipments in the Automotive Industry, Proceedings of the Annual Safe Transit Conference, ISTA, Clearwater, FL, 1995.

Comparison of New Packaging Materials for Protective Cushioning and Environmental Concerns, Proceedings of the AIP (Australian Institute of Packaging) Conference, Sydney, Australia, 1995.

Future of Plastic Pallets in the Grocery Industry, Proceedings of the 1995 Annual National Wood Pallet and Container Association Pallet Conference, St. Louis, MO, 1995.

Current Trends of Palletization and Packaging in the United States, Proceedings of the Canadian Pallet Conference, Vancouver, Canada, 1995.

Packaging Materials, Options and Developments. Paper presented at "Packaging - The Future and Challenge" International Conference, Auckland, New Zealand, October, 1994.

Designing Packages for the Overnight Shipping Environment. Paper presented at the 8th International IAPRI Packaging Conference, Sao Paulo, Brazil, June, 1993.

Environmental Impact of Packaging Cushioning Materials. Presented at the Pack Expo Conference, Chicago, November, 1992.

Protective Media for Shock and Vibration. Paper presented at the Industrial Packaging Conference, New Delhi, India, October, 1992.

Bruising of Apples as a Function of Truck Vibration and Packaging. Paper presented at 1991 Summer Meeting of ASAE (92-6036), Charlotte, June, 1992.

Measuring the Dynamic Environment of Automated Package Sortation Equipment Used in the United Parcel System. Paper presented at the 1992 International Material Handling Research Colloquium, Milwaukee, June, 1992.

Optimizing Pack Design for Distribution. Paper presented at World Packaging Congress, Seville, Spain, January, 1992.

Transportation and Military Packaging. Paper presented at the Colloquium on Current Concerns in Packaging for Management, San Diego, 1992.

New Package System for Fresh Strawberries and Raspberries. Paper presented at 1991 Summer Meeting of ASAE (91-6017), Albuquerque, 1991.

Vibration Levels in Commercial Shipments. Paper presented at 1991 Summer Meeting of ASAE (91-6016), Albuquerque, 1991.

What Can Robotic Assembly do for You? Singh, S.P. and H. Lockhart, Food Packaging Technology International, 45-46, 1991.

Packaging: A Quiz for the Automotive Industry. Twede, D., R. LaMoreaux and S. P. Singh, Action Line, September, 1990.

Correlating Real Life Shipments with Lab Testing. Presented at the Pack Expo Conference, Chicago, 1990.

Recycling and Disposal Issues of Pallets. Paper presented at the NWPCA Annual Meeting, Toronto, 1990.

Vibration Levels in Refrigerated Truck Shipments. Presented at the Refrigerated Transportation Foundation Annual Meeting, Baltimore, August, 1990.

Measuring the Truck Transportation Environment in United States. Paper presented at the Sixth Annual Conference on Distribution Packaging and Handling. San Francisco, 1989.

Environmental Measurement and Simulation, Singh, P. Paper presented at SPHE Conference, Traverse City, April, 1988.

Vibration Induced Settling of Particles in Herschel-Bulkley Fluids. Singh, P. and G. Burgess. Paper presented at 1987 Winter Meeting of ASAE (87-6527), Chicago, 1987.

Vibration Simulation of Insecticide Tanks. Singh, P. and C. Ritchie. Paper presented at 1987 Winter Meeting of ASAE (87-6528), Chicago, 1987.

Computer Hardware: Availability and Applications in Packaging. Presented at SPHE Conference, East Lansing, September, 1986.

Future Trends of Wood Containers and Pallets. Presented at Annual Meeting of Canadian Pallet and Container Association, Cambridge, September, 1986.

Role of Plastic Containers/Pallets in the Automotive Industry. Presented at Annual Meeting of National Wood Pallet Container Association, Toronto, June, 1986.

Effect of Multiple Drops in Damage Boundary Curves. Singh, P. and G. Burgess. Presented at the 4th International Conference on Packaging, East Lansing, MI, 1985.

Design Criteria and Dynamic Behavior of Premolded PE Cushions. Singh, P. and R. Bonlender. Presented at the 4th International Conference on Packaging, East Lansing, MI, 1985.

Modeling and Simulation of Packaging Lines Using Computer Aided Techniques. IBM, Rochester, MN, 1984.

#### **VIDEO TAPES FOR EDUCATION:**

Designing Safe Loads for LTL Shipments. Prepared for Overnite Transport, 2006.

Environmental Impact of Popcorn as a Cushioning Material. Prepared for National Television News Release through MSU Outreach, 1991.

Move Your Freight the ABF Way. Prepared for ABF Freight Inc. Principle Coordinator of the project, 1989.

Freight Movement Inside Trailer. Prepared for Yellow Freight Inc. Supervised with other faculty for Packaging Dynamics Sections, 1988.

Magicians of Packaging. Participated for the Environmental Measurement Section. Prepared at School of Packaging by Pi Kappa Gamma, 1988.

Future of Wood Pallet. Singh, P. Prepared for the National Wood Pallet Container Association, Washington, DC, 1986.

#### **SEMINAR MANUALS:**

1. Fundamentals of Shocks and Vibration. G. Burgess and P. Singh. Annual MSU School of Packaging Seminar.
2. Chapter on Distribution Packaging. G. Burgess and P. Singh. Principles of Packaging for Supervisors Course and PACTECH Seminar
3. Packaging/Unitization Seminar. P. Singh.
4. Automotive Packaging Seminar. Transportation Environment, Pallets.
5. Electronic Packaging and Advance Dynamics.
6. Fresh Produce (Vegetables and Fruit) Distribution and Packaging.

#### **PROFESSIONAL ASSOCIATIONS AND POSITIONS HELD:**

ASAE (American Society of Agricultural Engineers)  
Chairman, Packaging Committee FPE 711, 1987-1990.

ASME (American Society of Mechanical Engineers)  
Chairman, Protective Packaging Committee, 1991-1995.

European Committee for Standardization, CEN TC 331/WG4, Technical Expert, 1997-2000.

ASTM (American Society for Testing and Materials)  
Chair Division 1, D-10 Packaging Committee  
Member (D-10). Vice Chairman (D10.15) Fragility Assessment Committee. Chairman, Task Group on Reusable Pallets and Packaging.

IAPRI Board – International Association of Packaging Research Institutes

IOPP (Institute of Packaging Professionals), Member.

ISTA Board – International Safe Transit Association

NIPHLE Member – National Institute of Packaging Handling and Logistics Engineers

National Forensic Center, Member.

Pi Kappa Gamma (Honorary Packaging Fraternity), Advisor.

Packaging Alumni Association, Member, Board of Directors.

Produce Marketing Association – Chair - Packaging Standardization Task Group

National Society of Safety Engineers - Member



### **PACKAGING TEST PROJECTS:**

In addition Dr. Singh has written over a hundred reports on various studies done to test and evaluate packaging systems for various companies including the following:

Abbott Laboratories	Kellogg's Company
Abitibi Price	Kraft, Inc.
Amway Corporation	Laserfile Compact Disc
Anheuser Busch	Libbey Glass
Appleton Papers	Menasha Paper
Arco Chemical	Merillat
Association of American Railroads	Miller Brewery
Avon Company	Mitsubishi
AC Delco	Morton Grove Pharmaceutical
Beatrice/Hunt-Wesson	ODL (Glass Doors) Inc.
Becton Dickinson Company	Orbis Menasha
Buckhorn	Owens Illinois
Chevron	Ortho Pharmaceutical
Chiquita	Overnite Transport
Clorox Company	Pepsi Bottling Group
Coca Cola Company	PPG Industries
Colgate Palmolive	Proflowers
Con Agra Foods	Purepak
Coors Brewery	QVC Inc
Dow Chemical	SCA Packaging
Dupont	Sealed Air Corporation
Eastman Kodak Company	Simmons Mattress Company
Ethan Allen	Sonoco Products Company
Faygo	Stone Container Corporation
Ford Motor Company	Stroh Brewery
Frito Lay, Inc.	Trienda Corporation
General Motors	Tuscarora Plastics
General Electric Co.	Uncle Ben's Inc.
General Foods	United States Dept. of Agriculture
Gerber Foods	United States Postal Service
Haworth	Wood Mode
Herman Miller	Wyeth-Ayerst Laboratories
Hewlett Packard	Xerox
International Honeycomb	Yellow Freight System
Johnson Controls	Zenith Data Systems

### **INTERNATIONAL AGENCIES AND INSTITUTES:**

In addition served as a consultant and advisor to the following universities and institutes in training and developing packaging curriculum at graduate and postgraduate level and served as examiner at the following:

- California Polytechnic University, San Luis Obsipo, CA
- China Packaging Research, Beijing, China
- China Packaging Research and Testing Center, Tianjin, China
- Copenhagen Business School, Copenhagen, Denmark
- Danish Technological Institute, Copenhagen, Denmark
- Indian Institute of Technology, Roorkee, India
- Indian Institute of Packaging, India
- Japan Packaging Institute. Tokyo, Japan
- Kasetsart University, Bangkok, Thailand
- Nanyang University, Singapaore
- Massey University, Palmerston North, New Zealand
- Sheffield University, Sheffield, United Kingdom
- Victoria Institute of Technology, Melbourne, Australia