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Topic of the Speech:
Heat and Moisture Transfer of Multilayer Adult Incontinence Briefs in Computational Simulations and Objective Measurements

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Dr. Yueping Guo earned her Ph.D. degrees at Institute of Textiles and Clothing, The Hong Kong Polytechnic University. After her Ph.D. training, she consecutively joined The Hong Kong Polytechnic University and was a Post-Doctoral Fellow, Research Fellow, Project Manager, Project Deputy Coordinator and Lecturer. Later, Dr. Guo established Novel Protective Textiles Limited and is a Responsible Official of the company. She supervised M. Phil. and PhD students. To date, she has authored and co-authored more than 100 journal publications, conference papers/ presentations, technical reports, book chapters and patents. She has more than 10 awards on outstanding research papers, patent inventions and technology transfer.

The inventions from the research projects have been successfully commercialized, including Nano -facemasks, High Performance Sportswear, Anti-Heat Stress Clothing for construction workers and Summer Uniforms for cleansing workers, which won many international and regional invention/innovation awards such as grand prize and gold medal (2016, Geneva), Hong Kong Contraction Industry Council Grand prize (2015), Innovation Achiever's Award (2015), Distinguished Knowledge Transfer Awards – Community Excellence (2017), and has been transferred to the Hong Kong Construction Industry and the Food and Environmental Hygiene Department. She served as an editor for Journal of Fiber Bioengineering and Informatics and is the reviewers for CMAJ, American Journal of Infection Control, Textile Research Journal, Industrial Textile journal, Journal of Building Engineering and Marine Pollution Bulletin.

ABSTRACT SUBMISSION
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Heat and Moisture Transfer of Multilayer Adult Incontinence Briefs in Computational Simulations and Objective Measurements

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ABSTRACT (NO MORE THAN 500 WORDS:)

With a growing aging population, many individuals are experiencing incontinence. It's estimated that worldwide more than 200 million persons have some degree of urinary and/or fecal incontinence. There is a real need for personalized and effective continence care, especially in research for absorbent incontinence products because of their mainstay role. Therefore, this study aims to evaluate the heat and mass transfer of two kinds of multilayer adult incontinence briefs (diapers for short) in the dry condition and dynamic heat and moisture transfer processes in the wet condition in computational simulations and objective measurements. A commercial disposable brief (PROTEC) with polyethylene, superabsorbent polymers and polypropylene, and a newly designed and reusable brief (Reusable) with waterproof breathable fabric, full cotton inner pad and moisture management treatment nonwoven were evaluated. A software platform (S-smart system) with user friendly interfaces was employed in computational simulations. Wear trials were conducted by asking young female adults between 20 and 26 years old to wear incontinence briefs. Objective measurements revealed that there was significantly higher liquid moisture management capacity, water vapor permeability, thermal conductance and maximum value of heat flux in the Reusable than in PROTEC briefs. The simulation and wear trial results showed that there were significantly lower temperatures and humidity at the skin in the diaper area and diaper inner surface fabric in the Reusable briefs compared to the PROTEC ones. The good agreement between simulations and wear trials were observed. The 2D and 3D directly visualizes the changes of fabric temperature/humidity gradient and capacity of absorbing moisture etc. in each layer. The results indicate that the superior fabric's heat/moisture transporting properties, when incorporated into diapers, is the main mechanism for reducing heat and wetness of the diaper area, which could keep the wearers' dry to prevent skin irritation and rashes. The technological development in the evaluation and design continuously improves the wearing performance, maximal fit and comfort.