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Servo-hydraulic compaction simulators, an overview of the state-of-the-art

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ABSTRACT

Servo-hydraulic compaction simulators have been available to the Pharmaceutical industry and Academia since the 1980s and have contributed extensively to the advance of compaction physics and tableting manufacturing research. Servo-hydraulic simulators support die compaction, roll compaction, and can also be adapted to support capsule compaction. The introduction of 3D-generation equipment and the drive toward rational formulation of simple and complex compacts (multilayers) in a material-sparing, multivariate environment are leading to a resurgence in the use of experimental simulation technology. This study will provide the background of compaction simulators and will outline novel, state-of-the-art features, such as triaxial decompression, temperature impact, instrumented dies, and advanced press simulations (kinetics, temperature, elasticity). Although designed primarily for pharmaceutical tablets and ribbons, modern simulators can be easily adapted to support uniaxial die compaction in other industries, such as metallurgy, ceramics, and catalysts. The growing linkage between numerical simulation and physical/experimental simulation will also be discussed.

Biosketch: Jean LeFloch holds the position of Business Development Manager, North America, at Huxley Bertram (Cambridge, UK) a supplier of servo-hydraulic compaction simulators to the pharmaceutical industry. Formerly with Thomas Engineering in Chicago, Jean has 25 years of experience in the design, instrumentation, commercialization, and support of pharmaceutical tableting machinery. His study involved compression and coating processes and their automation. In the 1990s, Jean and his team designed one of the first fully-computerized tablet presses in collaboration with Manesty (Liverpool). Jean also worked for several years at Motorola, with a focus on statistical process control, operational excellence, and quality systems. Jean holds a Master of Science in Electrical Engineering from the University of Angers and a Master of Business Administration from the University of Notre Dame.