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B&P Process Equipment announces the next generation in technical compounding at K-Fair 2010

Dusseldorf, Germany, - November, 2010 – The Ko-Kneader, invented by Heinz Liszt in partnership with Baker Perkins in 1947, got a major facelift in 2010. In fact, the technological advancements are so dramatic that it is being considered completely new technology. K-Fair 2010 was the venue for the public announcement of the Tri-Kneader by B&P Process Equipment having its head office and works at 1000 Hess Avenue in Saginaw, MI USA.

A working model replica of a TriVolution-60, the launch model of the Tri-Kneader technology, was on display in B&P's hall 9 booth at K-Fair, the world's largest exhibition for plastics and rubber. The model, which sported an acrylic barrel for a convenient view inside the process zone, exhibited the unique operating principle of the Tri-Kneader which allows for extreme versatility and removes the limitations present in both four-flight kneader and legacy ko-kneader technology.

"Ko-Kneader technology has suffered from a lack of real game-changing development since its invention over 60 years ago and yet the product still offers many inherent advantages in the marketplace," commented Mr. Larry Slovin, President and CEO of B&P Process Equipment. "we challenged our product and process engineering teams to combine their talents and develop something truly innovative and game-changing. They responded with the Tri-Kneader concept. The theoretical advantages behind the concept were so attractive that we quickly outlined and funded a development project code-named 'Kommander'."

Project "Kommander" took flight in early 2009. It started by testing theories at a very low-level and advanced through a progression of increasingly complex theories. Each stage along the progression presented a "jumping-off" point in the event that theoretical possibilities were disproved. This prevented the project from bleeding money if it were to meet with failure. Each stage, however, saw great success and, in many cases, exhibited better than expected results. Soon, Project Kommander grew into a development project with much promise for an industry ripe with challenges.

The twin-screw extruder, which dominates approximately 80% of the compounding marketplace, is highly functional and effective as a high-torque machine which imparts a great deal of mechanical energy to melt and mix polymer compounds. B&P had established itself as a market leader in the manufacturing of twin-screws, particularly in the 1970's when it earned the John C. Vaaler award in back to back years for innovation in development of the first high free volume compounders, and again in the 1980's and 90's when it gained a 60% market share in twin-screws supplied to thermoset and powder coating processes

During those years, the Ko-Kneader however part of B&P's product offering, took a back-seat to the development and supply of twin-screw systems. In today's plastics processing landscape it has become clear that the finesse compounding capability of the Ko-Kneader coupled with its high free-volume and short L/D characteristics, makes a strong case for a comeback. But you can't just leave behind the high-torque, high-shear capabilities of the twin-screw. Both characteristics are needed in a truly versatile system. It is here where the Tri-Kneader delivers.

With the Tri-Kneader, B&P has achieved multiple oscillations per revolution of the screw shaft, whereas, in legacy ko-kneaders, only a single stroke-per-revolution was available. With each stroke of the screw shaft, the mixing flights of the screw interact with stationary pins which line the barrel wall. This flight-to-pin interaction represents the mixing interface of continuous kneader technology. With only one-stroke per revolution, the limitation is three or four flights mixing interfaces per revolution of the screw.

From as few as 4 to as many as 72 pin/flight interfaces in a single revolution of the shaft, TriVolution presents never before seen versatility and process control. Extensive Lab testing results reveal the following operational benefits of the TriVolution :

- Improved Mixing
 - ✓ Optimum extension and shear flow geometry
 - ✓ Imparts higher mechanical energy on demand
 - ✓ The expanded variety of elements allows optimum combination of free volume, shear and dispersive/distributive mixing.
- Uniform dispersion at lower melt temperatures
 - ✓ Minimizes product degradation
 - ✓ Reduces scrap and rework
 - ✓ Optimum temperature control
- Slower Screw Speed
 - ✓ Enhances life of wear components
 - ✓ Reduces downtime
 - ✓ Lowers maintenance overhead costs
- More mixing per unit volume
 - ✓ Greater maximum throughputs
 - ✓ Minimizes plant footprint
 - ✓ Results in more energy efficient process
 - ✓ Lower capital expense per kg of compound produced

Unlike the co-rotating twin-screw extruder, the Tri-Kneader is capable of being configured in a very low-temperature mixing configuration. And, unlike the Ko-Kneader, the Tri-Kneader can be configured in a very high-shear intensity mixing configuration. These configurations are possible in the shortest available L/D ratio and make the Tri-Kneader very unique and very versatile, expanding the processing range as well as improving day to day processing of like formulations.

Today, B&P has already delivered the first 30mm hybrid machine which incorporates key features of the Tri-Kneader. B&P has also installed a full-scale 60mm development and proving facility for TriVolution and are inviting customers from many different areas of compounding to come in and test run their most challenging formulations on this new technology.

A model CK-60 Ko-Kneader and a BP-50 Co-Rotating Twin-Screw Extruder are available in the B&P Technology Center to run the formulation side-by-side with the TriVolution-60 model Tri-Kneader for direct comparison of performance and results.

Contact B&P Process Equipment to get more information on the new TriVolution Series Tri-Kneader and schedule a test run.

B&P traces its heritage back to the 1886 establishment of their North American headquarters and manufacturing operation in Saginaw, MI USA and has been offering a wide range of chemical processing machinery, from batch and continuous mixers to centrifugal separation equipment, for over 120 years.

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GRAPHICS



A working replica model of the TriVolution-60 Tri-Kneader shown at K-Fair 2010



B&P Process Equipment exhibits the new TriVolution Series Tri-Kneader at K-Fair 2010