



Application Success Note



Application: Packaging – Horizontal Form, Fill and Seal Machine

Product: S-Series SMART Hydraulic Actuators

Industries: Consumer Packaged Goods, Pharmaceuticals, Medical and Food Products

6565 Davis
Industrial Parkway
Solon, OH 44139
PH: 440.220.5990
FX: 866.854.4578
Toll Free (US only):
855.596.8765

Horizontal Form, Fill and Seal Packaging Machine

Challenge:

Equipment designers are constantly on the lookout for innovative ways to improve performance and usability. This is especially true in the fast-paced world of packaging machinery—where adaptability and quick changeover are uniquely important. When Sean Dotson, President and founder of [RND Automation](#) in Lakewood Ranch FL, discovered a unique new smart actuator solution for the die cutting stations on their [MiniPack](#) rigid packaging Horizontal Form, Fill, and Seal machinery—the bulbs lit up with potential improvements RND’s clients could embrace:



- Smaller machine footprint
- Faster machine cycles
- Less changeover time
- Better process control
- Quieter operation
- More energy efficient
- No routine maintenance

As a bonus—a more compact actuator would make it easier for the RND team to assemble the die cutting stations. The previous design used a large free-standing Hydraulic Power Unit, dual cylinders, complex servo valves, long hoses, and messy fluids and filters. The improved design uses a single, totally sealed, zero maintenance, electrohydraulic actuator that delivers the force density and durability required for this high duty cycle application. In addition, RND wanted the upgraded machine to be quieter and more energy efficient—which a power on demand, whisper quiet actuator would more than deliver.

Eliminating the HPU allows RND to address the “no hydraulics” customer mandate—something that presents unique challenges for RND’s Rigid Packaging machines due to the high forces, repetitive loading, and high production rates involved.



Solution:

RND considered using Roller Screw actuators (EMAs) however they had concerns about pre-mature wear from concentrated loading. EMAs were also too large to fit into the available space at the forces required.

To achieve their targeted design objectives, RND decided to incorporate Kyntronics SMART Hydraulic Actuators (SHA) for their new, MiniPack die-cut stations. The SHAs are rated for 12,100 Lbf. (54kN) of force and provided in an inverted parallel configuration which allowed the all-in-one SHA to fit the available space envelope.



Kyntronics SHA rated at 12,100 Lbf. (54 kN) of force. Note the innovative” Inverted Parallel “configuration, a design feature unique to the SHA product.

The SHA’s closed-loop position and force control functions provide a substantial improvement in process control compared with the previously used hydraulic cylinders. In addition, an Ethernet/IP interface communicates between the machine PLC and the SHA servo controller. This allows position and force control parameters to be instantaneously communicated to allow quick changeovers and increase packaging machine flexibility.



The Kyntronics SHA eliminated this HPU, and dual hydraulic cylinders used on the previous machine.



Results:

The Kyntronics SHAs implemented on the upgraded Horizontal Form, Fill and Seal Machine die-cut stations exceeded RND’s requirements including the following highlights:

- The SHA eliminated the HPU and hydraulic components resulting in a machine package that was 20% smaller with cleaner and quieter operation and significant energy savings.
- The precise control of position and force in the SHA allowed closer synchronization of the die-cut station with the conveyor speed and improvement in the quality of die-cut registration.
- The all-in-one pre-engineered SHA system from Kyntronics saved RND significant assembly and test time compared with the previously used hydraulic system.

The all-in-one Kyntronics SHA combines the power of hydraulics with the precision of servo control resulting in an ideal solution for RND Automation to offer to their customers.

Feedback from RND Automation:

“Kyntronics worked with our engineers to develop a custom actuator that fit our space and duty cycle requirements. The closed loop system not only gives us the power we need for rigid material cutting but the servo control provides for accurate speed and acceleration control. Force feedback allows us to monitor die sharpness as well as provide data for FDA validation to our customers. We see a great future usina these actuators on all our die cut platforms.”

To find out more about how the advantages of Kyntronics SMART Hydraulic Actuators can improve your company’s machines and processes, [contact our Engineering team](#).