



## Technical Note

### Erecting and Sealing Ultra-Small and Irregular Shaped Cases

**How Pearson's CE50-UG and CS50-UG Case Erector and Sealer overcome the challenges associated with small, unstable and uncommon box designs**

Under the pressure of big box and convenience stores working to increase supply chain efficiency, many manufacturers are faced with packing their products into increasingly smaller cases. Shelf and display ready requirements further contribute to the acceleration of this trend.

Small cases have inherent characteristics that pose unique challenges to machine builders of secondary packaging automation processes. Their dimensions are ... well, small - the boxes are light and generally fairly unstable. Common case configurations are often tall and narrow or long and shallow, making them especially unsteady and difficult to control. In addition, assuming that the product output from the primary line remains unchanged, the number of cases required to pack the same amount of goods increases proportionally to the reduction in case size. With this increased case rate, erecting and sealing small and ultra-small boxes with a manual process does not present a favorable solution.

This technical note discusses four key challenges that machine builders, packaging operation managers, operators and maintenance technicians face when dealing with very small cases in an automated process and how Pearson's CE50-UG Case Erector and CS50-UG Case Sealer overcome them.

#### Pearson Packaging Systems

*Pearson Packaging Systems specializes in the design, production, integration and service of secondary packaging automation solutions. As a systems provider, Pearson offers a full line of customizable machinery to erect, pack, seal, and palletize top-loaded cartons, cases and trays.*

*Focused on minimizing total cost of ownership, Pearson Packaging Systems is dedicated to a solution-driven partnership. For sixty years, a diverse set of high-volume manufacturers and distributors has relied on our engineered systems and continuous service support.*

### **Challenge One - Consistent Infeed**

To form cases, blanks are stacked into a magazine that continually feeds the automatic case erector. Generally, the weight of larger blanks leaning against each other applies enough pressure to hold the stack in place and prevent individual blanks from falling backward. However, the light weight of small cases does not create enough pressure to hold the stack in place and keep it leaning forward. In addition, at the pick-off point, complete vertical alignment must be achieved to ensure a smooth transition into the erecting mechanism of the machine. This upright position can further contribute to the remaining blanks in the magazine tipping over backwards.

To overcome this challenge, the design of the magazine of Pearson's CE50-UG Case Erector differs from a standard case erector magazine in several ways. The blank stack is held in place and kept in proper orientation through a powered follower. At the front of the magazine, blanks are singulated through a unique dual drive, driving the boards to the front to ensure they are oriented perfectly upright. A stack pressure management system and articulating case strippers then isolate the board to be picked from the rest of the stack, which maximizes magazine pickoff reliability and performance.



**Powered follower maintains consistent pressure to guide knock down cases smoothly into the Case Erector**

### **Challenge Two - Downsizing of Components**

To handle ultra-small boxes, many components within the machine need to be substantially downsized. Subsequently, they are also much closer in proximity to each other, making an overall machine design much less tolerant to even the slightest variances. At the same time, many manufacturers of retail goods require an increasing amount of flexibility in their machines to accommodate frequent changes in their production line. No matter how exact certain positions might have to be, they still have to work for a broad range of box sizes and adapt to a fair amount of corrugate inconsistencies.

Many of the major functions within Pearson's CE50-UG and CS50-UG are accomplished through the use of servo drives. When changing between case sizes in the Human Machine Interface (HMI), the machine automatically calculates the required servo software camming and adjusts the position. The servo precision eliminates the need to manually set those points as well as any variability in the machine set up that can adversely affect performance. All other manual changeover points have been designed with rolling bearing elements with counters or scales, removing any guess work and ensuring the machine is simple and quick to change over repeatedly.

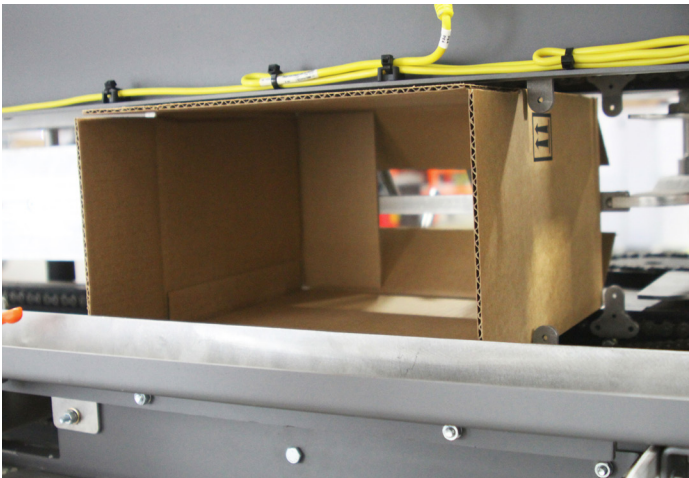
### **Challenge Three - Glue Application, Consistently Square Form**

Precision and timing are further critical in the application of glue onto the small surface area of tiny box flaps, especially when cases run at high speeds through the erector or sealer. In addition, case erectors generally employ a mandrel to compress and set the glue and square the box. To accommodate a large range of case sizes from extremely small to more traditional dimensions, the mandrel should generally be adjustable.

In the case of Pearson's CE50-UG and CS50-UG, servo motion and full case containment throughout the machine ensure well glued and consistently square



cases. Indexing servo motions reduce and control the case speed throughout the flap closing and glue application ensuring that the adhesive is applied consistently and in a repeatable pattern regardless of box size. From the time the case is set up, it is fully contained and held square in the flights, which eliminates the need for a precise squaring mandrel and inhibits unwanted movement of the case as it is indexed through the machine. An additional benefit of this design is a significantly reduced changeover time.



Case held securely in flights, maintaining it's square shape as it travels through the Case Erector

#### Challenge Four - Product Handling

The smaller the boxes, the more unbalanced they become. Long and short or tall and narrow case configurations make product handling particularly challenging. Furthermore, case formers often erect boxes on their side. To transfer the box from the case erector to the conveyor with the open side facing upward, cases must be tipped onto the conveyor. A smooth transition is necessary to enable steady, continuous transfer to the packing station.

Pearson's CE50-UG takes advantage of the proven technology of erecting a case on its side, but includes a unique tip up design that controls the case rotation from horizontal to vertical. As the case is

tipped, it is again contained on all sides, eliminating unwanted movement and ensuring correct positioning. This together with the smooth servo indexing motion of the machine enables cases to be accelerated out of the machine in a continuous, steady way. In contrast, traditional erector designs use continuous motion flights to drop the case at the tip up where it waits until it is impacted at full speed by the following case. This often causes cases to jump and move in an uncontrolled and unpredictable manner. By accelerating the cases smoothly from zero this problem is greatly reduced in the new design and cases are presented consistently to the customer's downstream equipment.



Tall cases move through the outfeed tip up station

**For information about our specific case forming and sealing solutions for ultra-small or unstable box designs, please visit our CE50 and CS50 product pages or contact us directly at 1-800-732-7766 or 509-838-6226.**

**We look forward to the opportunity to discuss how our machine designs can reliably overcome the challenges described above.**