# DOUGH SAVER

## BUN, ROLL, BAGEL, & ENGLISH MUFFIN LINES

## Automatic Divider Control System



## Model DSWB-115

- Touch screen graphical interface and control
- Food grade product contact surfaces
- Heavy stainless steel tube support structure
- Servo controlled UHMW weigh wheel
- Servo control for individual lane adjustment
- Weigh wheel rejection for up to 70 cuts per minute

## SPECIFICATIONS:

- Rates up to 115 cuts per minute
- Resolution 5 milligrams
- Repeatability 0.01 gram
- Capacity 1 kilogram

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***Portioning***  Dough density changes from the time it is dropped out of a mixer to the time it arrives at the divider. This is very significant when trying to measure and divide portions by volume.

***Ram and Shear or Pocket type dividers*** adjust scaling by increasing or decreasing the volume of each portioning chamber. If dough density was consistent, the same size pocket would always produce the same size dough piece.

***The Extrusion type dividers***—with or without a metering pump—force dough through an orifice at a given flow rate. A cutoff mechanism passes through the dough stream at a desired interval cutting a dough piece that is the inner diameter of the orifice with a length that is dictated by how often a cut is made. For example, 1 inch in diameter and 2 inches long. Two factors contribute to scaling errors in this scenario. First, the same size dough piece will almost never weigh the same. Second, there is an inability to keep the dough flow rate out of the cut-off orifice consistent, without over-working the dough and creating heat, which contributes to changing the dough density and characteristics.

### Weight Sampling and Control

The Dough Saver Divider Control System employs high speed high precision weigh cells with 5 milligram readability that provide up to 1000 weight samples per second. This weigh cell supports a 5 inch diameter UHMW wheel with four pockets machined ninety degrees apart. Dough pieces are conveyed to the wheels, and fall into the up-facing pockets. Approximately 250 weight samples are collected that reflect the weight of each dough piece at rest in its pocket. An average weight and standard deviation calculation determine each dough piece weight along with its degree of accuracy. When the arrival of the next dough piece occurs, the wheels rotate 90 degrees dropping the previous dough pieces in to their respective proofer cups. After the desired number of dough pieces are weighed, the average weight is calculated and compared to the divider target weight. If an error exists, a scaling adjustment signal is automatically sent to the divider without operator intervention. The system also reports the average variation between pockets (cuts). If any pocket variation exceeds the preset limit, the operator is alerted. Dividers that provide cut-to-cut manual adjustments can be fitted with optional servo motors for automatic pocket balancing. A convenient, industrial PC touch screen controller manages the process and stores the real-time weight information.

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**Optional Hardware:**

- Desktop PC with check manager software
- PLC based controller with discreet I/O and communication modules
- Validator checkweighers for packaged product

### Dough Saver & Validator Data Management

Check Manager is a data collection system that provides easy to use statistical evaluation functions that allow you to determine your overall process variation, and the relationship of divider weight to wrap weight. The PC software allows a supervisor to add or edit any of the Dough Saver's or Validator's product parameters and then transmit these changes to all of the controllers online. The Dough Savers & Validators respond back to the PC with each loaf weight, label count, and other essential information.
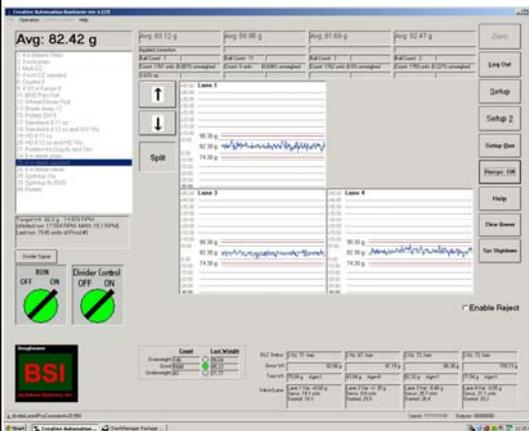



### Dough Saver vs. Divider Operator

The first Dough Saver installation occurred in a small bakery in Maine. The bakery owner knew that inconsistency in dough density required constant measurement and divider adjustment to maintain a consistent weight. Prior to installing the Dough Saver, the Benier divider operator was required to weigh each dough piece that was cut by the divider on a static hand scale.

The owner determined that every three seconds this operator would:

1. *Remove the next dough piece from the divider conveyor.*
2. *Place the dough piece on a static scale and let the weight stabilize.*
3. *Determine if the weight was out of range.*
4. *Either place the dough back into the divider hopper for rework if needed or place it back on the conveyor.*
5. *Remember the average weight of the last 5 dough pieces and determine if a scaling adjustment was required.*

The bakery owner purchased the Dough Saver because as he said, "The operator could not keep up."

With sufficient sampling of piece weights, the Dough Saver decreased the margin of error and increased the plant yield by 8%.

### Return On Investment

Based on many installations across North America, the average return on investment for the Dough Saver is less than one year.



# BSI
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