

DOUGH SAVER

BUN, ROLL, BAGEL, & ENGLISH MUFFIN LINES

Model DSWB-120

- Touch screen graphical interface and control
- Food grade product contact surfaces
- Heavy stainless steel tube support structure
- High speed .005 gram precision weigh cells
- Servo controlled weigh wheel
- Weigh wheel rejection for up to 70 pieces per minute (each lane)

SPECIFICATIONS:

- Rates up to 120 pieces per minute (per lane)
- Resolution 5 milligrams
- Repeatability 0.01 gram
- Capacity 1 kilogram

Divider Control System by BSI



The Dough Saver can reduce Ingredient costs up to \$350,000 per year!

Example:

- **4 Lane Pan O Mat 400 units per minute or 24,000 per hour**
- **24,000 uph x 6240 production hours = 149,760,000 units annually**
- **1 gram scaling reduction = 330,164 lbs. x \$.22 (\$72,636 annual savings)**
- **Normal 5 gram divider scaling weight reduction = (\$363,180 per year)**

Every baker knows that dough density changes from the time it is dropped out of a mixer to the time it arrives at the divider. That is very significant when we try 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, like water, 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 inches in diameter and 2 inches long. Two factors contribute to scaling errors in this scenario. The first is the same as the Pocket type divider, the geometry of your portioning chamber or tube is irrelevant the same size dough piece will almost never weigh the same. The second is the 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" 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 there 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.

BSI Bakery Systems, Inc.

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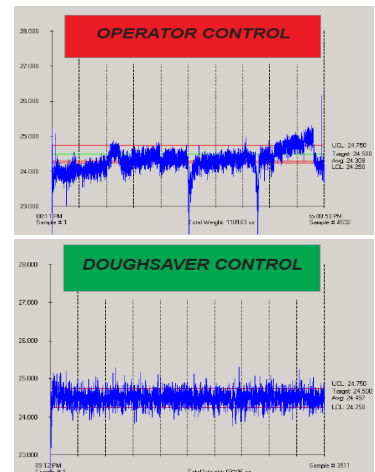
Dough Saver & Validator Data Management

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 on-line. The Dough Savers & Validators also respond back to the PC with each loaf weight, label count, and other important information. 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 relation ship of divider weight to wrap weight.

Model DSWB-120

Optional Hardware:

- Down stream reject conveyors for out of tolerance dough pieces
- Servo control for multi-pocket dividers aggregate and individual
- Desktop PC with check manager software
- PLC based controller with discreet I/O and communication modules
- Dough piece and flour recirculation systems
- Validator packaged product weigh systems



Dough Saver vs. a divider operator The first dough saver installation occurred in a small bakery in Maine. Where a very astute bakery owner new 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 every dough piece cut by the divider on a static hand scale. The maximum production rate on this bread line was 20 cuts per minute. 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 over or under if so the dough piece would be thrown back into the divider hopper for rework**
4. **If the piece was within the upper and lower range 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 reason Mr. Siegel purchased the dough Saver was simple **“The operator could not keep up”**. The Dough Saver increased the plant yield by 8%. He knew how to increase yield and control ingredient cost he only needed the right tool. The result of high production rates is insufficient sampling of piece weights. This dramatically increases the margin of error in determining proper scaling adjustments. A high speed multi lane divider with individual pocket adjustments further complicates the operator task.

The average package weight plus bake out loss equals the perfect divider weight for maximizing yield and reducing ingredient cost!

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