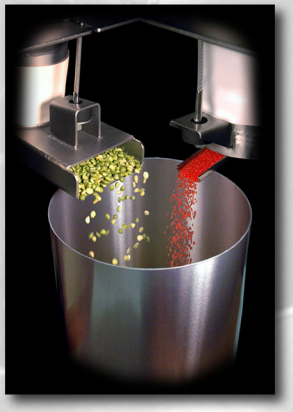
Continuous Loss-in-Weight Feeding Systems



Feeder Technologies

The dry material feeder is the most critical component in any continuous loss-in-weight system. The feeder must be able to provide a uniform bulk density product, without bridging, ratholing, or funnel flow. Without proper control of the bulk product the system is marginal at best. Therefore it is critical to match the correct feeding device to each of your products in meeting your goals. An accurate and dependable LIW system is comprised of four major components: The Feeder, The Scale, The LIW Controller, and The Refill Device.

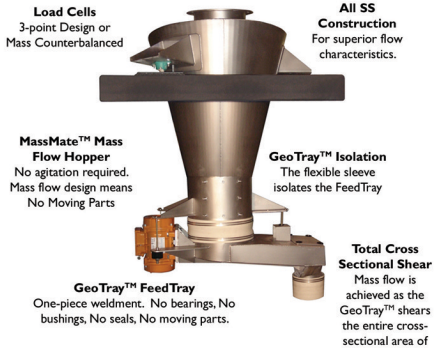
Mass Flow Feeders
- Most applications
- Abrasive, Cohesive, or Fragile products
- Low feed rates
- Pulseless Feed Required
- High accuracy ± 0.25%

Screw Feeders
- Floodable products
- Very adhesive products
- Agitated hoppers
- High accuracy ± 0.25%

Weigh Belt Feeders
- High feed rates
- Low headroom applications
- Non-floodable products
- High accuracy ± 0.25%

The Geomate™ Mass Flow Feeder

The Geomate™ is a Mass Flow feeding system, incorporating both a mass flow hopper and mass flow feeder. First, the hopper wall angles are designed to be steeper than the product's wall friction characteristics thereby promoting material flow in all areas of the bin. Second, the outlet is sized larger than the product's arching dimension, thereby preventing bridging. In addition the Geotray™ feed tray promotes mass flow *by shearing the entire cross sectional outlet of the hopper*. This "live bottom" action, working in unison with the MassMate™ hopper, provides a true mass flow feeding system. First in, first out, no moving parts and an industry best 2-year warranty translates into the lowest operating cost in the industry.



Refill Rates

During a LIW feeding cycle, at one point the feeder must be refilled while product is still being discharged. At this moment the scale system is no longer "useful", as it cannot recognize what it is losing while product is being added to the scale. Although the control system utilizes "learned data" to best control the feeder at this time, for all practical purposes the unit operates in the volumetric mode for this short period of time. Due to this it is vital to keep this duration to a minimum, thereby ensuring optimal accuracies. 3Sigma will specify and provide, if needed, the proper refill system to ensure optimal feed rate accuracies.

Scale System

In general 3Sigma provides an off the shelf strain gauge system. The configuration varies from a bench scale for very small units, to a 3-point scaling arrangement for most applications to a 4-point scaling arrangement for very large systems. The load cells employed in the scale are either environmentally protected or hermetically sealed and employ no levering system resulting in excellent stabilization time, accuracy, and repeatability. Each unit comes complete with jacking bolts allowing for load cells changes withouth having to remove any equipment.

Strain Gauge

Mass Counterbalanced

Loss-in-Weight Controller

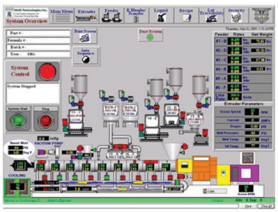
For single unit applications the Model 4060 LIW Rate Controller is utilized. This control takes 15 samples from the scale per second and makes corrective speed changes in the hundredths of a second to maintain the desired output rate. For optimal accuracy, the unit features a processor, which provides 1:1,048,576 counts of resolution and features vibration rejection technology, which intelligently deciphers true weight data – all contributing to excellent system accuracy.

An Auto Feed Rate Calibration automatically allows the control to tune itself to the specific feeding characteristics. In addition the unit comes complete with various analog and digital I/O, as well as an Ethernet connection.

PLC Based LIW Controller

Eliminating Proprietary Controls

For multiple feeder applications, and anywhere a customer truly desires a "standardized controller" we offer an Allen-Bradley PLC based control system. The PLC controller has been developed around the Allen-Bradley ControlLogix and CompactLogix hardware platforms, using standard RSLogix5000 programming software with Rockwell Automation RSView32 HMI. The field communications to the Hardy Instruments load cell amplifiers are open, standard Ethernet/IP components.



Our PLC system offers accurate feed rate control, process monitoring, communications, information collection, client/server based recipe and reporting all within one completely integrated and scalable feeding solution.

This allows your operators and electrical personnel to interface with a common/standard platform thereby minimizing the learning curve and long term maintenance, service issues and service costs associated with "proprietary controls".

Equipment and Systems

Portable and Height Adjustable Loss-in-Weight Batch System

Loss-in-Weight Bulk Bag Unloading Systems

Quick Clean Loss-in-Weight Feeder

Hydraulic Lift, IBC Cone Valve & Loss-in-Weight Feeder

IBC Unloading to (4) Loss-in-Weight Feeders

Equipment and Systems

Loss-in-Weight Feeder

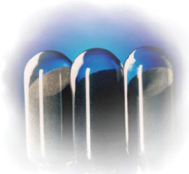
Portable Bag Dump Conveying System

Automated Batching Systems

Continuous Weigh Screw Feeder

Coating / Spreading Feeder

Testing Facility



3Sigma maintains a testing facility in Charlotte, NC for your use.
Please contact us to take advantage of our no obligation testing.

Geomate™ Specifications

GeoTray™ Diameter	Theoretical Max Flow Rate	HP	Voltage	Startup Current
4"	8 CFH	.10	110/1	1.0
6"	18 CFH	.17	230/460/3	1.8/.9
12"	68 CFH	.17	230/460/3	1.8/.9
18"	134 CFH	.52	230/460/3	7.2/3.6
24"	273 CFH	.52	230/460/3	7.2/3.6

The above theoretical flow rates are based upon Class II fine powders,
like flour and starch. Significantly higher rates are obtained
with heavier, granular or pellet materials.

Commitment

3Sigma brings over 25 years of hands on bulk material handling experience to your doorstep. Whether you are looking for a simple Loss-in-Weight feeder or a Complete Engineered System, 3Sigma has the experience to offer the correct solution - guaranteed.

Better By Design™

704-846-1617
www.3SigmaSystems.com