

Definitions used when discussing a Vac Counting system

To keep the communications simple and homogeneous, we have listed some of the basic terminology, “names” used in our descriptions.

To start, we need to define the equipment we use and how we use them:

- **Light Frame**
 - A frame approximately two feet (can be in several different shapes) made of various steel or plastic materials that houses a infrared light bar which registers a count each time an item passes through the frame.
 - Light frames come in several configurations from the Super Basic, which only registers a count, to a system that will file a report into a spreadsheet via a PLC controller, to a system that can be connected directly to port information in both directions over a computer network. This latter system is normally used with large system of five light frames and larger.
- **Tube (sometimes called a Lane)**
 - A PVC pipe normally 4” to 8” in diameter that is connected between the count station and the receiving container. Three (3) tubes are considered the maximum for a single table/operator.
- **Dump**
 - The action of a receiving container (vacuum bin, bulk bin, or BULLET) dumping into a sling/cart or onto a flat belt conveyor.
- **Vacuum Count System**
 - A system of vacuum tubes connecting a sorting platform usually a table or conveyor, to a vacuum bin. The bin normally sits above a flat belt conveyor. These vacuum tubes house a series of infrared eyes for counting by being connected to a control panel, which is connected to a computer, which is connected to a host server computer. One standard system is considered to be one table with two bins.
- **Count Station Table (normally called the “Table”)**
 - A table, conveyor or other platform where items are placed (by various means) and then sorted, inspected and thrown into a suction tube or light frame device.
- **Count Station Operator**
 - The person who operates the count station.
- **Standard Vacuum Bin**
 - A vacuum container that receives items after sorting them on the count station. Normally the vacuum chamber in this container holds about 20 lbs. of a specific item. Items going into the vacuum bin or of “like type” for each dump. Most often a vacuum bin is located over a flat belt conveyor, which receives the items dumping from the vacuum bin. Normally a 5 HP motor mounted on the bin per bin drives the vacuum.
- **Vacuum Buffer Bin**
 - The “Buffer” stands for a non-vacuum secondary container mounted directly onto or beneath a Standard Vac Bin. This is used to allow the operator additional space to place the current load, awaiting the conveyor to become clear under the vac bin and to free the main vac bin to begin counting the next item or account.

- **Vacuum Bulk Bin**
 - This is very similar to a vacuum bin only much larger. This container houses approximately 100 lbs. (depending on the size of the item). This bin normally does not dump onto a conveyor but rather dumps directly into a sling/cart and is used for one specific item. A 10 or 15 HP motor mounted off the bin normally drives this vacuum bin.
 - The normal operation is to place a sling/cart below this bin and leave the bin door closed while the items being counted are vacuumed into the bin. Once the maximum quantity of pieces or pounds are reached the bulk bin door opens, dumping the items into the awaiting sling cart. If this dump fills the sling/cart, an alarm sounds and/or a light flashes notifying the director to replace the “full” sling/cart with an empty one.
- **Bullet Classifier System (the transfer backbone of a large vac system)**
 - This is a patented product of Automation Dynamics and is very unique in its ability to have a vacuum at the count station tube, (like a standard vacuum bin) but then transfers the item inside the tube into a “blow or positive air stream”. This allows the item being transported inside the tube to be “blown” directly into a sling/cart without using a vacuum bin, flat belt conveyor or sweeper. A 10 or 15 HP motor, floor or roof, normally drives this delivery/counting device.
 - The ability to have one operator use one vacuum tube, at their normal count station, that can deliver into any bin, out of a series of bins, connected to this one tube.
 - This means that one tube can be used to carry and sort several items without the need for each item to have its own dedicated tube and without dropping these items onto a conveyor belt.
- **Bullet Collector Bin**
 - A non-vacuum holding bin used specifically with the Bullet Classifier system. This collector bin is used to collect and hold items of like type from each and every count station connected to this bin.
 - There are normally four to six (and could be as many as 99) of these bins laid out in series (or a set) one in front of the other, connected by one tube from each count station.
 - The normal operation is to place a sling/cart below this collector bin and leave the bin door open while the items being counted go directly into the sling/cart. Once the required quantity of pieces or pounds are reached the collector bin door closes, an alarm sounds and a light flashes notifying the director to replace the “full” sling/cart with an empty one.
 - The count operator does not need to wait or stop counting as the items being counted begin filling the collector bin until the sling/cart is removed and replaced with an empty one.
- **Bullet Transition**
 - This is the flapper style valve that directs the items into the proper Bullet Collector Bin. There is one for every table times the total number of Collector Bins, (a 5 table X 4 collector bins = 20 transitions).
- **Sweeper**
 - The person who removes the items from a flat belt conveyor and places them into a sling/cart.

- **Director**
 - The person who moves the full sling/carts into a holding area or onto a monorail system and replaces the full sling/cart with an empty one.

Frequently Asked Questions for setting up a Vacuum Count with a BULLET system for a typical Hospitality plant.

1. **What are the “key” issues to address when considering the installation of a counting/sorting system?**
 - a. **Accountability** is number one. Unnecessary expense is required for methods that do not track the piece count both in and out if the product is delivered by the piece to the customer. Loss of linen is a major expense for any laundry. The ability to count the incoming linen accurately and efficiently is a huge benefit to the bottom line of any laundry.
 - b. **Production Throughput** (in pieces per hour). Estimate increasing your throughput to 2000 pieces per operator hour (PPH) or more. The standard hospitality plant averages three pieces per pound, so this comes to approximately 670 pounds per hour. You can use this “rule of thumb” when calculating the number of operators (tables) you may require. Depending on the mix and the operator increasing this to 2400 PPH is realistic. NOTE: When using the BULLET™ system you may experience an increase of several hundred pieces per hour increase due to its ability to be in continuous use and dump directly into wash slings/carts. 2700 PPH is realistic in this case.
 - c. **Improved wash load setup with the BULLET™.** One of the best tools in the BULLET™ system is the ability to assign a weight to each item in the setup functions on the server. With a little investigation you can reach a very appropriate “soiled weight” for each item and then let the system calculate the quantity of this item times the assign weight for a superior wash load weight. This function, if used correctly, will give you a very accurate wash weight saving on chemical cost and producing a superior product. Used correctly this will almost replace the need for a scale or the step to stop and weigh each sling. This ability has also proven to improve wash aisle productivity since the slings are loaded to the correct capacity. Experience has shown that most slings are under loaded, so loading the sling to the correct full weight increases the amount of linen washed per day.
 - d. **Reducing required floor space and Flat Belt conveyors with the BULLET™.** Think about how you want your wash sling/cart to be loaded for the washers. One of the main “keys” in setting up an automated vac count/sort system is being able to place specific items into the respective wash sling/cart ready for the washers.

When laying out and designing your system, design the system to use the flat belt conveyor as little as possible. Instead, design your system to place 50 to 75% of the items into containers located directly over your sling carts. Depending on your mix this can be accomplished by installing the proper equipment together to create a multi-tiered system. NOTE: Refer to the section on definitions on the different types of components used in a complete system.

- e. **Space and utilities required when installing a system.** After running the numbers to calculate the quantity of tables you will need, then placement and utility requirements for the equipment is the next item to consider. Elevations should be considered in the layout process. Contact Automation Dynamics for sizing and utility requirements.
- f. **Environmental Issues.** Noise, lint and debris are the common issues to take into consideration. There are lint-collecting devices that can pre-filter the air before being released to the outside or in colder areas in the winter you may want to exhaust into the inside to save your heat. Venting the exhaust to the outside or a remote location within the plant can greatly reduce the noise. Directing the noise to the upper levels of the plant can help keep the noise to a very reasonable level. Debris is best controlled at the count table by “shaking out the items” to be counted and transported via the vac or BULLET system.

2. What is the best counting equipment mix for my plant?

- a. This depends on the size and mix of your plant. If you are a smaller plant your best bet is to start with a standard vacuum or light frame system and add additional equipment as required. Plan for this additional space when laying out the first system.
- b. If you have a high percentage of one item, you may only need a standard vac system with additional Bulk Bins for this high volume item.
- c. If you have more than one high volume item, then you should consider the BULLET Classifier system along with the standard vac system. NOTE: Bar/glass towels are transported and counted best via Standard Vac or Bulk Bins Vs the BULLET due to the heavy moisture and soil content.
- d. As a “rule of thumb” use 700 to 900 PPH for counting by hand, 900 to 1500 PPH for a Light Frame system and 1500 to 2500 counting with a Vac and or Vac and BULLET system.

3. How do you know if the BULLET should be a part of your counting/sorting system?

- a. If your mix is such that the top four to six items/sorts make up at least 50% of your total volume, the BULLET will increase your production throughput, sometimes dramatically.

- b. With this mix the BULLET should replace the need for having two vacuum bins per count table and reduce this to only one vacuum bin per table, along with one BULLET tube per table.
- c. Because each sort on the BULLET system has a cost associated with it, using over six sorts for the BULLET may not provide a short return on investment.

4. How do you calculate your layout for the BULLET?

- a. View your mix by the wash load. Because the BULLET places items sorted and counted directly into slings/carts ready for the washer, you need to make sure what goes into the slings from the BULLET matches the way you would load a sling for the wash wheel, as if you were doing it by hand.
- b. Understand that the BULLET is the main “backbone” which will transfer and count the majority of your items (depending on your mix) and place them into a wash sling/cart. For full plant production this system is often mixed with a “one bin” standard vacuum system and sometimes, again depending on the mix, a system might also include a bulk bin, for a three-tier system (BULLET, VAC, Bulk).
- c. Each Bullet Collector Bin requires about the same footprint as a standard vac bin.

5. How does the BULLET Classifier system work?

- a. The BULLET system uses a venturi method of creating vacuum instead of a direct pull from the blower. There is vacuum on the station side tube (very much like a standard vac), but the product is then transferred into a blow stream that delivers the items directly into a sling/cart. By the nature of how the system works, it will not have quite the “grab” that standard vacuum bins have, but it also does not require a vacuum bin, flat belt conveyor, sweeper to land items into a sling. And it can eliminate the need for all but one standard vac bin per station.

6. What items should we consider counting via a BULLET system and a standard Vacuum system?

- a. There are a few items that should be sorted by a standard or buffer vac bin, not the BULLET. These items are:
 - Bar Mops—Since bar mops normally come in to the soil room very damp and loaded with “gunk”, they are very difficult to pull up the tube. Bar mops go great up our vacuum bin, but are more difficult to pull up the BULLET tube. If bar mops are put up the BULLET tube, then there is a loss of accuracy and production. For this reason we do not recommend that bar mops go up the BULLET tube.
 - Very Large Items—Large heavy items, such as 70” or greater tops do not go up the tube well. A clean dry 70” top will go fine,

but if it is damp it will be harder to get up the tube. Tops larger than 70" should not go up the BULLET tube.

- Very Wet Items—Items that are dripping wet or extremely damp should not be put up the BULLET tube and care should be taken when putting very wet items up the regular vacuum tube as well. The water makes the item heavy; it makes the item stick to the side of the tube, and can cause miscounts.
- b. All other items should be handled by the BULLET tube, examples are:
 - All napkins
 - All tops less than 70"
 - All standard garments
 - All aprons
 - Small towels that are not wet
 - Etc.

This should get you a long ways into understanding how a multi-tiered system can be configured.

We at Automation Dynamics will be happy to size your plant for a counting system. We will help you answer all the above questions and many more.

Systems are often customized to each location and the software can interface with any Windows based software and with most non-windows based software, like AS400, etc.

Please call for more information or to book a visit to your plant.

Automation Dynamics
Phone 877-482-7200 (toll free)
816-461-8989 Office direct phone line
816-461-8889 Office direct fax line