

tablet handling systems



...a world of experience to meet your powder handling challenges

by



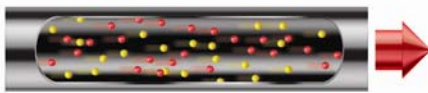
Industrial Equipment & Design Company

Tablet Handling Systems

Handling pharmaceutical tablets, or other fragile food products, continues to be plagued with ergonomic disadvantages. Many, many plants today are still lifting, scooping and dumping cores and tablets and living with the inefficiencies and ergonomic issues inherent to manual, repetitive motions.

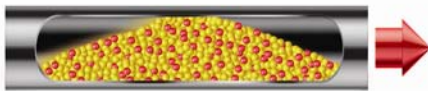
The manual handling of fragile products, in small containers, stems from various and legitimate issues associated with preventing product damage and dealing with other quality assurance issues. However, it is now possible to handle these fragile products in a completely automated and “hands off” fashion, using **dense phase vacuum conveying**.

Dense Phase Vacuum Conveying



**DILUTE PHASE
CONVEYING**

Vacuum Conveying has been given a “bad wrap” when handling fragile products due to the fact that many people have tried it, only to erode, or even explode, their product through a *high velocity* conveying line. These experiences are, in fact, representative of conventional *dilute phase vacuum conveying*. With dilute phase conveying there is a lot of air used for conveying and therefore a lot of product interaction at the high velocities necessary for conveying with traditional vacuum pumps.



**DENSE PHASE
CONVEYING**

Our pneumatically operated vacuum pump makes “Dense Phase” vacuum conveying possible. By being able to pull nearly a full vacuum (27” Hg.), the pump permits us to let in very little air for conveying. The product can be pulled through the line in dense slugs. These slugs move at low velocity, with little to no product interaction. The result is the ability to vacuum convey fragile products, without damage.

Obviously this opens up the door to automation, efficiency, labor savings and solving the ergonomic issues that plague the food and pharmaceutical industries.

Simplicity and Hygiene

All of the conveyor components are 316 stainless steel and modular for easy assembly, disassembly and cleaning. The conveying lines are food grade polyethylene hose, which can be cleaned fairly easily, or which can be thrown away and replaced as necessary.

The vacuum pump and controls are all pneumatic making installation and operation quick and simple.

We believe that we have as much, if not more, experience than anyone in the country, when it comes to the automated handling of tablets or other fragile products. Whether it be to or from a Tablet Press, Tablet Coater, Laser Drill or other tablet processing equipment, IEDCO has the knowledge and expertise to transport your tablets in a safe and reliable manner.

We hope that you will take advantage of that experience and let us help you make your operation a more efficient and ergonomically proficient one.



The IEDCO Tablet Carousel

Designed to transfer tablets from a tablet press to small buckets, the **IEDCO Tablet Carousel** holds up to 6 buckets and will fill each to an accuracy of +/- 3 grams. **IEDCO's Tablet Carousel** cuts bucket-handling time in half by automatically weighing each bucket accurately and eliminating the conventional 2-step process of filling at one station and weighing at another.

It's "Hands-Off" 6-bucket system frees the operator to become more productive with other tasks rather than watching and waiting for each bucket to fill. The **IEDCO Tablet Carousel** is designed to eliminate inconsistencies in bucket weight while focusing on safety, containment and ergonomics.

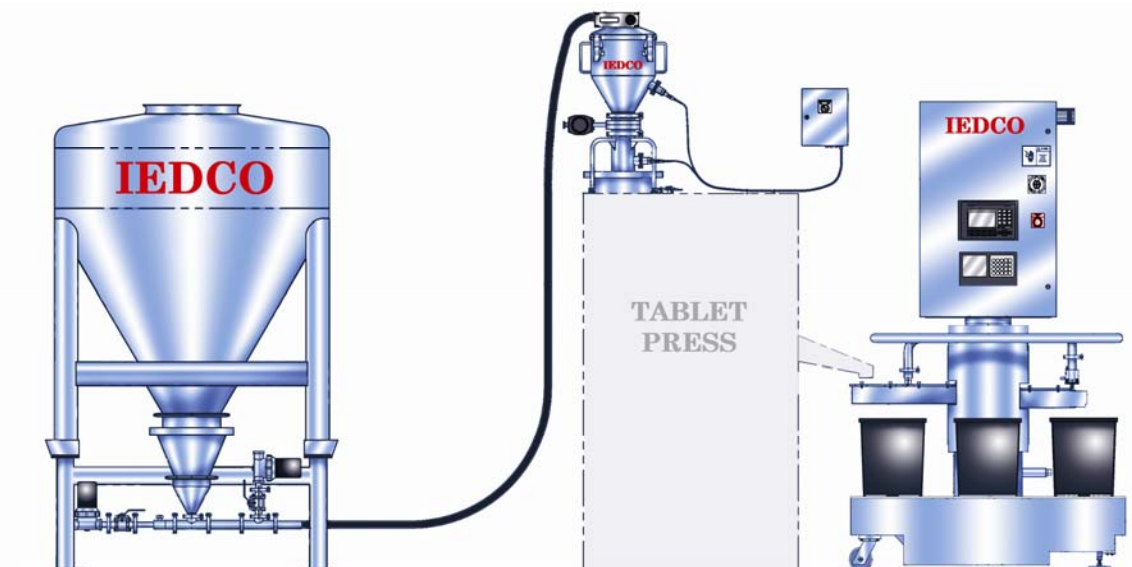
The advantages of the IEDCO Tablet Carousel System are simple:



Minimal Space Required - the design of the carousel is such that it can easily fit into a confined space without hassle. What was once a tight squeeze for an operator has become a simple task.

Man-Power Savings - rather than having an operator (or two) standing around waiting for containers to be filled, this system allows operators to occupy themselves with other tasks while the containers are automatically filled to accurate weights.

An operator is only required to replace empty buckets for filled ones when the alarm is activated. Even the labeling has become easier as the preprinted labels are waiting at the system for the operator to apply them to their appropriate container.



Case Study: Robotics in an Oral Solid Dose Facility

The Problem

An International Pharmaceutical Manufacturer had an Oral Solid Dosage (OSD) processing facility with a problem: They were manually loading and unloading tablets to and from dryer trays, as well as handling the unwieldy trays themselves in and out of an oven dryer. The existing operation was a labor-intensive, manual operation that required precision handling of the tablets. Each tray had to be loaded with the correct weight of tablets, placed in a dryer rack slot and subsequently loaded into an oven dryer. The reverse manual unloading operation also occurred.

The Solution

The initial concept was a “robotic arm” that would “read” indexed trays and remove the appropriate empty trays from the rack onto a table. Although this concept had some desirable characteristics, such as a small footprint and no operator intervention, it still contained several challenges: maintenance, cleanability and cost.

The design process developed into maneuvering the dryer rack itself with retractable arms at a fixed elevation. The dryer rack containing individual trays was mounted on a moveable carriage. The carriage would be maneuvered vertically (up and down) on a lifting mechanism. The retractable arms would pull or push individual trays in or out of their slots, across a series of rollers. A vibratory feeder would evenly distribute the tablets onto the trays before they pushed back into position. After replacing the filled tray into the rack, the lift mechanism would elevate the rack to the next indexed tray position, and the previous step was repeated.

During the unloading of the dried tablets, the same steps as above, in reverse, would occur. A tray would be indexed so that it lined up with the retracting arms. The arms would then remove the filled tray across the rollers. Clamps would grab and secure the trays, as the series of rollers, with the trays on top, is slowly lowered into an unloading chamber, which is directly connected to a discharge IBC/tote. After the tablets have been totally discharged from the tray, the retracting arms would elevate the empty trays back to the initial elevation and push them back into the tray rack. This step is repeated for each filled tray. Finally, the empty tray rack with all the empty trays is lowered back to floor level by the carriage hoist.

The Advantages

The advantages of this approach is that the fixed mechanical arms would not require nearly as much functionality, small parts or inelegance as the robotic arm approach and results in a much simpler design. No enclosed mechanical devices would be in contact with the product path. Any parts required for cleaning, such as the rollers, would be easily accessible and removable. In addition the number and complexity of mechanical items is greatly reduced. Finally, commercially available components such as the hoist mechanism and vibratory feeder are integral to the design, thereby helping to reduce costs and making available readily obtainable spare parts.

