

JBT Filling Expertise. It's What's Inside.

Take a deeper look inside the JBT Unifiller. Get to know what makes the Unifiller unique, and how it satisfies quality conscious consumers while keeping your operational costs down.



JBT Unifiller the perfect fit for your product

Capable of filling almost any kind of container (glass, cans, bottles), the JBT Unifiller is a piece of technology engineered to provide you with the best quality in filling, with fast and efficient product change-over, fast optional Clean-In-Place with total automation. No disassembly, no manual cleaning. As discussed the Unifiller's heavy-duty, highly robust design and unique filling concept results in superior filling accuracy and trouble-free use, even after many years of operation. The JBT engineers remain at your service during the full life span of your Unifiller, providing you with years of experience, even in the toughest of scenarios.

Need proof? Our experts will be happy to offer you a filling test with your own products at your production site. A highly flexible pilot machine proves the JBT Unifiller delivers accurate filling with easy-to-clean equipment, capable of adapting to each of your products, container-designs and container-types.

Put our promise to the challenge!
To experience a filling test by simply e-mail us.

hello@jbt.com

Understand what makes the Unifiller the best, and most versatile, volumetric piston filler, by looking in detail into the valve components, the design, and comparing the Working Principle, Unifiller versus a traditional Piston Filler.

The Unifiller is a volumetric piston filler, but with major differences in technology making it superior over any traditional piston fillers currently in use today. JBT engineers developed the original Unifiller over 35+ years ago and have since continuously refined the technology. Having sold over 2 000 machines, our engineers and technicians have faced and solved some of the toughest filling problems for processors within the food industry.

Today's Unifiller is unique with its large valve porting and short product paths. Making it capable of filling large particulate- and viscous-products that are nearly impossible to fill with other piston filling technology. Product flexibility, extreme accuracy, ease of -maintenance and -cleaning are major benefits of the Unifiller.

JBT is now offering a Unifiller with all its unique benefits, at a similar investment level of a traditional volumetric piston filler. With that in mind, why would you want to use anything else besides a Unifiller? Let's look in more detail into what makes the Unifiller so great.

Understanding the Unifiller The Filling Principle: Filled in 4 steps

The Unifiller filling operation consists of four (4) specific phases:

Phase 1: PRE-DOSING

The valve port is open to the product bowl and the piston moves upwards bringing a pre-defined volume of the product into the cylinder.

Phase 2: NOZZLE OPENING

In a rotary movement of the valve, the fillings station is closed from the product bowl, immediately followed by the opening of the nozzle to the container.

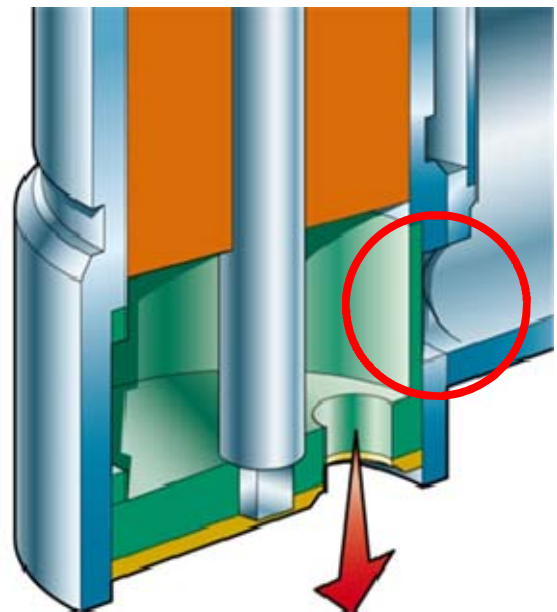
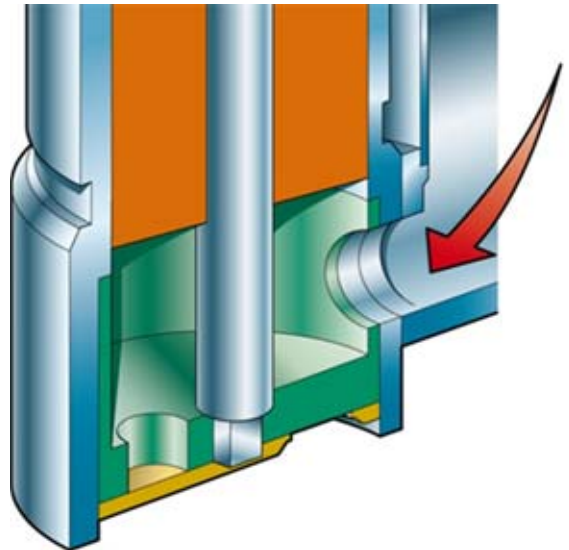
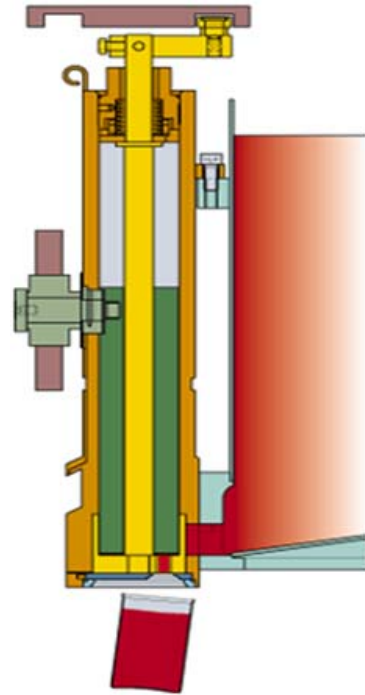
Phase 3: FILLING PHASE

The piston moves downward and the product enters the container.

Phase 4: NOZZLE CLOSING

The piston is at the bottom of the stroke and the container is filled. The valve port is then opened to the product bowl and phase 1 is repeated.

A broad range of fill stations, from 100 cc to 1500 cc, allows for selecting the optimum filling station for each application. Application-specific, quick-change filling nozzles allow optimum filling quality and accuracy for each product.

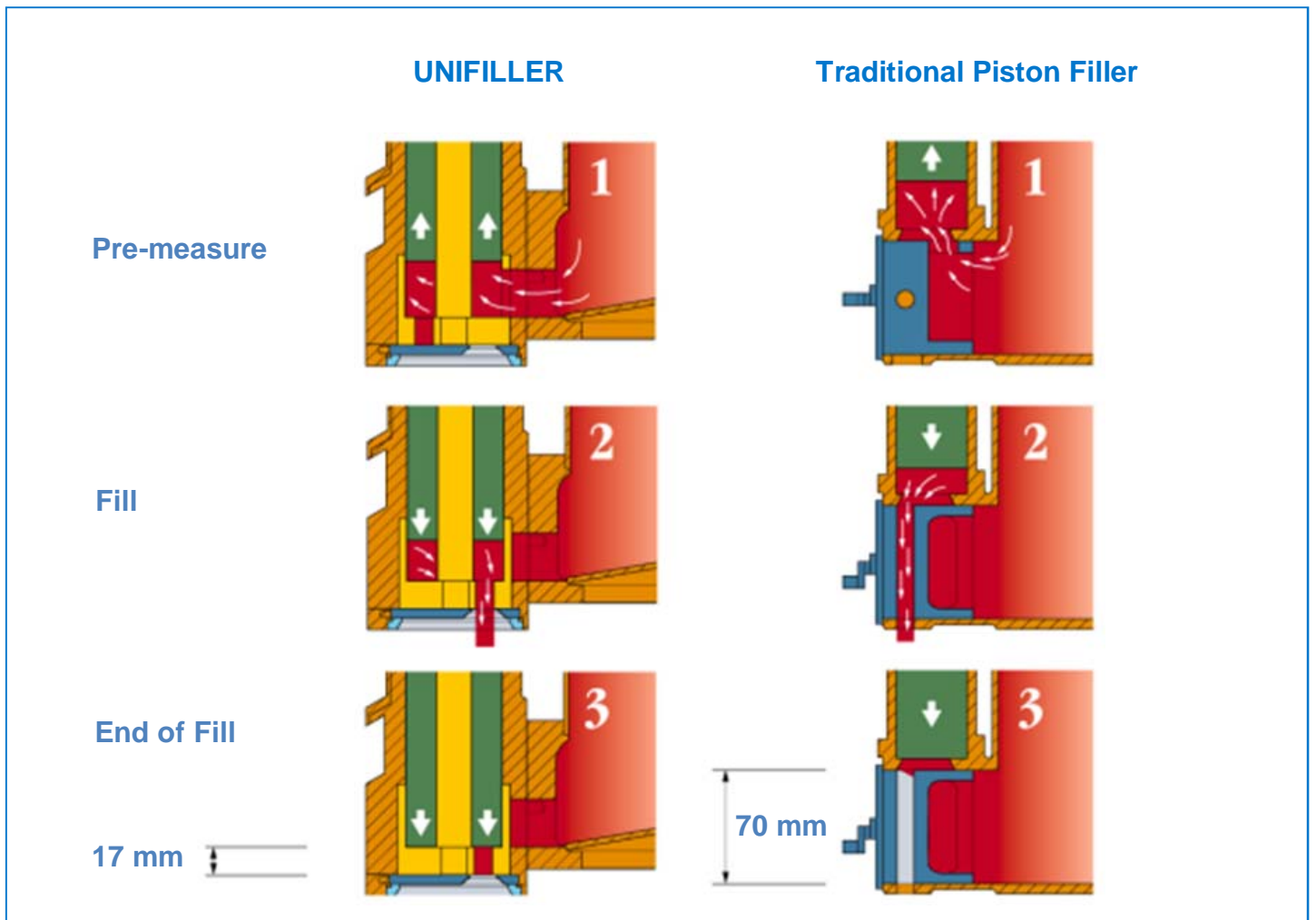


Valve Porting and Product Paths

To understand why the Unifiller is so much better than the piston filler we need to look more closely at the interior of the valves.

If we compare the product paths at the bowl port, you can see that the piston filler requires the product to turn almost 180 degrees, and upwards, to enter the cylinder as it flows through the valve plug.

In comparison the Unifiller bowl port opens up directly into the cylinder and the path length is just the thickness of the bowl wall. The unique Unifiller valve, vertically actuated, makes it possible to create a very large wide and tall bowl port. The key to being able to pump large particulates is in the relative size of the bowl port versus the particulate size to be filled. Adding a simple plow in the bowl keeps the particulates in a homogenous suspension and pushes the particulates into the cylinder.



Product & Container Flexibility

Many of today's applications require a wide range of products to be filled on a single filler. The Unifiller can do this. Were in the past, two different filling machines, with two totally different filling concepts was needed, today's Unifiller can handle the entire product range of both cold and hot fill, and also thin liquids like milk and juice to very thick viscous products with large particulates and very high solid content (50%+) with ease.

Applications involved

| | |
|-----------------|---|
| Ready Meals | Ready meals, stews and soups |
| Baby Food | Baby food and fruit puree |
| Honey & Spreads | Honey, chocolate spread, peanut butter, jams and marmalades |
| Beverages | Fruit Juices, non-carbonated beverages and nutritional drinks |
| Dairy | Cheese (liquid), cream, evaporated milk, infant formula, milk, milk-based products, sweetened condensed milk and thick cream, yoghurt |
| Meat | Pâté |
| Petfood | Canned petfood |
| Sauces | Dressings, cooking sauces, ketchup |

Container types that can be handled by a Unifiller :
Cans - Glass jars & bottles - Plastic bottles & cups



10x10x25 mm & 50% solids

▲ Example of Large Particulates with High Solid Content



Product Versatility

The Unifiller concept offers unmatched product versatility: from low viscous products without particles, to high viscous products with particles; both cold and hot fill.

The large product ports and short product path allow filling of high viscous products, with or without particles. Unifiller fill nozzles are designed especially for their application and can be exchanged easily. The custom-fit nozzles increase accuracy and minimize product drip for even the most complex products.

The result is a cleaner machine, cleaner containers and minimum risk of contamination of the rim for a more consistent seals. Besides minimum product give-away, superior filling accuracy assures consistent headspace for trouble-free in-container thermal processing.

Unifiller machine range

| FILLING STATION SIZE [ml] | TYPICAL BOWL PORT DIMENSIONS [mm] | TYPICAL NOZZLE PORT DIMENSIONS [mm] | FILLING SPEED (Up to # containers per hour) [CPH] |
|------------------------------|---|---|---|
| 100 | Ø 24 | Ø 9 - Ø 10 | 66.000 |
| 300 | Ø 30 | Ø 16 - Ø 19 | 60.000 |
| 350 | Ø 30 | Ø 16 - Ø 19 | 57.000 |
| 420 | Ø 30 | Ø 19 - Ø 21.5 | 51.000 |
| 500 | Ø 40 | Ø 22 - Ø 26 | 30.000 |
| 850 | Ø 40 | Ø 26 - Ø 28 | 27.000 |
| 1000 | Ø 45 | Ø 28 - Ø 32 | 21.000 |
| 1500 | Ø 45 | Ø 28 - Ø 32 | 18.000 |

Examples of applications and target filling accuracies

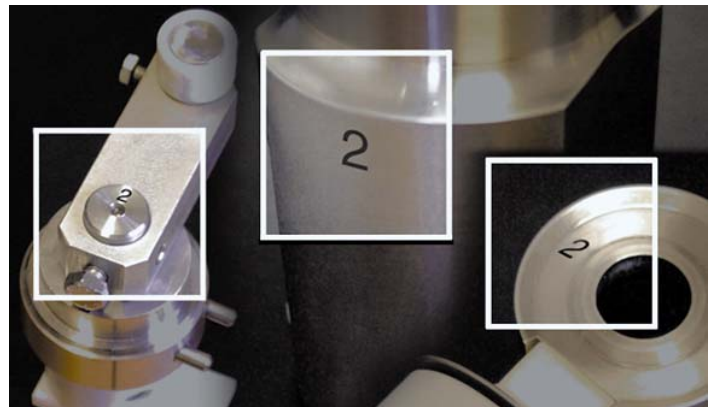
| Product | Filling volume [oz] | Typical filling accuracy (1 standard deviation) [gram] |
|---|------------------------|---|
| Baby food without particles | 2.5 oz | 0.25 ± 0,15 |
| | 4 oz | 0.30 ± 0,15 |
| Baby food with 10x10x10mm particles | 8.5 oz | 1.20 ± 0,30 |
| Gelee | 6 oz | 0.15 ± 0,10 |
| Apricot jam with 25x25x25 mm fruit pieces | 6 oz | 0.90 ± 0,25 |
| Stews, sauce with particles | 10 oz | 1.00 ± 0,30 |
| Milk and Nutritional Drinks | 8 oz | 0.10 ± 0,05 |

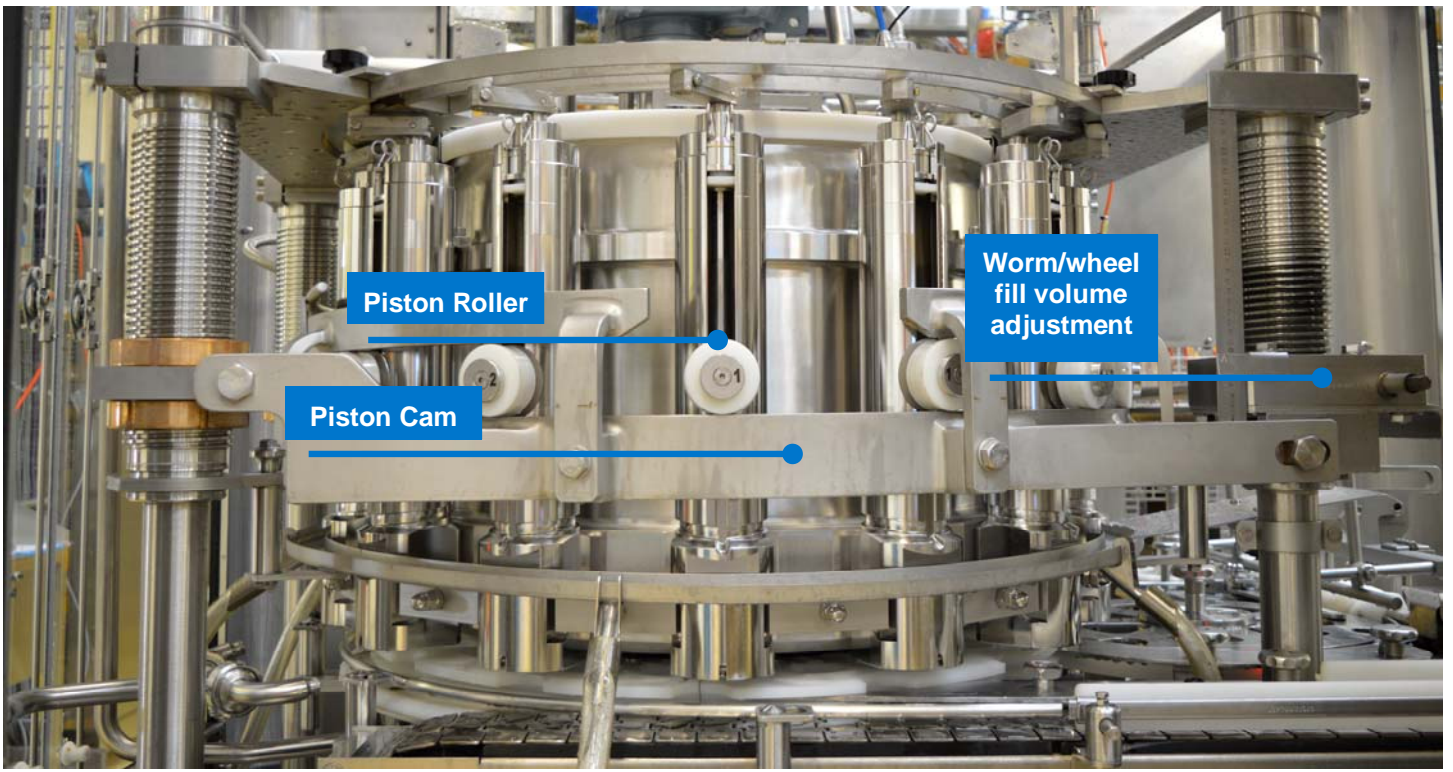


Fill Accuracy

A simple rule of thumb is that the Unifiller accuracy is about twice as good as a traditional plug valve piston filler. Why is that? The Unifiller valves are machined to extremely tight tolerances; in fact, control measurements of the individual valve parts have to be done in a temperature controlled room so that thermal expansion does not affect the measurements. The individual valves are virtually identical, so that each valve will fill within an extremely tight accuracy range.

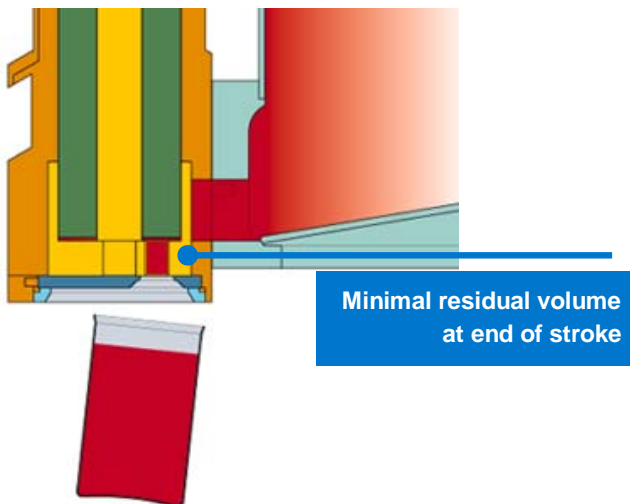
▼ Accurately Machined Parts – Lapped Together





Besides accurately machined parts, the Unifiller has an extremely large main bearing that holds the product bowl and filling stations firmly in place. No rocking. The heavy duty main bearing can easily last 10 years with proper lubrication. Grouped greasing points on the corner of the machine is standard, automatic lubrication is a nice option to eliminate any potential human error factor.

The volume cam is the largest and most rigid in its class. Minimizing deflection under high loads, even when very thick products are being pumped at high line speeds. The large center column, main bearing, and heavy duty fill cam contribute to maintaining the valve strokes within hundreds of a millimeter, making every stroke equal, so that identical fill volumes are pumped every revolution.



At the end of the stroke when the piston is at its lowest position and the millisecond before the valve closes...will the product drop or stay in the valve? Residual volume in the nozzle path is minimal in the unifiller product path. The piston actually enter the valve cup and positively displaces all product. Pushing all product out the nozzle. The Unifiller nozzle path is short with very small residual volume making it easier to control the product flow. Therefore accuracy is tremendous between fills.

Large fill volume range at high accuracy

Are you looking for a filler to fill a wide range of volumes? No problem. The Unifiller has been proven to fill larger volume ranges, at consistent high accuracy, with none to very simple change-over.

For example, a large 1000cc Unifiller valve can control a much larger volume range than a traditional plug-valve piston-filler, and will fill 32 oz down to 6 oz containers at extreme accuracy. No more need to purchase two fillers with two different valve sizes. The discussed accurately machine parts, short products path, minimal residual volume and custom nozzle design all contribute to this very unique feature on the Unifiller.

Product Integrity

Product damage is always a concern when running particulates and here the Unifiller outshines the traditional piston filler as well with only two (2) shear points: one at the bowl port, and one at the nozzle port. In comparison the piston filler has three (3) shear points as the product flows through the valve plug: one at the bowl port, but two when filling through the plug towards the opening of the container.

Over time there is a huge difference in product integrity, being able to reduce potential damage to product-pieces by one third, or 33%. Even if a piece is caught at the shear point, the surface is perfectly cut by the Unifiller porting so that the piece integrity is maintained, no smashed product.

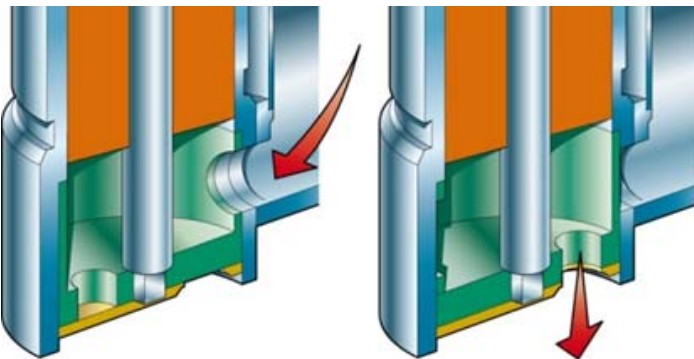
With this in mind, why would you want to use a traditional piston filler at all when running particulates?

Air entrapment and considerations for consistent accuracy

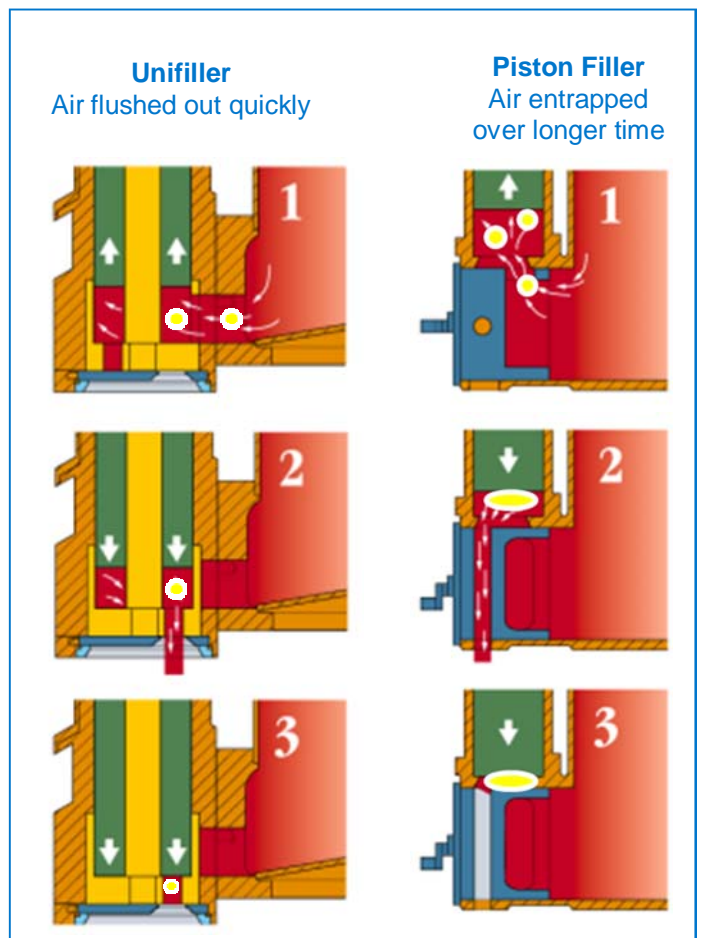
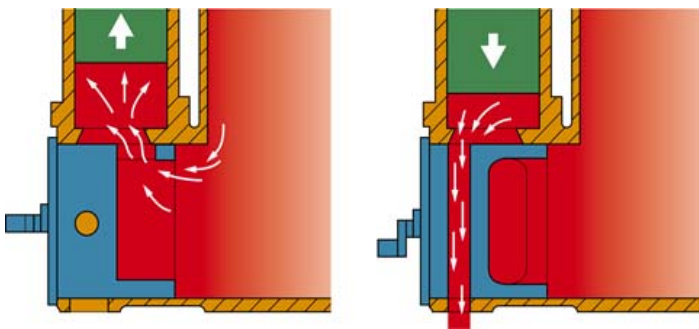
Sometimes air may enter the product in the form of entrapped air bubbles from the bowl. The air bubbles will cause under fills as they flow through the filling valve. It is important to remove air bubbles as quickly as possible. The unifiller valve principle with short paths is ideal for quickly pushing out these unwanted air bubbles. In comparison, with a regular piston filler there is higher likelihood that small bubbles are entrapped in the cylinder as a growing air bubble under the piston. Staying in there over many revolutions, causing under filled containers and inaccurate fills over longer time.

Having filled the product the accuracy then needs to be maintained by not spilling the product as the container moves on, to either a seamer, or capper, depending on the container type. Perfect synchronization is important. JBT engineers will size the Unifiller frame, number of valves and pitch for the best synchronization. Both mechanical and electronic synchronization options are available.

Unifiller – 2 shear points



Piston Filler – 3 shear points



Cleaning without disassembly

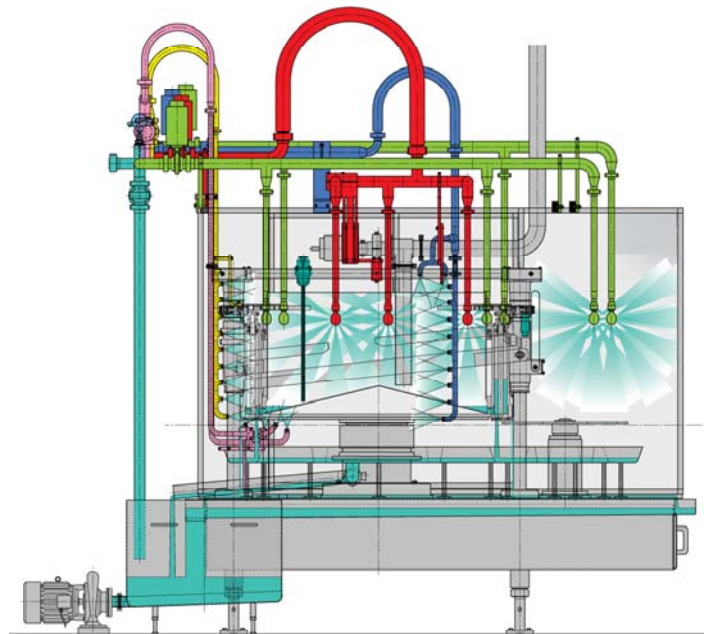
Besides the many advantages of: accuracy, simple product flow, product flexibility, ease of maintenance, etc. the Unifiller has a major benefit, versus the piston filler, in its **ease of cleaning**. **The JBT Unifiller is the only volumetric filler with Clean-In-Place capability that does not require disassembly of the fill stations as a standard feature.** Unique, as confirmed among others by the independent Dutch Dairy Research Institute NIZO. The main reasons are: the superior sanitary design, and self-draining valve design.

Without a self-draining design, (the optional) fully automatic CIP is not possible. Therefore a regular piston filler will never be CIP-able. On a piston filler you always need to disassemble and remove the valve plug to drain the last few inches of the bowl. With the unifiller the product can be pumped out and drained out, to the last drop, without having to remove any parts. The Unifiller is therefore well suited for batch processes with frequent product change overs. For example, a jam producer can switch between different types of products with a simple and quick hot water rinse. No disassembly required. The unseen benefits of this cleaning without disassembly, is that there is no risk for dropping part, damaging internal parts, potentially losing parts, or even having re-assembly errors. Cleaning without disassembly keeps your machine from being damaged prematurely, maintaining its "state-like-new", reducing wear and tear over-time.

A guarding with safety glass adds to the sanitary aspect of the machine, with every single part that comes into contact with your product made either of stainless steel or another, noncorrosive material. The self-draining fill station design allows the option of full CIP without disassembly. No need for labor-intensive manual disassembly or complex and maintenance intensive motorized disassembly of the filling stations.

The optional fully automatic CIP results in:

- Less downtime for cleaning and product/container change-over
- Consistent, recurrent cleaning, independent from the operator
- No damage and soiling of technical components



1. Piping with multiple spray balls positioned within the guarding for cleaning of food contact
2. Main manifold with sanitary valves and filter
3. Pump to customer's CIP kitchen.

Product & Format Change-over in 20 minutes

Ready for another round? With a few basic readjustments, your Unifiller will reset itself to handle another product, another volume, and another container. No engineers, no tools required. Simple, color coded change parts guarantee a very fast changeover from one format to another. The change parts are attached for correct mounting. Automatic height and single point, step-less volume adjustment get the job done without manual intervention. The volume can even be adjusted while the filler is running.

When fitted with the optional automatic, recipe driven format change-over, the operator simply selects the new format and the Unifiller adjusts itself automatically to the correct height and filling volume.

Typical change-over times (volume, height, Ø / shape)

| Change-over times [minutes] | (1) Container Height | (2) Filling Volume | (3) Container Diameter |
|-----------------------------|----------------------|--------------------|------------------------|
| Manual | 20 – 30 | 10 - 15 | < 10 |
| Automatic | < 5 | < 5 | < 10 |

| Change-over times [minutes] | (1)+(2)+(3) Complete change-over |
|-----------------------------|-------------------------------------|
| Manual | < 55 |
| Automatic | < 20 |

Maintenance

Perhaps the most important factor of accuracy, often neglected when choosing a filler, is how accuracy is maintained over time. It is easy to forget to understand filler maintenance over longer periods of time. Always ask: what sort of wear parts are needed on a regular interval, and how much time and effort is needed to keep the machine performing like new? Are there sensitive components that may fail unexpectedly? How much effort is needed to perform preventative maintenance?

The Unifiller valve has very few parts, and out of these, only a couple are actual wear parts. For example there are no mechanical or electronic components that can fail unexpectedly. No need to be chasing leaking seals with no seals to replace on the valve itself.

| ID | Diameter | Height | Bowl Height mm | Fill Volume cc | Speed Limit | Color Code |
|------------|----------|--------|----------------|----------------|-------------|------------|
| Selected 7 | 66 | 114 | 134.00 | 230.0 | 200.0 | Green |
| 1 | 78 | 88 | 108.00 | 230.0 | 200.0 | Black |
| 2 | 78 | 105 | 125.00 | 283.0 | 200.0 | Red |
| 3 | 78 | 125 | 145.00 | 395.0 | 200.0 | Yellow |
| 4 | 88 | 129 | 149.00 | 482.0 | 200.0 | Blue |
| 5 | 88 | 142 | 162.00 | 530.0 | 200.0 | Orange |
| 6 | 88 | 128 | 148.00 | 580.0 | 200.0 | White |
| 7 | 66 | 114 | 134.00 | 230.0 | 200.0 | Green |
| 8 | 66 | 134 | 154.00 | 275.0 | 200.0 | Black |
| 9 | 66 | 138 | 158.00 | 217.0 | 200.0 | Red |
| 10 | 0 | 0 | 0.00 | 0.0 | 9.0 | Black |

Machine display. 10 pre-set product-format combinations. Also change part color codes are shown.



360 Degree Valve Cam



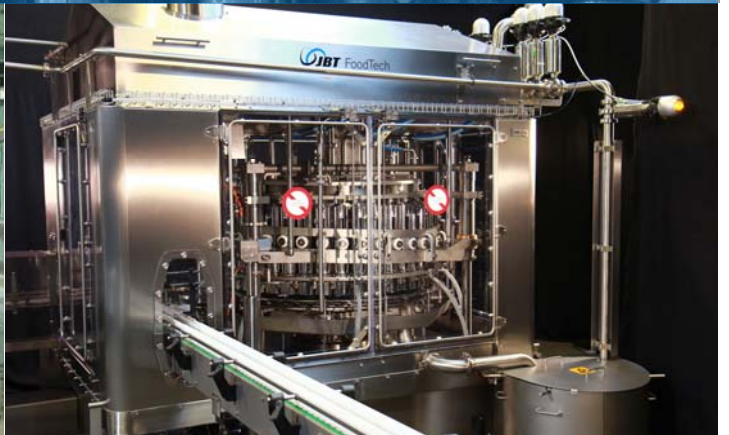
Color-marked Quick-change parts with locating pins for quick and correct positioning.

The Unifiller valve is vertically actuated with an enclosed valve track that runs 360 degrees around the machine. The valve is always open to either: the bowl, or to the container. There is never any risk of getting a hydraulic lock and damaging the filler. In comparison many traditional piston fillers have free floating plugs that if worn and lose, can slip into an in-between position and lock up the valve, creating a tremendous amount of damage on the valves, and cams. Guard yourself against hydraulic lock and catastrophic failure with the superior Unifiller design.



JBT tailors your Unifiller to your specific needs and requirements

All-Around to High-Hygienic to Product-Dedicated and everything in-between...



UNIFILLER

Gently filling your valuable products

- All-around high-performance configuration
- High fill accuracy
- Unmatched product & container flexibility
- Manual CIP without disassembly
- Quick change-over

HIGH-HYGIENIC UNIFILLER

For your sensitive products

- + Full CIP containment
- + Fully automatic CIP without disassembly
- + Lowest foreign particle risk
- + Automatic product change-over
- + All product dedicated configurations

JBT Process Technology Center comes to you



Put us to the test. Invite JBT over to your plant and witness the Unifiller Pilot customize itself to your product and specific needs. The single station, highly flexible pilot machine that conducts filling tests is a smaller version of the Unifiller.

By testing your own products, you can see the accuracy, determine valve configuration, optimize filling speed range and see filled product integrity. If you already have a Unifiller running at your facility, the Pilot is still at your service. Whether it is to perfect your processes or experimenting with new product recipes. Because we understand that the decision to market a new food product often depends whether it can be integrated into existing operations or will need new equipment capable of handling the new formulations.

The option to perform filling tests provides you with the insurance the Unifiller can handle your difficult-to-fill product with increased accuracy, optimal product quality and consistency, prior to making a key capital purchasing decision.

hello @ jbtc.com



Food processing expertise at your service, around the globe

Our mission: providing you with maximum uptime and smooth operation. Therefore, you can count on JBT for technological support, installation supervision, training and after-sales support anywhere in the world.

JBT has a long history of food processing equipment. Having sold over 40,000 machines worldwide our service technicians have faced and solved some of the toughest problems for processors within the food industry. JBT offers OEM parts for repairs and maintenance. Over 6,000 parts can be shipped within 24 hours to all continents. Other examples of JBT customer service include the standard exchange assemblies and preassembled kit to reduce downtime due to maintenance and repair. Our range of service packages make sure your equipment keeps running as profitably as possible, for as long as possible. With minimum downtime.

More than 50% of the world's shelf-stable foods are filled, seamed or sterilized on JBT equipment. With several thousands of canning lines in operation worldwide, JBT is the world's leading supplier of integrated processing solutions for metal, glass and plastic containers. From single machines to complete processing lines, we enhance product value and safety. JBT equipment captures the quality, nutrition and taste of your product at the lowest cost per unit produced.



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