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# FLOWMETERS VS. VOLUMETRIC LIQUID FILLING SYSTEMS.

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The volumetric filling system was the dominated technology for the liquid filling machines over decades. This simple and low cost technology, start to be replaced with other and more cost effective systems.

The most present, in the international markets, is the Flowmeters systems. In the past 2 decades and with wide steps in the electronic evolution, instruments manufacturers provided a very stable and accurate flow measuring instruments.

International machine builders lead R&D efforts to discover the possibilities of using this technic instead of the old volumetric technic, and then the Flowmeter instruments became the preferable solution to be used in liquid filling machines.

But what are the benefits of using this new technology, despite it's more expensive than the old volumetric technology?

To have a precise answer, we need to look closely at the following comparison criteria:

- **Accuracy:** one of the most important criteria of comparisons between the Flowmeters (FS) and Volumetric (VL) technology is the accuracy. The accuracy of the VL technology is around ( $\pm 2\%$ ) where the use the Flowmeters will improve the accuracy significantly to reach ( $\pm 0.5\%$ ) of total filling volume.
- **Productivity:** The use of the Flowmeters will be reflected positively on the machine productivity for more than 15% and may reach 30% depend on the number of filling head, product and volume, as shown in **Figure 1**.

## PRODUCTIVITY COMPARISON

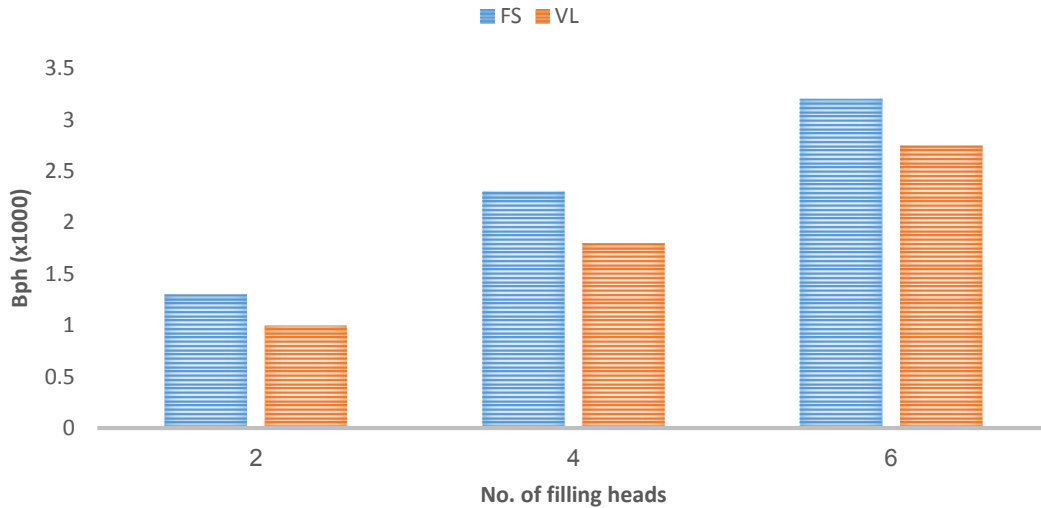


Figure 1 - productivity comparison

- **Complexity of system:** As shown in the **Figure 2**, the Flowmeter concept provides a simpler system components construction, hence, will provide simpler maintenance and cleaning which is very important factor for pharmaceutical and F&B industries (easy and reliable CIP/SIP process).

**Figure 2** illustrates the use of only one valve (-X1) and one FS (-B1) for each filling nozzle of the filling system. Where for VL system you need to use of 2 Valves (- X1 and -X2), and also, you need to use a linear actuator (-A1) which is based on pneumatic system or a servo system, and you must use a position feedback device (-B1) to close the position loop of the filling system.

All these components in the VL filling concept are considered a risk point in term of maintenance and hygienic requirements, which is considered as disadvantages of the traditional VL filling concept.

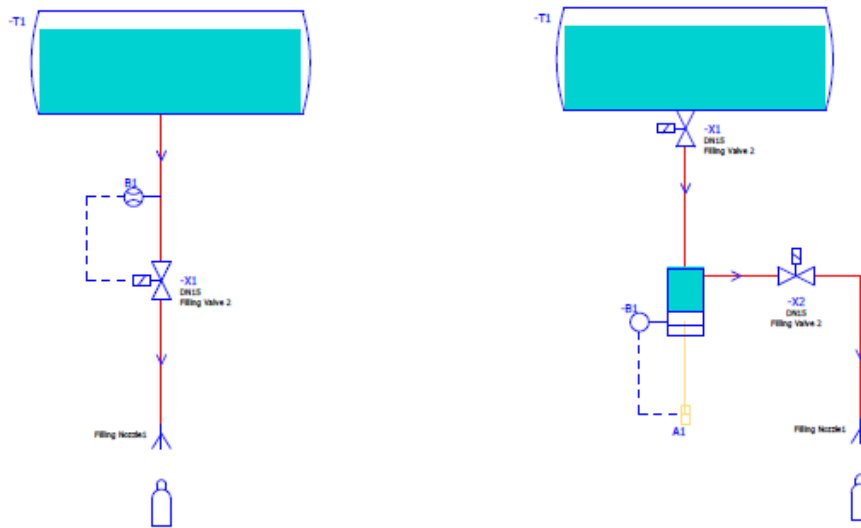


Figure 2 FS vs. VL Filling system (Single head)

- **Cost:** of course, the first payment of the machines equipped with FS is higher than the VL machines. But, the use of the Flowmeters still considered a cost effective solution, considering that the payback period is faster than the VL system because of the cost of maintenance and down-time problems in the VL system machines.

As a conclusion: the Flowmeter technology still considered as the preferred filling concept of liquid filling machines for both OEM and end user, despite the higher price, and that due to the previously discussed advantages including the system payback period.

Because of all these benefits, AFAQ provides its advanced filling machines series LLF-2x (<https://youtu.be/bdLUfdaMfc>) for linear filling machines and MLF-3x for monoblock filling and capping machines, equipped with the most advanced Flowmeters (Magnetic or Coriolis) instruments and with the linear servo systems to control the vertical motion of the filling nozzles and keep fixed distance between filling nozzles and the liquid surface.



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