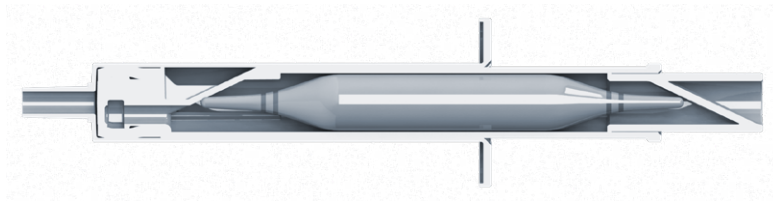


Speed-up vaccine manufacturing by aligning 2 existing niche technologies

Aware about the overall complex vaccine manufacturing process, nonetheless one crucial segment of it can be modified to **significantly accelerate** time to market of vaccines. Aligning **two existing state-of-the-art technologies** would result in a far **higher quantitative output** at much **lower product cost** with finally **less handling** and no disadvantages for the medical professionals at the point of administration. All without loss of safety and regulatory compliance.

Brief introduction of the two technologies



First technology - ampoules and ampoule filling

Usually and as a standard, vaccine ampoules or vials are filled sequentially on a **gravimetric ampoule-by-ampoule (or vial-by-vial)** base. A **considerably more efficient** niche technology exists since decades which is based on a **vacuum-tray-by tray** filling. About **750 ampoules set up in one tray are filled and closed simultaneously within 12 seconds**¹. A factor of 1: 750² is significant for time and cost of the final vaccine. The vacuum-fill technology with its components, equipment and its peripheral infrastructure is available on the market at reasonable cost but obligatorily requires ampoules named twin'tip that are particular in shape. They are different, less manageable, and less established compared to known ampoules. Vaccines can be filled in such twin'tip ampoules profiting from the high-speed vacuum filling technology **reducing time and cost**.

Second existing technology - the ampoule inside a syringe

Now, the **second technology** refers to the **necessity of a delivery device** which is due to the particularity of the twin'tip ampoule shape to render the vaccine available for injection. DISPENCE has therefor slightly **modified a standard syringe** with an **integrated** vaccine filled twin'tip-ampoule resulting in an **immediate and straight usability**. A separate loading of the vaccine from an external and separate container is not required any more, which **again saves time and resources** within the entire vaccination process. The look and the handling of this **fully assembled**³ ready-to-use twin'tip syringe though does not divert greatly from common syringes.

Please feel invited to contact Mr. Alberto C. Sògaro anytime and free of any obligation, your inquiries and questions are more than welcome. **+49(0)171 188.5927** or **alberto.sogaro@dispence.de**

Alberto C. Sògaro
DISPENCE GmbH

¹ figures are relating to one machine with a nominal capacity of 300 trays/h translating to 62 twin'tip ampoules/second.

² factor based on the assumption of equal time cycles of a standard ampoule vs. one tray.

³ syringes might come with separate injection needles which are to be attached to syringe prior vaccination.