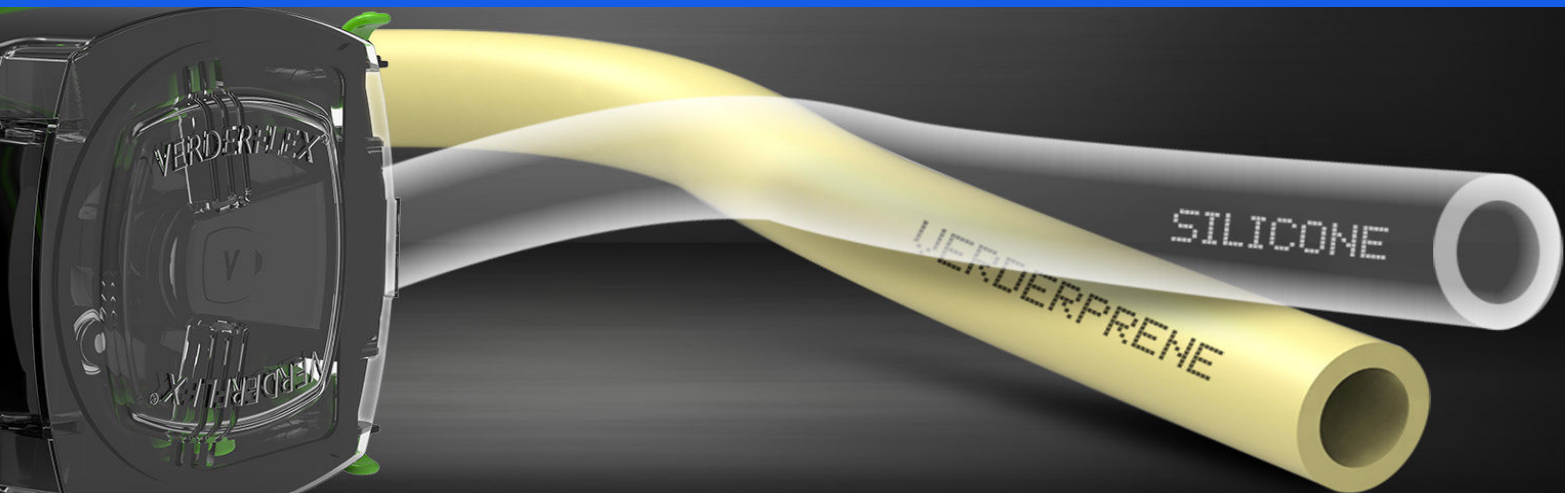


No more cross contamination: change to single tubing



In Biotech, Food, Chemical, and Pharma industries, clean down procedures and preventing cross-contamination are critical issues that consume considerable time and effort. Addressing these procedures has significant financial implications, both directly and indirectly. Moreover, inadequate cleaning can lead to health and safety risks and product damage if cleanliness standards are not met. Therefore, ensuring thorough and effective cleaning processes is essential across these industries.

No cross contamination allowed

According to FDA specifications and EHEDG guidelines, it is mandatory to prevent any transfer of ingredients between different products. Special precautions must be taken when manufacturing multiple products using the same equipment. Ensuring product quality is paramount, and the use of tubing or any other components must not compromise or alter product quality. For instance, it is crucial to prevent any residue, such as nut residue, from remaining in the pipework to avoid potential allergenic reactions in end users, such as those consuming soup.



Cleaning and disinfection process

The cleaning process is time-consuming and costly due to the critical importance of hygiene in these applications. Federal regulations mandate a comprehensive description of each step involved in cleaning and disinfecting equipment. Therefore, manufacturers must develop fully documented cleaning procedures for processing equipment.



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An essential requirement is that the fluid path, including pump chambers and tubes, must be designed for easy and effective cleaning. It is crucial that the cleaning procedures and the materials used in the tubes do not impact the product quality in any manner.

The solution

Use a reputable tube manufacturer. Contamination is due to hose spallation. Spallation is explained as rate of wear to the hose internal, the rate at which small particles is released into the liquid stream. Reputable manufacturers is determined by the spallation wear rate, if any. Pump and tube manufacturers collaborate to develop suitable tubes to achieve best results, by installing non OEM approved tubes the spallation rate may increase and influence contamination.

A peristaltic tube pump is particularly suitable for applications requiring precise and controlled flow rates, such as dosing and metering. Using a peristaltic tube pump offers several advantages: it allows for **single-use, quick changeover, low maintenance, user-adjustable flow rates, reduced risk of cross-contamination and leaks, and eliminates the need for extensive cleaning and downtime.**

Only used once

After a single use, the tube is discarded, ensuring validated single-use fluid paths that eliminate the risk of cross-contamination and support aseptic processing. Using peristaltic pumps, which are positive displacement

technologies, consumes less energy compared to traditional methods. From an environmental perspective, discarding the tube for potential recycling—currently under consideration in the industry—is more favorable than the historical use of strong chemicals. Chemical use necessitated intensive waste processing to remove both chemicals and product residue from effluent systems, incurring high direct and indirect costs in a complex process.

Easy to change

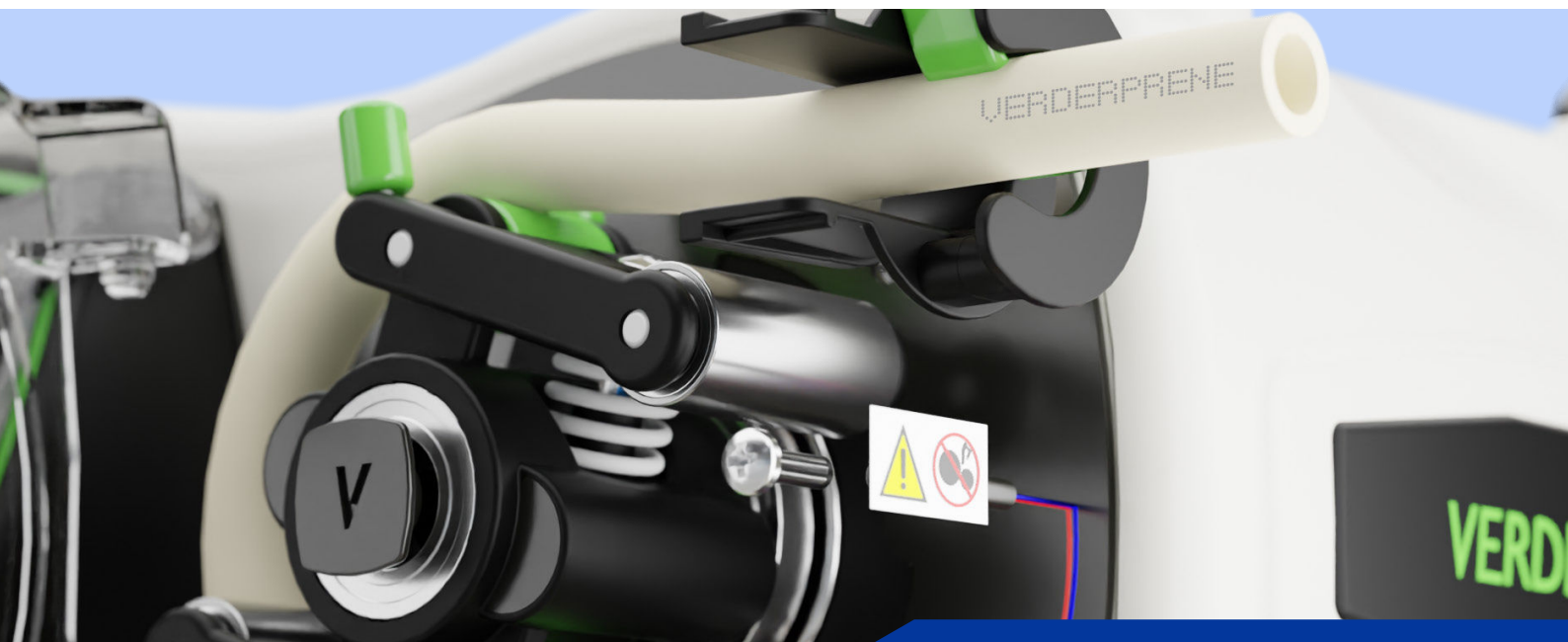
Changing a tube is easy and quick. Simply click to open, remove the old tube, insert a new one and click the housing to close again!

Other benefits include:

- Clean from start to end
- No cross contamination
- Eliminates cleaning and downtime
- Water and energy cost reduction
- No chemical waste
- Reduced labor on maintenance
- Increased efficiency

Is it always the best solution?

Yes and no. Certainly, peristaltic tube pumps with single-use tubing are the optimal solution for contamination-free pumping in rapidly changing batches. However, there are alternative solutions as well. See the table below.



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Hygienic high flow pumps - clean and safe

If you are pumping high flow rates a suitable centrifugal will be best suited. Any low/high viscous liquids either a lobe or twin screw pump will be suitable for liquid transfer. To avoid cross-contamination and reduce cleaning downtime, an important aspect of these pumps is CIP (Clean In Place) cleanability. This means the pumps can be cleaned perfectly without being dismantled or removed from the process(COP).

The CIP cleanability of the pumps mainly depends on the design, where seals are located in the fluid stream, and the surface roughness/treatment of the stainless steel pumps, which will ensure minimal dirt adhesion and maximum cleanability.

The CIP procedure involves several steps where water, bases, and acids are alternately rinsed through the system. Following this procedure, a disinfection step is typically applied to eliminate any remaining harmful bacteria from the pumps and the process. Although this procedure requires significant water and chemical usage, it improves efficiency and ensures no contamination.



For example: lobe pumps are designed for high-viscosity products transfer at low liquid velocities to minimize shear, which is contrary to the objectives of a CIP procedure. However, advanced engineering has made it possible for lobe pumps to also be CIP cleanable today.

	SINGLE USE TUBING	TWIN SCREW	LOBE	CENTRIFUGAL
Hygienic	Yes*	Yes	Yes	Yes
Flow range	From 0.7 ml/min to 17 l/min	100m³/h	200m³/h	150m³/h
Pressure	2 bar standard (4-6 bar optional)	12	20	75m
Suction Lift	Up to 9mwc	NPSHr<1 meter	NPSHr<1 meter	NPSHr<1 meter
Dry Running	True dry running pump	Yes	Yes	No
Viscosities	Typically up to 2500 cP	1.000.000	1.000.000	500 cP
Soft solids	Particle size up to 25% of tubing ID	31mm	24mm	22mm
Hard solids	Particle size up to 5% of tubing ID	n/a	n/a	22mm
CIP/SIP	No	Yes	Yes	Yes
Single use tube	Yes	No	No	No
Dosing/metering	Yes	Yes	Yes	CIP clean CRP pump
Transfer/Process	Yes	Yes	Yes	CIP clean CRP pump
Standards FDA/USP				

* (dependant on the tubing)

Conclusion

The single-use tubing is the best and easiest solution for manufacturers with low flow applications. The new piece of tubing is simply placed in the system, and the process is ready to go again—quick, clean, and without crosscontamination. However, if you have other pumps in your production line or require greater flow rates, you may need to choose another method.

Which solution works best for you?

Regarding the technical aspects of your production line, our consultants can provide you with the perfect information about the best solution for your process. Do you want to know which solution works best for you?

Call our team because we have all these methods in-house.



More than 65 years of experience in professional pumping applications make VERDER the pump manufacturer of choice for customers from many industries on all continents. VERDER offers you process understanding, the technological expertise and the market insight to develop pumping solutions which rank among the best in the world. This is how we enable your progress.

