

Ensure your silicone solutions meet cleanliness and quality specifications.

Process Description

Silicone products are used in a wide variety of applications, as diverse as pharmaceutical formulations or car headlights. Available in many different forms, silicone products have broad interest across several industries mainly because of their high temperature stability and good heat transfer.

Depending on the production process and the nature of the finished products (resins, oil emulsions, gels, pastes, antifoam coatings, polymers, etc.), filtration technologies are used to remove impurities while improving quality.



Production Challenge / Pall Solution

Challenge

- Get crystal clear finished products for high value downstream market segments (pharmaceuticals, cosmetics, food & beverage)
- Consistently meet cleanliness specification on silicone solutions or intermediate products by removing solid particles, degraded catalysts, salt, micro-gels at the different stage of the production process
- Improve the overall quality of silicone solutions for any downstream of manufacturing process when silicone solutions used as raw materials)

Solution

Intermediate products (silicone oils) – L/L Coalescing systems protected by high flow high capacity pre-filters to remove acidic water from silicone oils

- PhaseSep[®] high efficiency L/L coalescers operate without disarming and provide effective removal of acidic water from silicone oils. The water concentration can be up to 3% (5%w with testing) – see [filter L1 in the Process flow diagram](#)
- Ultipleat[®] High Flow – Ultipor GF series elements are used as pre-filters to protect PhaseSep[®] coalescers – see [filter F1 in the Process flow diagram](#) In the absence of L/L coalescers downstream the hydrolysis process, Niro or Membraplan DGM series plate and frame filters (with K or T grades depth filter sheets) are used as filters F1

Intermediate products (silicon resins) – Depth filtration combining long service life, low initial DP and good mechanical resistance

- SUPRAdisc[™] series depth filter modules offer not only excellent filtration performance, also increased operator protection and simplified process handling. This is important, when toxic materials such as catalysts or contaminant activated carbon have to be removed – see [filter F2 in the Process flow diagram](#)

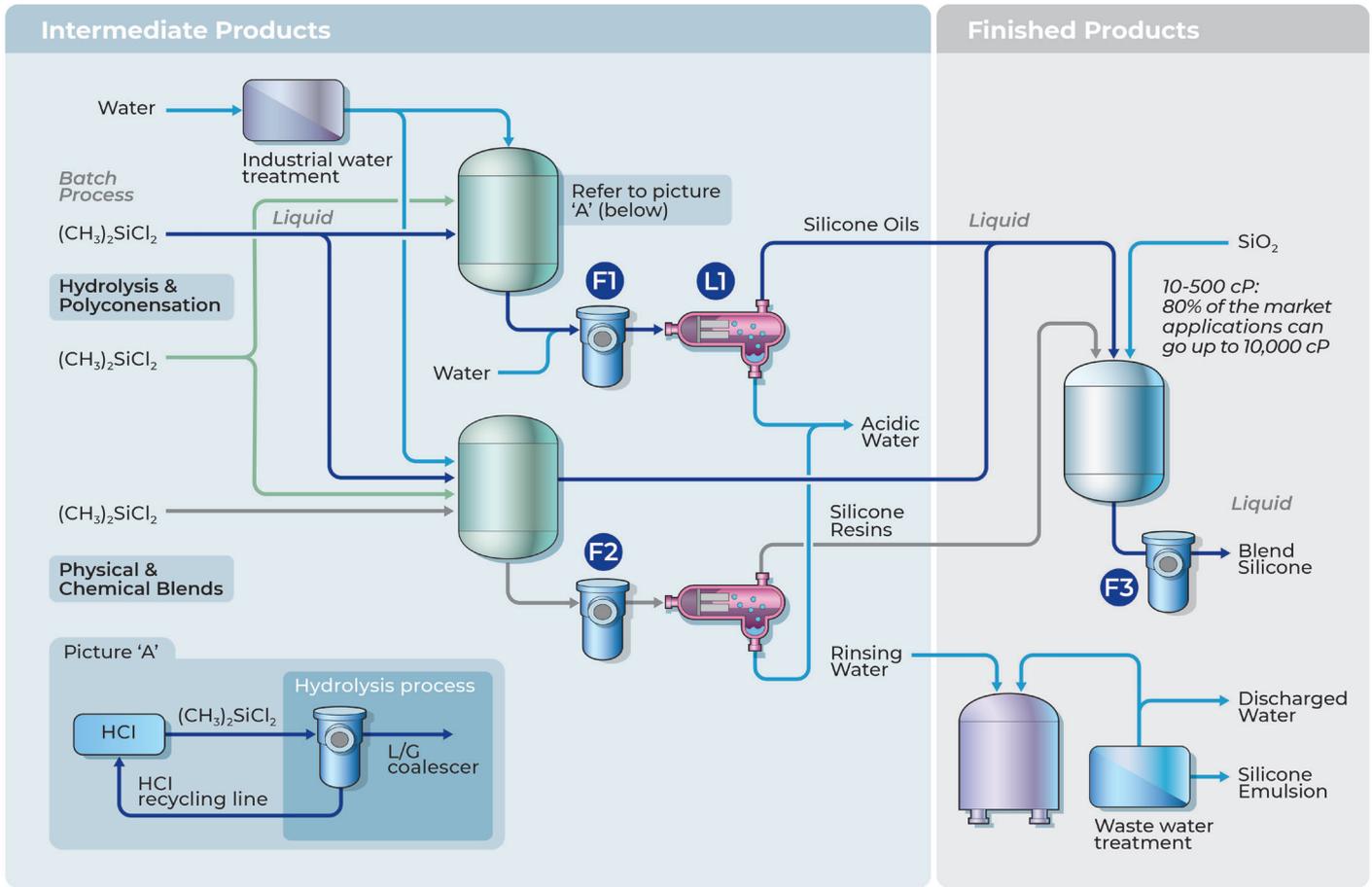
Recycled HCl gas – L/G coalescer to remove silicone oil droplets from the recycled gas in order to improve the overall downstream process performance

- L/G high efficiency coalescer removes droplets of silicone oils from the HCl gas which can be recycled and reused downstream of the production process (polypropylene 10µm Coreless elements – part-number: E604Y100)

Final Products (blend silicones) – Depth filtration is by far the most appropriate technology to control the cleanliness of silicone fluids, whose viscosity range can vary a lot (up to 10,000 cP)

- SUPRAdisc[™] depth filter modules provide an efficient cost effective off-line filtration solution for heavily contaminated fluids. These depth filters operate at a low flow density to maximize the retention of solid or liquid contaminants by adsorption. Their cellulose based filter medium associated to a large filtration surface area enable them to retain gels, colloids and traces of free water without a dramatic rapid DP increase – see [filter F3 in the Process flow diagram](#)

Process Flow Diagram



Key Applications / Filter Recommendations

Application	Pall Product	Advantages	Customer Benefits
F1 Protect the L/L coalescer*	Ultipleat® High Flow – Ultipor® GF medium	High filtration surface area, high filtration efficiency (caking effect)	Extend the service life of the L/L coalescer cartridges (no DP increase due to solid contamination), OPEX under control
L1 Remove acidic water from silicone oils	PhaseSep® coalescer	High efficiency L/L coalescer even with heavily contaminated fluid (up to 3% - 5% max with testing)	Silicone oils are in excellent condition to be mixed with SiO2 and resins. This is key to produce clear products meeting the technical specification
F2 Protect the L/L coalescer and retain toxic materials	SUPRADisc™ depth filter modules	Filtration by adsorption mechanism. Large filtration surface area, high dirt-holding capacity, maintenance oriented filtration design.	Retain gels & polymers, catalysts, etc., high filtration efficiency, long service life, low change-out frequency, filter modules very easy to handle
F3 Filter blend silicone before shipments (final stage)			

* In the absence of L/L coalescer installed on the hydrolysis line (L1), filter solution (F1) can be Niro or Membraplan depth filter sheets

Customer Benefits

- Production process fully under control with Pall filtration solutions
 - Silicone intermediate and finished products within the cleanliness and quality specifications
 - Low operating costs and minimization of waste
- Large range of filter grades, media and technologies available to meet new market requirements
- Pall extensive knowledge and ability to perform field audits and trials to improve process



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