



SELCOPERM ELECTROLYSIS SYSTEM (SES)

Safe and simple production of sodium hypochlorite solution (110-1800 g/h)

Composition

Selcoperm systems comprise an electrolysis cell, a degassing column, a brine dosing pump, an exhaust fan with quantitative air flow monitor for air dilution of electrolysis chamber, and a water softening system. In addition, a salt saturator, a tank for storage of the generated sodium hypochlorite (NaClO) solution and dosing pumps are required. The installation can be rounded off with a measuring and control unit for chlorine dosing.

The Selcoperm system is supplied as a turn-key solution. Only the tubing for the water connection, the connections for the salt and product storage tanks and the exhaust air tubing have to be installed.

Electrochlorination

Selcoperm systems produce sodium hypochlorite electrolytically, directly from a solution of common salt using electricity. On-site production of the disinfectant solution means maximum safety at minimum costs.

In the electrolysis cell, caustic soda solution, hydrogen and chlorine are generated. The chlorine reacts immediately with the caustic soda solution, resulting in a sodium hypochlorite solution, which is the disinfectant.

The disinfectant can be dosed directly into the piping system with a dosing pump.

Benefits

- Safe and reliable method of producing sodium hypochlorite on-site
- Only water, common salt and electricity are needed for the electrolysis - low operating costs, world-wide use
- Fresh sodium hypochlorite is always on hand and does not dissociate like commercial sodium hypochlorite solutions
- Low formation of chlorate as a by-product
- Less safety requirements than chlorine-gas-based systems
- Lower pH value than commercial sodium hypochlorite reduces scaling of injection units etc. in hard water areas
- Robust design for easy installation and maintenance
- Long service life, compared with membrane cell electrolysis

Applications

Typical disinfection applications for Selcoperm systems are especially in

- drinking water treatment,
- swimming pool water treatment,
- water treatment for industrial processes and cooling towers

Remark: Legislation on the use of disinfection products in water treatment applications are country specific. Please contact your local Grundfos Sales office for further details on the use of our products in your application and area.

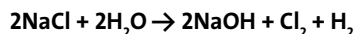
Technical data

Preparation capacity	Type	Capacity/hour [g Cl ₂]	Capacity/day [kg Cl ₂]
	SES-125	110	2.64
	SES-250	220	5.28
	SES-500	450	10.80
	SES-1000	900	21.60
	SES-2000	1800	43.20
Water demand	140-170 litres per kg of prepared chlorine		
Water pressure	3-10 bar For lower water pressures, booster pumps are available		
Soft water quality for operation	Drinking water quality, softened to: 1 °dH / 17.8 ppm CaCO ₃ and less		
Soft water temperature	10-20 °C (for higher or lower temperatures an external chiller or heater is required)		
Salt consumption	4 - 4.5 kg of salt per kg of prepared chlorine		
Salt quality	Food-grade granular/pellet salt (98.5 % NaCl) according to EN 14805 type 2		
Sodium hypochlorite concentration	5 - 6.5 g/l		
Electrical connection	SES-125: 110-120 V or 220-240 V SES-250: 220-240 V SES-500, -1000, -2000: 380-415 V		
Power consumption (AC)	Approx. 5.5 to 6.5 kWh per kg of prepared chlorine		
Drain	An on-site drain for the regeneration water of the water softener is necessary		
Exhaust air	<ul style="list-style-type: none"> The outlet of the exhaust air has to be as close as possible to the electrolysis system In addition, natural air supply via a ventilation hole in the room is required 		

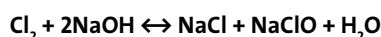
The Selcoperm electrolysis principle

With electrolysis, sodium hypochlorite is produced directly from a solution of common salt using electricity.

The following reactions take place in the electrolytic cell:



The chlorine (Cl₂) produced reacts immediately with the caustic soda solution (NaOH) also formed, resulting in a sodium hypochlorite solution (NaClO):



The sodium hypochlorite solution, which is the disinfectant, has a pH value between 8.5 and 9.5, and a chlorine concentration in the range of 5 - 6.5 g/l. It has a half-life of several months, which makes it ideal for storage in a buffer tank.

After dosing the solution into the water flow, no pH value correction is necessary, as it is often required e.g. in electrolysis according to the membrane principle. The sodium hypochlorite solution reacts in a balance reaction, resulting in hypochlorous acid (HClO), the effective disinfectant:



The dosing quantity depends on the application as well as the local regulations. In general, the concentration after the injection unit is 0.3 to 2 ppm chlorine equivalent.

