LiqTech

Hydrasic®
the complete solution for cleaning of flue gas condensate
HydraSiC®
SiC membrane systems

Semi- or fully automated plants all with the option of remote monitoring and control

The HydraSiC solution ensures that even the strictest discharge limits are maintained

The HydraSiC solution in many cases provides a return-on-investment in less than three years, from reducing effluent levies as a result of reusing the flue gas condensate

HydraSiC S131 (2 m³/h, simplex operation)
HydraSiC

HydraSiC is a standardized series of UF membrane systems suitable for cleaning of scrubber water and flue gas condensate. The HydraSiC systems which utilize LiqTech’s patented silicon carbide (SiC) membranes ensures an effective and consistent retention of particles and heavy metals. SiC ceramic membranes provide a stable operation even at a recovery as high as ≤99%*. In addition, the SiC membranes are extremely sturdy as well as temperature and chemical resistant. The HydraSiC series is available in various versions capable of handling flows from 0.1 m³/h to as much as 40 m³/h with options and accessories covering any needs. The units are delivered either semi- or fully automated and all with the option of remote monitoring and control through either a VPN gateway or local SCADA integration. Multiple working hours affiliated with traditional wastewater handling at power plants and district heating facilities are hereby emancipated. The HydraSiC solution ensures that even the strictest discharge limits are maintained at all times. Furthermore, the system facilitates condensate reuse through additional treatment with an RO unit. This results in a remarkable reduction of effluent levies providing a typical return on investment in less than three years.

*Contingent upon a preceding particle reducing flue gas cleaning technology (e.g. bag- or electrostatic filter)
SILICON CARBIDE (SiC) CERAMIC MEMBRANES

The Heart of the LiqTech systems
The SiC ceramic membrane filters and retains heavy metals and particles within the ultra-filtration range. The silicon carbide (SiC) material is extremely sturdy and resistant to abrasive media, temperatures up to 800°C and rough cleaning with aggressive and oxidizing chemicals in the pH range from 0 to 14 - Such conditions are solely tolerated by membranes made from SiC - in addition and due to the unique hydrophilic properties of the silicon carbide material the SiC membrane offers an outstanding high flux capacity at low pressures, requiring lesser membrane surface area per treated m³ of water, compared to other membrane materials. Furthermore, this property allows the LiqTech SiC membrane systems to consume considerably less energy - Thus the SiC membrane is in its element when filtering flue gas condensate and waste water from power, CHP and district heating plants.

OBVIOUS ECONOMICAL AND ENVIRONMENTAL ADVANTAGES
A LiqTech solution based on UF and RO membrane technology treats the condensate to a quality which may be used as make-up water in the transmission grid. This means that your district heating facility no longer has to pay expenses affiliated with effluent levies and, in addition, saving money for purchasing and refilling of potable (drinking water) as make-up water in the district heating pipes.
Without the use of polymers - Protecting the environment!
**PROCESS FOR WASTEWATER DISCHARGE**

- **Flue Gas Condensate**
- **Precipitation**
  - No Polymers
- **UF plant**
- **UF permeat 95-98%**
- **Filterpress**
- **Reject 2-5%**
- **Dewatered sludge**

*Figure 4*

**PROCESS FOR REUSE**

- **Flue Gas Condensate**
- **Precipitation**
  - No Polymers
- **UF plant**
  - **UF permeat 95-98%**
  - **suitable for RO treatment**
- **GAC**
- **RO unit**
  - **Permeate 95-98%**
  - **suitable for RO treatment**
- **Filterpress**
- **Dewatered sludge**

*Figure 5*
VERSIONS

CROSS-FLOW SEPARATION

**HydraSiC S**
(100 - 6.800 l/h) Semi Automatic - Simplex operation, Manuel CIP station

**HydraSiC PS**
(600 - 6.800 l/h) Fully automated - Simplex operation, Automatic CIP station

**HydraSiC PM**
(600 - 17.100 l/h) Fully automated - Multiplex, continuous operation**

SEMI DEAD-END FILTRATION

**HydraSiC SD**
(600 - 7.900 l/h) Semi Dead-End - Simplex operation, Manuel CIP station

**HydraSiC PD**
(7.900 - 25.200 l/h) Semi Dead-End - Simplex operation, Automatic CIP station

**HydraSiC MD**
(10.700 - 39.500 l/h) Semi Dead-End - Multiplex, continuous operation**

HYDRASIC ACCESSORIES

- CP units 0,2 - 14m³ (Precipitation tank)
- Buffer tanks with level sensor 0,5 - 15m³
- Simex filter presses for dewatering of UF rejet

**All systems are available with VPN gateway or SCADA gateway**

**Automatic CIP station. The system is capable of operating during CIP procedure**
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<th>Type</th>
<th>SD17</th>
<th>S27</th>
<th>S131</th>
<th>S231</th>
<th>S199</th>
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**NOTES:**
- Simplex Cross Flow
- Multiplex Cross Flow
SELECTED REFERENCES

EON is one of the largest investor owned energy companies in the World, servicing approximately 35 million customers in Europe, Russia and the United States.

In 2015 LiqTech supplied SiC UF technology for two systems making it possible for EON to comply with the very strict effluent regulations which applies for the coal fired plants in Germany.

Horsens Kraft Varmeværk (Horsens CHP, DK) has an annual production which utilizes approximately 200.000 MWh of power and district heating by incinerating 80.000 tons of waste.

In 2014 LiqTech delivered a SiC UF solution entailing savings which facilitates a short ROI as well as maintaining the effluent limit values.

In 2016 Vestervig District Heating Facility a.m.b.a. (DK) has invested in a HydraSiC systems to ensure compliance of primarily their Cadmium limit values.

ABOUT LIQTECH

LiqTech International A/S is a Danish clean tech company, specialized in designing, producing and delivering industrial filtration units and solutions for the treatment of la. waste water from power plants. LiqTech focuses on the cleaning of flue gas condensate and scrubber water, essentially rendering possible the vision of reusing the once encumbering waste water, by transforming it into a highly feasible and a precious asset instead, through the employment of Ultra Filtration units based on ceramic silicon carbide membrane technology.

LiqTech's turnkey solutions has already proven their performance, by delivering both reliability, sturdiness and extremely high efficiency, for power plant customers in Denmark and Germany as well.

LiqTech was listed on NYSE in 2013.

TAGS:
#scrubber water #waste water treatment #wood chips #stubble and biomass fired plants #flue gas condensate #flue gas #flue gas condensation #wet scrubber #reuse #process water #make-up water #heavy metal removal #SiC #reverse osmosis #RO #nano filtration #NF #UF #effluent #levy #levies #discharge #environment #silicon carbide #ultra filtration #ceramic membrane