



Shieldmax

BPHE's for tough applications



Introducing Shieldmax platform

Developed for tough applications



Scaling Leaching
Aggressive medias
Corrosion Fouling Robustness
High Temperatures Prolonged Lifetime

The Shieldmax-platform

SWEPs offering with enhanced resistance to corrosion, scaling, fouling and leaching

Why

Serve applications that benefit from BPHE's unique values in an environment that sets tough requirements on endurance & lifetime with respect to corrosion, scaling & fouling that cannot be met with standard BPHE's.

How

A range of BPHE's with adapted coating or BPHE's with All Stainless filler instead of copper under the Shieldmax-platform through existing channels and to both existing and new customers



Coated BPHE-range for tap water applications protecting against corrosion, scaling and leaching

Made of 100% stainless steel for the most demanding applications.

Coated BPHE-range for extra tough applications protecting against corrosion, scaling and fouling

All-Stainless

For the most demanding applications

- ⌚ Corrosive heat transfer media such as Ammonia, Deionized water or Biogas can cause copper corrosion, leading to system failure and shorter lifetime
- ⌚ Aggressive oils can trigger copper leaching, resulting in a regular need for changing the oil
- ⌚ Pharmaceutical process industry may require extreme cleanliness and that contamination of metals is kept to minimum.

SWEP All-Stainless is the ideal solution to all these challenges:

- ⌚ It combines high corrosion resistance, low contamination tendencies and high thermal strength without compromising on its outstanding thermal performance.

Prolonged life-time, decreased maintenance need or just high expectations on cleanliness.



Applications

100% copper free BPHE eliminates the risk for copper corrosion or copper leaching



Ammonia



Deionized water



Biogas



Oils



Pharmaceuticals

Prevents Cu-corrosion and prolongs the lifetime of the system.

The ideal choice for deionized water systems at low conductivity levels below $1\mu\text{S/cm}$

Corrosive Sulphur content in the gas call for All-Stainless.

100% copper free ensures zero copper leaching.

When hygiene is a deciding factor and copper leaching must be avoided.

Ammonia chillers
Ammonia compressors
Ammonia heat pumps
Cascade systems

Fuel cells
Lasers/Printers
Medical equipment
Semiconductors
Power electronics

Biogas drying
Biogas compressing

Air compressors
Hydraulics
Test Benches

Pharmaceuticals
CBD extraction equipment



Advantages

You can always rely on a SWEP All-Stainless

- ⌚ Highly efficient heat transfer
- ⌚ Exceptional corrosion resistance
- ⌚ Extremely low leaching tendency
- ⌚ Robust design withstanding high pressures and temperatures
- ⌚ Compact design fits into small spaces
- ⌚ Low carbon footprint with efficient use of material
- ⌚ Low on maintenance and self-cleaning yielding longer lifespan
- ⌚ Customized flexibility with modular concept
- ⌚ Low refrigerant charge leading to lower environmental impact

Product Range

All-Stainless



BPHE Model		B5T	B10TS	B80S	B85S	B221	B222
Plate type		H	H	H	H	H/L	H/L
Dimension	mm	193x75	289x119	526x119	526x119	529x271	529x271
	inch	7.59x2.95	11.3x4.68	20.7x4.68	20.7x4.68	20.8x10.6	20.8x10.6
Port size	mm	16	24	33	33	42	53
	inch	0.630	0.945	1.30	1.30	1.65	2.09
Pressure @135°C	bar	31/31	31/31	27/19	39/35	40/40	25/25
	psi	450/450	450/450	392/276	565/507	580/580	363/363
Max Temperature	°C	350	350	350	350	200	200
	°F	662	662	662	662	392	392
Max number of plates (NoP)		60	140	140	140	150	150



Close cooperation for sustainable solutions

"We truly appreciate the time and dedication from the SWEP team over the years, especially in this project. By supplying their specialized range of All-Stainless BPHEs, they helped us tackle an ongoing problem by providing a sustainable solution moving forward."

Sean Weera, Lead Engineer – R&D at Glen Dimplex.

INDUSTRY

Cooling metal laser cutting equipment with resistant BPHE's



GLEN DIMPLEX

Precise temperature control

Glen Dimplex Thermal Solutions (GDTS) manufactures air- and water-cooled chillers. On operation, accurate temperature control is critical in maintaining the integrity and accuracy of the cutting beam and deionized water is used which is very corrosive. With an in-depth selection guidance (through SWEP's selection software SSP) and extensive technical support resulted in a solution with SWEP All-Stainless BPHE's. Leaking BPHEs, cross-contamination and excessive downtime have become a thing of the past with SWEP's help.

A robust but compact solution to upgrade biogas as fuel to PowerGen

LUMING INTELIGENCIA ENERGETICA

Luming Inteligência Energética is an energy company in Brazil with many different focus areas and with good reputation throughout whole South America. In this specific project for Ambev, they are reusing the energy contained in the biogas in order to generate electric energy. They need a compact, non-corrosive solution to do the work.

The biogas consists of a mixed composition of substances such as H₂S, water, Methane, Oxygen, CO₂, and CO. Due to the presence of H₂S, the heat exchanger needs to be produced in 100% Stainless Steel. SWEP's B10TS in All-Stainless was competing for the job against S&T (Shell & Tube) technology and won the job based on our advantage of "size vs performance".

The idea for this application was to build modular systems and SWEP's BPHEs were perfect for this because they are extremely compact, yet highly efficient compared with other technologies. In fact, the BPHE footprint can be as little as one tenth that of a shell & tube heat exchanger or half that of a gasket PHE. AMBEV is the 2nd largest company that exists in the Brazilian food market today with a presence in 19 countries – boasting 32 breweries, 30 beverage brands, and providing jobs to around 35 thousand in Brazil.



This kind of application brings numerous advantages:

- *A possible carbon footprint certificate*
- *Benefits on the environmental legislation*
- *Energy recovery and co-generation*
- *Energy efficiency (less energy loss)*

Benefits with SWEP BPHE in All-Stainless:

- *Corrosion resistance*
- *Excellent performance relative its size.*

Sealix®

SWEF
A DOVER COMPANY



SealiX



Sealix®

CHALLENGE EFFICIENCY



The smart solution

Sealix® keeps water running

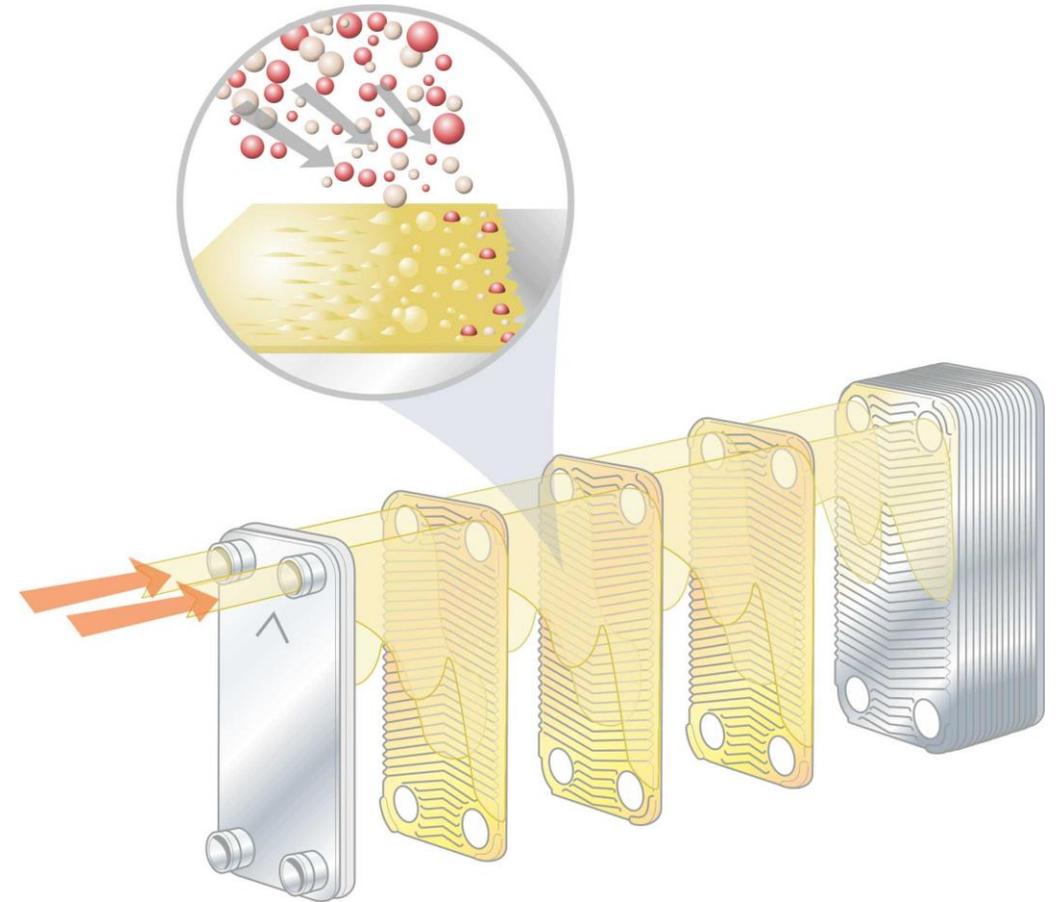
SWEP Sealix® range consist of a range of BPHE which uses thin-film technology to seal the inner surfaces of the brazed plate heat exchanger with a protective layer of SiO_2 to enhance the resistance of the BPHEs in terms of:

- ⊕ CORROSION
 - The ceramic nature of the SiO_2 -based Sealix® layer improves corrosion stability.
- ⊕ SCALING
 - Organic functionalities that are present in the Sealix protective layer, modify the surface energy and thus improve the surface behavior in terms of scaling.
- ⊕ LEACHING
 - Metal leaching is decreased by sealing the surfaces in contact with water.
- ⊕ THERMAL & HYDRAULIC PERFORMANCE NOT AFFECTED
 - While providing the above-mentioned advantages, the Sealix® thin-film technology, maintains the high thermal and hydraulic performance of BPHEs.

How Sealix[®] layer is created

Reliable adhesion through chemical vapor deposition

- The chemicals circulate through the BPHE at controlled flow rate and temperature
- The coating chemicals reach small irregularities in complex geometries such as channel plates of the BPHE.
- This is where the chemical reaction takes place during which the reaction product forms on the inner surfaces of the BPHE, thus forming the protective Sealix[®] layer.
- Customized organic functionalities in the Sealix[®] layer enhance mechanical and thermal stability of the protective layer.
- The complete seal is checked and ensured using optical measurement techniques



Applications

Suitable not only for Tapwater

- Tap-water applications
 - Protection for Ni-leaching and reduce scaling
- District water
 - Reduces tendency for scaling
- Cooling tower
 - Withstands chlorides up to 1000 ppm at 60°C, reduces scaling, offers corrosion protection from additives
- Oil applications
 - Significantly reduces Cu-leaching



Sealix[®] Product Range

Available from stock



	SXE8AS / SXE8LAS	SXB15T	SXB28	SXB85	SXB16DW	SXB220	SXB320HT	SXB320LT
Plate Type	H	H	H	H	H	M	H	H
Length x Width (mm)	315 x 74	466x74	526x119	526x119	377x119	524x202	525x243	525x243
Max Flow (m ³ /h)	4	4	17	17	11	39	62	76
PED Pressure (bar @ 135°) (circuit 1/circuit 2)	16/16	45/45	26/26	46/32 bar	16/16 bar	25/25 bar	33/29 bar	25/25 bar
Max Temperature (°C)	150	150	150	150	150	150	150	150
Connections	ISO-G ¾"	ISO-G ¾"	ISO-G 1 ¼"	ISO-G 1 ¼" & 28U	ISO-G ¾"	ISO-G 2"	ISO-G 2 ½"	ISO-G 2 ½"
Number of plates	24, 42, 40, 50, 60, 70	30	36, 46, 56	24, 70, 100	12, 14	100, 120	100, 120	80

Other plate packages available upon request - but with longer lead times and MOQ.

Oventrop: Keep water running with Sealix® BPHEs

Customer

oventrop

Oventrop is one of Europe's leading manufacturers of sanitary fittings and water systems. The company is an expert partner to the stockists, consultants, contractors and industry. Oventrop offers its partners a long-term beneficial relationship.

Opportunity



Scaling and corrosion are two of the main reasons for the breakdown of tap water heating systems. Some regions of Germany face challenging water compositions with up to 155 mg chloride per litre. The chloride concentrates on scaling deposits on the stainless steel and corrodes the BPHEs in just two years.

SWEP's BPHE solution

Sealix®



- ⊕ **Challenge:** Corrosive water compositions have forced Oventrop to find new alternatives to BPHEs with traditional nickel or stainless-steel brazed joints. Just two years after completing a project with many heat exchangers near Leipzig, the customer started to report that the stainless-steel plates were completely corroded.
- ⊕ **Solution:** Searching for a suitable solution, Oventrop started to replace the corroded BPHEs with SWEP Sealix® protected heat exchangers. Sealix® is a revolutionary SiO₂-based thin-film which is applied as a protective layer on all inner surfaces of the BPHE. The result is better resistance against metal leaching, scaling and corrosion. The thermal and hydraulic performance are maintained.
- ⊕ **System description:** Oventrop have installed a range of BPHEs: 8LAS, B15 and B28 with varying numbers of plates.
- ⊕ **Result:** Since 2016, the manufacturer offers all new "Regudis" home stations and "Regumaq" freshwater stations with a Sealix® option. As of 2020, several thousand stations are in operation. "For locations with critical water conditions, we generally recommend to our customers to use our Sealix® variants. But we also have customers who simply want to have it as an extra security. They know SiO₂ from other areas, e.g. glass in the food industry, as a very hard material, which is resistant to chemical attack and weathering. Therefore, they have confidence in this technology." Says Dieter Stich, Sales Engineer at Oventrop.

Coming soon/under development

Sealix® Plus

A range of BPHE's featured with a new SiO₂ based coating that enhances the corrosion resistance and minimize scaling, fouling and leaching. The protective layer is applied to all inner surfaces.

Sealix® Plus compared to Sealix®

- ✓ Sealix® Plus = Thicker coating
- ✓ Sealix® Plus = 5-15% reduced heat transfer and increased pressure drop
- ✓ Stronger resistance towards aggressive media



SUPER

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