



## The spiral approach to sludge heat exchange

ALSHE spiral heat exchangers for sludge treatment



# Turning the tables on tube-in-tube

The new Alfa Laval ALSHE design has turned the tables on old-fashioned tube-in-tube heat exchangers.

ALSHE units only need one sixth of the space, yet give you higher heat transfer coefficients, less fouling and up to 75% lower pumping power consumption. With a completely clear passage and no sharp bends, the sludge flow channel keeps clear and you can count on efficient and continuous operation – time and time again.

Tube-in-tube heat exchangers are on a downward path throughout their working lives. But if you install an ALSHE spiral heat exchanger, it's the benefits that accumulate, not the solids from the sludge.



The new Alfa Laval ALSHE design

- takes up only one sixth of the space
- means lower costs for buildings, pumps, valves and piping
- uses 75% less pumping energy
- provides higher K value and a close temperature approach
- ensures continual self-cleaning effect for maximum operating efficiency

# New look at basic ideas

Alfa Laval has now introduced an important, redesigned version of our well-known spiral heat exchanger.

After more than 50 years' experience and more than 5,000 sludge heat exchanger installations worldwide, Alfa Laval has taken a completely new look at the basic design ideas – and made significant improvements in all key areas.

For decades, spiral heat exchangers have been one of the most cost-effective ways to keep a digester warm, to preheat sludge before dewatering, to pasteurize sludge and to perform a wide range of other sludge heating applications.



## A major step forward

Alfa Laval's new ALSHE design means a major step forward in using spiral heat exchangers for heat transfer in conjunction with sludge treatment. ALSHE means that tube-in-tube heat exchangers are no longer a competitive alternative – on any terms.

## The fundamental advantage

When you cut down on size and space, you also economize on everything else. An Alfa Laval ALSHE unit only takes up one sixth of the space required for a tube-in-tube heat exchanger of comparable capacity. And – in marked contrast to the tube-in-tube design – only very limited space is required for service work, due to easy access with a hinged cover that exposes the entire sludge channel for CIP.

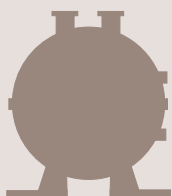


And because the ALSHE is so much smaller, it needs 50% less heating medium. This means major savings in operating costs – and also means lower costs for buildings, pumps, valves and piping.

The rectangular flow channel gives a high K value and a close temperature approach, so you need smaller pumps and use less energy. An ALSHE unit normally uses up to 75% less pumping power than a comparable tube-in-tube installation.

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An illustration of the difference in size and service area required between a tube-in-tube heat exchanger and an Alfa Laval ALSHE spiral heat exchanger.

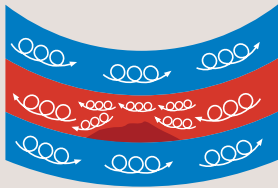






**Smaller does it better**

Naturally, savings on size are only part of the equation. The Alfa Laval ALSHE is not only an ultra-compact solution, but also provides a series of significant advantages that place this technology in a different league than the tube-in-tube design.



The spiral flow and continuously curving passages create turbulence that produces a constant scrubbing action. This self-cleaning effect flushes away deposits as they form, resulting in minimal fouling and low maintenance.

And when service and cleaning are required, it is rapid and easy. A hinged door and easy-clean hook bolts are easy to open, exposing the entire sludge channel for cleaning.



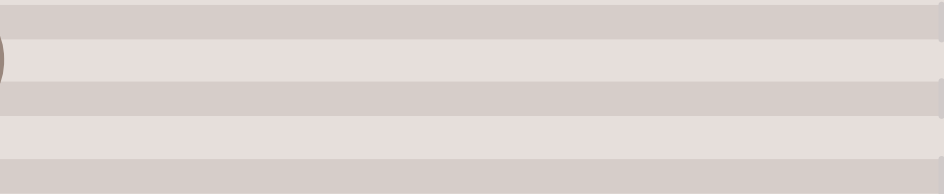
**New features**

The important new features of the ALSHE design include:

- improved heat exchange area, with focus on distribution features on the heating side
- additional “easy clean” features that make it easier to inspect the inlet without opening the unit, and faster opening/closing of the unit

- all the pump and valve connections are at the same level and have the same spacing, irrespective of heat exchanger size.

at exchanger with the same capacity



Physical comparison index, for identical duties		
	Tube-in-tube	ALSHE
K value index	1	1.3
Total weight:		
- drained	1	2
- operating	2	1
Floor area:		
- installation	6	1
- maintenance	5	1
Required fouling margin	15%	max. 5%



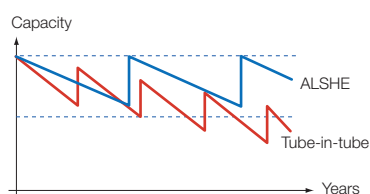
## The murky side of things

If sludge was a clean liquid, and there were no such things as plastic, hair, paper, etc., you would not need to worry about cleaning heat exchangers.

Unfortunately, sludge contains a lot of these undesirable elements. They have a natural tendency to clog up tube-in-tube heat exchangers – which is a major problem, because it is impossible to clean a tube-in-tube completely on the sludge heat transfer side, due to its basic design.

This means that such units are on a downward path right from the very beginning, with efficiency that is continually being eroded.

### Retains capacity over time



### Eliminate the problem

Any spiral heat exchanger will reduce fouling compared with a tube-in-tube installation – but the new ALSHE design will reduce it even further.

With no internal supports, no sharp bends and no rough edges where hair and other matter can catch and subsequently clog the sludge channel, and with a maximum of turbulence that provides a constant self-cleaning effect, an ALSHE spiral heat exchanger is the only viable path to efficient operation – and low costs.

### The bright side

ALSHE spiral heat exchangers make a major difference to operating costs, with:

- 75% lower power consumption
- up to 50% less heating medium
- 25% shorter maintenance downtime

### Saved space is saved money

The significantly smaller footprint of ALSHE spiral heat exchangers means that capital costs for both the heat

exchanger unit and the ancillary equipment, as well as for the buildings and structures in which they are installed, are also significantly lower.

### Improved operations – lower costs

The operating cost of ALSHE spiral heat exchangers is much lower than for a comparable tube-in-tube unit. They also require much less service and maintenance.

This makes the new Alfa Laval ALSHE best value for money in heat exchanger solutions for sludge treatment – and the easy path to good financial returns.

### Cost comparison index, for identical duties

	Tube-in-tube	ALSHE
Volume of heating medium required	2	1
Pumping energy required	3	1
Cleaning intervals	3	1
Lifetime cost	2	1
Price index	1	1

### Alfa Laval in brief

Alfa Laval is a leading global provider of specialized products and engineering solutions.

Our equipment, systems and services are dedicated to helping customers to optimize the performance of their processes. Time and time again.

We help our customers to heat, cool, separate and transport products such as oil, water, chemicals, beverages, foodstuffs, starch and pharmaceuticals.

Our worldwide organization works closely with customers in almost 100 countries to help them stay ahead.

