

APPLICATIONS

WATER TREATMENT
WASTEWATER TREATMENT
INDUSTRIAL
MUNICIPAL

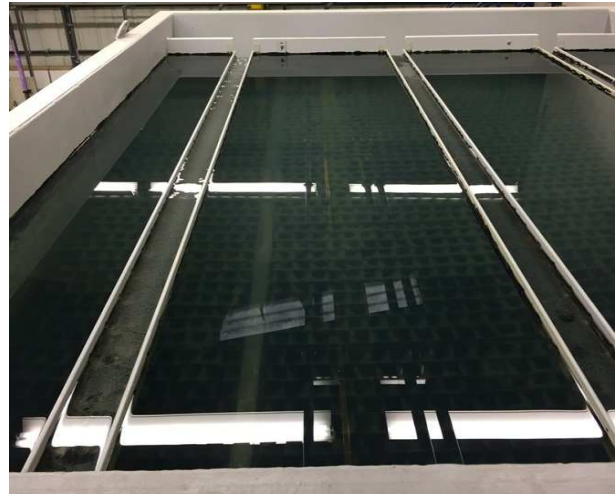


Lamella Tube Settlement Systems



Improve the removal of suspended solids from your water or wastewater with a Tube Settler, proven over more than 40 years.

H+E Tube Settlers provide highly efficient settlement of flocculated solids in industrial and municipal applications where the volume of sludge accumulated is relatively large, in situations where conventional lamella clarifiers really struggle.



Tube Settlers: What are the benefits to you?

■ Highly efficient removal of suspended solids

When you want to remove suspended solids from water, even when a pre-flocculation stage is included, there are inevitably some particles that are smaller and lighter than others, and which therefore do not settle easily. The lamella tube modules provide an area where additional flocculation of such small particles takes place (which does not occur in a conventional design clarifier), thereby allowing their removal and therefore producing a better quality treated water stream than you can get from a conventional clarifier.

■ Efficient Handling of Settled Solids

Flocculated solids **need** a layer of sludge to settle onto. This enables particles to stabilise (they are effectively “grabbed” by the settled sludge). This means that the settlement tank (or “clarifier”) needs to have a substantial volume available to “store” settled sludge. One of the big advantages of Tube Settlers is that, they have around twice the sludge holding capacity than traditional lamella settlers for a comparable projected settlement area.

■ Range of Sizes and types

Tube settlers are available in a wide range of sizes, to handle maximum flow rates from $5\text{m}^3/\text{h}$ upwards. Where the flow rate is high enough, more than one unit can be installed, and the flow simply divided between them. Depending on the type of solids being removed, they can be provided with different types of sludge collection cones.

See below for more information

■ Tube modules

The tube modules themselves are manufactured in ABS plastic and are therefore light and easy to handle. Each module is approximately 2950mm long x 760mm wide x 535mm high, 2.2m^2 plan area, but has a projected settlement area of 18.6m^2 , making the footprint of the Tube Settler much smaller than a conventionally-designed settlement tank.

Operation

The flow is distributed evenly across the settler in two ways:

1. Incoming flow is divided and enters the settler at a number of different points across the settlement area
2. Outgoing flow is removed via a number of overflow weirs across the settlement area.

In this way, any spots of high flow velocity that could impair settlement efficiency are eliminated.

Sludge collects in the base cones, which are provided with sight glasses so you can see the level of the sludge inside. This is important since, without this, you cannot be sure how much sludge has collected without expensive instrumentation; the level could be anywhere!



Standard Tube Settler

So you may ask: “how often do I remove the sludge, and how do I know if I have removed enough?”

The answers are:

- “Little and often”. Typically you might remove sludge every 5 or 10 minutes for 10 seconds.
- As long as you can see the sludge level in the sight glasses, all is OK



Full cone Tube Settler showing sight glasses

Sludge is simply removed by hydrostatic head to a separate holding tank via either an automatic valve, or an automatically-operated pump.

Each sludge collection cone has at least one sight glass so you can see the sludge blanket collecting inside it. Each sight glass has a “flushing” connection to ensure that the sludge level you see is the real level. Basically as long as you can see the top of the sludge blanket inside, all is well.



Two Tube Settlers operating in parallel

The Tube Settler Range

H+E Tube Settlers are available in a range of standard sizes, depending on your application. Two types of sludge collection cones are also available, depending on the type of solids settled.

● Standard Range

The Standard range is suitable for any solids that will flow freely following settlement.

Each Tube Settler is 3,600mm high

● Full Cone Range

The Full Cone range is suitable for solids that have a tendency not to flow particularly well.

Examples of this might include precipitated water hardness or similar calcium-based solids.

Each Tube Settler is nominally 4,500mm high

Whichever type is required, each is available in various standard sizes, depending on the flow rate you need to handle:

Model	Nominal Capacity (m ³ /h)	Nominal Internal Plan (mm)	Nominal Settlement Area (m ²)	Projected Settlement area (m ²)	Plate inclination
TS 2.5	5	1,560 x 1,525	2.38	18.6	60 °
TS 01	5	3,000 x 805	2.41	18.6	60 °
TS 02	10	3,000 x 1,560	4.68	37	60 °
TS 03	15	3,000 x 2,310	6.93	56	60 °
TS 04	20	3,000 x 3,065	9.19	74	60 °
TS 05	25	3,820 x 3,000	11.46	93	60 °
TS 06	30	4,475 x 3,065	13.7	112	60 °
TS 08	40	5,950 x 3,065	18.23	149	60 °

As you can see from the table above the difference between the nominal settlement area (floor space used) and the actual ("projected") settlement area is approximately 8:1. The actual flow capacity of each Tube Settler depends on the actual wastewater characteristics, so that flow capabilities do vary a little but the common advantage is that you can get your Tube Settler in a much smaller space than a conventional-design clarifier / settlement tank.

● Materials of Construction

Standard Tube Settlers are manufactured in welded mild steel, shot blasted and epoxy painted inside and out. Our paint finish is very high quality and, most importantly, it lasts a long time; we really do have clients with operating tube settlers that we supplied approximately 25 years ago that remain in first-rate condition without any refurbishment.

DWI Regulation 31 coatings are available if required.

Choosing the correct Tube Settler model

The flow rate that you need to treat is a good starting point. However, other factors such as the type of solids, whether or not the solids have been efficiently flocculated and, importantly, what treated water quality you need to achieve, are also very important in ensuring the correct model is chosen. You can also split the flow between say two or three Tube Settlers if necessary.

Sludge Tank Option

We can also provide sludge tanks to collect the sludge discharged from the tube settler. For the smaller Tube Settlers there is also the option of having the sludge tank added as an integral part of it (effectively you get a twin-compartment tank). This is normally limited to the three smallest models (see the picture at the bottom of this page).

Examples of installations

Tube Settlers have been installed in many locations worldwide. Just a few examples in the UK are listed below:

Jaguar Land Rover (2 plants)
GE Aviation (4 plants)
Outokumpu Stainless Steel
Huber Technology
Ford Motor Company

Inspectorate International
Chromalloy (2 plants)
Egyptian Copper Works
e2v
Gestamp Tallent

Amersham International
Bombardier
Vertik-AI
Vector Aerospace
Euramax



Full Cone Tube Settler with extended legs

Complete Treatment Plant

We are happy to supply just a Tube Settler if that is what you need, but can also supply more of the ancillary equipment needed if you wish. We have mentioned Sludge Tanks above, but then there is the chemical treatment, sludge dewatering, control system, chemical storage and dosing systems and so on that typically make up a complete plant.

Equally, if you need a complete new Water or Wastewater Treatment plant we would be happy to design and supply that to you. Whatever you need, please talk to us!

On-going support

Whatever you need, to ensure that your plant continues to operate and benefit your business, our team of engineers is always available to provide support, troubleshooting and the occasional spare part throughout its life. We can also provide maintenance and service packages for your complete water or wastewater treatment plant if you wish, and on a basis that suits you.

We would be happy to discuss your needs; please do contact us!



TS 01 Tube Settler with integral sludge tank

H+E ranks among the world's leading suppliers in the fields of: water & wastewater treatment, and energy efficiency. Based on its global presence, the **H+E GROUP** has completed projects in over 50 countries.



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