

OUR PARTNERSHIP:

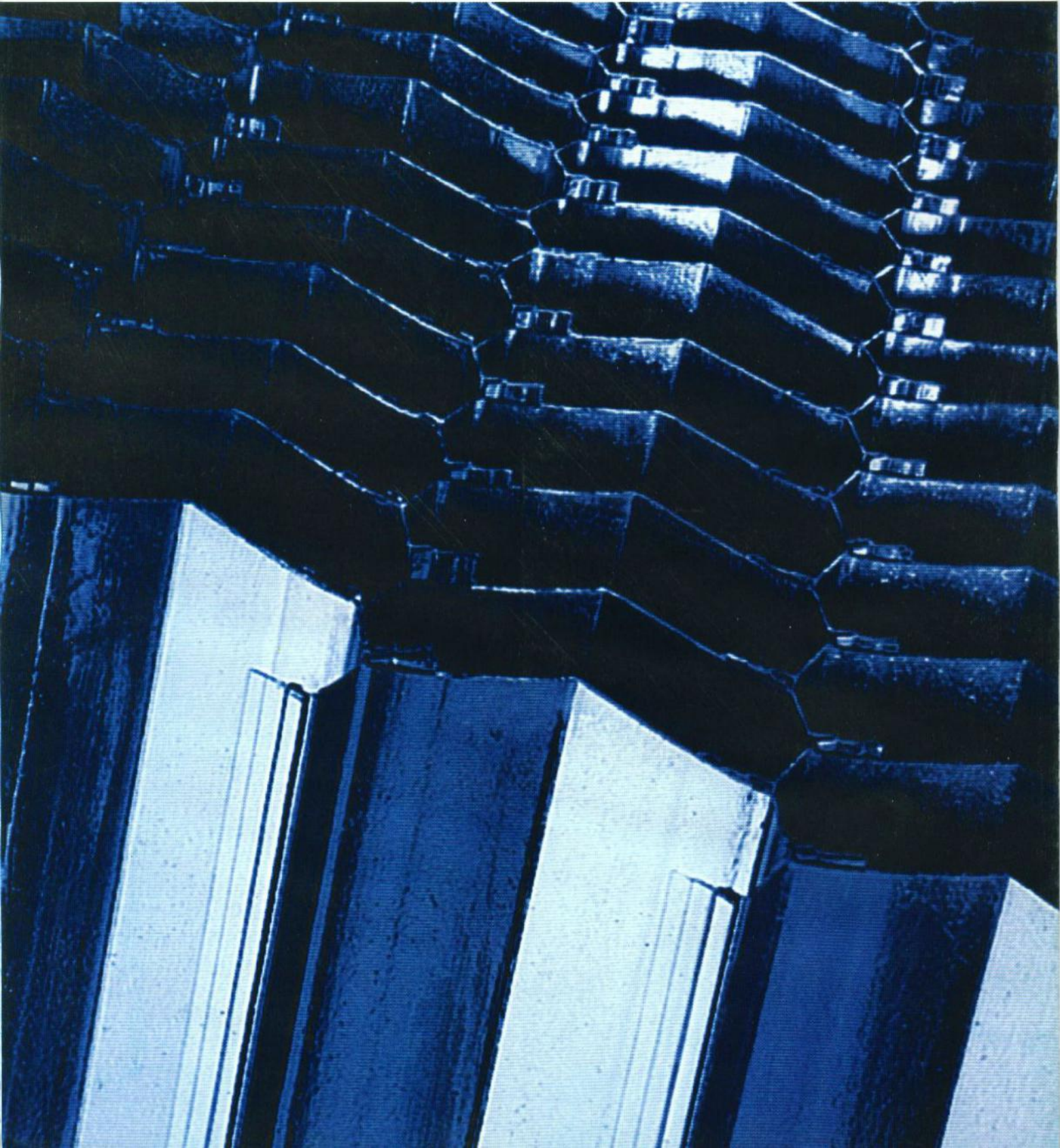


MM Aqua

TUBEdek



PT. DWIJAYA SELARAS



TUBEdek

Traditional sedimentation tanks or clarifiers are large structures occupying much valuable space on site and are perceived as high investment cost items.

Attacking the very crux of this problem, MM Aqua's TUBEdek is a PVC tube settler which offers enhanced capacity for settling suspended solids, in a fractional area. Using Munters technology, TUBEdek provides the most economical way of improving clarifier performance in a variety of municipal, industrial and wastewater applications. TUBEdek can be installed within settling tanks, both existing and new.

TUBEdek settling media helps reduce the amount of suspended solids in carrier fluids thus improving effluent quality significantly, which in turn improves the efficiency of existing plants. Moreover with TUBEdek, new clarification tanks can be designed smaller and yet maintain the same performance level, at far less cost. The use of TUBEdek leads to the formation of large settling areas and small sink paths.

The TUBEdek model, FS 41.50 is easy to install in any shape of clarifier; its hexagonal chevron shape is the most ideal for effective settling with or without coagulation or flocculation. High settling surface area (11 and 13m²/m³) leads to a very small clarifier size and the detention time requirement is also very low when compared to conventional clarifiers.

Features

- TUBEdek increases the capacity of a clarifier, improves the resultant effluent and increases the stability of the process in the event of surges of other process upsets.
- TUBEdek increases the effective area of a basin (by 5.5m²/m² for a 500 mm deep module) and decreases the effective particle settling distance drastically.
- TUBEdek enhances the particle agglomeration and growth, bringing the particles into closer contact with each other at the bottom of the tube. This is aided by the v-shape of the tubes and

the counter-current flow of the incoming effluent and receding solids.

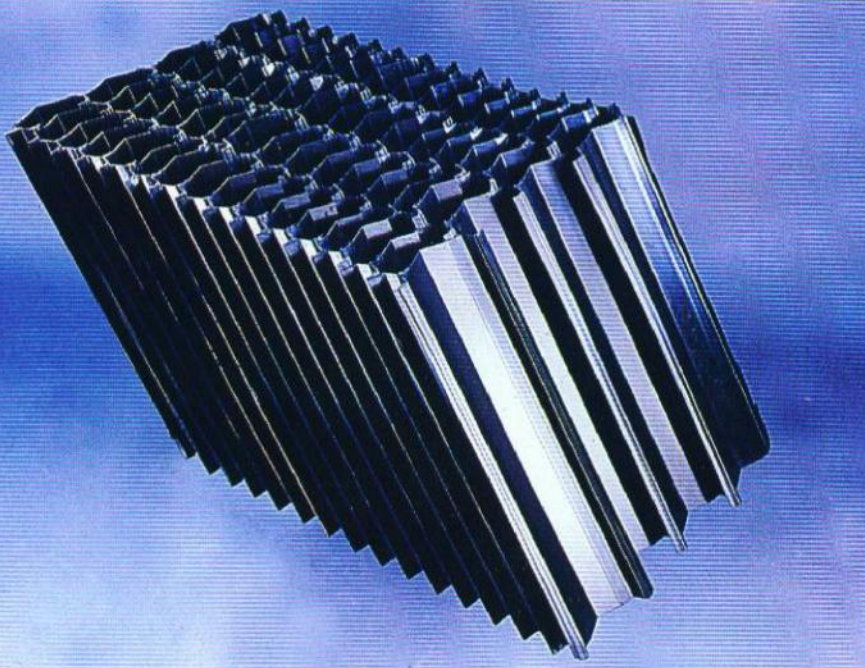
Advantages

- When fitting TUBEdek to an existing clarifier, the suspended solids concentration in the effluent is greatly reduced. The improved settling environment means that the flow can be increased significantly while still achieving excellent results.
- In a new clarifier design, the use of TUBEdek can reduce the cross-sectional area of the tank substantially, hence reducing civil costs and minimizing space requirements, while still maintaining a high quality effluent.
- The simple hexagonal-chevron configuration is a proven superior design in settling applications.
- The controlled flow pattern in TUBEdek provides the best settling conditions. This also dampens the eddies, currents and turbulences leading to the basin, thus approaching an ideal situation.
- The robustness of the TUBEdek pack easily allows foot traffic for periodic maintenance.
- Installation is fast and easy. The tubes are supplied as profiles in nested form, to save on transportation cost. These are easily installed at site with the tongue and groove arrangement which is an integral part of the package.
- TUBEdek profiles can be assembled to fit into any size or shape of settling tanks - whether square, rectangular or circular - without any difficulty.

Applications

Water Treatment

Application of TUBEdek FS 41.50 provides effective settling in potable and industrial



water treatment plants, to settle chemically treated water in the clarification stage.

Waste Water Treatment

TUBEdek may be widely applied in the field of wastewater treatment plants to provide effective settling at primary and secondary stages.

Anaerobic Digestors

This is a new application of TUBEdek where solid retention is maintained in sludge blanket type of reactors. TUBEdek is placed above the Sludge blanket in the clarification zone of the anaerobic digester to remove solids from digested waste. This maintains the required solid concentration in sludge blankets.

Other applications

- Clarification of raw river water in water treatment plants
- Clarification of process water from coal fines in coal washeries
- Clarification of waste water from wet scrubbers
- Mineral Processing Industry
- Concentrate Thickener (primary thickener)
- Clarifier/Secondary Thickeners
- Middling Thickeners
- Tailing thickeners (clarifiers) for reclaiming process water
- Phosphoric acid clarification
- Clarification and thickening of mill scale
- Clarification of water from sand in hydraulic stowing systems in underground mines
- Various settling/clarification applications in thermal power plants
- Various settling applications in iron and steel plants

Media Configuration

TUBEdek is designed to expand the settling capacity of existing and new clarifiers and sedimentation basins, of either circular or rectangular shape.

This is achieved by providing multiple tubular channels, sloped at an angle of 60° and adjacent to each other, with a wave-like geometry of flow cavity which allows a rapid sloughing-off of any accumulated solids.

Individual tubes are continuous and smooth to minimize any mixing currents within the tubes. The configuration and shape of each tube is designed to give a low "Reynolds Number" and laminar flow conditions. This enables rapid accumulation and settlement of solids through the tubes.

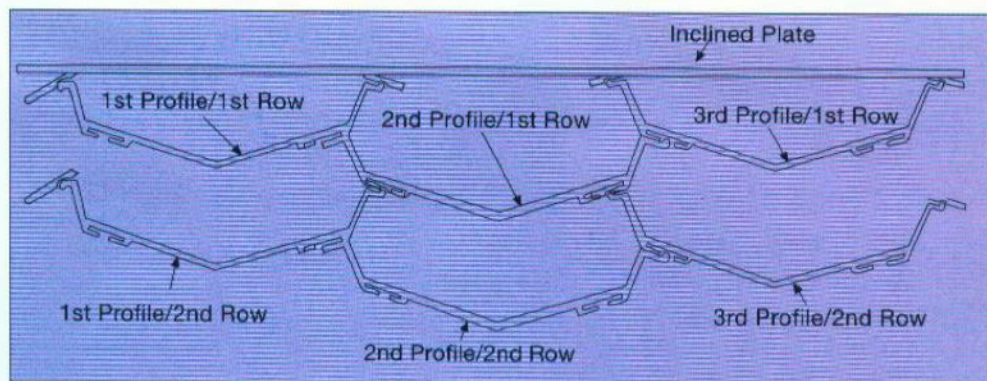
Moreover, the individual tubes are continuous and imperforate and prevent any transfer of liquid between each tube. This eliminates any mixing currents within the tubes. Mixing currents adversely affect the settlement of solids and re-suspend the settled solids within each tube. The high surface area of tubes, combined with these features, enables substantial expansion of settling capacity at high "rise rates".

The tube settling modules are assembled to give multiple tubes of approximately hexagonal-chevron shape. Tube settlers can be placed adjacent to each other, to snugly fit and cover as much area as is required in the clarifiers or sedimentation basins.

The availability of TUBEdek in multiple lengths offers flexibility in the design and spacing of tube settler "supports". For circular clarifiers, the tube settler module ends are "angle cut" to offer a close fit in pile segments.

Installation

1. A module of standard size block is placed in one corner of the tank along with the centre channel. Care should be taken that the module is placed right side up, with the tongue and groove system underneath. The slope of the module is inclined to the side wall of the tank and slight pressure is then applied on the module to push it into the corner, so that it touches the two wall sides. The space underneath the slope at the end of the module and the wall can stay empty.
2. The next standard module has to be placed alongside the first one. The two modules have to touch each other such that the grooves of the second module lie upon the tongues of the first.
3. The step has to be repeated until the last standard module is installed. Care must be taken that each module is supported by at least two beams symmetrically. If a module is not supported symmetrically, it has to be lengthened or shortened to achieve the necessary support symmetry.



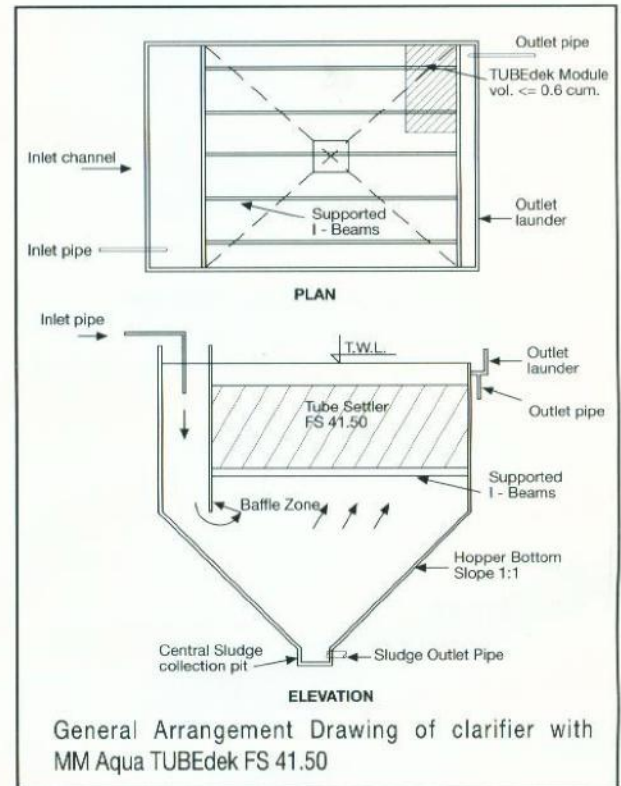
TUBEdek Mounting Procedure

All modules that are required to be stored in the open beyond 2 weeks should be covered by a light coloured cover (such as a tarpaulin) and securely anchored on all sides, to prevent any wind or atmospheric damage. In view of the media modules getting brittle at low temperatures and soft at high temperatures, handling of modules should be minimal at temperatures other than ambient.

When designing basins using TUBEdek, it should be remembered that if the hydraulic loading is to be increased, the rate of sedimentary deposition on the tank bottom will also increase. This will place an additional burden on sludge removal equipment.

Technical Specs

The material used for TUBEdek is rigid, fire-proof, self-extinguishing PVC . The material is also resistant to naturally occurring constituents in water and to the recommended dosage of any treatment chemicals required in the treatment process.



Design Data		Recommended Block Dimensions	
Settling area	60° slope : 11.0 m ² per m ³ 55° slope : 13.0 m ² per m ³	Block widths	(R - 1) x 127mm + 176mm; where R = number of profile rows
Hydraulic radius	1.5 cm	Block volumes	W x L x H ≤ 0.6m ³ ; otherwise a lifting aid is required for moving the blocks.
Cross sectional area	120 x 44 mm	Block length	to be adapted to the distance of supports in such a manner that the block is supported by 2 beams.
Shape	Hexagonal-Chevron	Support	Distances at max. 1000mm. Larger distances possible if the blocks are also supported by T sections. Support width : minimum 60mm
Product Data		Transport volume	Finished blocks: 2 to 3 times the separator volume. Profiles : approx. 25% of the volume of finished separator.
Weight	approx 75 kg/m ³		
Separator heights			
Standard 500mm	5.5 m ² settling area/m ²		
1000mm	11.0 m ² settling area/m ²		
Other heights	upon request		
Material	PVC		
Maximum continuous working temperature	55°C (depends on the load and the kind of supporting structure)		

The information provided in the catalogue is subject to change without prior notice, based on R&D updates.

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