



# SEDIMENTATION TECHNOLOGY

The main principle of treatment by sedimentation is to remove readily settleable solids and floating material and thus reduce the suspended solids content. The scraper mechanism which is installed inside the tank collects the settled solids. Almost all treatment plants use mechanically cleaned sedimentation tanks of standardized circular or rectangular design. The selection of the type of sedimentation unit for a given application is governed by the size of the installation, by the characteristics of solid suspension of process liquid and by the experiences etc.

Clarification is the process of separating solids from the liquid. The principle is to create flocs from the suspended material in the liquid and let these flocs settle by gravity in a calculated retention time. The selection of a tank configuration and collector mechanism as scraper type and/or suction type depends upon the characteristics of solids suspension of process liquid.

Astim designs and manufactures complete range sedimentation tank scrapers. Mainly these equipment are;

- Peripheral Driven Scrapers for circular tanks
- Travelling Scrapers for longitudinal tanks
- Central Driven Scrapers for circular tanks



## PERIPHERAL DRIVEN SCRAPERS

In circular tanks; the flow pattern is radial. To obtain a radial flow; the wastewater can be fed to the tank from the center or around the periphery of the tank. During radial flow the suspended solids in wastewater is settled by gravity and the peripheral driven rotating scrapers are used to remove the settled sludge.

The scraper blades can either be echelon or logarithmic spiral shaped. By the help of these blades the sludge is pushed towards the center and collected in the central located sludge collection pit. The scraper arms of rotating bridges are mostly designed as a hollow section type and attached to the bridge by hinges. For heavy duty conditions, adjustable tension bars are used for additional safety.

Also suction system can be widely used in the conditions where excavation costs dictate a flat or very shallow bottom and in applications where very hot climates or other process limitations forcing a short retention period, in order to prevent de-nitrification and septic conditions for settled solids. In this design the settled sludge is evacuated by pipes and removed to the central trough. This design has the advantage of working in horizontal bottom tanks which decreases the excavation and civil construction works.

Rotating Bridge is designed according to static calculations and requirements as Full Wall, Half Wall, Steel Profile or Truss Beam. Bridge is equipped with open mesh walkway, handrails, access ladder and optionally an emergency ladder. The peripheral drive unit at the rotating bridge is mounted on the end carriage of the bridge. Speed reducing unit includes gearbox for gentle slow movement and optionally a torque limiter.

Surface skimmer device is used for removal of scum and other floating materials. The device consists of blade suspended from the bridge, scum board, scum box with approach lip and adjustable rubber wiper blades.

Manufacturing specifications of Astim Peripheral Driven Scrapers are valid for primary or secondary units and also flocculating type clarifiers. The collecting mechanism is bridge supported in order to be suitable to fit any type of tank.



*Rotating Full Bridge with blade scrapers*



*Suction Scraper spanning the full diameter of the tank*



*Peripheral Driven Scraper Bridge with surface skimmer*



*Rotating Bridge with suction type sludge removal*

# TRAVELLING SCRAPERS

Travelling Scraper Bridge is designed according to span as Full Wall, Half Wall, Steel Profile or to avoid high wind loads as Truss Beam. Carriages, which are located at both ends of the bridge, can travel on rails with or without pinion rack or on polyurethane lined wheels with guide wheels. The drive unit can be mounted either at the end carriages or at the middle of the bridge. Bridge movement is controlled by limit switches.

For removal of settled sludge, both scraping and suction methods can be used. The solids settling in the tank are scraped or pumped to solids hopper. Also for removal of floating matter; skimming or pumping types are available. Power feed can be done by using cable carrying roller or by means of motorized or spring loaded cable drums.

# CENTRAL DRIVEN SCRAPERS AND THICKENERS

Circular clarifiers equipped with Central Driven Scrapers are manufactured for installation at pier supported or peripheral carried fixed bridges. Generally, fixed bridges are offered for using in small medium sized tanks, in which the sludge has high concentration of solids. Also pier supported bridges with centre drive cage can be used for mining or heavy loaded primary applications.

Thickeners have similar design and manufacturing features with Central Driven Scrapers. After the thickener, sludge can be fed to the digestion tanks or dewatering machines. The main difference is Thickeners with picket fence are improved to scrape heavier sludge and to obtain higher dry solid concentration so that the thickening rakes and stirrers are constructed against heavy sludge loads.



*Travelling Scraper Bridge with straight blades*



*Travelling Scraper Bridges with liftable bottom blade scrapers*



*Thickener with automatic lifting unit against overload*



*Central Driven picket fence Thickener*



*Suction Scraper with Aluminium Truss Bridge*

## ADDITIONAL FEATURES

- Anti-frost heating lamp
- Scum baffles
- Scum removal channels with approaching ramps
- Over flow weirs
- Effluent launders
- Inlet diffuser cylinders, Stengel inlets
- Channel cleaning brushes
- Scraper lifting mechanism for overload protection
- Illumination on bridge
- Lamella settlers to obtain higher separation efficiency

Astim Scrapers and Thickeners are manufactured in epoxy coated or hot dip galvanized carbon steel, stainless steel or aluminium according to requirements or process conditions. Local control panels using PLC or conventional systems which can be controlled manually, automatically or remote from a main control cabinet can be added in the scope of supply. Optional mechanical or electrical overload security systems with or without alarm system can be adapted to avoid damages under high sludge loads.



*Detail from effluent channel cleaning brush*



*Rotating Full Wall Scraper Bridges spanning Ø 60m diameter Sedimentation Tank*

## ASTİM Endüstri Tesisleri İmalat Montaj ve Taahhüt A.Ş.

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