



SCREENING TECHNOLOGY

The initial step of the water and wastewater treatment plants is the mechanical treatment. Screening equipment are the most important members of this pre-treatment process.

Wastewater coming to the treatment plant will occasionally include wood, sticks, rags, and other debris in it. Before further processing, the wastewater must be screened to remove these materials, in order to protect the chemical and biological processes. Also pumps, pipelines are protected by means of these screens. Nevertheless; although screening is acknowledged along with the physical treatment; as a result of their compact construction and purposeful design; screening equipment can be used in various aspects of many applications. Astim designs and manufactures manually cleaned or mechanically raked screens in a wide range of sizes and types for water and wastewater treatment plants and pumping stations. Astim design and manufacturing range for screening equipment covers;

- Manually Cleaned Bar Screens and Basket Screens
- Mechanically Raked Bar Screens
- Belt Screens
- Inline Screens
- Conveyor Screens
- Screening Treatment Systems



MECHANICALLY RAKED BAR SCREENS

Mechanically Raked Bar Screens are proper equipment for full automatic removal of solids from all kinds of water and wastewater. The screens consist of steel bars spaced to catch debris of a certain size. Mechanical rakes scrape the screening bars to carry the debris and discharge them through a chute into transport equipment or into a container.

Mechanically Raked Bar Screens can be equipped with electrical control cabinet; with PLC or conventional systems. Additionally to prevent damages due to high screening loads electronically or mechanical torque limiting devices can be used. Astim designs and manufactures Mechanically Raked Bar Screens in a wide range of sizes and types. These Screens can be classified as:

- Cable Operated Bar Screens
- Chain Driven Bar Screens
- Arc Curved Bar Screens
- Pin-Rack Screens

Cable Operated Bar Screens

Cable Operated Bar Screens (either stationary or travelling type) are robust equipment designed for heavy duty applications. They are specially designed for deep and wide channels for installation in pumping stations or inlet structures of high capacity water and wastewater treatment plants. With vertical installation possibility they require less space for screening.

Chain Driven Bar Screens

Chain Driven Bar Screens (either with single or multi rake) are the mostly preferred screening equipment for removal of solids sizing in a wide range. They are specially designed for installation as coarse and fine screens for medium and large sized water and wastewater treatment plants.

Arc Curved Bar Screens

The continuously curved surface design of arc curve screens provides a perfect holding action and produces high capacity, efficient separation and a dry coarse product discharge. Astim offers two different types of Arc Curved Bar Screens which the arm rake is either rotating drawing a circular or a curved arc orbit.

Pin-Rack Screens

Pin-Rack Screens are screening equipment specially designed for installation for medium sized water and wastewater treatment plants. Suitable for both coarse and fine screening, as either a front or back raked screen, the Pin-Rack Screen ensures an efficient and reliable cleaning of the bar screen.

General Features of Mechanically Raked Bar Screens

Bar Spacing: 8 ÷ 100 mm

Channel Width: 600 ÷ 3000 mm (5m with Cable Operated design)

Discharge Height: 2, 5 ÷ 15m (30m with Cable Operated design)

Installation Angle: 70° ÷ 85° (90° with Cable Operated design)

Material: Carbon Steel with surface protection or Stainless Steel



Chain Driven Bar Screens



Arc Curved Bar Screens

BELT SCREENS

Belt Screens are self cleaning screening equipment. These screens consist of a rotating endless belt to catch and remove the debris. Belt Screens are not only used in water and wastewater treatment plants in pretreatment. They are also used in pulp and paper industries for mill effluent screening, fiber recovery, log flume water and wood room effluent screening and other industries such as sea food processing, meat processing, poultries, sugar processing, fruit and vegetable processing, vineyards, breweries, textile industry, paint sludge dewatering, glass ceramics mining industries.

Astim designs and manufactures different type of Belt Screens in a wide range of sizes.

These Screens can be classified as:

- Perforated Belt Screens
- Rota-Lift Screens

Perforated Belt Screens

Perforated Belt Screens are mainly used as fine screening equipment for large and medium sized municipal and industrial water, wastewater treatment plants. Especially for fine screening, the perforated screening elements provide superior separation efficiency in comparison with bar screening elements. The Perforated Belt Screen is able to cope with even high amounts of gravel and grit. Also the screening elements prevent especially long fibers from passing through the screen and thus achieve the maximum separation efficiency. As the endless perforated belt rotates in the channel the screenings kept on perforated plates are slowly separated from the water stream. Screenings rolls is prevented by rake bars extending over the full width of the screen in combination with the screen's installation angle. Even cans and bottles are lifted by these rakes.

Rota-Lift Screens

The Rota-Lift Screens are fine screens designed to remove solids from liquids in waste water treatment plants and process plants. They have a very low head loss which makes them ideal for open channel installations. With its distortion free reliable construction, high separation efficiency and low head loss Rota-Lift Screen is the most preferable fine screen for small, medium and large sized water and wastewater treatment plants. The wastewater flows through the screening blades of the screen. Solid matter is held back by these screening blades forming a mat, while the wastewater flows through the channel. When pre-set differential water level is reached the drive motor of the screen is activated. The moving blades make a rotational movement between the stationary blade grid and during each rotation cycle, the debris is transported onto the next higher notch of the fixed blade grid assembly and conveyed step-by-step to the discharge.

General Features of Belt Screens

Slot Width: 1 ÷ 6 mm (2 ÷ 12 mm with Perforated Belt design)
Channel Width: 400 ÷ 3000 mm (up to 2m with Rota-Lift)
Discharge Height: up to 10m (up to 3,5m with Rota-Lift)
Installation Angle: 60° ÷ 75° (40° ÷ 53° with Rota-Lift)
Material: Carbon Steel with surface protection or Stainless Steel



Perforated Belt Screen



Rota-Lift Screen

INLINE SCREENING SYSTEMS

Many screens can be installed in steel tanks to use as inline screens. Besides Astim designs and manufactures different type of Wedge-wire Inline Screening Systems in a wide range of sizes. Inline Screening Systems are compact, self cleaning screening equipment.

Mainly Inline Screens can be classified as:

- Rotating Drum Screen (outer fed)
- Rotating Drum Screen (inner fed)

Rotating Drum Screen (outer fed)

Outer Fed Rotating Drum Screens are continuously operating screening system with automatic cleaning device. They are general purpose self cleaning micro screening equipment which are suitable for both municipal and industrial water, wastewater treatment plants as well as the applications for collection of recyclable materials. But they are especially suitable for separation of floating, greasy and adhesive solids. The screen is formed by a frame, a drive unit, a delivery tank, a screen drum and a doctor blade.

Rotating Drum Screen (inner fed)

Inner Fed Rotating Drum Screens are originally, developed for the paper industry. But the system has been used for clarification plants and in many branches of industry for wastewater treatment.

General Features of Inline Screens

Slot Width: 0, 25 ÷ 3 mm

Drum Diameter: 600 mm (up to 2000 mm with Inner Fed design)

Material: Stainless Steel



Rotating Drum Screen in operation



Series of Drum Screens used in brewery industry



Detail showing feeding of the drum



Completely enclosed Rotating Drum Screen

CONVEYOR SCREENS

Conveyor screens are compact screening equipment equipped with a screw conveyor compactor unit. These screens can both be installed in channels or in steel tanks to be used as inline equipment. Conveyor Screens operation is based upon a compact system that allows the combination of screening, washing, transport, compaction and dewatering in a single unit.

The Conveyor Screens can also be equipped with every required instrument to become a package unit for screening purpose. Astim designs and manufactures different type of Conveyor Screens in a wide range of sizes.

These Screens can be classified as:

- Strain Screens
- Rotary Screens
- Sewage Acceptance Plant - SAP

Strain Screens

Strain Screens also can be installed directly in a channel or into a separate tank. They are mainly consisting of a stationary screen basket and a cleaning screw conveyor. As the water flows in through the open front end of the screen basket solids are retained on the basket. The rotating screw removes the screenings and convey up to discharge point.

Rotary Screens

As all types of Conveyor Screens, Rotary Screens can also be used as channel mounted or as inline screen by installation in a separate tank. They are mainly consisting of a rotating screen basket and a screw conveyor. As the water flows in through the open front end of the rotating screen basket solids are retained on the basket and fell down in the conveyor trough.

Sewage Acceptance Plant -SAP

Septic sludge which is delivered by sewage trucks, must be screened in order to separate the solid content before discharging to wastewater treatment plant. Conveyor Screens can also be installed in a stainless steel tank and can be equipped with all necessary instrumentation to be used as Sewage Acceptance Plant (SAP). The truck discharge can be directly connected to inlet flange of SAP.

After mechanical treatment sludge can be directly discharged to digester or in to the inlet channel of the treatment plant.

General Features of Conveyor Screens

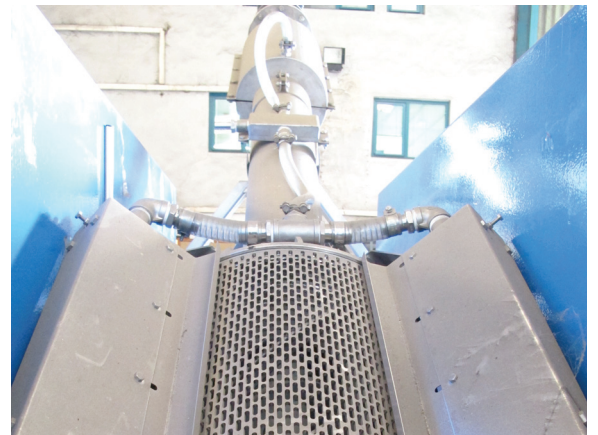
Slot Width: 0,5 ÷ 8 mm
Channel Width: 600 ÷ 2000 mm
÷ 700 mm in Strain design)
Discharge Height: up to 5m
Installation Angle: 35° ÷ 45°
Material: Stainless Steel



Sewage Acceptance Plant - SAP



Strain Screen



Rotary Screen

SCREENING TREATMENT SYSTEMS

The screenings are wastes which must be minimized; reduced in volume as much as possible and shall be land filled or incinerated. Therefore the aim is to restrict screenings production as far as possible.

Screenings content 80% water, partly bound with organic material, 10% other material like hygienic material, plastic articles, cloth, fibers, stones, 5% organic material like paper, food residues etc. and 5% faeces.

In order to reduce weight, water has to be pressed out. This means that the most important point is to press the screenings. Since washed screenings can be better pressed, there must also be a washing in order to remove faeces and other organic material. Further positive effects are that the washed out organic material increases the organic content in relation to nitrogen which has again a positive effect on de-nitrification. Also the operating conditions (odors, handling etc.) in the screens area will be considerably more hygienic which has a beneficial effect on the staff.

The Screening Treatment Systems not only dewater the screenings, but also remove the organic material in the screenings by washing system integrated in the compacting zone. Astim offers different types of Screening Treatment Systems.

These Treatment Systems can be classified as:

- Screening Press
- Shaftless Conveyor Compactor

Screening Press

The screenings to be treated are discharged directly from a screen or conveyor into the feed trough of the Screenings Press. A robust conveying and compacting screw transports the screenings into the wash zone where they are exposed to powerful wash water. The washing achieves perfect separation of organic particles. The screenings are further conveyed in the rising pipe to the press zone where they are pressed and dewatered by the compacting screw to a high DS content. The wash water from screenings compaction which is rich in carbon is discharged back into the waste water stream. The washed and compacted screenings are finally transported through the conical discharge pipe into a skip.

Shaftless Conveyor Compactor

The main idea of this equipment is to combine the Shaftless Conveyor with a compacting zone in order to reduce the investment and operation costs. The efficiency in the end is slightly smaller than the robust Screening Press but is acceptable. The design and working principle of Shaftless Conveyor Compactor is exactly the same with the Screening Press



Shaftless Conveyor Compactor



Screening Press

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