



Intake Water Screening Equipment

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Coarse, medium and fine screening equipment can be used effectively in combination to remove debris, weeds, branches, grass, fish, etc. from water sourced from rivers, lakes and oceans.

Travelling Band Screens

Screening of large volumes of water meant for industrial use can be done by Travelling Band Screens (TBS). TBS consist of Basket frames fitted with screen meshes and arranged in a link chain system. The intake water flows through and the debris is trapped in the baskets. The debris is carried to the top by the revolving band screen. At the top, jets of water wash out the debris into a refuse disposal trench. Depending on the pattern of water flow, Travelling Band Screens can be classified into three types:

Through-Flow Band Screen

In this configuration the water flows through the screens, effectively using 50% of the submerged mesh area. Mesh sizes range from 4 to 10 mm.

Dual-Flow Band Screen

In this configuration the water flows from outside to the inside of the screens, effectively using 100% of the submerged mesh area. Mesh sizes range from 4 to 10 mm.

Centre-Flow Band Screen

In this configuration the water flows from inside to the outside of the screens. The configuration of the baskets ensures 150% use of the submerged mesh area. Mesh sizes range from 0.1 to 10 mm.

Dual Flow and Centre Flow TBS

The water flow patterns enforced by the Dual Flow Band Screen and Centre Flow Screen remove the possibility of debris being carried over. Compared to Through-Flow Screen, these screens are 50% and 100% more efficient respectively.

The Through-flow TBS and Dual-flow TBS have flat basket design whereas the Centre-flow TBS has a semi-circular basket design which ensures a much higher capacity for removing debris/trash. The Centre-flow TBS takes the help of gravity for discharging much of the debris, thus requiring less back wash for its screens.

Centre-flow TBS can handle up to 1,00,000 cu.m flow of water per hour with optimal filtering owing to its highly efficient screening capacity. A Centre-flow TBS also scores over the other two types of TBS by requiring less civil construction owing to its higher sump level (30% less than a Dual-flow TBS and 50% less than a Through-flow TBS).

The mesh size is determined by the quality of water required for processing. Fine mesh is used to ensure screening out of tiny particles. In case of power utilities and desalination units, the mesh sizes are generally 1 mm to 2 mm.

Bar Screens

Filtration at the first stage of water intake system is done by Bar Screens (also known as Trash Racks). The spacing of bars on such bar screens depends upon the quality of filtered water required. Bar screens may be used in two stages where the first screen with wider bar spacing remove bulky solids and a second bar screen with smaller bar spacing then remove debris still coarse enough to clog travelling band screens.

Removable type bar screens: Single or multiple segments of bar screens are lowered into or raised out of the intake chamber by means of guides installed on the sides walls.

Fixed type bar screens: Steel frames of welded design with flat bar sections are fixed to the bottom of the chamber by grouting/bolting. Interchangeable bar sections are provided for easy replacement. Fixed type bar screens have to be cleaned by bar screen cleaning equipment.

Bar Screen Cleaner

A manual/automatic bar screen cleaner mechanically cleans out bar screens with the help of a grab carriage having anti-wedging design. The grab carriage runs on guides. Multiple channels can be cleaned by a mobile bar cleaner moving on rails. The grab travels down in an open position and closes automatically when reaching the bottom of the channel. It then travels upwards with the collected debris and discharges it on a conveyor or waste collector.

There are three versions of cable operated bar screen cleaners:

- 1) Fixed type (which cleans individual channels)
- 2) Mobile type (which can clean multiple channels)
- 3) Portal Track type (also meant for cleaning multiple channels).

Stop Log Gates

When intake channels or intake equipment need repairs and absolute sealing out of water is not necessary, the stop log gate is used as a shut off device.

Depending on the handling facility and headroom available at site, the stop log gate can be of one or several segments. To ensure effective sealing, replaceable rubber profile sealing is provided on all sides. For ease of handling during lifting and lowering of gates, an automatic engagement/disengagement type lifting beam is provided.

Penstocks

Manually or Power operated Penstocks are the most commonly used isolation device. Penstocks have cast iron/welded steel frame, door and guides with seal clamping strips, rollers, bolts and SS adjustable wedges. Both frame and door are provided with replaceable seals. The stem is constructed of carbon steel or stainless steel, with a stainless steel spindle.

Intake screening equipment manufactured by MACMET is installed in many countries across the globe. In India MACMET has supplied equipment to almost all major power plants.