EIMCO
WATER TECHNOLOGIES

Bosker Range of Trashrakes

A Solution for Every Intake

A GL&V COMPANY

Bosker Range of Trashrakes

The Brackett Green® Bosker Range of Trashrakes provide efficient and high volume debris removal for all sizes and types of water and waste water intakes. Successful installations range from those at Shanghai's main sewage treatment works in China, to major hydropower stations such as Pitlochry in Scotland and Tarraleah in Tasmania. Eimco Water Technologies (EWT) has installed over 600 Bosker Raking machines.

EWT has offices located throughout the world and our engineers are able to inspect, advise and recommend the correct machine for any site, worldwide.

Bosker Trashrake features

- The Bosker monorail system leaves clear access at deck level and optimises available working area on the screen deck.
- Structural supports can be easily positioned at most sites to accommodate the track.
- No submerged moving parts, therefore more reliability and less maintenance.
- Low maintenance – service intervals twice a year.
- All gearboxes are life-time filled.
- Low noise operation for urban sites.
- Capacity ranges from 250kg to 3000kg safe working load (debris loading).
- Barscreen spacing from 12mm to 200mm+ is possible.
- Intake depths of over 60m can be cleaned.
- Vertical barscreens can be cleaned.
- The gripper is open sided to allow extraction of debris such as long tree trunks and can easily extract awkward debris such as logs, oil drums, pallets and plastic sheets etc.
- The system does not require a washwater trough or debris conveyor. Debris is extracted from the screen and transported directly to the dumping area.
- Multiple dump areas are selectable.
- The monorail track can be curved to achieve remote location dumping.
- Travel speeds from 10 to 60m/min are possible on wide screens reducing overall cleaning cycle times.
- Fully automatic start from pushbutton, time clock, periodic timer, level differential signal and remote signal from telemetry is available.
- Full manual control is available via remote or pendant radio control.

Applications include:

- Hydropower stations
- Sewage treatment works
- Land drainage
- Culverts
- Sea water intakes
- The first application of Nuclear power stations

3,000kg machine under manual control at a hydro-electric power station.

Urban and rural waste
All manner of domestic waste and debris can be removed by Bosker equipment. In urban areas this might include plastic sacking, chemical barrels or tyres. In more rural locations machines often deal with large quantities of river weeds, driftwood and floating vegetation. In seawater intakes, the Trashrake easily removes seaweed (kelp) and the grab can be adapted for jellyfish.

Most medium to large intakes utilise the Bosker Overhead Trashrake whilst smaller intakes, that might have previously relied upon manual clearing methods, are well suited to the Bosker Bandit Trashrake – a compact powerful machine with an extendible rotating arm.

Both the Overhead and the Bosker Bandit Trashrakes can be fitted with Rake heads manufactured from a variety of materials, selected according to the working environment, and each machine offers numerous operating and arrangement options.

Static Bosker Bandit Trashrake.

Neither the Overhead or Bosker Bandit Trashrake permanently submerges any moving machinery parts, nor do any serious modifications have to be made to existing civil works to allow these machines to be retrofitted to existing sites.

An Overhead Trashrake with curved track on a hydro-electric power station.

An Overhead Trashrake with straight track on a land drainage pumping station.

Bosker Mobile Bandit Trashrake.

Bosker Range of Trashrakes

Managing debris removal

EWT has installed Bosker Trashrakes at a wide variety of water intakes where a key objective has been the provision of simple and effective coarse screening. Often acting as the very first screening stage, Trashrakes offer a vital means of removing a large volume of awkward debris, such as driftwood and tree trunks, from the water and protecting critical power generation equipment or down stream pumps.

At very large plants, where debris is extremely heavy, multiple bar screens are often employed each with its own individual raking head as signed to each screen. At slightly smaller plants, a travelling Trashrake and trolley assembly can service a multiple screen installation. With either design, the overhead positioning of the Rake's trolley creates the advantage of a clean and entirely accessible screen deck.

Protected machinery

All motors for the Bosker Range of Trashrakes are concealed and protected within the trolley assembly. A hoist motor, which lowers and lifts the Rake's gripper, drives through a gearbox to the main hoist shaft. Cable drums are fitted to this shaft on which the main lift cables are wound. The Trashrake's powerpack is a self-contained unit where core components such as the motor, pump, solenoid valve, filters and pressure relief valve can all be easily accessed for maintenance.

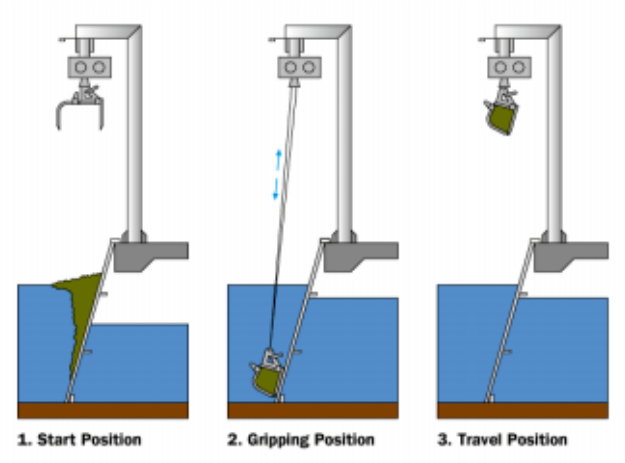
The control cabling is routed through the supporting framework. Hydraulic drums, which contain the hoses to the grab's close and open rams, are driven by the main hoist motor with a spring tension system to ensure a constant and equal tension is always maintained. The trolley also contains the travelling motor and hydraulic powerpack.

Bar Screen	Minimum	Maximum
Bar Screen spacing	12mm	300mm
Bar Screen depth	1.5 metres	60+ metres
Bar Screen angle	≥0	40

Bar screen specification details

Trashrake operation

The Trashrake traverses on a monorail track over the screen and dump areas. Travel speeds are between 10-30m/min. At installations where there is a long track length and a heavy debris loading, a dual travel speed of 30-60 m/min would be specified to reduce the overall cleaning cycle time.



1 At the start signal, in automatic mode, the Bosker Overhead Trashrake travels to a designated screen area and stops over its first pickup point.
2 The gripper descends to the bottom of the screen collecting debris in its teeth. Cylinders close the gripper and the hoist elevates the gripper and debris to the trolley.
3 The trolley and gripper return to the dump area where the gripper lowers then opens, releasing debris into the hopper, trailer or other dumpsite.

The Bosker Overhead Trashrake then moves to the second pick-up point at the screen, continuing the automatic cycle until the screen area is clean.

Full manual control by remote pendant.

Alternative materials

Grippers can be produced in a variety of materials depending upon the application. These vary from stainless steel, with its non-corrosive properties well suited to seawater and sewage, to hot-dipped galvanised steel for fresh water environments. A non-spark aluminium-bronze design is a further alternative for sewage plants where non-sparking materials are mandatory.

The Bosker Overhead Trashrake operating fully automatically under heavy debris conditions.

The supporting framework for the Overhead Bosker Trashrake is constructed from long-lasting hot-dipped tubular galvanised steel sections. This structure is tailored to each installation and is designed to optimise available space, whilst being aesthetically sympathetic when retrofitted to existing sites. In order to reduce alterations to civil works the Trashrake's framework is mounted to existing floors and walls.

Sewage gripper

The gantry and grab can be designed to suit any layout.

An installation in Hong Kong with two Bosker Overhead Trashrakes working over two intakes on a common track.

Eimco Water Technologies designed, manufactured and installed the above Bosker Overhead Trashrake with two machines on a common track each with a 3,000kg lifting capacity.

Bosker Bandit Trashrake

Small or remote intakes
Bosker Bandit Trashrakes are the ideal solution for small, often remote, intakes such as culverts and land drainage systems. As with Bosker Overhead Trashrakes, Bandits can be easily retrofitted into existing intakes and can be operated either by a pre-programmed cycle, manual activation or level differential. The latter option is particularly useful for dealing with the unexpected volumes of debris often caused by severe seasonal conditions.

Bosker Bandit Trashrakes can also be successfully applied to alternative sites, including river intakes and sewage treatment plants. In these installations the Rake's grab can be manufactured in different materials according to the nature of the effluent, including hot-dipped galvanised mild steel, stainless steel or non-sparking aluminium bronze for particular sewage applications.

Stainless steel, with special coatings to enhance its non-corrosive properties, is commonly used for saltwater environments in the Middle East.

Dexterity
Bosker Bandit Trashrakes are supplied by EWT as a standard 250kg SWL design. A single cabinet control panel is included within the package. All Bosker Bandit Trashrakes have the ability to execute turns of up to 270°.

This dexterity in movement, combined with an extendible raking arm that is operated by three hydraulic rams, ensures even the most awkward intake can be effectively cleared of rubbish. Like the Bosker Overhead Trashrake, the tines of the Bosker Bandit's grab fully penetrate the intake's bar screens, so that even embedded and trapped debris is cleanly removed.

Bosker Mobile Bandit Trashrake
For intake widths greater than 2.7m, the Bosker Bandit Trashrake can be located on a deck-mounted travel carriage. This enables the Rake to clean multiple intakes and provides a low profile alternative to the Overhead Trashrake.

Bosker Bandit Trash Rake Specifications	
Safe working load	250kg
Grab width – minimum	1.2m
Grab width – maximum	2.5m
Maximum depth of screen	5m
Bar spacing – minimum	12mm
Bar spacing – maximum	200mm
Stroke length	2.5m (approx)
Dump height	1.6m (approx)
Mounting dimensions	Length 1m, width 1m, height 3m
Hydraulic motor size	2.2kW
Hydraulic working pressure	200 bar

Bosker Bandit debris being dumped directly into containers for waste treatment or recycling.

Design and analysis
EWT uses state-of-the-art computer aided design programmes at its manufacturing facilities with ProEngineer used as the basis for design and draughting activities. With advanced 3D graphics and modelling, products are designed and tested in different operating conditions and requirements for its customers. This system, in conjunction with our finite analysis package, always ensures sound engineering is always applied to each project.

Install, commission, maintain
EWT's service engineers will install, commission and maintain all machines supplied by the EWT Group. Our team of international engineers will visit sites around the world to advise on all aspects of our products.

EWT is able to provide long-term agreements covering spares and maintenance,relieving you of costly overheads by providing trained personnel where and when you need them – particularly during planned shut downs.

Spare parts
EWT retain comprehensive records of all the machines they have built. The records can be accessed quickly on our computerised spare parts database held in Colchester, UK, and Houston, USA. The spares supplied are genuine, guaranteed and backed by our detailed knowledge of all the subsequent modifications, or upgrades, that may have occurred since the machines were supplied.

Our spares managers are available for advice at any time. We can recommend suitable spare parts both for holding on site as strategic spares, and for your long term needs for planned maintenance shut downs. Spares are ex-works, delivered to site for installation.

Training
As a supplier of engineered capital equipment, it is natural for us to offer our end users on-site or in-house training courses. We have skilled instructors available and can train your staff in all aspects of equipment use, including detailed instructions for replacement of parts, adjustment and monitoring.

The training courses are for individuals on a one-to-one basis or for groups of up to eight, either on-site or in our worldwide offices. Contact our spares and service managers for details of the courses available.

EIMCO WATER TECHNOLOGIES

Brunel Way
Colchester
Essex, C04 9QX

Tel: +44 (0) 1206 756600
Fax: +44 (0) 1206 756500

For more information visit us at www.glv.com