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# **SOLUTIONS FOR ENVIRONMENT**

**ADVANCED WASTEWATER TREATMENT EQUIPMENT**



DOWON APEX CORPORATION  
ISO9001:2015 Q288511

# Top quality management and customer impression is DWA' s business goal.

DWA, DOWON APEX CORPORATION is a professional manufacturer that designs and fabricates advanced water & wastewater equipment in Korea. Since the foundation in 1996, DWA has supplied & installed metal or non- metal chain flight sludge scraper systems, rotary automatic bar screens, mechanical coarse & fine bar screens, automatic grab screens, travelling bridge scraper systems, bridge sludge collectors, band screens, cake hoppers, belt & screw conveyors at water, sewer, and wastewater treatment plant in 15 countries on the world.

Together with continuous growth in every year, DWA has awarded Million Exporter Trophy and Certificates of Commendation for exporting activities from Korean government, Busan Metropolitan city, and the ministry of natural resources and environment, Vietnam government from 2011 to 2018. DWA has been qualified its quality management system by ISO 9001:2015 since 2004 and hopes to provide with the best solutions in the development of advanced water & wastewater technology on world. Our brochure reflects the level of our commitment with finest technology to our valuable customers. Please choose DOWON APEX CORPORATION. to your technical partner in your project.



ISO 9001 : 2015



Million Exporter Trophy 2011

## Rotary automatic bar screens

Automatic rotary bar screens are installed on inlet side of river water intake and pumping station to lift-up trashes and screenings automatically in raw water. The opening of bar is 50mm mostly. Wet parts contacting water are made of stainless steel. Double chains are also made of stainless steel. Rotary operated chains are installed both end sides of equipment and lift trashes and screenings by 4 rakes automatically. Different reduction ratio of geared drive system (cycloid) is applied. Lifting weight is 350kg/cycle. Inclination of screen is 75 degree. Pitch of screen, number of rakes, space of bars, rotation speed, and others, are adjustable at the design stage of equipment, according to customer's requests.



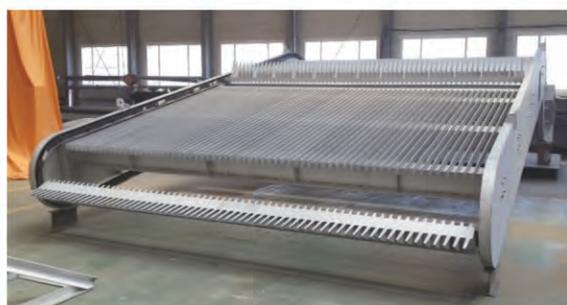
Channel dimension W8 x H13m, Bangkok, Thailand



Channel dimension W8 x H13m



Channel dimension W5 x H10m



Channel dimension W5 x H11m

## Mechanical bar screens



Installation of fine mechanical bar screen

DWA supplies Coarse & Fine mechanical automatic screens, double chain rakes rotation type, for grit chamber. All of equipment are made of stainless steel 304 or 316. Main chain for rake rotation is also made of stainless steel. PLC system is applied to automatic operation and interactive with auxiliary equipment. For the rake cleaning, a sludge scraper installed on the top of screen equipment. Installation inclination is 60. to 75°. Bar clearance is 25mm for coarse screens and 6mm for fine screens. Typical raking speed is 3m/min. The bar clearance, rake speed and others will be adjustable according to customer request. A wedge bar system will be applied to fine screen to avoid clogging of screenings passing through.



Test run in DWA's shop



## ■ Automatic band screens

Automatic band screens are installed on rear flow of travelling bridge scraper system at river water intake station for potable treatment plant, to lift-up fine screenings. Inclination of screen is 85 to 90 degree. The equipment is consisted of stainless-steel mesh screen, rib plate, chain, drive & driven sprocket, shaft, guide & guide angle, cycloid geared type drive & reduction system. Mostly opening of mesh screen is 3 to 4mm. Driving speed of mesh screen is variable according to inlet volume of screenings.



6 Band screens are installed in potable water treatment plant in Korea



2nd stage of water intake station



Stainless mesh plates to lift up small screenings, 3mm of opening

### ■ Chain flight sludge scraper systems

Rectangular metal chain flight sludge scraper system for high loads of sludge removal. It provides higher sludge removal efficiency than any other scraper mechanism due to metal flights installed. In the view of high loads of sludge removal, space of installation, power consumption, and long duration of operation, the most economical scraper system is chain flight sludge scraper system.



20 sludge scrapers installed in rectangular primary and secondary settling tanks in Istanbul, Turkey  
W4.8 x H4.3 x L42m 10 units and W4.8 x H4.3 x L24m 10 units.  
Scrapping speed is 0.2 ~ 0.6m/min. Cycloid drive system.

## ■ Chain flight sludge scraper systems



Cast iron sprockets and steel flights tar epoxy coated



## ■ Sludge cake hopper



Slide gates opens by power cylinders. 4 road cells installed.



## ■ Belt and screw conveyors



Belt conveyor, 51m, with platform



### ■ Non-metal chain flight sludge collectors

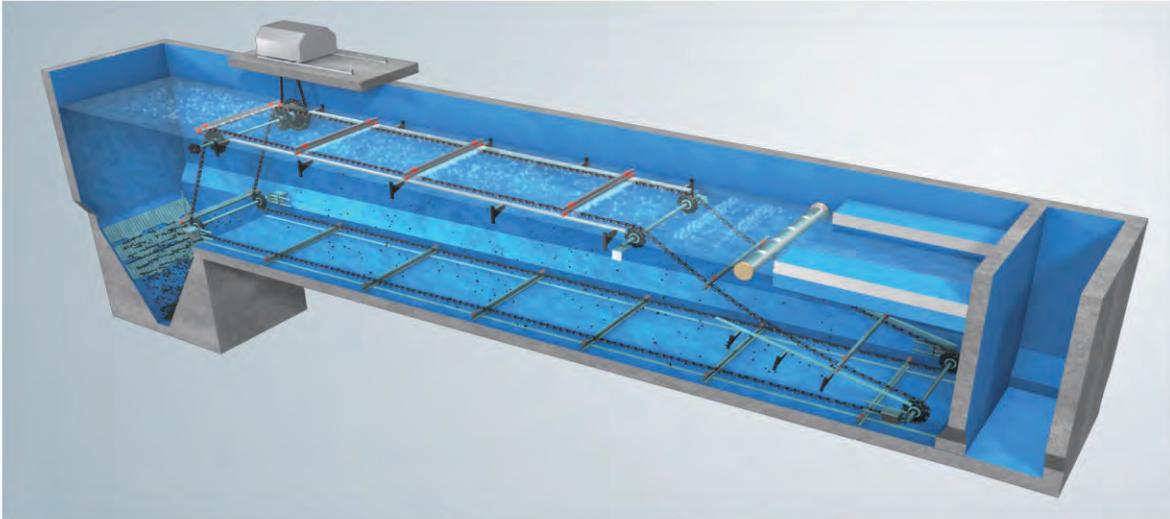
DWA designs, manufactures and supplies non-metallic sludge collectors for primary & secondary rectangular sludge settling tanks in sewer and wastewater treatment plants on international market. Non-metal sludge collector is characterized in its anti-corrosiveness and easy installation by the lightweight of materials applied, and because of those reasons, most of plants on the world tend to install non-metallic sludge collectors on their sewer, wastewater, and desalination plants. Primary sludge settling tanks collect settled sludge by flights to sludge hopper in the end of settling tanks and remove floated scums by the run of flights on the top of system to scum skimmers. Surplus sludge will be removed in secondary sludge settling tanks



Non-metal sludge collectors, 8 units for primary sludge settling tanks, and 4 units for secondary sludge settling tanks, supplied and has started run by DWA in Kathmandu, Nepal in 2018 to 2019. Dimensions are 23Lx5Wx3.5Hm and 40Lx4Wx3.5Hm



## ■ Non-metal chain flight sludge collector



Cross section of non-metal sludge collector

### ■ Drive unit

Drive unit will be a horizontal cycloid reduction unit. Power transmission will be done by non-metallic drive chain, Nylon 66, 66.27 mm of pitch.



### ■ Collector chain

A high tension of non-metal, Polyketone, chain, Pintle type, 152.4mm of pitch, will be applied to collector chain. Average weight per meter is 2.4kg. Stainless steel pins are inserted.



Collector chains, Head sprockets, Driven sprockets, Take up sprockets

### ■ Non-metal chain flight sludge collectors

#### ■ Sprocket wheel

Driven sprocket is made of high-density polyurethane, less than 0.3% of absorbing rate and no. of tooth is 40 pcs, pitch of 66.27mm Main sprocket wheel for collector chain will be high density of polyurethane, which is 12 pcs of tooth no. and 152.4mm of pitch. Idle sprocket for collector chain is made high density of polyurethane, less than 0.5% of absorbing rate, which is 9 pcs of tooth no. and 152.4mm of pitch.



Head sprockets, Driven sprockets, Take up sprockets



#### ■ Wearing shoe

12mm thickness of wearing shoe will be attached each flight to prevent abrasion of flight during run of flight on rail and return track. Wearing shoe will be made of high tensile of polyurethane.

## ■ Non-metal chain flight sludge collectors

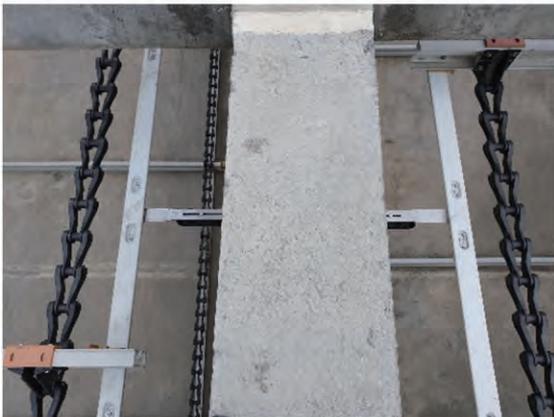
### ■ Flight



Flight will be made of G.R.P. which is drawn construction to avoid crack and maintain high strength. GRP has been reinforced by high strength of fiber glass by 50% and absorbing rate is less than 0.5%. Mostly installed by 3m of interval

### ■ Carry & return wear strip

In order to guide flight running on bottom of settling tank, a set of wear strip, 10mm thickness, UNMW polyethylene will be installed. Wear strip will be fixed by stainless steel cone type washer



### ■ Control panel

650 x 900 x 400mm 2T,  
STS304.

Automatic and manual operation by Remote/Local selector switch. Alarm and auto stop of motor by torque limit installed. Automatic stop of equipment by all fault signals and re-set are available.



### ■ Non-metal chain flight sludge collectors

#### ■ Scum skimmer

Main body of scum skimmer will be made of stainless pipe 304,  $\varnothing 250\text{mm}$ . There will be some openings to receive and discharge scums. The pipe will be supported by both sides to endure twist and loop of pipe. A drive unit and control panel embedded.



Scum pipes



Actuator control panel embedded

## ■ Submersible sludge scrapping system by travelling bridge

Travelling bridge scraper systems installed at local sewer treatment and potable water treatment plants. Wide is 5 to 12 meters in one bridge for one channel or one bridge for two channels. Ideal for the scrapping of heavy-duty top and bottom sludge. Forwarding speed of bridge is 0.2 to 1.8m/min, variable, and reverse speed is 1.8m/min, variable. Cycloid reduction drive system, skimmer and scraper installed to scrap top and bottom sludge. Cable reel installed.



10 units installed in a local sewer treatment plant



Submersible sludge scraper driven by stainless steel wires



Scraper in potable water treatment plant



One drive for two channels

## ■ Circular bridge sludge scrapers & thickening systems

According to inlet sludge flow, either center driving or peripheral driven type of sludge scraper system will be selected. If the inflow capacity is bigger, or applied to sludge thickening, peripheral driven type of sludge scraper will be selected. Surface scum will be removed by scum skimmer and sludge settled on bottom will be scraped to center hopper by bottom scraper



Center feed well made of stainless steel



Insulation devices



Scraper arms & handrails



Center cages and walkway

### ■ Automatic grit separators

DWA supplies automatic grit separator to separate grit and water in grit chamber. All materials are made of stainless steel 304 or 316. Screw conveyor, to discharge grit to out, is also made of stainless steel, and PLC system is applied to automatic operation and interactive with auxiliary equipment. For the cleaning of sludge, a cleaning air fan system, 0.75kw is installed. The system is consisted of inlet nozzle, settling tank, inclination plate to separate the grit and water well, cleaned water drain, & etc. A water enclosure gland packing inserted to avoid leakage of settled water in the bottom of screw conveyor. Typical diameter and length of screw conveyor is  $\varnothing 250 \times 4500\text{mm}$ .



PLC testing for 2 automatic grit separators for Viet Tri Wastewater Treatment plant in Vietnam.  
Capacity is 20,000m<sup>3</sup>/day



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