

JORSUN SHANGHAI JORSUN ENVIRONMENT CO.,LTD.

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Product Catalog [2023]

O1 JORSUN CORPORATE PROFILE

2004

Inception In Shanghai

3000+

Global Project Application Cases

40 + Patents













Inception in 2004 in Shanghai, Shanghai Jorsun Environment Co., Ltd is a professional environmental protection equipment manufacturer with business covering research and development, design, manufacturing, sales and service.

Jorsun main technology focuses on DAF (Dissolved Air Flotation), Lamella[®] Clarifier and system solutions.

Jorsun is a national high-tech enterprise and possess certification of ISO9001. With the concept of "professionalism and innovation", Jorsun has made breakthroughs in the standardization and series technology of high-speed DAF, high-speed Lamella [®] Clarifier and other equipments, and has 40+ related patents.

Adhering to the commitment of "integrity and safety", Jorsun continuously improves the quality of products and services in the process of cooperation with customers to enhance customer satisfaction. Jorsun has provided quality products and services to hundreds of contractors and thousands of users in more than 40 countries and regions worldwide. Up till now, Jorsun has more than 3,000 water treatment project application cases.

With the goal of becoming a leading water separation technology company with a sense of safety and trust, after years of operation, Jorsun has gathered a team of energetic and motivated professionals to move forward without forgetting the original intention.

JORSUN CORPORATE CULTURE



QUALIFICATION CERTIFICATE



















Trade Mark Certificate

实用新型专利证书

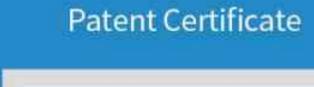
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Patent Certificate



Patent Certificate

Patent Certificate

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Patent Certificate

JORSUN JORSUN 05 JORSUN **MAJOR ACHIEVEMENTS** 2004 — Worked on service, sales and marketing in dissolved air flotation field. 0000 2005 — Designed a high-efficiency inclined plate settler, named Lamella Clarifier. 2008 — Applied for the patent of chain plate slag scraper and promote its application. 2019 2009 — Standardize DAF series as 2000 version. 2010 — Developed high efficient sedimentation DAF. 2012 — Optimized the lamella clarifier 2013 version. 2012 2019 — Optimized DAF series 2020 version. 2020 — Developed and launched the Roll flow® —DAF. 2022 — 2023 improved high-speed Lamera precipitator. 2010 2009 2008 2004

JORSUN MANUFACTURING PROCESS







2 CNC Cutting



3 CNC Bending



Welding



5 Detection





7 Factory Commissioning



Delivery

JORSUN

COOPERATION PROCESS



Consultation



Manufacturing 04



Proposal



Contract





Delivery

05



On-site Service 06

JORSUN 09

JORSUN **OUR CLIENTS**























































































































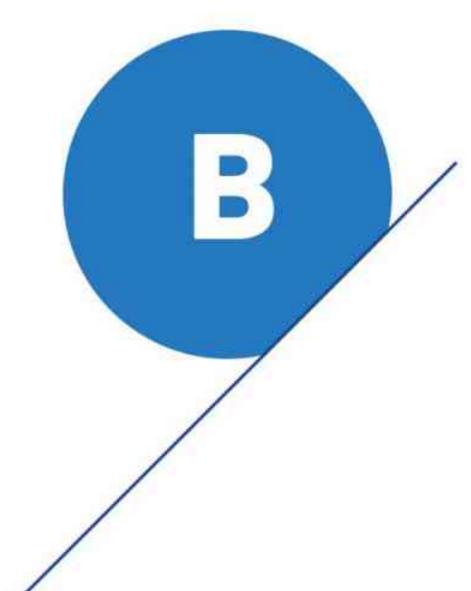




DAF Introduction DAF&IDAF- Standard &Integrated DAF DAF2&IDAF2- Sedimentation&Integrated DAF SDAF-High Efficiency Sedimentation DAF RF-DAF-Super Roll Flow®-DAF

JORSUN

11~20



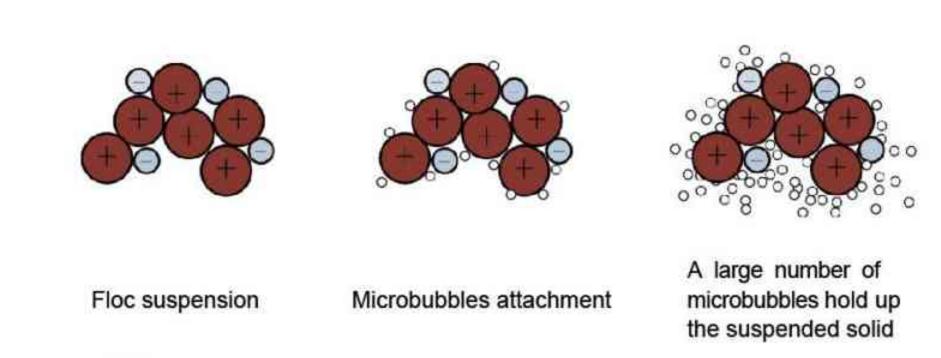
Lamella ®Clarifier

Lamella®Clarifier Introduction LST2-Lamella®Clarifier

21~24

JORSUN Dissolved Air Flotation





Application Fields

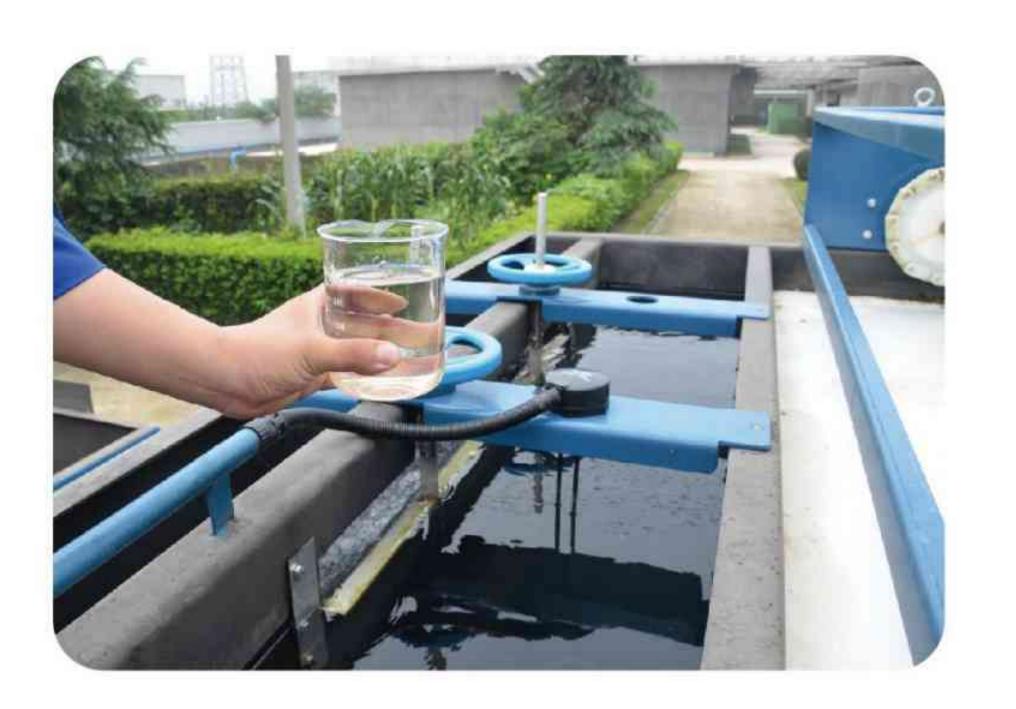
- Industrial wastewater pretreatment: food, pharmaceuticals, textile printing and dyeing, semiconductors, machinery, steel, chemical industry, breeding and etc.
- Sewage treatment plant: pretreatment, standard improvement, phosphorus removal.
- Waterworks: algae removal.
- Ecology: river and lake water purification, landscape water treatment.
- Seawater desalination.

About DAF

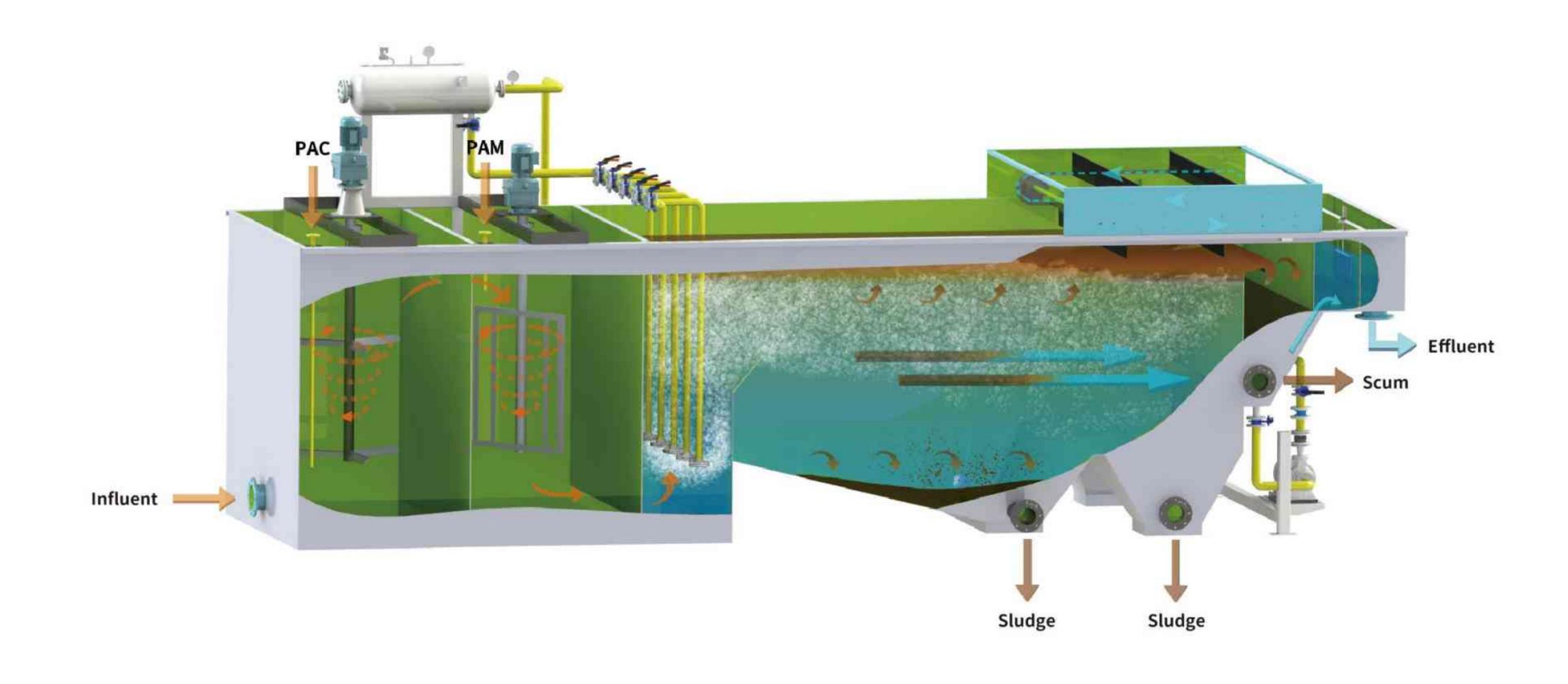
Working Principle

Air flotation is a process technology device to achieve solid-liquid separation or liquid-liquid separation. It is mainly used to separate and remove suspended solid, colloid, oil or grease, algae and other substances in water with density close to or smaller than water.

According to Henry's law, through the dissolving and releasing process of air flotation, the air flotation device can produce a huge amount of micro bubbles with particle size of 3~30µm in water. After water or wastewater is coagulated or flocculated, the suspended solid or colloid in water forms large flocs, and after entering the air flotation device, the large flocs fully mix and contact with the micro bubbles, and form a floating body with less density than water after adhering to the micro bubbles, which floats to the water surface and is skimmed off by the scraper to achieve solid-liquid separation and purification of water quality.



DAF Process

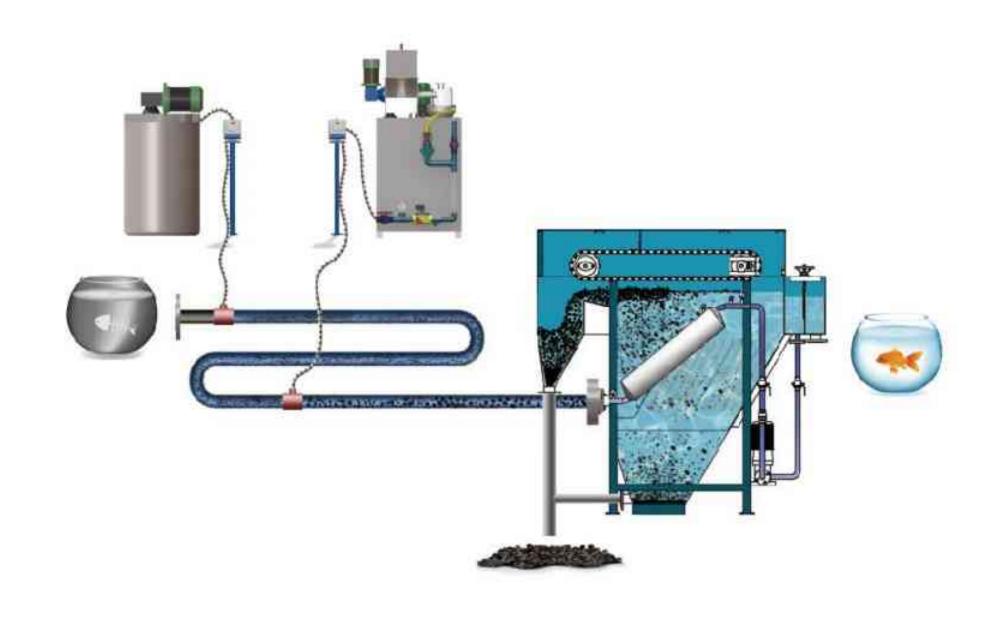


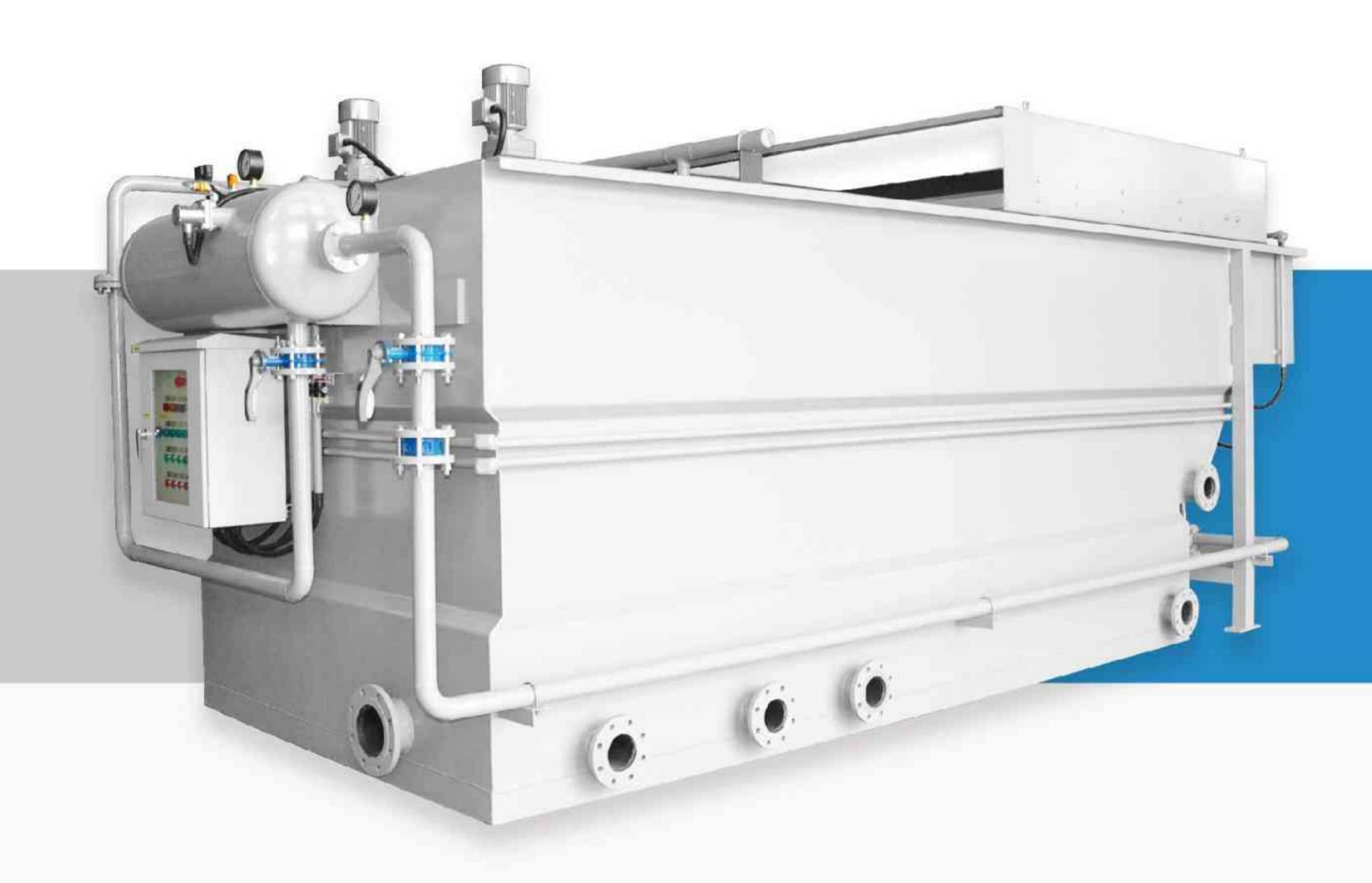
DAF Effects



DAF System Process

JORSUN

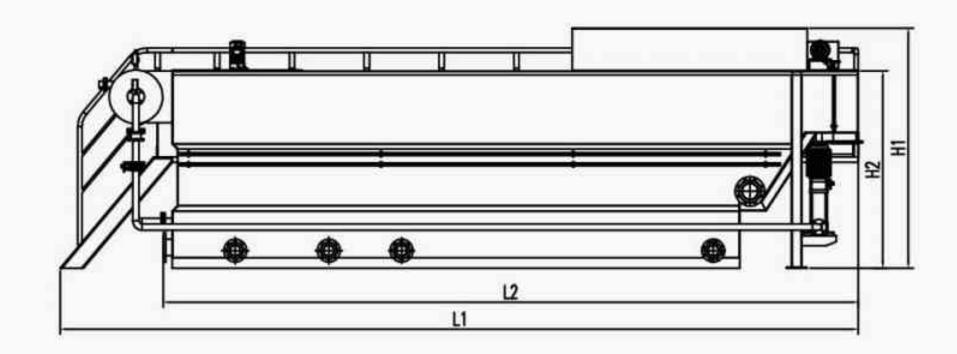




This DAF (Dissolved Air Flotation) device is a typical dissolved air flotation model with high market retention, wide range of applications, high resistance to solid load, and excellant operational stability. It is mainly used in the industrial wastewater pretreatment stage and has better performance when used after sedimentation processes. It is also widely used in river and lake water purification treatment.

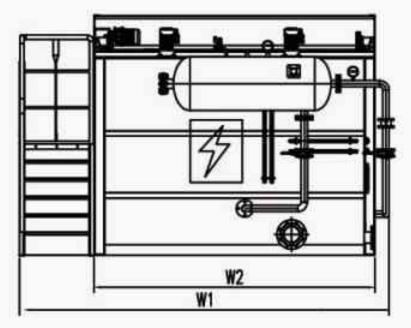
Features •

- Overall pry installation, facilitating installation and application.
- Equipped with an efficient dissolved air system and had a stable and reliable separation structure.
- Come with a safe scum removal device.
- Stable performance that is easy to maintain.
- The hydraulic load is 5~8m/h.
- Withstand high suspended solids concentrations, up to 1500mg/L of suspended solids.



Application Fields •

- Industrial wastewater pretreatment
- Aquaculture wastewater treatment
- Sewage treatment for small and medium-sized water volumes and river/lake water treatment



DAF&IDAF

Standard & Integrated DAF

Model	Capacity		P	ower (k	W)			Dimens	ion (m)			Nozzle l	ist (DN)	
DAF/ IDAF	m³/h	Recycle	Air compressor	Skimmer	IDAF Fast mixer	IDAF Slow mixer	DAF L ₁ /L ₂	IDAF L ₁ /L ₂	W ₁ /W ₂	H ₁ /H ₂	Inlet (a)	Outlet (b)	Sludge outlet (c)	Vent nozzle (d)
003	~ 3	0.75	0.55	0.12	0.37	0.25	3.6/2.8	4.1/3.2	2.4/1.2	2.2/1.7	50	50	80	80
005	~ 5	1.1	0.55	0.12	0.37	0.25	3.8/3.0	4.4/3.6	2.4/1.2	2.2/1.7	80	80	80	80
010	~ 10	4.0	0.55	0.12	0.37	0.25	4.3/3.3	5.0/4.0	2.9/1.7	2.4/1.9	100	100	100	100
020	~ 20	4.0	0.75	0.12	0.37	0.25	5.7/4.8	6.2/5.2	3.2/2.2	2.4/1.9	150	100	100	100
030	~ 30	5.5	0.75	0.12	0.37	0.25	6.5/5.5	7.7/6.7	3.2/2.2	2.4/1.9	150	150	150	100
040	~ 40	5.5	0.75	0.12	0.75	0.37	6.5/5.5	7.7/6.7	3.6/2.7	2.4/1.9	200	200	150	100
050	~ 50	7.5	0.75	0.12	0.75	0.37	7.3/6.3	8.8/7.8	3.6/2.7	2.4/1.9	200	200	150	100
080	~ 80	11	1.5	0.12	1.5	0.37	8.9/7.6	10.6/9.2	4.4/3.4	2.7/2.3	250	200	150	100
100	~ 100	11	1.5	0.12	1.5	0.37	10.8/9.4	13.2/11.8	4.4/3.4	2.7/2.3	300	250	150	100
120	~ 120	11	2.2	0.12	1.5	0.37	11.7/10.4	14.2/12.8	4.4/3.4	2.7/2.3	300	250	150	100
150	~ 150	15	3	0.12	1.5	0.37	13.5/12.0	15.8/14.4	4.5/3.8	2.7/2.3	300	300	150	100

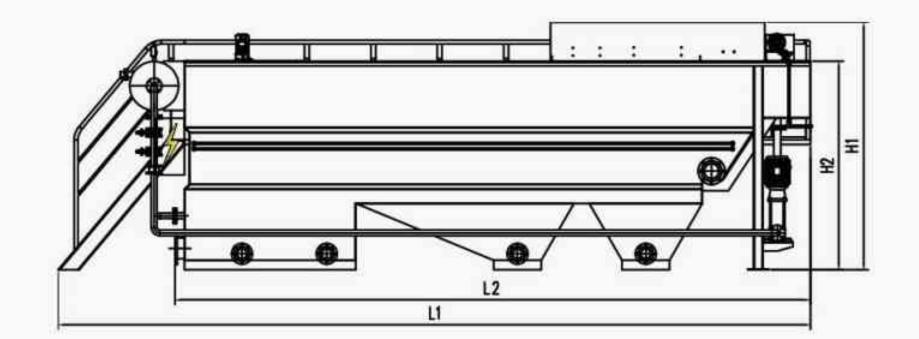
DAF2&IDAF2

Sedimentation & Integrated DAF

This DAF (Dissolved Air Flotation) device is an upgraded version of the standard DAF device which can better adapt to adverse conditions such as complicated water quality, high concentrations of suspended solids, and easy sedimentation of flocs during the flotation process. It has stronger tolerance to water quality and can withstand higher solid loads. It is widely used in industrial wastewater pretreatment and high-suspended solids water treatment processes.

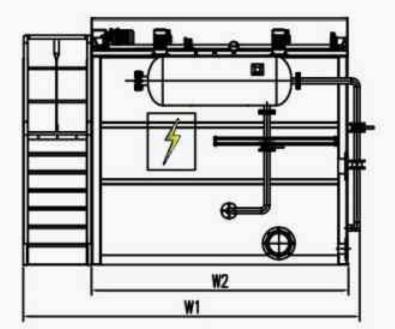
Features •

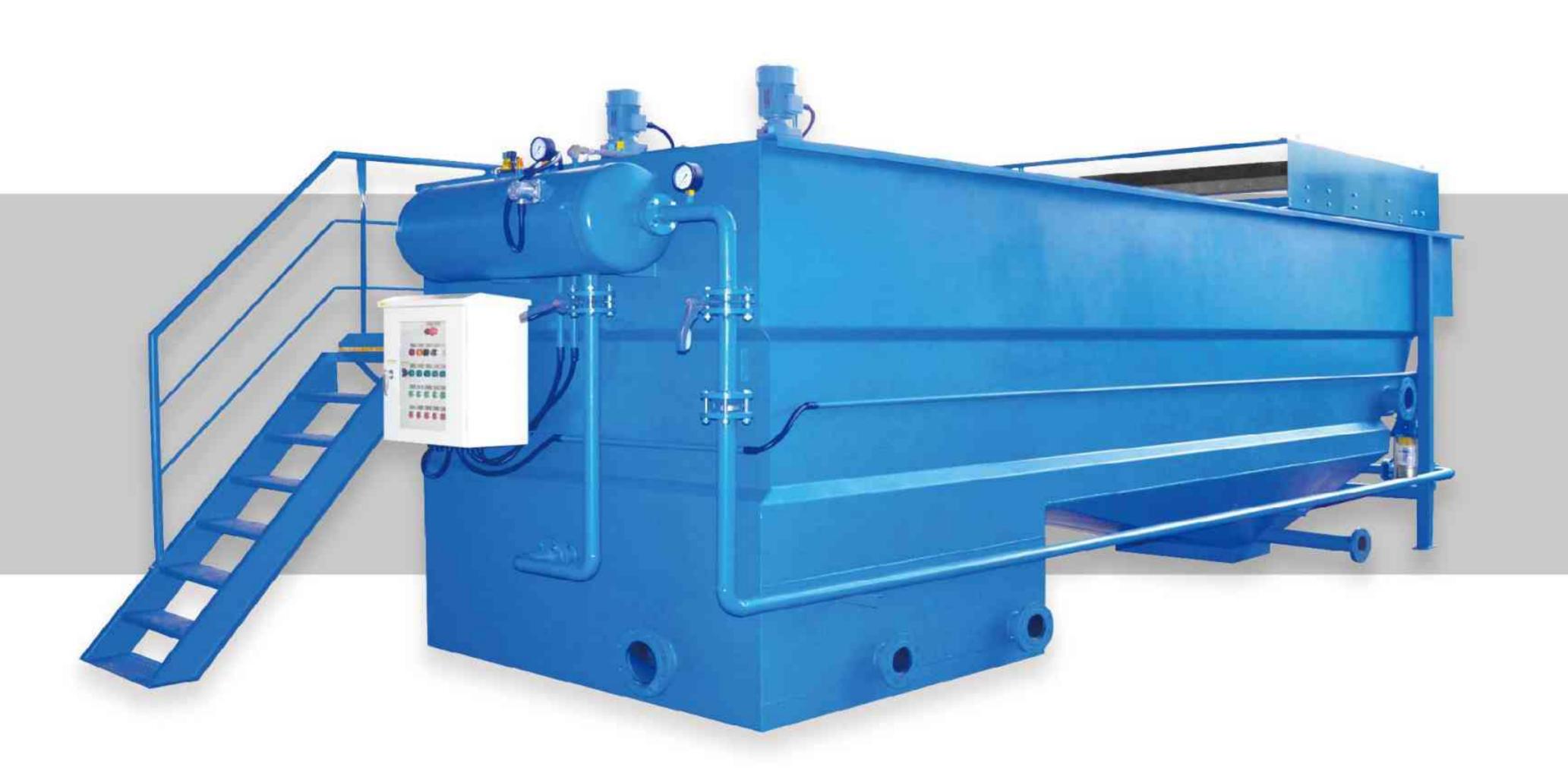
- Overall pry installation, facilitating installation and application.
- Equipped with an efficient dissolved air system and a stable and reliable separation structure.
- Come with a safe scum removal device.
- The hydraulic load is 5~8m/h.
- Withstand high suspended solids concentrations, usually up to 2500mg/L of suspended solids.



Application Fields •

- Industrial wastewater pretreatment
- Aquaculture wastewater treatment





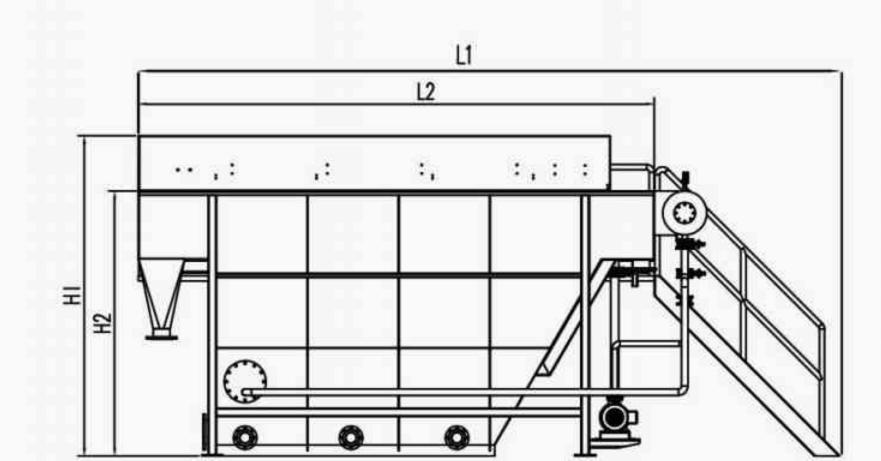
Model	Capacity		P	ower (k	W)			Dimens	ion (m)			Nozzle	list (DN)
DAF2/ IDAF2	m³/h	Recycle	Air compressor	Skimmer	IDAF2 Fast mixer	IDAF2 Slow mixer	DAF2 L ₁ /L ₂	IDAF2 L ₁ /L ₂	W ₁ /W ₂	H ₁ /H ₂	Inlet (a)	Outlet (b)	Sludge outlet (c)	Vent nozzle (d)
010	~10	4.0	0.55	0.12	0.37	0.25	4.3/3.3	5.3/4.0	2.9/1.7	2.7/2.2	100	100	100	100
020	~ 20	4.0	0.75	0.12	0.37	0.25	6.1/4.8	6.5/5.2	3.2/2.2	2.7/2.2	150	100	100	100
030	~ 30	5.5	0.75	0.12	0.37	0.25	6.8/5.5	8.0/6.7	3.2/2.2	2.7/2.2	150	150	150	100
040	~40	5.5	0.75	0.12	0.75	0.37	6.8/5.5	8.0/6.7	3.6/2.7	2.6/2.2	200	200	150	100
050	~ 50	7.5	0.75	0.12	0.75	0.37	7.6/6.3	9.1/7.8	3.6/2.7	2.6/2.2	200	200	150	100
080	~ 80	11	1.5	0.12	1.5	0.37	9.2/7.6	10.8/9.2	4.4/3.4	3.0/2.6	250	200	150	100
100	~ 100	11	1.5	0.12	1.5	0.37	11.0/9.4	13.4/11.8	3 4.4/3.4	3.0/2.6	300	250	150	100
120	~ 120	11	2.2	0.12	1.5	0.37	12.0/10.4	14.4/12.8	3 4.4/3.4	3.0/2.6	300	250	150	100
150	~ 150	15	3	0.12	1.5	0.37	13.5/12.0) 15.8/14.4	4.5/3.8	3.0/2.6	300	300	150	100



SDAF is a dissolved air flotation product developed based on air flotation separation process. It has high resistance to suspended solids concentration and solid load.

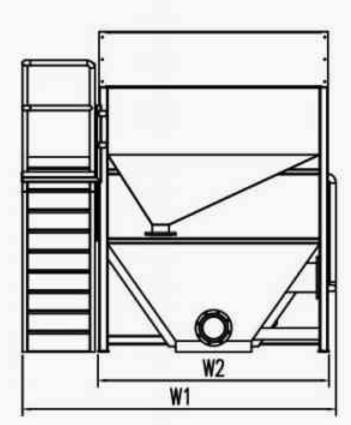
Features •

- Inclined plates in separation zone, it not only provides more effective separation area but also optimizes the flow distribution.
- Suitable for high concentration solid (suspended solids, oil and colloidal substance) content (the highest concentration of 10000 mg/L) waste water.
- Maximum hydraulic load at 12m/h and with better outlet water quality.
- Lower chemical consumption.
- No dead angle in scum collection area, no deposit.



Key Technology

- Micro bubbles generation technique
- Surface capture technology
- Counter flow box type skimming techique
- Horizontal flow technology in separation zone
- Scum recirculation and flocculation technology



SDAF

High Efficiency Sedimentation DAF

Model	Capacity		Power (kW)		Di	mension (m	1)	No	zzle list (D	N)
SDAF	m³/h	Recycle	Air compressor	Skimmer	Sludge scraper	L ₁ /L ₂	W ₁ /W ₂	H ₁ /H ₂	Inlet (a)	Outlet (b)	Sludge outlet (c)
003	~ 3	0.75	0.55	0.12	1	3.4/2.2	2.4/1.7	2.4/1.9	80	80	100
005	~ 5	1.1	0.55	0.12	/	3.8/2.5	2.4/1.7	2.5/2.1	80	80	100
010	~ 10	1.1	0.55	0.12	/	5.1/3.8	2.4/1.7	3.0/2.4	100	100	100
020	~ 20	3.0/5.5	0.75	0.12	/	5.4/4.1	2.9/2.2	3.0/2.4	150	150	150
030	~ 30	3.0/5.5	0.75	0.12	/	5.5/4.2	3.2/2.5	3.2/2.6	150	150	150
040	~ 40	4.0/5.5	0.75	0.12	/	6.5/5.2	3.2/2.5	3.2/2.6	200	200	150
050	~ 50	7.5	1.5	0.12	1.5	7.2/5.9	3.2/2.5	3.2/2.6	200	200	150
060	~ 60	7.5	1.5	0.12	1.5	7.6/6.7	2.7/3.3	3.3/2.7	250	250	150
080	~ 80	11	1.5	0.12	1.5*2	9.4/8.5	3.6/2.4	3.3/2.7	250	250	150
100	~ 100	15	2.2	0.12	1.5*2	10.0/8.8	3.7/3.0	3.3/2.7	300	250	150
120	~ 120	15	2.2	0.12	1.5*2	10.9/9.7	3.7/3.0	3.3/2.7	300	300	150
150	~ 150	18.5	2.2	0.12	1.5*2	13.5/12.2	3.7/3.0	3.3/2.7	350	300	150

RF-DAF

Super Roll Flow® DAF

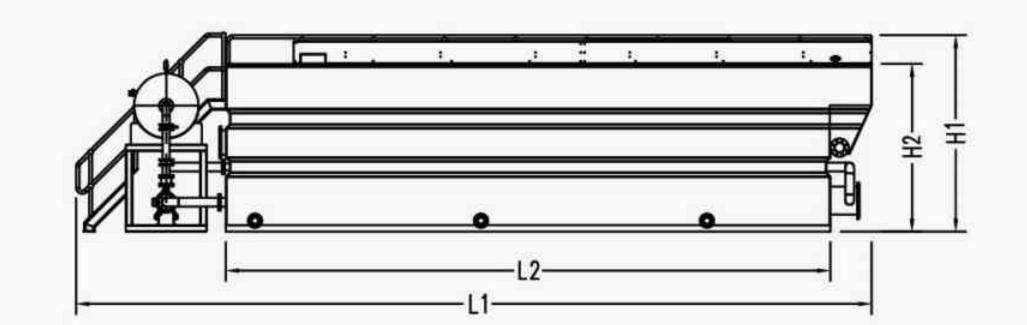
Roll Flow® DAF is a new generation of dissolved air flotation products adoting Jorsun's patented achievements. It is a high-speed and high-efficiency air flotation product that can handle large water volumes and withstand high hydraulic loads.

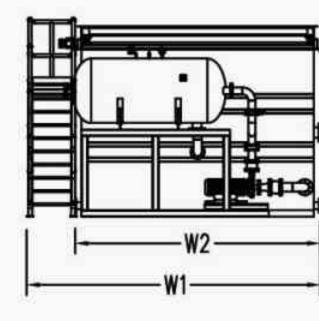
Features •

- High load, surface load at 15~52m/h.
- Large water volume, single unit processing capacity can reach 5×10⁴ m³/d.
- Low energy consumption with more than 50% saving.
- Save land occupation, reduce land occupation by 40~70%.
- Excellant water quality with effluent SS at less than 5mg/L, phosphorus at less than 0.1mg/L.
- Skid-mounted or civil construction are both available.

Key Technology

- Steady-state laminar flow technology in the separation zone
- Small resistance linear water distribution, isopotential synchronous water collection
- Dispersed dissolved air water distribution technique
- Equal load parallel separation technique
- Strong injection and wrapping high-speed dissolved air technique
- Full coverage skimmer technique







Application Fields •

- Sewage treatment for phosphorus removal, algae removal in water plants, purification of rivers, lakes and landscape water, pre-treatment for seawater desalination, etc.
- Industrial wastewater treatment.

Model	Capacity		Power (kW)		Di	mension (m)	Nozzle list (DN)				
RF-DAF	m³/d	Recycle	Air compressor	Skimmer	L ₁ /L ₂	W ₁ /W ₂	H ₁ /H ₂	Inlet (a)	Outlet (b)	Sludge outlet (c)	Vent nozzle (d)	
200	5000	11	2.2	0.12	8.0/6.0	3.8/3.0	2.9/2.6	350	300	150	100	
400	10000	18.5	2.2	0.12	10.9/8.6	4.6/3.8	3.1/2.8	500	400	150	100	
600	15000	22	3	0.24	13.5/11.2	4.8/4.0	3.1/2.8	600	500	150	100	
800	20000	30	3	0.24	16.8/14.5	4.8/4.0	3.1/2.8	650	600	150	100	
1000	24000	37	3	0.24	18.9/16.6	4.8/4.0	3.1/2.8	700	600	150	100	

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JORSUN Lamella ®Clarifier



Main Advantages

- ✓ High efficiency, usually the precipitation efficiency can be increased by 6~10 times.
- Small pool volume, less land occupation, saving about 80% of footprint compared to horizontal or radial sedimentation tanks.
- No dead corners, short circuits or vortices in the separation zone, using isobaric linear water distribution and synchronous water collection technology.
- The inclined plates do not clog, with a large enough spacing and equipped with backwash devices.
- Smooth sludge discharge, designed without sludge dead corners and equipped with mechanical scraping.
- Sturdy and durable, the thin plate components in the separation zone are made of high-strength and corrosion-resistant materials.

Construction Forms

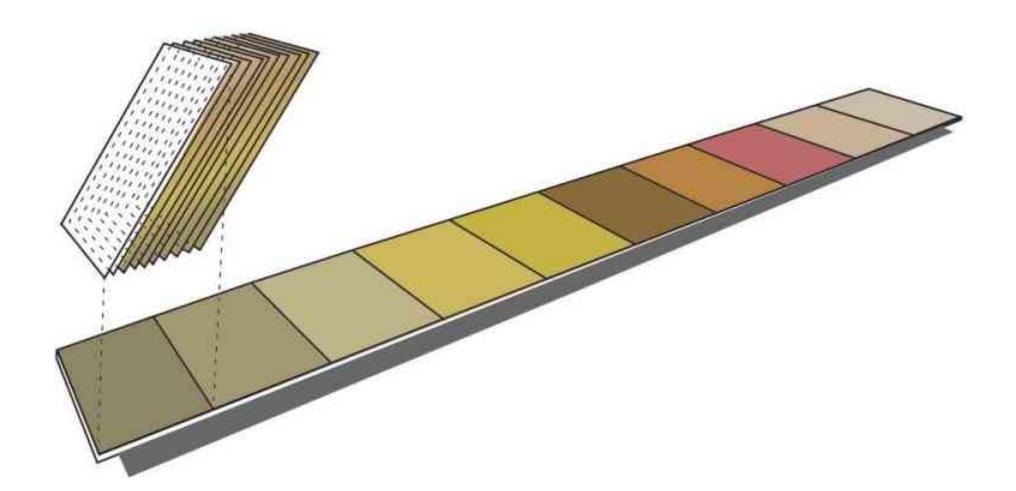
 Skid-mounted/civil structure/container transportation

About Lamella ®Clarifier

Working Principle

Lamella clarifier is an applied technology developed based on the shallow pool principle proposed by Hazen. That is, by setting a number of parallel inclined thin plates in the pool, a multiple effective precipitation area and excellent hydraulic flow pattern are obtained. Since there is positive correlation between precipitation capacity and effective precipitation area, the precipitation treatment efficiency can be increased by multiples.

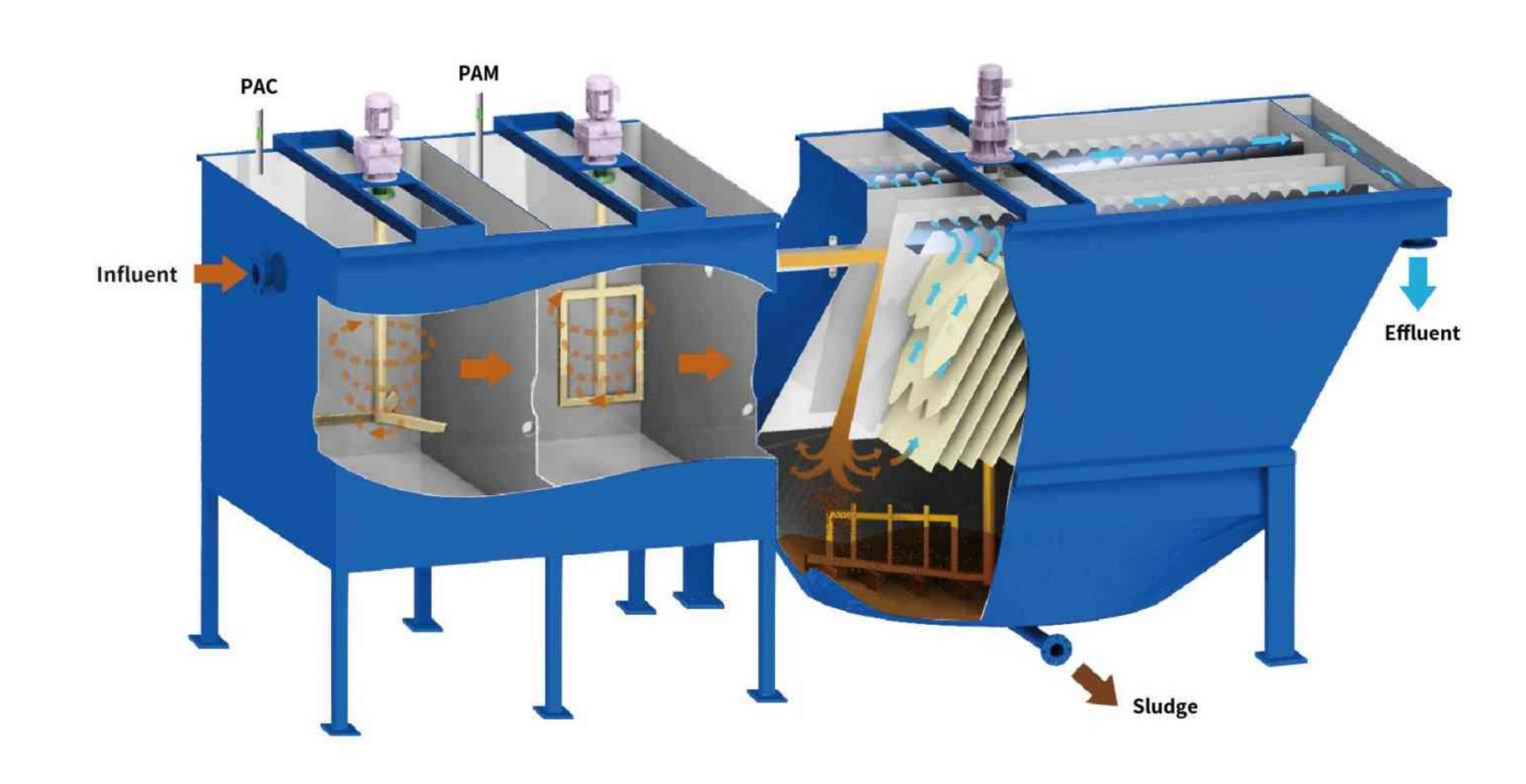
The effective precipitation area of lamella clarifier is the accumulation of the projection area of the inclined plates (as shown in the schematic diagram below).



Application Fields

- Chemical precipitation of industrial wastewater.
- Biochemical precipitation replacing traditional secondary sedimentation tanks.
- Upgrading of sewage treatment plants.
- Treatment of river and lake water.

Lamella Clarifier Separation Mechanism



Precipitation Effects

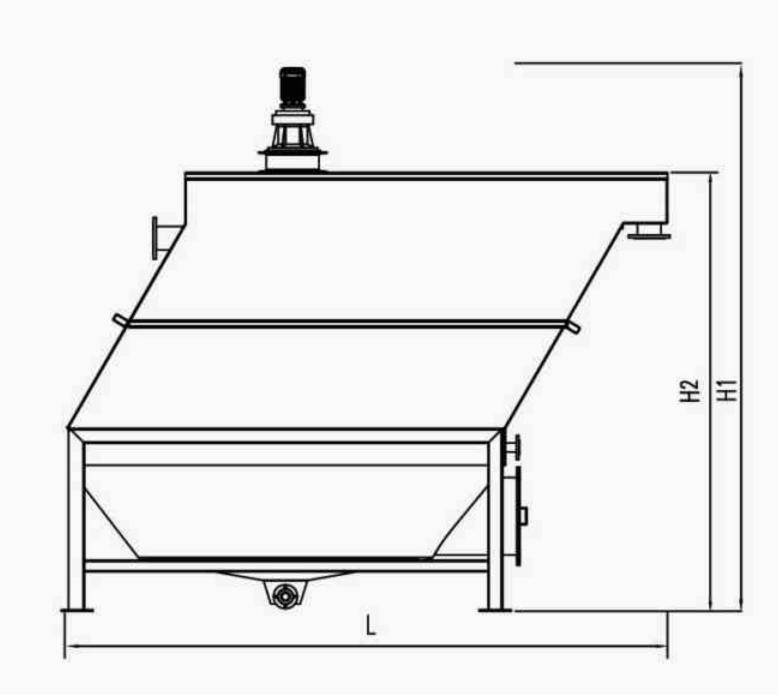


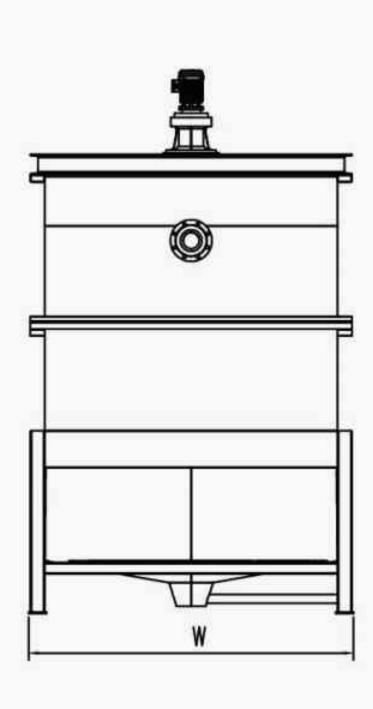


The Lamella clarifier is a high-efficiency solid-liquid separation device which achieves a multiple effective precipitation area per unit land area by setting a number of thin plates in the precipitation separation zone.

Features

- LST2 is a sedimentation tank with a mud hopper and scraper. It has one or more mud hopper with scrapers. It has significant advantages in the complete set of large sedimentation tanks.
- Advantages include large mud hopper volume, no dead corners for sludge discharge.

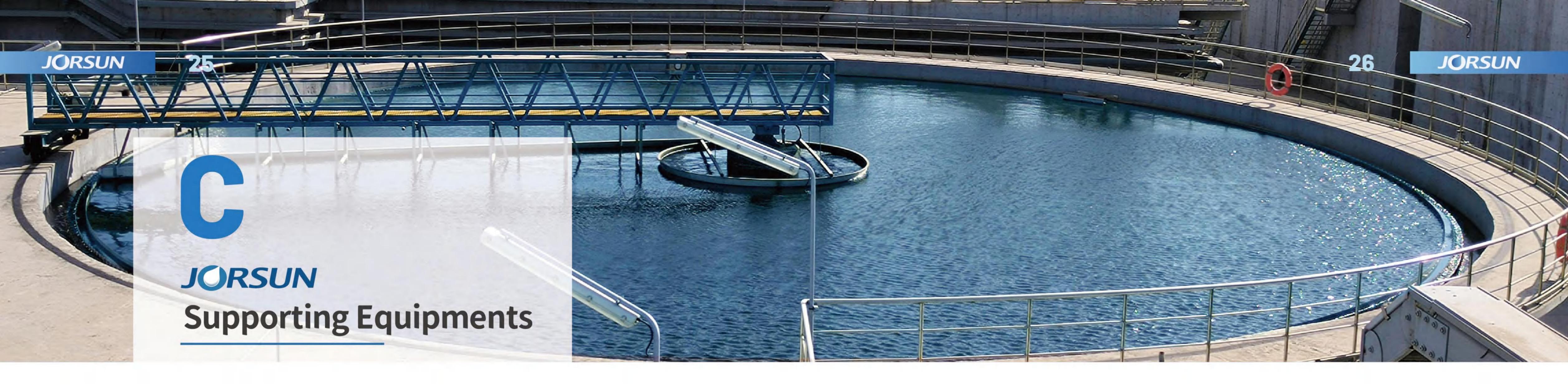




LST2

Lamella Clarifier

Model	Capacity	D	imension	(m)	Sludge scraper		lozzle list (DN) GB/JIS	/ANSL
LST 2	m³/h	L	W	H ₁ /H ₂	kW	Inlet (a)	Outlet (b)	Sludge outlet (c)	Backwash (d)
005-7	5	2.2	1.7	3.2/2.4	0.25	80	50	50	50
010-11	10	2.9	1.7	3.2/2.4	0.25	100	80	50	50
015-21	15	2.8	2.2	3.8/3.0	0.25	100	80	80	50
020-30	20	3.5	2.2	3.8/3.0	0.25	150	150	100	50
035-43	35	3.9	2.2	4.3/3.5	0.25	200	150	100	50
040-52	40	3.8	2.8	4.3/3.5	0.25	200	200	100	50
055-72	55	4.4	2.8	4.3/3.5	0.25	250	250	100	50
065-82	65	4.2	3.3	4.3/3.5	0.25	250	250	100	50
080-105	80	4.9	3.3	4.3/3.5	0.25	250	250	100	50
%070-95	70	6.6	2.2	4.3/3.5	0.25*2	250	250	100	50
%120-150	120	7.7	2.8	4.4/3.6	0.25*2	300	300	100	50
※180-215	180	8.5	3.3	4.4/3.6	0.25*2	350	350	100	50



MFR Mechanical Chemical Reaction



MFR device is a common chemical reaction device for Dissolved Air Flotation and Lamella Clarifier. Normally it is made of one fastreaction chamber and one slow reaction chamber and can be customized to single tank, double tanks and multi tanks.

PFR Pipe Flocculator

Features:

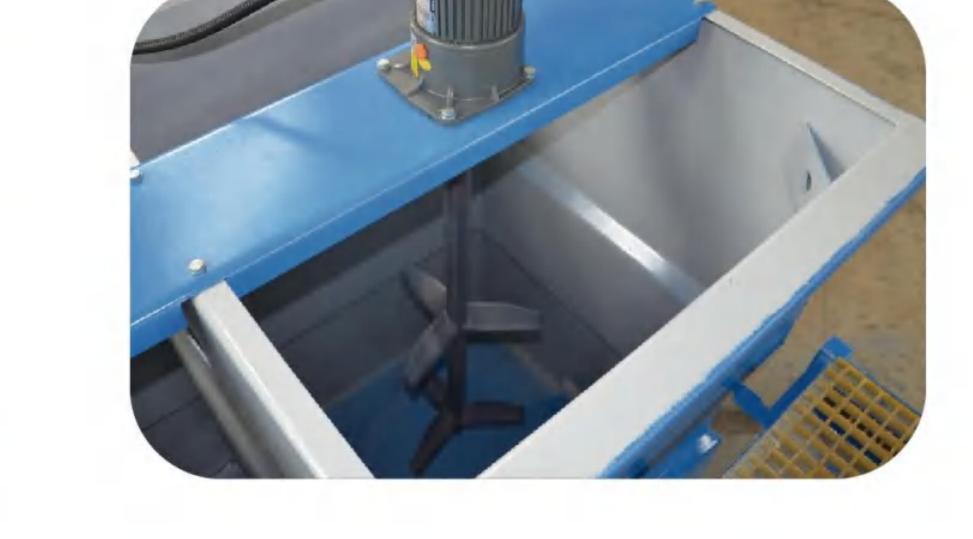
- Clear reaction process.
- Sufficient reaction time.
- Adjustable stirring intensity.

PFR is hydraulic mixing device providing reaction kinetic energy by hydraulic head pressure, changing the Gvalue and the reaction time by transforming pipe diameter and length.

Features:

- Energy saving, area saving.
- Durable, low maintenance cost.
- Carried out in the closed pipeline, clean and sanitary.





Achemical dosing system that combining with chemical dissolving, dilution and storage. Quantitative amount of water and chemical are added into device, dissolved and diluted into certain concentration solution by mixer. It has two types: sJY simple chemicaldosing system and DJY continuously chemical dosing system.

Features:

- Suitable for PAC, acid, alkali and other chemicals.
- Simple structure, easy operation.
- DJY type can achieve continuous dosing operation.

SJY&DJY Chemical Dosing Device



HS

Static Screen



Static screen is a pretreatment equipment in industrial wastewater with a mesh of between 0.5 and 1 mm. Its function is to eliminate the thick waste in the paper, textile, tanning, laundry, canning and milk industries, abattoirs, and etc. The static screen offers an economic solution in the continuous solid-liquid separation process with almost no maintenance requirements and no power consumption.

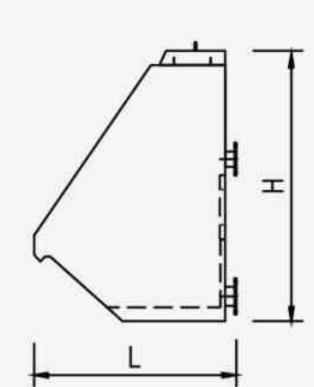
Features •

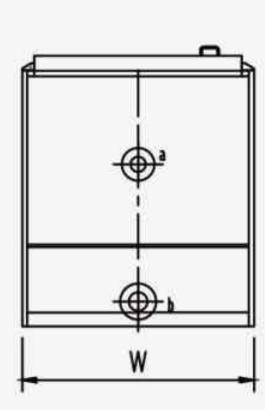
- Optimal selection of solid-liquid separation for wastewater pretreatment.
- Stainless steel material, strong and durable.
- Cost-effective, maintenance free,no power consumption required.

Application Fields •

Pre-treatment of industrial wastewater: papermaking, textile, leather, printing and dyeing, chemical and slaughtering industries.

Model	M	esh size	& Capa	city (m³,	/H)	Dimension (mm)			
HS	0.2mm	0.5mm	1mm	1.5mm	2.0mm	L	W	Н	
300	3	6	13	19	30	1420	430	1900	
500	5	10	22	32	50	1420	630	1900	
600	6	12	27	39	60	1420	700	1900	
800	8	16	36	52	80	1420	930	1900	
1000	10	20	45	65	100	1420	1130	1900	
1500	15	30	65	100	150	1420	1630	1900	





JRDS

Rotary Drum Screen



The rotary drum screen is an effective fine filter for continuously screening solid suspended matter in water. Mainly used in sewage pre-treatment or industrial screening processes, it can efficiently removes suspended solid particles or fibrous impurities from water.

Features •

- The whole machine is skid-mounted for easy installation.
- Easy to maintain and caring.
- Intelligent control, energy-saving and efficient.

Application Fields •

- Pre-treatment of industrial wastewater.
- Fine grating for municipal sewage.
- Suitable for removing relatively small solids, fibrous garbage, such as gravel, hair fibers, floating grease, plastic, etc.

Model	Gate Gap	(mm) 8	k Capacity	(m³/h)	Drum Diameter	Drum Length	Power
JRDS	0.25	0.5	1	2	mm	mm	KW
03/300	6	13	24	34	325	300	0.18
06/600	36	68	116	160	610	600	0.55
06/1000	60	115	195	268	610	1000	0.55
06/1500	90	165	290	400	610	1500	0.75
06/2000	120	230	390	535	610	2000	0.75
08/2000	173	346	600	820	800	2000	1.1
08/2500	216	432	750	1025	800	2500	1.1



PL3 Automatic Polymer Preparation Device



An integrated equipment that prepares PAM solution automati-cally. It could be applied for PAM preparation and dosage. The powder will be dissolved, diluted, aged and dosed automatically. No manual operation required in the whole process. Normally concentration of PAM solution is just 0.05%~0.15%.

Features •

- Automatic and continuous operation.
- Variable solution concentration.
- Small footprint and great capacity.
- Stainless steel, PP or mild steel with coating.

Model	Preparation capacity	Effective volume	Ripening time	Power	(kW)	Dimension (m)			Nozzle list (DN) GB/JIS/ANSL			
PL3	(L/h)	(L)	(min)	Feeder	Blender	L	W/W ₁	H/H₁	Inlet (a)	Outlet (b)	Vent nozzle (c)	
1000	~1000	1200	50	0.12	0.55×3	1.96	1.26/0.86	1.7/0.99	DN25	DN32	DN32	
2000	~2000	2400	50	0.12	0.55×3	2.53	1.50/1.1	2.2/1.18	DN25	DN32	DN32	
3000	~3000	3800	50	0.12	0.55×3	2.83	1.55/1.2	2.5/1.43	DN25	DN32	DN32	
5000	~5000	6600	50	0.12	0.75*3	3.90	2.00/1.5	2.6/1.45	DN40	DN40	DN40	

JORSUN Sludge Scraper





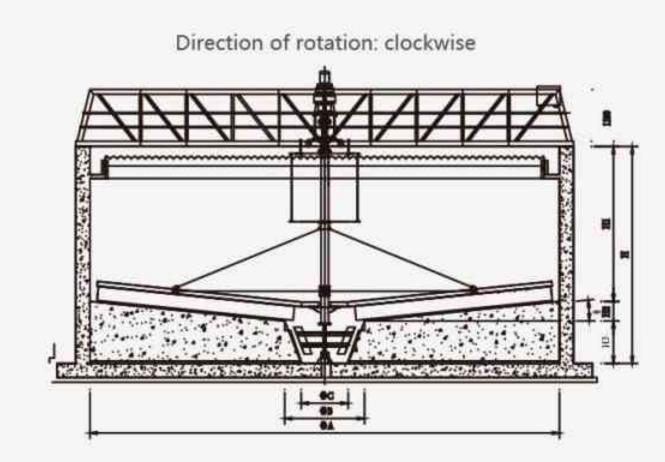
ZXG/ZXN

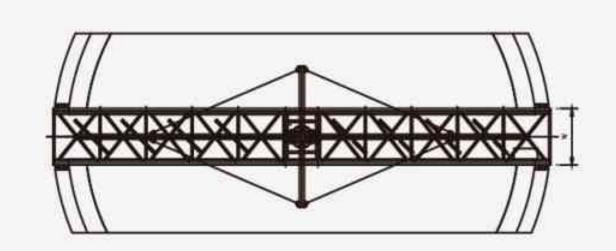
Central Drive Sludge Scraper

Central drive sludge scraper is applied for small and medium sized clarifier with central inlet, sur-rounding outlet and central sludge discharge. It is mainly used for sludge discharge of clarifiers especially for industrial wastewater and urban sewage treatment projects.

Features •

- Working bridge with steel truss structure, simple, elegant and lightweight, which can be made of concrete platform.
- Simple installation & maintenance and low operating cost.
- High Energy-efficient drives with over torque protection device, or it can be equipped with torsiometer as needed.
- Material options: carbon steel with coating (epoxy,-FRP or rubber), stainless steel (sus304 or sus316L).
- Optional units: rake unit, skimming device, v typeoutlet weir.





Model	Diameter	H Depth	Peripheral line	Rotation (rpm)	Bottom slope	Driving	Guide tube	Standard	Gear reducer model
ZXG/ ZXN	(m)	(m)	m/min	r/min	%	(kW)	(m)	N.m	
4	4	2.8 ~ 4.0	2.4	0.19			0.6	600	
6	6	2.8 ~ 4.0	2.2	0.11		0.25	0.8	1500	
8	8	3.0 ~ 4.0	1.8	0.07		0.23	1.1	2640	
10	10	3.0 ~ 4.0	1.6	0.05			1.4	4000	Direct coupling
12	12	3.0 ~ 4.0	1.7	0.04	0.5~1.0	0.55	1.7	5750	
14	14	3.0 ~ 4.0	1.6	0.04		0.55	1.9	7900	
16	16	3.0 ~ 4.0	1.7	0.03			2.2	10300	
18	18	3.0 ~ 4.0	1.7	0.03		0.75	2.5	13000	
20	20	3.0 ~ 4.0	1.7	0.03			2.8	16200	