SAND WASHING EQUIPMENT

Sorting and Washing of Aggregates & Sludge Treatment



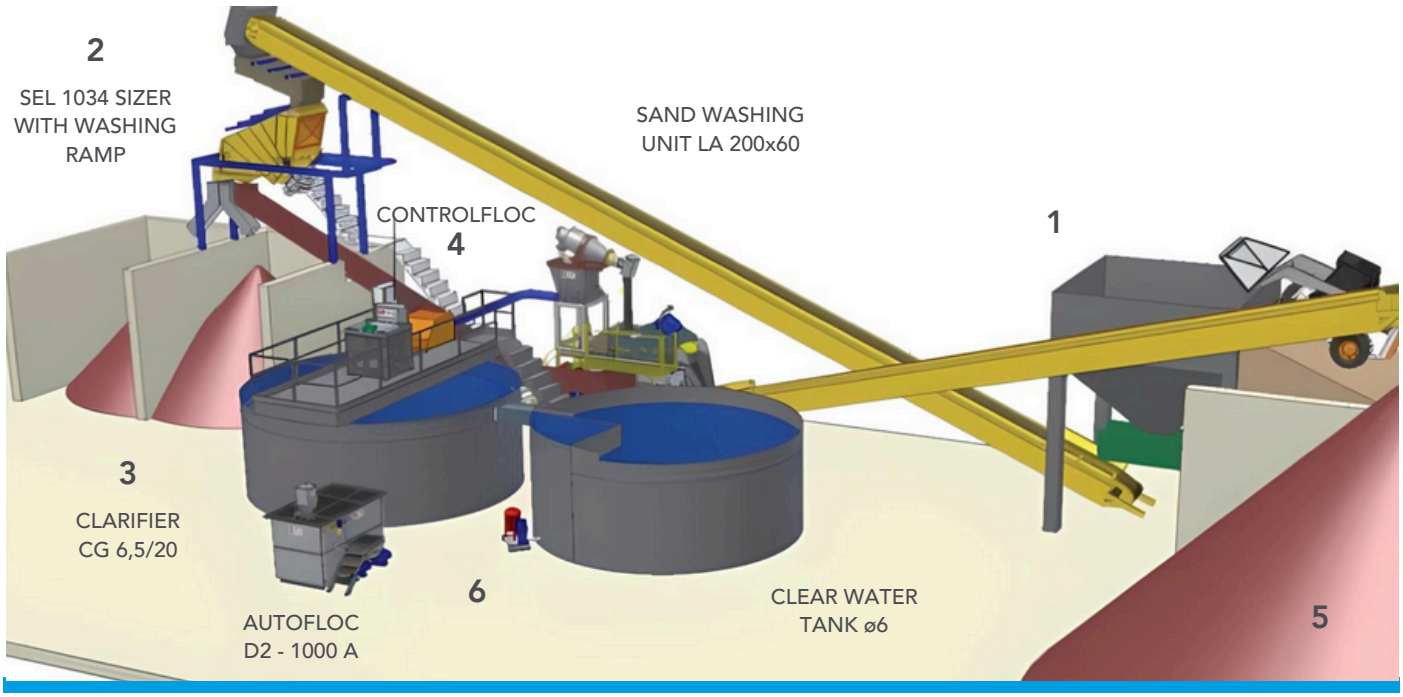


MOGENSEN

SAND WASHING UNITS

The sand washing units have been designed to obtain sand meeting the requirements of the industry, such as grainsize, fineness modulus, cleanliness, friability, content of non-wished elements (organic material, chloride, sulphate, etc.) These units are used to treat sand for use in concrete, frac sand, foundry as well as other industrial sands, bentonite slurry and other minerals.

Structure of an aggregate plant



Structure of an Aggregate Wash Plant

1. Collection of the material in a chute.A feeder controlsinfeed material flow.
2. Separation and washing of the different grain size fractions in a Mogensen sizer with irrigation (wet screening). Gravel and other fractions go directly under the Mogensen sizer, between walls or with conveyor belts to stockpile.
3. Washing and dewatering of the sand pulp and water which goes through the smallest mesh of the Mogensen sizer. The best way of carrying out this stage of washing is by means of a hydro-cyclone with a dewatering screen (sand washing unit). The washed and drained sand is obtained during this stage, also with dirty water, loaded with ultrafine, resulting from the process.
4. Sand drained and clean goes to stockpile via conveyor, usually gyratory stacker type.
5. Clarifying of the dirty water, containing clays and filler, in a settler tank or clarifier with the help of a flocculant solution. There are two aims on this stage: recover the most quantity of water to the process; and concentrate the generated slurry as high as possible to reduce its volume in sludge storage or to optimize the size of the press filters, also to recovery the maximum of water.



8 m Ø Clarifyer and 8 m Ø clear water tank

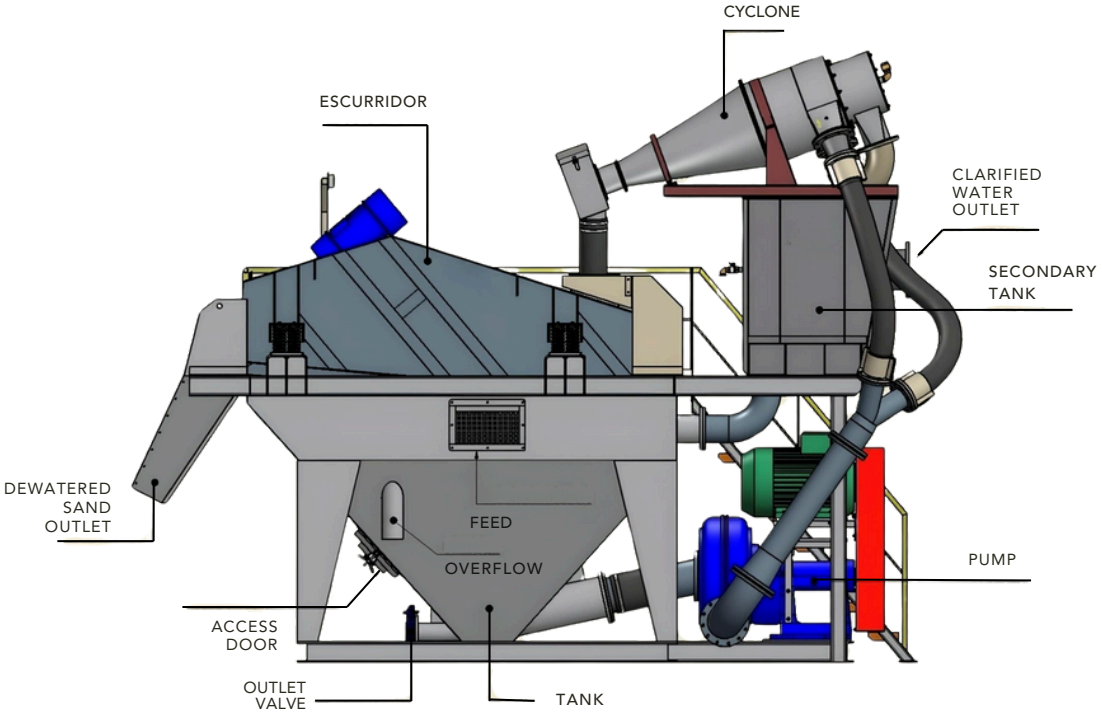


Sand washing unit LA 400x130

COMPACT SAND WASHING UNITS

The use of sand washing machinesequipped with hydro cyclones is the best way to achieve good sand washed. This method worksby the elimination of the fraction below63-106 µm range (250 - 140 mesh). Its performance is much higher than carried out by other machines, such as water wheels or washing screws. The result is a high-quality sand, with very low contentof particles lowerthan 75 µm but retaining the fine sand.

Sand Washing Units



The components of each unit, as pumps, motors,dewatering screen, hydro cyclones, etc., are selected in accordance with the job specifications. The wide variety of available combinations allows us to design a broad range of practically tailor -made machinesto be manufactured for each customer, optimizing the investment for the production facility.

Depending on the percentage of ultra fine material to be removed and the desired quality of the desired final product, multiple washing stages may be necessary. In this multiple stage hydro cyclones processes, the material obtained in the vortex of the firsthydro cyclone goes to the tank of the next untilthe sand washingis achieved.



Sand washing unit LA 400x160



Sand washing unit LA 800x300

SLUDGE TREATMENT AND WATER RECYCLING

After the washing process stage of any material, two problems appear. On the one hand the treatment of the sludge produced in the washing process and, on the other hand, the water recovery for its recirculation. The solution is the installation of a settler/clarifier and a proper flocculant preparation, with automatic dosing.

Clarifiers

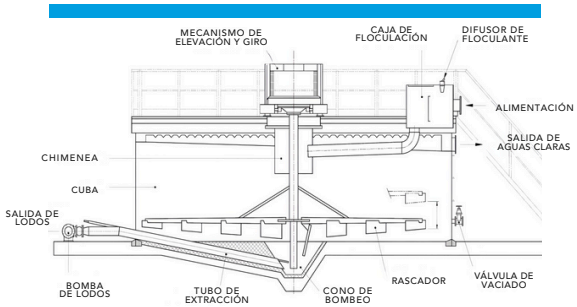
The dirty water, loaded with ultra fines, produced during the process is sent to the decanter by means of the mixing box, where is mixed with the flocculant solution. The flocculant dosage and its concentration are very important for an optimum development of the process.

In the box, the dirty water and the flocculant are forced to take a particular route, allowing the creation of flocks with the appropriate size and shape. After this stage, the mixture flows to a central pipe, where the sludge quickly settles to the bottom.

The clarifier incorporates a sludge pump which absorbsthe sludge in the central cone of the clarifier and pumps it up to the desired unloading point (as standard,the maximum pressureof pumping is 3 bar or 45 psi).

The pump starts automatically when torque of the of the rake increases. This takes place when the mud reaches the consistency and ideal concentration. When the concentration falls, it stops.

Because of the possible sludge accumulation due to an excess of dirt, a lifting system for the rake is installed, and is automatically controlled by the rake torque.





Flocculant preparation and dosage

As mentioned before, an appropriate preparation of the flocculant is basic in the sludge treatment process. GOSAG sand washing units are equipped with an automatic control system that controls the stages.

Depending on the flow of material lower than 60 -105 µm range, there are different types of AUTOFLOC.

The flocculant dosage is carried out by means of a pump, whose speed is set via a frequency converter according with the dirt conditions of the inlet material.



Controlfloc



Autofloc D2 1000-A

A correct control of the dosage of flocculant solution introduced to the installation means an important economic saving. The CONTROLFLOC has been designed to carry out this process automatically without the need of staff dedicated exclusively to its control.

This equipment automatically controls the dosing of flocculant solution, taking constant samples of the mixture of dirtywater / flocculant solution and analyzing flockingtimes and water quality. Depending on the result of the analysis, the frequency converter controls the dosage pump, changing the feed of flocculant solution and obtaining always a high-quality recovered water with cost savings.



CG 16/100 Clarifier with clear water tanks

DESANDERS: BENTONITE RECOVERY UNITS

The GOSAG desanders equipment, manufactured by Mogensen, mainly are used for the recovery of the water with bentonite in boring applications, during the construction of foundations.

These equipment separate rock and sand debris, allowing reuse the bentonite together with the water, used in foundations works. They can be used too in processes where is necessary the separation by hydro-cyclone to a size less than those what are gotten with the sand washing groups, as cleaning of concrete mixer or recovering contaminated soils.

Mogensen manufactures the following GOSAG types of bentonites desanders:

A) Single stage hydro cyclones: recommended for soils with low sand contents or with low contents of fine sands. Flow rates from 50 to 400m3/h.

B) Double stage hydro cyclones is necessary for sandy soils. This type is recommended to guarantee the sand removal in any kind of soil. Flow rates from 40 to 220 m3/h.



Double stage desander.

Other applications of hydrocyclones

The use of hydro cyclones in industrial applications has proven to be excellent, for instance in the treatment of silica sands, feldspar, or kaolin clay.

This type of work is more complex than the sand washing, considering the givenspecifications of the cut points.

Depending on the cut point to obtain and the feed rate, the diameter and the number of cyclones should be selected and it could be necessary use micro-cyclone arrangements and several hydro cyclone stages.



Second hydro cyclone stage with micro cyclones

Dewatering Screens

Dewatering screens are generally used to eliminate the excess water of the materials in the outlet of the washing equipment. However, its employment is valid in any application that needs to concentrate a more solid water pulp.

The vibration is carriedout by means of two vibratory motors which produce a linear movement and contribute to the transport of the drained product up to the outlet. The water filtration is accomplished through polyurethane screens of high quality by a special design that avoids blinding.



E 20x40 Dewatering screen for 300 t/h

EQUIPMENTS SPECIFICATIONS

Sand washing machines

MACHINE	PUMP		CYCLONE	DEWATERER
Type	ø	kW	ø	Type
LA 40x20	3"	7.5	300	E 5x15
LA 100x20	4"	11	440	E 7x18
LA 100x30	4"	14.7	440	E 7x18
LA 200x30	6"	18.5	560	E 7x18
LA 200x60	6"	18.5	560	E 9x21
LA 250x60	6"	22	650	E 9x21
LA 250x100	6"	30	650	E 11x24
LA 300x100	8"	37	750	E 11x24
LA 300x130	8"	37	750	E 13x27
LA 400x130	8"	45	900	E 13x27
LA 400x160	8"	45	900	E 15x30
LA 500x160	10"	45	2x650	E 15x30
LA 500x200	10"	55	2x650	E 18x33
LA 600x200	10"	55	2x750	E 18x33
LA 800x200	10"	75	2x900	E 18x33
LA 800x300	10"	90	2x750	E 20x40
LA 1000x300	12"	100	2x900	E 20x40

Recovery of fine sand

MACHINE	PUMP		CYCLON	PERFORMANCE
Type	ø		ø	m³/h
RAF 15	50 mm	4	140	15
RAF 40	70 mm	5.5	300	40
RAF 60	90 mm	8	300	60
RAF 100	115 mm	15	440	100
RAF 130	135 mm	18	440	130
RAF 180	135 mm	22	560	180
RAF 250	165 mm	30	650	250
RAF 300	160 mm	37	650	300
RAF 400	160 mm	55	750	400
RAF 750	10"		2x650	750

Clarifiers

TYPE	Ø	Max. Sludge flow m³/h	Max. Capacity m³/h
CG 3/6	3 m	6	45
CG 4/12	4 m	12.0	75
CG 5/20	5 m	20	120
CG 6,5/20	6,5 m	20.0	200
CG 8/40	8 m	40.0	300
CG 10/40	10 m	40.0	400
CG 10/60	10 m	60	400
CG 12/60	12 m	60	500
CG 14/100	14 m	100	700
CG 16/100	16 m	100	1000
CG 18/140	18 m	140	1300
CG 20/200	20 m	200	1600

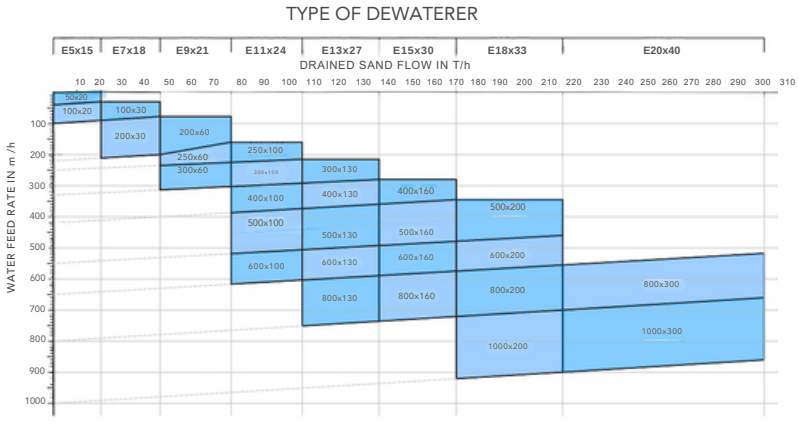
Dewaterer

Type	m³	kW	Capacity (Sand 0-5 mm) t/h
E 5x15	1	2x0,5	20
E 7x18	1	2x0,5	30
E 9x21	2	2x0,96	60
E 11x24	3	2x1,80	100
E 13x27	4	2x2,69	130
E 15x30	4.5	2x3,35	160
E 18x33	6	2x4,80	200
E 20x40	8	2x6,2	300

Autofloc

Type	Tanks	Capacity m³/h
D1 1000 A	1	0 - 150
D1 1500 A	1	100 - 200
D2 1000 A	2	200 - 400
D2 1500 A	2	400 - 600
D2 2000 A	2	600 - 800

Selection of sand washing units



MOGENSEN

MOGENSEN: A HISTORY OF PROGRESS

PRECISION
DESIGN.
Innovative
Processing.

Founded in 1966 by French engineers Gobil and Champanier, GOSAG SAU began an era of innovation in separation and classification technologies. Since its beginnings in Avilés (Asturias), where it initially manufactured under license MOGENSEN screens, sand washers, vibration feeders and densimetric separation tables, the company has been a benchmark of quality and technological progress.

The acquisition of GOSAG SAU by Allgaier in 2003 marked a new phase of expansion and technological upgrading, strengthening our position on the world market.

The merger with JOEST in 2023 and the transition to MOGENSEN Spain not only represents a union of local expertise with global reach, but also a milestone in our evolution, combining extensive know-how and cutting-edge technology.

We continually strive to exceed industry standards and innovate advanced technologies to address current and future challenges. Our passion for excellence and our commitment to sustainability and leadership in separation and sorting provide effective solutions.



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