



SOLIDS CONTROL & WASTE MANAGEMENT

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Part 1: Company Profile

1.1 Company Introduction

GN Solids Control focuses on solids control and waste management equipment manufacture. After research and development for over 10 years, GN Solids Control has become the leading brand for solids control. And GN is honored to be the National High Tech Company, which means we pay 15% income tax instead of 25%, this will give benefit to our customer for buying cost effective product from GN.



- GN is the first API Certified separation equipment manufacturer in China.
- GN Solids America is the first USA based solids control company from China.
- GN own two facilities of total area of 40,000 SM(430,000 SF) close to Beijing.
- GN products have been exported to over 70 countries, and GN have branch or distribution center in America, Russia, Australia, Latin America, Middle East.
- GN owns a specialized factory for making shale shaker screens.
- GN owns over 20 patents for separation equipment.
- GN products are CE certified for Europe market and CU-TR Certified for Russia.
- GN management system also comply with ISO9001, ISO14001, OHSAS18001 standard

Our Vision: Build a world-class Brand for the separation industry: GN Solids Control

1.2 GN No.1 Factory

GN No.1 factory is located in Chaobai River Development Area, which is close to Beijing. The function for No.1 factory include: Headquarter administration, steel construction, complete system assembly. GN have automatically ball blasting machine, dust free painting and heating room, powder coating production line, material cutting workshop, welding workshop, complete system assembly work shop, warehouse etc.



GN Headquarter Office



No.1 Warehouse



Ball Blasting Machine



Powder Coating Production Line



Material Cutting Workshop



Welding Workshop



System Assembly Workshop

1.3 GN No.2 Factory

GN No.2 Factory is about 3KM from the No.1 Factory and located in the same industry Zone. The No.2 factory is for high technology equipment manufacture. GN has the No.2 Office Building, CNC machinery workshop, balancing workshop, centrifuge assembly and testing workshop, shale shaker screens workshop, electrical control equipment workshop, warehouse etc.



No.2 Office Building



CNC Machinery Workshop



CNC Machinery Workshop



High Speed and Low Speed Balancing



Shaker Screen Workshop



Electrical Control Equipment



No.2 Warehouse

1.4 GN Solids America

GN Solids America is the first USA based solids control company from China. GN America company is located in the oil center city – Houston, Texas. GN have 30,000 SF facility in Houston for stock, equipment assembly, maintenance and office.



GN America Company



America Warehouse



Workshop Area

1.5 GN Certificates

70% of GN products is made for export to international market, GN make high quality products according to international standard. We have almost all certificates available for export to high end market. GN Explosion proof standard can be IEC Ex, Europe ATEX. And the lifting certification can meet DNV2.7-1 for offshore operation.



API Certificate:Q1-1003



ISO9001:2008 No.:1208



DNV CE for Europe



CU-TR For Russia



National High Tech Certificate



IEC Ex Certificate



HSE Certificate



ISO14001 Certificate



OHSAS18001 Certificate

Download Link: <http://www.gnsolidscontrol.com/company/certificates>

Part 2: Decanter Centrifuge

2.1 GN Industry Decanter Centrifuge

GN design and manufacture different size of decanter centrifuge for industry separation. Solid bowl decanter centrifuges have been operating according to the same basic principle since the 19th Century. GN centrifuge production line is from 9inch (220mm) bowl to 30inch (760mm) bowl, with bowl length and diameter ration up to 4.2, and the adjustable G force is up to 3000G to meet different industry separation applications

GN design specific centrifuges according to specific separation tasks and the use of resilient, high-quality materials have improved the performance of the centrifuges.

Moreover, GN owns a branch for design PLC and electrical control system; this gives GN advantages in electrical components for measuring and control technology. The performance and availability of the decanter centrifuge or three-phase centrifuges are significantly improved by the control system.



Main Function of GN Industry Centrifuges

- Dewatering sludge / mud and suspensions
- Thickening sludge or mud
- Clarifying different type liquids
- Separating 3-phase mixtures, i.e. two immiscible fluid phases and a solid phase
- Classifying solids in a wet suspension by grain size
- Separation of solids according to various densities

GN Centrifuge Main Application Industry

- Oil Gas Drilling Mud Solids Control
- Drilling Waste Management
- Oil Sludge Treatment
- HDD trenchless mud cleaning
- Bored Pile and TBM mud dewatering
- Waste water treatment
- Chemical and Pharmaceutical separation
- Mining industry separation
- Food and Beverage industry separation

2.2 GN Centrifuge Features



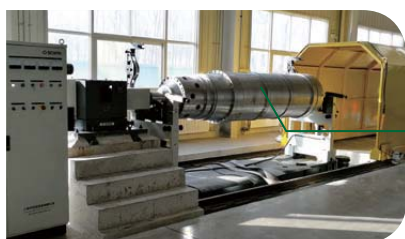
The bowl of GN centrifuge is made from Duplex Stainless Steel SS2205 or SS2304 by centrifugal casting which is better than SS304 or SS316.

The solids discharge port is made from Tungsten carbide inserts, the anti-abrasion will extend the life.



Flexible pond depth adjustment for different material separation.

The air-operated spring for assisting open of the cover with safety locking system.



3 Stage balancing process to maximize the balance of the centrifuge include 1800RPM low speed balancing and real operation high speed balancing as well as the assembly balancing.



The Screw is protected by interchangeable Tungsten Carbide Tiles for longer life and easy maintenance

The mud distribution port is made from Tungsten carbide inserts, the anti-abrasion will extend the life for heavy mud.



The screw is made from stainless steel with heat treatment, and the opening impeller will improve the centrifuge capacity. Single Lead or double lead screw is optional



Two motors in one side to give more space for the operator to do maintenance.

The bearings are premium SKF bearings for reliable and longer operation. The automatically lubrication system is available for option.

2.3 GN Centrifuge VFD Control Panel

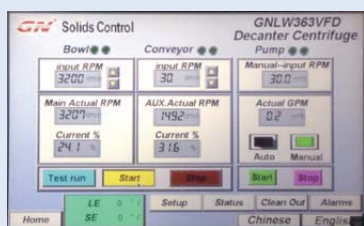
For the oil gas industry and mining industry, most of the time, the client need to use Explosion proof VFD control panel for hazardous area. GN Developed the pressurized explosion proof VFD control panel to meet the IEC Ex, ATEX, and CNEX zone 1 and zone 2 applications.



- 3 VFD for bowl speed, differential speed, and pump capacity.
- The VFD brand is ABB or YASKAWA



- The positive pressurized VFD panel can be cooling by vertex tube or air conditioner to work for ambient Temp. up to +55 C degree.
- The VFD panel is optional for IEC Ex or ATEX or CNEX zone 1 or Zone 2 application.



- The HMI and PLC system for user-friendly operation and smart control and protection.
- It's optional for client to choose bearing temperature protection, vibration switch.

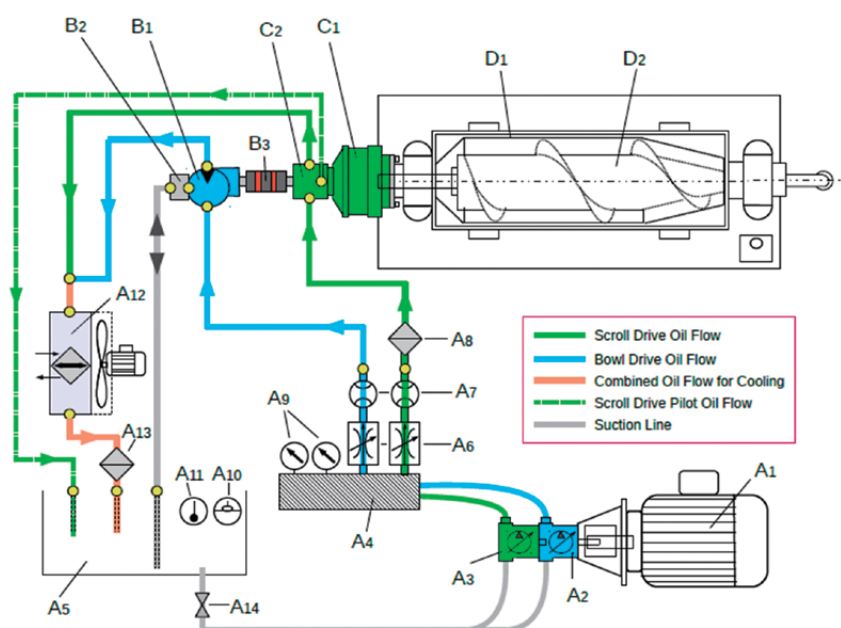
2.4 Fully Hydraulic Drive Centrifuge

GN Solids Control is a leading decanter centrifuge manufacturer. And Viscotherm and ROTODIFF® from Switzerland are leading brand for centrifuge hydraulic driving system. GN and Viscotherm has been jointly working together to develop the Full hydraulic drive centrifuge for international clients to meet the highest standard.

The advantage of the FHD centrifuge is for using in high temperature ambient for heavy mud with flexible bowl and differential speed. The compact one skid design makes it easier for rig up.



The full hydraulic system consists of A the Hydraulic Pump Unit, B the Bowl drive hydraulic motor, and C the Scroll drive (Rotodiff). The hydraulic pump unit A feeds hydraulic oil to the scroll drive C and the bowl drive B by means of two separate and individually independent operating circuits. An electric motor A1 drives the combined pumps A2 and A3. Each operating circuit is equipped with its own hydraulic pump and its own controls. The pump unit contains all setting devices and safety valves, as well as pressure gauges. With this system, the bowl's rotational speed as well as the scroll's differential speed may be manually adjusted independently from one another, continuously and infinitely variable during the centrifuge's operation.



A Hydraulic Pump Unit :

- A1 EEx Electric Motor
- A2 Variable Displacement Hydraulic Piston Pump, Bowl Drive
- A3 Variable Displacement Hydraulic Piston Pump, Scroll Drive
- A4 Controls A5 Oil Tank A7 Flow Meters
- A6 Variable Scroll Speed, Variable Bowl Speed
- A8 High Pressure Oil Filter
- A9 Pressure Gauges
- A10 Oil Level Gauge A11 Oil Temperature Gauge
- A12 Oil-Air Cooler A13 Return Line Oil Filter
- A14 Shut Off Valve

B Bowl Drive:

- B1 High Speed Hydraulic Piston Motor
- B2 Anti Cavitation Device
- B3 Semi-Flexible Coupling

C Scroll Drive:

- C1 Rotodiff Hydraulic Motor
- C2 Connection Block

D Centrifuge:

- D1 Centrifuge Bowl
- D2 Centrifuge Scroll

2.5 9 inch (220mm) Decanter Centrifuge

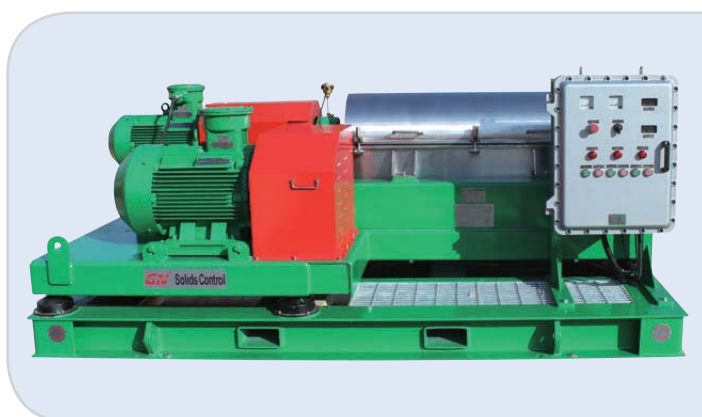
The 9 Inch Decanter Centrifuge is a baby centrifuge which is the one of the world smallest industry decanter. The bowl of the centrifuge is 9 inch (220mm). As the compact design, it is popular for client to use it in small capacity or limited space application for solids and liquid separation. It is also considered to be the best choice for experiment testing with decanter centrifuge. GN 9 inch decanter centrifuge is optional in three types includes: fixed gear box drive, fully hydraulic drive, and variable frequency drive.



Model	GNLW223D	GNLW224EP-VFD
Max Capacity	130 l/min	130 l/min
Effective Capacity	100 l/min	100 l/min
Bowl Diameter	9inch(220mm)	9inch(220mm)
Bowl Length	26.4inch(670mm)	36.4inch(924mm)
Max Bowl Speed	4500RPM	5000RPM
Typical Bowl Speed	3800RPM	0-4500RPM
Max G Force	2492G	3077G
Typical G Force	1777G	2492G
Main Motor	15HP(11KW)	15HP(11KW)
Back Motor	N/A	7.5HP(5.5KW)
Gearbox Ratio	35:1	95:1
Gearbox Torch(N·M)	500N·M	1400N·M

2.6 14inch (360mm) Decanter Centrifuge

GN 14inch (360mm)decanter centrifuge is the most popular centrifuge for oil gas industry, it is popular for drilling mud treatment, and also it can be used for industry waste water treatment, oil sludge treatment, mining water treatment, chemical industry separation. GN 14 inch decanter centrifuge is optional in three types includes: fixed gear box drive, fully hydraulic drive, and variable frequency drive.

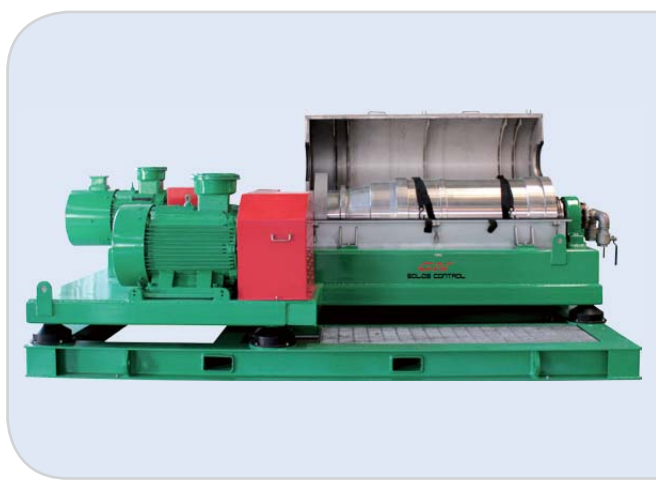


Model	GNLW363C	GNLW363C-VFD	GNLW363D-FHD	GNLW364EP-VFD
Dive Mode	Fixed Speed	VFD	FHD	VFD
Bowl Diameter	14inch(360mm)	14inch(360mm)	14inch(360mm)	14inch(360mm)
Bowl Length	50inch(1271mm)	50inch(1271mm)	50inch(1271mm)	59.5inch(1512mm)
Designed Capacity	200GPM(45m ³ /h)	200GPM(45m ³ /h)	200GPM(45m ³ /h)	242GPM(55m ³ /h)
Typical Capacity	132GPM(30m ³ /h)	132GPM(30m ³ /h)	132GPM(30m ³ /h)	154GPM(35m ³ /h)
Max Bowl Speed	3900RPM	3900RPM	3900RPM	3900RPM
Typical Bowl Speed	3200RPM	0~3200RPM	0~3200RPM	0~3200RPM
Max G Force	3063G	3063G	3063G	3063G
Typical G Force	2062G	0~2062G	0~2062G	0~2062G
Cut Point	2~5μm	2~5μm	2~5μm	2~5μm
Differential Speed	38RPM	0~45RPM	0~65RPM	0~65RPM
Gearbox Torch	3500 N·M	3500 N·M	3717 N·M	3500 N·M
Gearbox Ratio	57:1	57:1	Hydraulic Gearbox	57:1
Main Motor	37KW(50HP)	37KW(50HP)	45KW(60HP)	37KW(50HP)
Back Drive Motor	11KW(15HP)	11KW(15HP)	N/A	11KW(15HP)
Recommend Pump Motor	7.5KW(11HP)	7.5KW(11HP)	7.5KW(11HP)	7.5KW(11HP)
Remarks	Above Max capacity is for water, the treating capacity would be various as per different material conditions and customer required treating results.			

2.7 18inch (450mm) Decanter Centrifuge

GN 18inch(450mm) decanter centrifuge is optional with 3 different bowl length. GNLW452 is an economic centrifuge, popular for drilling mud treatment. To meet different applications, the GNLW453 and GNLW454 is designed with longer bowl.

GN 18 inch decanter centrifuge is optional in three types includes: fixed gear box drive, fully hydraulic drive, and variable frequency drive.



Model	GNLW452C	GNLW453C-VFD	GNLW454EP-VFD
Bowl Diameter	18inch(450mm)	18inch(450mm)	18inch(450mm)
Bowl Length	43.5inch(1105mm)	61inch(1540mm)	74.5inch(1890mm)
Designed Capacity	250GPM(57M ³ /h)	352GPM(80m ³ /h)	400GPM(90m ³ /h)
Typical Capacity	176GPM(40m ³ /h)	264GPM(60m ³ /h)	300GPM(68m ³ /h)
Max Bowl Speed	1800RPM	3200RPM	3500RPM
Typical Bowl Speed	1800RPM	0~2800RPM	0~3200RPM
Max G Force	815G	2578G	3084G
Typical G Force	815G	0~1973G	0~2578G
Cut Point	5-7μm	2~5μm	2~5μm
Differential Speed	32RPM	0~45RPM	0~45RPM
Gearbox Torch	3500 N·M	7500 N·M	7500 N·M
Gearbox Ratio	57:1	35:1	57:1
Main Motor	37KW(50HP)	55KW(75HP)	55KW(75HP)
Back Drive Motor	N/A	22KW(30HP)	22KW(30HP)
Recommend Pump Motor	11KW(15HP)	15KW(20HP)	15KW(30HP)
Remarks	Above Max capacity is for water, the treating capacity would be various as per different material conditions and customer required treating results.		

2.8 22inch(550mm) Decanter Centrifuge

GN 22inch(550mm) decanter centrifuge is widely used for different industry .It is the medium size centrifuge which has the normal capacity requirement for most of the applications. It is popular for drilling mud treatment, and also it can be used for industry waste water treatment, oil sludge treatment, mining water treatment, chemical industry and food industry separation.



Model	GNLW553C-VFD	GNLW554EP-VFD
Bowl Diameter	22inch(550mm)	22inch(550mm)
Bowl Length	71inch(1800mm)	91inch(2310mm)
Designed Capacity	500GPM(114m ³ /h)	600GPM(136m ³ /h)
Typical Capacity	400GPM(90m ³ /h)	480GPM(108m ³ /h)
Max Bowl Speed	3000RPM	3150RPM
Typical Bowl Speed	0-2500RPM	0~2800RPM
Max G Force	2719G	3051G
Typical G Force	0~1888G	0~2412G
Cut Point	2-5μm	2~5μm
Differential Speed	0~45RPM	0~45RPM
Gearbox Torch	12000 N·M	12000 N·M
Gearbox Ratio	35:1	35:1
Main Motor	90KW(120HP)	90KW(120HP)
Back Drive Motor	37KW(50HP)	45KW(60HP)
Remarks	Above Max capacity is for water, the treating capacity would be various as per different material conditions and customer required treating results.	

2.9 30inch(760mm) Decanter Centrifuge

The GN 30 inch (760mm) bowl diameter decanter centrifuge is a big bowl centrifuge. GN 30inch centrifuge is with bowl length and diameter ration of 4.4:1. This bowl size allows client to handle big volume fluids with one single unit. Because of GN unique design for the screw and bowl, the GN 30 inch decanter centrifuge is design for best performance in Tunnel Boring Project Mud Cleaning, Dredging Slurry Separation, and Municipal Sewage Sludge in Purification Plants, Industry Waste Water Treatment. The tungsten carbide protection in the slurry distribution port or solids discharge port as well as the screw conveyor inside the bowl makes the GN 30 inch decanter centrifuge lasts longer.



Model	GNLW764A-VFD
Bowl Diameter	760mm
Bowl Length	3328mm
Designed Capacity	528GPM/120m ³ /h (Mud with 20% Solids Content)
Max Bowl Speed	2650RPM
Typical Bowl Speed	0-2200RPM
Max G Force	3000G
Typical G Force	0~2060G
Cut Point	2-5μm
Differential Speed	5~28RPM
Gearbox Torch	25000 N·M
Gearbox Ratio	38:1
Main Motor	160KW(217HP)
Back Drive Motor	90KW(120HP)
Remarks	Above Max capacity is for reference only, the treating capacity would be various as per different material conditions and customer required treating results.

Part 3: Shale Shaker Screen

3.1 GN Shaker Screen Factory

GN Shaker Screen is a division for GN Solids Control to provide high quality & cost effective GN OEM shaker screens, and replacement screens for different shale shaker manufacturers.

GN has the automatically production line for shale shaker screens, include CNC punching machine, robot welding, injection molding machine. This will help GN to make high quality screens with consistent quality.

With the worldwide network branches and partners, GN Solids Control provides technical support, consignment support, and fast delivery to the international drilling industry.

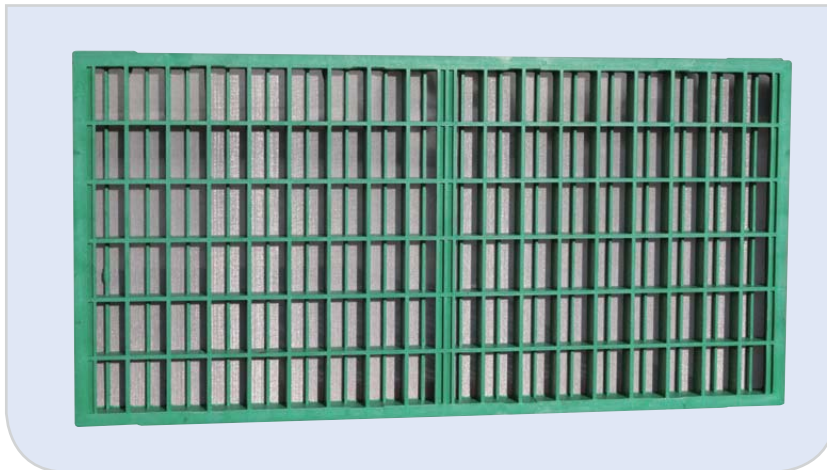
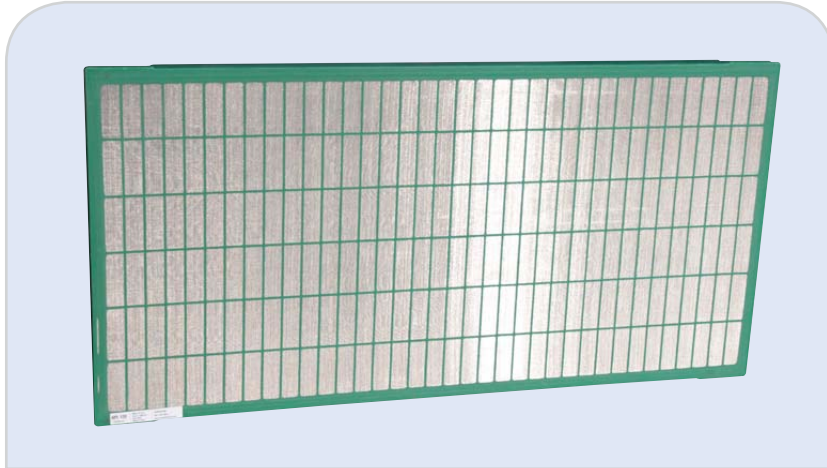


Robot Welding



Plastic Injection Machine

3.2 GN Shaker Screen Advantages



- Automatic Robot Welding of the steel frame to have better quality and consistency.
- High quality fiber glass to improve plastic quality and screen temperature resistant to 140 C degree.
- Four side tension of mesh during the heat press to minimize the gap between the top screen and support screens, in a result extending the screen life. Our competitors normally do not use any tension for heat press.
- GN 3 layer wire mesh for API 60 and above for longer screen life, our competitor normally use 3 layer only for API 120 and above.
- GN high performance wire mesh configuration is compliant to API RP 13C with normally longer screen life.
- GN comprehensive line composite frame replacement screen for GN shakers, MI-Swaco Mongoose, MI-Swaco MD-3/MD-2, Nov Brandt Cobra, Venom, VSM-300, FSI screen, Derrick 2000. And we can customize the Injection mold for your screen dimension.
- The composite frame screen is repairable to save cost.
- Compared to metal frame, the composite frame useable area is 10% to 20 % larger.
- Since the composite frame is covered by plastic, it is rust resistant for long time storage up to over 5 years.

3.3 ASTM Mesh and API Cut Point

Up to Jan, 2019, GN Solids Control is the only Chinese Manufacturer who got fully API RP13C Third Party Test Report. You can contact GN Solids Control for detailed report.

ASTM Mesh and Cut Point	
D100 Cut Point	ASTM Single Mesh
2000 microns	ASTM 10 Mesh
1000 microns	ASTM 18 Mesh
850 microns	ASTM 20 Mesh
710 microns	ASTM 25 Mesh
600 microns	ASTM 30 Mesh
500 microns	ASTM 35 Mesh
425 microns	ASTM 40 Mesh
355 microns	ASTM 45 Mesh
300 microns	ASTM 50 Mesh
250 microns	ASTM 60 Mesh
212 microns	ASTM 70 Mesh
180 microns	ASTM 80 Mesh
150 microns	ASTM 100 Mesh
125 microns	ASTM 120 Mesh
106 microns	ASTM 140 Mesh
90 microns	ASTM 170 Mesh
75 microns	ASTM 200 Mesh
63 microns	ASTM 230 Mesh
53 microns	ASTM 270 Mesh
45 microns	ASTM 325 Mesh
38 microns	ASTM 400 Mesh

API No. and Cut Point Table	
D100 Cut Point	API No.
> 1850.0 TO 2180.0	API 10
> 780.0 TO 925.0	API 20
> 462.5 TO 550.0	API 35
> 390.0 TO 462.5	API 40
> 275.0 TO 327.5	API 50
> 231.0 TO 275.0	API 60
> 196.0 TO 231.0	API 70
> 165.0 TO 196.0	API 80
> 137.5 TO 165.0	API 100
> 116.5 TO 137.5	API 120
> 98.0 TO 116.5	API 140
> 82.5 TO 98.0	API 170
> 69.0 TO 82.5	API 200
> 58.0 TO 69.0	API 230
> 49.0 TO 58.0	API 270
> 41.5 TO 49.0	API 325
> 35.0 TO 41.5	API 400

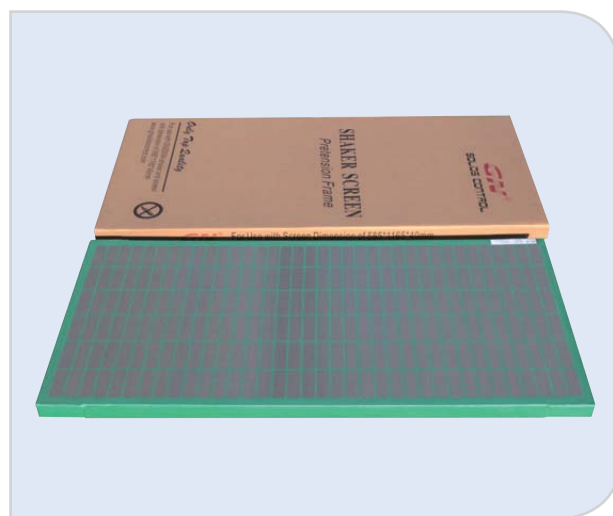
NOTE

- 1) ASTM is short for The American Society for Testing and Materials, ASTM E11:01 mesh equals to ISO 3310-1:2000 mesh. This method determines the cut point of single layer ASTM screen mesh size. For shaker screen mesh, normally means the surface screen mesh size. Whilst the shaker screen is usually a composition of 2 or 3 layers, the cut point of the first layer mesh is not equal to the final shaker screen cut point.
- 2) API is short for American Petroleum Institute, "API Number" is determined by API RP13C or ISO13501, the cut point is related to the combined 3 layer wiremesh test result. So before order, we will need API number, or the cut point, to define a more proper shaker screen configuration.

3.4 GN Shaker Screen Types

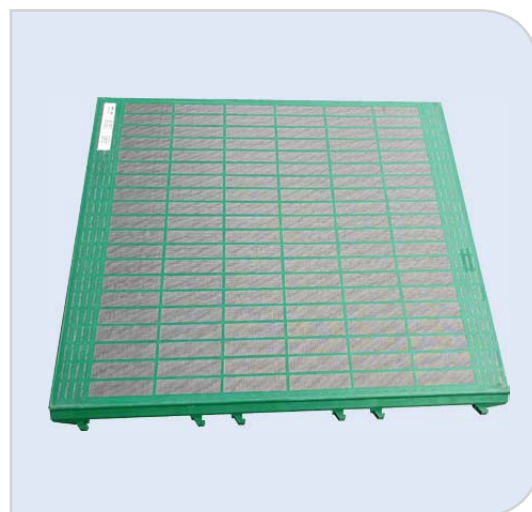
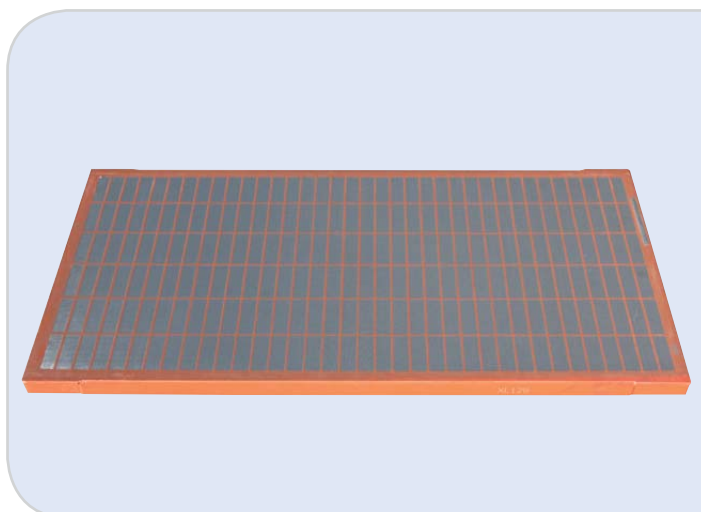
3.4.1 GN OEM Screen

GN Solids Control sells around 200 shale shakers a year, we have shale shakers operate around the world. To use GN OEM screen will improve your shaker performance and save your operational cost. OEM Shaker Screen for GNZS series shale shaker include screen for GNZS703, GNZS752, GNZS594 shale shaker and screen for GNZJ703, GNZJ752, GNZJ594 mud cleaners.



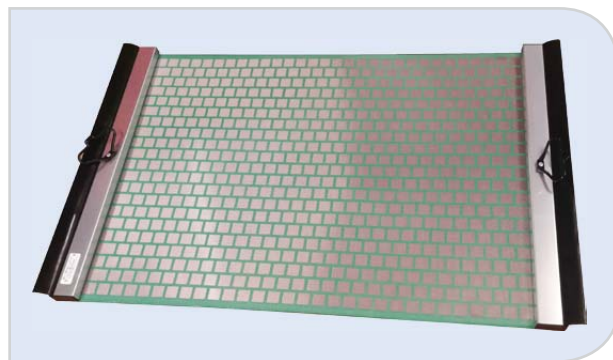
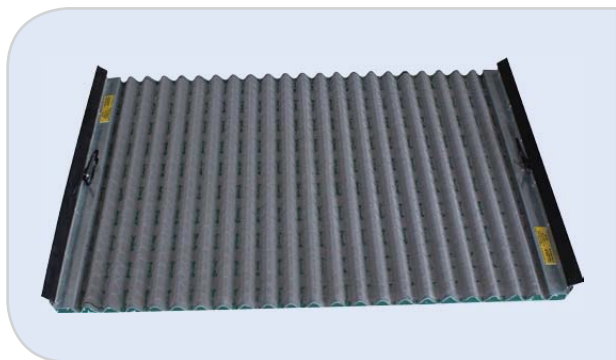
3.4.2 Replacement Screen for MI-Swaco Shaker

Replacement Shaker Screen for MI-Swaco MONGOOSE PRO, MONGOOSE PT & MEERKAT, ALS, BEM, MD-3 series shale shaker or mud cleaner. Available in Steel frame or composite frame.



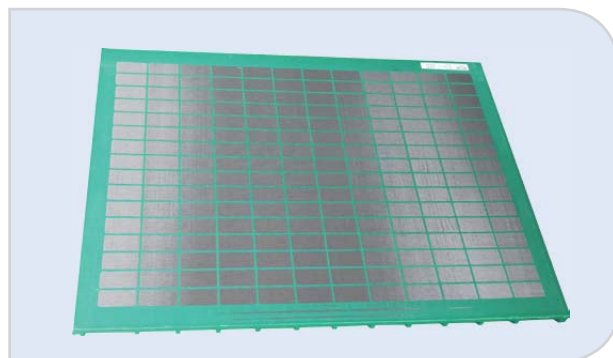
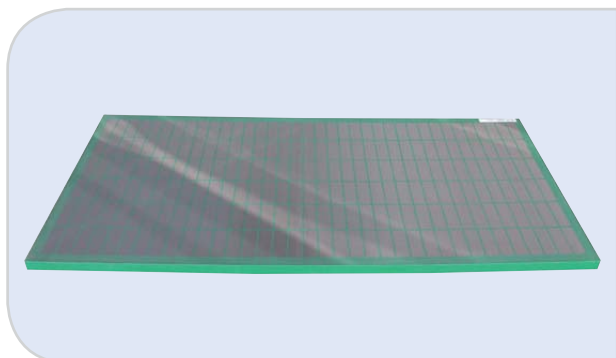
3.4.3 Replacement Screen for Derrick Shaker

Replacement Shaker Screen for Derrick FLC 2000, FLC 500 , DP 600 and Hyperpool series shale shaker and mud cleaner. The screens are available in flat screen or pyramid screen. Composite screen is available for high quality and longer screen life.



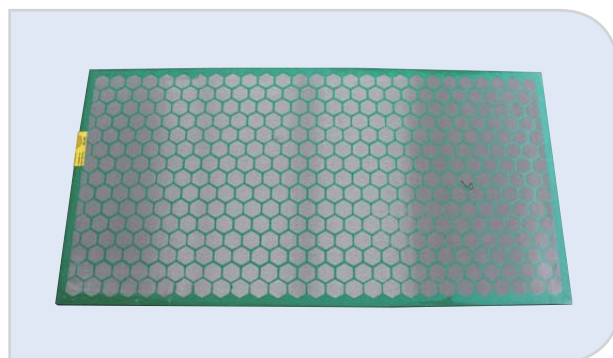
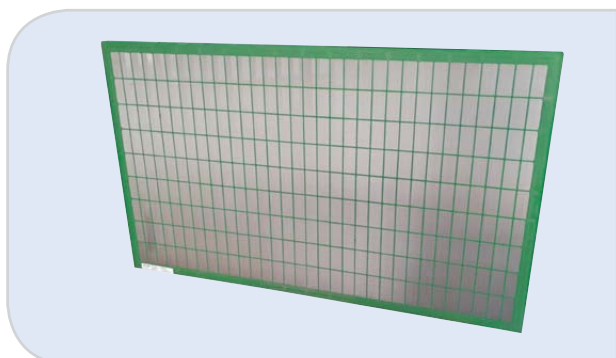
3.4.4 Replacement Screen for NOV Brandt

Replacement Shaker Screen for NOV Brandt Cobra, King Cobra, Mini Cobra, Venom, LCM-2D, LCM-3D, VSM 300 series and D380/D285P shale shaker and mud cleaner. Available in steel frame or composite frame.



3.4.5 Other shaker screen or customized screens.

Other replacement shaker screen for Fluids System 29x42, Kemtron/Elgin KPT series and other shale shaker manufacturer. Customized or OEM Shaker Screens are available.



Part 4: Solids Control Equipment

4.1 Shale Shaker

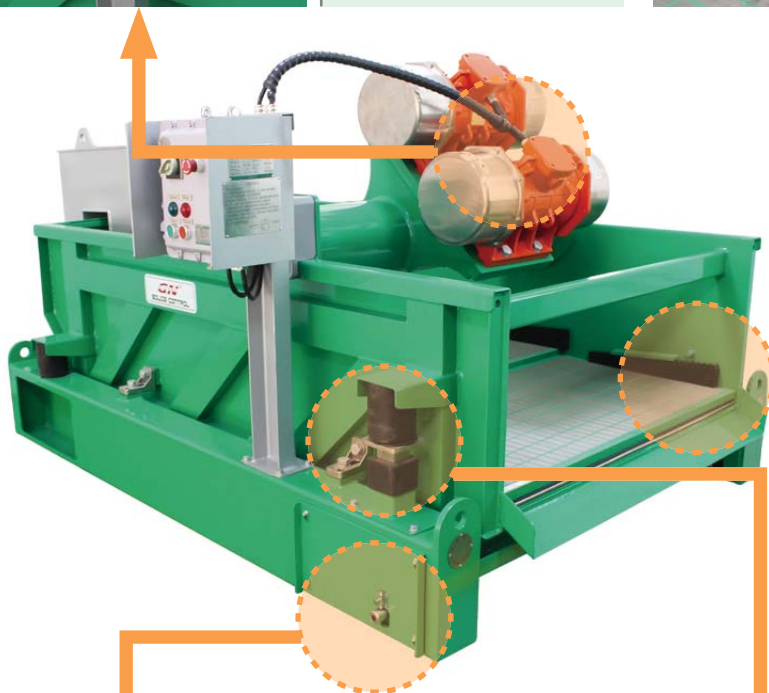
4.1.1 GN Shale Shaker Features



Italy OLI or US Martin Brand Vibration Motors
GN Ex Control panel with SIEMENS or Schneider Component



Pretensioned composite frame screen with Gear unit for fast screen change and longer screen life



- 1) Heavy Duty design and heat treatment for the shaker basket to get the adjustable G force up to 8.0G.
- 2) The shaker bed below the screen is made from stainless steel to have anti-corrosion features for longer life.
- 3) Patent shaker screen seal technology for avoiding fine solids bypass and to have easy maintenance.






Mechanical Deck angle adjustment while working system to work reliably for different drilling fluids



- 1) User friendly shaker locking system made from stainless steel.
- 2) The vibration spring is covered with rubber for safety and less noise.

4.1.2 GN Shale Shaker Specs

	<p>GNZS752 series Mini shakers have been widely used in trench-less HDD, water well drilling, diamond core drilling etc., best option for compact system and low flow rate.</p>
	<p>GNZS703 & GNZS594 series single deck shale shaker is popular in oil gas drilling, big trench-less HDD projects, or other industry separation demand.</p>
	<p>GNZS706 series double deck shaker is properly designed for piling, TBM, big oil gas rig, big trench-less project, or the industry separation for multi-phase separation.</p>

Model	GNZS752F-MDZF	GNZS703F-SDZF	GNZS703F-SHBF	GNZS594F-SHBF	GNZS706F-SHBF
Vibration Mode	Linear Motion				
Capacity(m ³ /h)	45(200GPM)	120(528GPM)	120(528GPM)	140(616GPM)	140(616GPM)
Vibration Motor(Kw)	2×1.0	2×1.72	2×1.72	2×1.72	2×1.94
Screen Qty(Pcs)	2	3	3	4	6
Screen Size	750×900	700×1250×29	700×1250×29	585×1165×40	Up:750×900 Down:700×1250
Screen Area(m ²)	1.35	2.63	2.63	2.73	Up: 2.03 Down: 2.63
Adjustable G Force	≤7.5G				≤7.3G
Vibration Amplitude(mm)	4.14~5.96	4.14~5.96	4.14~5.96	4.14~5.96	4.04~5.82
Deck Angle	+2°	-1~+5°	-1~+5°	-1~+5°	-1~+5°
Feeding Type	Top Box Feeder	Top Box Feeder	Weir Feeder	Weir Feeder	Weir Feeder
Weir Height(mm)	714	1060	895	895	895
EX Standard	ExdIIBT4/IECEX/ATEX				
Weight(Kg)	929	1665	1571	1624	1795
L×W×H(mm)	1816×1657×1083	2462×2007×1476	2744×1968×1435	2989×1968×1435	2744×1968×1435

4.1.3 ViST Vacuum Shaker Screen



Item	Specs Model No.: GNVIST03A	
Supply Air Pressure	0.7-1.0Mpa (100-150PSI)	
Air capacity required	4.5 m ³ /min (160 CFM)	8 m ³ /min (280 CFM)
Operation Shaker	For 1-2 Shakers	3 Shakers
Applicable Mud	OBM,SBM,WBM	
Extra Fluids Recovery	2000-3000 L / Day (By 1 Shaker with ViST On)	
Recovery Efficiency	30%-50%	
Mud Temperature	-15 +85°C	
Suction Inlet	2 Inch (3 Sets)	
Discharge Outlet	2 Inch (1 Set)	
Air Supply Inlet	1 Inch	
Dimension (Weight)	1058x730x1068mm (350KG)	
Remarks	No. Electrical, Air operated, adjustable suction time	
Weight(Kg)	929	
L×W×H(mm)	1816×1657×1083	

ViST is Vacuum Screen Technology is to work with shale shaker to reduce drilling waste and recycle drilling fluids.

ViST was pending patent design developed by GN Solids Control from June, 2017. In May, 2018, GN tested ViST with drilling fluids. It proved to be very efficient for recycling drilling fluids.

The ViST Pan is installed under the last screen or mounted externally. And a suction hose is connected to ViST vacuum unit. The compressed air from air compressor or the rig air supply is required to create suction on the last screen surface, pulling additional fluid off the cuttings. It can reduce the liquid on the cuttings by 30-50%.

In a result ,ViST maximizes the volume of recovered and reused fluids and it provides dryer cuttings. Dryer cuttings mean less drilling waste and more recovery drilling fluids. So ViST can save money for operators on drilling fluids and waste management.

4.2 Desander & Desilter

4.2.1 Mud Cleaner






Model		GNZJ703F-D1S8N	GNZJ703F-2S12N	GNZJ594F-2S12N	GNZJ703F-3S16N	GNZJ594F-3S16N
Capacity(m³/h)		120(528GPM)	240(1056GPM)	240(1056GPM)	360(1584GPM)	360(1584GPM)
Desander Size(Inch)		10	10	10	10	10
Desander Qty(PCS)		1	2	2	3	3
Desilter Size(Inch)		4	4	4	4	4
Desilter Qty(PCS)		8	12	12	16	16
Working Pressure(Mpa)		0.25~0.4	0.25~0.4	0.25~0.4	0.25~0.4	0.25~0.4
Inlet Size (Inch)		6				
Outlet Size (Inch)		8				
Bottom Shaker Specs.	Shaker Model	GNZS703F	GNZS703F	GNZS594F	GNZS703F	GNZS594F
	Vibration Mode	Linear Motion				
	Motor(Kw)	2×1.72				
	Screen Qty(Pcs)	3	3	4	3	4
	Screen Size: (mm)	700×1250	700×1250	585×1165	700×1250	585×1165
	Screen Area(m2)	2.63	2.63	2.73	2.63	2.73
	Adjust G Force	≤7.5G	≤7.5G	≤7.5G	≤7.5G	≤7.5G
	Vibration Amplitude(mm)	4.14~5.96	4.14~5.96	4.14~5.96	4.14~5.96	4.14~5.96
	Deck Angle Range	-1~+5°				
EX Standard		ExdIIBT4/IECEX/ATEX				
Weight		1930	2235	2285	2328	2378
Dimension(mm)		2462×2042×1848	2462×2042×2147	2707×2042×2147	2462×2042×2147	2707×2042×2147

Features



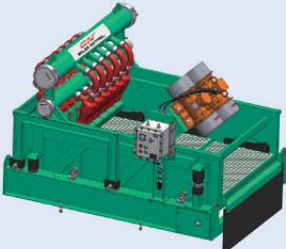
- Desander & Desilter & Shale Shaker 3 in one unit for compact footprint.
- Polyurethane Material hydro cyclone for long life.
- Removable hydro cyclone assembly for adjust to be a shale shaker.
- Mechanical shaker deck angle adjustment while working.
- Patent tighten rubber sealing for shaker deck and screen for fine screen
- Shaker bottom deck made from Stainless Steel for long service life.
- Heat treatment on complete shaker deck for High G force operation.
- Pretensioned Shaker screen for fast screen replacement.
- Famous Brand Vibration Motors : IEC Ex, ATEX and UL Certified

4.2.2 Desander

Desander Cut Point: + 40 Microns	Description
	Type: Desander without downstream drying shale shaker Model: GNWS-2SF / GNWS-3SF Application: For oil gas drilling un-weighted drilling mud. Features: Small footprint, economic choice, no consumable screens. Result: Wet cuttings, not recommended for Weighted mud and drying solids.
	Type: Desander with GNZS752 Series Mini Shale Shaker Screen Area: 1.4m ² Model: GNZJ752F-1S / GNZJ752F-2S Application: For oil gas drilling small drilling rig , CBM drilling, HDD, Water Well drilling. Features: Small footprint, economic choice, acceptable drying solids.
	Type: Desander with GNZS703 Series 3 Panel Shale Shaker Screen Area: 2.6m ² Model: GNZJ703F-S2SF / GNZJ703F-S3SF Application: For oil gas drilling big drilling rig , large HDD rig, Tunneling Boring Machine etc. Features: Big capacity, drying solids.

Model		GNZJ752F-1S/2S	GNZJ703F-S2SF	GNZJ703F-S3SF	GNWS-2SF/3SF
Capacity		120/240m³/h (528/1056GPM)	240m³/h (1056GPM)	360m³/h (1584GPM)	240/360m³/h (1056/1584GPM)
Desander Size(Inch)		10"			
Desander Qty		1/2 Pc	2 Pcs	3 Pcs	2/3 Pcs
Working Pressure		0.25~0.4Mpa			
Feeding Size		DN150			
Output Size		DN200			
Bottom Shaker Specs.	Shaker Model	GNZS752F	GNZS703F		N/A
	Vibration Mode	Linear Motion			
	Vibration Motor	2x0.75Kw	2x1.72Kw		
	Screen Qty	2 Panels	3 Panels		
	Screen Size	750x900mm	700x1250mm		
	Screen Area	1.35m²	2.63m²		
	Adjust G Force	≤7.1G(Adjustable)	≤7.5G(Adjustable)		
	Vibration Amplitude	3.92~5.62mm	4.14~5.96mm		
	Deck Angle Range	+2°	-1~+5°		
EX Standard	ExdIIBt4/IECEX/A-TEX				
Weight(Kg)		1059/1114kg	1835kg	1924kg	502/559kg
Dimension: mm		1676×1754×1822	2419×2131×1656	2419×2135×2066	2177×1000×1901

4.2.3 Desilter

Desilter : Cut Point +20 Microns	Description
	Type: Desilter without downstream drying shale shaker Model: GNWS-12NF / GNWS-16NF Application: For oil gas drilling un-weighted drilling mud. Features: Small footprint, economic choice, no consumable screens. Result: Wet cuttings, not recommended for Weighted mud and drying solids.
	Type: Desilter with GNZS752 Series Mini Shale Shaker Screen Area:1.4m ² Model: GNZJ752F-8NF / GNZJ752F-12NF Application: For oil gas drilling small drilling rig , CBM drilling, HDD, Water Well drilling. Features: Small footprint, economic choice, acceptable drying solids.
	Type: Desilter with GNZS703 Series 3 Panel Shale Shaker Screen Area:2.6m ² Model: GNZJ703F-D8NF/ GNZJ703F-D12NF/ GNZJ703F-S16NF Application: For oil gas drilling big drilling rig , large HDD rig, Tunneling Boring Machine etc. Features: Big capacity,,drying solids.

Model		GNZJ752F-8NF/12NF	GNZJ703F-D8NF/D12NF	GNZJ703F-S16NF	GNWS-12NF/16NF
Capacity		120/240m³/h		360m³/h (1584GPM)	240/360m³/h (1056/1584GPM)
Desilter Size		4"			
Desilter Qty		8/12 Pcs		16 Pcs	12/16 Pcs
Working Pressure		0.25~0.4Mpa			
Feeding Size		DN150			
Output Size		DN200			
Bottom Shaker Specs.	Shaker Model	GNZS752F	GNZS703F		N/A
	Vibration Mode	Linear Motion			
	Vibration Motor	2x0.75Kw	2x1.72Kw		
	Screen Qty	2 Panels	3 Panels		
	Screen Size	750x900mm	700x1250mm		
	Screen Area	1.35m²	2.63 m²		
	Adjust G Force	≤7.1G(Adjustable)	≤7.5G(Adjustable)		
	Vibration Amplitude	3.92~5.62mm	4.14~5.96mm		
	Deck Angle Range	+2°	-1~+5°		
	EX Standard	ExdIIBt4/IECEX/A-TEX			
Weight		1057/1097kg	1813/1839kg	1974kg	504/539kg
Dimension: mm		1676×1745×1719	2419×2150×1608	2419×2150×2126	2189×900×1511

4.3 Degasser

4.3.1 Vacuum Degasser



Model	GNZCQ270B	GNZCQ360B
Tank Diameter	920mm	
Capacity	≤270m ³ /h	≤360m ³ /h
Vacuum Degree	-0.02~-0.04Mpa	
Handling Efficiency	≥95%	
Main Motor Power	22Kw(30HP)	37Kw(50HP)
Pump Motor Power	7.5Kw(10HP)	
Rotation Speed	700RPM	860RPM
Ex Standard	ExdIIBt4/IECEX/ATEX	
Suction Size	DN150	
Output Size	DN200	
Weight	1779kg	1815kg
Dimension: mm	2100×1605×1729	2100×1605×1729

Features

GNZCQ Series Vacuum Degassers that are able to service the needs of any application. It is usually installed after the shakers. Each degasser effectively and efficiently removes gases from gas-cut mud, thus ensuring that the proper mud weight is pumped downhole. In doing so, the degassers are able to aid in the prevention of potential blowouts. Unlike the traditional vacuum degasser, GNZCQ vacuum degasser is a self-contained unit, GN Vacuum Degasser is monitored by level sensor to protect over suction of the fluids. The gas-cut mud is drawn into the degasser by a vacuum created by a regenerative vacuum without needing centrifugal pump. GN degasser can act as a big agitator for the drilling mud, which helps the treatment for desander and desilter.

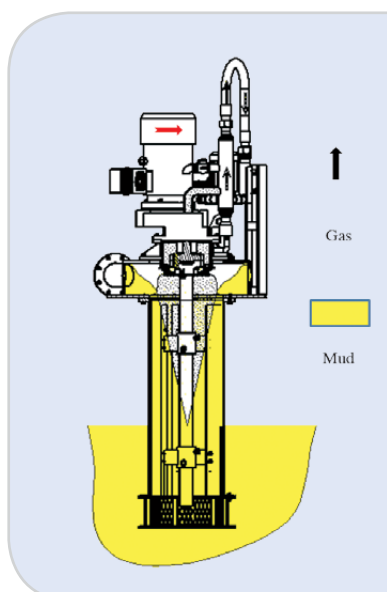
4.3.2 Centrifugal Degasser



Model	GNLCQ300C
Liquid Inlet Size	20"
Liquid Outlet Size	8"
Gas Outlet Size	2"
Max Liquid Throughput	300m ³ /h
Max Gas Removed	30m ³ /h
Main Motor	22Kw
Fan Motor	1.1Kw
Weight	1093kg
Dimension	1148×1055×3430mm

Features

GNLCQ300C centrifugal degasser is a new type degasser, specialized in processing gas cut drilling fluid. Normally it is installed after shale shaker and widely used in various solids control system, and it is very important for recovering mud weight, stabilize mud viscosity performance, reduce drilling cost. Meantime it can be used as a big power blender. Its advantages are large capacity, high rate of degassing, less area required, low energy consumption, easy operation and maintenance.



Working Principle:

Via the rotating impeller, the degasser sucks the drilling fluid into the vessel. The fluids will stay at a level higher than the gas cut drilling fluid and then a cylindrical liquid layer with inverted cone shape space in the middle will be formed. Drilling fluid is discharged from discharge port along a tangent line. With the impeller rotating, bubble breaks, gas will be extracted from liquid, and finally accumulate in the cone shape space as the lower density. Pressurizing unit(similar to exhaust fan) will suck air through the narrow channel between the air distribution disk and air separation ring into the discharge cone, and then gas manifold, braided hose and pressurized device to pressuring unit, finally discharge the gas out through pressuring device with pressure.

4.3.3 Mud Gas Separator



Model	Tank Diameter	Capacity	Inlet	Outlet	Ventline	Weight	Dimension:
GNZYQ1000A	1000mm	200~280 m ³ /h	4"	10"	8"	2411kg	2265×2000×5681mm

Features

GN Mud Gas Separator is designed for continued drilling in underbalanced conditions where dramatic pressure surges are normal. The GN Mud Gas Separator is manufacturing according to API and ISO Standard.

In dangerous “kick” conditions, the Mud Gas Separator allows operators to circulate the drilling fluid by removing large pockets of gas. The gas cut mud enters the flow line of the unit, where it hits a series of baffle plates. These baffle plates provide surface area for the dispersion of the gas cut mud. The mud is routed to solids control equipment for further processing while the separated gas travels to the flare line at the top of the unit to be vented at a safe distance from the rig and rig personnel.

4.4 Mud Agitator, Mud Gun

Mud Agitator



Model	Motor	Speed	Impeller	Impeller Qty	Ratio	EX Standard	Weight	Dimension:mm
GNJBQ030D	3kW	60/72RPM (50Hz/60Hz)	650mm	1	25:1	EXdIIBt4/ IECEX/ A-TEX	154kg	717×560×472
GNJBQ055D	5.5kW		850mm	1			280kg	892×700×600
GNJBQ075D	7.5kW		950mm	1			287kg	980×750×608
GNJBQ075DD			800mm	2			297kg	
GNJBQ110D	11kW		1050mm	1			402kg	1130×840×655
GNJBQ110DD			850mm	2			419kg	
GNJBQ150D	15kW		1100mm	1			423kg	1158×840×655
GNJBQ150DD			950mm	2			441kg	
GNJBQ185DD	18.5kW		1050mm	2			746kg	1270×1000×730
GNJBQ220DD	22kW		1100mm	2			820kg	1270×1000×730

Remarks: Shaft and impeller will be provided by GN, but not including in the weight & dimension. Shaft is 15 Kg per meter.

Mud Gun



Model	GNNJQ50A-3G	GNNJQ50A-3X	GNNJQ80A-3G	GNNJQ80A-3X
Working Pressure	≤6.4MPa			
Rotation Angle	0°	360°	0°	360°
Nozzle Qty	3 Pcs			
Gun Diameter	2 Inch(DN50)		3inch (DN80)	
Connection Size	G2"	G3"	G2"	G3"

4.5 Jet Mud Mixer

Mud Hopper



Model	Pressure	Capacity	Nozzle	Inlet	Outlet	Weight	Dimension
GNSLDSB	0.25~0.4Mpa	500-1500GPM (113-340m ³ /h)	40mm	DN150	DN150	174kg	1100×680×949mm
GNSLDMB		200-500GPM (45-113m ³ /h)	20mm	DN100	DN100	113kg	850×570×851mm

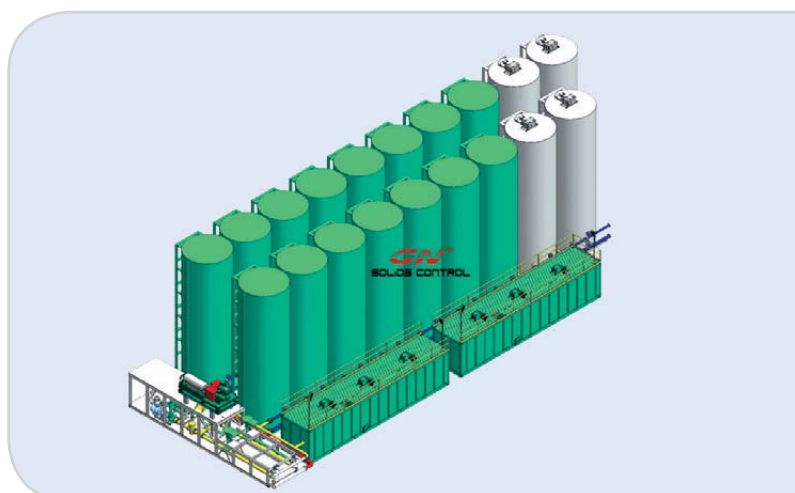
Jet Mud Mixer



Model	Capacity	Pressure	Motor	Inlet	Outlet	EX Standard	Weight	Dimension(mm)
GNSLH-750B	320m ³ /h	0.25~0.4Mpa	75kW	DN200	DN150	EXdIIBt4/ IECEX/A-TEX	1785kg	2200×1840×1150
GNSLH-550B	272m ³ /h		55kW	DN200	DN150		1675kg	2200×1840×1100
GNSLH-450B	200m ³ /h		45kW	DN150	DN150		1475kg	2200×1840×1135
GNSLH-370B	150m ³ /h		37kW	DN150	DN150		1460kg	2200×1840×1135
GNSLH-300B	120m ³ /h		30kW	DN125	DN150		1380kg	2200×1840×1100
GNSLH-220B	90m ³ /h		22kW	DN125	DN100		1167kg	1850×1540×1000
GNSLH-185B	65m ³ /h		18.5kW	DN100	DN100		1147kg	1850×1540×1030
GNSLH-150B	55m ³ /h		15kW	DN100	DN100		970kg	1850×1540×1030
GNSLH-110B	45m ³ /h		11kW	DN100	DN100		950kg	1850×1540×1030

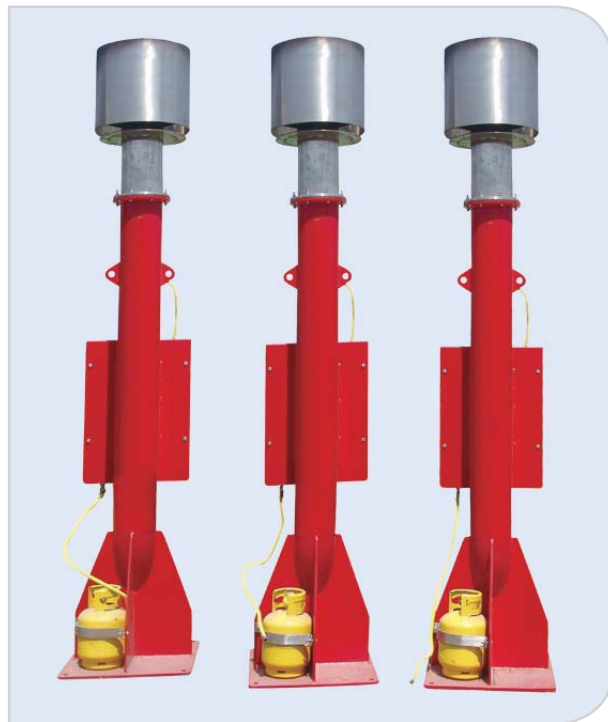
Remarks: Electrical Control Cabinet should be quoted separately, not included.

4.6 Mud Tank



GN solids control designs and manufactures various types of tank including mud tank, water tank, oil tank, etc. GN solid control mud tanks are usually used to install solids control equipment, storage mud, mixing mud, etc. It meets utility request of the drilling solid control system, mud plant and solid-liquid separation system. According to different working conditions, mud tanks can be customized into horizontal mud tank, vertical mud tank and trailer mounted mud tank.

4.7 Flare Ignition Device



Model	GNYD200A
Main body Diameter	DN200
Charging Power	100V-240V~50/60Hz
Ignition Voltage	16KV
Ignition Media	LPG/LNG
Weight	520kg
Dimension	650×1232×3211mm

Features

The GN Flare Igniters used for connecting to the gas discharge line of Mud Gas Separator, which fire the dangerous gas from the drilling mud like H₂S. GN Flare Igniters have options for electrical power charge or Solar Energy charged. The upper part of the flare ignition system is stainless steel, and it is designed for rain proof in the oilfield. The major components for the electrics are from famous Brand like SIEMENS or Schneider. The power for the electric can be directly from industry normal power, or users can charge the battery and take the unit for remote areas application. GN flare device is with remote control, and PLC is optional available for less manpower notice for continually and automatically working.

Part 5: Waste Management Equipment

5.1 Vertical Cuttings Dryer

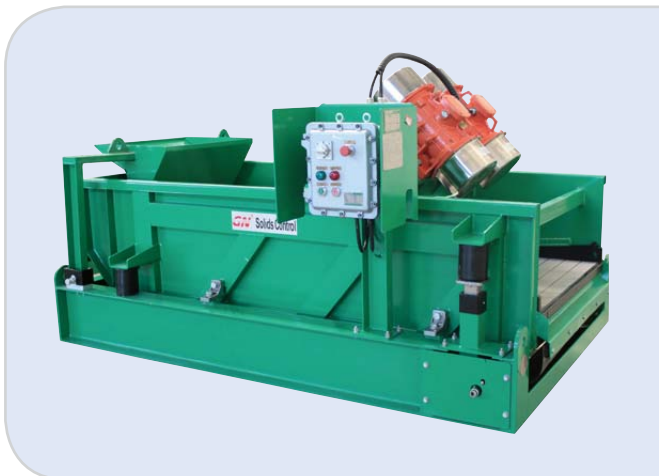


Model	GNCD930E	GNCD930E-VFD
Capacity	30~50Ton/h	
Drying Efficiency	OOC≤5%	
Max Screen Basket Diameter	930mm	
Screen Opening	0.25~0.5mm	
Rotation Speed	900RPM	0~900RPM
Oil Tank Capacity	48L	
Air Knife Input Pressure	0.41Mpa	
Air Knife Input Capacity	4.8m3/min	
Flushing Pump Qty	1 pc	
Main Motor	55Kw(75HP)	
Oil Pump	0.55Kw(0.75HP)	
Flushing Pump Power	4Kw(5.5HP)	
EX Standard	ExdIIBt4/IECEX/A-TEX	
Electric Cabinet	Exd	Positive Pressurized
Weight(Kg)	4200kg	4200kg
Dimension:L×W×H (mm)	2650×1720×1630mm	

Features

- More Application: Working for OBM and SBM.
- High G Force: Normal 420G @ 900RPM, optional to drive by VFD with variable speed.
- FAG Brand premium bearing.
- The Flights on the rotor is hard facing to HRC 65, longer life than our competitors.
- Special high pressure air knife design to clean the basket screen automatically to avoid the screen blinding especially for high viscosity mud and water based mud.

5.2 High G Drying Shaker

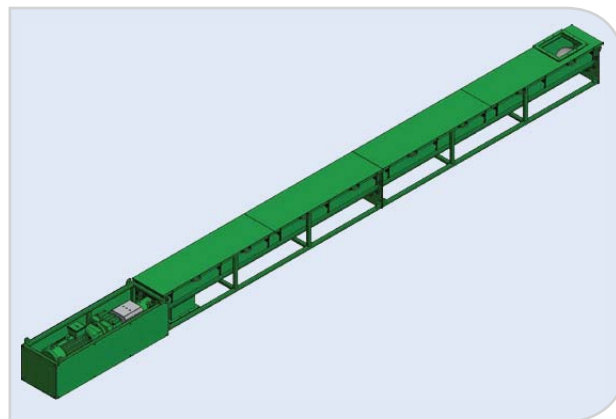
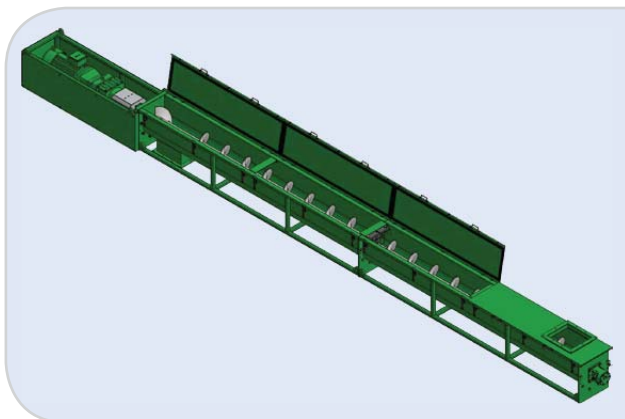


Model	GNZS594F-SGZF	GNZS703F-SGZF
Vibration Mode	Linear Motion	Linear Motion
Capacity(m³/h)	140(616GPM)	120(528GPM)
Vibration Motor(Kw)	2×1.94	
Screen Qty(Pcs)	4	3
Screen Size: L×W(mm)	585×1165	700×1250
Screen Area(m²)	2.73	2.63
Adjustable G Force	≤8.2G	≤8.3G
Vibration Amplitude(mm)	4.5 ~ 6.48	4.6 ~ 6.62
Deck Angle	-1 ~ +5°	
Feeding Type	Hopper Feeder	
Feeder Height(mm)	1065	1065
EX Standard	ExdIIBT4/IECEX/ATEX	
Weight(Kg)	1590	1538
L×W×H(mm)	2912×1968×1435	2667×1968×1435

Features

- G force up to 8.0 adjustable for drying solids discharge.
- Mechanical shaker deck angle adjustable while working
- Patent tighten rubber sealing for shaker deck and screen, long life and easy replacement.
- Shaker bottom deck made from Stainless Steel for long service life.
- Heat treatment on complete shaker deck for High G force operation.
- 4 Panel Pretensioned Shaker screen for fast screen replacement.
- Famous Brand Vibration Motors : IEC Ex, ATEX and UL Certified
- Low Profile Feeder for easier cuttings transfer.

5.3 Screw Conveyor



Model	Screw Diameter Inch/mm	Screw Length Ft/m	Capacity (Tons/Hour)	Motor Power (Kw)	Screw Speed (Rpm)
GNSC10-24B	10/250	24/7.3	15	5.5(7.5HP)	50-60
GNSC10-36B	10/250	36/11	15	5.5(7.5HP)	
GNSC10-48B	10/250	48/14.6	15	11(15HP)	
GNSC12-24B	12/315	24/7.3	20	5.5(7.5HP)	50-60
GNSC12-36B	12/315	36/11	20	7.5(10HP)	
GNSC12-48B	12/315	48/14.6	20	11(15HP)	
GNSC14-24B	14/350	24/7.3	30	7.5(10HP)	50-60
GNSC14-36B	14/350	36/11	30	11(15HP)	
GNSC14-48B	14/350	48/14.6	30	15(20HP)	
GNSC16-24B	16/400	24/7.3	45	11(15HP)	50-60
GNSC16-36B	16/400	36/11	45	15(20HP)	
GNSC16-48B	16/400	48/14.6	45	18.5(25HP)	
GNSC18-24B	18/450	24/7.3	55	11(15HP)	50-60
GNSC18-36B	18/450	36/11	55	15(20HP)	
GNSC18-48B	18/450	48/14.6	55	22 (25HP)	
Remarks: According to clients requirement, GN Provide customized equipment.					

Features

GN Solids utilize a custom designed and constructed Screw Conveyor (Auger) as part of drilling waste management system. The Auger is designed with 12 feet per section which makes it to be standard spare parts for exchange with each other. The screw material utilized by GN is abrasive material which lasts longer then our competitors. The Screw Conveyor (Auger) is designed to offer an efficient, low cost, cuttings transport system for offshore and onshore drilling installations. The screw conveyor are manufactured to the highest safety standards and are fitted with protective grating or cover to prevent foreign bodies entering the conveyor system, and to offer enhanced safety for all personnel.

5.4 Inclined Plate Clarifier



Model	Max Flow Rate	Inlet Size	Outlet Size	Sludge Chamber Volume	Discharged Liquid Chamber	Dimension(mm)
GNIPC-06A	6m ³ /h	3in	3in	136L	9L	1905×1041×1930
GNIPC-12A	12m ³ /h	4in	4in	218L	18L	2006×1346×2210
GNIPC-18A	18m ³ /h	4in	4in	245L	18L	2311×1346×2464
GNIPC-25A	25m ³ /h	4in	4in	377L	68L	2489×1956×2489
GNIPC-35A	35m ³ /h	4in	4in	509L	77L	2489×2565×2489
GNIPC-40A	40m ³ /h	6in	6in	636L	90L	2489×3226×2489
GNIPC-60A	60m ³ /h	6in	6in	881L	136L	2489×4445×2489
GNIPC-80A	80m ³ /h	6in	6in	1250L	213L	2489×5664×2489
GNIPC-120A	120m ³ /h	8in	8in	886L	318L	2997×4496×3581

Features

GN Inclined Plate Clarifiers (IPC) is a high performance, Lamella plate design for removal of settleable solids in a variety of waste streams. The lamella plate is made from stainless steel.

GN IPC design incorporates inclined plate settling surfaces pitched at a 55° angle from the horizontal with uniform plate spacing. Due to plate angle the solids slide down the plates into the sludge hopper below the plate pack. The simple, inexpensive design, combined with sludge conveyor Auger makes the GN IPC easy to install, operate and maintain.

Chemical like polymer pretreatment often improves solids removal efficiencies. The use of chemical flocculants with GNIPC is based on system efficiency, application contaminant characteristics and cost.

5.5 Oil Water Separator



Model	Max Flow Rate	Inlet Size	Outlet Size	Oil Export Size	Sludge Chamber Volume	Oil Chamber	Dimension(mm)
GNOWS-05A	5m ³ /h	2in	2in	2in	57L	15L	1828×711×1219
GNOWS-08A	8m ³ /h	3in	3in	3in	113L	23L	1828×1016×1229
GNOWS-11A	11m ³ /h	3in	3in	3in	152L	30L	1828×1320×1229
GNOWS-16A	16m ³ /h	4in	4in	3in	250L	45L	2362×1016×1397
GNOWS-24A	24m ³ /h	4in	4in	3in	250L	45L	2362×1016×1711
GNOWS-32A	32m ³ /h	4in	4in	3in	250L	57L	2362×1016×1956
GNOWS-43A	43m ³ /h	6in	6in	4in	345L	76L	2362×1320×1956
GNOWS-54A	54m ³ /h	6in	6in	4in	427L	95L	2362×1626×1956
GNOWS-65A	65m ³ /h	6in	6in	4in	514L	113L	2362×1936×1956
GNOWS-87A	87m ³ /h	6in	6in	4in	598L	151L	2362×2540×1956
GNOWS-98A	98m ³ /h	6in	6in	4in	768L	189L	2362×2845×1956

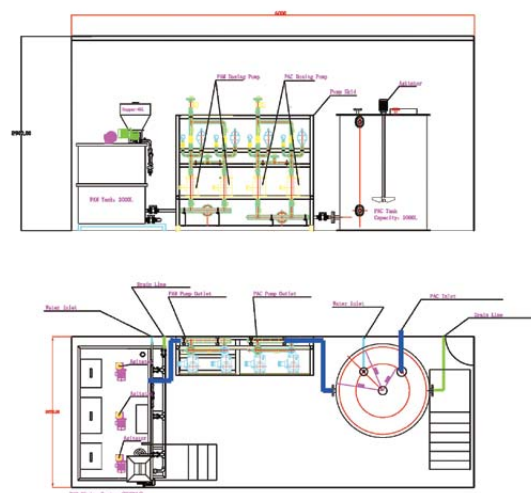
Products Features

GNOWS series oil water separator separates the oil and water by gravity stratification, its main application is the separation of oily waste water for refinery. The unit is composed of waste water inlet, clean water outlet, clean oil outlet, gas release ports 4pcs, waste discharge port. It is equipped with a detachable coalescer, the oily waste enters into the coalescer, separates the oil and water, then the oil flows to the oil chamber, the water flows to the water chamber. The tank design allowed the fluids to stay in the tank for a reasonable time to ensure the complete separation of oil and water. The Tank equipped with level meter to watch the level of oil and water conveniently.

5.6 Chemical Dosing Equipment



GN-2000 series 20ft container chemical dosing equipment is mainly used for mixing of flocculation, coagulation or de-emulsifier. It works together with dewatering centrifuge to separate the ultra-fine solids from the mud or waste water, to get clean water for industry applications; or support the separation of waste sludge.



Chemical Dosing System	Model: GN-2000A
Three Chamber automatic Dosing Unit Model: GN-2000S	<p>Include 20ft container with decoration, include electric control system, exhaust system, lighting system.</p> <p>Max powder adding capacity:1-6 Kg/Hr(Speed Adjustable)</p> <p>Tank Material: SS304</p> <p>Hopper Volume:45 L</p> <p>Tank Capacity:2000L</p> <p>Output for concentration 0.1%:2000L/Hr, if aging time is 45 Min.</p> <p>Mud agitator: 3 sets</p> <p>Dosing pump: 2 sets, single pump capacity:2000L/h(adjustable)</p> <p>Dimension:2000x1400x1500mm</p> <p>Including Ex liquid level meter, Ex electromagnetic flow meter, Ex solenoid valve, relief valve, buffer, filter and pressure gauge, etc accessories.</p>
Single tank chemical Dosing Unit Model: GN-2000L	<p>Tank Material: Outer material is carbon steel, inner material is PE</p> <p>Dissolving Tank Volume: 2000L</p> <p>Dissolving Tank Dimension 1400x2200mm(Agitator included)</p> <p>Mud agitator: 1 set</p> <p>Dosing pump: 2 sets, single pump capacity:530L/h(adjustable)</p> <p>Attached with Magnetism rolling board level meter, relief valve, buffer, filter and pressure gauge, etc accessories.</p>

5.7 Waste Solidification Unit

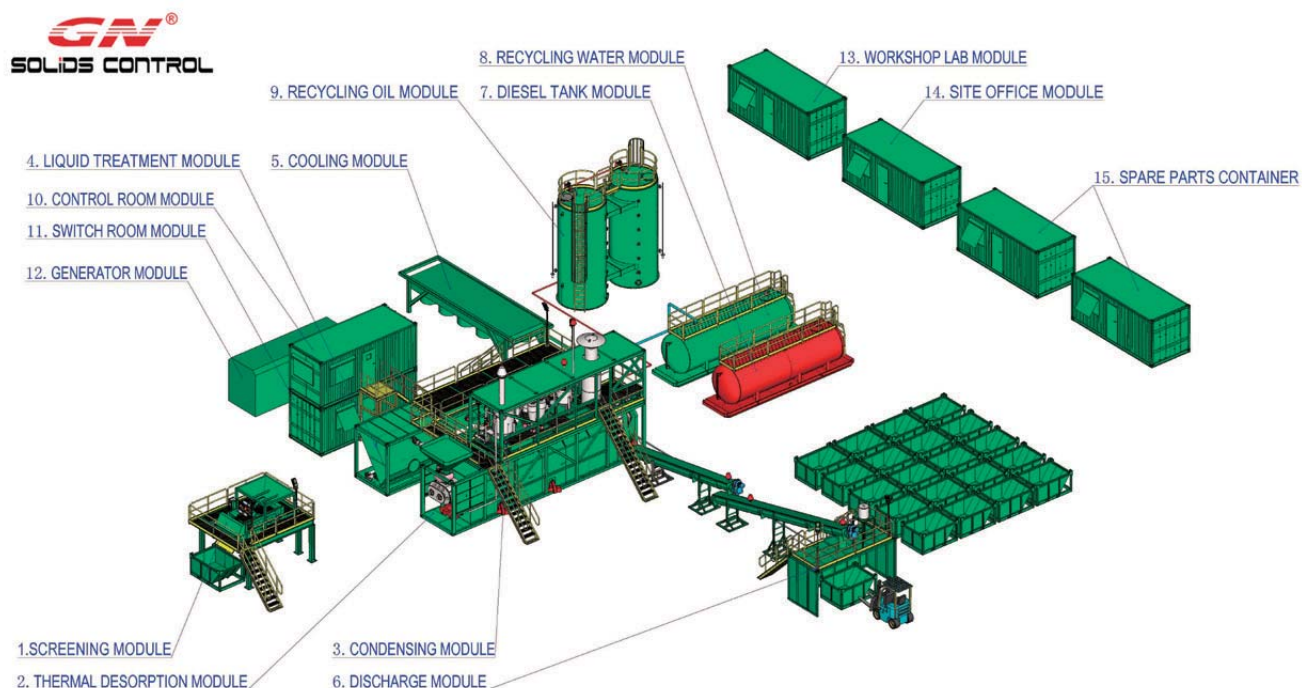


Model	GNGH-15C
Treating Capacity	15m ³ /h
Mixer Tank Volume	4000L
High-Shear Mixer Power	45KW
Sludge Storage Volume	5m ³
Sludge Conveyor Flow	≤15m ³ /h (VFD Adjustable)
Sludge Conveyor Power	7.5KW
Lime Storage Volume	2000L
Lime Conveyor	3Kw, 3m ³ /h (VFD Adjustable)
Absorber Storage Volume	2000L
Absorber Conveyor	3Kw, 3m ³ /h (VFD Adjustable)
Transportation Dimension:	11524x2200x2528mm
Remarks	2 pieces of 1.5inch liquid inlets located beside the mixer inlet for water feeding and liquid chemical feeding.

Features

- Cost can be relatively inexpensive for both oil based and water based drilling cuttings.
- The GN Solidification/Stabilization unit required is easily operated and maintained, also since its adjustable preset capacity, it works continuously and automatically, so it needs relatively few man hours, moreover, no chemical waste that requires further treatment is produced.
- The stabilization /solidification unit provide an effective method for processing oil- base waste and water based waste; in a result, it produces an environmentally safe, dry material that is acceptable for onsite, or land farming disposal at an approved waste facility.
- Solidification of wastes involves the production of a solid mass having sufficiently high structural integrity to allow transport and /or disposal of the solid without requiring secondary containment. This technology converts hydrologic sensitive liquid and semi-liquids waste in a physical form that can be stored safely.
- Stabilization involves the immobilization of constituents in wastes by chemical alteration to form insoluble compounds, or by entrapment within the solidified product.

5.8 Thermal Desorption Unit



Model	GNTDU-35A
Capacity (Ton/h)	3.5-5.0 Ton/h
Oil Content after TDU Treatment	0.3%-1% As per request

Main Module

Screening Module, Thermal Desorption Module, Condensing Module, Liquid Treatment Module, Discharge Module, Diesel Tank Module, Recycling Water Module, Recycling Oil Module, Control Room Module, Switch Room Module

Features

GN Mobile TDU is an ex-situ, non-incineration technology designed to separate hydrocarbons from various matrices including oilfield waste, soil, sludge, sand, filter-cake, tank and tanker bottoms, organic-based hazardous waste and contaminated soil in a non-oxidizing atmosphere without destroying the hydrocarbons.

GN Mobile TDU is popular for treatment of different waste streams in particular oily sludge, drill cuttings, organic-based hazardous waste processing and contaminated soil remediation.

The TDU technology has been used extensively for waste management, and recovery of the oil from the waste material as a sellable product throughout the world.

Indirect heated treatment technology. oily waste will be heated firstly. The oil and moisture will gasified, and gases will be quenched and condensed for oil/water separation.

Part 6: Transfer Pumps

6.1 Centrifugal Pump



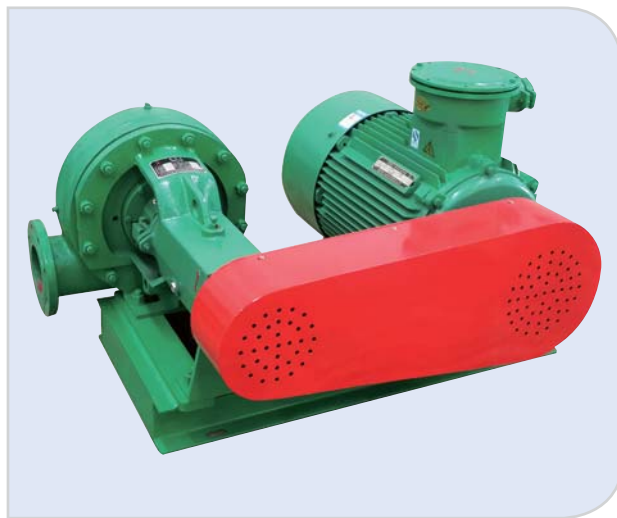
Model	Flow	Lift	Motor	Speed	Impeller
GNSB8×6C-14J	320m ³ /h	35m	75kW	1450RPM(50Hz)	14in
GNSB8×6C-12J				1750RPM(60Hz)	12in
GNSB8×6C-13J	272m ³ /h	35m	55kW	1450RPM(50Hz)	13in
GNSB8×6C-11J				1750RPM(60Hz)	11in
GNSB6×5C-13J	200m ³ /h	35m	45kW	1450RPM(50Hz)	13in
GNSB6×5C-10J				1750RPM(60Hz)	10in
GNSB6×5C-12J	150m ³ /h	30m	37kW	1450RPM(50Hz)	12in
GNSB6×5C-9.5J				1750RPM(60Hz)	9.5in
GNSB5×4C-13J	120m ³ /h	35m	30kW	1450RPM(50Hz)	13in
GNSB5×4C-11J				1750RPM(60Hz)	11in
GNSB5×4C-12J	90m ³ /h	30m	22kW	1450RPM(50Hz)	12in
GNSB5×4C-10J				1750RPM(60Hz)	10in
GNSB4×3C-13J	65m ³ /h	35m	18.5kW	1450RPM(50Hz)	13in
GNSB4×3C-12J				1750RPM(60Hz)	12in
GNSB4×3C-12J	55m ³ /h	28m	15kW	1450RPM(50Hz)	12in
GNSB4×3C-10J				1750RPM(60Hz)	10in
GNSB4×3C-11J	45m ³ /h	25m	11kW	1450RPM(50Hz)	11in
GNSB4×3C-9.5J				1750RPM(60Hz)	9.5in
GNSB3×2C-10J	35m ³ /h	35m	7.5kW	1450RPM(50Hz)	10in
GNSB3×2C-9J				1750RPM(60Hz)	9in

Remarks: Spare Parts interchangeable with Mission pump.

Features:

GN SB Series Centrifugal pump is used for transferring drilling mud. It can be used as feeding pump for desander, desilter, or used as mixing pump for Jet Mud Mixer. Also it can be used as trip pump, and supercharging pump for rig mud pump. All GN model centrifugal pump use tungsten carbide mechanical seal, with famous brand Bearing. And spare parts interchangeable with most of the international Brand pump which helps customer to source spare parts easily. Open impeller design that lowers axial thrust loads, and make it easier for installation, repair and maintenance.

6.2 Shear Pump



Model	Flow	Lift	Motor	Speed	EX Standard	Weight	Dimension(mm)
GNJQB6X5C-550	155m ³ /h	32m	55kW	1900RPM	EXdIIBt4/ IECEX/A-TEX	965kg	1333×1000×931mm

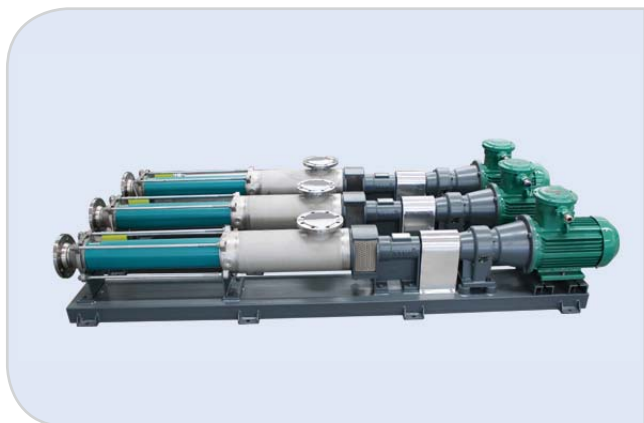
Features:

The GN shear pump reduces the cost of mixing polymers and clays while improving mud properties. Shearing the polymers eliminates fish eyes and prevents polymer chaining (long strings), which cannot pass through the shaker screens. The GN shear pump is available as a belt-driven or diesel-driven package including a hopper, mud gun, and transfer line orifice plate. A complete system with skid, tanks, and piping are also available.

GN Shear Pump impeller is specially designed to have a wider flow pass and smooth vanes, with larger flow area and smooth fluid pass, making the shear pump reach the internationally advanced level in shear pump efficiency and energy-saving, 10% higher than similar products. The shear pump has adopted a shell thicker than normal one, with rational pass and less turbulence.

GN Shear pump Impeller and shell are made of high wear resistant cast irons, with longer servicing life. The shear pump shaft has high strength that can bear certain load, reducing shafts deflection and extending seals service life; The shaft is lubricated with lubricants and lubricating grease and the oil seal is made of special structure and materials, suitable for high and low temperatures and complicated environment; Front opening structure is used for convenient installation, repair and maintenance.

6.3 Screw Pump



Model	Flow	Pressure	Motor	Max Speed	Inlet	Outlet	Ex Standard	Weight	Dimension (mm)
GNG10-040B	10m ³ /h	0.3MPa	4kW	244RPM	DN80	DN80	EXdIIBt4/ IECEX/ A-TEX	245kg	2245×320×550
GNG20-055B	20m ³ /h	0.3MPa	5.5kW	210RPM	DN80	DN80		323kg	2450×340×562
GNG30-075B	30m ³ /h	0.3MPa	7.5kW	258RPM	DN100	DN100		386kg	2761×370×600
GNG40-110B	40m ³ /h	0.3MPa	11kW	252RPM	DN100	DN100		454kg	3270×370×665
GNG50-110B	50m ³ /h	0.3MPa	11kW	273RPM	DN125	DN125		608kg	3790×400×782
GNG60-150B	60m ³ /h	0.3MPa	15kW	225RPM	DN125	DN125		649kg	3322×550×740
GNG70-220B	70m ³ /h	0.3MPa	22kW	230RPM	DN150	DN150		875kg	3740×420×785
GNG80-220B	80m ³ /h	0.3MPa	22kW	283RPM	DN150	DN150		875kg	3740×420×785
GNG90-220B	90m ³ /h	0.3MPa	22kW	205RPM	DN150	DN150		875kg	3740×420×785

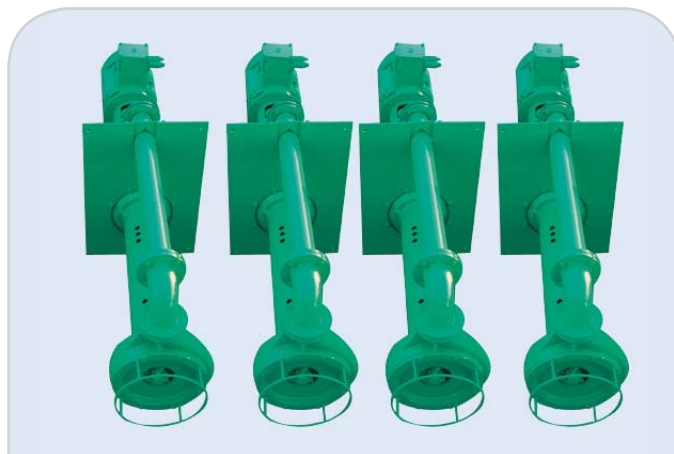
Features:

The GNG Series Positive Displacement Pump is a single screw pump. The pump is an ideal pump for feeding to decanter centrifuge without shearing or agitating the drilling mud. The main parts are screw shaft (rotor) and screw shaft bushing (stator). Because of the special geometry shape of the two parts, they form pressurize capacity separately. The fluids flow along with the shaft, inner flow speed is slow, capacity remains, pressure is steady, so it will not generate vortex and agitating. The shaft of the pump is made from Stainless steel, GNG series pump is available for option with complete stainless steel body,

It can drive by coupler, or adjust the speed by using variable speed motor, Triangle V-belt, gear box, etc G series positive displacement pump is with less accessories, compact structure, small volume, easy maintenance, rotor and stator are wear parts of this pump, it is convenient to replace.

The stator is made of elastomeric material, so it has particular advantages than other pump to transfer the fluids of high viscosity and hard suspended particles included.

6.4 Submersible Slurry Pump



Model	Flow	Lift	Motor	Speed	Outlet	EX Standard	Weight	Dimension (mm)
GN50YZ20A-18	30m3/h	10m	4kW	1450RPM(50Hz)	DN50	EXdIIBt4/ IECEX/ A-TEX	370kg	2620×500×720
				1750RPM(60Hz)				
GN50YZ40A-10	40m3/h	10m	5.5kW	1450RPM(50Hz)	DN50		600kg	2700×500×700
				1750RPM(60Hz)				
GN80YZ50A-20	60m3/h	18m	7.5kW	1450RPM(50Hz)	DN80		610kg	2650×500×700
				1750RPM(60Hz)				
GN80YZ80A-20	80m3/h	20m	11kW	1450RPM(50Hz)	DN80		718kg	2750×580×730
				1750RPM(60Hz)				
GN100YZ100A-30A	110m3/h	24m	18.5kW	1450RPM(50Hz)	DN100		840kg	2900×600×900
				1750RPM(60Hz)				
GN100YZ100A-30	120m3/h	28m	22kW	1450RPM(50Hz)	DN100		880kg	2950×600×900
				1750RPM(60Hz)				
GN100YZ160A-38B	164m3/h	26m	30kW	1450RPM(50Hz)	DN100	1300kg	3100×750×900	
				1750RPM(60Hz)				
GN150YZ250A-40B	240m3/h	24m	37kW	1450RPM(50Hz)	DN150	1420kg	3160×700×1130	
				1750RPM(60Hz)				
GN150YZ250A-40A	270m3/h	30m	45kW	1450RPM(50Hz)	DN150	1510kg	3190×700×1130	
				1750RPM (60Hz)				

Remarks: The Weight and dimension is for the standard submersible length pump: 1.3m.

Features:

GN YZ Series Submersible slurry pump is with structure of vertical single stage and single suction system overhung centrifugal pump, it is made of abrasion-resistant alloy, it can transfer medium with high concentration particle. The normal submersible length is 1.3m, customized length is available. There is no bearing and Gland Seal between impeller and pump body, so the slurry pump is maintenance-free and high temperature resistance, the slurry pump is the ideal centrifugal pump for feeding to decanter centrifuge, and feeding from mud pit for to the shale shakers on the mud system, it can also be used as feeding pump for desander and desilter.

6.5 Vacuum Pump

Waste vacuum pump, also named as solids transfer pump. With special structure design, it can be used at tough environmental for solids transfer, high working performance and less maintenance. The pump can transfer material with high gravity and high density, solids content max. up to 80%.



GN Sludge Vacuum Pump Parameter

Model	GNSP-40B	GNSP-20B	GNSP-10B
Max Capacity(m³/h)	40m³/h	20m³/h	10m³/h
Inlet/Outlet Size(Inch)	4”(114mm)	4”(114mm)	3”(89mm)
Vacuum Degree	25”HG (Mercury Column)	85Kpa/25 inch HG(Mercury Column)	
Max Suction Distance(m)	50m		
Max Discharge Distance(m)	1000m	500m	
Max Solids Content	80%		
Max Solids Size(mm)	75mm	50mm	
Pressure Request	550Kpa-785Kpa (80-114PSI)	550Kpa-690Kpa (80-100PSI)	
Air Demand	17m³/min (600CFM)	8m³/min(280CFM)	4.3 m³/min(150CFM)
Weight(kg)	892kg	386kg	320kg
Dimension: L×W×H(mm)	1690×1468×1983mm	1421×900×1448mm	1283×800×1370mm

Material transfer applications

- 1) Waste mud and waste solids discharged from shale shaker, mud cleaner and centrifuge transfer
- 2) Drilling mud transfer
- 3) Waste pit cleaning
- 4) Hazardous waste recovery
- 5) Oil sludge, tank bottoms residual removal and transfer
- 6) Barge holdings and vessel bottom clean out
- 7) Bulk tank and silo transfer of material
- 8) Sand; Course, fine, conventional and frac sand
- 9) Diatomaceous earth
- 10) Animal waste etc.

Part 7: Explosion Proof Electrical Control

7.1 EX Proof Electrical control panel

GN Explosion proof electrical control panels are used in hazardous Location. It is accordance with the requirement of China CNEX Certificate, Europe ATEX certificate and International IEC Ex certificate.



Features of GN EX Proof Electrical control panel:

- 1) Different type control panel can meet different requirements with customized design, to provide complete electrical control solutions.
- 2) Flameproof or Positive pressurized control panel with different certificate, can meet the requirements of different countries.
- 3) Various electrical components can be attached in the control panels: buttons, lights, meters, switches, circuit breakers, contactors, relays, measuring instruments, PLC and other necessary electrical components.
- 4) Control panel enclosure is made of aluminum alloy, steel plate or stainless steel. EX proof Electrical control box applications:

Application of GN EX Proof Electrical control panel:

- Suitable for Explosive gas environment Zone1 or Zone 2
- Suitable for IIB, IIC Explosive gas environment and Suitable for group T1-T4 temperature group
- widely used in refinery, chemical plant, offshore oil drilling platform, oil exploitation, oil tanker and other flammable and explosive gas environment

According to the requirement, we can offer solutions with electrical control design, EX proof box selection and installation.

7.2 Motor Ex proof starter

Motor Ex proof starter made by GN Solids Control is with strong and compact design; can meet the requirement of China CNEX Certificate, Europe ATEX certificate and International IEC Ex certificate; can be used for Division 1 or Division 2 hazardous areas. Motor Starter type including: Ex proof electromagnetic starter; Ex proof star delta starter and Ex proof soft starter.



Features of Ex-proof electromagnetic starter:

- Starter enclosure is made of Aluminum Alloy by casting, surface by high pressure electrostatic spraying process or powder coating.
- With thermal relay, self-settable conversion switch. If with main switch, high breaking miniature circuit breaker and AC contactor will be equipped.
- Various international EX proof certificates, to meet the requirements of EX proof environment all over the world.
- Can directly start and stop of AC three-phase asynchronous motor, and provide the motor from overload, phase failure and voltage loss.
- Remoter control available
- Steel pipe or cable wiring for option

Features of Ex soft starter:

- Torque Control the soft start and soft stop for motor, can improve the availability, security of equipment, to meet the communication function of the control system.
- With Altistart torque control function, linear control the motor torque.
- Various protection functions: pre heating protection, under load protection, over current protection, PTC thermal protection.
- PLC programming control available, to meet equipment adjustment and optimization.
- Set different starting parameters, select the conventional start or overload start.

EX proof star delta starter is a kind of reduce voltage start function for big power motors, simple operation and economical saving. Compared with soft starter, much cost saving for client.

7.3 Positive pressure EX proof electric control panel

GN Explosion Proof Pressurized Control Panel is popular used for VFD control and soft starter of motor, especially in high temperature ambient. The explosion proof pressurized control panel consists of main cavity and auxiliary cavity. GN Explosion Proof Pressurized Control Panel can meet the requirement of China CNEX Certificate, Europe ATEX certificate and International IEC Ex certificate.



Explosion Proof Pressurized Control applications:

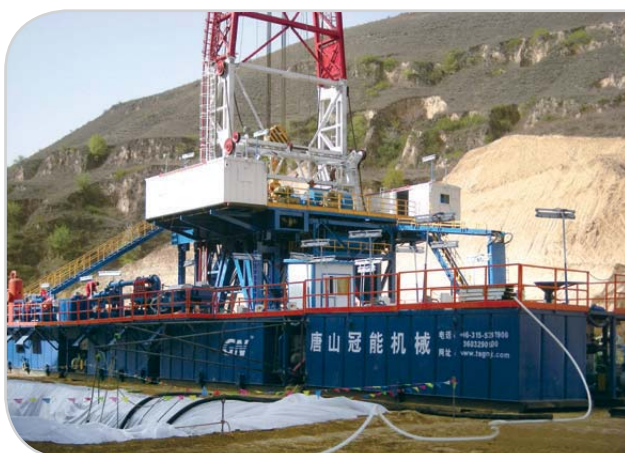
- Suitable for Explosive gas environment Division 1 or Division 2
- Suitable for IIB, IIC Explosive gas environment
- Suitable for combustible dust environment zone 21, zone 22.
- Suitable for group T1-T4 temperature group
- Protection level: IP65/IP66.

Positive pressure ventilation EX proof use principle of dielectric isolation ignition source, equivalent to all the electrical components installed in a positive pressurized clean medium shell, the mixed gas in the flammable and explosive substances outside of shell cannot come into contact with electrical components, not appear in normal electric studio spark or dangerous temperature, so as to achieve the purpose of electrical explosion proof. GN positive pressure ventilation ex proof control panel is divided into two categories: PZ and PX. PZ series meet the use of Ex-proof Zone 2, PX series of products to meet the use of explosion-proof area Zone 1.

Part 8: Industry Application

8.1 Oil & Gas Drilling Solids Control System

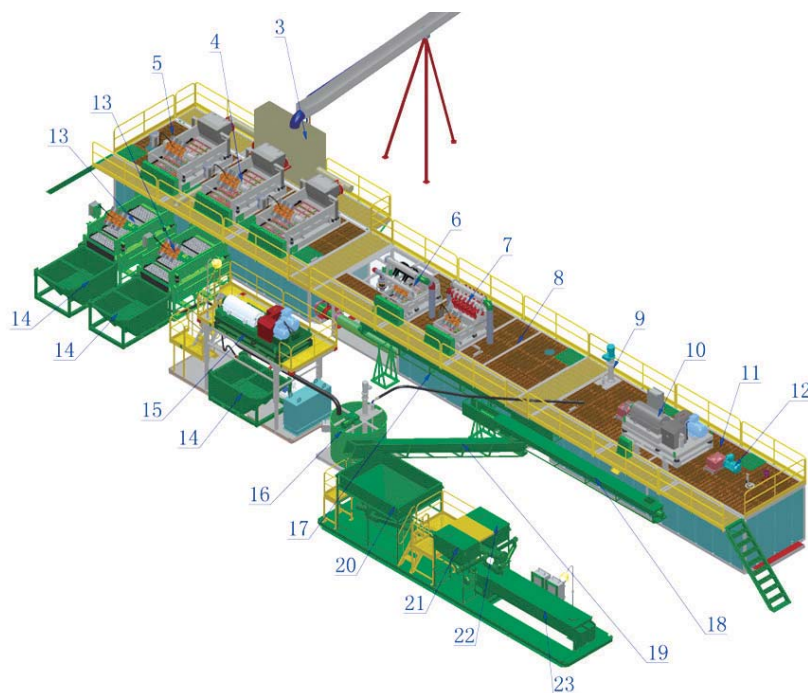
GN Solids Control manufactures all solids control equipment. Mud tanks are also designed and manufactured to compose whole mud systems to meet the demands of drilling rigs from 250HP to 3000HP. As a solids control manufacturer owns USA API and ISO certifications, GN Solids Control also certified by Europe CE for exporting to developed countries.



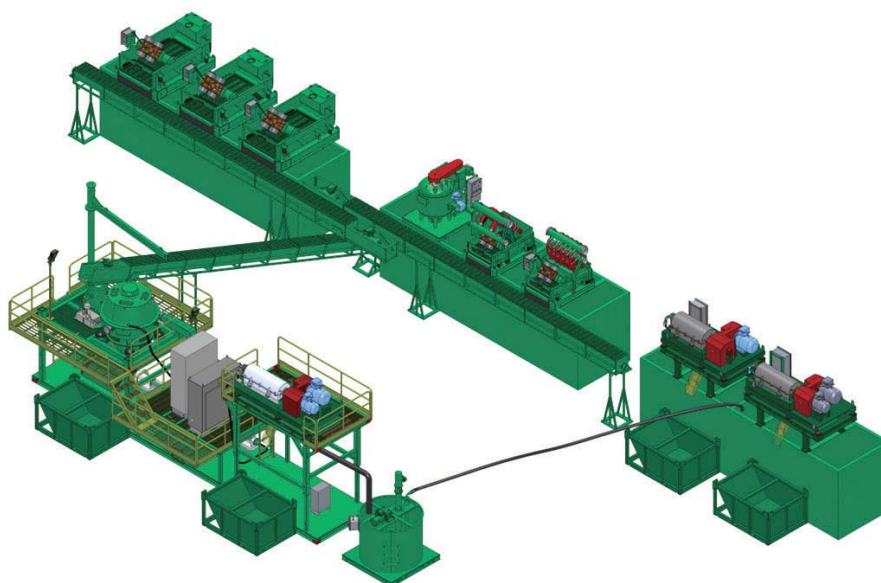
8.2 Drilling Waste Management System

GN Solids Control provides turnkey solutions for closed loop drilling mud and drilling waste management system. Key equipment includes Hi-G Shaker, Cuttings Dryer, Decanter Centrifuge, Flocculating Dosing Unit, Sludge Solidification Unit, and Thermal Desorption Unit. They can be used to treat WBM, OBM and SBM.

Typical WBM Treating System Layout



Typical OBM Treating System Layout



Drilling Waste Management Projects



European Treating Plant Project



Shell (Sichuan) Project



Siberia Russia Project



Africa OBM Treating Project



Inner Mongolia WBM Treating Project



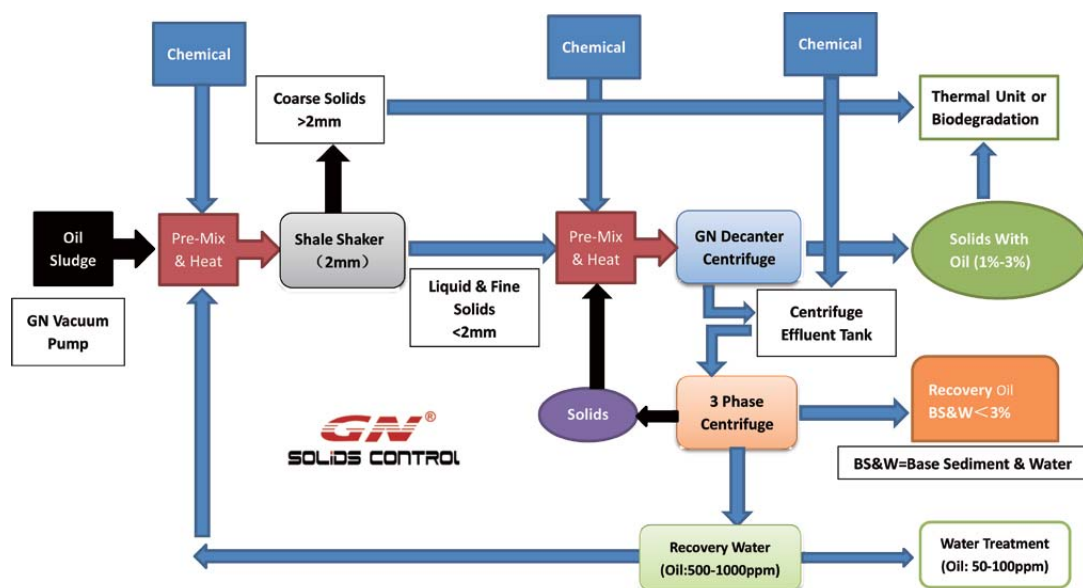
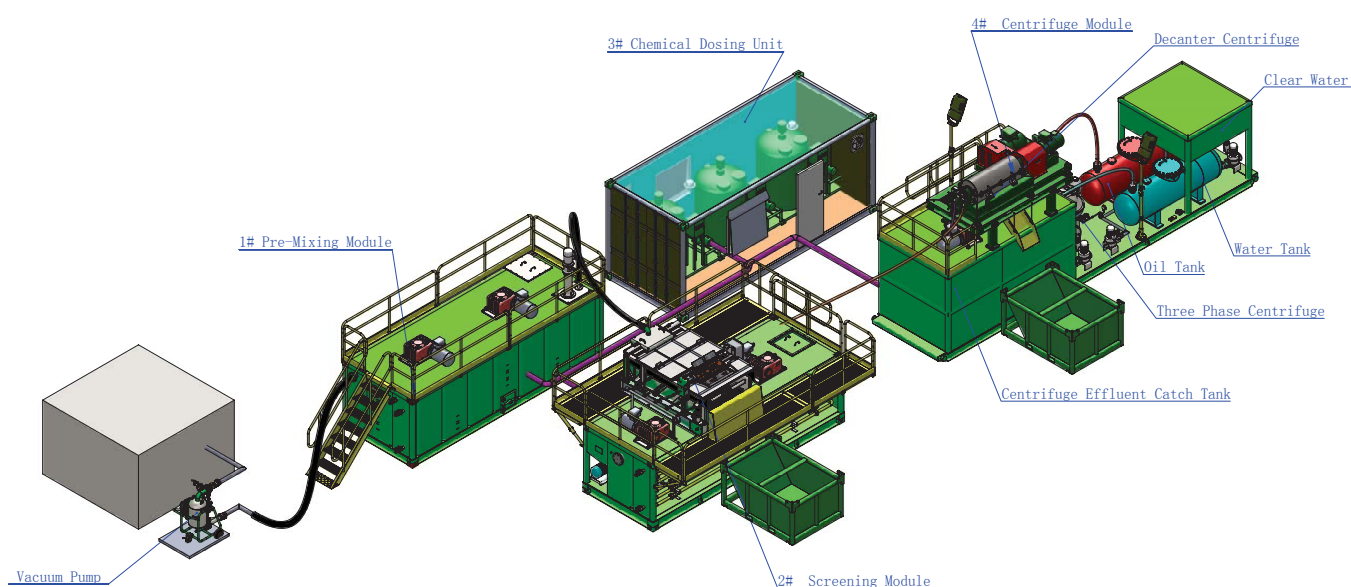
Argentina WBM Treating Project

8.3 Oil Sludge Treatment

GN Oil Sludge Treatment System is to use chemical to wash the oil sludge with heat to temperature of 60-70 C degree. After washing the slurry is pumped to GN separation equipment to separate into oil, water and solids. The recycled water can be reused in the washing process, and the oil is clean enough to sell to the refinery company, the solids contain oil which can be sent to biodegradation or thermal unit for final disposal.

Typical Oily Sludge source:

- Oil tank bottom sludge
- Oil sludge from refinery plant
- Drilling waste oil sludge



8.4 Trenchless/HDD Mud Recycling System

GN is committed to the research and development of trenchless mud recycling system, mud mixing system, decanter centrifuge etc. As a leading brand in the world, GN's products have been exported to over 60 countries and regions, and set up branches & services stations in 8 countries. GN Solids America is GN's USA brand.



Configuration Type	High Configuration						
System Function	Mud Recycling/Mixing/Strage						
Model	GNMS-200G	GNMS-350G	GNMS-500B	GNMS-500G	GNMS-500GL	GNMS-1000G	GNMS-1000GL
Capacity	50m ³ /h	80m ³ /h	120m ³ /h	120m ³ /h	120m ³ /h	240m ³ /h	240m ³ /h
Cleaning Stage	2 Stages	2 Stages	2 Stages	3 Stages	3 Stages	3 Stages	3 Stages
Treating Precision	20μm	20μm	20μm	20μm	20μm	20μm	20μm
System Volume	5m ³	9.5m ³	9.5m ³	15.5m ³	24.5m ³	30m ³	48m ³

Advantages of GN Recycling Equipment

- Preferred supplier of well-known rig manufacturers and contractors.
- Leading capabilities on both hardware and software, welcome for facility site visiting.
- Certified with US API, Europe CE and Russia CU-TR standard.
- High level material selected: stainless steel shaker deck bottom frame, Italy OLI vibration motor and Siemens electric components.
- Independent research and manufacturing on 4-Stage cleaning equipment: Shale Shaker, Desander, Desilter and Decanter Centrifuge.

8.5 TBM & Bored Piling Mud Cleaning

GN Solids Control is providing the assembled-type mud cleaning system for piling and TBM projects. The production line includes models with capacity of 120m³/h, 240m³/h, 360m³/h, 500m³/h, 1000m³/h, 1500m³/h, 2000m³/h, 3000m³/h. In addition, GN also provides big bowl decanter centrifuge and chemical dosing system for treating the mud to discharge-able water.



Bored Pile Desander



Configuration Type	Economic Configuration		
System Function	Mud Cleaning/Recycling		
Model	GNMS-200D	GNMS-500D	GNMS-1000D
Capacity	50m³/h	120m³/h	240m³/h
Cleaning Stage	2 Stages	2 Stages	2 Stages
Treating Precision	20µm	40µm	40µm
System Volume	1m³	1~5m³	1.5m³

8.6 Industrial Solids & Liquid Separation System

As a professional manufacturer of solids and liquid separation equipment, GN Solids Control provides many kind of separation equipment including vibration screen equipment, horizontal decanter centrifuge, hydro cyclone separation equipment, gravity settlement separation equipment, and 3-Phase separation equipment. According to different separation request, GN is able to provide customized solution to maximize the treating result and reduce the cost for customers' biggest profit.



Mining & Core Drilling Mud Solids and Liquid Separation



Water Well Drilling Mud Recycling



Geothermal Well Drilling Mud Cleaning



Mining Slurry Solids and Liquid Separation



Dredging Slurry Solids and Liquid Separation



Hydrovac Slurry Treatment System

Equipment Separation Cut Point

Particle Size (Microns)	0-2	2-5	5-20	20-40	40-60	60-1000	1000-2000	>2000
Solids Control Stages	4 th Stage			3 rd Stage	2 nd Stage	1 st Stage		
Shale Shaker	No				API 270/325	≤API 230	API 10/20	≤API 10
Desander	No				Yes			No
Desilter	No			Yes			No	
Decanter Centrifuge	Flocculant	High Speed	Middle Speed	Middle Speed	Low Speed			No
Inclined Plate Clarifier	Flocculant	Flocculant	Yes					
Vertical Cuttings Dryer	No					Solids Should be above 250 microns		
Centrifugal Pump	Yes						No	

Remarks: The above table is for reference only.

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