Sludge Dewatering: The Rotary Press

NAWT 6th Waste Treatment Symposium
Camp Camby, IN
September 25, 2013

Company Background

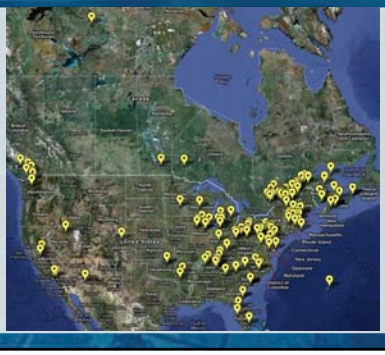
- Founded in 1960
- Located in Quebec, Canada
- 250 Employees
- Building the Rotary Press since 1989
- Full fabrication shop

Rotary Press Installations (as of 8-1-13)		
USA	Canada	Rest of World
148	83	156

Installations
Rotary Press vs Applications
August 2013

Application	Number of units
Municipal	340
Septic sludge	17
Pulp and Paper	9
Animal manure	6
Industrial	6
Others	9
TOTAL	387

North American installations

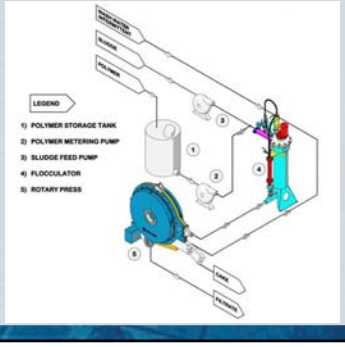


The Rotary Press

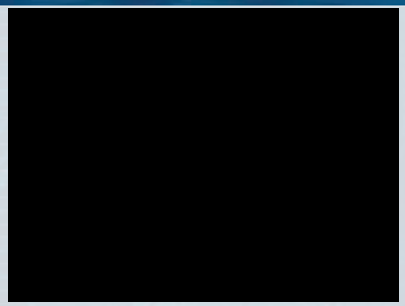
- Process Description
- Anatomy of the Press
- Performance

- Maintenance
- Selected Installations
- Q&A

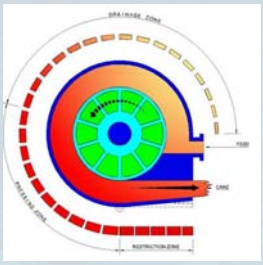
Process Flow



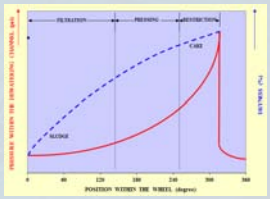
3D Animation



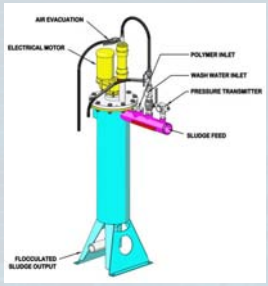
Inside the Wheel



- Drainage Zone
- Pressing Zone
- Restriction Zone



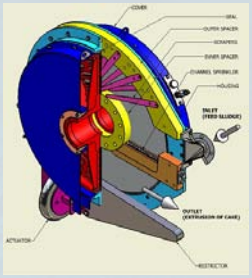
Rotary Press Flocculator



- 17 gallon flocculation chamber
- Variable speed agitator
- Inlet feed pressure transmitter
- Bypass valving
- Sludge sightglass

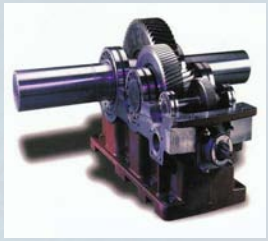
Rotary Press Dewatering Channel

- 36” diameter wheel
- 2” channel bracketed with dewatering screens
- Sludge scrapers
- Air actuated restrictor bar
- FRP covers
- Water spray nozzles

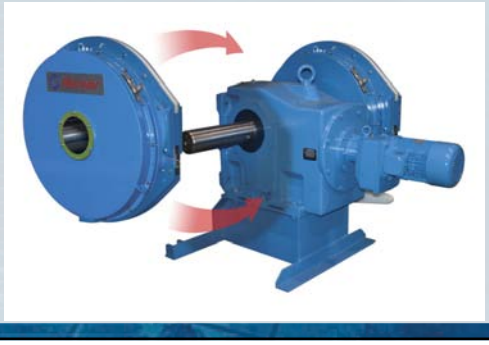


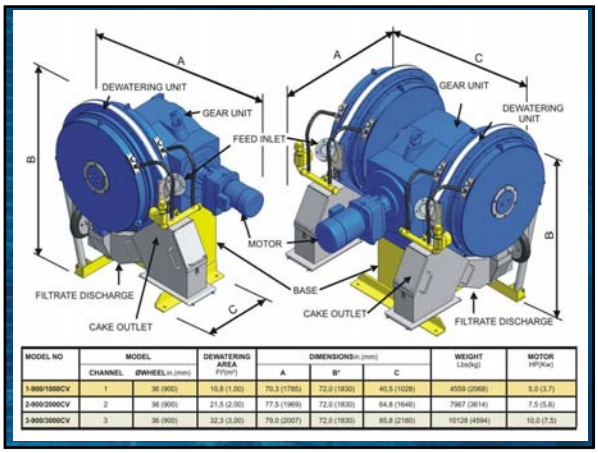
Rotary Press Gear Units

- Solid cast construction – greater rigidity, low noise.
- Case hardened gearing – proven long-term performance for strength and durability.
- High capacity roller bearings.
- Nitrided hollow bore standard on shaft mounted units – resists fretting corrosion.
- Hardened and group pinion shaft – long wearing seal surface.

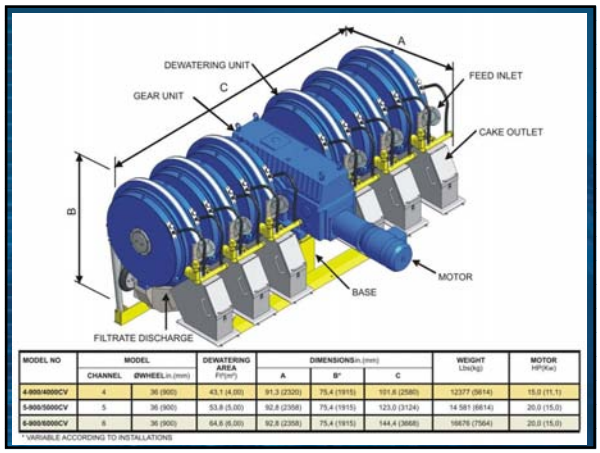


Expandability





MODEL NO	MODEL		DEWATERING AREA	DIMENSIONS in.(mm)			WEIGHT	MOTOR
	CHANNEL	ØWHEEL in.(mm)		A	B*	C		
1-900/1000CV	1	36 (900)	10,8 (1,00)	70,3 (1785)	72,0 (1830)	40,5 (1028)	4559 (2068)	5,0 (3,7)
2-900/2000CV	2	36 (900)	21,5 (2,00)	77,5 (1969)	72,0 (1830)	64,8 (1646)	7967 (3614)	7,5 (5,6)
3-900/3000CV	3	36 (900)	32,3 (3,00)	79,0 (2007)	72,0 (1830)	85,8 (2180)	10128 (4594)	10,0 (7,5)



MODEL NO	MODEL		DEWATERING AREA	DIMENSIONS in.(mm)			WEIGHT	MOTOR
	CHANNEL	ØWHEEL in.(mm)		A	B*	C		
4-900/4000CV	4	36 (900)	43,1 (4,00)	91,3 (2320)	75,4 (1915)	101,6 (2580)	12377 (5614)	15,0 (11,1)
5-900/5000CV	5	36 (900)	53,8 (5,00)	92,8 (2358)	75,4 (1915)	123,0 (3124)	14 581 (6614)	20,0 (15,0)
6-900/6000CV	6	36 (900)	64,6 (6,00)	92,8 (2358)	75,4 (1915)	144,4 (3668)	16676 (7564)	20,0 (15,0)

* VARIABLE ACCORDING TO INSTALLATIONS

Process Control Parameters

Sludge inlet pressure :
2 to 7 psi
Outlet restrictor:
0 to 100 psi
Press rotating speed:
0.2 to 1.6 rpm
Flocculator mixing speed:
100 to 450 rpm
Polymer dosage:
1% to 15%

Typical Performance

Type of sludge	Feed Concentration (%)	Sludge Flow (gpm)	Cake Dryness (%)	Production Rate Per Channel (dry lbs/hr)	Capture Rate (%)
Domestic Septage	0.5	63	40	110	>95
	1.0	58	40	250	>95
	2.0	58	39	500	>95
	4.0	55	38	1100	>95
Primary	2.0	45	32	440	>95
	4.0	30	32	550	>95
60% Prim. / 40% WAS	4.0	23 - 35	27 - 33	375 - 450	>95
50% Primary / 50% WAS	3.5	18 - 30	25 - 28	225 - 300	>95
30% Primary / 70% WAS	3.0	12 - 18	23 - 26	165 - 275	>95
Anaerobic Digested (primary or mixed)	1.5 - 2.5	15 - 25	22 - 26	100 - 165	>95
Anaerobic Digested (WAS only)	1.5 - 2.5	8 - 15	18 - 22	65 - 140	>95
Aerobic Digested (Ext. Aeration)	1.5 - 2.5	10 - 15	15 - 20	85 - 120	>93
WAS (Conventional Activated)	1.5 - 2.5	10 - 15	15 - 17	75 - 100	>95
	1.0 - 1.5	13 - 20	14 - 16	65 - 85	>93
SBR WAS	2.0 - 3.5	8 - 15	16 - 20	85 - 120	>95
	1.5 - 2.0	13 - 20	15 - 18	85 - 115	>93
Ox. Ditch/MBR WAS	0.6 - 1.0	15 - 25	13 - 16	60 - 85	>93

Performance Comparison

Feature	Rotary Press	Centrifuge	Belt Press
Moving Parts	Low	Higher	Highest
Spare Requirements	Low	Low	Largest
Structural Requirements	Low	Highest	High
Modular/Expandable	Yes	No	No
Routine Maintenance while Operating	Yes	No	No
Life of Major Wear Parts	Longer	Shorter	Shorter
Polymer Dose/Flocculation	External; Optimized	In Bowl; Not Optimal	External; Optimized
Environmental Impact	None	Noise, Vibration	Odors, Mists, Pathogens

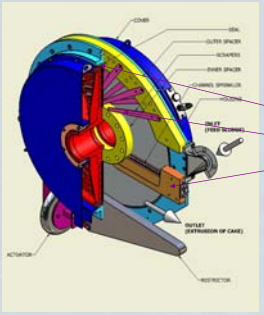
Performance Comparison

Item	Rotary Press	Screw Press
Footprint	Small	Larger
Maintenance	Performed by plant personnel	Major components repaired by manufacturer
Partial Operations	Simultaneous operations and maintenance	Maintenance requires total machine shutdown
Operation	Feed solids changes compensated automatically	Feed solids changes compensated manually
Screens	Long-lasting (over 10 years)	Changed every 2-3 years
Wash Water	5 minutes/day at shutdown	Frequent/Continuous
Influent Sludge	Rotary press can accept feed solids as low as 0.0%	Pre-thickening common for effective dewatering
Capture Rate	95% Avg.	90% or less
Polymer Use	Lower	Higher

Maintenance Schedule

MAINTENANCE TYPE	PRODUCTS REQUIRED	FREQUENCY
LUBRICATION		
Rotary Press (Helical-Bevel Foot mount)	ISO VG220 Qty: 29 litres (7.6 gallons)	Oil changes: ▸ If mineral oil: Every 10,000 hours or 2 years ▸ If synthetic oil: Every 20,000 hours or 4 years
Helical In-Line Flange mounted	ISO VG220 Qty: 3 litres (0.8 gallon)	Oil changes: ▸ If mineral oil: Every 10,000 hours or 2 years ▸ If synthetic oil: Every 20,000 hours or 4 years
Flocculator (Shaft seal)	Polyurea base grease No. 2	Every 200 hours.
Flocculator (Motor Gear Reducer)	ISO VG220	Life lubricated
INSPECTION		
Rotary Press Deflector liner	Deflector liner (Spare parts)	Every 5,000 hours
Rotary Press Scrapers Inlet spacer assembly	Scrapers (Spare parts)	Every 5,000 hours
Rotary Press Torque covers bolts to 60 lb-in (6.7 N-m)	No products required	After 24 hours of operation, from the initial start-up.
Rotary Press Torque covers bolts to 60 lb-in (6.7 N-m).	No products required	After the first 24 hours of operation and after every 1000 hours of operation.

Replacement Schedule



Wear Parts:
- Seals (2 per channel)
- Scrapers (6 per channel)
- Deflector (1 per channel)

Wear Parts	8,000 hours
2 screens	45,000 hours
Gearbox	100,000 hours

Features and Benefits

- Completely enclosed minimal odors
- Few moving/wear parts
- Minimal footprint
- Low energy requirement
- Smooth operation with changing sludge quality, feed rate
- Low speed < 3 RPM
  - quiet
  - safe for unattended automatic operation
  - minimal structural support
  - minimal wear

Features and Benefits

- Easy start-up and shutdown
- Polymer use comparable to or lower than centrifuge and belt press
- Excellent capture rate and cake dryness on selected sludges
- Low wash water requirement, 5 minutes/day at shutdown only
- Low maintenance vs other technologies
- Complete automation of process
- Easily expandable

Hapchuk Hauling Services, PA
Liquid Assets Disposal Inc, Wheeling West Virginia

- Process: Dewatered sludge from different sources, mostly industrial from soil decontamination process.
- Rotary Press: 1 Unit
  Model 4(6)-900/6000CV
  Commissioned: 2008
- Performances:
  - Feed concentration: 1-6 % (TS)
  - Throughput: 9,5 dry tons/day (8 hrs)
  - Cake dryness: 34-47 % (TS)
  - Capture rate: 96-98 % (TSS)

Village of Johnstown, OH

- Process: Waste activated sludge
- Rotary Press: 1 Unit
  Model: 2(4)-900/4000CV
  Commissioned: 2012
- Performances:
  - Feed concentration: 1,4 % (TS)
  - Throughput: 1,15 dry t/d (8hrs) (2 channels)
  - Cake dryness: 22 % (TS)
  - Capture rate: 95 % (TSS)

Questions?

Thank you!

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