

BLUEWIN

◆ *a Family Group working for*

■ *World Unique ELODE system for Sludge Dewatering, Reduction, Recycling, Renewable.*

■ *Advanced New Technology Sewage and water purification system with the shortest time, lowest cost, and highest efficiency using Nano.Micro-bubbles.*

■ *Reproducing "Renewable energy" using 3-phase separation system for "Palm oil sludge, Food sludge, Other Heavy Oil Sludge" separate "Water, Oil, Solid" at once*

By Green Advanced Technology & Dynamic venture company

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CHAPTER-I :

ELODE: Electro Osmosis Dewatering M/C

CHAPTER-II :

**2P/3P-CENTRIFUGE SEPARATOR, SCREWPRESS,
BELT-PRESS, FILTERPRESS : Mechanical
Dewatering M/C**

CHAPTER-I

ELODE

REMARKABLE SLUDGE DEWATERING

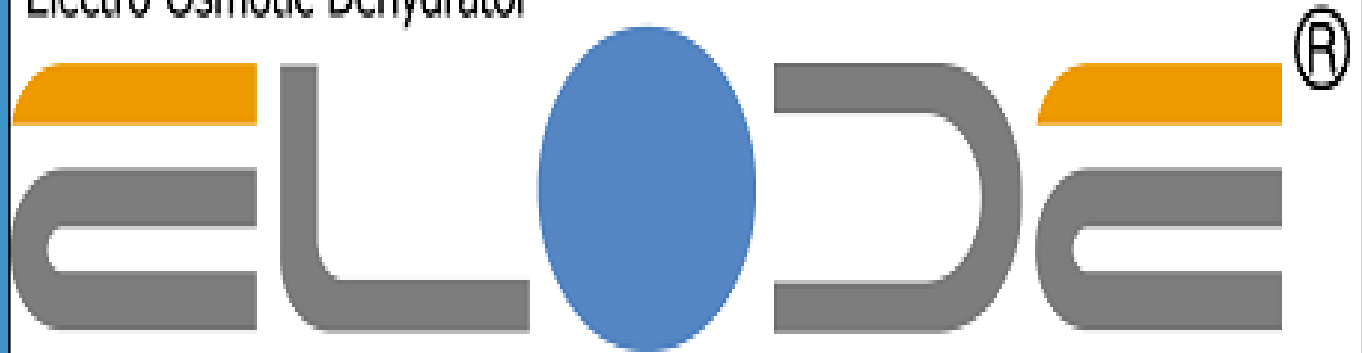
- World NO Competitor !!
- *30%wt (70%ds) Guarantee! (For most of WWTP Sludge)*
- *0.35kWh/liter water removed! (Lowest Energy Consumption)!*
- *12months Recovery of Investment (Faster ROI)*
- *World Lowest Operating Expenditure!*
- *World Lowest Capital Expenditure!*

MOVIE

**Click here to see FINE-ELODE operating;
“Full Operating BELTPRESS+FINE-ELODE”**



Electro-Osmotic Dehydrator



Remarkable Dewatering system 70% Volume Cut-Down Reborn to Renewable Energy

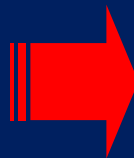
**30 years Know-How for Sludge
Dewatering**

**Belt press, Centrifuge, Filter press,
Screw press, Volute, Other
Mechanical Dewatering M/C**

FINE-ELODE

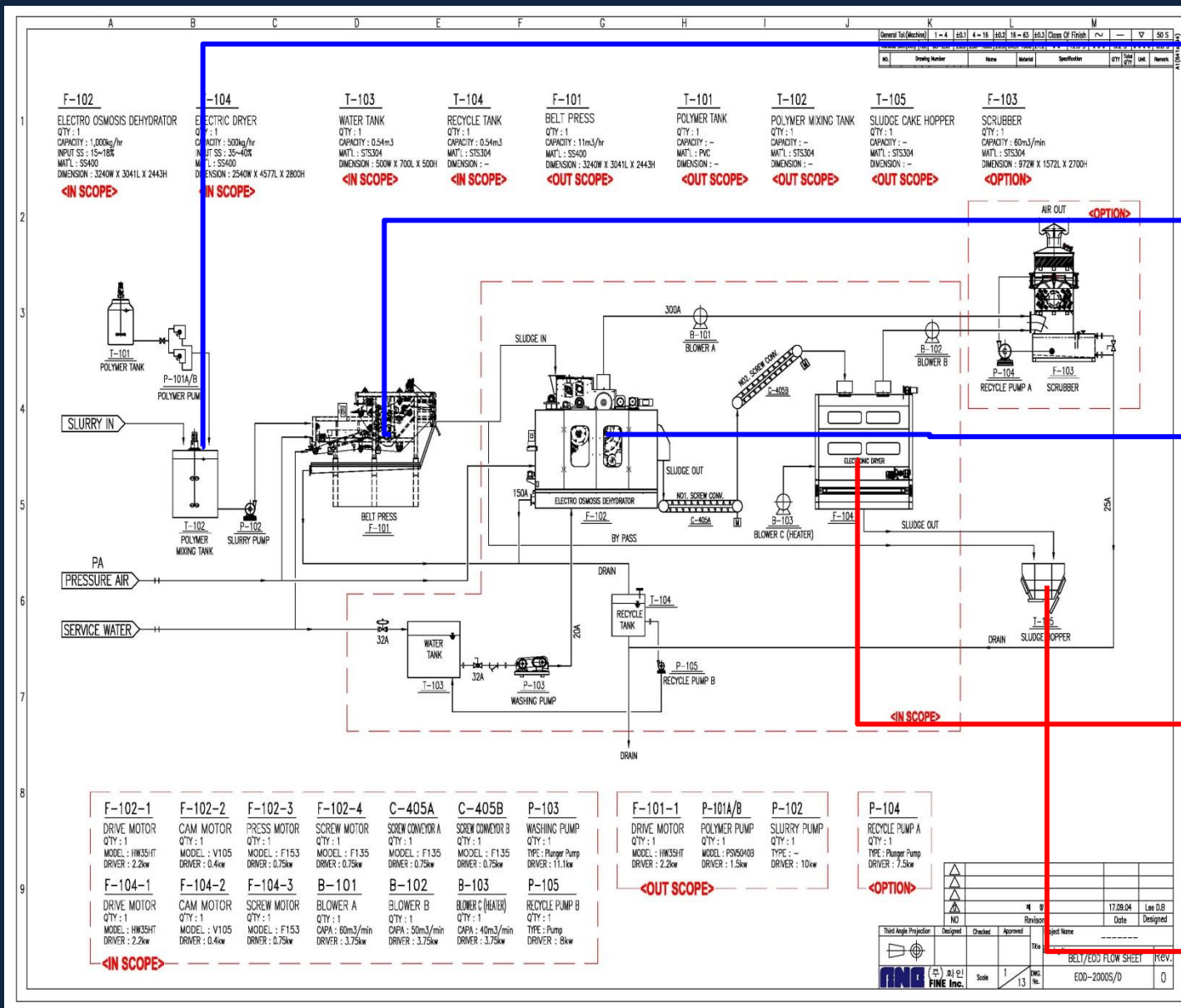


(Moisture Content 70~**80%**)



(Moisture Content 10~**30%**
70~90%ds)

To Get 70%~90%ds FLOW SHEET



Input 1-5%ds

1st Dewatered by Mechanical Machine as Beltpress, Decanter, Filterpress, Screwpress

Input 15~20%ds 2nd Dewatered by ELODE

Input 40~50%ds 3rd by NVD (Natural Ventilation Dryer)

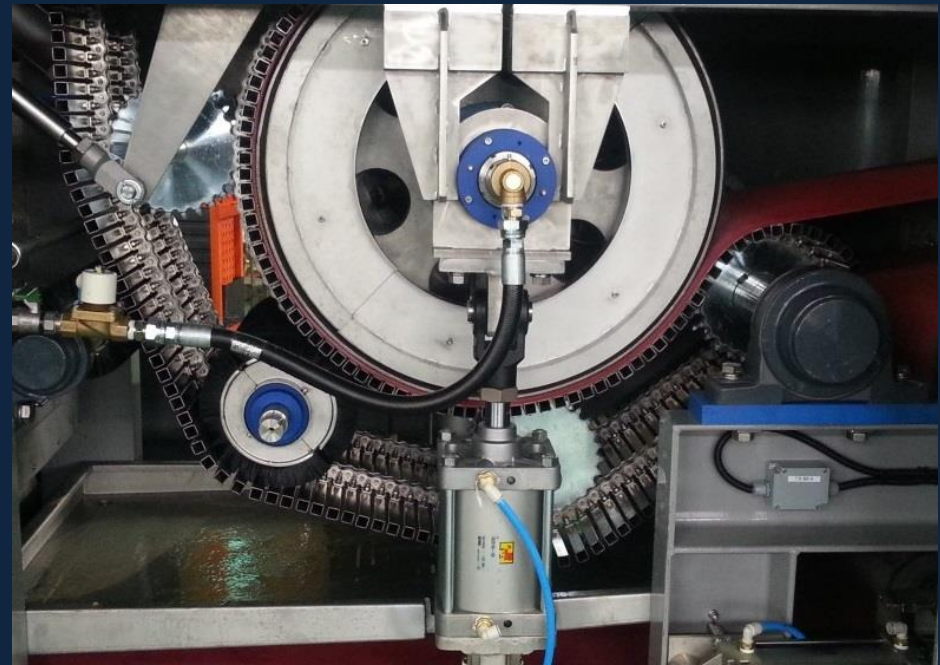
Final Output 70~90%ds

What is FINE-ELODE?

FINE-ELODE = ELECTRO OSMOSIS DEWATERING EQUIPMENT

The world first “Field Proven” commercialized electro osmosis dewatering device which treat almost all types of Organic wastewater,

- All Kinds of Organic sludge
- Municipal sewage
- Food & beverage
- Livestock
- Dyeing & painting
- Chemical
- Fishery
- Etc...



Why FINE-ELODE?

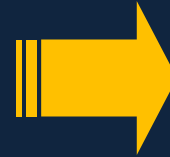
The “Deficiency” of present available equipment

Conventional Dewatering Devices

- ▶ Only extract the free water contained in the liquid sludge, limited to ~25%DS in sludge cake.
- ▶ Cannot extract the remaining of absorbed water.

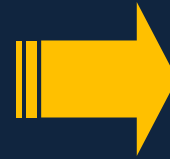
Thermal Dryers

- ▶ High capital
- ▶ High energy consumption



FINE-ELODE

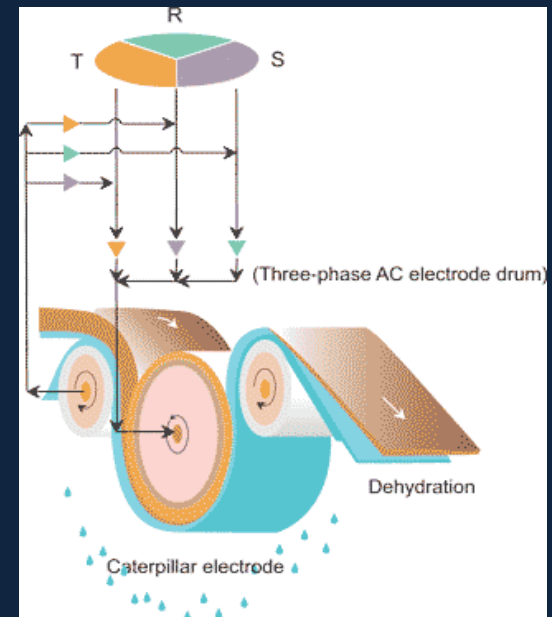
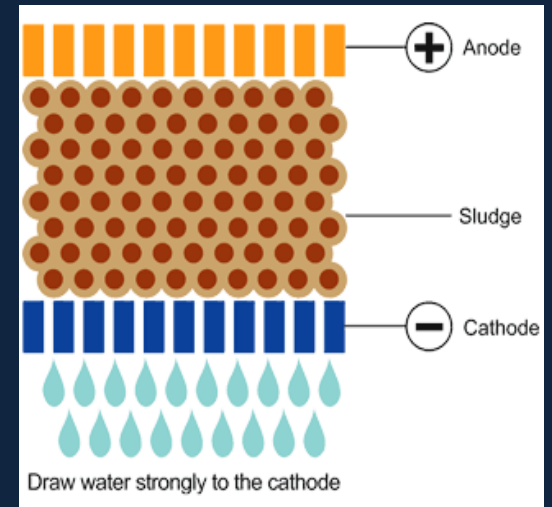
- ① Extract both “Free & Absorbed” water
- ② Cuts typical waste volume in half
- ③ Efficiently Achieves >70~90% dry solid
- ④ Low energy consumption against thermal dryers



How FINE-ELODE works?

Dewatering Method

- ▶ Combined actions of **electrophoresis** and **electro-osmosis**
- ▶ The sludge cake first goes through between the **anode Drum** and the **cathode Carbon**.
- ▶ Apply 3-phase DC voltage between the two electrodes, strongly push the sludge particles (-) toward the anode and water (+) toward cathode.



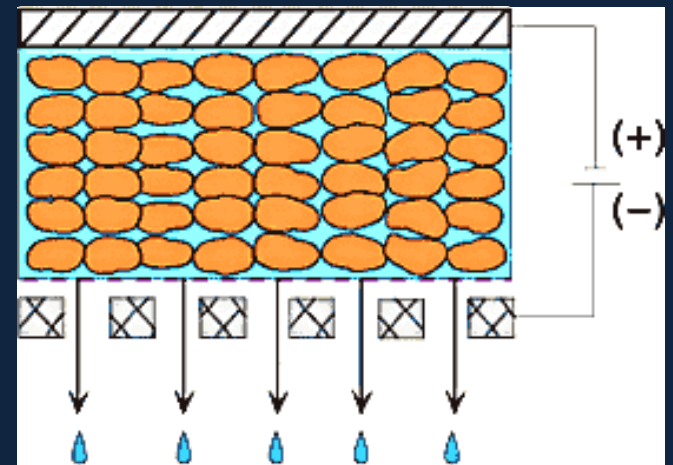
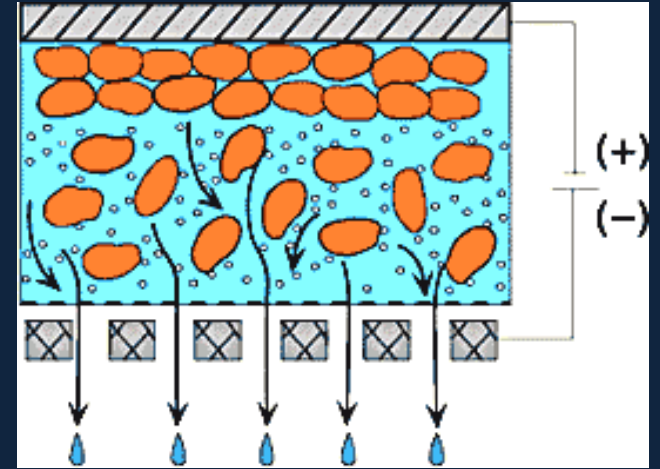
How FINE-ELODE works?

Electro-Osmosis Process of FINE-ELODE

1. **Early Electro-Osmosis, Electrophoresis**
 - Strongly push sludge particles (-) to anode (+) by an electrical potential difference



2. **Intermediate Electro-Osmosis**
 - Dehydration through movement of water (+) to cathode (-)

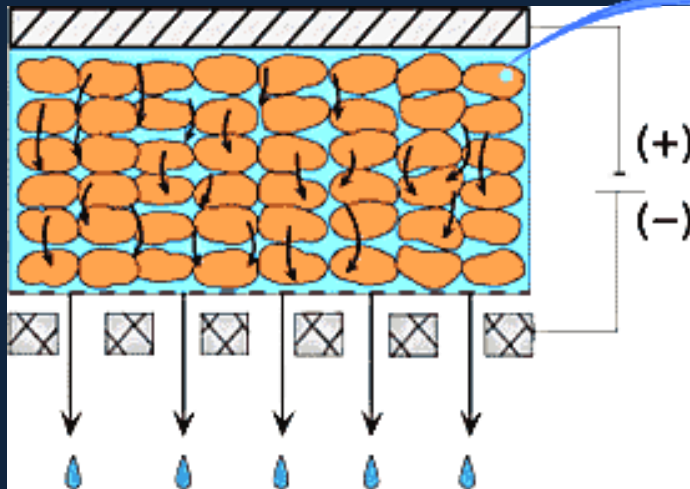


How FINE-ELODE works?

Electro-Osmosis Process FINE-ELODE

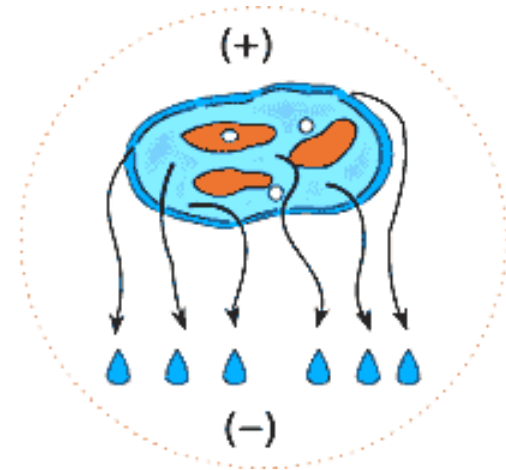
3. Final Electro-Osmosis Capillary Pressure

- Force the absorbed water flow through porous solid to cathode (-)



Destruction of Cell Membrane

- Destruction of cell membrane discharge the absorbed water of sludge



The FINE-ELODE Machine



EODS- SINGLE FINE-ELODE

- 2nd stage of dewatering
- Retrofit to existing conventional dewatering device



EODB – BELT-PRESS BUILT-IN FINE-ELODE

- New Setup
- Integrate 1st & 2nd stage dewatering into one machine

EODS — Single FINE-ELODE

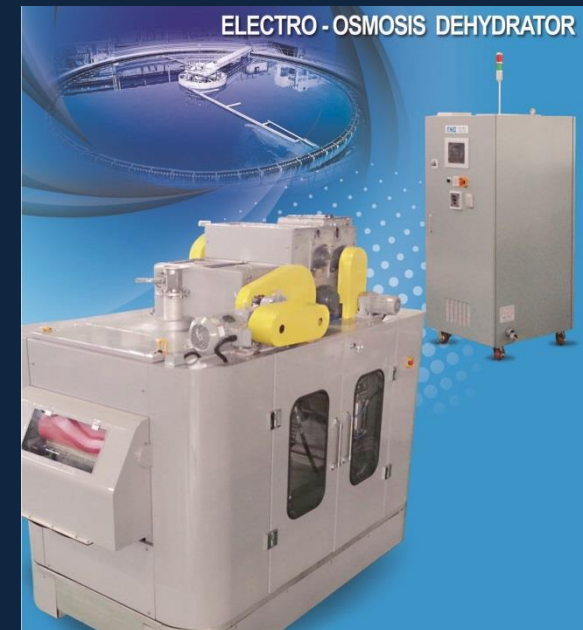
Specification

Dimension (mtr) L x W x H	Model	Belt Width (mm)	Throughput @20% DS (kg) Max	Energy Consumption (kw/h)
2.7 x 0.6 x 1.5	EODS-50	500	250	40~60
2.7 x 1.6 x 1.5	EODS-100	1,000	500	80~120
2.8 x 2.6 x 1.6	EODS-200	2,000	900	140 – 160
2.9 x 3.6 x 1.7	EODS-300	3,000	1,250	190 – 220

Typical Examples with SELO

Dryness (% DS)	Wet Ton (Unit)	Improvement (Weight Reduction)
18% ➔ 42%	100 ➔ 43	57%
22% ➔ 45%	100 ➔ 49	51%

Note : Input sludge must be > 6% DS
 : Optimal sludge condition for FINE-ELODE processing is with conductivity of 2000 μS – 8000 μS



EODB — Belt-Press Built-In FINE-ELODE

Specification

Dimension (m) L x W x H	Model	Belt Width (mm)	Throughput @1~2% DS (kg) Max	Energy Consumption (kw/h)
4.48 x 1.35 x 2.38	EODB-100	1,000	7,800	80 – 120
4.58 x 2.56 x 2.38	EODB-200	2,000	15,600	140 – 160
4.58 x 3.86 x 2.38	EODB-300	3,000	23,000	190 – 220

Typical Example with BELO

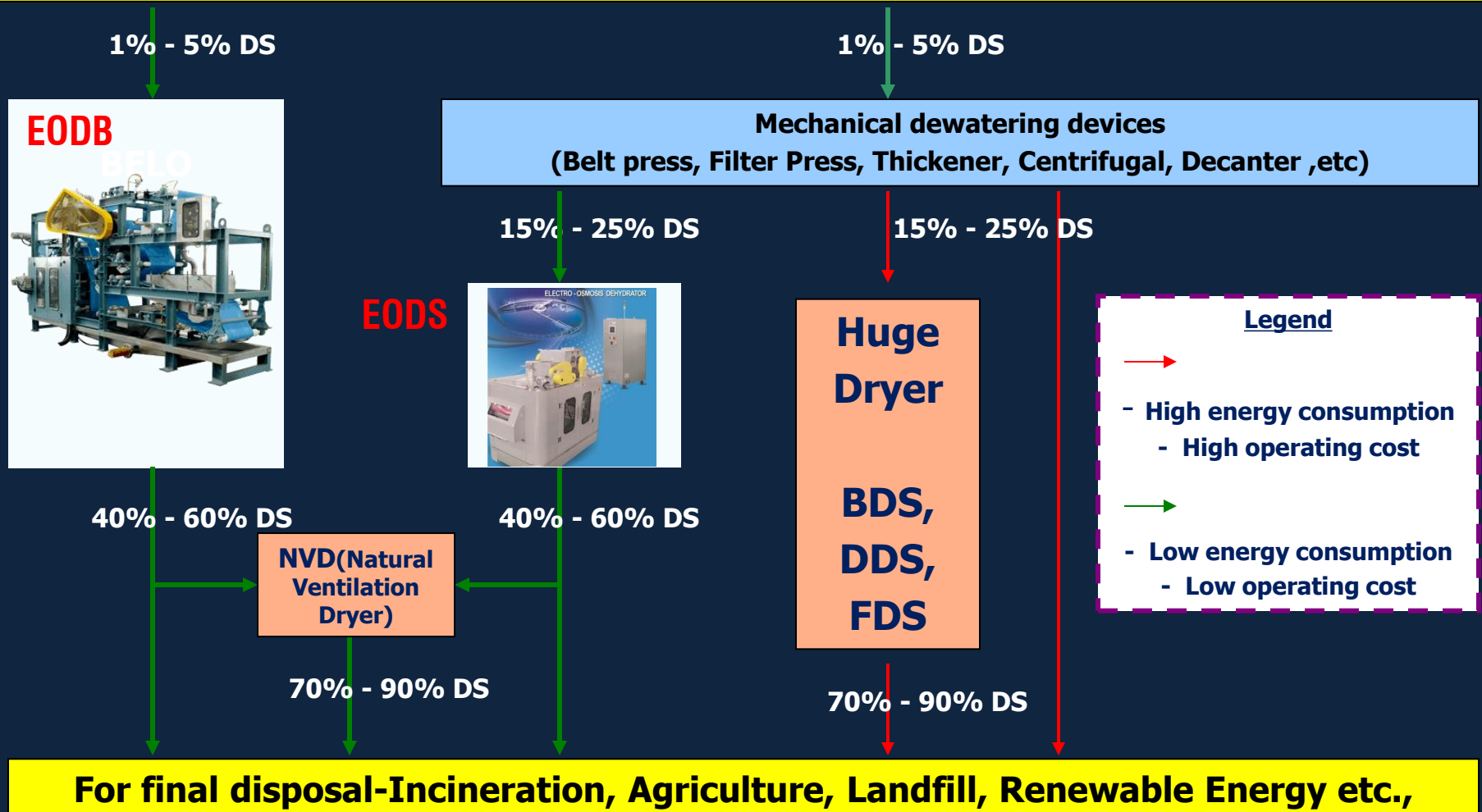
Dryness (% DS)	Wet Ton (Unit)
1% → 45%	100 → 2.22



Note : Optimal sludge condition for FINE-ELODE processing is with conductivity of 2000 μS – 8000 μS

FINE-ELODE Improves Environment

Sludge mixed with Polymer (Influent)



FINE-ELODE Cuts Disposal Cost

Typical municipal sewage sludge

Example : Sludge concentration : 1% DS (99% wt)
Sludge weight : 1,000 ton daily

Mechanical dewatering device

(Belt-Press, Filter press, Centrifugal, Screw press, Decanter, Thickener-Dewatering, etc.,)

EODS

Sludge concentration : 70% DS (30% wt)
Sludge weight : 14.27 ton
Est. Disposal cost : USD 1,142
Est. Electricity cost : 7,920 kW x USD 0.15
= USD 1,188
Est. Total cost = USD 2,330

Sludge concentration : 18% DS (82% wt)
Sludge weight : 55.5 ton
Est. Disposal cost : USD 4,440

Reduction in waste sludge = 41.23 ton (74%)
Cost Saving = USD 2,110 daily
Annual Saving = USD 633,000

Assumption

Sludge disposal cost = USD 80 / ton

Working Hour = 22 hrs / day

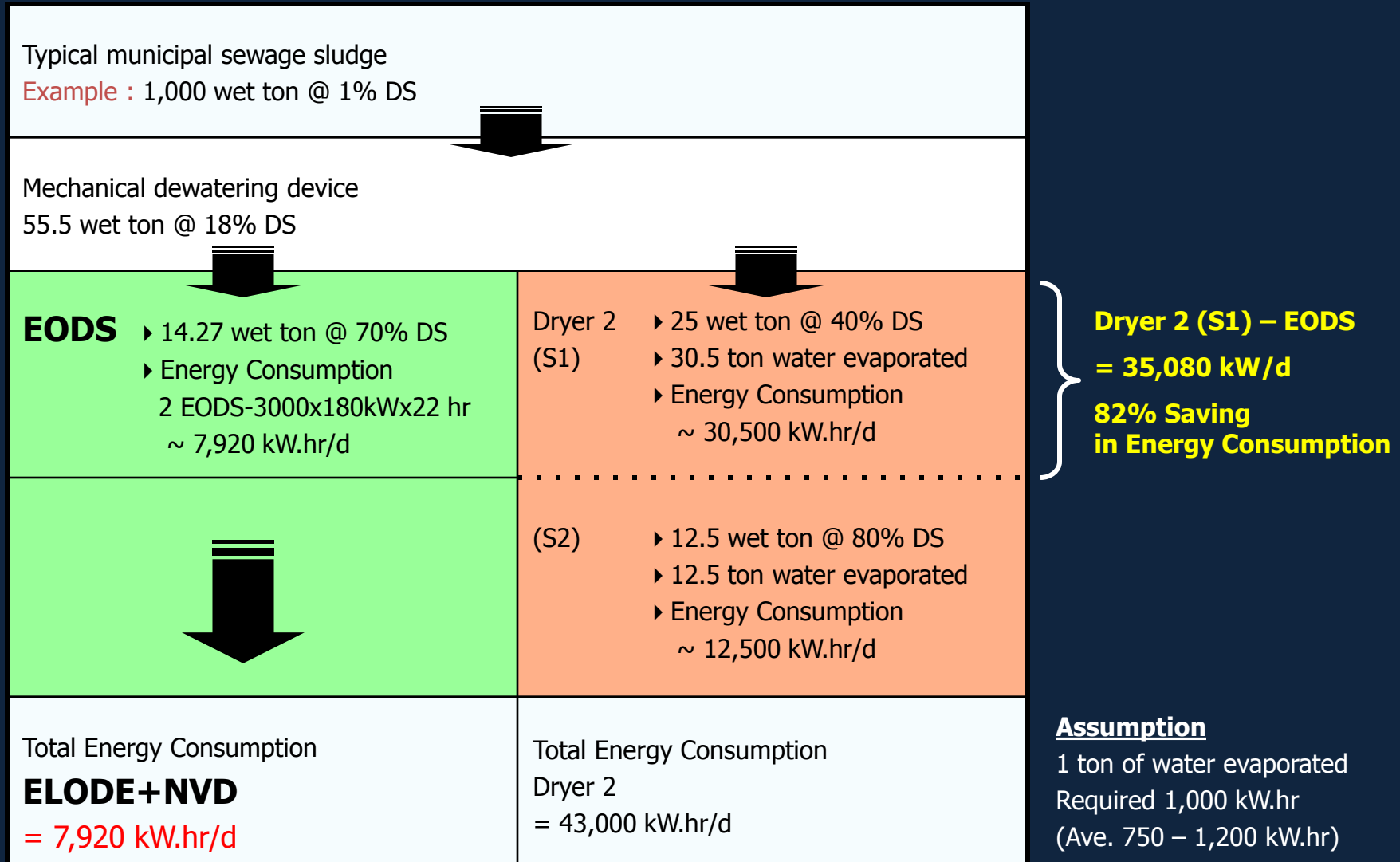
= 25 days / month

Electricity tariff = USD 0.15 kW.hr

EODS-3000 = 2 units

Energy Consumption = 180 kW / machine

FINE-ELODE **Reduces Energy Consumption**



Features & Benefits

1. High dryness (reduce water level 20%+)



Significant reduction in disposal cost

- **Facilitates storage**
- **Transportation using standard vehicles**
- **Reduce costs of incineration**

2. Reduce final cake to half (70%+Reduced)



Significant cost reduction in

- **Transportation**
- **Landfill disposal**
- **Enable energy recovery**

3. Low energy consumption compared to dryers (70%+ Saved)



Minimum operating cost

- **Use less electricity, high energy efficiency**

Features & Benefits

4. Universal and compatible



Easily integrated into existing mechanical dehydrators

5. Compact in size



Reduction in infrastructure cost

6. Field tried and tested for more than 2 years



Minimum production lost

- **Reliable, superior quality and performance**
- **Potential polymer reduction**

7. Fully automated, easy to use and less maintenance



Minimum operating cost

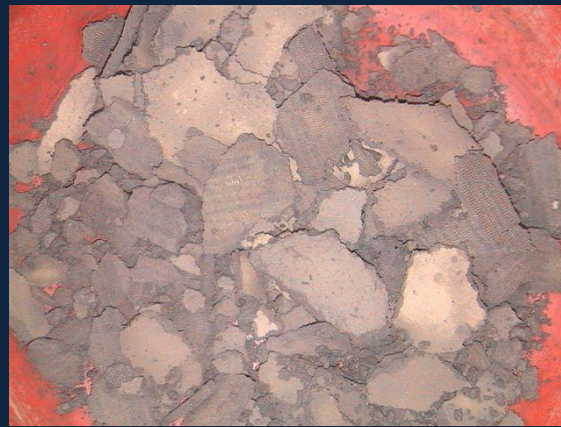
- **Less operation supervision**
- **Easy parts accessibility for maintenance**

PERFORMANCE

Result of Final Cake Out for each Different Sludge



Municipal Sludge 57%wt



Chemical Sludge 53%wt



City Bio Sludge 55%wt

Livestock Sludge 52%wt



High Organic Dyeing 48%wt



Municipal+Excreta 51%wt



PERFORMANCE

Result of Final Cake Out for each Different Sludge



Industrial Oil Sludge 52%wt



Soy Bean Sludge 53%wt



Organic Mineral 55%wt

Pharmaceutical Sludge 48%wt



Milk Sludge 58%wt



Human Excreta 43%wt



RESULT : Average Reduced Volume (NON-NVD)

Before : 14%DS (86%WT)




After : 52%DS (48%WT)




61.3% Out-Cake volume reduced!


DETAIL DATAS (NON-NVD)

CLIENTS	DuPont Inc. Korea		Remark
Model	FINE-ELODE: EODS-150, 1.5meter Belt Width		Main Process machine
Running Start	November, 2013		
Operating term	3.2 years		
Site Location	Ulsan. Korea		
Sort of Sludge	High Organic Chemical Sludge		
Sludge Characteristic	Very difficult high organic sludge		Impossible at existing FINE-ELODE
1 st Machine & Input DS%	Beltpress 88%wt ±2%		
Daily Throughput	700kg x 5hours = 3.5ton		
Result of Before & After	Before (88%wt)	After (64%wt)	2.34tonx300days=702ton reduced. x\$150 = Yearly U\$105,300 SAVED
	3.5ton/day	1.16ton	
	Reduced 66.85%	Daily 2.34ton Reduced	
Refer-Photos			
Electric Consumption	Average : 120~140kWh		
Electric-Consumption vs Dehydrated	Dewatering discharged/hr : 468liter, Max 140kW = 0.299kWh		General Dryer: 0.9~1.1kW/liter

DETAIL DATAS (NON-NVD)

CLIENTS	SONGWON INDUSTRIES. Korea		Remark
Model	FINE-ELODE: EODS-300, 3.0meter Belt Width		Main Process Machine
Running Start	December 2013		
Operating term	3.1years		
Site Location	Ulsan city. KOREA		
Sort of Sludge	High Organic Sludge		
Sludge Characteristic	Non-Dewaterable sludge with high conductivity of 15,000 μ S.		impossible at existing FINE-ELODE
1 st Machine & Input DS%	Multiple discs Press 83%wt \pm 3%		
일일 처리량 / Daily Throughput	1000kg x 20hours = 20ton		
FINE-ELODE 후 감량률 및 결과 Result of Before & After	Before (83%wt)	After (65wt)	10.3tonx300days=3,090ton reduce dx\$170 = Yearly U\$525,300 SAVED
	20ton/day	9.7ton	
	Reduced 51.5%		
참고사진 Refer-Photos			
Electric Consumption	Average : 80kW~120kWh		
Electric-Consumption vs Dehydrated	Dewatering discharged/hr : 515liter, Max 120kW = 0.27kWh		General Dryer: 0.9~1.1kW/liter

DETAIL DATAS (NON-NVD)

CLIENTS	EXPORT TO JAPAN		Remark
Model	FINE-ELODE: EODS-50, 0.5meter Belt Width		PILOT Machine
Running Start	March, 2014		
Operating term	2.9 years		
Site Location	Japan night soil Treatment Plant		
Sort of Sludge	Organic Municipal Sludge		
Sludge Characteristic	90% high organic Night Soil, 10% city sludge		
1 st Machine & Input DS%	DECANTER 80%wt ±5%		
Daily Throughput	200kg/hr x 12 hours = 2.4ton		
Result of Before & After	Before (80%wt)	After (57%wt)	1.24tonx300days=372ton reduced x\$180 = Yearly U\$66,960 SAVED
	2.4 ton/day	1.16ton	
	Reduced 53.48%	Daily 1.24ton Reduced	
참고사진 Refer-Photos			
Electric Consumption	Average : 40kW~60kWh		
Electric-Consumption vs Dehydrated	Dewatering discharged/hr : 103liter, Max 60kW = 0.58kWh		General Dryer: 0.9~1.1kW/liter

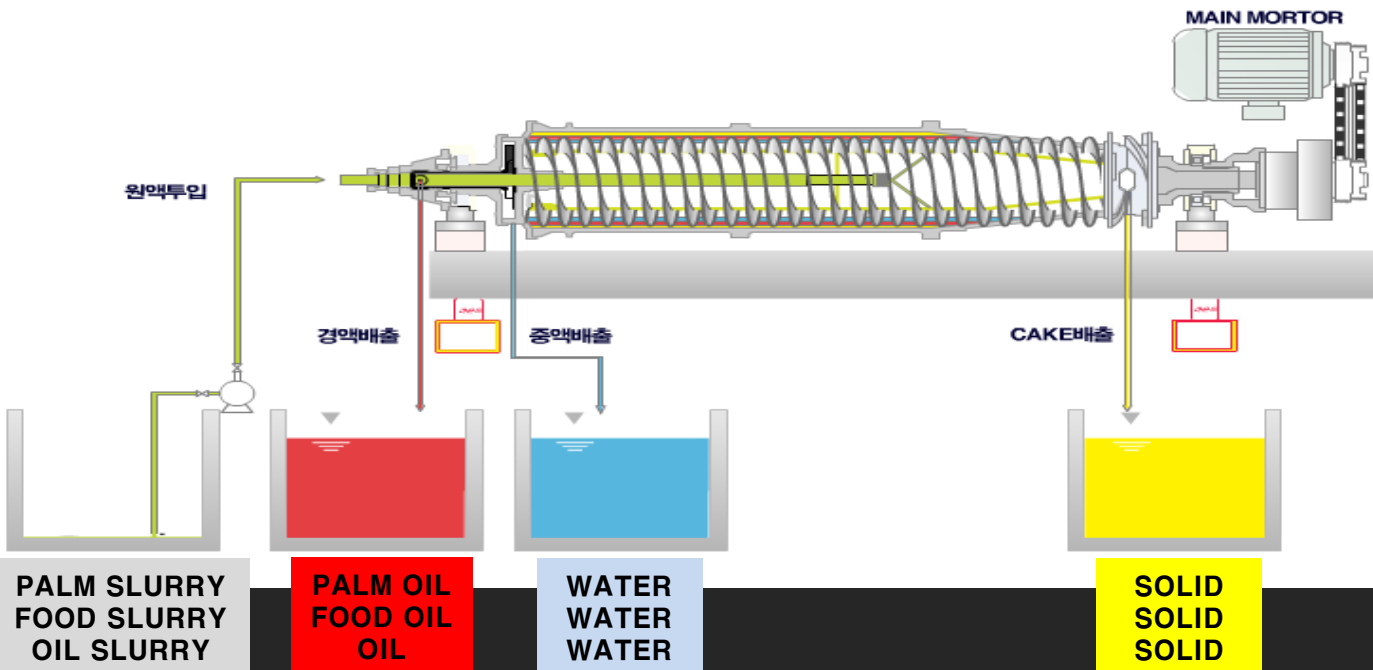
CHAPTER-II

**Centrifuge, Separator,
Screw press, Belt press**

CENTRIFUGE 2P & 3P



**2-PHASE
CENTRIFUGE
for SLUDGE
DEWATERING**



**3-PHASE
SEPARATOR
for 3
DIFFERENT
KINDS
SLURRY
DEWATERING**

**What
we
have?**

DECANTER, CENTRIFUGE, SEPARATOR

**30years Accumulated Manufacturing
know-how**

**More than 3,000units, 1,000 sites References
and Field Experience**

**Rapid After sales service, realizing customer
impressions**

PATENTS

SORT	NAME OF PATENT	REGISTERED NO.
TECHNICAL PATENTS	Screw conveyor for screw decanter type centrifuge with detachable screw wings	#10-1081751
	Centrifuge with multistage controller dam plate	#10-1068577
	With a two-stage accelerated discharge cover formed in a screw conveyor Screw Decanter Type Centrifuge	#10-0977196
	A concentrate having a rotation angle or a cake outlet Screw Decanter Type Centrifuge	#10-0953671
	A screw decanter type centrifugal separator equipped with a plate for noise prevention on the rotating body of the outer shell bolt	#10-0920493
	Centrifuges for industrial, sewage and wastewater treatment Wing end surface hardening method of screw conveyor	#10-0857057
	Horizontal centrifuge for sludge concentration and dehydration	#0407896
	Acceleration / deceleration gearbox unit for two-stage accelerating centrifuge	#0340190
	Automobile decelerators for centrifugal concentrators and dehydrators	#0302832
UTILITY PATENTS	Mechanical concentration and dehydrator by centrifugal force	#0251596
	Screw conveyor of decanter type centrifuge consisting of injection nozzle with directional spray angle	#20-0459173

GOVERNMENT LICENSED LICENSE

사업자등록증
(법인사업자)
등록번호 : 503-81-28637

법인명(단체명) : (주) 로알정공
대표자 : 박재덕

계업년월일 : 1995년 07월 01일 법인등록번호 : 170111-0090374
사업장소재지 : 대구광역시 달서구 성서공단로25길 6 (갈산동)
본점소재지 : 대구광역시 달서구 성서공단로25길 6 (갈산동)

사업의종류 : ☒ 제조업 ☐ 서비스업 ☐ 기타
제조업 : ☒ 금속제품의 제조업 ☐ 기계장치의 제조업 ☐ 전기·전자제품의 제조업 ☐ 화학제품의 제조업 ☐ 석유제품의 제조업 ☐ 기타제조업
서비스업 : ☐ 운수업 ☐ 숙박업 ☐ 음식점업 ☐ 도매·소매업 ☐ 기타서비스업

국·도·시·군·구 : 대구광역시 달서구 성서공단로25길 6 (갈산동)
국·도·시·군·구 : 대구광역시 달서구 성서공단로25길 6 (갈산동)

사업자등록증에 적용사업자 여부 : 여() 부()
전자세금계산서 전용메일주소 : royal583@bill36524.com
담당자 : 김현석(053-583-8651, F053-583-8655)
2013년 08월 27일
서대구 세무서장

1

공장등록증(신설)
등록번호 : 2003. 5. 7

업종 : 기계설비제조업
상호 : (주)로알정공
대표자 : 박재덕
법인(주인) : 박재덕
등록번호 : 170111-0090374
국·도·시·군·구 : 대구광역시 달서구 성서공단로25길 6 (갈산동)

건설산업기본법 제9조의 규정에 의한 건설업자임을 증명합니다.

2003년 5월 7일
대구광역시 달서구청장

변경사항

변경년월일	변경구분	변경내용	기록년월일 기록자

2

건설업등록증

업종 : 기계설비제조업
상호 : (주)로알정공
대표자 : 박재덕
법인(주인) : 박재덕
등록번호 : 170111-0090374
국·도·시·군·구 : 대구광역시 달서구 성서공단로25길 6 (갈산동)

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2003년 5월 7일
대구광역시 달서구청장

변경사항

변경년월일	변경구분	변경내용	기록년월일 기록자

3

개인하수처리시설설계·시공업등록증

등록번호 : 500828-1768321

상호(명칭) : (주) 로알정공
성명(대표자) : 박재덕
영업소재지 : 대구광역시 달서구 갈산동 358-81번지
설계·시공소재지 : 특정대행계약 체결 [제출한경정(주)]

「하수도법」 제51조제1항과 같은 법 시행규칙 제50조제3항에 따라 등록하였음을 증명합니다.

2007년 11월 19일
대구광역시 달서구청장

4

환경전문공사업 등록증

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업종 : 환경전문공사업
상호 : (주)로알정공
대표자 : 박재덕
법인(주인) : 박재덕
등록번호 : 170111-0090374
국·도·시·군·구 : 대구광역시 달서구 성서공단로25길 6 (갈산동)

건설산업기본법 제9조의 규정에 의한 건설업자임을 증명합니다.

2009년 7월 9일
대구광역시 달서구청장

변경사항

변경년월일	변경구분	변경내용	기록년월일 기록자

5

건설업등록증

업종 : 상하수도설비제조업
상호 : (주)로알정공
대표자 : 박재덕
법인(주인) : 박재덕
등록번호 : 170111-0090374
국·도·시·군·구 : 대구광역시 달서구 성서공단로25길 6 (갈산동)

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2009년 7월 9일
대구광역시 달서구청장

변경사항

변경년월일	변경구분	변경내용	기록년월일 기록자

6

- ① Business Registration
- ② Factory registration certificate
- ③ Registered construction business (machinery equipment field)
- ④ Registered construction (sewage plant)
- ⑤ Construction of sewage treatment (design, commissioning etc)
- ⑥ Environment special construction (water quality)

CERTIFICATE



14001



9001



INNOBIZ
기술혁신형중소기업



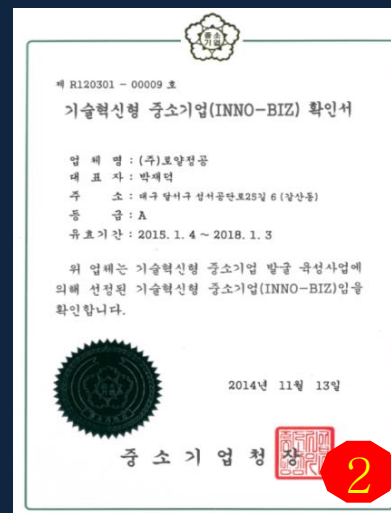
성능인증제품



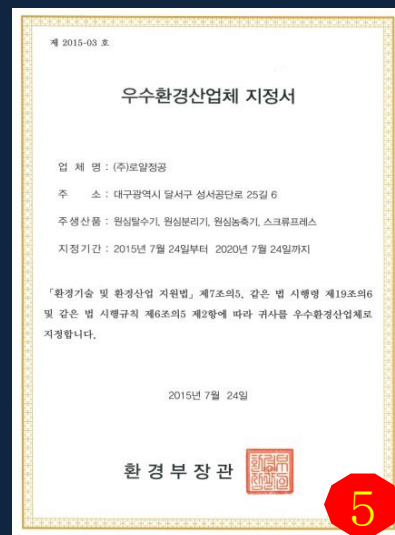
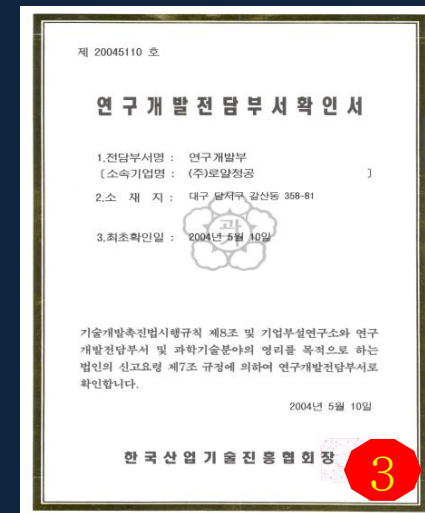
CERTIFICATE



- ① API Certificate
- ② Technology innovation company certificate
- ③ Research and Development Institute Certificate



- ④ Certificate of Excellent Product Designation
- ⑤ Certificate of Excellent Environment Industry
- ⑥ ISO9001
- ⑦ ISO14001

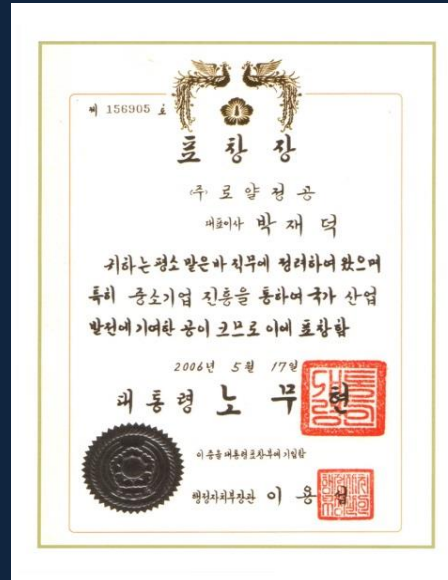


AWARDS & PRIZE

BRONZE TOWER



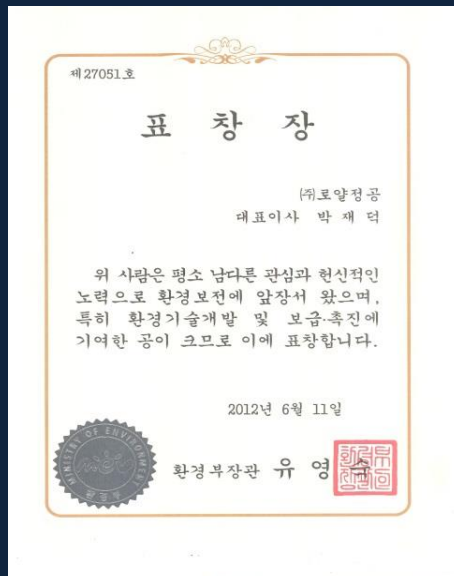
THE PRESIDENT PRIZE



PRIME MINISTER PRIZE



MINISTER OF ENVIRONMENT PRIZE

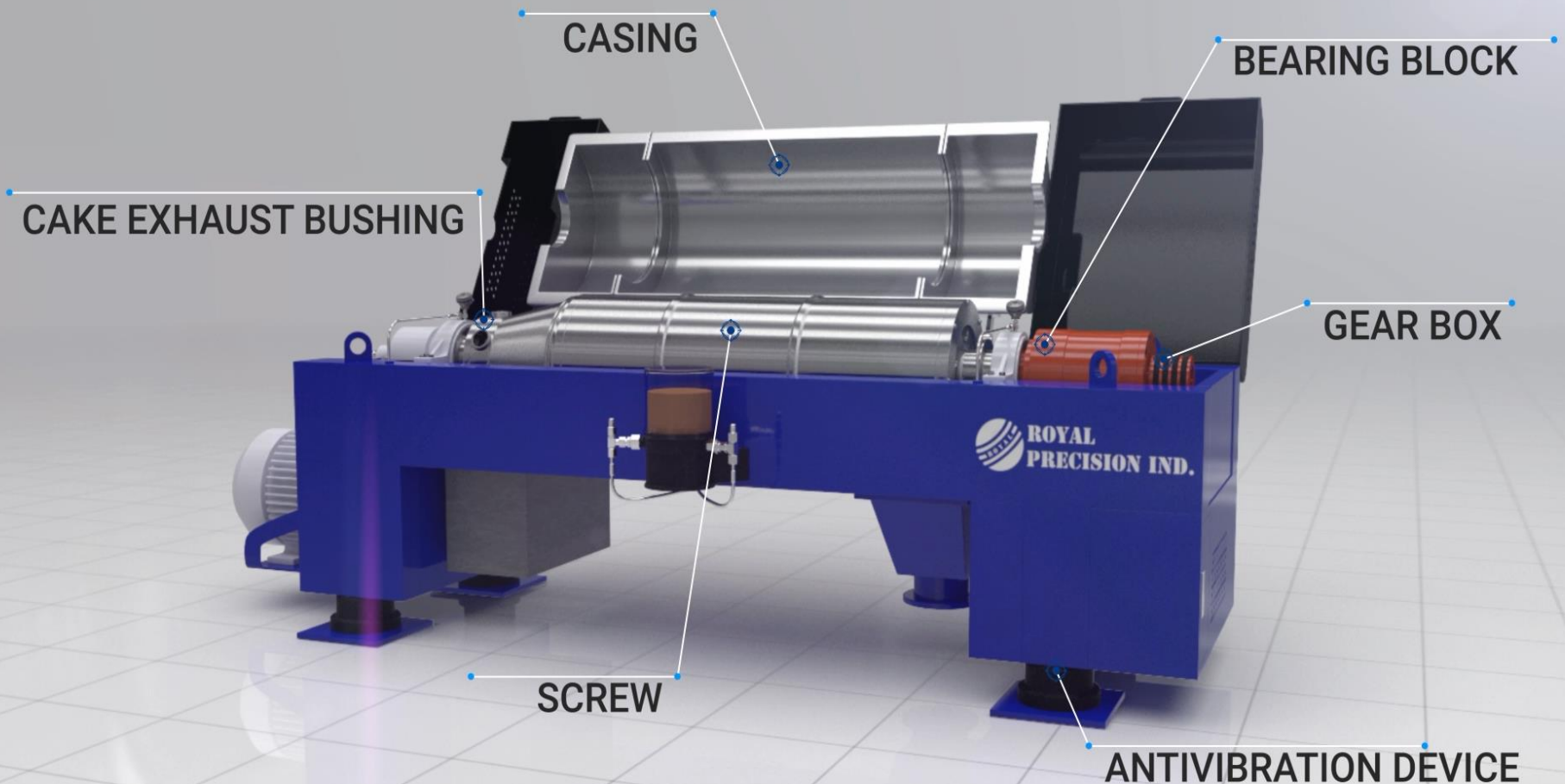


KOREA PROCUREMENT AGENCY PRIZE



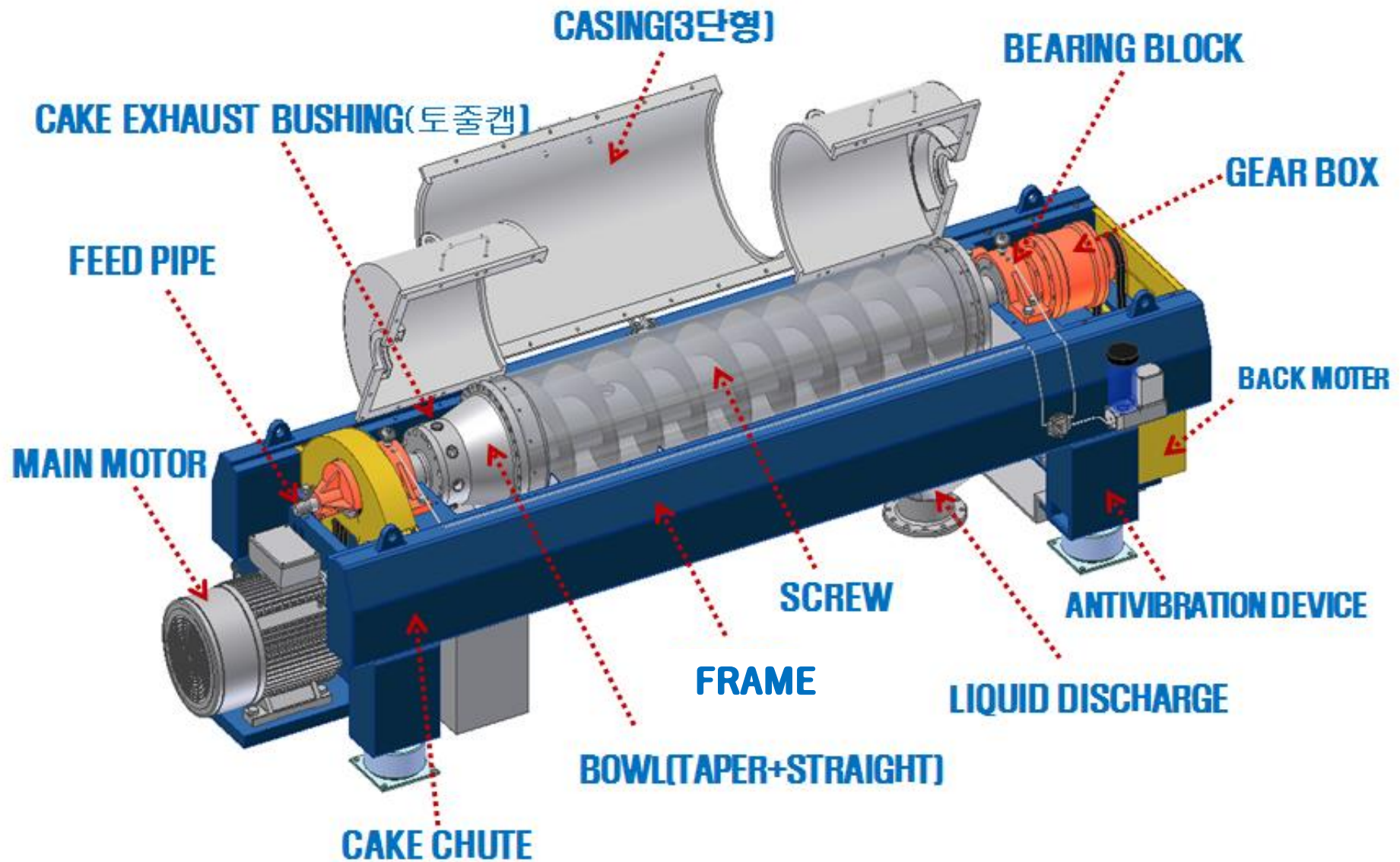
NAME & STRUCTURE OF EACH PART

Key Structure



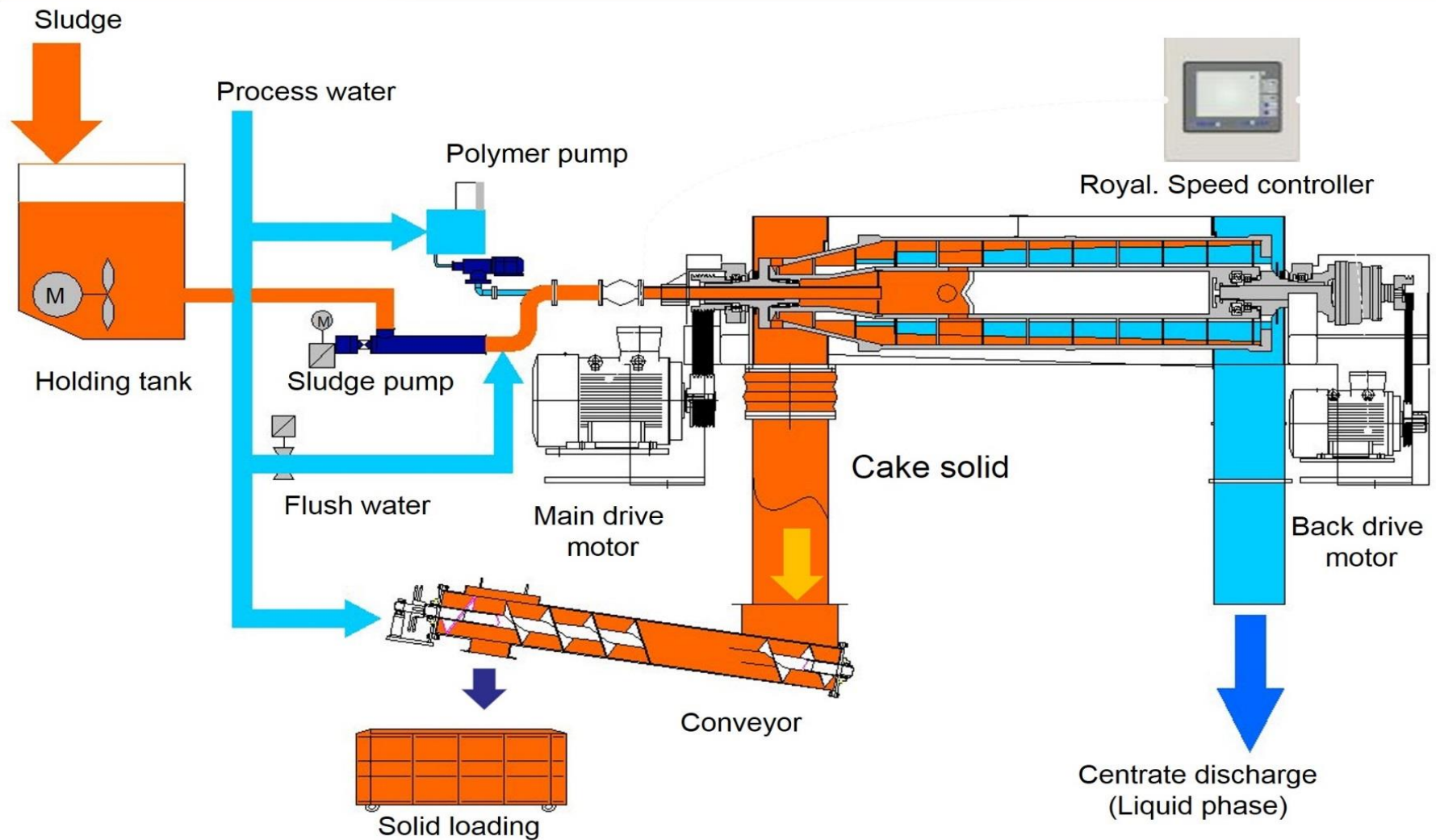
NAME & STRUCTURE OF EACH PART

Structure



DESCRIPTION & OPERATING PRINCIPLE

Centrifuge installation for dewatering of sewage sludge Installation



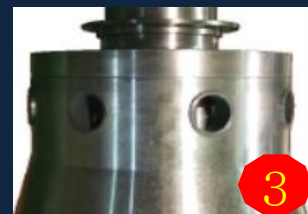
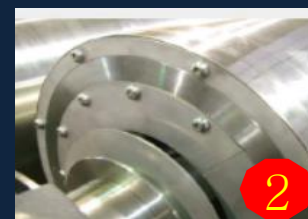
Sludge characterization

	Primary	Thickening	Excess biological	Centrifuge thickening	Digested	Mixed
TS (mg/L)	18,775	22,852	4,936	46,707	31,215	33,391
VS (mg/L)	10,796	13,918	3,403	33,614	14,920	18,647
VS/TS (%)	57.3	60.6	68.9	72	47.8	56.2
Moisture content(%)	74 ~ 77	75 ~ 80	77 ~ 83	77 ~ 83	71 ~ 75	74 ~ 77

VS/TS ratio % & Moisture content

	Primary	Excess biological	Digested
VS/TS (%)	50 ~ 60	68 ~ 70	40 ~ 50
Moisture content(%)	74 ~ 80	77 ~ 83	71 ~ 77

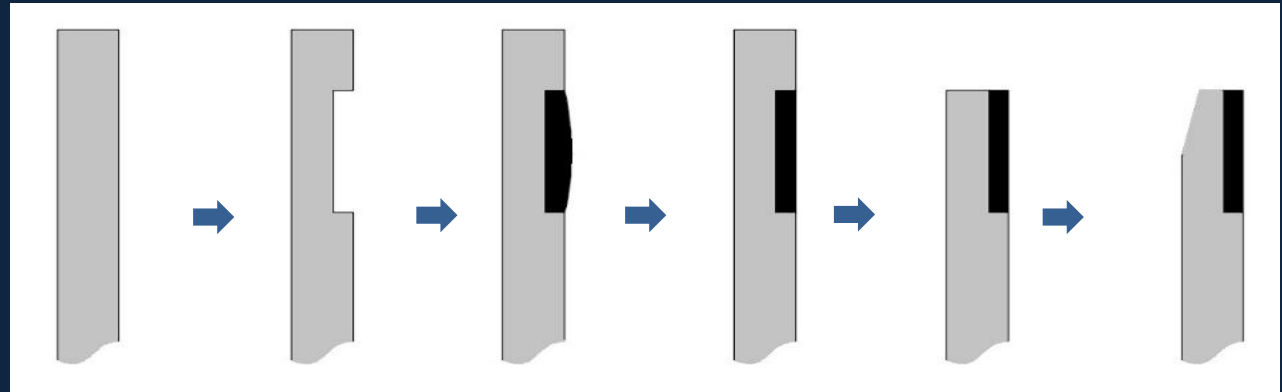
MAIN FEATURE & QUALITY GUARANTEE CORE PARTS



1. Patent 10-0857507: Wing hardening technology Core is durable even in High density sludge.
2. Patent10-0920493: Noise prevention plate is excellent in noise prevention function.
3. Patent10-0953671: Screw-Decanter-Centrifuge type that Sludge concentration time is fast and dehydration rate is increased.
4. Patent10-0977196: The two-stage accelerated discharge cover device shortens the concentration time and accelerates the peeling of the cake.
5. Patent 0340190: Two-stage accelerating gearbox maximizes dewatering rate
6. Patent 0407896: Has the effect of reducing exhaust energy, minimizing load, and maximizing volume

MAIN FEATURE & KEY TECHNOLOGY

1. Screw fight hardening method



- Smooth surface
- Making regular gap
- Lower turbulent eddy creation
- Scroll efficiency increase
- Smaller scrolling torque
- Reduction in power consumption

MAIN FEATURE & KEY TECHNOLOGY

2. Noise control plate



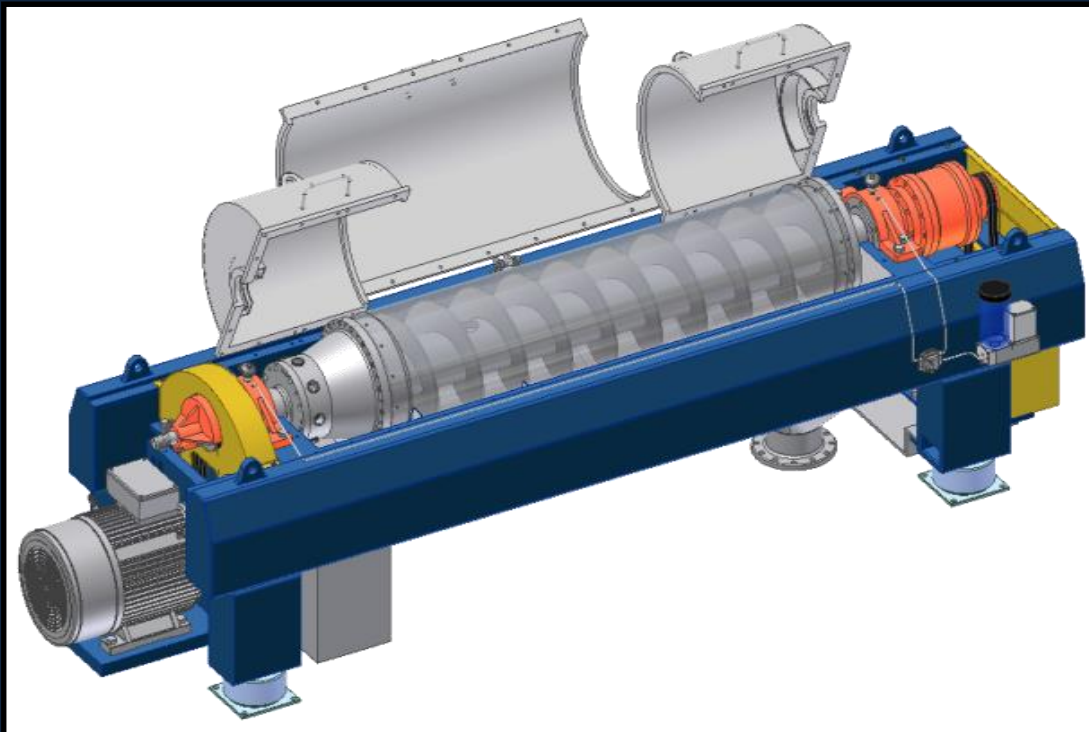
Achieve 60dB

- To reduce decanter machine noise,
- Specially to minimise the bolt hole that produce vortex/turbulence noise
- Noise control plate should be designed so that the noise is produced within parts of the sound spectrum that have low noise levels.

- ✓ Noise control plate mounted onto wrench bolt
- ✓ Round head bolt reduce noise level

MAIN FEATURE & KEY TECHNOLOGY

3. Multi stage casing cover



**Fast & Easy Maintenance,
Save working time!**

- Multi-stage casing
- Convenient maintenance, only opening small casing
- Reduce Noise & vibration of the effects of increased stiffness
- Reduce maintenance workers

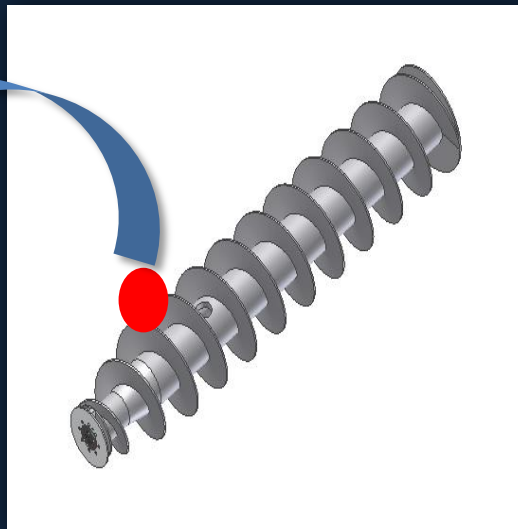
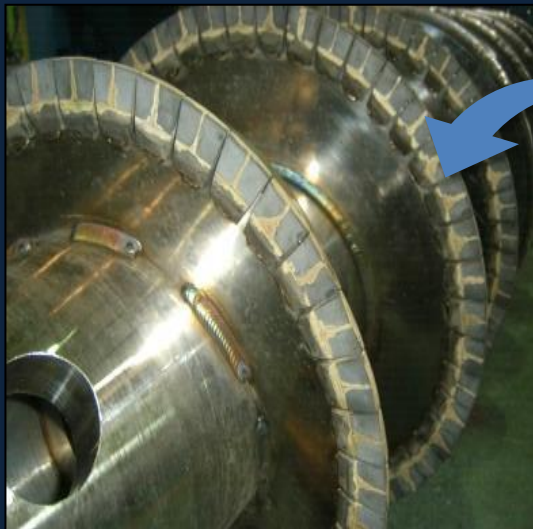
MAIN FEATURE & KEY TECHNOLOGY

4. Screw conveyor hardening



Strong to Heavy Solid

Flame sprayed & WC Tile Ceramic , tungsten carbide and Special surface coating for high acid, non abrasive corrosive material – Duplex, hastelloy fusion



5. Solids discharge wear protection



WC Bush

Permanent durability, No maintenance

- Existing Decanter that there are too many maintenance, as brittle ceramic cause discharge port to break easily.
- Non permanent complicated structure is extremely dangerous for the case of high revolution machine.
- New material discharge cap is almost permanent and internal exchange structure that is adapted for high revolution.

MAIN FEATURE & KEY TECHNOLOGY

6. Wear protection & Corrosion resistance part

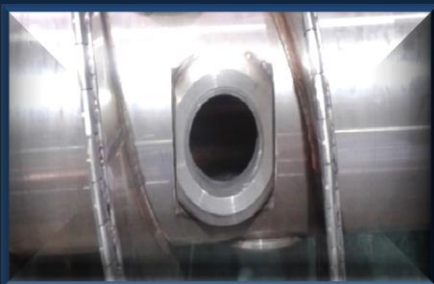
WC Carbide Tile



WC Alloy Eutalloy



Sludge Exhaust Bushing



Cake Exhaust Bushing



Great permanence and reliability

- uses high-grade stainless steel for all parts.
- High stiffness screw design,
- WC Tile, and Hastelloy, Ceramic-carbide coating.
- Special thermal processing. Kolsterizing.

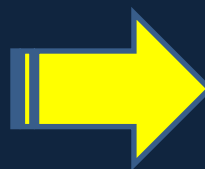
MAIN FEATURE & KEY TECHNOLOGY

7. Power Transmission

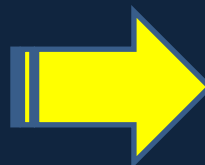
Parts photo

Assembled

Planetary
reducer



Cyclo
+
Planetary
reducer



Wide-ranging

- Offers a variety of gearboxes that are used in decanter
- Designed to fit into all applications.
- Our engineering experience has allowed us to provide customers with many alternatives that will save them money in the long run by allowing them to avoid many unnecessary repair costs

MAIN FEATURE & KEY TECHNOLOGY

8. HMI total automation



Convenient operation

- HMI conventional operation panels allows easy operation
- Siemens PLC Program + Yasakawa Inverter can be centralized control method and has all interface working operations.
- With touch screen is positioned close to decanter centrifuge & used mainly for maintenance
- The operator can observe and verify the results of operating condition, if required.

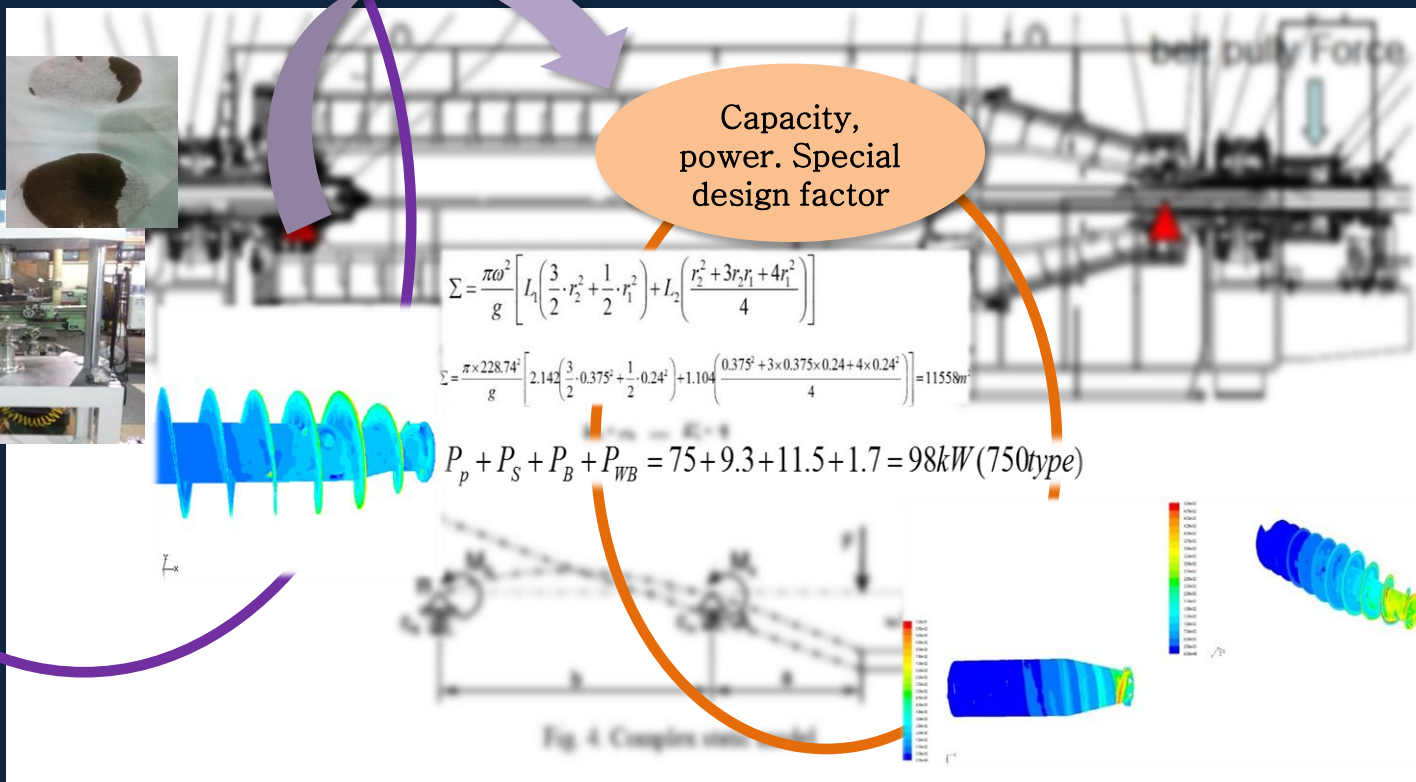
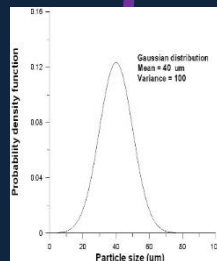
MAIN FEATURE & KEY TECHNOLOGY

9. Optimum design, CFD Simulation

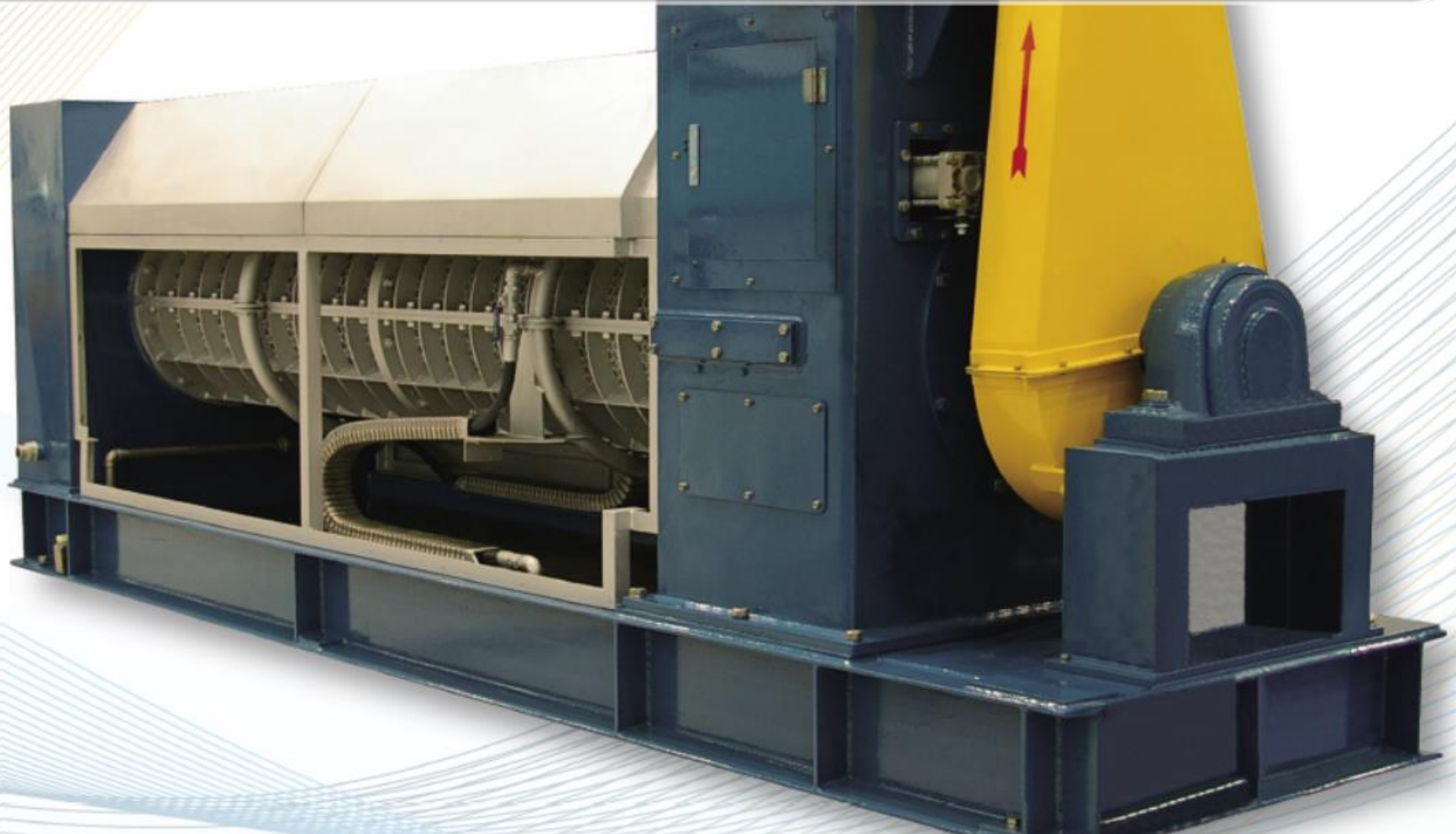
More than 1,000 sludge ingredients have been successfully, We provides optimal design value with abundant field experience.

Partical size,
viscosity, density
etc..
Parameter
considering

Capacity,
power. Special
design factor



LOW ENERGY HIGH DEWATERING **SCREW-PRESS**

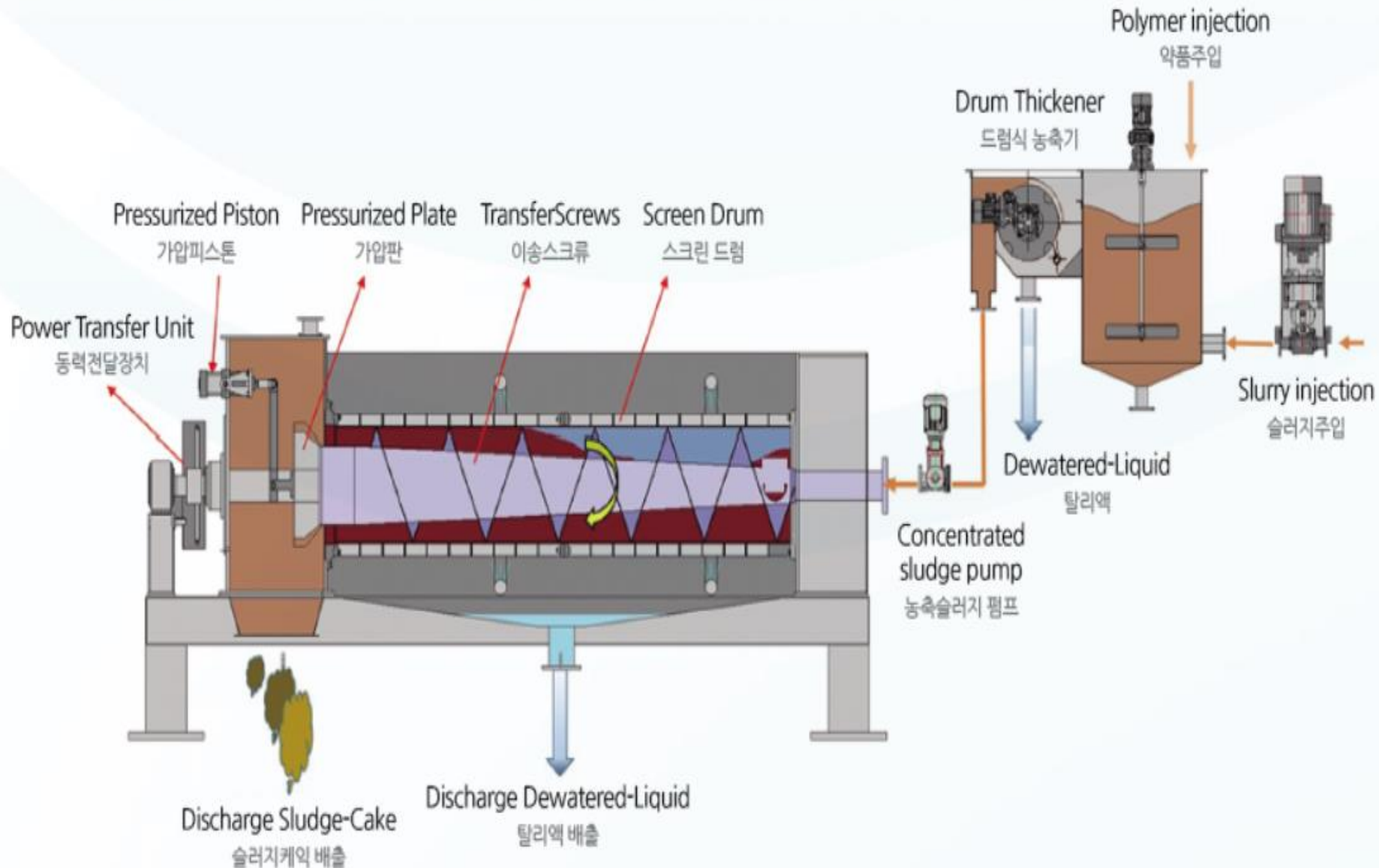


■ KEY PART OF SECTION - With ensuring quality 주요 핵심 부분 - 품질보증

All 100% are designed and manufactured in our R&D, and provides after strict quality inspection and load test.



INSCOPE OF ROYAL-SCREW PRESS FLOW SHEET



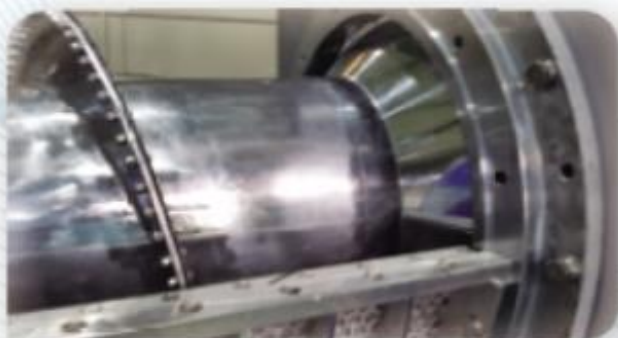
KEY CORE PARTS, MAIN FEATURE



CHAMBER & SHUTTLE WASHING DEVICE



SELF CLEANING NOZZLE



SCREW BLADE



DRUM THICKENER DEVICE



MAIN DRUM



MAIN SCREW FABRICATION

BIG 7 ADVANTAGES & BENEFITS

- 1. High efficiency low power** 고효율 저동력
Royal-screw press realized high efficiency with low power operation by low speed operation.
The power range is from Min 0.75kW to Max 5.5kW up to 40m³/hr up to 25%ds, enabling green energy.
- 2. Removal of screen clog by removable cleaning device** 이동식 세척장치 장착으로 스크린 막힘 현상 제거
By installing nozzles in the circumferential direction, it is possible to evenly clean all parts of the screen of the drum. Since it moves back and forth during the operation and washing the drum screen, it has excellent cleaning ability even with a small washing water,
- 3. Ultra low noise realization** 초저소음 실현
Because of the screw rotates at low speed (0.2~1.3rpm), It generates little noise by using low power motor.
(Average 30dB)
- 4. Large Capacity Processing** 대용량 처리 가능
Thickener for the concentration of inflow sludge and Self-agglomerating device with high efficiency at the front end of screw press are essential mounted, It makes that the incoming sludge is agglomerated up to 3%SS and can achieve high dehydration rate and high throughput at the same time.
- 5. Lower consumables costs and lower maintenance costs** 적은 소모품 비용과 유지보수 비용 절감
In addition to applying durable materials, A core device at low speed operation of drum screw has a excellent durability of the consumables and long-term Life Span and lower maintenance costs.
- 6. High dehydration rate** 높은 탈수율 실현
Because of the inflow sludge is concentrated at the front end of the screw press and dewatered by a screw press and the backpressure plate is installed at the outlet Cake of the compression part, and the pressure is applied by the pneumatic cylinder, the Royal screw press has a higher dehydration rate than other screw presses.
- 7. Adoption of attitude nozzle Prevention of nozzle clogging** 자세정 노즐 채택 노즐막힘 예방
SELF CLEANING Nozzle Designed for Self Cleaning is to prevent nozzle clogging and convenient maintenance.

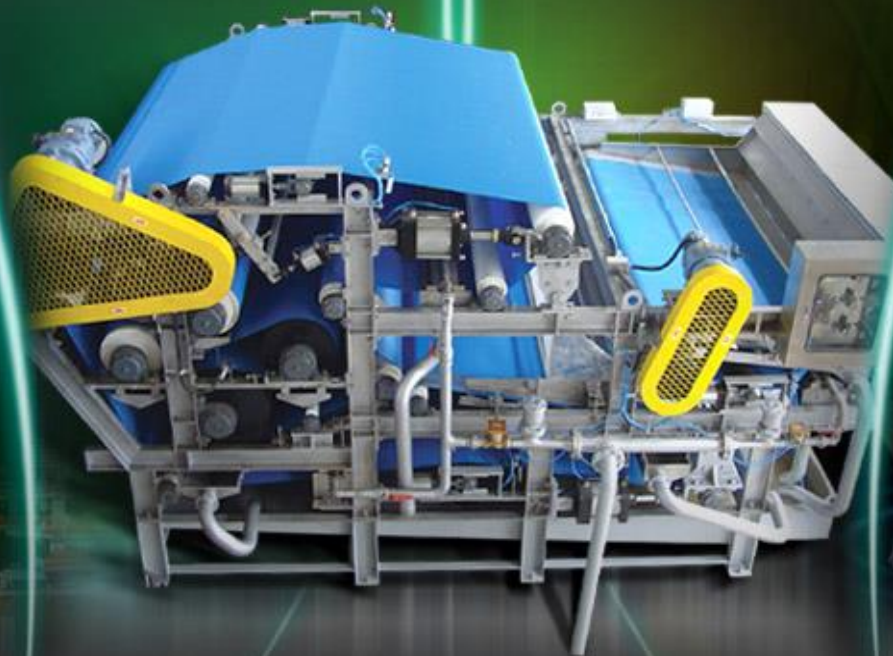
HIGH PRESSURE VERTICAL DEWATERING BELTPRESS

EFFICIENT SLUDGE DEWATERING

CAKE SOLID UP TO 50% DEPENDS ON
SLUDGE CONDITIONS

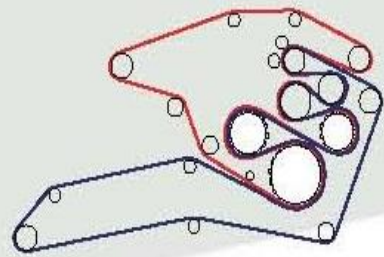
LOW INVESTMENT AND OPERATING COSTS

AUTO WASHING AND CLEANING
NOZZLE SYSTEM

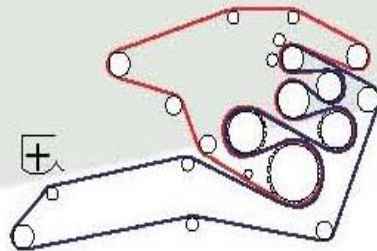


WHAT DIFFERENT ?

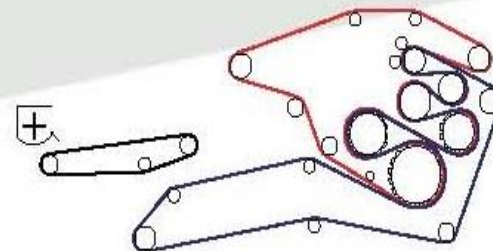
Pre-section + Dynamic High Efficiency 6 stage Roller Main Section + After Section



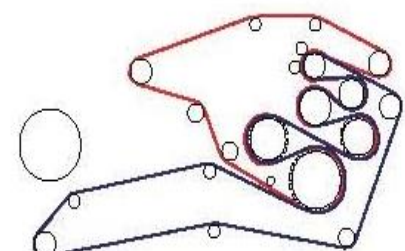
Standard Type(A Type)



(A)⁺
Auto Feeder attached(B Type)
- option -



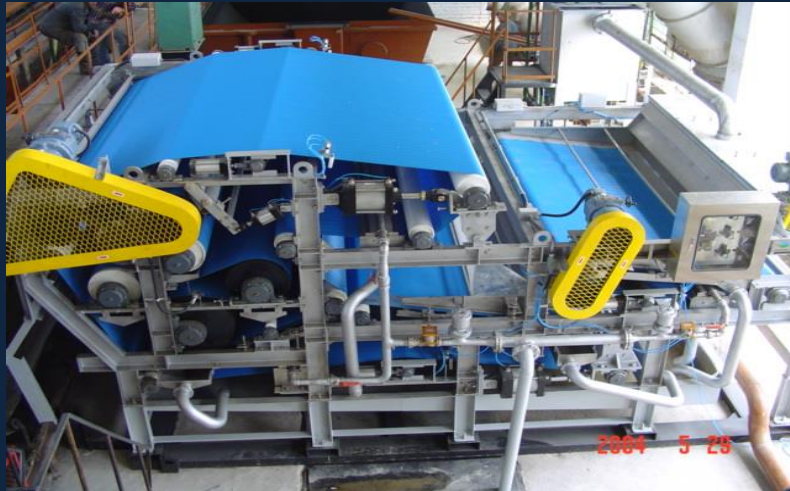
(B)⁺
Belt Thickener attached(C Type)
- option -



(A)⁺
Drum Thickener attached(D Type)
- option -

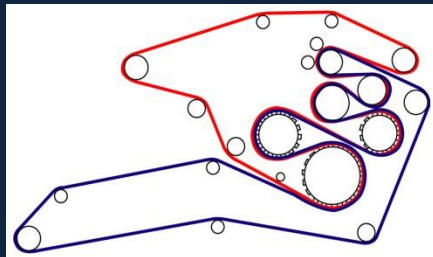
Component parts of Pre-Section, Drum Screen, Auto-Feeder, Belt Thickener + Dynamic Work Frame and Various kinds of S-Shape Roller Stages arrangement in Main Body + Ending composed of Add High Pressure Zone dewatering device gives High dewatering effects for all different types of wastewater sludge.

BASIC MODEL

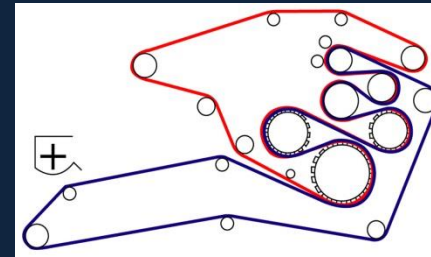


6 STAGE MEDIUM PRESSURE

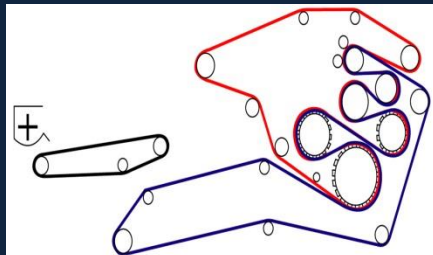
- 6 Stage Roller pressure
- Can be mounted with DRUM/BELT Thickener, AUTO-Feeder accordingly.
- Use for General type Sludge
- + 15% DS



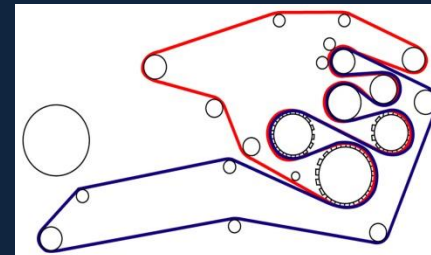
STANDARD (A) TYPE
6 Medium pressure
Roller + Gravity
Zone



AUTO-FEEDER
Mounted+ A (B)



Auto-Feeder+ Belt
Thickener
Mounted+ A (C)



DRUM SCREEN
Mounted+ A (D)

WHY ?

The “Sufficiency Dewatering” available equipment

ROYAL-BELTPRESS

Extract both “Free & Absorbed”
water

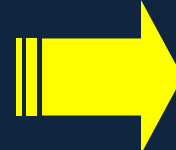
Cuts typical waste volume
higher than others

Efficiently achieves >20% dry
solid

Low energy, Long Durability,
High Effect against others

Conventional Dewatering Devices

- ▶ Dynamic Frame Work
- ▶ High Drainage Zone
- ▶ Wedge Zone
- ▶ Squeeze Zone
- ▶ High Pressure Zone



Extract the free water contained in the liquid sludge, limited to ~20%DS in sludge cake.

LIFE SPAN ?

LONG DURABILITY, DYNAMIC FRAME WORK

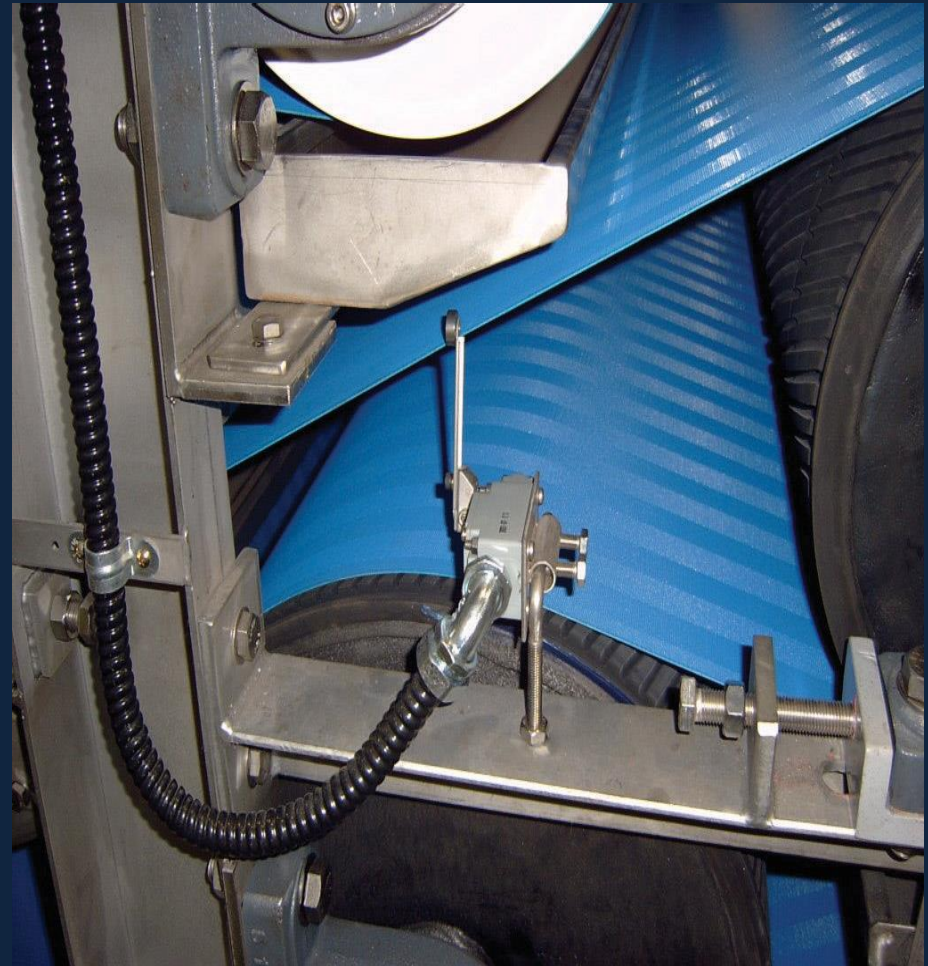
- ① The well Conditioned Sludge fed on the upper Belt,
- ② Distributes evenly by Dynamic Frame, Good arrangement Rollers, good attachments,
- ③ Belt Thickener, Drum Screen, Auto-Feeder etc.



MAIN FEATURE & QUALITY ?

SPECIAL HAND-MADE RUBBER ROLLER

- The Special Flute Helical gives fast High drain & Squeeze dewatering effect
- Filtrate flow through both Belts without Rewetting the Cake
- Dynamic S-Shape roller arrangement gives High Effect dewatering



MAIN FEATURE & QUALITY ?

DYNAMIC STRUCTURED ROLLER ARRANGEMENT

- Polyamide coated Roller gives high effect squeezing,
- Belts travel around rollers of smaller Diameter,
- The pressure increases gets more water squeezed out.



MAIN FEATURE & QUALITY ?

SELF-CLEANING NOZZLE SYSTEM

- No need cleaning work
- Timer, Sensor operates by Full Automatic Washing System
- Long Durability Nozzle Tip
- High Pressure but Low water Consumption
- Recycle Water reuse



MAIN FEATURE & QUALITY ?

THICKENER OPTION

Depending on the nature of the sludge, Thickener option can be adopted to dehydrate the FLOC free-water as much as possible Before entering gravity dehydration section:



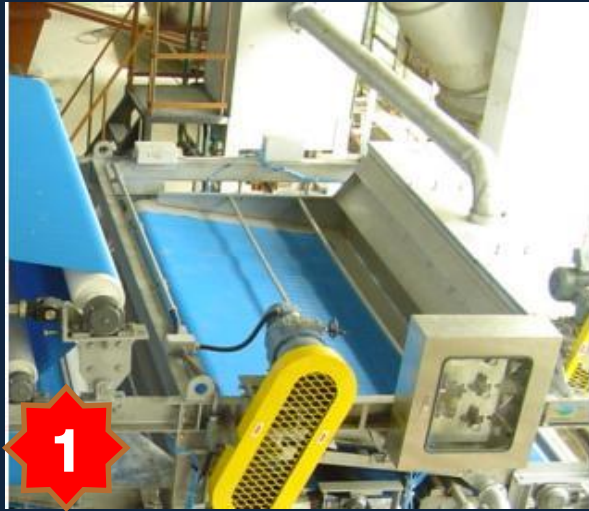
AUTO-FEEDER



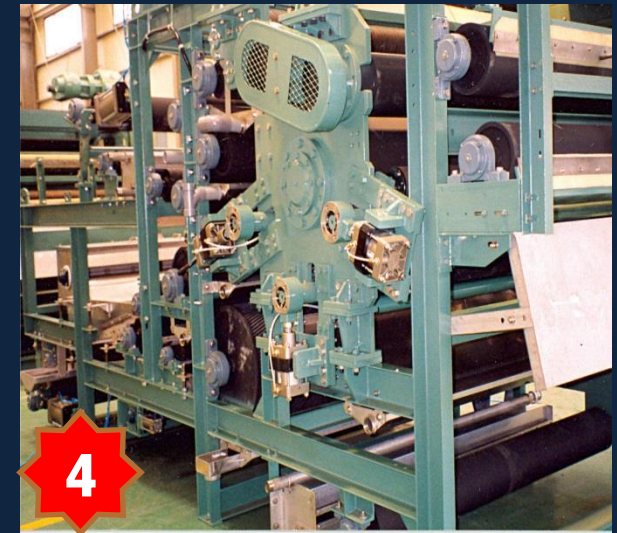
DRUM SCREEN

MAIN FEATURE & QUALITY ?

30-year KNOW-HOW and more than 300 sets reference-achievements, and a variety of actual site sludge from all over the world

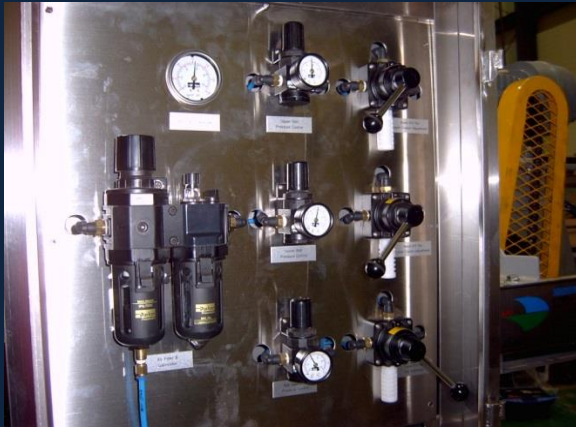


1. BELT-THICKENER,
2. LOW PRESSURE ROLLER,
3. MEDIUM PRESSURE ROLLER,
4. HIGH PRESSURE ROLLER



MAIN FEATURE & QUALITY ?

ATTACHEMENTS DEVICES



AIR CONTROL PANEL

Depending on the thickness of the sludge inlet, the most appropriate pneumatic tension control is automatically adjusted to ensure optimum dehydration.



AUTO-FEEDER DEVICE

Auto Feeder is the best device to do enough pre-dewatering before inputting sludge to main roller. It is a device that raises the dehydration efficiency by natural dehydration of free-water formed by FLOC as much as possible.



BELT THICKENER

The gravity dehydrator Belt-Thickener is designed to obtain the optimal conditions for natural dehydration, the sludge should be designed and checked carefully for its properties, speed, tilt angle, and belt conditions as well.

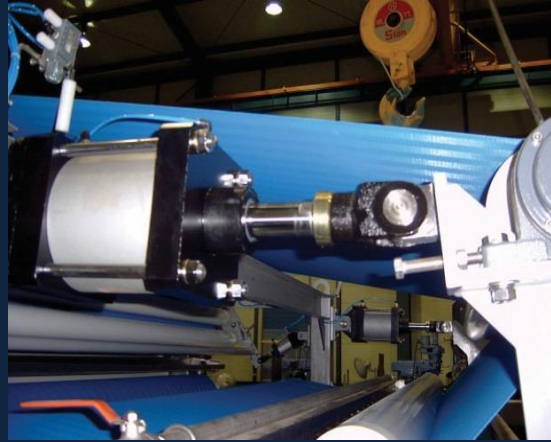
MAIN FEATURE & QUALITY ?

ATTACHEMENTS DEVICES



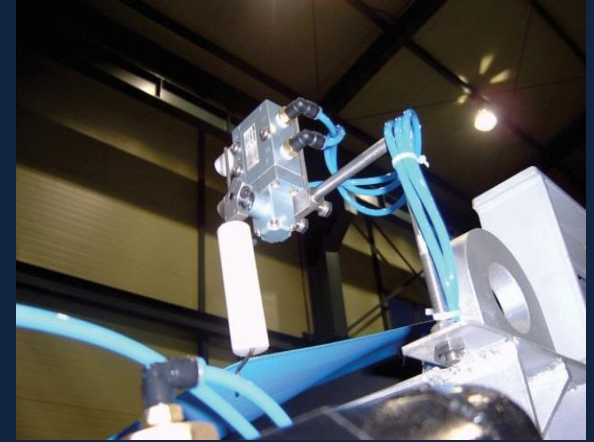
ADD-PRESSURE
ROLLER

*The final add-pressure roller is helps to peeled off the final cake with linear pressure and to help dehydrate the filtrate.
(Option)*



AIR-CYLINDER
TENSION
DEVICE

The reason for using Air Cylinder (without Bellows) and Limit Switch are that, The Air Cylinder & Limit Switch is attached to the left & right sides or Upper & Lower position to find the optimum balance point to prevent belt tilt and help to travel in the correct position.



LIMIT SWITCH

MAIN FEATURE & QUALITY ?

ATTACHEMENTS SYSTEM



BELT JIG

The Belt Jig is provided to the customer for ease in replacing or mounting the Belt.



AUTO SELF-CLEANING WASHING NOZZLE SYSTEM

The automatic cleaning nozzle device system is not the conventional manual cleaning method, that Sludge deposits in the nozzle are discharged instantaneously and Nozzle clogging is eliminated by the automatic timer. Nozzle clogging prevents sludge from entering the belt and shortens the life of the nozzle.

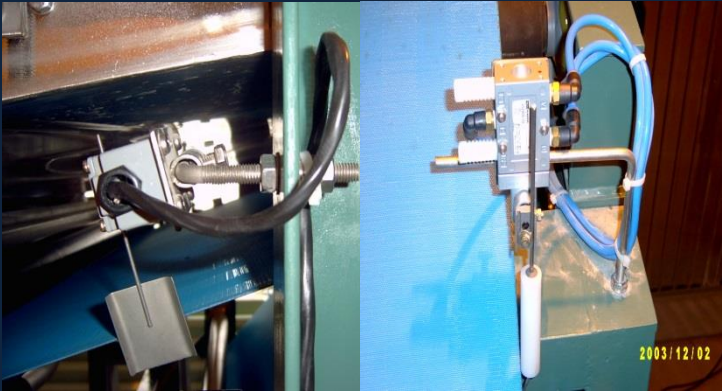


INDIVIDUAL SLUDGE MIXING SYSTEM

It is designed to form Floc to be an optimal Dewatering with Polymer and sludge mixed well.

MAIN FEATURE & QUALITY ?

ATTACHEMENTS SYSTEM



UPPER & LOWER BELT MEANDERING S/W

Upper and lower BELT Meandering adjustment Switch is always helps to allows the belt to continue to travel at the correct position. In particular, It is also designed to be safe to shut down the equipment while ringing an alarm when the Belt is out of range.

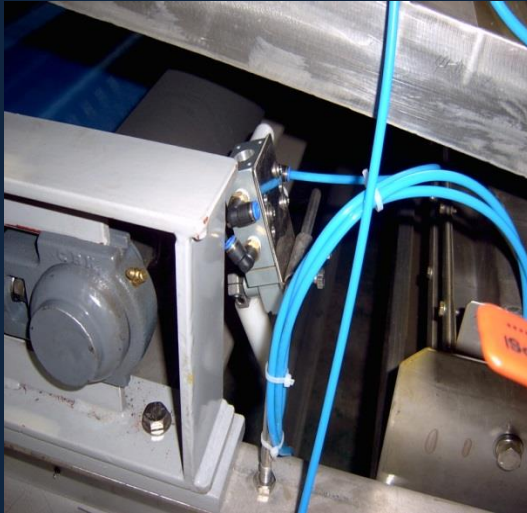


PLC CONTROL PANEL

It can work with several unit Beltpress and other devices through PLC Program and also Can check and adjust real-time equipment via the Internet in the central control room.

MAIN FEATURE & QUALITY ?

ATTACHEMENTS SYSTEM



ROLLER
ALIGNMENT

*It is a function to
prevent derailment of
Roller in advance.*



AUTO POLYMER
MIXING SYSTEM

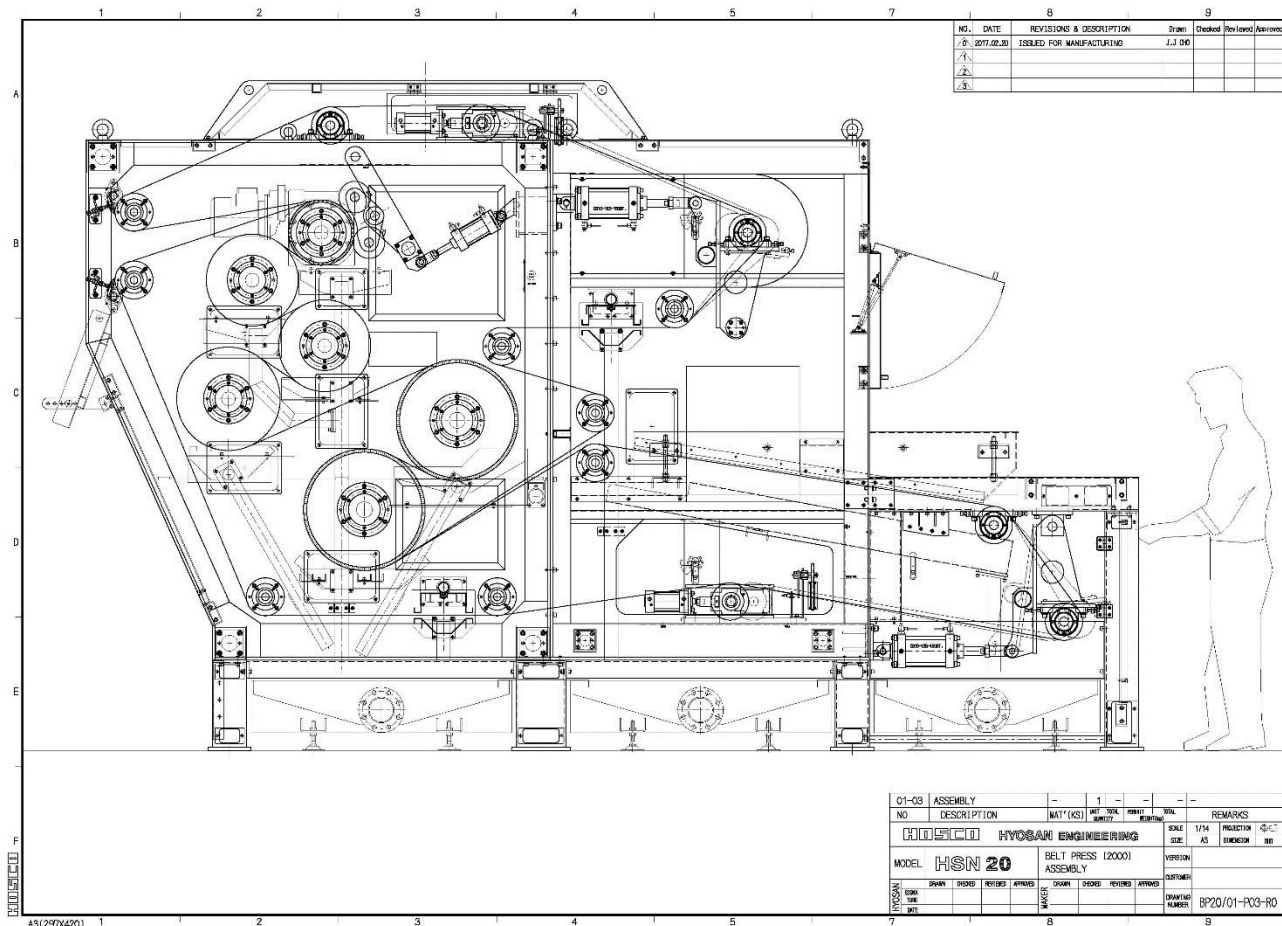
*Find out the most
economical amount of
polymer and set-up, It is
automatically supplied to
help form optimal floc.*



CAKE CHUTE

*It is designed to get as clean
as possible from the belt of
the tear cake finally.*

MAIN FEATURE & QUALITY ?



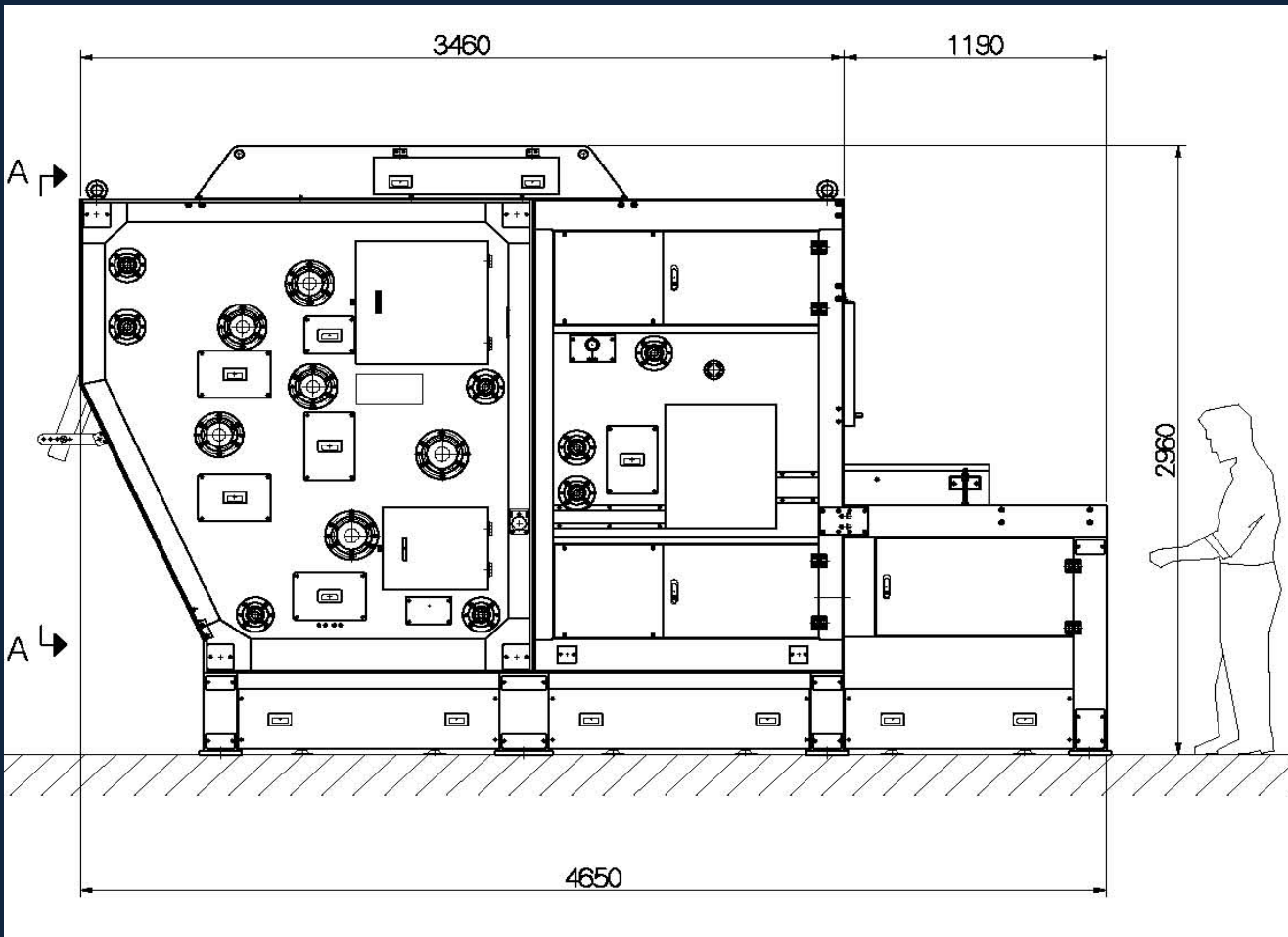
*MAIN
SPECIFICATION
MEDIUM
PRESSURE*

*“NAKED OPEN
TYPE”*

Specification

Dimension (mtr)LxWxH	Model	Belt With (mm)	Weight (kg)	Energy Consumption (kw/h)
4.2 x 1.6 x 2.3	HSN-100W	1,000	2,900	0.75
4.6 x 2.8 x 2.5	HSN-200W	2,000	5,300	1.5
4.6 x 3.8 x 2.6	HSN-300W	3,000	10,000	2.6

MAIN FEATURE & QUALITY ?



*MAIN
SPECIFICATION
MEDIUM
PRESSURE*

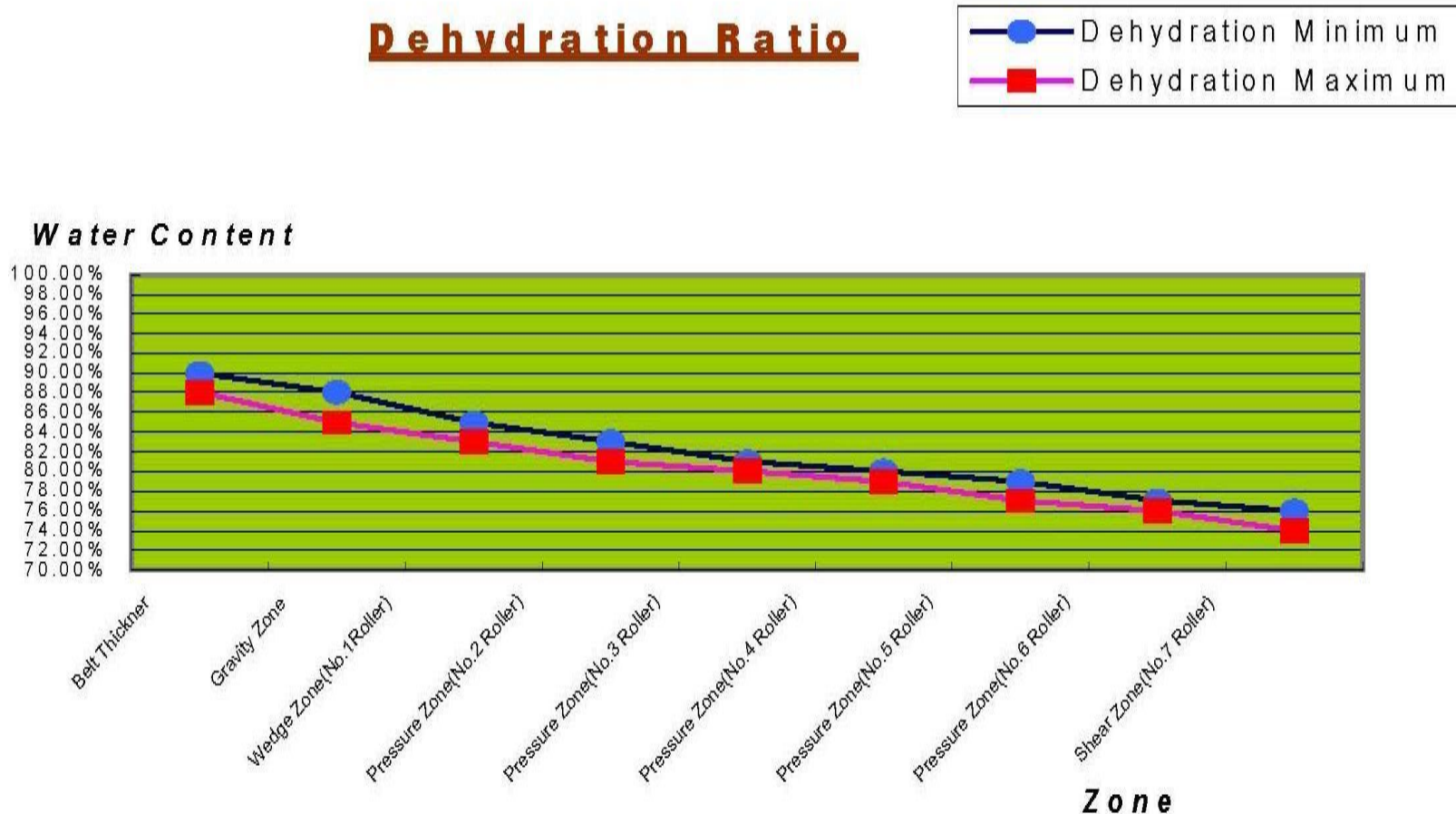
*“CLOSED
TYPE”(option)*

Specification

Dimension (mtr)LxWxH	Model	Belt With (mm)	Weight (kg)	Energy Consumption (kw/h)
4.2 x 1.6 x 2.3	HSN-100W	1,000	2,900	0.75
4.6 x 2.8 x 2.5	HSN-200W	2,000	5,300	1.5
4.6 x 3.8 x 2.6	HSN-300W	3,000	10,000	2.6

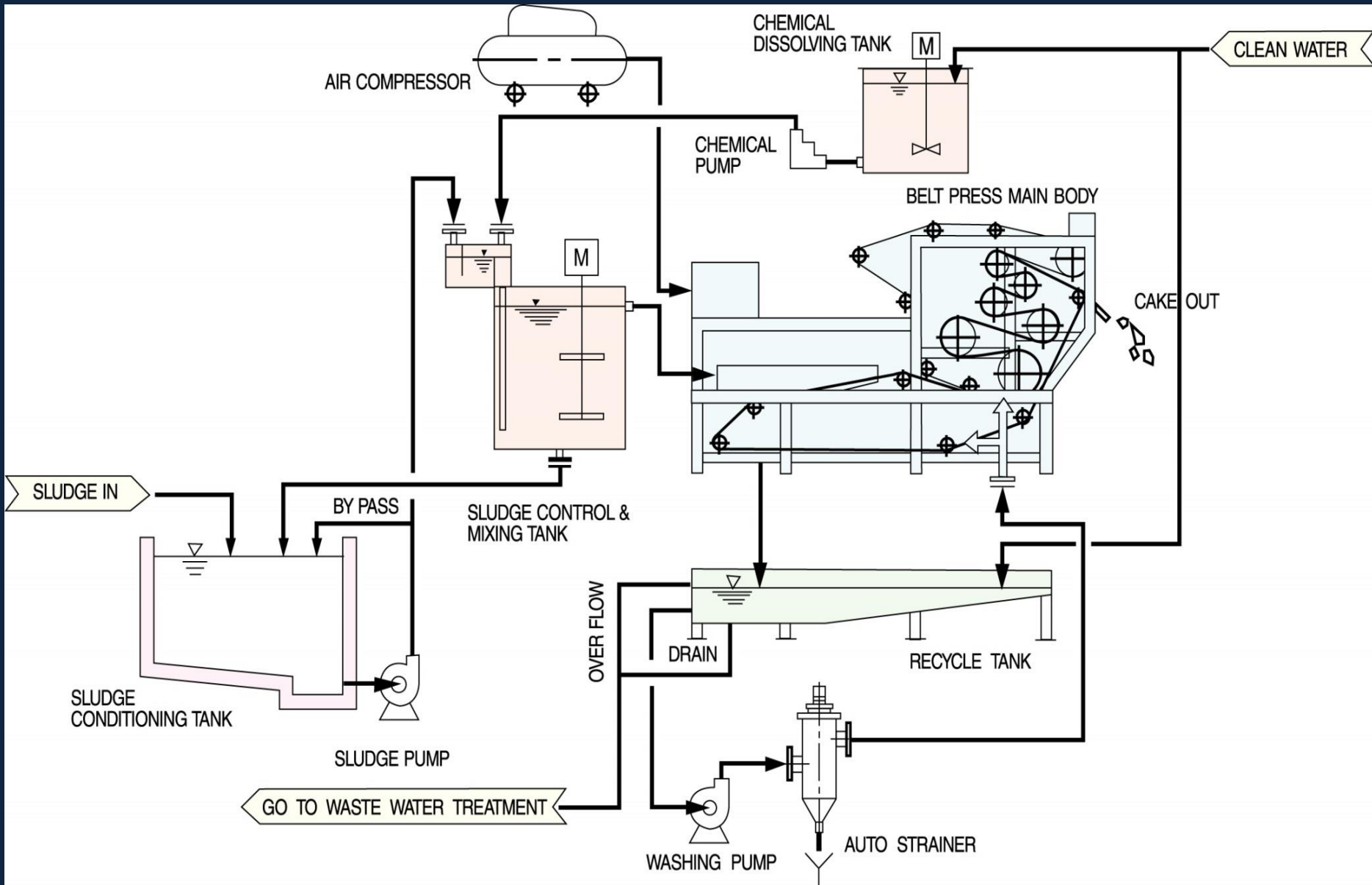
DEWATERING RATIO for each section of 6 stage Roller

Dehydration Ratio



● Note: Dehydration Ratio depends on Circumstance of Sludge condition

FLOW-SHEET & SUPPLY SCOPE



MAIN BENEFITS

1. High dryness
(reduce water
level > 20%)

- ① Reduce final cake Volume
- ② Significant reduction in disposal cost
- ③ Facilitates storage
- ④ Transportation using standard vehicles
- ⑤ Reduce costs of incineration
- ⑥ Landfill disposal
- ⑦ Enable energy recovery

2. Low consumption
compared to Others

- ① Minimum operating cost
- ② Low maintenance cost
- ③ Long-run Warranty

MAIN BENEFITS

3. Int'l Standard



ISO9001, 14001, KS Standard
Superior Quality & Long durability
guarantee

4. Various Type Choice



4, 6, 8, 12 Roller Stages choice
according to client's require or Sludge
conditions

5. 30 years Over
References



700 units + Installed into World
Market with Much experienced
Engineering commissioning service

6. Competitive Price

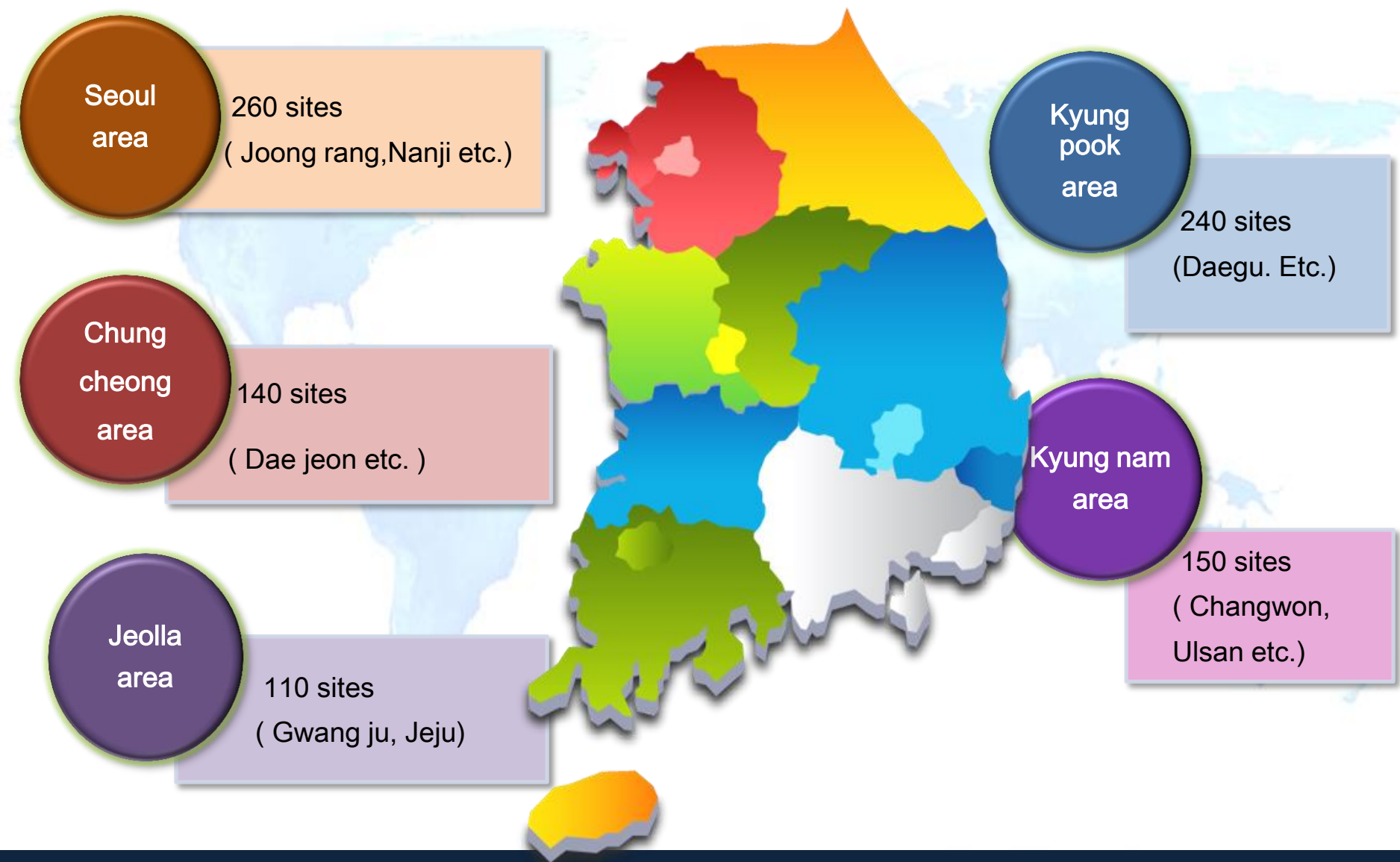


- Small Investment
- Minimum operating cost
- Quick Recovery of Investment
- Less operation supervision
- Easy parts accessibility for maintenance

REFERENCES

OVERVIEW

REP. LOCAL OPERATING SITES



MAIN CLINETS

- ✓ Over 1,000 regular customers
- ✓ 2,000 end-user consumers
- ✓ More than 3,000 units are operating in Local & Overseas at WTP, WWTP, and Industrial Sites.
- ✓ Top Rank References, The Best performance in Korea
- ✓ Has more than 3,000 sludge experiences.



Ministry of
Environment



COMPANY PROFILE

SUMMARY

Group Company Name	BLUEWIN, FINE INC, ROYAL PRECISION IND. CO., LTD.		
BOM	Mr. LEE SANG JUN(Korean)/CEO & President Mr. PARK JAE DUCK(Korean)/CEO & President Mr. ANTONIO KIM (Korean)/CMO, CEO		
Established	SEPT, 15, 1989		
Main Item & Business Fields	<p>-World Unique ELODE system for Sludge Dewatering, Reduction, Recycling, Renewable.</p> <p>-Advanced New Technology Sewage and water purification system with the shortest time, lowest cost, and highest efficiency using Nano.Micro-bubbles.</p> <p>-Reproducing "Renewable energy" using 3-phase separation system for "Palm oil, solid, water" or "food (water, oil, solid)"</p>		
Marketing Headquarters	4Fl, Baeksan Bldg, 157 street, Jungnung-Dong, Seongbuk-Gu, SEOUL. KOREA.		
Capital Fund	US\$3.2mil	Turnover	US\$68.2mil/2016'
Employee	181 staffs / 2019' present		
Official line	Tel: +82.70.7868.8920 / Fax: +82.2.912.4438 E-mail: antonio.kim@elode.co / www.BLUEWIN.kr & www.elode.co		

FINANCIAL STATE

Setting day-Validity Period :Dec/31/2015~Apr/22/2017

Financial standing for past 3years

- Credit standing: BBB-
- Cash Flow : CF2(B)
- Turnover: U\$68.2mil/year ave.

Bank Information

- Industrial Bank of Korea
- KOREA.

Credit Rating Authorized Agency

NICE평가정보 주식회사
NICE Information Service Co., Ltd.



ORGANIZATION

Employees 181
2017' Present

BOARD OF MEMBER

CEO & President

Vice president

Audit

Management Innovation Headquarters

R&D Engineers	38 staffs
Sales & Business Management	36 staffs
Products Processing	73 staffs
After sales Service	20 staffs
Education. Training. Human resource etc.	14 staffs

**ELODE
Department**

**DECANTER
Department**

**OTHER
Department**

Administration

Sales Engineering

R & D Center

Production

Sales Engineering

R & D Center

Production

Sales Engineering

R & D Center

Production

Admin

Account

Procurement

PATENTS

SORT	NAME OF PATENT	REGISTERED NO	DATE	ITEM
TRADE MARK	FINE	#40-0701110	2007.03	Trade Mark
TECHNICAL PATENTS	PIN-TUBE MFG-PROCESSING DEVICE	#10-0612624	2006.08	F.A.
	WATER-OIL SEPARATOR	#10-0697688	2007.03	SEPARATOR
	WASTE SLUDGE RECYCLE DEVICE	#10-0947465	2010.01	DECANTER
	SLUDGE PROCESS OF FINE-ELODE	#10-1045151	2011.06	FINE-ELODE
	SCM-SPECIAL RUBBER MFG-PROCESSING	#10-1076740	2011.10	SCM FILM
	CATHODE & ANODE DRUM OF FINE-ELODE	#10-1070296	2011.10	FINE-ELODE
	PERMEABILITY RUBBER SHEET MFG-PROCESSING	#10-1089592	2011.11	SCM FILM
	RUBBER SHEET FOR SHOE MFG-PROCESS	#10-1129702	2012.03	SCM FILM
	SLUDGE PROCESS OF FINE-ELODE	#10-1156498	2012.06	FINE-ELODE
	DIGITAL CONTROLLING CIRCUIT AND SYSTEM OF FINE-ELODE	#10-1172365	2012.07	FINE-ELODE
	APPARATUS FOR INPUTTING VOLTAGE OF FINE-ELODE	#10-1171730	2012.07	FINE-ELODE
UTILITY PATENTS	RUBBER FILM FIBER & OTHERS	3 different kinds	-	SCM FILM

※Yellow text is FINE-ELODE System

CERTIFICATE

ARTICLES	AUTHORIZED BY	REGISTERED NO.
R&D CENTER of FINE INC.	KOREA INDUSTRIAL TECHNOLOGY ASSOCIATION	#20084189
WORLD CLASS PRODUCTS	MINISTRY OF KNOWLEDGE ECONOMY	#2008-310
GREEN TECHNOLOGY	MINISTRY OF ENVIRONMENT	#GT-12-00173
INNOVATIVE S.M.E (INNO-BIZ)	SMBA	#R2021-524
ISO9001 QUALITY MANAGEMENT SYSTEM	SMBA CENTER	D 152-211
ISO14001 ENVIRONMENT MANAGEMENT	CRS	EMS-0080
LEADING COMPANY FOR MACHINERY PARTS & MATERIALS PARTS	MINISTRY OF KNOWLEDGE ECONOMY	#6801
BUSAN-LEADER FOR MACHINERY PARTS & MATERIALS PARTS	BUSAN METORPOLITAN CITY	#2006-2-89
FINANIAL A+ MEMBER CLUB	TECHNICAL ASSURANCE FUND (KOREA GOVERNMENT)	#836
CE	Lloyd's Register	KPA 58161
DESIGNATED AS A DEFENSE COMPANY	MINISTRY OF KNOWLEDGE ECONOMY	#196
DEFENSE QUALITY MARK	DEFENSE TECHNOLOGY and QUALITY AGENCY	DTaQ-CDQ-13

AWARDS & PRIZE

Year	Contents
1999	Commendation of SMBA
	Commendation of the National Tax Service
2001	Busan Venture Company Excellence Award (Busan Metropolitan city)
2003	Commendation of Ministry of Science and Technology
2004	Commendation of the Prime Minister
2005	Excellence Prize for Busan Excellent Small Business
2007	Awarded U\$3mil export and commendation of KITA
2008	Presidential Citation
	Awarded U\$5mil export
2009	Worker-company win-win concession negotiation practice enterprise certification (Ministry of Labor)
2011	Selected as a good company to work in our region (Ministry of Knowledge Economy)
	Busan Employment Grand Prize (Busan Metropolitan city)
	Certified as world-class product of SCM film (Ministry of Knowledge Economy)
2012	Selected as proud Small and Medium Businessman(SMBA)
	Acquired Green Technology Certificate (Ministry of Environment)
	Awarded U\$10mil Export
	Awarded Excellence Prize for Busan Export Award (Busan Metropolitan city)
2013	Received the Bronze Tower Order of Industrial Service Merit
	Selected as Excellent Employment Company in Busan
2015	Selected as World Class 300 company
	Awarded Busan Industrial Grand Prize

1st (Head) Factory in BUSAN. KOREA for

- ELODE Manufacturing & Water project fields



Ground Area: 8,910sqm

2nd (Head) Factory in DAEGU. KOREA for

- DECANTER, CENTRIFUGE, BELTPRESS, SCREWPRESS. THICKENER



GROUND FLOOR: 6,627sqm

CONTACT POINT

BLUEWIN CO., LTD

e-mail	info.bluewinkorea@gmail.com	www.bluewin.kr www.elode.co
Person in charge	Moon KIM Assistant Manager of Overseas Sales	Mobile Phone +82.10.6236.3127

We're ready to reply within 24 hours for Serving you.

CONTACT ID

Wechat: manchch

Kakaotalk: manchch

THANK YOU