

# ENSA

构建未来的固废处置与资源循环系统  
Establish Future Solid Waste Disposal & Recycling System

**SLUDGE**  
污泥

**ORGANIC WASTE**  
有机废物



**集团公司总部**  
Group Location

北京 | Beijing

**固体废物处置运营公司**

sub. Enterprises for Solid Waste Disposal

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贺州·广西 | Hezhou-Guangxi  
永安·福建 | Yong'an-Fujian  
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**北京恩萨工程技术有限公司**

Beijing ENSA Engineering Co., Ltd.

总机 / Tel: +86 10 8176 1068

市场 / Mkt: +86 10 5773 2829

销售 / Sales: +86 10 5773 2827

传真 / Fax: +86 10 8485 1357

邮箱 / E-mail: info@ensa.cn

网址 / Web: http://www.ensa.cn

地址 / Add: 中国 北京市北京经济技术开发区科创三街 19 号  
No. 19, 3rd KECHUANG Rd, Beijing Economic-Technological  
Development Area, China 100023



<http://www.ensa.cn>



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知行合一  
Integrating Knowledge & Action  
利他主义  
Benefiting Others  
创造价值  
Creating Values

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旨在构建未来的固废处置与资源循环系统  
Establish Future Solid Waste Disposal & Recycling System

## 愿景 Vision

固废安全处置 资源高效循环  
Solid Waste Safe Disposal & Recycling Efficiently



## 有机废物处置与资源化

Organic Waste Disposal & Recycling

高压压榨短程预处理 + 湿式厌氧消化技术  
High Pressure Short Distance Squeezing + Wet Anaerobic Digestion Technology

EDAC™ 干式厌氧反应技术工艺  
EDAC™ Dry Anaerobic Technology Process

核心装备系统  
Products

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## 污泥处置与资源化

Sludge disposal & Recycling

污泥干化焚烧系统

Sludge Drying & Incineration System

垃圾焚烧发电厂污泥直喷协同焚烧处置

MSW Incineration Power Plant Sludge Direct Injection Incineration Co-processing

项目案例  
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## 关于恩萨 ABOUT ENSA

北京恩萨工程技术有限公司（以下简称“恩萨”）成立于2009年，聚焦固体废物处置与资源化领域，以核心装备制造为基础，为客户提供先进的整体解决方案，是集工程设计、项目建设和运营服务为一体的生态环境治理综合服务商。

近年来，恩萨已在工业危险废物、污泥、餐厨垃圾、厨余垃圾、陈腐垃圾、飞灰、污染土”等不同的细分领域，为国内外近500家客户提供了高可靠性、高性价比的装备系统和整体解决方案，为客户和合作伙伴持续创造价值的同时，对践行“绿水青山就是金山银山”的生态环境保护大政方针作出积极贡献。

作为国家高新技术企业和北京市专精特新“小巨人”企业，恩萨自2017年至今先后获得金沙江联合资本等国内外知名机构战略投资，并作为北京市环保装备制造业重点扶持和培养对象，于2021年底成功入驻北京经济技术开发区。目前，恩萨已拥有数十项自主知识产权，产品通过了ISO9001-2015质量体系认证和欧盟CE认证。

目前，恩萨旗下已拥有9家从事危险废物和飞灰无害化处置的项目公司，已规划总处置能力近200万吨/年。

恩萨以“知行合一、利他主义、创造价值”为价值观，以“固废安全处置、资源高效循环”为使命，与客户和合作伙伴共同努力，旨在构建未来的固废处置与资源循环系统。

Beijing ENSA engineering technology co., Ltd. (Hereinafter referred to as "ENSA") was established in 2009, focusing on the field of solid waste disposal and recycling, based on the R&D and manufacturing of core equipment, to provide customers with advanced overall solutions. , Project construction and operation services as one of the integrated ecological environment management service provider.

In recent years, ENSA has provided highly reliable and cost-effective products for nearly 500 customers at home and abroad in different segments such as industrial hazardous waste, sludge, restaurant waste, kitchen waste, stale waste, fly ash, contaminated soil etc. Equipment systems and overall solutions, while continuing to create value for customers and partners, make positive contributions to the implementation of the ecological environmental protection policy of "lucid waters and lush mountains are invaluable assets".

As a national high-tech enterprise and a "little giant" enterprise specializing in specialization and new in Beijing, ENSA has successively obtained strategic investment from well-known domestic and foreign institutions such as Jinshajiang United Capital since 2017, and has become a key support and training object for Beijing's environmental protection equipment manufacturing industry. , And successfully settled in Beijing economic and technological development zone by the end of 2021. At present, ENSA has dozens of independent intellectual property rights, and its products have passed ISO9001-2015 quality system certification and EU CE certification.

At present, ENSA has 9 project companies engaged in the harmless disposal of hazardous waste and fly ash, with a planned total disposal capacity of nearly 2 million tons per year.

With the values of "unity of knowledge and action, altruism, and value creation" and the mission of "safe disposal of solid waste and efficient recycling of resources", ENSA works with customers and partners to establish future solid waste disposal & recycling system.



- 丰富经验**  
Professional Experience
- 实力团队**  
Solid Team
- 先进技术**  
Advanced Technology
- 服务至上**  
Service & Reputations

## 3 大板块 3 Major Sections



## 7 大业务领域 7 Business Areas

针对不同种类的固体废物，恩萨可为客户提供技术先进的高可靠性和高性价比的**预处理系统和整体解决方案**  
For different types of solid wastes, ENSA can provide customers with advanced, highly reliable and cost-effective pretreatment systems and overall solutions



## 不同预处理环节 Different Pretreatment Steps



## HONORS / 企业荣誉



### 1

### 高压短程压榨 + 湿式厌氧消化技术 High Pressure Short Distance Squeezing + Wet Anaerobic Digestion Technology



#### 应用领域 / Application

- 餐厨垃圾、厨余垃圾项目  
Restaurant waste project, kitchen waste project
- 餐厨垃圾、畜禽粪污、市政污泥等有机固废联合厌氧项目  
Combined anaerobic project of organic wastes such as kitchen waste, livestock manure & municipal sludge

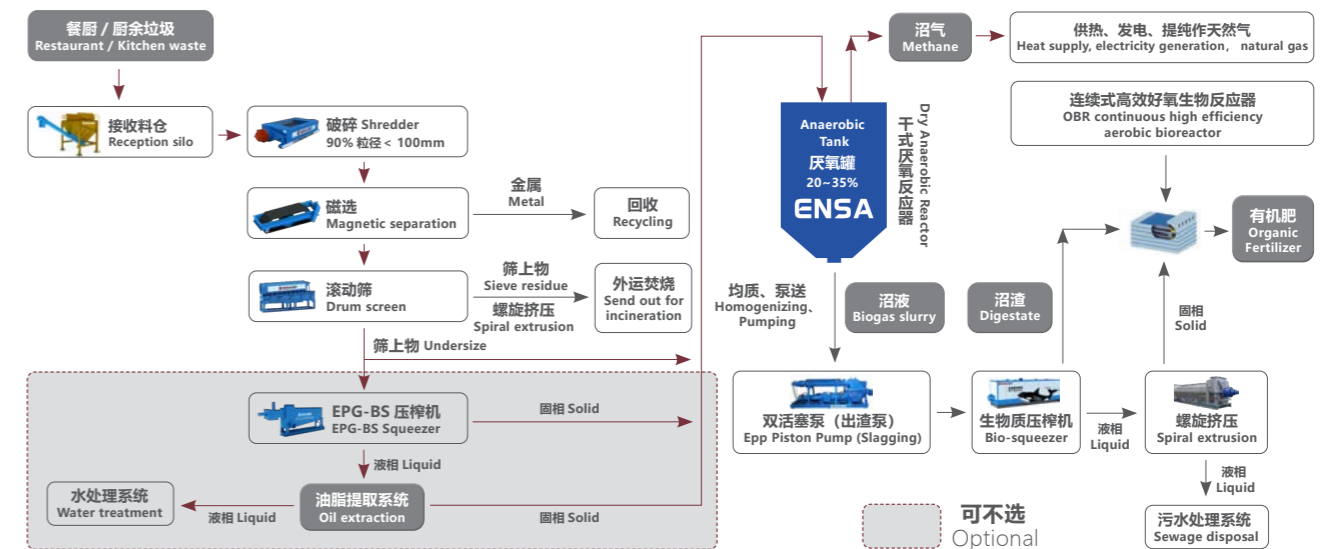


#### 优势与特点 / Features

- 短程高效高压压榨预处理技术，大大缩短预处理工艺的流程，节省了占地  
Short range high efficiency high-pressure squeeze pretreatment technology, greatly shortens the pretreatment process, saves land.
- 工艺先进成熟，且比传统工艺有机物回收率高出至少 8%。  
Advanced & mature technology, and organic recovery rate of traditional process is at least 8% higher.
- 最大程度资源化、能源化。沼气可用于供热、发电或提纯为车用天然气；油脂、塑料、金属、玻璃可回收再利用，可燃物可作为焚烧厂燃料，沼渣经过干化后制作固态有机肥料等  
Maximize resource utilization, energy utilization. Biogas is used for heat supply, power generation or purified as natural gas for vehicles; grease, plastics, metals and glass can be recycled; combustibles can be used as fuels for incineration plants; biogas residues is dried to make solid organic fertilizers, etc.
- 环境友好，全过程密闭运行  
Environmentally friendly, the whole process is closed.
- 故障点少，完全实现自动化，现场无人值守  
Fewer failures, fully automated, unattended on site.

### 2

### EDAC™ 干式厌氧反应技术工艺 EDAC™ Dry Anaerobic Technology Process

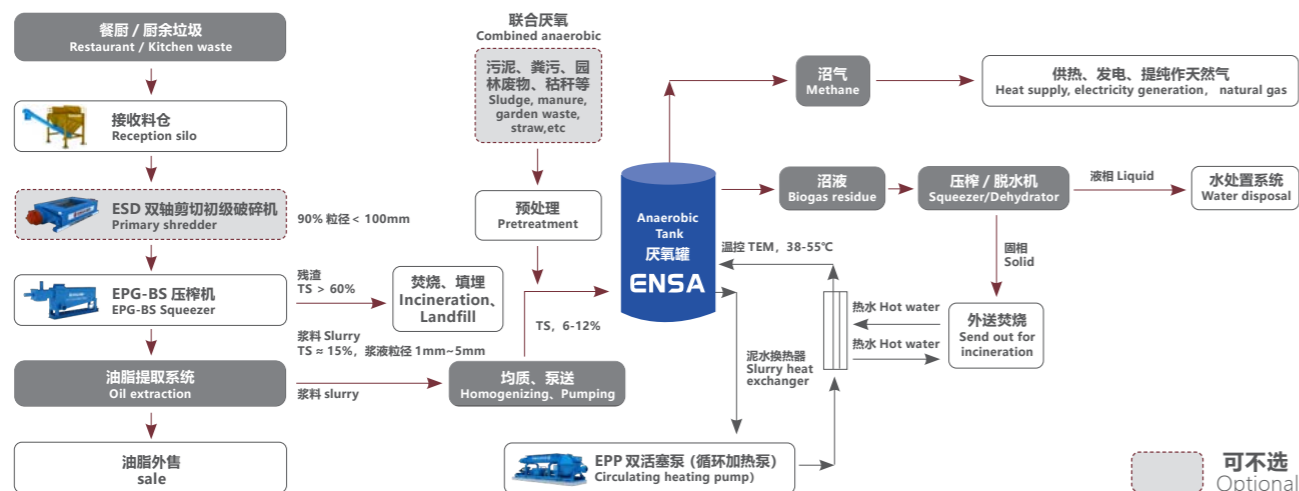


#### 工艺介绍 / Process Introduction

经过预处理后制备好的有机质物料（含固率约 15~40%）进入滑架料仓暂存，再通过输送柱塞泵从预处理车间送到厌氧罐区。首先送入具备物料连续混合给料功能的混合器内，并在此与从 EDAC 干式厌氧反应器回流的消化液进行充分的混合，再通过进料柱塞泵送入 EDAC 干式厌氧反应器顶部。厌氧罐运行温度可以通过循环柱塞泵及泥水换热器控制在中温 38°C 或高温 55°C，有机质物料在厌氧消化罐内停留 20~25 天，经过消化后产沼气。厌氧底部渣通过出渣泵送入沼渣处置环节。

After pretreatment, the prepared organic materials (with a solid content of about 15-40%) enter the carriage silo for temporary storage, and then are sent from the pretreatment workshop to the anaerobic tank farm through the delivery plunger pump. First, it is sent to the mixer with the function of continuous mixing and feeding of materials, where it is fully mixed with the digestive liquid returned from the EDAC dry anaerobic reactor, and then sent to the top of the EDAC dry anaerobic reactor through the feed plunger pump. The operating temperature of the anaerobic tank can be controlled to 38 °C at medium temperature or 55 °C at high temperature through the circulating plunger pump and the mud water heat exchanger. The organic material will stay in the anaerobic digestion tank for 20~25 days and produce biogas after digestion. The anaerobic bottom residue is sent to the biogas residue disposal link through the residue pump.

#### 工艺流程 | Process



#### 工艺介绍 / Process Introduction

市政有机废物进入接收料仓沥水后可直接进入高压短程生物质压榨机（EPG-BS），在超高压挤压作用下进行制浆与除渣，浆液进行油脂提取等预处理后最终进入厌氧消化系统，产生的干渣可直接进行填埋或者焚烧（含水率可达 40%）。经过预处理后的有机质物料进入均质罐，再通过进料柱塞泵从 EWAC 湿式厌氧反应器底部送入厌氧反应器，有机质物料在厌氧消化罐内停留 20~25 天，经过消化后产沼气。

After the municipal organic waste enters the receiving silo for drainage, it can directly enter the high-pressure short-range biomass squeezer (EPG-BS) for pulping & slag removal under the action of ultra-high pressure extrusion. The slurry will finally enter the anaerobic digestion system after pretreatment such as oil extraction. The dry residue generated can be directly landfilled or incinerated (with a moisture content of up to 40%). The pretreated organic materials enter the homogenizing tank, and then are sent to the anaerobic reactor from the bottom of the EWAC wet anaerobic reactor through the feed piston pump. The organic materials stay in the anaerobic digestion tank for 20~25 days, and produce biogas after digestion.

3

核心装备系统  
Products

高压压榨短程预处理装备

High-Pressure Squeeze Short Range Pretreatment Equipment

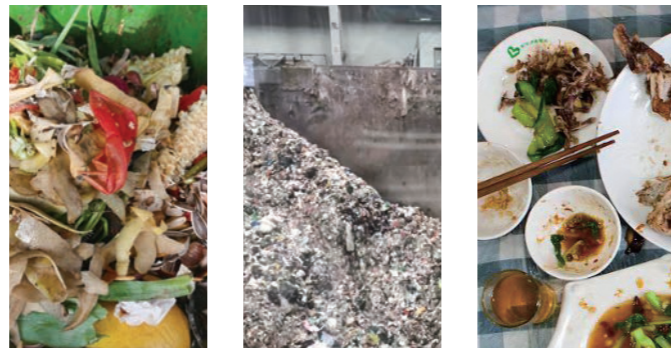
高压压榨短程预处理工艺以 EPG-BS 生物质压榨机为主体进行制浆与固液分离，预处理后所得浆料性状均匀，有机质含量高，适宜进行湿式厌氧。

High pressure squeeze short pretreatment process takes EPG-BS Biomass Squeezer as the main equipment for pulping & solid-liquid separation. The slurry obtained after pretreatment has uniform properties and high organic content, suitable for wet anaerobic treatment.



优势与特点 / Features

- 短程高效，大大缩短了传统预处理工艺的流程，故障点少。  
Short range & high efficiency, greatly shorten the process of traditional pretreatment process, fewer failure points.
- 适应性强，杂物粒径可超 100mm，浆液粒径大小可定制。  
Strong adaptability to sundries and can hold at least 100mm. size of slurry particle can be customized.
- 有机物质回收率高（回收率 > 90%），大大减量，残渣率低。  
High recovery rate of organic substances, up to 90%, greatly reduced, low residue rate.
- 压榨的含水率可调节，可低于 40%。  
Moisture content of residue can be lower than 40%.



BS 生物质压榨机  
Bs Biomass Squeezer



优势与特点 / Features

- 超强物料适应能力；  
Super material adaptability
- 工作压力高，可超过 150bar，含水率可达到 40%；  
Working pressure is high, exceed 150bar, water content up to 40%；
- 可实现液相物料远距离输送；  
Realize long-distance transportation of liquid materials；
- 模块化设计、功能高度集成、自动化程度高；  
Modular design, highly integrated functions & degree of automation；
- 固液分离效率高，有机质含量可达到 90%；  
Solid-liquid separation efficiency is high, organic matter content can reach 90%；
- 分离粒径大小可定制；  
Separation particle size can be customized；
- 使用寿命长；  
long life time；

恩萨 BS 生物质压榨机，是一款高压压榨固液分离与泵送一体机，用于流动性较好物料的固液分离、除渣。

ENSA BS Biomass Squeezer is a high pressure solid-liquid separation and pumping machine, which is used for solid-liquid separation and slag removal of materials with good fluidity.

破碎系统

Shredder

ESD 双轴回转剪切破碎机

ESD Double Shafts Rotary Shredder



优势与特点 / Features

- 软硬物料通吃，坚固结构  
Soft & Hard Materia Take-all, Durable Structure
- 高强适应性，安全可靠  
High Strength & Adaptability, Safe & Reliable

应用范围 / Application

- 餐厨垃圾、厨余垃圾 Restaurant Waste, Kitchen Waste
- 危险废物、医疗垃圾 Hazardous Waste, Medical Waste
- 电子废物、废金属 Electronic Waste, Scrap Metal
- 废轮胎、废塑料 Waste Tires, Waste Plastics
- 废纸、造纸废物 Waste Paper, Papermaking Waste

输送系统

Conveying system

EPP 双活塞泵（“S-摆管”技术）

EPP Double Piston Pump ("S Tube" Technology)



应用范围 / Application

- 餐厨垃圾 / 厨余垃圾及其它有机废弃物（渣料输送、冷热循环）  
Food waste/kitchen waste and other organic wastes (residue transportation, cold & hot circulation)
- 市政污泥、河道底泥、工业污泥  
Municipal sludge, river sediment and industrial sludge
- 尾矿、充填膏体 Tailings, backfill paste
- 半固态危险废物（例如：油泥、漆渣、重金属污泥等）  
Semi solid hazardous waste (such as oil sludge, paint residue, heavy metal sludge, etc.)

优势与特点 / Features

- 采用全球新一代 S-摆管技术，杂物适应能力极强。  
Adopts the global new generation S tube technology, with strong adaptability to debris.
- 可实现超远距离输送，泵出口压力可达 150bar。

Realize long-distance transmission, and the pump outlet pressure up to 150bar.

- 具备柱塞密封常态监测功能。  
With plunger seal on-line monitoring function.
- 采用特殊耐腐蚀涂层材料及电化学防腐。  
Special corrosion resistant coating materials & electrochemical corrosion protection are used.

EPG “虎鲸”单活塞固体系 / 柱塞泵

EPG "Killer Whale" Single Piston Solid Pump/Plunger Pump



皇冠切割头，切割杂物，杜绝缠绕堵塞  
Crown cutting head is used to cut sundries and prevent winding and blocking



应用范围 / Application

- 有机残渣 / 有机废物 Organic residue/organic waste
- 格栅栅渣 / 板框脱水污泥  
Grid residue/plate frame dewatered sludge
- 石油焦 / 危险废物 / 造纸废渣  
Petroleum coke/hazardous waste/paper waste residue

优势与特点 / Features

- 适合更高含固率、更多杂物的有机残渣输送  
Suitable for conveying organic residues with higher solid content and more impurities
- 可实现超远距离输送，泵出口压力可达 150bar  
It can realize long-distance transmission, and the pump outlet pressure can reach 150bar
- 耐磨及抗腐蚀 Abrasion resistant & Corrosion resistance
- 维修简便，使用寿命长 Simple maintenance & long life time

## OBR™ 好氧生物反应器

OBR™ Aerobic Bioreactor

OBR 好氧生物反应器基于立式多层移动仓式智能化自动控制技术和生物干化与堆肥技术，是一种高效连续好氧反应器系统，可实现有机垃圾好氧干化与发酵的核心设备。

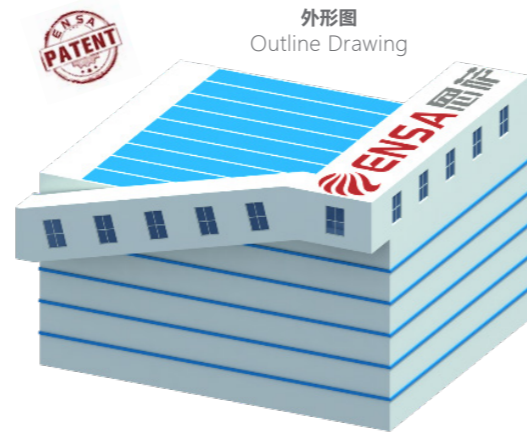
OBR aerobic bioreactor is based on vertical multi-layer mobile bin intelligent automatic control technology and biological drying & composting technology. It is a highly efficient continuous aerobic reactor system, realize the aerobic drying & fermentation of organic waste.

OBR 好氧生物堆肥系统主要包括多层的进料单元、料仓单元、重载滑架单元、供氧通风单元、渗滤液收集回喷单元、卸料单元、PLC 电气控制单元。

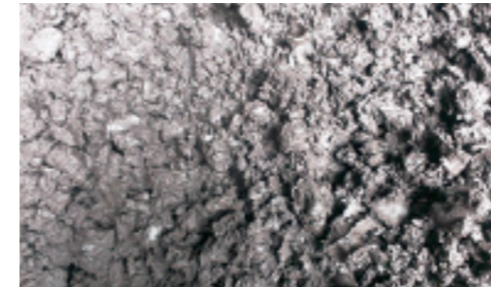
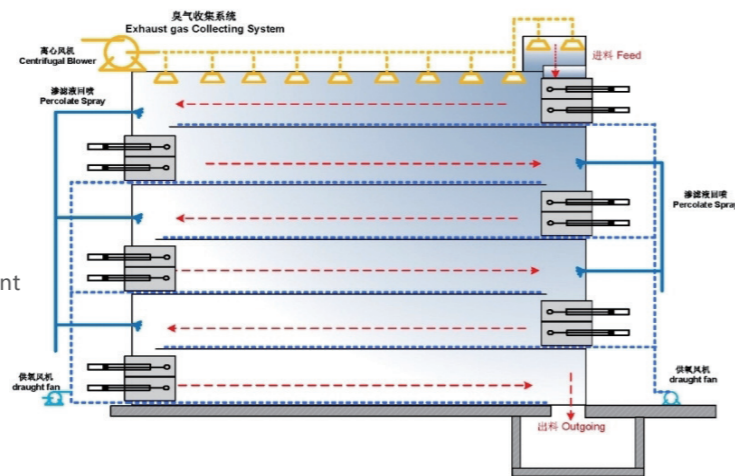
OBR aerobic biological composting system mainly includes multi-layer feeding unit, silo unit, heavy load carriage unit, oxygen supply and ventilation unit, leachate collection and back spraying unit, unloading unit and PLC electrical control unit.

### 优势与特点 / Features

- 节省占地、投资 Save Land Occupation & Investment
- 高效、稳定、可靠 Efficient, Stable & Reliable
- 自动化节省人工 Automation Saves Labor
- 能耗低 Low Energy Consumption
- 无害化 Harmless



工艺原理示意图 Schematic Diagram of Process Principle



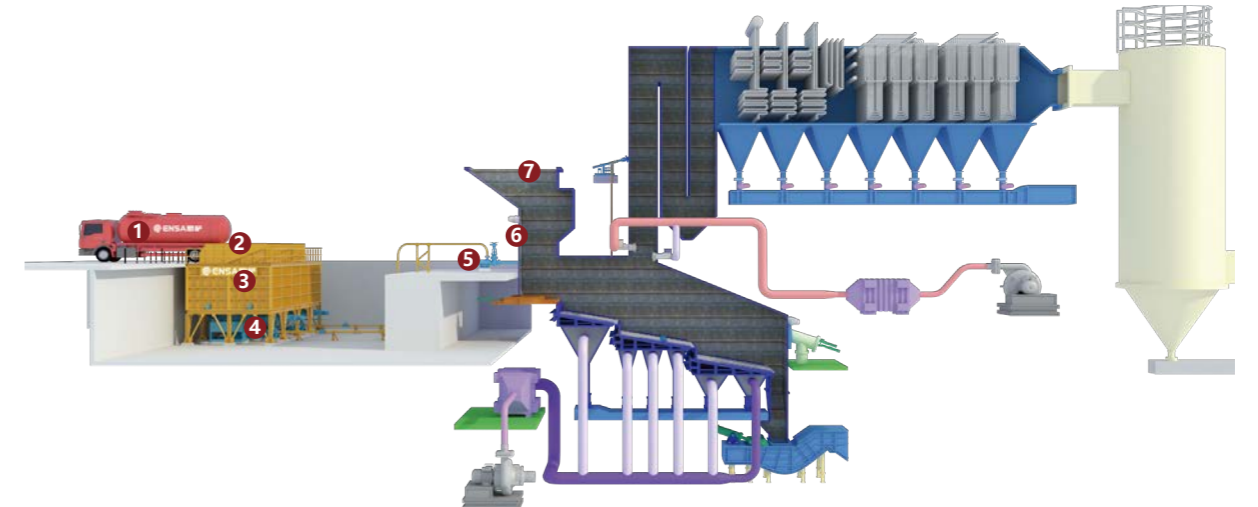
### 适应物料 / Application Range

市政污泥 Municipal Sludge  
工业污泥 Industrial Sludge

### 优势与特点 / Features

- 全程实现洁净接收与输送。 Clean reception & transportation throughout the process
- 干化效率高，可实现 60%~90% 的干度要求。 The drying efficiency is high, and the dryness requirement of 60%~90% can be achieved.
- 可适应水泥窑协同焚烧、垃圾焚烧发电厂或燃煤电厂掺烧、污泥焚烧发电厂。 Used for cement kiln co-processing incineration, MSW incineration power plant or coal-fired power plant co-processing combustion, and direct sludge incineration power plant.
- 焚烧厂内有蒸汽、烟气等热源与污泥干化结合更佳。 It is better to combine steam, flue gas and other heat sources with sludge drying in the incineration plant.

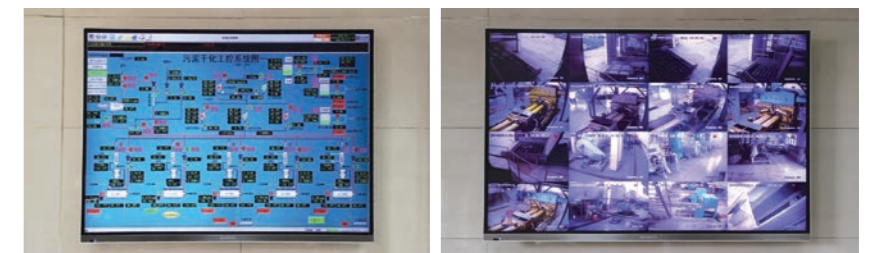
## 2 垃圾焚烧发电厂污泥直喷协同焚烧处置 MSW Incineration Power Plant Sludge Direct Injection Incineration Co-processing



- |                       |                            |              |               |                       |                               |                                 |
|-----------------------|----------------------------|--------------|---------------|-----------------------|-------------------------------|---------------------------------|
| 1 车载污泥 Vehicle Sludge | 2 卸料接收 Unloading Receiving | 3 储存 Storage | 4 泵输送 Pumping | 5 除杂 Impurity Removal | 6 雾化分散 Atomization Dispersion | 7 入炉掺烧 Mixed burning in furnace |
|-----------------------|----------------------------|--------------|---------------|-----------------------|-------------------------------|---------------------------------|

将污水处理厂的污泥（含水率 80%）由车辆倒入污泥接收 PSR/PSS 储存料仓，再由恩萨 EPS 泵送系统进行输送，污泥经管道自动除杂后，再通过恩萨独有雾化喷枪系统进入焚烧炉直接焚烧。

Sludge (with a moisture content of 80%) from the sewage treatment plant is poured into the PSR/PSS storage silo by vehicle, and then transported by ENSA EPS pumping system. After the sludge is automatically removed through the pipeline, it enters the incinerator through the unique ENSA atomizing semi-solids lance system for direct incineration.



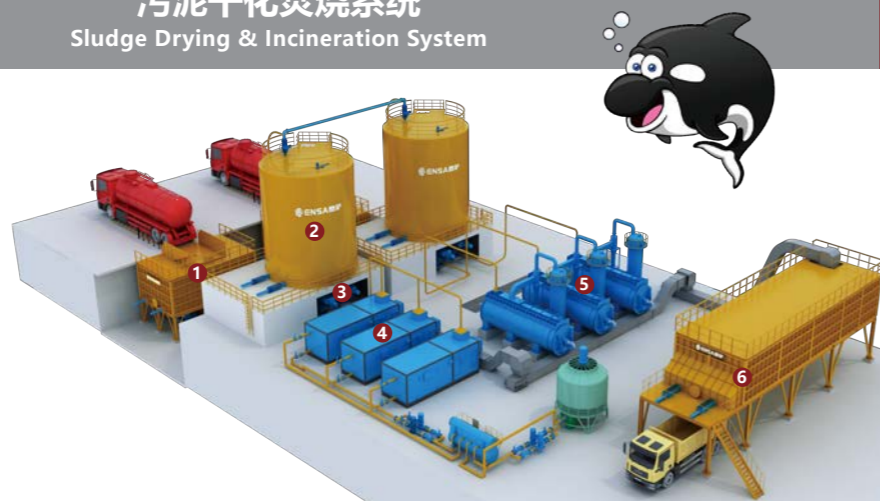
ENSA

## 污泥处置与资源化 Sludge Disposal & Recycling

1

### 污泥干化焚烧系统 Sludge Drying & Incineration System

- 1 PSR 接收储存料仓 PSR Receiving Storage Silo
- 2 PSS 储存料仓（缓存） PSS Storage Silo (Buffer)
- 3 EPP 双活塞泵 EPP Double Piston Pump
- 4 BD 低温带式干化机 BD Low-Temperature Belt Dryer
- 5 DD 圆盘干化机 DD Disc Dryer
- 6 WSR 固体废弃物接收料仓 WSR Solid Waste Receiving Silo



优势与特点 / Features

- 布置简单, 投资成本、协同焚烧成本低  
Simple layout, low investment cost & collaborative incineration cost
- ECP 恒流技术, 实现污泥的连续进料, 使焚烧系统更加稳定  
ECP Continuous Flow Technology, realize continuous feeding of sludge, making incineration system more stable.
- 全过程 PLC 程序控制, 根据炉出口烟气温度程序自动调节污泥加入量  
Whole process PLC program control, automatically adjust the amount of sludge added according to the flue gas temperature program at the furnace outlet
- 对垃圾焚烧系统影响小, 不增加系统排放  
Little impact on waste incineration system, no increase in system emissions
- 管道输送, 布置简单, 输送距离可达 500m  
Pipeline transportation, simple layout, transportation distance up to 500m
- 无人值守车间、环境友好  
unattended workshop, environment-friendly
- 多点布料连续入料, 多种组合方式可选, 污泥充分雾化分散  
Continuous feeding of multi-point, combination modes are available, and sludge is fully atomized and evenly dispersed



优势与特点 / Features

- 适用高浓度料浆的超长距离输送 (含固率可达 80%)  
Suitable for Extra-long Distance Transportation of High Consistency Slurry (up to 80% solid content)
- 适应苛刻的工作环境  
Adapt to harsh working environment
- 输送压力可达 150bar  
Output pressure up to 150bar
- 处理量可达 400m<sup>3</sup>/h  
Pumping Capacity up to 400m<sup>3</sup>/h
- 高压力泵送, 无返料  
High pumping pressure and no backflow
- 恩萨 ECF 系统可实现连续流  
ECF System Realize Continuous Flow
- 使用寿命长  
Long life time

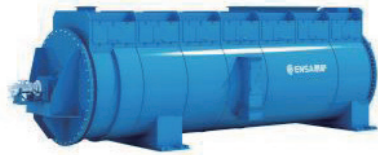


核心装备 | Products

干化系列

Dryer

DD 圆盘干化机  
DD Disc Dryer



用于市政污泥、工业污泥干化, 25-100t/d/台, 投资低, 连续运行, 适用性强, 安全可靠。  
Applied to the drying treatment of municipal sludge and industrial sludge, each equipment 25-100t/d.

BD 低温干化机  
BD Low Temperature Dryer



用于市政污泥、工业污泥干化, 利用低温烟气 (<130°C) 或热空气为干燥介质。  
Applied to the drying treatment of municipal sludge & industrial sludge, Uses low-temperature flue gas (<130 °C) or hot air as the drying medium during material drying.

料仓系统

Silo



PSR 接收储存料仓  
PSR Reception/Storage Silo

PSS/ WSS 储存 (缓存) 料仓  
PSS/ WSS Storage (Buffer) Silo

WSR 固体废物接收料仓  
WSR Solid Waste Reception Silo

MSR 混合仓  
MSR Mixer Silo

泵送系统

Pump

EPP 双活塞泵  
EPP Double Piston Pump



应用于市政污泥、尾矿膏体、煤泥、赤泥、矿井水仓污泥、转炉尘泥等。  
Applied to municipal sewage sludge, paste tailings, coal slime, red mud, mine sludge sump, kilning sludge & gas sludge from iron steel industry.

EPS 双活塞泵 (锥阀/提升阀技术)  
EPS Double Piston Pump (Poppet/Valve Technology)

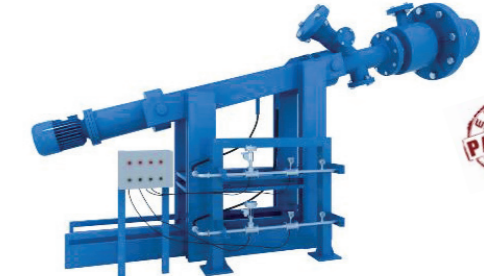


其它设备

Others

自动除杂器 / 除杂压榨机  
Automatic Solids Separator/ Squeezer

针对介质较均匀物料, 超强雾化效果  
For materials with uniform medium, super atomization effect



固废喷枪  
Solid Waste Lance  
高效率杂物分离  
High efficient separation for foreign bodies.



### 餐厨垃圾及市政污泥联合厌氧发酵项目

Restaurant Waste & Municipal Sludge Combined Anaerobic Fermentation Project

处理能力: 餐厨垃圾 2100t/d, 市政污泥 400t/d  
Scale: restaurant waste 2100t/d, municipal sludge 400t/d



### 生活垃圾焚烧厂污泥干化焚烧项目

MSW Incineration Plant Sludge Drying & Incineration Project

处理能力 /Scale: 1500t/d



### 污水处理厂污泥干化项目

Sewage Treatment Plant Sludge Drying Project

处理能力 /Scale: 300t/d

### 水泥窑协同处置市政及工业污泥项目

Municipal & Industrial Sludge Cement Kiln Co-processing Project

处理能力 /Scale: 600t/d



### 燃煤发电厂污泥干化项目

Coal fired Power Plant Sludge Drying Project

处理能力 /Scale: 800t/d