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Ariş Enerji is an engineering and production company founded in 1987 and serving in the sector of obtaining energy from waste (Landfill Gas and Biogas). Ariş Enerji designs, manufactures and installs the equipment used in Landfill Gas and Biogas power plants. Moreover, it offers turnkey solutions to its customers, including business development, landfill site design, piping, equipment and engine supply, automation design.

Ariş Enerji, which has a mechanical, electrical and automation engineering infrastructure, provides process development services with successful and innovative business models.

Ariş Enerji has a turnkey reference and equipment supply for Landfill Gas and Biogas Power Plants in Turkey and abroad.



LANDFILL GAS

Landfill gas is a mixture of different gases formed by the effect of microorganisms in the landfill. Landfill gas contains approximately 40-60% methane and 40-50% carbon dioxide. Landfill gas has a negative impact on climate change. The main components are CO₂ and methane, both greenhouse gases. Methane has much more emission, and has twenty-five times more impact than carbon dioxide.

For this reason, the formation of methane gas and its control or evaluation are very important in engineering applications. By converting this methane gas into electrical energy, both the danger is eliminated and electrical energy is produced.

Ariş Enerji Inc. In this context, the services offered in line with the customer's request and demand:

- Turnkey Landfill Gas Power Plant
- Landfill Projects
- Equipment Design, Production, Installation
- Business Development
- Piping and Installation
- Equipment and Engine Supply
- Automation
- Technical Consulting

LANDFILL GAS



BIOGAS

Biogas is the gas obtained by anaerobic digestion, which is a biochemical method for obtaining energy from organic wastes.

It consists of methane and carbon dioxide and has a high calorific value. Since the production of biogas is mainly based on the decomposition of organic materials; vegetable wastes or animal manures can be used as the feedstock material.

Ariş Enerji Inc. In this context, the services offered in line with the customer's request and demand:

- Turnkey Biogas Power Plant
- Turn-Key projects
- Equipment Design, Production, Installation
- Business Development
- Piping, Welding and Assembly
- Equipment and Engine Supply
- Automation Design
- Technical Consulting

BIOGAS



EQUIPMENT DESIGN AND MANUFACTURING

Ariş Enerji designs and manufactures all kinds of machinery and equipment both for biogas and landfill gas plants, and independent of the sector, using its engineering background in line with customer demands and requirements.



MECHANICS AND AUTOMATION

Ariş Enerji offers all mechanical and automation services within the company in line with customer demands. In this context; provides mechanical design, welding, assembly and piping services. Within the scope of automation; offers software development, control panel manufacturing, cabling and electrical installations.



TURN KEY PLANT DESIGN

Ariş Enerji can build Landfill Gas and Biogas Power Plant on a turnkey basis starting from scratch. This service includes complete plant design, project development, site design, supply of equipment, power transmission line and commissioning.



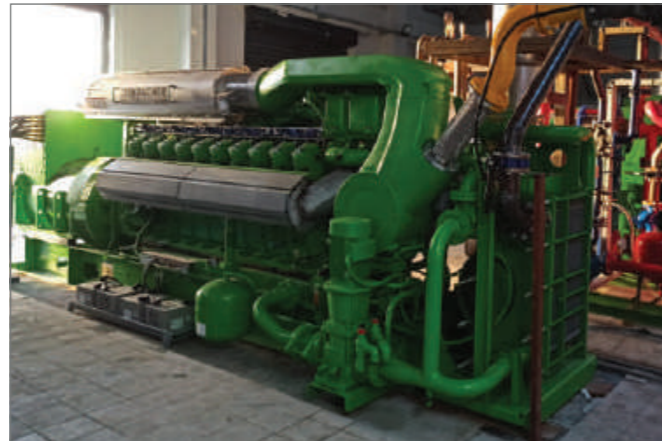
R&D STUDIES

Ariş Enerji is a technopolis company that has adopted the R&D culture. In this direction, it has the vision of producing new products by developing R&D projects that are either customer-supported or financed by the company's own resources. In line with domestic production technologies, it continues its Research and Development studies in every subject that will primarily contribute to our country.



COGENERATION SYSTEM INSTALLATION

ARIŞ Enerji designs and builds cogenerations systems for biogas and landfill gas power plants. Ariş Enerji also manufactures and/or does the installations of gas engine container, piping, ventilating, cooling systems, heating systems, waste heat exchanger equipments.



TECHNICAL SOLUTIONS PARTNERSHIP

Apart from giving services within area of activities, Ariş Enerji supports its customers with a partnership in every subject in line with its capabilities. The only reason is that to ensure complete customer satisfaction without any condition.



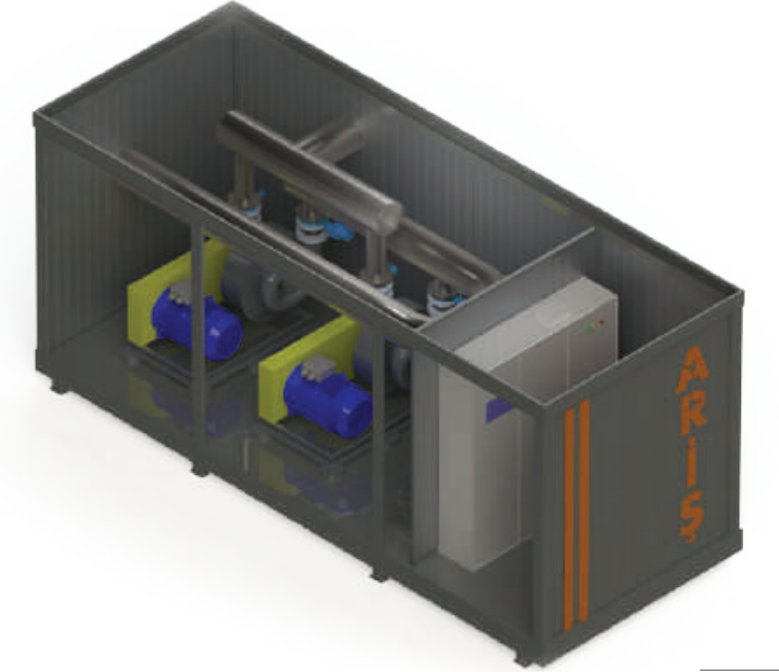
GAS BOOSTER UNIT

Gas Booster unit one of the high-tech products, was produced by Ariş Enerji for the first time in Turkey and presented to the market for biogas and landfill gas power plants.

It pressurises the biogas in accordance with gas engine requirements and has many sensors to control and follow up gas condition.

Gas Booster units supplies;

- Gas supplyt at constant pressure
- Gas content inline analysis
- Gas flow measurement
- Gas temperature measurement
- Gas pressure measurement



Technical Specifications

Gas Booster unit is manufactured in different capacities and specifications according to the needs of the facility. Complete and compact solution according to the required capacity in the container;

- Gas blower
- Condensate filter
- Suction and discharge gas collector
- Measurement Sensors and transmitters.
- Inline gas analyser (CH₄, CO₂, H₂S, O₂)
- Control Room and control panel including frequency controller, HMI, PLC
- Desing and manufacturing according to Gold standarts
- Automation system able to communicate to every type of gas engine

Product Code: GBU

Capacity: 500 m³-12.000 m³ (Higher capacities available)

GAS DRYING (COOLING) SYSTEM

Gas Dryer is a system that prevents the water vapor and water in the biogas to enter to the gas engines. While considering the efficiency of the system, Gas Dryer is a unit that must be included in the process. Having a gas drying unit in a plant makes it possible to produce the electricity with 5-10% less gas.

Technical Specifications

- Increases the efficiency of the CHP engine
- Reduces engine oil contamination.
- Increases the life of the absorbents.
- Removes impurities such as hydrogen sulfide, ammonia and siloxanes as a part.
- Complies with the technical instructions of all major gas engine suppliers.
- Integrated on the chassis, the stainless steel tubular heat exchanger chiller consists of a condensate filter.
- Low energy need
- Automatic discharge of condensate water from the cyclone tank is optional.
- It can drop from 40 °C to 10 °C.
- Prevents corrosion.

Product code: GAC

Capacity: 100 m³/h – 5.000 m³/h (Higher capacities available upon request)



GAS DRYING (COOLING) SYSTEM

AIR COOLED BIOGAS COOLER

Air cooled biogas dryer, cools and dehumidifies the biogas/landfill gas to ambient temperature before gas dryer unit to decrease the cooling load on the chiller unit. Air Cooled biogas cooler decrease the power needed for gas cooling. Designed by Ariş Enerji, many landfill gas power plants are using air cooled gas cooler. Air Cooled gas cooler decreases the chiller cooling load up to %40, that means %40 power saving.

Technical Specifications

- Stainless Steel /Carbon Steel body
- AISI316L / AISI 304 L stainless steel cooling pipes
- Insulation
- Radial Cooling fans

Product code: GDC

Capacity: 100 m³/h – 5.000 m³/h (Higher capacities available upon request)



AIR COOLED BIOGAS COOLER



FLARE

FLARE

The Gas Flare is an emergency equipment that is used to discharge biogas safely when gas engines are not working. Biogas Flares are used for safe combustion of biogas.

The gas combustion chimney, which is designed and manufactured by Ariş Enerji, can be produced in different capacities according to the customer needs.

Technical Specifications

- Enclosed flare for large capacities
- Materials: AISI 304 /310L/316L stainless steel, hot dip galvanized.
- Crimped Ribbon inline flame arrester
- Automatic(solenoid) main/pilot gas line valves
- Special design Multi nozzle stainless steel burner
- IP65 Control panel with PLC
- Pilot burner for providing a stable flame
- PLC controlled air control damper.
- Designed for complete combustion, retention time > 0,3 sc
- Ceramic fiber coating for protection and safety
- Automatic control system
- PLC control panel
- Remote control available
- Design and manufacturing according to GOLD standards



Product Code : GFU

Capacity: 100 m³-5.000 m³ (Higher capacities available)



BIOGAS ELEVATED FLARE



BIOGAS ELEVATED FLARE

- Materials: AISI 304 /310L/316L stainless steel, hot dip galvanized.
- Crimped Ribbon inline flame arrester
- Automatic (solenoid) main/pilot gas line valves
- Special design Multi nozzle stainless steel burner
- IP65 Control panel with PLC
- Pilot burner for providing a stable flame
- Ceramic fiber coating for protection and safety
- Automatic control system
- PLC control panel
- Remote control available
- Suitable for low capacities where emission limits are not applicable

Product Code : EGFU

Capacity: 100 m³-5.000 m³ (Higher capacities available upon request)



DESULFURIZATION SYSTEM

Hydrogen Sulfide (H_2S) is always present in biogas, although its amount varies depending on the organic matter used. Since H_2S causes corrosion, smells bad and turns into SO_2/SO_3 during the combustion of biogas, it must be removed from biogas. H_2S causes serious damage to equipment parts due to the sulfur it contains in its body. The company has developed a system that physically and chemically remove H_2S , which is designed and produced by the R & D unit. This system has been produced and put into use by us for many biomass power plants in Turkey.

Technical Specifications

- Filter Material: Complete AISI 304 Stainless Steel
- Perforated screen for gas distribution at the bottom
- Sight Glass
- Material: FerroSorp®S
- The Pellet Size: 5-25mm
- Specific Gravity: ~700 kg/m³
- Output Gas speed <0.25s
- Flanged connection
- Special grid for the output of carbon from the bottom
- Double Carbon loading upper grille
- Side grill for carbon evacuation of the bottom
- Automatic condensate drain in the inlet

Product code: GDU

Capacity: 100 m³/h – 5.000 m³/h
(Higher capacities available upon request)



DESULFURIZATION SYSTEM



SILOXANE REMOVAL SYSTEMS

SILOXANE REMOVAL SYSTEMS

Apart from H₂S, which is harmful to the system, in the biogas, there are siloxane group gases. These siloxanes turn into a plastic structure called silicate as a result of combustion in gas engines. This, in turn, reduces the volume of the combustion chamber by holding onto the gas engine pistons. This situation decreases the efficiency of the engine. Ariş Enerji designs and manufactures siloxane removal systems. There are two types of siloxane removal system:

Regenerative siloxane removal systems

- Twin filter for continuous operation
- Automatic regeneration system
- PLC and HMI Control
- Long lifetime filter media
- Regenerative filter media
- Flare unit optional

Activated Carbon filter for siloxane removal

- High adsorption capacity >95%
- Low OPEX
- Low pressure drop <10 mbar
- ATEX compliant
- Standalone or twin filter with by-pass
- Stainless steel construction
- Differential pressure transmitter

Product code : GSRU

Capacity: 100 m³-5.000 m³ (Higher capacities available upon request)

CYCLONE SEPARATOR SYSTEM

They are systems that work on the principle that substances whose density is different from each other with the effect of centrifugal force, substances with an excess density, decompose and collapse to the bottom with the effect of a vortex.

In biogas plants, it is used for the separation of water from biogas.

Technical Specifications

- Technical Specifications
- AISI 304 stainless steel
- Automatic drainage of internal condensate water
- Flanged connection
- High condensate disposal efficiency
- Easy maintenance

Product Code: GWS

Capacity: 100 m³/h – 5.000 m³/h (Higher capacities available upon request)



CYCLONE SEPARATOR SYSTEM

GRAVEL FILTER

More likely to be encountered in landfill gas facilities is the filter used to prevent coarse parts (bags, nylon, cardboard, etc.) from entering the systems.

Technical Specifications

- AISI 304/316 stainless steel
- Control cover
- Automatic discharge of condensate water
- Flange connections
- Gravel grain sizes $30\text{mm} < d < 60\text{ mm}$

Product Code: GGF

Capacity: $100\text{ m}^3/\text{h}$ – $5.000\text{ m}^3/\text{h}$ (Higher capacities available upon request)



GRAVEL FILTER

DOUBLE MEMBRANE GAS HOLDER

For Biogas Power Plants:

The biogas produced in the digester must be stored in a controlled manner. For this purpose, gas balloons are used for storage.

In order for the production to be controlled, a gas balloon should be used in biogas power plants either on the fermenter or on an external part to which the fermenters are connected.

Landfill Gas For Power Plants:

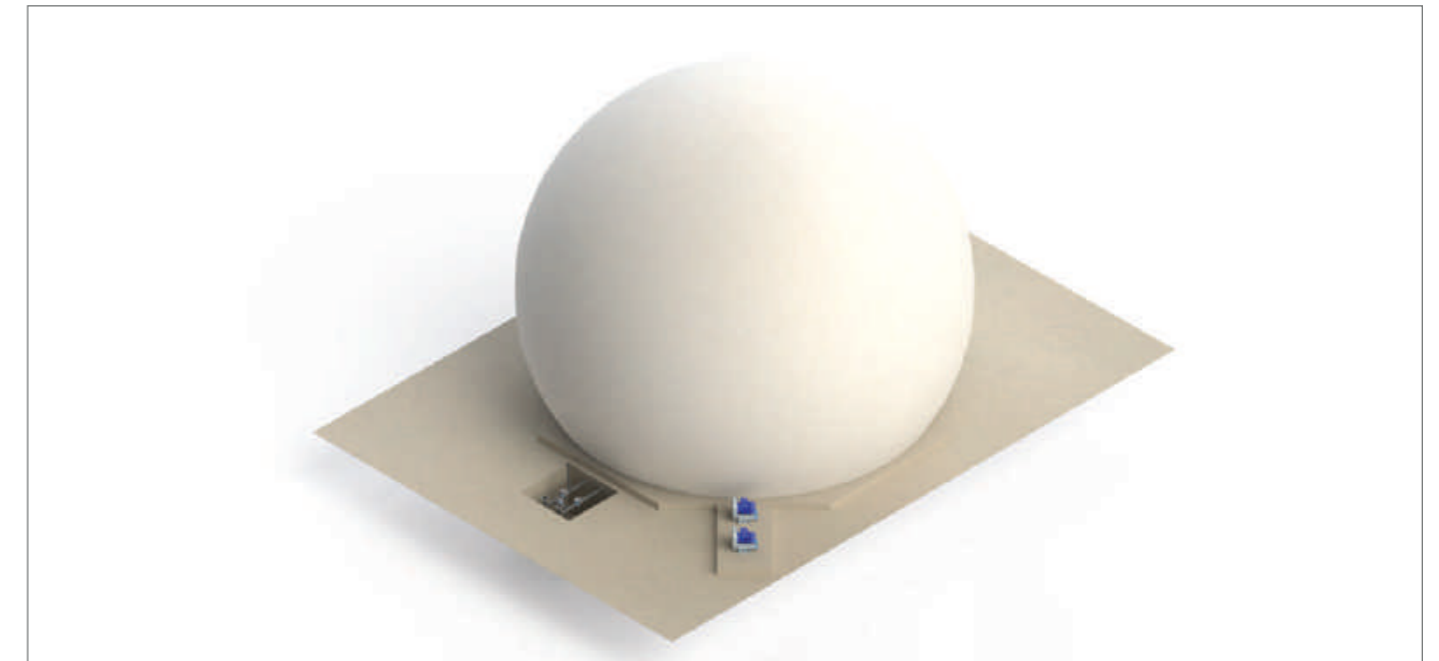
For landfill gas Power plants gas holders are used to stabilise the gas transmitted to gas engine. Also in low-capacity power plants, a gas balloon is an equipment that should be used to minimize the cost of gas engine maintenance.

Technical Specifications

- Available in single-storey, two-storey and three-storey options
- Working in the range of 3 mbar to 50 mbar
- Precise level measurement with laser level sensor
- Membrane internal pressure protection feature with safety valves
- Ready for continuous gas storage with single and multiple fan options
- Every electrical and electronic equipment used is exproof.

Product Code: DMGH

Capacity: 100 m³ – 16.000 m³ (Higher capacities available upon request)



DOUBLE MEMBRANE GAS HOLDER

EXHAUST GAS HEAT EXCHANGER

Exhaust gas at a temperature of 500 – 600 °C is discharged from the gas engine chimney in biogas/landfill-gas power plants. The waste heat exchanger converts the waste energy in the exhaust gas into usable energy. Exhaust gas energy can be used as hot water, superheated water, superheated oil or hot air.

Usage areas

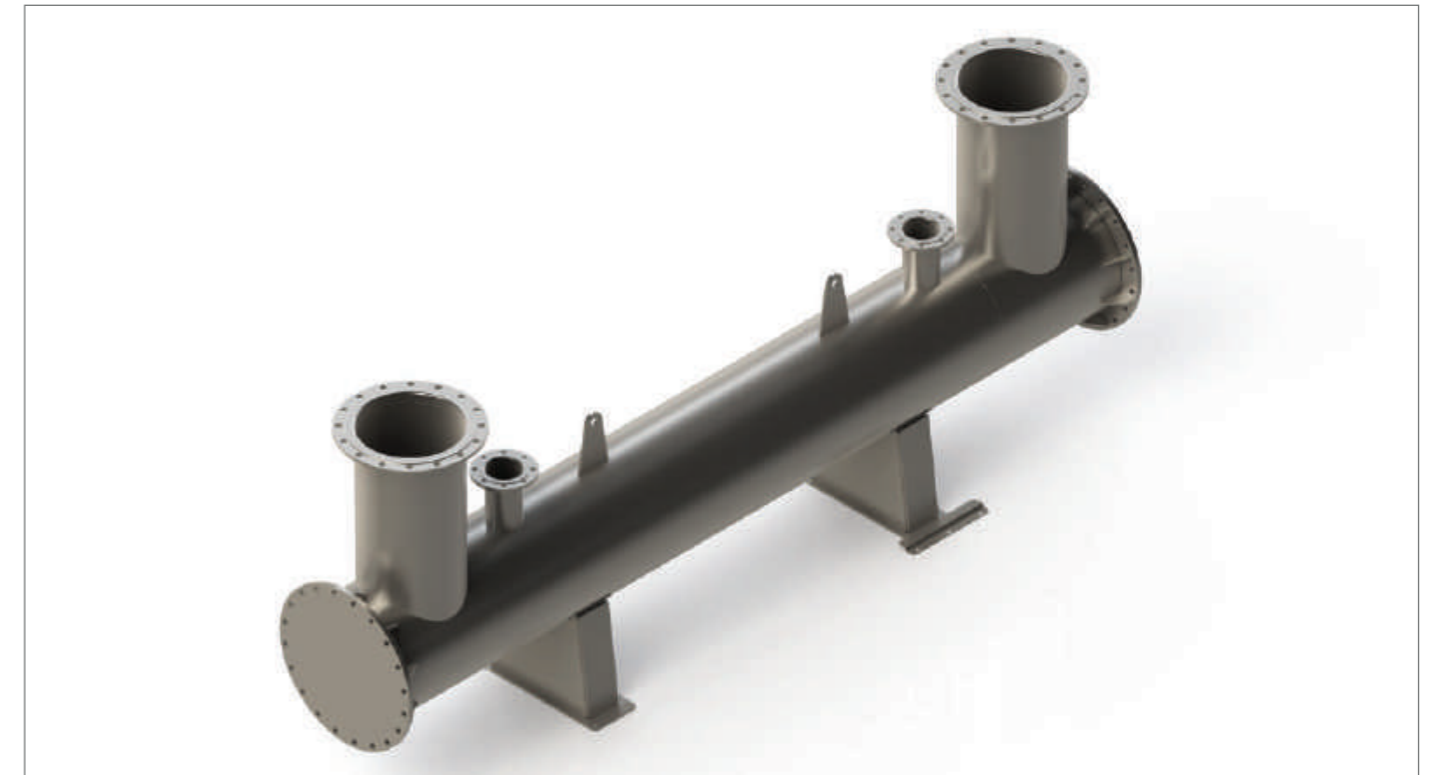
- Domestic heating
- Greenhouse heating
- Digestate drying
- Manure Heating for biogas plants
- Pasteurisation of digestate

Technical Specifications

- Stainless steel construction AISI304/AISI 316L
- Maximum System Efficiency
- Minimum Pressure Drop
- High Efficiency at Variable Loads with Proportional Control
- Custom Design
- Integrated Control and Energy Monitoring System
- Heat Recovery (Energy) Performance Guarantee
- Easy Installation with Compact Design

Product code : EGHE

Capacity: 100 kW-1.000 kW (Higher capacities available upon request)



EXHAUST GAS HEAT EXCHANGER

3 WAY VALVE

A 3-way flap is required for exhaust gas by-pass systems as an additional equipment to the exhaust gas heat exchangers. These dampers can be found in combustion gases and industrial ventilation applications. It is used to direct the gas flow/exhaust gas to the heat exchanger or chimney.

Product Code: EED

Capacity: DN 100-DN 500 (Higher capacities are also available according to customer demand.)

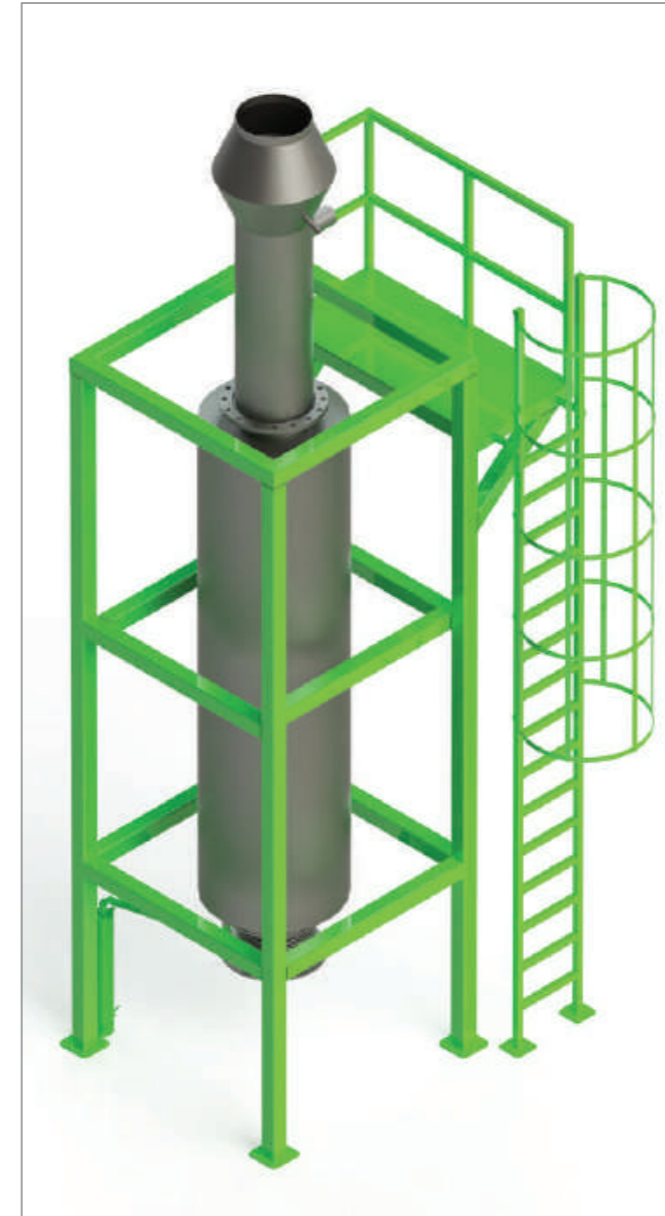


EXHAUST SILENCER

The exhaust noise of the engine is designed based on the target noise levels required and the available pressure drop. While there are standard silencers for stationary engines, special silencers are designed and produced according to customer specifications. In addition to reducing the exhaust noise, extremely compact designs are made considering the usable space.

Product Code: EES

Capacity: DN 100-DN 1000 (Higher capacities are also available according to customer demand.)



JET-CAP

The chimney cap, which must be made in all process chimneys in accordance with the environmental regulation, is called jet-cap. While helping the waste gases to be discharged into the atmosphere on the vertical axis in a pressurized and rapid manner, rain, snow, etc. External factors are collected in the conical inside the jet cap, and it is ensured that they leave the chimney without entering the system with the help of the discharge pipe.

Technical Specifications

- AISI 304 / AISI 316 Stainless Steel
- Special design of back pressure preventer
- Special drainage system for rainwater

Product Code: EEJ

Capacity: DN 100-DN 1000 (Higher capacities are also available according to customer demand.)



SCRUBBER

In cases where H₂S is 2000 ppm and above, it shortens the life of the filling material used in the H₂S removal system. This increases the operating cost. For this reason, it is a system that biologically reduces the amount of H₂S, which is a different method. Its working principle is based on the H₂S retention principle of bacteria fed with H₂S by spraying a biologically rich washing solution with high nutritional value onto biogas with a high H₂S value.

Technical Specifications

- Delivered ready to use, completely mounted on the chassis.
- AISI 304 stainless steel
- PH controlled solution tank
- IP 65 control panel PLC controlled
- Circulation and caustic dosing pump
- Automatic water filling/solution adjustment

Product Code: GBDS

Capacity: 100 m³/h – 5.000 m³/h (Higher capacities available upon request)



DOUBLE PIPE HEAT EXCHANGER

Double-pipe heat exchanger is used to heat-up feedstock efficiently before digester at biogas plants. A heat exchanger is needed to heat the feedstock with the water heated by utilizing the heat of gas engines (cogeneration).

Double pipe heat exchangers are the most suitable heat exchangers for directly heating a dense and low flow material such as manure.

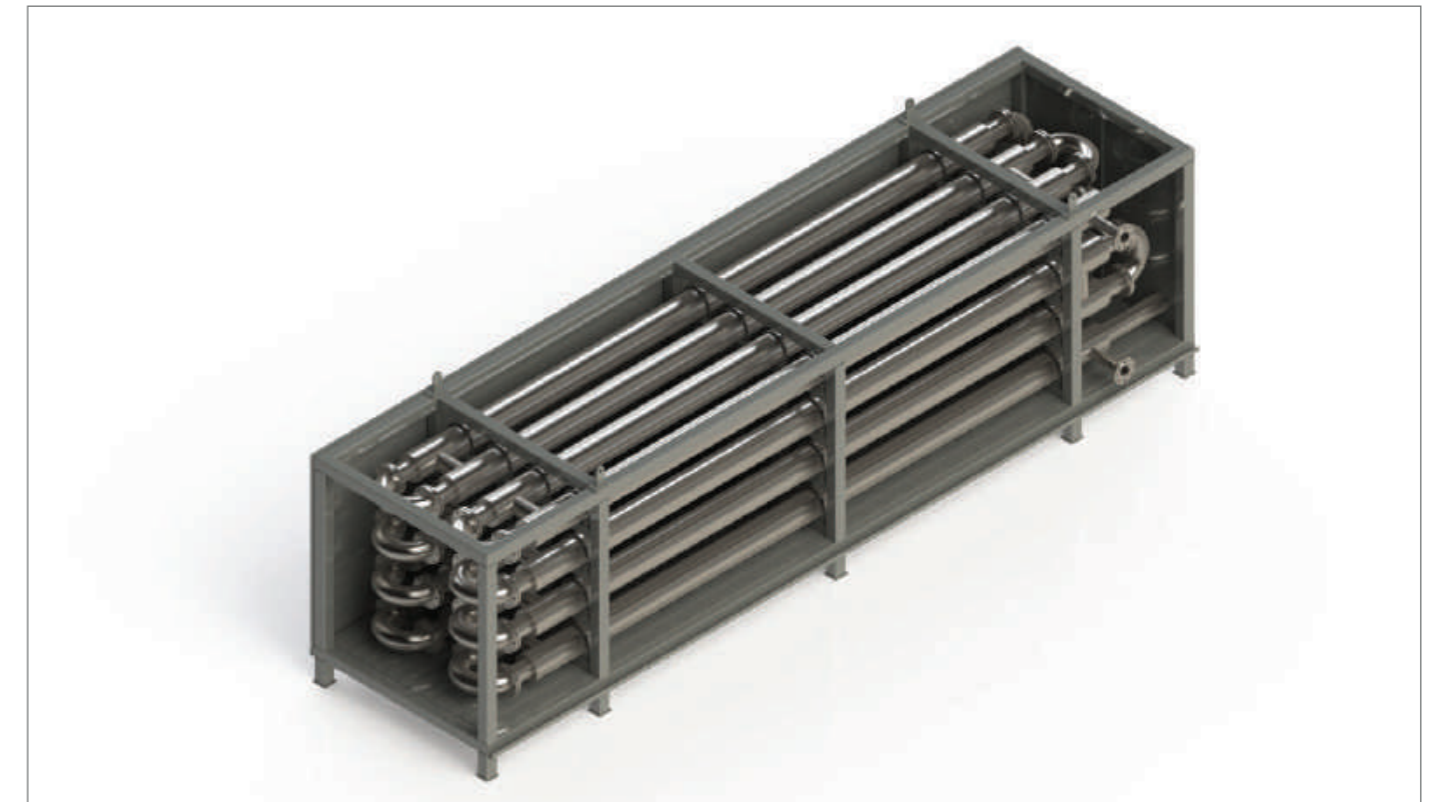
The design of the double tube heat exchanger depends on the calculations made according to the feedstock type to be used and the amount of feedstock.

Technical Specifications

- Custom design and construction
- Function stability
- Low risk of clogging
- Low pressure drop
- High heat transfer due to large transfer Surfaces
- Adapted for the location consoles and frames

Product Code: DPHE

Capacity: 100 kW- 1000 kW (Higher capacities available upon request)



DOUBLE PIPE HEAT EXCHANGER

PASTEURISATION SYSTEMS

In biogas power plants, largely degassed raw materials become inert. Using it directly in the fields harms the environment due to the bacteria it contains.

For this reason, it should be subjected to the hygiene process beforehand.

In order to make this process efficient and controlled, a hygiene system has been developed and is produced by Ariş Enerji.

According to the regulation, the waste to be sanitized must first be heated to at least 70 °C and kept at this temperature for 1 hour.

Technical Specifications

- 304 carbon steel
- insulation aluminum coating
- Automation system
- Heating system option according to customer demand
- Temperature log recording
- Compatible with SCADA

Product Code: DPU

Capacity: 50 m³/day – 500 m³/day (Higher capacities are also available in accordance with customer demand.)



DIGESTATE PADDLE DRYER

It is the system that dries the organic fertilizer, which is the output of biogas plants, with the indirect drying method. Since it is indirect drying, its energy consumption is lower than other drying systems.

Technical Specifications

- It can work with Hot Oil/steam or hot water.
- High thermal efficiency
- Ability to work in a wide capacity range
- Precise control possibility
- Low maintenance
- Easy to use

Product Code:PDD

Capacity: 250 kg/hour - 5 tons/hour (Higher capacities are also available in accordance with customer demand.)

OTHER EQUIPMENT

Ariş Energy designs and manufactures all kinds of machinery and equipment independently of the sector, using its engineering infrastructure in line with customer demands and requirements.



DIGESTATE PADDLE DRYER

REFERENCES

ENERBES BİYOGAZ SANTRALİ	Mechanical Piping, Installation Flare Gas Booster System Desulfurization System Gas Drying (Cooling) System
PADAŞ ENERJİ	Pasteurisation Systems Desulfurization System
POLRES ENERJİ	Gas Drying (Cooling) System Mechanical Piping, Installation
ÜREGEN ENERJİ	Gas Drying (Cooling) System Flare Exhaust Gas Heat Exchanger Double Pipe Heat Exchanger Precipitation Tank
ASKOÇ ENERJİ	Gas Drying (Cooling) System Flare Desulfurization System Mechanical Piping, Installation
ANAHTAR ENERJİ	Gas Booster System Gas Drying (Cooling) System Desulfurization System Flare Double Membrane Gas Holder Gravel Filter Complete Plant Piping Installation
BK ALTERNATİF ENERJİ	Gas Booster System Gas Drying (Cooling) System Desulfurization System Flare Double Membrane Gas Holder
BİBERCİ İNŞAAT	Gas Booster System Gas Drying (Cooling) System Desulfurization System Flare Double Membrane Gas Holder
BİTEK ENERJİ	Gas Drying (Cooling) System
SCANDI ENERJİ	Flare Gas Drying (Cooling) System Air Cooled Gas Cooler Exhaust Gas Heat Exchanger
BİOKÜTLE ENERJİ	Desulfurization System Air Cooled Gas Cooler Gas Drying (Cooling) System Gas Booster System Siloxane Removal System
DİSAN HİDROLİK MAKİNE	Double Membrane Gas Holder
TÜRKÇİM BİYOGAZ SANTRALİ	Condensate Filter Desulfurization System Flare

EMAN EGE ENERJİ	Pasteurisation Systems Gas Drying (Cooling) System Mechanical Piping, Installation Digester Isolation Gas Booster System Gas Drying (Cooling) System Desulfurization System
EMAN ENERJİ	Flare Siloxane Removal System Gas Booster System Gas Drying (Cooling) System
ERDEMİR	Autoclave Automatic Feeding System Manifold
ERKAR ENERJİ	Flare Gas Drying (Cooling) System
ESA / DE SOLAR 7 ENERJİ	Exhaust Gas Heat Exchanger Flare Gas Drying (Cooling) System Desulfurization System Condensate Tank Mechanical Piping, Installation
ESA / ARSLAN BES	Double Pipe Heat Exchanger Gas Drying (Cooling) System Desulfurization System Gas Engine Installation / Skid Group Flare Condensate Tank Exhaust Gas Heat Exchanger / Automation Exhaust Line / Jetcap / Exhaust Silencer Mechanical Piping, Installation
ESA / HİSAR BİYOGAZ	Double Pipe Heat Exchanger Gas Drying (Cooling) System Desulfurization System Flare Condensate Tank Mechanical Piping, Installation
ESA / DHARMA	Double Pipe Heat Exchanger Gas Drying (Cooling) System Desulfurization System Gas Engine Installation / Skid Group Flare Condensate Tank Exhaust Gas Heat Exchanger / Automation Exhaust Line / Jetcap / Exhaust Silencer Mechanical Piping, Installation
ESA / ÇAĞLAYANLAR	Double Pipe Heat Exchanger Gas Drying (Cooling) System Desulfurization System

ESA / COD ENERJİ	Flare Condensate Tank Mechanical Piping, Installation Double Pipe Heat Exchanger Gas Drying (Cooling) System Desulfurization System Flare Condensate Tank Mechanical Piping, Installation
ESA / EVB BİYOGAZ	Gas Drying (Cooling) System Desulfurization System Flare Condensate Tank Mechanical Piping, Installation
ESA / ASYA LALE	Double Pipe Heat Exchanger Gas Drying (Cooling) System Desulfurization System Flare Condensate Tank Exhaust Gas Heat Exchanger / Automation Exhaust Line / Jetcap / Exhaust Silencer Mechanical Piping, Installation
ATLAS İNŞAAT	Gas Drying (Cooling) System Desulfurization System Flare
CEV ENERJİ	Gas Booster System Flare Condensate Filter Gas Drying (Cooling) System Gas Booster System
ITC	Flare Gas Drying (Cooling) System
ALP ERDEM ELEKTRİK	Gas Drying (Cooling) System Flare
PAKMAYA / INTEGRO	Paddle Dryer Feeding Auger Cyclone Separator System
FMH ENERJİ	Flare
BIOPAC ENERJİ	Gas Drying (Cooling) System Flare Condensate Filter Exhaust Gas Heat Exchanger
EMİN BİYOGAZ	Flare Desulfurization System Gas Drying (Cooling) System Condensate Filter Mechanical Piping, Installation
AKODA ENERJİ	Desulfurization System Flare Gas Drying (Cooling) System Substrate Distributor Mechanical Piping, Installation
ALTACA ENERJİ	Flare

BEYAZ PİRAMİT ENERJİ	Desulfurization System Substrate Distributor Flare Gas Drying (Cooling) System
SİMİKSA ENERJİ	Gas Booster System Desulfurization System Gas Drying (Cooling) System Flare
RANA BİYOGAZ	Desulfurization System Flare Gas Drying (Cooling) System Substrate Distributor Mechanical Piping, Installation
KONYA ŞEKER FABRİKASI	Gas Drying (Cooling) System
BİYOKÜTLE ENERJİ	Gas Booster System Flare
TOHMA ENERJİ	Gas Drying (Cooling) System Flare Condensate Filter
NOVTEK ENERJİ	Gas Booster System Gas Drying (Cooling) System
DETAŞ / SANVAR ENERJİ	Gas Booster System Flare Condensate Filter Gas Drying (Cooling) System Desulfurization System
AREL ENERJİ	Gas Booster System Gas Drying (Cooling) System
FLAŞ ENERJİ	Desulfurization System Flare Gas Drying (Cooling) System Gas Booster System
AVDAN ENERJİ	Gas Booster System Flare Polymer Preparation Tank
HER ENERJİ	Gas Drying (Cooling) System
2M ENERJİ	Gas Booster System Gas Drying (Cooling) System
VEGA ENERJİ	Flare
DALİ ENERJİ	Gas Booster System Gas Drying (Cooling) System
SOWA ENERJİ	Gas Booster System Gas Drying (Cooling) System
PALMİYE ENERJİ	Gas Drying (Cooling) System
YAPILCANLAR BİYOGAZ	Gas Drying (Cooling) System
RİTİM ENERJİ	Gas Drying (Cooling) System
KALDE ENERJİ	Gas Drying (Cooling) System
AVATO BIOGAS (GREECE)	Pasteurisation Systems



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