

References



High performance digestion plants

High performance digestion plant DAEJEON – South Korea



Location
Daejeon
South Korea

SCOPE OF WORK
Basic Engineering
Detail Engineering

PROJECT
Turn Key

START UP
July 2016

CAPACITY
377 t/day food waste

PRODUCTION
Biogas 1,300 m³/hour

DESCRIPTION

High performance digestion of food waste according to the Schwarting/Uhde process

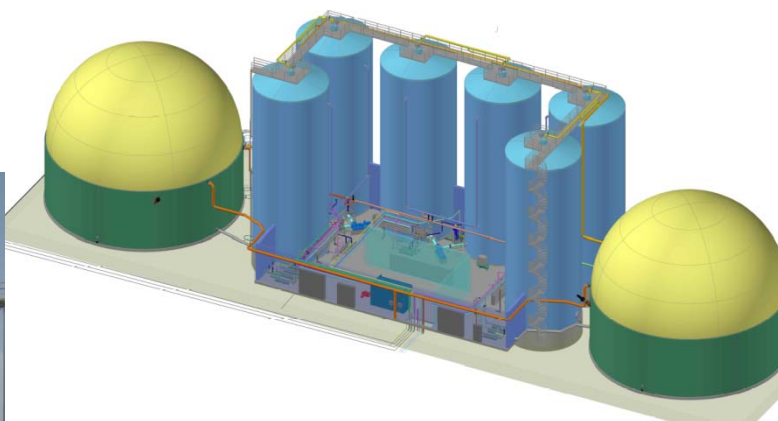
CAPACITY: 377 t/day food waste

Concept of treatment:

Mixing tank, disintegrator, feeding pump, heat exchanger, high performance digesters, impulse mixing system, sediment discharge system, digestate storage tank, biogas storage tank

Tank capacity: Digester: 6 units x 850 m³ each
Digestate storage tank: 2 units x 2,000 m³ each

Biogas production: 1,300 m³/hour



digesters, digestate storage, machine hall

High performance digestion plant in FLEHINGEN - Germany



LOCATION

Flehingen
Germany

PROJECT

Turn Key

GENERAL CONTRACTOR

Schwarming Biosystem GmbH

START UP

December 2015

INPUT

48,5 m³/day primary- and excess
sewage sludge

PRODUCTION

Biogas 34 m³/hour

DESCRIPTION

High performance digestion according to Schwarming/Uhde process

Input: 48,5 m³/day primary- und excess sewage
sludge

Concept of treatment:

Disintegrator, feeding pump, heat exchanger, high performance digester, impulse mixing system, sediment discharge system

Tank volume: Digester: 2 units x 175 m³ each

Biogas production: 34 m³/hour



digesters, machine hall



piping



Schwarting
Biosystem

High performance digestion plants in ULSAN I-V - South Korea



LOCATION

Ulsan
South Korea

PROJECT

Turn Key

INPUT

70 m³/day liquid food waste
30 m³/day pig manure

SCOPE OF WORK

Basic Engineering
Detail Engineering

START UP

Ulsan I: 2012
Ulsan II: 2013
Ulsan III: 2014
Ulsan IV: 2014
Ulsan V: 2014

PRODUCTION

Biogas 300 m³/hour
(per plant)

DESCRIPTION

High performance digestion according to Schwarting/Uhde process

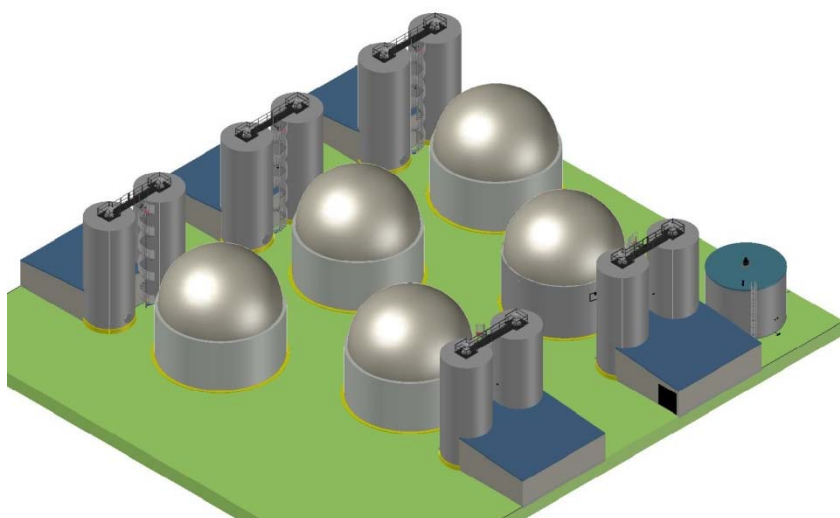
Input per plant: **70 m³/day liquid food waste**
 30 m³/day pig manure

Concept of treatment:

Mixing tank, disintegrator, feeding pump, heat exchanger, high performance digesters, impulse mixing system, sediment discharge system, digestate storage tank, biogas buffer, steam boiler, emergency flare

Tank volume per plant: Digester: 2 units x 330 m³ each

Biogas production per plant: 300 m³/hour



total site plan



digesters

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High performance digestion plant in ULSAN II - South Korea



LOCATION

Ulsan
South Korea

PROJECT

Turn Key

INPUT

70 m³ / day liquid food waste
+ 30 m³ / day pig manure

SCOPE OF WORK

Basic Engineering
Detail Engineering

START UP

2013

CO-GENERATION PLANT

PRODUCTION

Biogas 300 m³ / hour

DESCRIPTION

High performance digestion according to Schwarting /Uhde-process

Input: 70 m³ /day liquid food waste
 30 m³ /day pig manure

Status
March
2013

Concept of treatment:

Mixing tank, disintegrator, feeding pump, heat exchanger, high performance digesters, impulse mixing system, sediment discharge system, digestate storage tank, biogas buffer, steam boiler, emergency flare

Tank volume: Digester: 2 units x 330 m³ each

Biogas production: 300 m³ / hour



digesters



biogas plant



Schwarting
Biosystem

High performance digestion plant in ILSFELD - Germany



LOCATION

ILSFELD
Germany

PROJECT

Turn Key

INPUT

45 m³ / day
sewage sludge

GENERAL CONTRACTOR

Schwarting Biosystem GmbH

START UP

2008

CO-GENERATION PLANT

50 kW

PRODUCTION

Biogas 550 m³ / day

DESCRIPTION

High performance digestion of sewage sludge according to Schwarting/Uhde process

Input: 45 m³ / day primary- and excess sewage sludge

Concept of treatment:

Mechanical thickening, disintegrator, feeding pump, heat exchanger, plug-flow digester, impulse mixing system, microfiltration unit, biogas buffer, boiler, emergency flare, co-generation plant

Tank volume: Digester: 280 m³

Biogas production: 550 m³ / day

Co-generation plant: Electric power: 50 kW



machines equipment



biogas plant

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High performance digestion plant in WUTÖSCHINGEN - Germany



LOCATION

Wutöschingen
Germany

PROJECT

Turn Key

INPUT

20 m³ / day
sewage sludge

GENERAL CONTRACTOR

Schwarting Biosystem GmbH

START UP

2007

CO-GENERATION PLANT

PRODUCTION

Biogas 250 m³ / day

DESCRIPTION

High performance digestion of sewage sludge according to Schwarting/Uhde process

Input: 20 m³ / day sewage sludge

Concept of treatment:

Feeding pump, heat exchanger, plug-flow digesters, impulse mixing system, microfiltration unit, biogas buffer, emergency flare

Tank volume: Digester: 2 units x 80 m³ each

Biogas production: 250 m³ / day



high performance digesters



high performance digesters

High performance digestion plant in TAUBERBISCHOFSDORF - Germany



LOCATION

Tauberbischofsheim
Germany

PROJECT

Turn Key

INPUT

60 m³ / day
sewage sludge

GENERAL CONTRACTOR

Schwarting Umwelt GmbH,
Flensburg

START UP

2001

CO-GENERATION PLANT

50 kW

PRODUCTION

Biogas 450 ... 870 m³ / day

DESCRIPTION

High performance digestion of sewage sludge

Input: 60 m³ / day sewage sludge

Concept of treatment:

Disintegrator, feeding pump, heat exchanger, plug-flow digester (mesophilic), impulse mixing system, gas treatment, biogas buffer, co-generation plant

Tank volume: Digester: 360 m³

Biogas production: 450-870 m³ / day

Co-generation plant: Electric power: 50 kW



high performance digester



biogas plant

EXTENSION of HPD in TAUBERBISCHOFSCHEIM - Germany



LOCATION

Tauberbischofsheim
Germany

PROJECT

Turn Key

INPUT

65 - 100 m³ / day
sewage sludge

GENERAL CONTRACTOR

Schwarting Biosystem GmbH

START UP

2005

CO-GENERATION PLANT

120 kW + 50 kW

PRODUCTION

Biogas 1,550 m³ / day

DESCRIPTION

Extension of the high performance digestion of sewage sludge

Input: 65-100 m³ / day sewage sludge

Concept of treatment:

Plug-flow digesters, impulse mixing system, microfiltration unit, co-generation plants

Extension
of the
plant

Tank volume: Digester: 2 units x 360 m³ each

Biogas production: 1,550 m³ / day

Co-generation plants: Electric power: 120 kW + 50 kW



roof of high performance digester



high performance digester



Schwarting
Biosystem

High performance digestion plant in FINSTERWALDE - Germany



Quelle: Schwarting Umwelt GmbH

LOCATION

Finsterwalde
Germany

PROJECT

Turn Key

INPUT

63,510 tons / year manure
+27,755 tons / year food waste

GENERAL CONTRACTOR

Schwarting-Uhde GmbH,
Flensburg

START UP

1995

CO-GENERATION PLANT

750 kW

PRODUCTION

Biogas

DESCRIPTION

High performance digestion according to Schwarting/Uhde process

Input:	40,150 t/year	cow manure
	23,360 t/year	pig manure
	14,250 t/year	slaughterhouse rests
	13,505 t/year	kitchen waste

Concept of treatment:

Reception tank, disintegrator, feeding pump, heat exchanger, plug-flow digesters, external biogas desulphurisation, biogas buffer, co-generation plant, digestate separation, impulse mixing system

Tank volume:

Digester: 4 units x 940 m³ each

Co-generation plant:

Electric power: 750 kW



Quelle: Schwarting Umwelt GmbH

biogas plant



Quelle: Schwarting Umwelt GmbH

high performance digester

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REPOWERING of HPD in FINSTERWALDE - Germany



Quelle: Schwarting Umwelt GmbH

LOCATION

Finsterwalde
Germany

PROJECT

Turn Key

INPUT

60-65 tons / day corn silage
+ 30 m³ / day cow manure

GENERAL CONTRACTOR

Schwarting-Uhde GmbH,
Flensburg

START UP

2006

CO-GENERATION PLANT

140 kW+ 375 kW + 625 kW

PRODUCTION

Biogas

DESCRIPTION

High performance digestion according to Schwarting/Uhde process

Input: **60-65 t/day** **corn silage**
 30 m³ / day **cow manure**

REPOWERING

Concept of treatment:

Reception tank, disintegrator, feeding pump, heat exchanger, plug-flow digesters, external biogas desulphurisation, biogas buffer, co-generation plants, digestate separation, impulse mixing system

Tank volume: Digester: 4 units x 940 m³ each

3 co-generation plants:	Electric power:	140 kW
		375 kW
		625 kW



high performance digester



co-generation plant



biogas plant



Schwarting
Biosystem

High performance digestion plant in GÖRITZ - Germany



Quelle: Schwarting Umwelt GmbH

LOCATION

Göritz
Germany

PROJECT

Turn Key

INPUT

31,850 tons / year cow manure

GENERAL CONTRACTOR

Schwarting-Uhde GmbH,
Flensburg

START UP

1995

CO-GENERATION PLANT

260 kW

PRODUCTION

Biogas

DESCRIPTION

Digestion plant according to Schwarting/Uhde process

Input: 31,850 t/year cow manure

Concept of treatment:

Reception tank, disintegrator, feeding pump, heat exchanger, high performance digester, digestate separation, biogas desulphurisation, biogas buffer, co-generation plant

Tank volume:

Digester: 2 units x 685 m³ each

Co-generation plant:

Electric power: 260 kW



Quelle: Schwarting Umwelt GmbH

biogas plant

High performance digestion plant in LEONBERG - Germany



LOCATION

Leonberg
Germany

PROJECT

Turn Key

INPUT

110 m³ / day sewage sludge

GENERAL CONTRACTOR

Schwarting-Uhde GmbH,
Flensburg

START UP

1994

CO-GENERATION PLANT

PRODUCTION

Biogas 2,000 m³ / day

DESCRIPTION

High performance digestion of sewage sludge according to Schwarting/Uhde process

Input: 110 m³ / day sewage sludge

Concept of treatment:

Disintegrator, feeding pump, heat exchanger, plug-flow digesters (mesophilic/thermophilic), impulse mixing system

Tank volume: Digester: 2 units x 560 m³ each

Biogas production: 2,000 m³ / day

