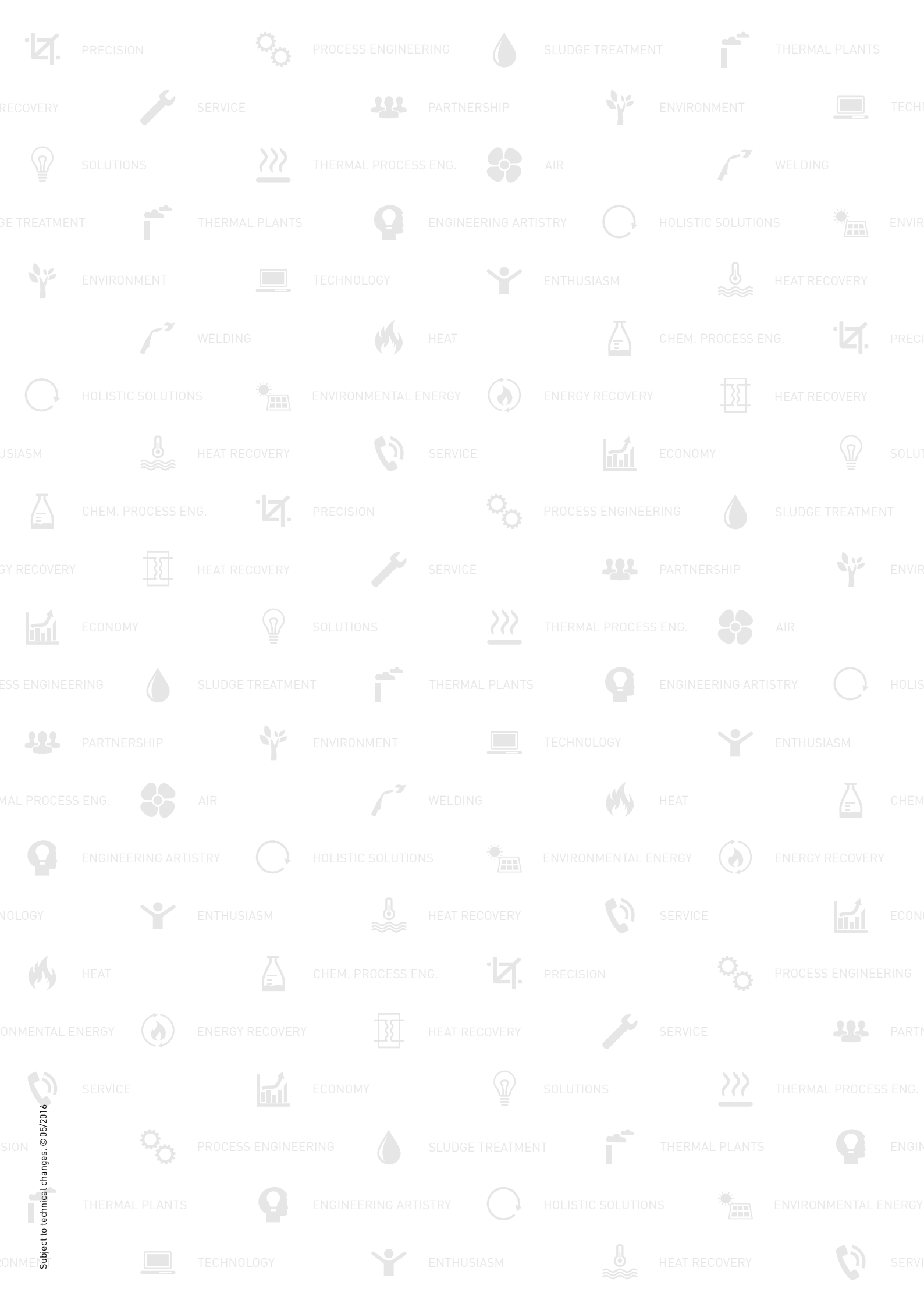
SÜLZLE KLEIN

References

Belt Dryer



CONTENTS

SLUDGE DRYING WITH SÜLZLE KLEIN:

- The entire drying technology is completely made of stainless steel to ensure a long service life.

- The smart system is very resistant to failure, easy to operate and needs low maintenance.

- As a result of long retention time inside the dryer, the dried material is hygienised, almost dust-free, easily storable and corresponds to the US EPA Class A-standard.

- The system works at under-pressure with no emissions because of its high quality housing.

- The system meets the ATEX-requirements (European guidelines for explosion prevention). In case of failure the plant is shut down automatically without any hazard potential.

- The drying technology is designed for an automatic and continuous operation. No observation is needed.

Chemical scrubber

Distributor

Heat recovery

Bunker

- Careful cooling of the dried material by integrated cooling section at the dryer outlet. A cool granulate is important for safe storage.

- Very careful transportation elements for minmal grain abrasion and dust formation.

- The exhaust air is led through a scrubber and a biofilter to meet the requirements of the local exhaust air regulations.

- The design of the SÜLZLE KLEIN drying technology and its robust construction ensure a long service life with minimum downtime.

Biofilter

Silo

Air fans (top), two dryer lines (center), Pro-Dry® 2/4 (right)

CHRISTCHURCH (NEW ZEALAND)

Two Belt Dryer, type Pro-Dry® 2/4

ENERGY SUPPLY: HOT WATER (165 °C)

SPECIAL FEATURES:

- The required drying heat is recovered from the energy center
- The thermal energy is transferred by means of hot water at 165°C to the drying air
- Seismic design

FURTHER EQUIPMENT:

Sludge bunker, granulate storage silo with truck loading station, chemical scrubber and biofilter

TECHNICAL DATA

Sludge type	aerobic stabilized
Dryer capacity	5,900 kg/h or 44,250 t/y
Operating time	7,500 h/y
Inlet DS-concentration	approx. 20 % DS (nominal)
Outlet DS-concentration	> 90 % DS
Water evaporation capacity	2 x 2,500 kg-water/h
Amount of dried granulate	approx. 9,600 t/y
Waste air flow	approx. 2 x 25,000 m³/h
Temperature	approx. 40 °C
Electrical energy consumption	< 350 kWh/h
Thermal energy consumption	< 3,900 kWh/h
Dimensions of the entire drying plant (LxWxH)	40.0 x 17.0 x 10.0 m

Pro-Dry® 2/2 (top), sludge layer in the dryer with sprinkler (center), biofilter (right)

GEORGSMARIENHÜTTE (GERMANY)

Belt Dryer, type Pro-Dry® 2/2

ENERGY SUPPLY: WARM WATER (75 °C)

SPECIAL FEATURES:

- The required energy is recovered from the biogas-CHP
- The plant uses the German KWK bonus (combined heat and power bonus) acc. to the EEG 2009 (renewable energy law)
- The thermal energy is transferred by means of warm water to the drying air

FURTHER EQUIPMENT:

Granulate storage silo with truck loading station, chemical scrubber

TECHNICAL DATA

Sludge type	anaerobic stabilized
Dryer capacity	913 - 983 kg/h or 7,305 t/y
Operating time	8,000 h/y
Inlet DS-concentration	23.5 % DS (nominal)
Outlet DS-concentration	> 90% DS
Water evaporation capacity	675 kg-water/h
Amount of dried granulate	approx. 1,900 t/y
Waste air flow	approx. 8,500 m³/h
Temperature	approx. 40 °C
Electrical energy consumption	< 80 kWh/h
Thermal energy consumption	< 560 kWh/h
Dimensions of the entire drying plant (LxWxH)	15.0 x 13.0 x 5.1 m

Pro-Dry® 2/1 (top), rotational heat exchanger (center), air channel system for heat recovery (right)

HALL IN TIROL (AUSTRIA)
Belt Dryer, type Pro-Dry® 2/1

ENERGY SUPPLY: WASTE HEAT (380 °C) FROM A CHP

SPECIAL FEATURES:

- The thermal energy is transferred by means of waste heat from the CHP to the drying air
- The dryer has two temperature zones and an integrated heat recovery

FURTHER EQUIPMENT:

Sludge silo

TECHNICAL DATA

Sludge type	digested sludge
Dryer capacity	1,200 kg/h bzw. 8,400 t/y
Operating time	7,000 h/y
Inlet DS-concentration	approx. 30 % DS (nominal)
Outlet DS-concentration	92 % DS
Water evaporation capacity	750 kg-water/h
Waste air flow	approx. 5,000 m³/h
Temperature	approx. 50 °C
Electrical energy consumption	approx. 43.4 kWh/h
Thermal energy consumption	approx. 530 kWh/h
Dimensions of the entire drying plant (LxWxH)	10.0 x 4.0 x 7.0 m

Two Pro-Dry® 2/4 (top), air fans (center), heat recovery (right)

KAUNAS (LITHUANIA)

Two Belt Dryer, type Pro-Dry® 2/4

ENERGY SUPPLY: WARM WATER (90 °C) FROM CHP

SPECIAL FEATURES:

- Complete solution for sludge treatment incl. construction of the dryer building, CHP and gas purification supply of CHP and gas purification, sludge processing facility and optimization of existing digestion
- Sludge feeding from three bunkers

FURTHER EQUIPMENT:

Sludge bunker, silo, sludge dewatering, heat recovery

TECHNICAL DATA

Sludge type	anaerobic stabilized
Dryer capacity	2 x 1,865 kg/h or 29,840 t/y
Operating time	8,000 h/y
Inlet DS-concentration	24 % DS (nominal)
Outlet DS-concentration	> 90 % DS
Water evaporation capacity	2 x 1,350 kg-water/h
Amount of dried granulate	8,240 t/y
Waste air flow	2 x 15,000 m³/h
Temperature	approx. 42 °C
Electrical energy consumption	approx. 350 kWh/h
Thermal energy consumption	approx. 2,300 kWh/h
Dimensions of the entire drying plant (LxWxH)	25.0 x 30.0 x 10.0 m

Compact-Dry 2/4 (top), heat recovery (center), dried product (right)

KENOSHA (USA)

Belt Dryer, type Compact-Dry 2/4

ENERGY SUPPLY: WARM WATER (90 °C) FROM CHP

SPECIAL FEATURES:

- Dried product corresponds to the US EPA Class A-standard

FURTHER EQUIPMENT:

Heat recovery

TECHNICAL DATA

Sludge type	anaerobic stabilized
Dryer capacity	1,050 kg/h or 8,400 t/y
Operating time	8,000 h/y
Inlet DS-concentration	22 - 30 % DS
Outlet DS-concentration	> 90 % DS
Water evaporation capacity	700 kg-water/h
Amount of dried granulate	approx. 300 kg/h
Waste air flow	15,050 m³/h
Temperature	approx. 45 °C
Electrical energy consumption	< 84 kWh/h
Thermal energy consumption	< 595 kWh/h
Dimensions of the entire drying plant (LxWxH)	15.2 x 11.0 x 8.0 m

Pro-Dry® 2/4 (top), air fans (center), bunker (right)

KLAIPEDA (LITHUANIA)
Belt Dryer, type Pro-Dry® 2/4

ENERGY SUPPLY: WARM WATER FROM CHP

SPECIAL FEATURES:

- Complete solution for sludge treatment

FURTHER EQUIPMENT:

Silo, sludge bunker, exhaust air treatment, heat recovery, back mixing, screening washing, sand washing, sludge disintegration, sludge dewatering

TECHNICAL DATA

Sludge type	aerobic stabilized
Dryer capacity	2,500 kg/h or 20,000 t/y
Operating time	8,000 h/y
Inlet DS-concentration	approx. 25 % DS
Outlet DS-concentration	> 90 % DS
Water evaporation capacity	1,800 kg-water/h
Amount of dried granulate	approx. 5,520 t/y
Waste air flow	14,000 m³/h
Temperature	approx. 40 °C
Electrical energy consumption	≤ 111 kWh/h
Thermal energy consumption	1,500 kWh/h
Dimensions of the entire drying plant (LxWxH)	36.0 x 14.0 m x 9.0 m

Pro-Dry® 2/4 (top), condensation unit with heat recovery (center), distributor (right)

KOBLENZ (GERMANY)
Belt Dryer, type Pro-Dry® 2/4

ENERGY SUPPLY: WARM AND HOT WATER (90/140 °C)

SPECIAL FEATURES:

- Extraction of the drying heat for heating of the digestion tower
- Dryer with different temperature levels

FURTHER EQUIPMENT:

Sludge bunker, exhaust air treatment, silo

TECHNICAL DATA

Sludge type	anaerobic stabilized
Dryer capacity	1,840 kg/h or 13,800 t/y
Operating time	7,500 h/y
Inlet DS-concentration	29 % DS (20 - 33 % DS)
Outlet DS-concentration	> 90 % DS
Water evaporation capacity	1,250 kg-water/h
Amount of dried granulate	4,425 t/y
Waste air flow	< 7,500 m³/h
Temperature	approx. 40 °C
Electrical energy consumption	< 125 kWh/h
Thermal energy consumption	< 1,040 kWh/h
Dimensions of the entire drying plant (LxWxH)	30.0 x 12.0 x 10.0 m

Compact-Dry 2/2 (top), chemical scrubber (center), dried product (right)

MALLERSDORF (GERMANY)
Belt Dryer, type Compact-Dry 2/2

ENERGY SUPPLY: WASTE HEAT FROM BIOGAS PLANT

SPECIAL FEATURES:

- The drying process is designed waste water free
- The plant uses the German KWK bonus (combined heat and power bonus) acc. the EEG 2009 (renewable energy law)

FURTHER EQUIPMENT:

Chemical scrubber

TECHNICAL DATA

Sludge type	dewatered sewage sludge
Dryer capacity	500 kg/h or 4,000 t/y
Operating time	8,000 h/y
Inlet DS-concentration	25 - 28 % DS (nominal)
Outlet DS-concentration	> 90 % DS
Water evaporation capacity	400 kg-water/h
Amount of dried granulate	approx. 1,250 t/y
Waste air flow	approx. 15,000 m³/h
Temperature	approx. 40 °C
Electrical energy consumption	< 40 kWh/h
Thermal energy consumption	approx. 310 kWh/h
Dimensions of the entire drying plant (LxWxH)	10.0 x 6.0 x 4.0 m

Pro-Dry® 2/2 (top), air fans (center), distributor (right)

ORZEGOW (POLAND)

Two Belt Dryer, type Pro-Dry® 2/2

ENERGY SUPPLY: HOT WATER (120 °C)

SPECIAL FEATURES:

- The thermal energy is transferred by means of hot water with 120 °C to the drying air
- The dewatering is effected by a Belt Filter Press with a Gravity Belt Thickener on top, our solidXklein-C

FURTHER EQUIPMENT:

Sludge bunker, biofilter

TECHNICAL DATA

Sludge type	aerobic stabilized
Dryer capacity	2,600 kg/h or 18,200 t/y
Operating time	7,000 h/y
Inlet DS-concentration	22 % DS (nominal)
Outlet DS-concentration	90 % DS
Water evaporation capacity	2 x 1,100 kg-water/h
Amount of dried granulate	3,940 t/y
Waste air flow	approx. 18,000 m³/h
Temperature	approx. 40 °C
Electrical energy consumption	approx. 80 kWh/h
Thermal energy consumption	approx. 1,640 kWh/h
Dimensions of the entire drying plant (LxWxH)	23.5 x 20.0 x 7.0 m

Pro-Dry® 2/3 (top), air fans (center), heat recovery (right)

PORTLAOISE (IRELAND)

Belt Dryer, type Pro-Dry® 2/3

ENERGY SUPPLY: NATURAL GAS

SPECIAL FEATURES:

- The dryer is equipped with a back-mixing unit

FURTHER EQUIPMENT:

Back-mixing unit, heat recovery

TECHNICAL DATA

Sludge type	aerobic stabilized
Dryer capacity	1,940 kg/h or 14,550 t/y
Operating time	7,500 h/y
Inlet DS-concentration	approx. 20 % DS (nominal)
Outlet DS-concentration	> 90 % DS
Water evaporation capacity	1,500 kg-water/h
Amount of dried granulate	approx. 3,230 t/y
Waste air flow	approx. 15,000 m³/h
Temperature	approx. 40 °C
Electrical energy consumption	< 110 kWh/h
Thermal energy consumption	< 1,250 kWh/h
Dimensions of the entire drying plant (LxWxH)	16.0 x 10.0 x 8.0 m

Two Pro-Dry® 2/2 (top), distributor unit (center), silo (right)

SALALAH (OMAN)

Two Belt Dryer, type Pro-Dry® 2/2

ENERGY SUPPLY: NATURAL GAS

SPECIAL FEATURES:

- The dried material is used for nutrient enrichment and for improvement of local soils

FURTHER EQUIPMENT:

Sludge bunker, silo

TECHNICAL DATA

Sludge type	aerobic stabilized
Dryer capacity	2 x 1,460 kg/h or 2 x 10,500 kg/h
Operating time	7,200 h/y
Inlet DS-concentration	22 % DS (nominal)
Outlet DS-concentration	90 % DS
Water evaporation capacity	2 x 1,100 kg-water/h
Amount of dried granulate	approx. 5,135 t/y
Waste air flow	approx. 2 x 8,500 m³/h
Temperature	approx. 40 °C
Electrical energy consumption	< 110 kWh/h
Thermal energy consumption	< 1,830 kWh/h
Dimensions of the entire drying plant (LxWxH)	30.0 x 25.0 x 8.5 m

Pro-Dry® 2/4 (top), biofilter (center), sludge bunker (right)

SIEDLCE (POLAND)

Belt Dryer, type Pro-Dry® 2/4

ENERGY SUPPLY: WARM WATER (90 °C) FROM CHP

SPECIAL FEATURES:

- The dryer is equipped with a back-mixing unit
- Sludge feeding from centrifuge or from third-party supply

FURTHER EQUIPMENT:

Sludge bunker, exhaust air treatment, heat recovery, back-mixing, exhaust gas heat exchanger

TECHNICAL DATA

Sludge type	dewatered sewage sludge
Dryer capacity	1,625 kg/h or 13,000 t/y
Operating time	8,000 h/y
Inlet DS-concentration	22 % DS (20 - 33 % DS)
Outlet DS-concentration	> 90 % DS
Water evaporation capacity	1,300 kg-water/h
Amount of dried granulate	approx. 2,600 t/y
Waste air flow	24,500 m³/h
Temperature	approx. 40 °C
Electrical energy consumption	< 130 kWh/h
Thermal energy consumption	< 1,100 kWh/h
Dimensions of the entire drying plant (LxWxH)	30.0 x 15.0 x 10.0 m

Pro-Dry® 3/5 (top), natural gas burner unit (center), distributor (right)

UFA (RUSSIA)

Two Belt Dryer, type Pro-Dry® 3/5

ENERGY SUPPLY: NATURAL GAS

SPECIAL FEATURES:

- Two lined plant with three-belt-dryer
- The outlet DS concentration is > 60 %

FURTHER EQUIPMENT:

Sludge dewatering, exhaust air treatment

TECHNICAL DATA

Sludge type	aerobic stabilized
Dryer capacity	13,600 kg/h or 109,100 t/y
Operating time	8,000 h/y
Inlet DS-concentration	24 % DS (nominal)
Outlet DS-concentration	60 % DS
Water evaporation capacity	2 x 4,000 kg-water/h
Amount of dried granulate	approx. 43,600 t/y
Waste air flow	approx. 2 x 20,000 m³/h
Temperature	approx. 40 °C
Electrical energy consumption	approx. 366 kWh/h
Thermal energy consumption	approx. 6,800 kWh/h
Dimensions of the entire drying plant (LxWxH)	30.0 x 42.0 x 10.0 m

Pro-Dry® 2/3 (top), natural gas burner (center), sludge bunker (right)

ZYWIEC (POLAND)

Belt Dryer, type Pro-Dry® 2/3

ENERGY SUPPLY: NATURAL GAS/BIOGAS

SPECIAL FEATURES:

- The required drying heat is transferred through natural gas burners in the form of hot air to the air circulation
- The dryer is equipped with a back-mixing unit

FURTHER EQUIPMENT:

Sludge bunker, exhaust air treatment

TECHNICAL DATA

Sludge type	dewatered sewage sludge
Dryer capacity	1,800 kg/h or 14,400 t/y
Operating time	8,000 h/y
Inlet DS-concentration	15 - 35 % DS (nominal)
Outlet DS-concentration	92 - 94 % DS
Water evaporation capacity	1,400 kg-water/h
Amount of dried granulate	approx. 3,900 t/y
Waste air flow	15,000 m³/h
Temperature	approx. 40 °C
Electrical energy consumption	< 113 kWh/h
Thermal energy consumption	< 1,160 kWh/h
Dimensions of the entire drying plant (LxWxH)	30.0 x 17.0 x 8.5 m

CUSTOMIZED SOLUTIONS

REFERENCE LIST BELT DRYER

PROJECT	COUNTRY	BELT DRYER	WATER EVAPORATION (KG/H)	SLUDGE TYPE
Bayr. Untermain	Germany	3 x Pro-Dry® 2/5	3 x 700	aerobic stabilized
Granetal	Germany	2 x Pro-Dry® 5/2	2 x 250	potable water filter sludge
Hall in Tirol	Austria	Pro-Dry® 2/1	750	digested sludge
Kempten	Germany	Pro-Dry® 2/4	1,200	digested sludge
Schaumburg	Germany	Pro-Dry® 2/2	700	waste/fertilizer
BOSZ Nusbaum-Freilingen	Germany	wood chips dryer 3/2	500	wood chips
Abha	Saudi Arabia	Pro-Dry® 2/3	800	aerobic stabilized
Khamiz old	Saudi Arabia	Pro-Dry® 2/3	820	aerobic stabilized
Taschkent	Uzbekistan	Pro-Dry® 3/6	1,200	aerobic stabilized
Abha East	Saudi Arabia	Pro-Dry® 2/5	1,620	aerobic stabilized
Khamiz new	Saudi Arabia	Pro-Dry® 2/5	1,650	aerobic stabilized
Wangen	Germany	Pro-Dry® 2/3	800	aerobic stabilized
Watercare	New Zealand	Pro-Dry® C	400	aerobic stabilized
Tarnow	Poland	Pro-Dry® 3/5	2,900	aerobic stabilized
Morzine	France	Pro-Dry® 2/2	500	aerobic stabilized
Donegal	Ireland	Pro-Dry® 2/3	1,000	aerobic stabilized
Orzegow	Poland	2 x Pro-Dry® 2/2	2 x 1,100	aerobic stabilized
Georgsmarienhütte	Germany	Pro-Dry® 2/2	675	anaerobic stabilized
Nyon	Switzerland	Pro-Dry® 2/2	1,000	digested sludge
Bruckmühl	Germany	Pro-Dry® 2/2	450	digested sludge
Ufa	Russia	2 x Pro-Dry® 3/5	2 x 4,000	aerobic stabilized
Portlaoise	Ireland	Pro-Dry® 2/3	1,500	aerobic stabilized
Tengen	Germany	Compact-Dry 2/2	300	waste / fertilizer
Oyonnax	France	Pro-Dry® 2/4	1,400	aerobic stabilized
Christchurch	New Zealand	2 x Pro-Dry® 2/4	2 x 2,500	aerobic stabilized
Clonmel	Ireland	Pro-Dry® 2/3	1,500	aerobic stabilized
Salalah	Oman	2 x Pro-Dry® 2/2	2 x 1,100	aerobic stabilized
Mallersdorf	Germany	Compact-Dry 2/2	400	dewatered sewage sludge
Letterkenny	Ireland	Pro-Dry® 2/3	1,620	dewatered sewage sludge
Klaipeda	Lithuania	Pro-Dry® 2/4	1,800	aerobic stabilized
Mariampole	Lithuania	Pro-Dry® 2/2	1,213	dewatered sewage sludge
Zywiec	Poland	Pro-Dry® 2/3	1,400	dewatered sewage sludge
Siedlce	Poland	Pro-Dry® 2/4	1,300	dewatered sewage sludge
Biffa	Great Britain	Conti-Dry 2/5	1,300	dewatered waste/ fertilizer from decanter
Erfurt	Germany	Disk Dryer	2,500	dewatered sewage sludge
Koblenz	Germany	Pro-Dry® 2/4	1,250	anaerobic stabilized
Kaunas	Lithuania	Pro-Dry® 2/4	2 x 1,350	anaerobic stabilized
Kenosha	USA	Compact-Dry 2/4	700	anaerobic stabilized

Scan QR-Code and watch the video

ENERGY SOURCE (TEMPERATURE)	START UP	FURTHER EQUIPMENT
natural gas	1997	with automatic loading of dried product
electrical energy	1998	with thickening and dewatering
flue gas (380 °C)	2004	with sludge silo
warm water (80 °C)	2005	with sludge silo and dry product loading silo
biogas/waste heat (380 °C)	2005	-
warm water (85 °C)	2005	wood chip bunker
natural gas	2005	with sludge silo and dry product loading silo
natural gas	2005	with sludge silo and dry product loading silo
natural gas	2006	-
natural gas	2006	with dewatering
natural gas	2006	with dewatering
warm water	2006	with dewatering and sludge receiving bunker
warm water	2006	in combination with drum dryer
natural gas	2008	with sludge receiving bunker and biofilter
biogas/fuel oil	2008	-
natural gas	2008	-
hot water (120 °C)	2008	with sludge receiving bunker and biofilter
warm water (75 °C)	2008	with chemical washing and biofilter, dried sludge silo
warm water (60 °C)	2008	-
biogas	2008	-
natural gas	2009	-
natural gas	2009	with dried sludge back mixing unit
warm water (80 °C)	2009	-
natural gas	2009	-
hot water (165 °C)	2010	with wet sludge silo, dried sludge silo, chemical washing and biofilter
natural gas	2010	with sludge receiving bunker
natural gas	2010	with sludge receiving bunker and granules loading silo
waste heat from biogas plant	2011	with chemical washing
fuel oil	2012	-
warm water (90 °C)	2013	with screen washing plant, grit washer, sludge des-integration and sludge dewatering
natural gas	2013	with sludge receiving bunker and dried sludge silo
natural gas	2013	with sludge receiving bunker and chemical washing
warm water (90 °C)	2014	with sludge bunker and chemical washing
warm water (90 °C)	2014	-
steam (9 bar, 220 °C)	2014	with sludge receiving bunker, pneumatic conveying
hot water (90/140 °C)	2015	sludge receiving bunker, chemical washing, pneumatic conveying and dried sludge silo
warm water (90 °C)	2015	with sludge receiving bunker, dried sludge silo and sludge dewatering
warm water (90 °C)	2015	-

SÜLZLE

überzeugt.

STEEL
ENERGY
IDEAS

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