RASCHKA
SINCE 1946

Raschka Engineering Ltd

Address: Panoramastrasse 40
CH-6373 Ennetbürgen, Switzerland
Tel: +41 61 534 9913 or +41 79 750 9845
E-mail: info@raschka-eng.com

Raschka Guangzhou Engineering & Technology Co., Ltd

Address: 15 Floor, North Tower, Peace Business Centre,
No. 880 of Guangzhou Avenue South, 510305, Guangzhou, China
Tel: +86 (0) 20 8966 4228
Fax: +86 (0) 20 8966 4278
E-mail: info@raschka-eng.com

Raschka Representative Tianjin, China

Address: 1868, Jinxing Plaza, No. 65 of Xiqing Road, Tianjin, China
Tel: +86 (0) 22 2292 7887

Raschka Representative Singapore / S.E.A Novexx Engineering Pte Ltd

Address: 8 Tuas View Loop, Singapore 637674
Tel: +65 6896 6620

Raschka Representative Brazil / BIOCAL Burntech

Address: Rua Pitangueira, 865, Bairro Siegel, Agrolândia
Santa Catarina – CEP: 88.420-000
Tel: +55 47 3534 5400

www.raschka-engineering.com

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Raschka FBI Technology

reliable and efficient incineration process technology

For industrial- and sewage sludge

Proven and internationally established and recommended since 1946

Sludge | Waste from chemical industries | Waste from paper & pulp industries | Inferior coal, low-grade coal
Industrial, refinery & coal slurries | Biomass, bark | Household waste, mechanical-biological recyclable waste

Index

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About Us

Raschka Engineering Ltd
Ennetbürgen, Switzerland
Engineering and EPC-Plant Construction

Histroy

1946
Dipl.-Ing. Georg Raschka
ingenieurüro GmbH&Co.KG
Heidelberg, Germany

2008
Lonza Engineering Ltd
Basel, Switzerland

2011
Lonza Engineering acquires
Raschka Ingenieurbüro GmbH&Co.KG

2013
Lonza Engineering renamed as
Raschka Engineering

Currently

Raschka Engineering Ltd and its 100% subsidiary
Raschka Guangzhou Engineering & Technolgy Co., Ltd
Guangzhou, China

Offices:
Ennetbürgen (Switzerland) | Guangzhou | Tianjin | Wuxi
Beijing | Shanghai

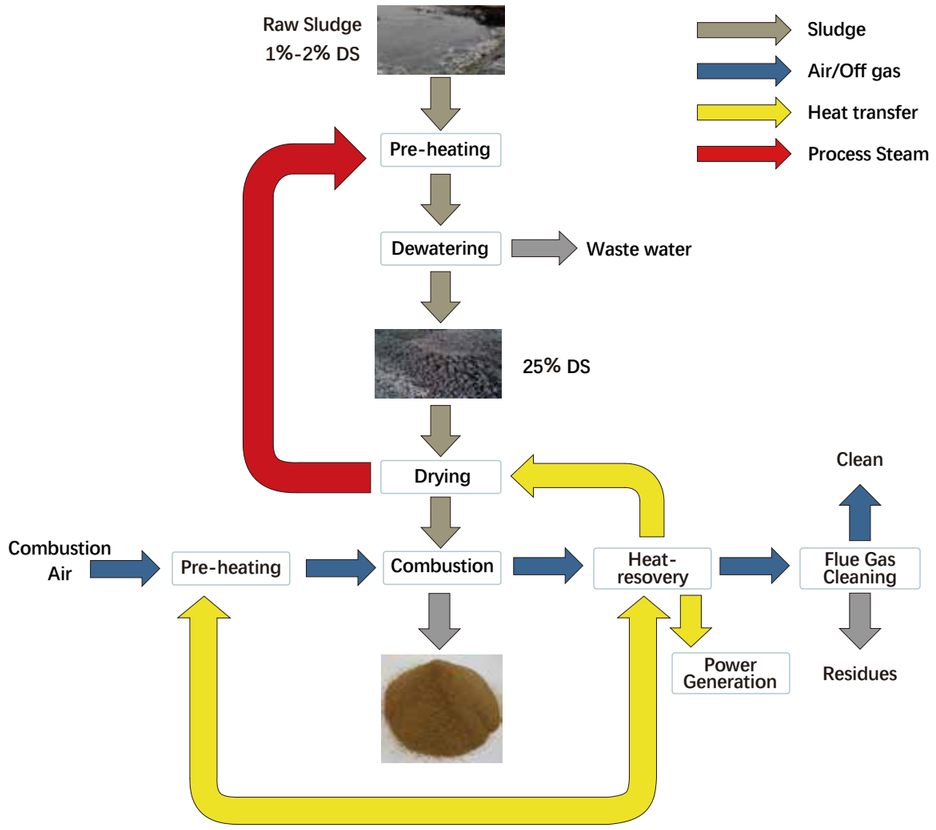
Performance & Success

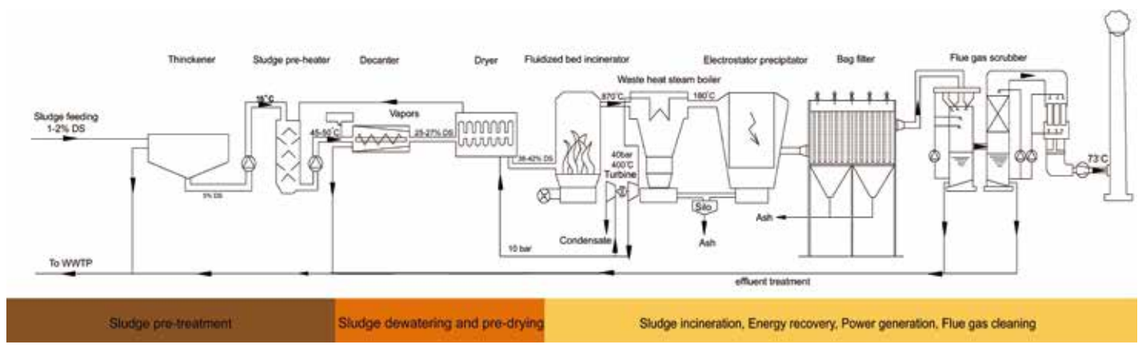
- More than 100 RASCHKA references in Europe and Asia
- RASCHKA products and services are generally accepted as a landmark and state of the art
- 2021: 75th anniversary

Raschka FBI Technology

- More than 70 years experience
- More than 100 RASCHKA-references in Europe and Asia
- Used for solid, pasty & liquid waste incineration
- Particularly used for the incineration of:
  - Sludge from communal- & industrial waste water treatment plants
  - Waste from chemical industries
  - Waste from pulp & paper industries
  - Inferior coal, low-grade coal
  - Industrial, refinery & coal slurries
  - Bark, wood chips, rice husk and other biomass

Sludge Treatment (Raschka Process)





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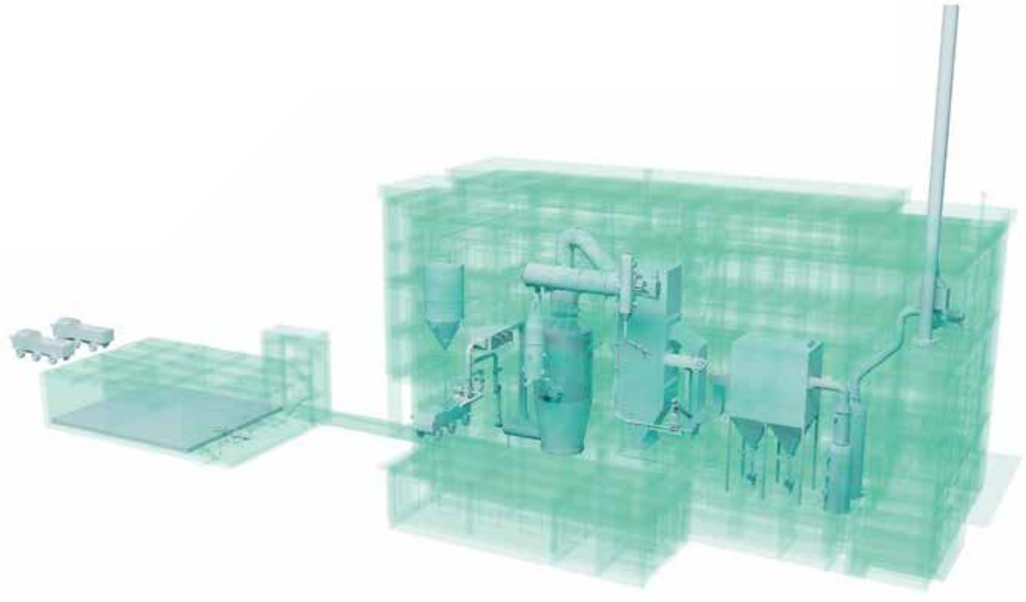
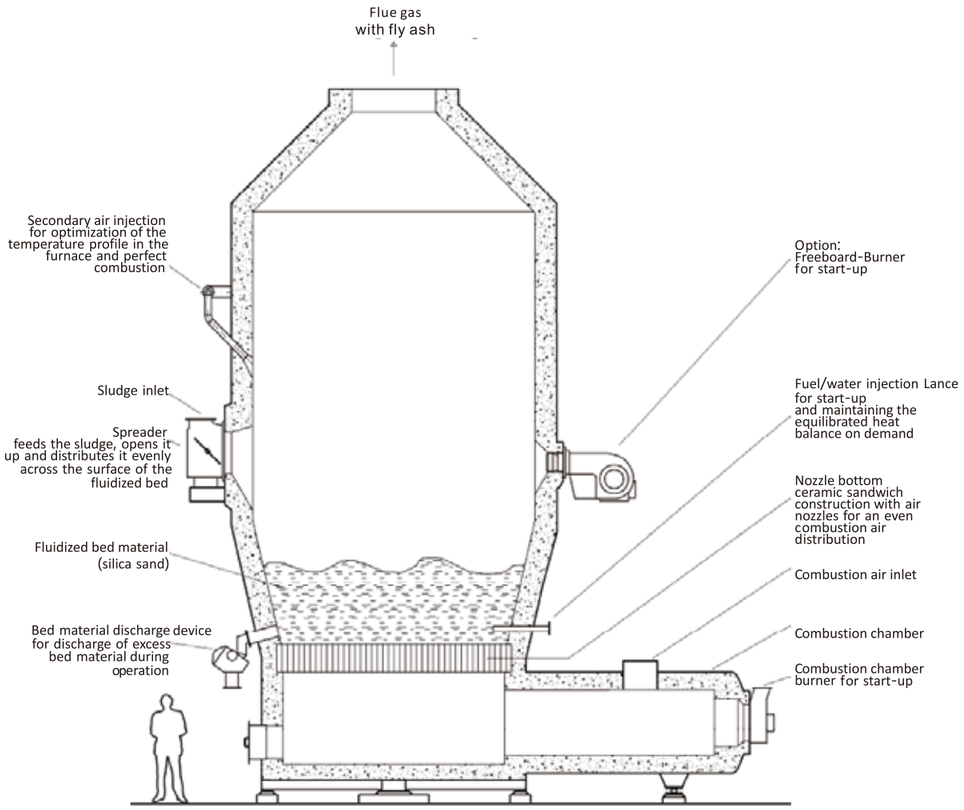
Sludge Incineration Process Key Advantages

- All organic substances are combusted completely due to a long retention time in the FBI at approximately 870℃.
- RASCHKA FBI can maintain an auto thermic incineration with no additional fuel assuming the organic content in the sludge is sufficiently high.
- The energy set free by incineration process is recovered in the waste heat steam boiler and used for sludge pre-drying, power generation and other heating purposes.
- Reliabe and long lasting operation with minimum maintenance.
- Advanced control system enables an optimized process which leads to minimum operation cost.
- Specific energy consumption is low due to the use of high efficient fans and pumps.
- RASCHKA experience and the use of the advanced control system enable a polymer optimized operation.



FBI Functions and Characteristics

- Nozzle bottom: ceramic sandwich construction, alternatively steel bottom or nozzle system permeable for foreign matters, air nozzles of special design to ensure even and exact air distribution.
- Discharging of bed material and foreign matters during the operation of the incinerator.
- Special design injection lances system for the injection of natural gas and/or fuel oil during start-up.
- Feeding of sludge and other combustible into the incinerator by means of the RASCHKA-spreader, which serves for an even distribution over the entire cross section of the fluidized bed.
- Injection of secondary air for controlled staged combustion.
- Extreme long retention time and low flow velocity in the freeboard, thus enabling excellent and complete combustion.
- Very low NOx due to advanced RASCHKA technology.



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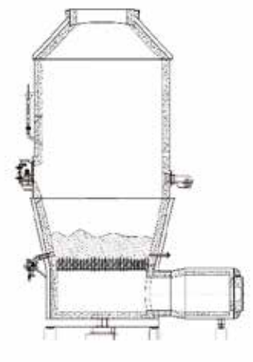
Type of Fluidized Bed Incinerators

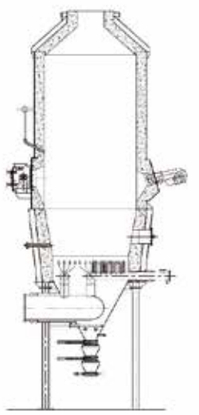
Raschka Windbox type FBI (fluidized bed incinerator)

- High moisture, low calorific value, loose block (granular) solid waste (such as municipal sludge, industrial sludge, etc.)
- Waste liquid
- Waste water, etc



Raschka Open Nozzle Bottom type FBI (fluidized bed incinerator)

- High moisture, low and medium calorific value, loose block (granular) solid waste
- Non-fluidized solid waste in sheet form (eg. domestic waste)
- Waste liquid
- Waste water, etc



Extract from Reference List

Plant	Sludge incineration plant
Customer	Lonza Group
Start up	Visp, Switzerland 1976
Fuel	Sewage sludge from municipal waste water treatment plants
Fuel capcacity	Sludge: 5 t/h (20% DS)
Incineration temperature	850-900°C
Steam parameters	3 t/h
Steam generation	10 bar(g)
Flue gas cleaning	Acc. to German 17. BImSchV/ European regulations
Flue gas volume	12'000 Nm³/h

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Plant	Bottrop ZSB (Central sludge treatment plant) Fluidized bed incineration plants # 1 + 2
Customer	Emschergenossenschaft Essen, Germany
Start up	Plant 1: 1979, plant 2: 1991
Fuel	Sewage sludge and residues from municipal waste water treatment plant
Fuel capcacity	3 t/h dry solids each
Incineration conditions	Acc. to German 17. BImSchV / European regulations
Steam parameters	35 bar(g) 400 °C superheated
Flue gas cleaning	Electrostatic precipitator, flue gas scrubbing system
Flue gas volume	21'000 Nm³/h

Plant	Stuttgart Hauptklärwerk Mühlhausen Fluidized bed incineration plant # 2
Customer	City of Stuttgart Stuttgart, Germany
Start up	1992
Fuel	Sewage sludge and residues from municipal waste water treatment plant
Fuel capcacity	4 t/h dry solids
Incineration conditions	Acc. to German 17. BImSchV / European regulations
Steam parameters	12 bar(g) saturated
Flue gas cleaning	Electrostatic precipitator, flue gas scrubbing system
Flue gas volume	25'000 Nm³/h

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Plant	Fluidized bed incineration plant Lünen
Customer	Innovatherm GmbH Lünen Germany
Start up	1997
Fuel	Coal conditioned sewage sludge from municipal waste water treatment plants, other waste materials
Fuel capcacity	13 t/h dry solids
Incineration conditions	Acc. to German 17. BImSchV/ European regulations
Steam parameters	40 bar(g) 400°C superheated
Steam generation	41 t/h
Flue gas cleaning	Electrostatic precipitator, flue gas scrubbing system (effluent free)
Flue gas volume	12'000 Nm³/h

Plant	München Klärwerk Gut Grosslappen Fluidized bed incineration plant # 1+2
Customer	City of Munich Munich, Germany
Start up	1997
Fuel	Sewage sludge from municipal waste water treatment plant
Fuel capcacity	3 t/h dry solids each
Incineration conditions	Acc. to German 17. BlmSchV/ European regulations
Steam parameters	40 bar(g) 400°C superheated
Steam generation	8 t/h
Flue gas cleaning	Electrostatic precipitator, flue gas scrubbing system
Flue gas volume	18'000 Nm³/h

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Plant	Fluidized bed multi waste incineration plant
Customer	Tongliao Meihua Bio-Tech Co., Ltd Tongliao, Inner Mongolia, China
Start up	November 2011
Fuel	Sludge from waste water treatment plant, waste coal, waste liquid
Fuel capcacity	Sludge: 3’125 kg/h(20%DS); Waste liquid: 8’330 kg/h
Incineration conditions	GB18484-2001; GB16297-1996
Steam parameters	12 bar(g) saturated
Steam generation	20 t/h
Flue gas cleaning	Quench, bag filter, flue gas scrubbing system
Flue gas volume	47'000 Nm³/h

Plant	Karlsruhe klärwerk Neureut Fluidized bed incineration plant # 2
Customer	Karlsruhe, Germany
Start up	1991
Fuel	Sewage sludge and residues from municipal waste water treatment plants
Fuel capcacity	2 t/h dry solids
Incineration conditions	Acc. to German 17. BImSchV/ European regulations
Steam parameters	40 bar(g) 400°C superheated
Steam generation	8 t/h
Flue gas cleaning	Electrostatic precipitator, flue gas scrubbing system
Flue gas volume	18'000 Nm³/h

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Plant	Norske Skog Cheongwon Mill Cheongwon, Korea Fluidized bed incineration plant
Customer	Samsung Engineering (genceral contractor) Seoul, Korea
Start up	1996
Fuel	Paper sludge, rejects and refuse from paper factory
Fuel capcacity	5.6 t/h dry solids
Incineration conditions	Acc. to German 17. BImSchV/ European regulations
Steam parameters	10 bar(g) superheated
Steam generation	20 t/h
Flue gas cleaning	Electrostatic precipitator, flue gas scrubbing system
Flue gas volume	45'000 Nm³/h

Plant	WWTP Chifeng Fludized bed incineration plant
Customer	Chifeng Derun Drainage Co., Ltd. Chifeng, Inner Mongolia, China
Start up	2015
Fuel	Sewage sludge
Fuel capcacity	90 t/h of sewage sludge (max. 2% DM)
Incineration conditions	Acc. to German 17. BImSchV/ European regulations
Steam parameters	12 bar(g) saturated
Steam generation	6 t/h
Flue gas cleaning	Bag filter, flue gas scrubbing system
Flue gas volume	18'000 Nm³/h

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Plant	Formosa Plastics Corporation Fluidized bed incineration plant (open nozzle bottom)
Customer	Formosa Plastics Corporation (FPC) Kaohsiung, Taiwan, China
Start up	2015
Fuel	Industrial sludge incl. fibres (20-30% DS) and waste oil from production plant
Fuel capcacity	Industrial sludge: 2 t/h; Waste oil: 200 kg/h
Incineration conditions	Acc. to German 17. BImSchV/ European regulations
Heat recovery system	Combustion air pre-heating to 500°C
Flue gas cleaning	Quench, bag filter, flue gas scrubbing system
Flue gas volume	8'000 Nm³/h

Plant	Hazardous wastes incineration plant
Customer	Nantong Acetic Acid Chemical Co., Ltd. Nantong, Jiangsu, China
Start up	2021
Fuel	Solid waste (Active Carbon, Sludge, etc.) and liquid waste
Fuel capcacity	35'000 ton/year
Incineration conditions	Acc. to European Regulations/ Chinese regulation GB18484-2020
Steam parameters	25 bar(g), 226℃
Steam generation	15 t/h
Flue gas cleaning	SNCR+Quench+BHF+Scrubber+Absorber +WESP+GGH
Flue gas volume	57'000 Nm³/h

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Plant	Standardkessel Baumgarte GmbH for KENOW Bremen
Customer	Standardkessel Baumgarte GmbH for KENOW Bremen Bremen, Germany
Start up	2022
Fuel	Municipal sludge
Fuel capcacity	6’875 kg/h（DS）
Incineration conditions	Acc. to European Regulations
Steam parameters	65 bar(g), 450℃
Steam generation	21.2 t/h