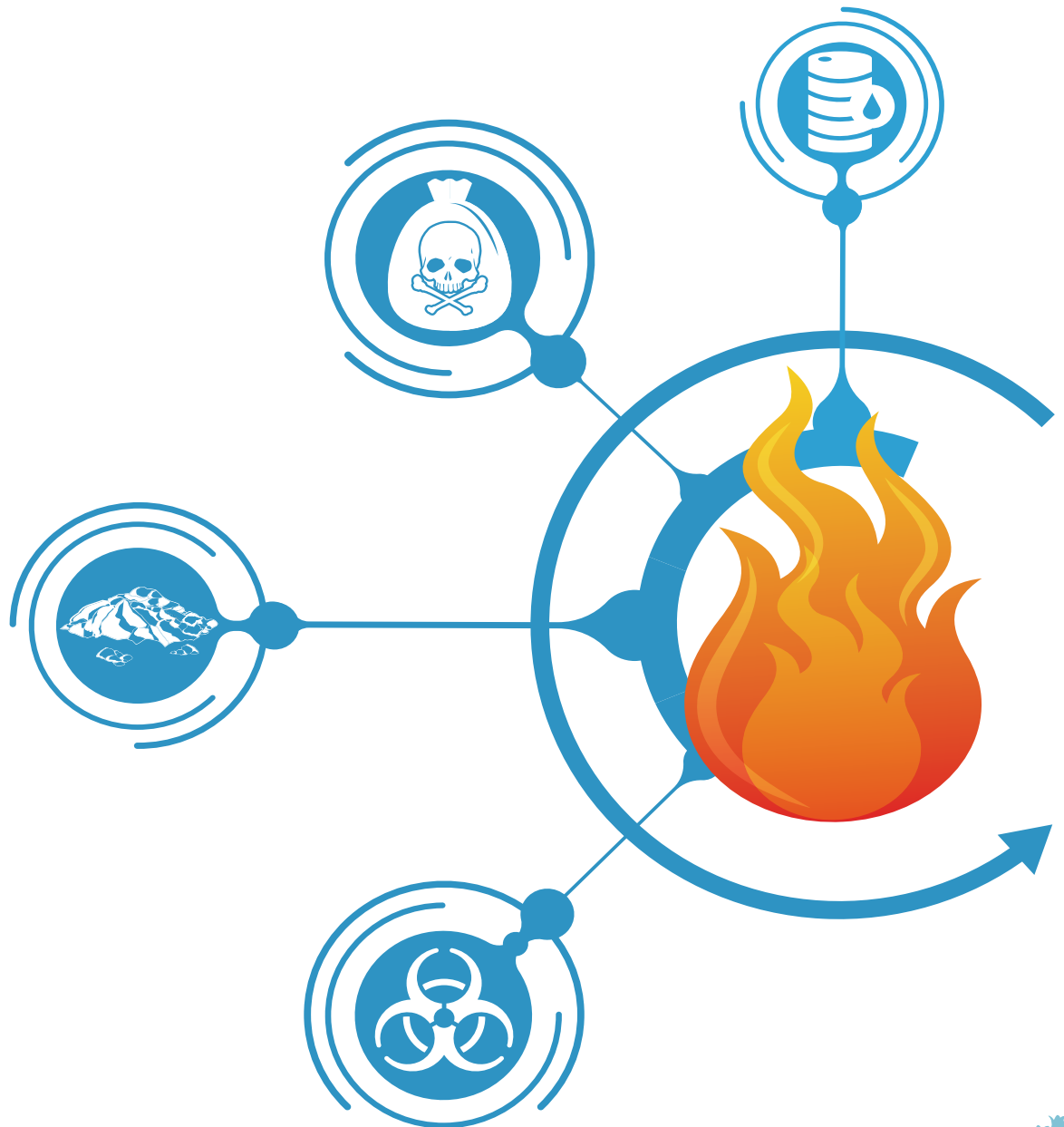


RASCHKA

SINCE 1946

Reliable and efficient incineration process technology



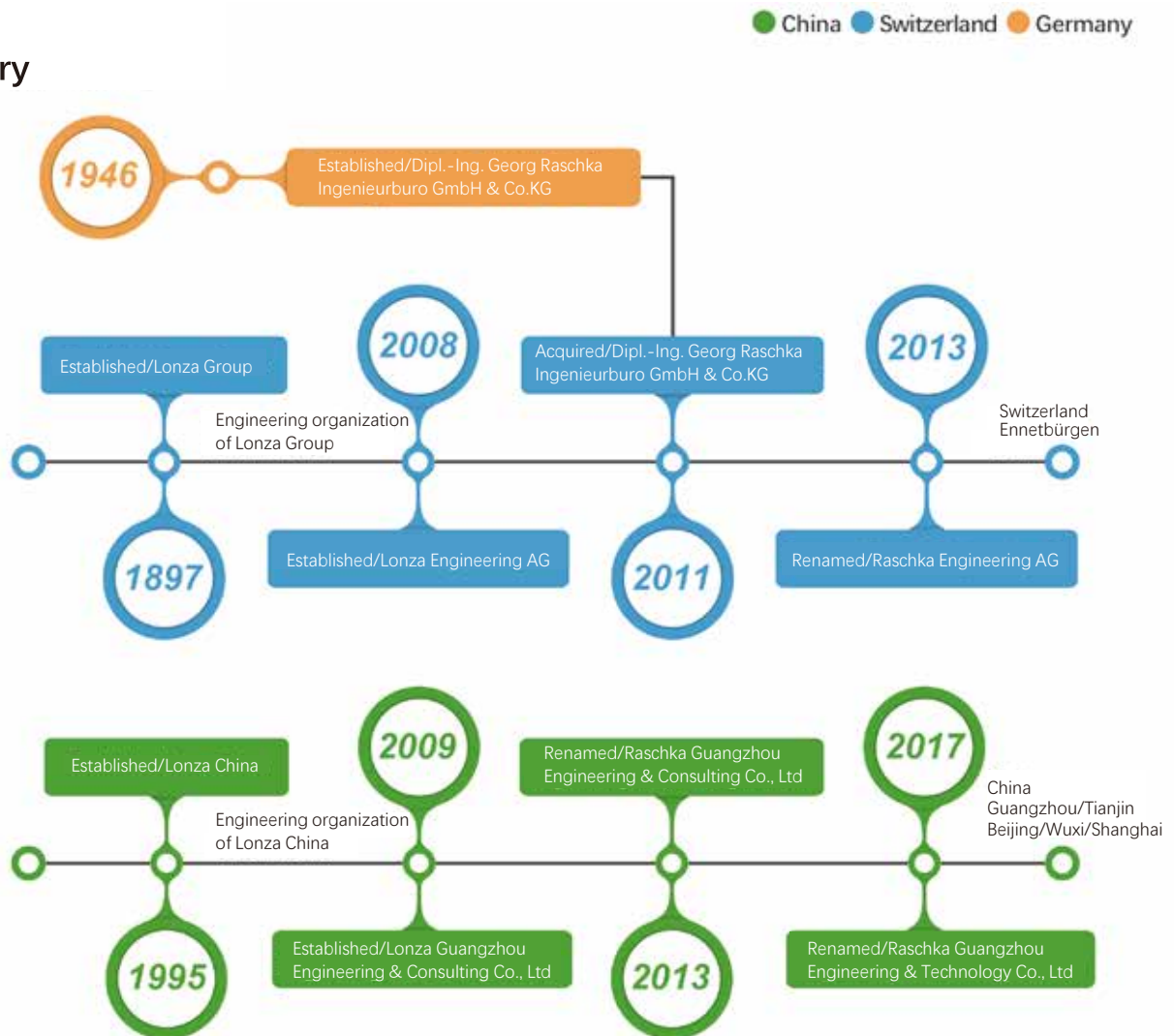
RASCHKA ENGINEERING

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About us

History



What We Do

Depending on the type of waste, its composition and physical/chemical characteristics, Raschka Engineering provides customized incineration process solutions, which include but are not limited to:

- Sludge drying and incineration systems
- Waste liquid and off-gas incineration systems
- Rotary kiln with secondary combustion chamber systems
- High salt content waste liquid or solid salt incineration systems
- High halogen content waste incineration systems

Raschka Engineering also provides onsite training, technical assistance, facility operation and maintenance support, tailoring to customers' needs.

References Worldwide



Our Strengths

- More than 100 RASCHKA-references in Europe and Asia
- Delivering highly reliable and cost-effective system
- Rich experience in system operation and maintenance:
 - 120 t/d sludge drying and incineration system owned by Lonza Group, operational since 1976 with a proven track record
 - 50,000 t/a hazardous waste incineration center (phase 1 & 2) owned by Lonza Group, commissioned in 1984 and 1998 respectively, still today represents a major regional hazardous waste treatment facility in south of Switzerland
- Strong commitment to innovation and R&D development with a growing number of patents awarded
- Awards & Honors: Guangdong High-Tech Enterprise Business Award, Guangdong Technologically Advanced SME Business Award, Guangdong Innovative SME Business Award, Guangzhou Pioneer Enterprise Business Award

Fluidized bed incineration system

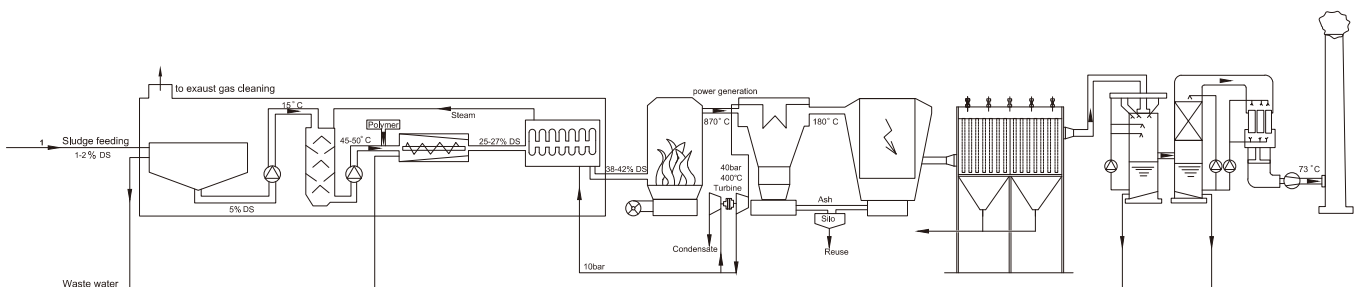
Chifeng sewage sludge treatment plant

- Start up: 2015
- Location: Inner Mongolia China
- Fuel Capacity: Sewage sludge 1.8 t/h (DM)

The first-ever integrated sludge treatment facility featuring the whole process of sludge dewatering, drying and incineration in China



- 70 plus FBI operating experience
- Incineration temperature approx. 870°C
- Suited for incineration of (mixture of) solid, pasty and liquid waste streams
- Auto-thermal incineration even with low heating value
- Delivered the world's largest single-line Fluidized Bed Incinerator for sludge (Throughput: 13.5 t/h (DM))
- Particularly used for the incineration of:
 - Sludge from communal & industrial waste water treatment plants
 - Waste from chemical industries
 - Waste from pulp & paper industries
 - Inferior coals, low-grade coals
 - Industrial, refinery & coal slurries
 - Bark, wood chips, rice husk and other biomass



Sludge pre-treatment

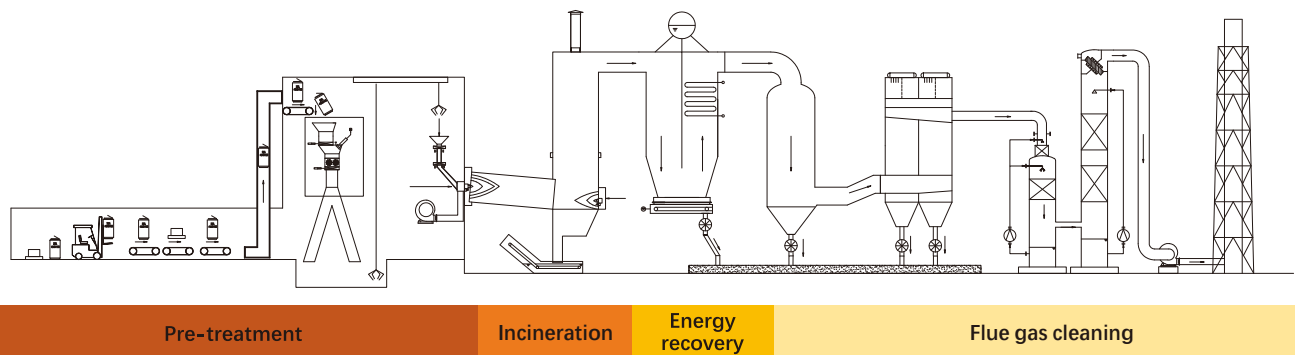
Sludge dewatering & drying

Sludge incineration, Energy recovery, Power generation, Flue gas cleaning

Rotary kiln & secondary combustion chamber system



- Applicable to a wide variety of waste types
- Used for solid, liquid & gaseous waste incineration
- Widely used in hazardous waste treatment center and chemical producers
- Achieving complete combustion via incineration process at 1'100°C and above
- High efficiency SNCR process
- High-level operational reliability and efficiency
- High availability with annual operating hours >7'200h, easy access for maintenance
- Cost-effective operation in line with low carbon, green growth



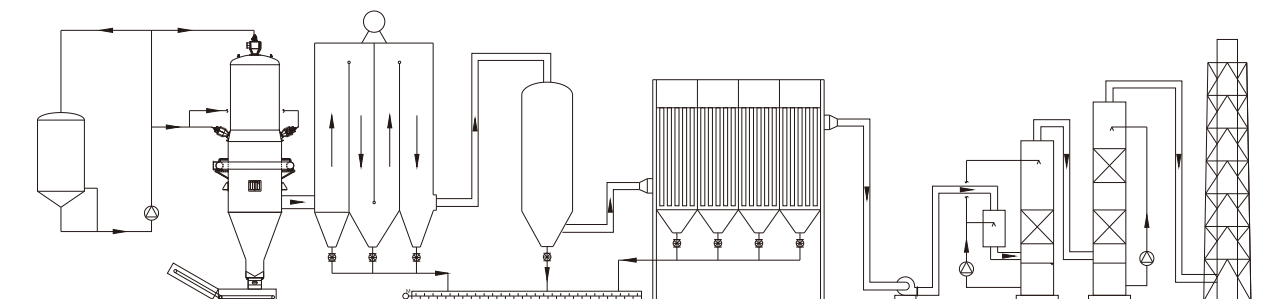
Static combustion chamber system

SCIP SITA waste services Co., Ltd

- Start up: 2017
- Location: Shanghai Chemical Industry Park
- Fuel capacity: Liquid waste 180 t/d + Off-gas 74'000 Nm³/d



- Used for liquid & gaseous waste incineration
- Achieving complete combustion via incineration process at 1'100°C and above
- High-level operational reliability and efficiency
- Highly automated operation
- Widely used in hazardous waste treatment center and chemical producers
- High availability with annual operating hours >8'000h, easy access for maintenance
- Cost-effective operation in line with low carbon, green growth



Pre-treatment

Incineration

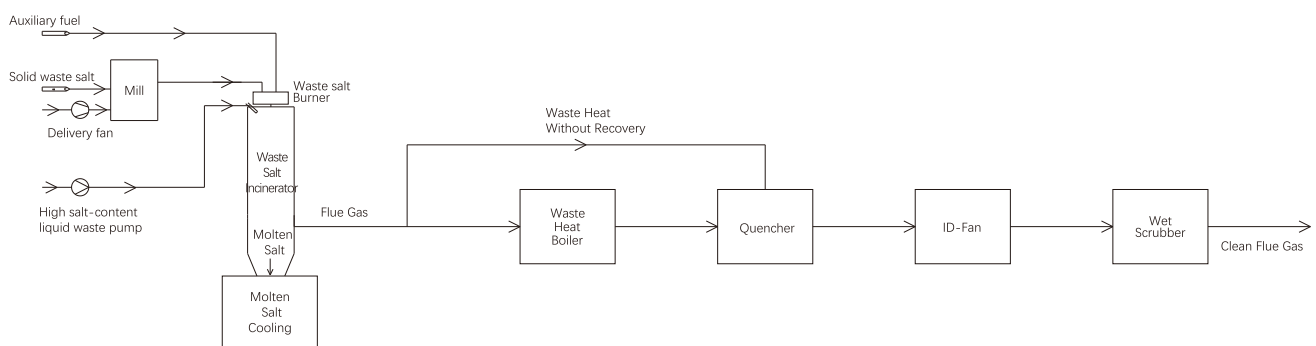
Energy recovery

Flue gas cleaning

Solid waste salt continuous incineration system



- Milling waste salt to less than 150 microns prior to incineration
- Achieving complete combustion of organic compounds within 0.5 second
- Supporting incineration of salty liquid and solid waste salt simultaneously
- Using waste liquid for fuel combustion to maximize cost efficiency
- Recovering heat from steam boiler
- Recovering industrial-grade salt with TOC<30 ppm
- Meeting emission standards for flue gas treatment
- Achieving zero liquid discharge from wastewater treatment



Pre-treatment

Incineration

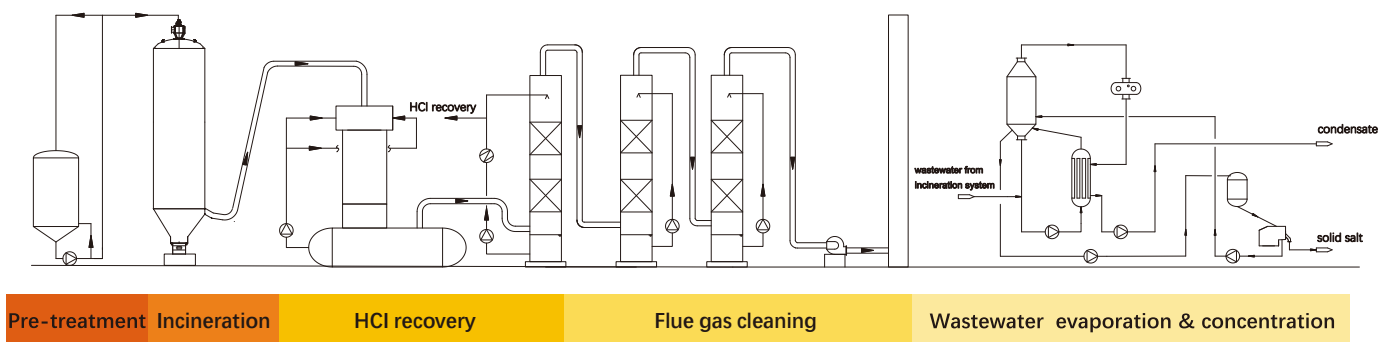
Energy recovery

Flue gas cleaning

High halogen concentrated waste incineration system



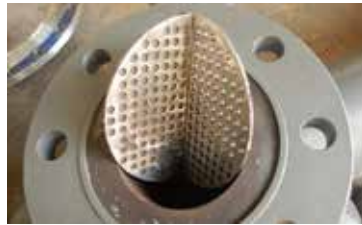
- Developing a refractory formulation suited to incineration of high halogen content waste with a proven track record
- Meeting emission standards for flue gas treatment by maintaining a longer residence time for flue gas ($RT \geq 3s$) in a flame zone with temperature above 1'200°C
- Recovering hydrochloric acid from flue gas treatment
- Reducing NO_x emissions to below 100mg/Nm³ via patented low nitrogen combustion technology and wet scrubbing de-NO_x process
- Achieving zero liquid discharge from wastewater treatment



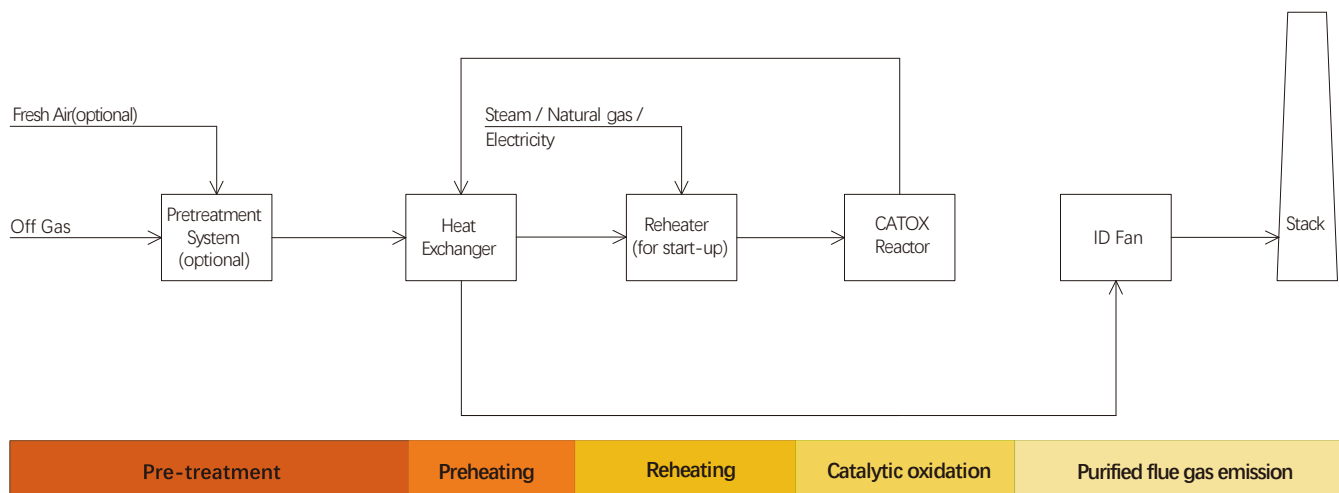
Catalytic oxidizer system

Catalytic oxidizer unit at Shaanxi Yanchang facility

- Year of Startup: 2012
- Location: Yulin City, Shaanxi Province, China
- Capacity: 126kg/h (hydrogen mixture off gas)



- Using catalyst reduces activation energy, accelerates oxidation at lower temperature and maintains self-sustaining combustion with low or moderate VOC's concentration, thus minimizing fuel consumption
- Treating off gas without an open flame ensures safe and reliable operation
- Less rotating equipment is required and continuous steady-state operating conditions are maintained, thus lowering equipment maintenance and lower cost
- No thermal NOx is generated, producing no secondary pollutants
- Highly automated system achieving autonomous operation
- The oxidation of VOC's takes place at much lower temperature compared to conventional thermal oxidizer, and for the thermal resistance requirement of the equipment is lower
- Compact and highly integrated designs allows for skid-mounted installation
- Catalytic oxidizer unit is widely applied in the treatment of VOC's in off gas, odor gas, and nitrogen seal gas



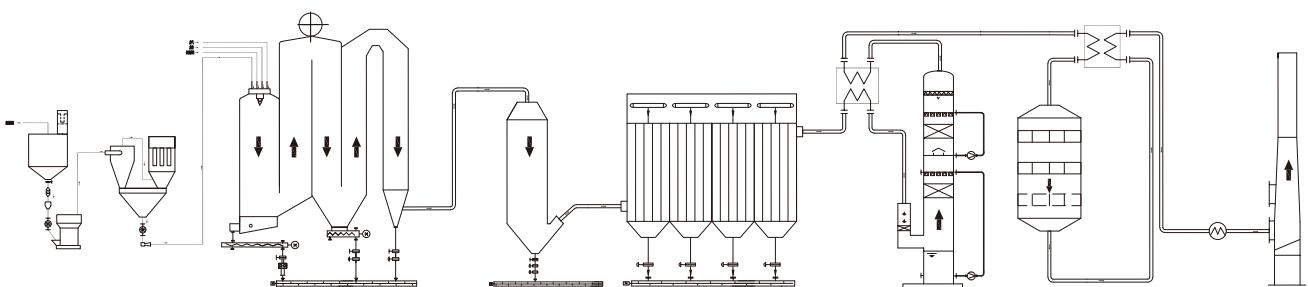
Integrated incineration boiler

Wanhua Chemical (Fujian) Isocyanate CO., LTD Waste-to-Energy (WtE) Unit

- Year of Startup: 2022
- Location: Fujian, China
- Capacity: Solid tar & waste liquid 22'000 t/a + off-gas 170'000'000Nm³/a



- Suited for incineration of waste liquid and off gas with high calorific value generated by petrochemical industries
- Co-disposal of solid tar, powdered activated carbon and high salinity wastewater
- Maximization of energy recovery and achieving high thermal efficiency while complying with national regulations and emission standards
- Less facility area required thanks to compact design, less material consumption and investment input as compared to conventional incineration system
- Achieving low NO_x combustion and lowering NO_x emission as compared to flue gas recirculation system



Pre-treatment

Integrated Incineration Boiler

Flue gas treatment system

Extract from reference list

More project information, please visit our website
www.raschka-engineering.com

S/N	Client	Place	Project overview
124	WANHUA CHEMICAL GROUP CO., LTD	Shandong China	Engineering and delivery of entire plant (EPC contract) for waste liquid and off-gas(2*75MW) Throughput: waste liquid 44'000t/a, off-gas 80'000'000Nm ³ /a
123	WANHUA CHEMICAL GROUP CO., LTD	Shandong China	Engineering and delivery of entire plant (EPC contract) for waste water, waste liquid and off-gas Throughput: waste water 9'440t/a, waste liquid 45'000t/a, off-gas 115'000'000Nm ³ /a
122	KUZUTOPLUKONUTINSAATA.S. &ALKATASINSAATVETAHHUTA.S.JV	Podgorica Montenegro	Engineering and delivery of Fluidized Bed Incinerator (FBI) Throughput: sewage sludge 4'400 (TS) t/a
120	JV COMPRISED OF UES HOLDINGS PTE. LTD & CHINA HARBOUR (SINGAPORE) ENGINEERING COMPANY PTE LTD FOR NEA	Singapore	Integrated Waste Management Facility (IWMF) Communal sludge dewatering and pre-drying, engineering of incineration process system, supply, commissioning and operation support (EPC contract) Throughput: sewage sludge 2*135 tDS/d
119	WANHUA CHEMICAL (FUJIAN) ISOCYANATE CO., LTD	Fujian China	Engineering and delivery of entire plant (EPC contract) for waste liquid and off-gas Throughput: hazardous waste 20'000 t/a
118	WANHUA CHEMICAL (FUJIAN) ISOCYANATE CO., LTD	Fujian China	Engineering and delivery of entire plant (EPC contract) for hazardous waste Throughput: solid tar & waste liquid 22'000 t/a, off-gas 170'000'000Nm ³ /a
117	SCIP-ANYO-SUEZ ENVIRONMENTAL TECHNOLOGY COMPANY LIMITED	Shanghai China	Engineering and delivery of entire plant (EPC contract) Throughput: 40'000 t/a
116	BEIJING HONGTENGWEITONG TECHNOLOGY CO.,LTD	Zhenhai China	Engineering/consulting for a waste liquid incineration system Waste liquid: 20 t/h
115	STANDARDKESSEL BAUMGARTE BIELEFELD FOR KENOW BREMEN	Bremen Germany	Engineering and delivery of Fluidized Bed Incinerator (FBI) Throughput: sewage sludge 55'000 t/a (DM)
114	NINGXIA RUITAI TECHNOLOGY CO., LTD	Ningxia China	Engineering and delivery of entire plant (EPC contract) for hazardous waste with high chlorine content Throughput: hazardous waste 21'000 t/a
113	JIANGSU RUIHENG NEW MATERIAL TECHNOLOGY CO., LTD	Lianyungang China	Engineering and delivery of entire-plant (EPC contract) for hazardous waste with high chlorine content Throughput: hazardous waste 20'000 t/a
112	SUEZ GO HIGHER ENVIRONMENTAL TECHNOLOGY (DONGYING) COMPANY LIMITED	Dongying China	Engineering and delivery of entire plant (EPC contract) of Hekou Blue Economy Industrial Park Solid Waste Treatment Centre Throughput: hazardous waste 30'000 t/a
111	NANTONG ACETIC ACID CHEMICAL CO., LTD	Nantong China	Engineering and delivery of entire plant (EPC contract) Throughput: hazardous waste 35'000 t/a
109	JIANGSU CHANGQING AGROCHEMICAL GROUP CO., LTD	Yangzhou China	Engineering and delivery of high F ⁻ content waste liquid incineration system Throughput: high F ⁻ concentrated waste liquid 9'000 t/a
108	WEIFANG XINLV CHEMICAL CO., LTD	Weifang China	Engineering, supply and delivery of entire plant (EPC contract) for salt waste Throughput: salt waste 4 t/h, waste liquid 1.3 t/h, off-gas 2'000 Nm ³ /h
107	NANTONG QIDONG INTEGRATED SOLID WASTE TREATMENT CENTER	Nantong China	Engineering and delivery of entire plant (EPC contract) for solid waste Throughput: 25'000 t/a

S/N	Item	Place	Project overview
106	SHANGHAI ZHONGXI PHARMACEUTICAL (GROUP) CO., LTD	Shanghai China	Engineering and delivery of entire plant (EPC contract) for waste liquid and off-gas Throughput: waste liquid 100 kg/h, off-gas 300 Nm ³ /h
105	SCIP SITA WASTE SERVICES CO., LTD	Shanghai China	Engineering and delivery of entire plant (EPC contract) for waste liquid and off-gas Throughput: waste liquid 180 t/d, off-gas 74,000 Nm ³ /d
104	JIANGSU CHANGQING AGROCHEMICAL GROUP CO., LTD	Yangzhou China	Engineering and delivery of entire plant (EPC contract) for hazardous waste from the plant Throughput: salt waste 40 t/d, hazardous waste 70 t/d
103	NORTHEAST PHARMACEUTICAL CO., LTD	Shenyang China	Engineering and delivery of entire plant (EPC contract) for hazardous waste from the plant Throughput: waste liquid 300 kg/h, solid waste 625 kg/h, pasty waste 292 kg/h
102	FORMOSA PLASTICS CORPORATION	Kaohsiung China	Basic and detail engineering and supply of special parts for a fluidized bed incineration plant Throughput: 2 t/h of industrial sludge and fibres (20-30% DM), waste oil 0.2 t/h
101	CHIFENG DERUN DRAINAGE CO., LTD	Chifeng China	Engineering and delivery of entire plant (EPC contract) for communal sludge dewatering, pre-drying, RASCHKA fluidized bed incinerator, heat recovery and flue gas treatment Throughput: sewage sludge 90 t/h (max.2% DM)
100	MEIHUA HOLDING GROUP LTD XINJIANG WUJIAQU PLANT	Urumchi China	Engineering and delivery of fluidized bed incineration plant with second combustion chamber, waste heat steam boiler, flue gas cleaning system (EPC contract) Throughput: liquid waste 15 t/h, sludge 4.4 t/h (15-20% DM), coal 2.5 t/h
98	STADT KARLSRUHE	Karlsruhe Germany	Engineering and delivery of RASCHKA special parts for the retrofit of the fluidized bed incineration plant #2 Throughput: sewage sludge 5.4 t/h (36% DM), WWTP residues 0.6 t/h (45% DM)
97	MEIHUA HOLDING GROUP LTD TONGLIAO MEIHUA BIO-TECH CO., LTD	Tongliao China	Engineering, supply, erection and commissioning of a fluidized bed multi waste incineration plant for the incineration of sludge from waste water treatment plant, waste coal and waste liquid Throughput: sewage sludge 3.125 t/h (20% DM), waste liquid 8.33 m ³ /h
96	LONZA GUANGZHOU NANSHA CO., LTD	Guangzhou China	Engineering and delivery of entire plant (EPC contract) for waste liquid and off-gas Throughput: 0 Zone off-gas 1'400 Nm ³ /h, waste liquid 9'000 t/a
88	KALOGEO ANLAGENBAU GMBH LEOBERSDORF	Leobersdorf Austria	Engineering/Consulting: elaboration of the process parameters and process alternatives, project and detail planning services for a fluidized bed incinerator Throughput: sewage sludge 5 t/h (33% DM)
83	GENTECH ENGINEERING & TRADING	Taipei China	Basic- and detail engineering and supply of special parts for a fluidized bed incinerator Throughput: coal conditioned paper sludge 16.1 t/h (35% DM)
69	SAMSUNG ENGINEERING CO., LTD	Seoul Korea	Engineering, partial supply for a fluidized bed incineration plant, personnel dispatch Throughput: paper sludge, waste and rejects 15.7 t/h (35-40% DM)
67	INNOVATHERM GMBH	Lünen Germany	Approval planning, engineering, supply, erection and commissioning of the fluidized bed incinerator, two sludge hoppers and feeding system and ash cooling and transportation for a sewage sludge incineration plant Throughput: 13.5 t/h (DM) of coal-conditioned sewage sludge corresponding to a TC of 37 MW
63	LANDESHAUPTSTADT MÜNCHEN	München Germany	Approval planning, engineering, supply, erection and commissioning of two fluidized bed incinerators for the sewage sludge incineration plant Throughput: each 3 t/h of sewage sludge (referring to DM)
39	LANDESHAUPTSTADT STUTTGART	Stuttgart Germany	Engineering, supply, erection, commissioning of the fluidized bed incinerator, waste heat steam boiler and electrical and process measuring and control system for the fluidized bed incineration plant (Plant #2, s.b.) Throughput: sewage sludge 18.2 t/h (22% DM), WWTP residues 1.0 t/h (15% DM)
19	HAMBURGER AG	Pitten Austria	Engineering, partial supply, commissioning of a fluidized bed incineration plant Throughput: brown coal patent fuel corresponding to a TC of 67 MW
5	LONZA AG	Visp Switzerland	Engineering, supply, erection, commissioning of a fluidized bed incineration plant Throughput: sewage sludge 5 t/h (15% DM)

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