

Nuremberg waste incineration plant.



Entered service: 2001, Capacity: 3×10.5 Mg/h

Nuremberg waste incineration plant – an environmentally optimized facility.

In the early 1990s, the City of Nürnberg (Nuremberg) began to consider how its existing waste treatment facility could be replaced, as it would have to be around the turn of the century.

The city and the EWAG Energie- und Wasserversorgung AG formed a consortium, TAN Thermische Abfallbehandlung Nürnberg GmbH, to implement the project. TAN was commissioned with planning, financing and implementing the new waste treatment plant.

A variety of candidate technologies were thoroughly evaluated, and the decision fell on grate incineration with state of the art engineering and environmentally optimized flue gas treatment.

A central site in the Nuremberg railway triangle "Gleisdreieck", close to the old facility and the EWAG works, was chosen. Because the new facility lay near the center of the city, its architectural design was a critical point.

Construction got under way in 1998, and the new plant finally came on stream in 2001.

State of the art technologies for extensive recovery and recycling of various materials.

The plant handles approx. 204,000 Mg of waste annually, in three process trains – each with a capacity of 10.5 Mg/h. Waste is incinerated on a water-cooled reciprocating Von Roll grate. Most modern infrared technology aids in combustion control.

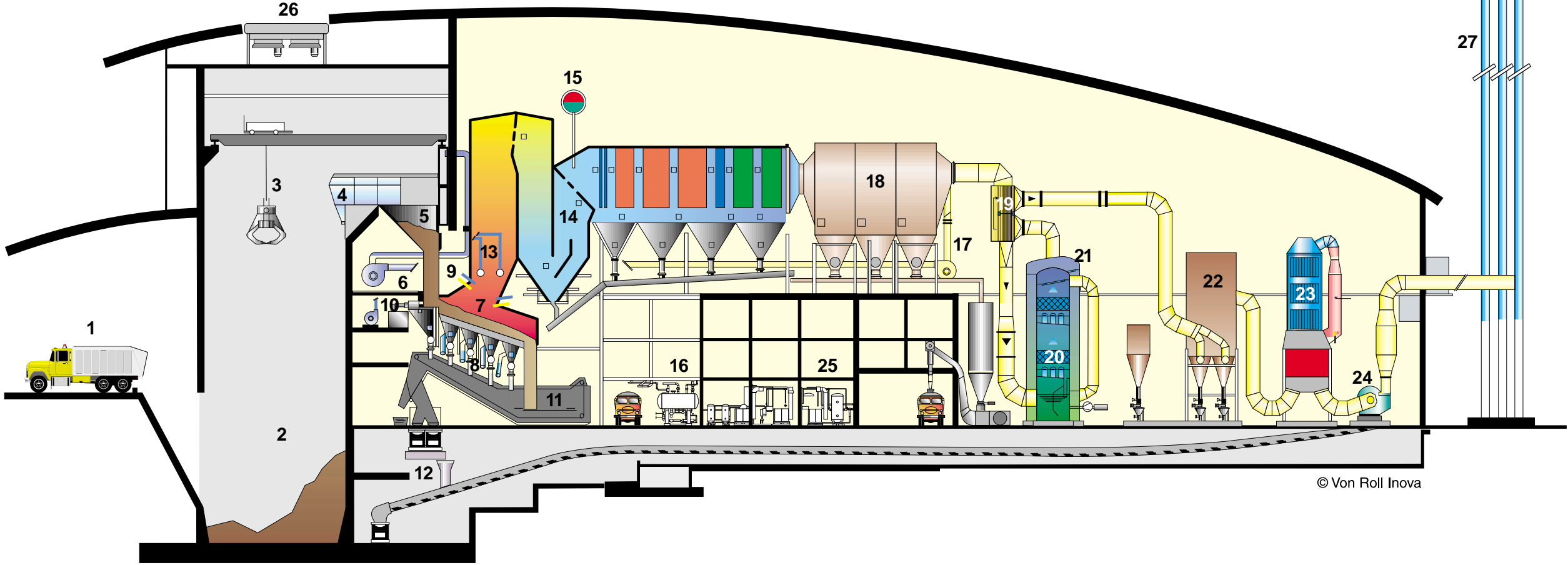
Slag is conveyed to an interim storage building and ultimately transported by rail to an off-site slag conditioning facility.

To recover the greatest possible amount of marketable materials from the flue gas, the treatment system consists of several distinct components.

The system includes an electrostatic precipitator, an acid scrubber and a neutral gypsum scrubber for the separate removal of acidic

components and heavy metals. In the next step, organic pollutants (such as dioxins and furans) and residual heavy metals are separated in an entrainment unit to which a mixture of activated carbon and hydrated lime is added. Nitrogen oxides are removed catalytically in the last stage.

Treatment of the acid scrubber effluent yields 30% hydrochloric acid, while gypsum is recovered from the neutral scrubber blowdown; both products are marketable. A mixture of various salts is obtained by evaporation of the residual saline solution. Energy liberated by waste incineration is forwarded to EWAG, which uses it for electric power and district heating.



Waste delivery and storage

- 1 Truck unloading area
- 2 Waste storage pit
- 3 Overhead crane
- 4 Crane operator pulpit

Incineration, slag, energy recovery

- 5 Feed hopper
- 6 Primary air
- 7 Reciprocating grate (water-cooled)
- 8 Primary air distribution
- 9 Secondary air
- 10 Ram feeder
- 11 Wet deslagger
- 12 Slag discharge
- 13 Auxiliary burners
- 14 Four-pass steam generator
- 15 Steam drum
- 16 Condensate tank
- 17 Flue gas recirculation

Flue gas purification and residues

- 18 Electrostatic precipitator
- 19 Gas-to-gas heat exchanger
- 20 Acid scrubber
- 21 Neutral scrubber
- 22 Adsorbent entrainment process
- 23 SCR catalyst
- 24 Induced draft fan
- 25 Electrical and control center
- 26 Water cooling system
- 27 Stack

General project data	Owner	TAN Thermische Abfallbehandlung Nürnberg GmbH
	Operator	ASN Abfallwirtschaft und Stadtreinigungsbetrieb Nürnberg
	On-stream date	2001
	Total project cost	approx. 243 million euro
	Provided by Von Roll Inova	Management of the consortium
	Intended service	Incineration, flue gas treatment, wastewater treatment with gypsum recovery, evaporator unit, hydrochloric acid recovery unit, waste handling cranes, slag loading system
		Incineration of municipal and industrial wastes
Specification	Capacity	204,000 Mg/a
	Heating value	12 MJ/kg
	Installation	3 incineration trains with flue gas and wastewater treatment
	Thermal capacity	3 × 35 MW
	Availability per unit	7000 h/a
Size reduction of bulky waste	Type	Shears
Feed system	Type	Von Roll ram feeders
Incineration system	Type	Aquaroll reciprocating grates, 8 m × 4.8 m
	Combustion temperature	850 to 1000 °C
	Auxiliary firing	Natural gas support burners
Slag handling system	Type	Von Roll wet deslaggers
Steam generator	Type	Four-pass steam generators
	Steam capacity	3 × 41 Mg/h
	Steam temperature	400 °C
	Steam pressure	44 bar
Energy recovery	Electric power	60,000 MWh/a
	District heating	400,000 MWh/a } in power plant
Flue gas purification	Type	Electrostatic precipitators, acid scrubbers, neutral scrubbers, bag filters with adsorbent metering, catalysts, induced draft fans
Hydrochloric acid recovery	30% hydrochloric acid	approx. 3,800 Mg/a
Gypsum precipitation and recovery	Gypsum	approx. 1,000 Mg/a
Evaporator	Mixed salts	approx. 800 Mg/a

vonRoll INOVA

Von Roll Environmental
Technology Ltd.
Hardturmstrasse 133
P.O. Box 760
CH-8037 Zurich
Telephone +41 (0)1 277 11 11
Telefax +41 (0)1 277 13 13