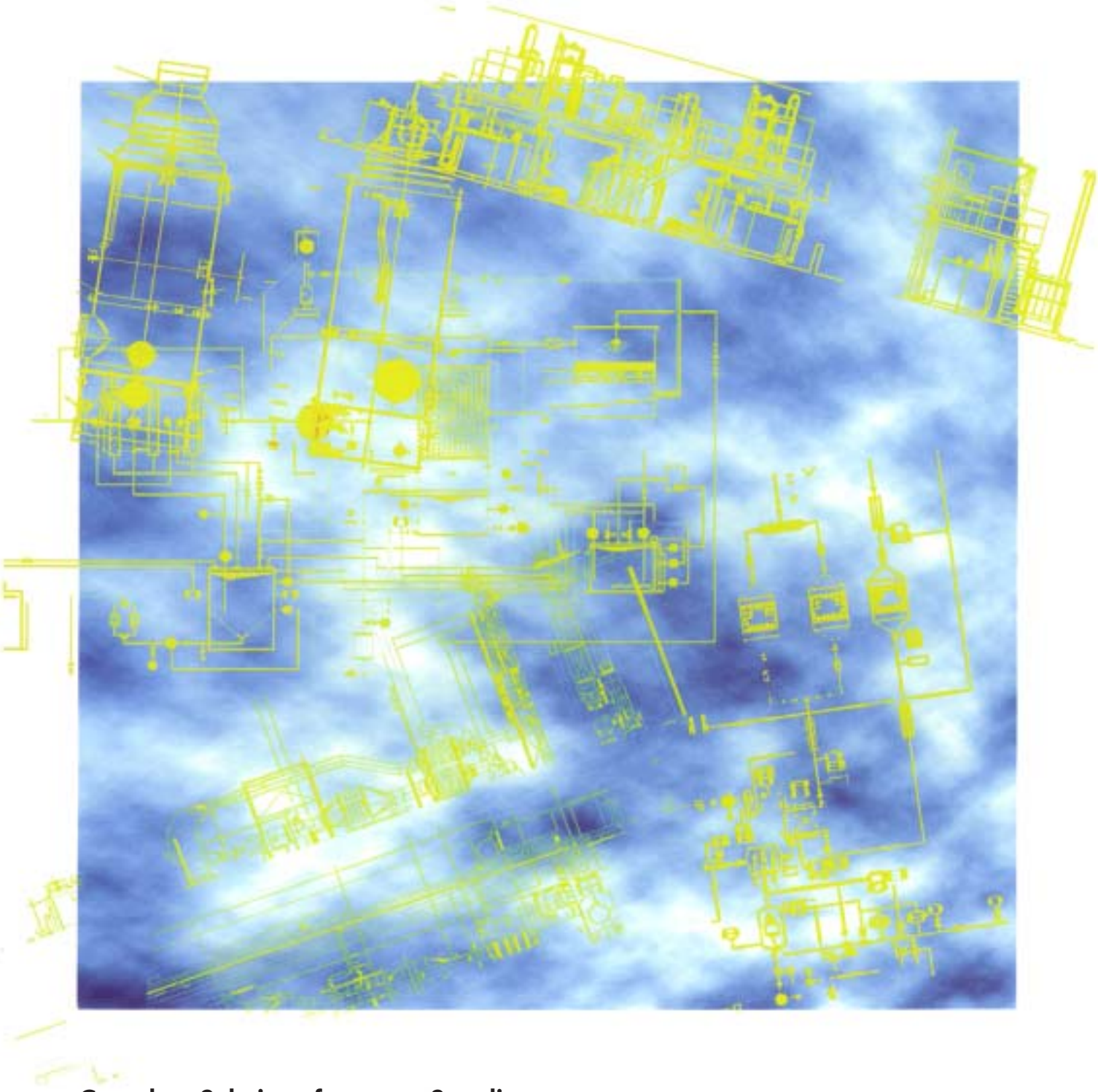
EQUIPMENT ENGINEERING

STEULER
Anlagenbau GmbH & Co. KG



Complete Solutions from one Supplier

Flue Gas Purification for Process Waste and Special Waste Incineration Applications

Flexibled solutions through modular designs

Environmental Technologies from one Supplier

Flue Gas Purification Systems: Based on the Steuler Know-How

STEULER flue gas purification systems have been proven in many different fields of application. Our vast experience has confirmed us to be one of the market leaders in this type of technology, with operational experience over many years. The research and developments undertaken by STEULER will ensure you can meet all current and future emission limits. STEULER provide high efficiency systems with low investment, operating and maintenance costs, with the emphasis being placed upon the safety of operation and ease of maintenance.

Local authorities (LA), the Integrated Pollution Prevention and Control (IPPC) and other environmental groups are forcing industry to reduce flue gas emissions from process and special waste incineration plants. Flue gases containing SO_2, HCL, HF, NOx, Dust, Heavy metals and organic compounds such as Dioxins and Hydrocarbons (VOC) in various concentrations can be described as being harmful substances.

STEULER also offer flue gas purification with reusable matter as end products, it should be noted that spent catalyst can also be recycled for use in other industries, STEULER can offer written documentation as to the disposal of any waste catalyst material.

Modular Systems – Allow Optimisation of each Installation

Based on well-known processes and plant components that have been well tested in practice for many years, the STEULER modular flue gas treatment con be tailor mode to our customers needs.
STEULER can provide a full turnkey facility, from the initial order we would provide all the engineering drawings, installation and inspection, operational and set-up training along with full service back up. STEULER modular systems provide a unique opportunity to upgrade or retrofit your plant should stricter emission levels be required.

The Benefits: Reduction of Operating Costs Minimisation of Residual Materials

- Using STEULER experienced technical engineers reduces the planning and delivery times thus ensuring maximum safety procedures are adhered to
- Full and extensive range of Products, proven over 10 years
- Modular systems con be installed in new or retro-fit applications
- Upgrading of old systems are mode easy With the Modular design
- Large organisation employing nearly 1000 people

Dust Separation and Flue Gas Conditioning

A spray drier with quencher to dilute the waste and to treat the flue gas for the subsequent dust seperator.

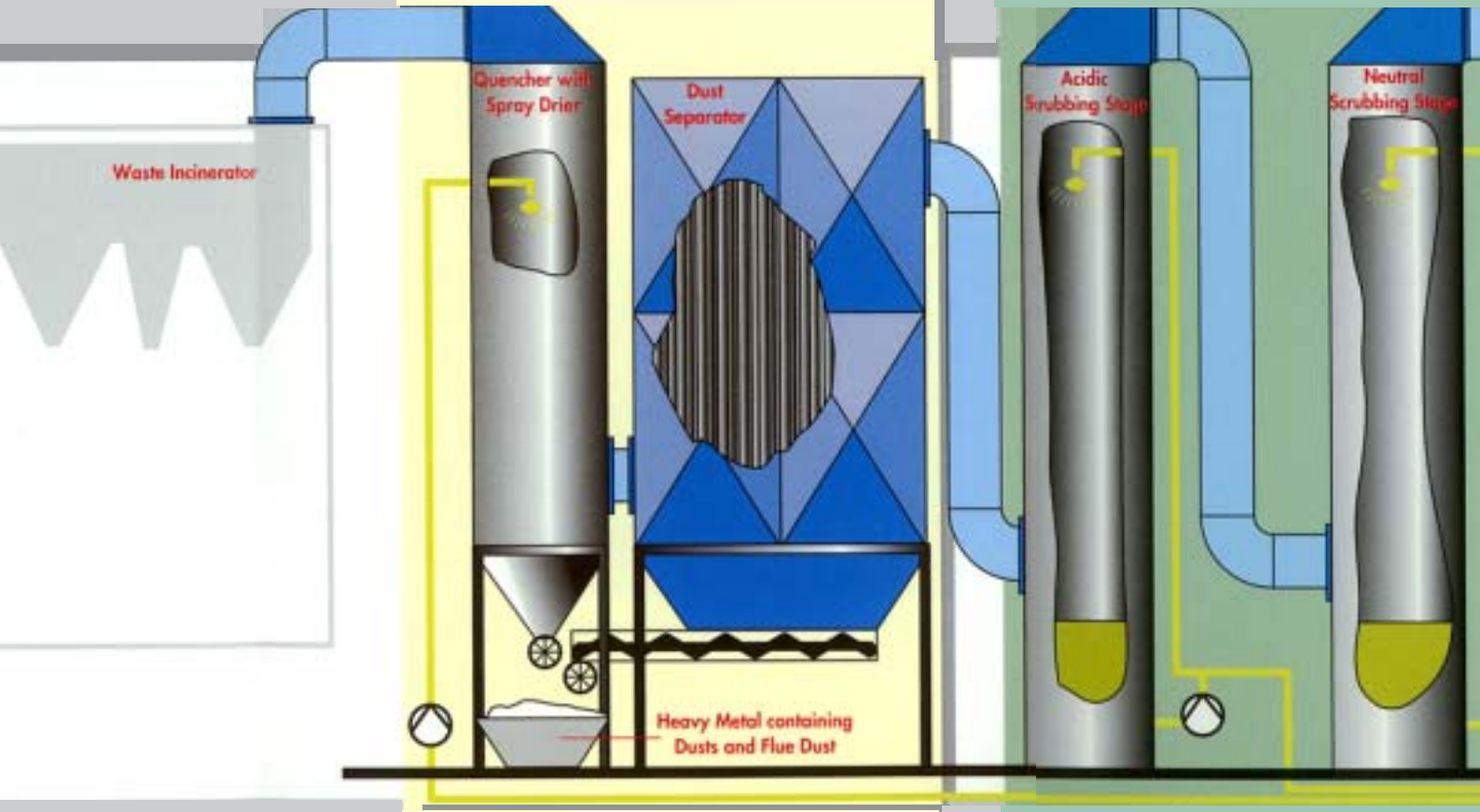
Fibrous and electrostatic filter for separation of dusts, salts, metals and soot along with the simultaneous separation of gaseous pollutants by metering additives.

Absorption Technology

For the absorption of gaseous pollutants different types of water scrubber technologies can be offered:

- Free space scrubber
- Packed srubber
- Cappillary tray scrubber
- Aerosol seperator

The scrubbers can be designed as single or multistage units depending upon the pollutant emission values and the residual materials required. The scrubbers can be used for acidic, neutral or alkaline operations.
As absorbent water, the following chemicals can be used, NaOH, Na_2, CO_3, CaO, $Ca(OH)_2$, or $CaCO_3$, the quencher is installed in the scrubber inlet to cool the flue gases to the desired temperatures.



- High separation rates of solids
- By metering additives gaseous pollutants are separated
- Minimum downtime periods, with high safety operational procedures
- Minimum quantity of dry residual materials
- Any residual material remaining are returned to the combustion process

- High reduction of gaseous pollutants and heavy metals
- Conversion of the pollutants into reusable matter
- Low water and chemical consumption
- Components are made of corrosion free Material
- Minimum quality of residual materials and waste water
- Minimum downtime periods, high safety standards with low operating and maintenance costs
- Low space requirement

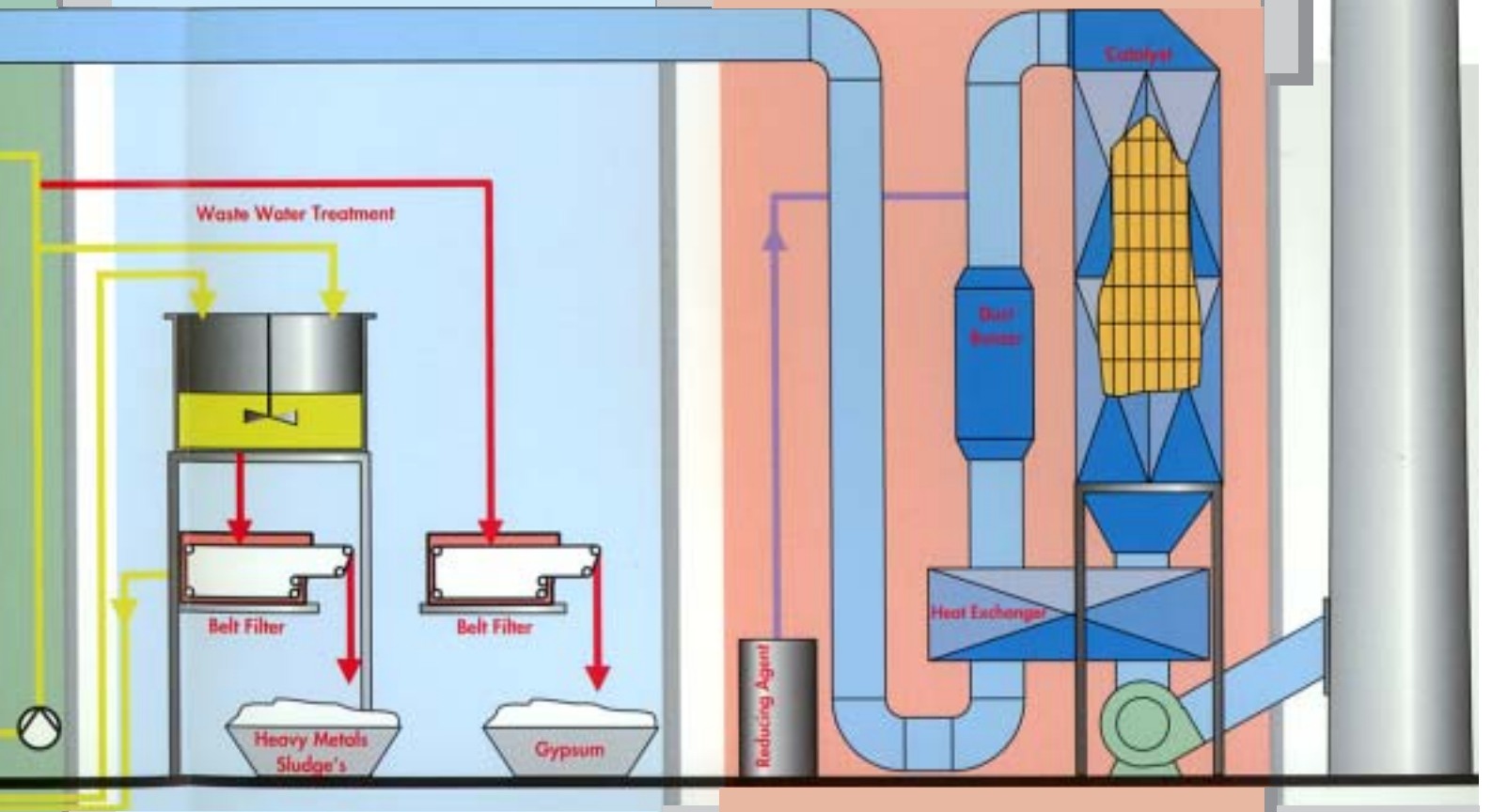
Waste Water Treatment and Regeneration Technology

Many different systems can be applied:

- Separation and dehydration of gypsum
- Waste water neutralisation and precipitation of heavy metals
- Filtration for separation and dehydration of heavy metals and solids
- Reverse osmosis and electrodialysis for salt separation and water recovery
- Electrodialysis with bipolar membranes to split the salts into the respective acid and base while recovering the absorbent

Catalyst Technology

STEULER have been manufacturing and installing both SCR and Oxidation catalyst since 1980, this catalyst technology has been used to significantly reduce pollutants such as NO_x, CO, CH_x and dioxins into their natural constituents, nitrogen, carbon dioxide and water. The STEULER catalyst are fully recyclable and can be used to manufacture new catalyst or added to compounds in the glass or cement industry.
SCR Catalyst for NO_x reduction: STEULER use different types of SCR Catalysts utilizing urea or ammonia as reducing agent. SCR Catalysts are also decomposing Dioxins and Furans.
Oxidation Catalyst for CO and CH_x reductions: Oxidation catalyst convert Carbon Monoxide (CO) and Hydrocarbons (CH_x) into Carbon Dioxide (CO_2) and Water (H_2O)



- Recovery of raw materials
- Reduction of the residual materials produced
- Recovery of the absorbent and the water
- Operation exempt from waste water
- Low operating costs due to the small quantity of residual materials that have to be disposed

- High reduction of pollutants
- No waste products produced
- Suitable for a wide temperature window ranging from 270 °C up to 525 °C, for various applications, low temperature stert up catalyst available to operate at 160 °C.
- Simultaneous decomposition of NO_x dioxins and furans.
- Stoichiometric consumption of the reducing agent urea or ammonia
- Simple plant construction, ensuring minimum downtime periods with a safe operational maintenance procedure
- Low investment costs and operating costs

Proven Flue Gas Purification Systems:

- Special waste incineration plants
- Process and waste water treatment plants
- Crematories, hospital incineration units
- Combustion plants for chemical waste
- Sewage sludge combustion plants
- Mixed acid and pickling lines, galvanizing industry
- Other firing systems

SCR/Oxidation catalyst to reduce NO_x, CO, CH_x, dioxins and furans

Mixed acid regeneration system

Thermal combusion chamber, heat exchanger, porticulate filter and wet scrubber downstream of a special waste incinerator

$DESO_x$ scrubber downstream of a rotary kiln with gypsum as end product

Steuler – your system partner with the connected know how

- **Surface treatment facilities** with integrated environmental protection to improve quality, increase throughput and lower operating costs.
- **Single and multiple wire lines** for galvanic and electrolytic coating offering high throughput, requiring little space and maintenance.
- **Regeneration plants** using membrane technology to recover water, acids, alkalis and metals from rinse water, spent acids, waste and treatment solutions.
- **Waste water treatment facilities for industrial water** with complete water recycling and disposal concepts for the residual materials.
- **Catalytic exhaust gas treatment facilities** for the conversion of NO_X, CO, CH_X, NH_3 dioxins and furanes into their natural components N_2, CO_2, und H_2O using fully recyclable zeolite catalyzers.
- **Absorption facilities** to separate and break down the hazardous substances HCl, HF, SO_X, aerosols, sublimates and heavy metals into raw materials.
- **Waste-water-free flue gas purification facilities** conforming to the German Clean Air Act and all pertinent regulations (17. BImSchV. and TA-Luft) for power stations, combustion engines, waste and hazardous waste incineration plants, process gases, etc. with recycling of residual materials.

Flexibled solutions through modular designs

TÜV CERT
DIN ISO 9001 / EN 29001

STEULER
Anlagenbau GmbH & Co. KG

- ☐ Refractory Systems
- ☐ Surface Protective Systems
- ■ Equipment Engineering
- ☐ Plastics Engineering
- ☐ Tiles/Design Ceramics

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