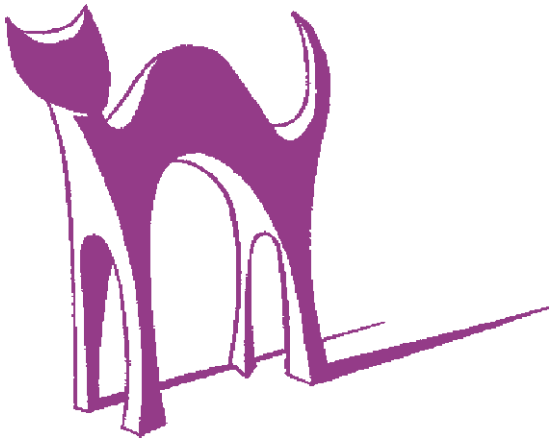
It's Up To Date



PLASMACAT®

Clean air at low cost

It's Up To Date

PLASMACAT exhaust air cleaner

PLASMACAT uses extremely efficient technology to clean exhaust air by excitation in an electrical alternating voltage field with a follow-up catalytic converter. The main advantages - apart from low operating costs - are the high purity of the treated gases and the control and operating-friendliness of the plant.

Applicational areas

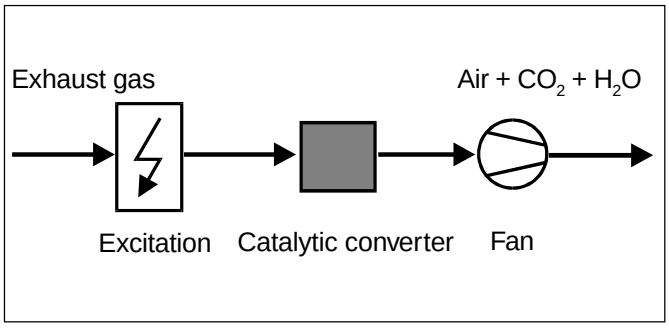
- ✓ Odour elimination
- ✓ Smoke elimination
- ✓ Cleaning of supply air
- ✓ Sterilization
- ✓ Elimination of solvents in exhaust air flows

PLASMACAT for odour elimination at an effluent treatment plant

Description of process

The PLASMACAT process consists of two stages: First the pollutant molecules are made to react readily in the excitation unit and after this they are converted into harmless substances in a contact catalyst (e.g. hydrocarbons are converted to H_2O and CO_2). Both stages operate at room temperature or at the actual temperature of the exhaust air such that no heat energy has to be added to - or removed from the gas. This is the main reason for the extremely high energy efficiency of the PLASMACAT process.

The energy required for exciting the molecules is generated by a strong electrical alternating field of several thousand volts inside the excitation chamber. As the electrons and gas molecules collide, positively and negatively charged ions, free electrons and other gas molecules are generated. Thanks to the special design of the excitation unit only very little energy is lost during these processes. The intermediate products, which are formed in the excitation unit, depend on the composition of the exhaust air and the electrical field strength. They usually only have a very short life-span and are therefore oxidized or reduced in the catalytic converter directly after the excitation process.



Flow diagram of the PLASMACAT process

In this process the organic and many of the inorganic substances are broken down. In many cases the purity is so high following treatment that the treated«exhaust air» can be reused as room air, for example in production shops.

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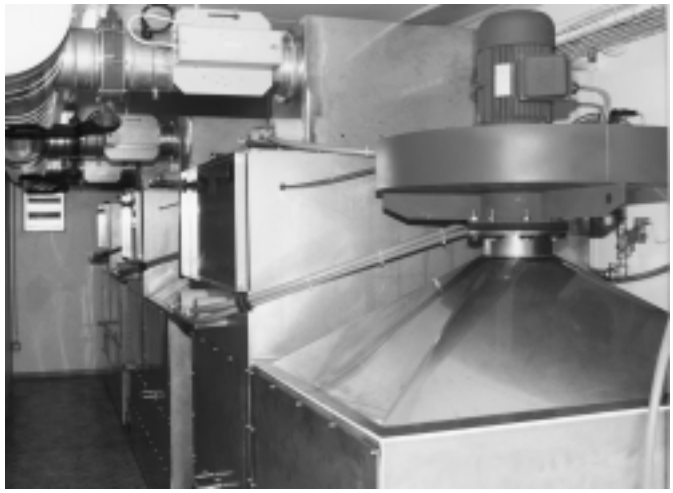
Properties

- **For any volumetric flow level**
  Thanks to the simple, modular design of the plant an efficient application can be guaranteed for volumetric flows from 20 m^3 per hour right up to several hundred thousand m^3 per hour.
- **Universal**
  The possible applications include organic and many inorganic, gaseous compounds.
- **Operator-friendly**
  The plant can be switched on and off at any time, no heating up or adaptation time etc. is required.
- **Reliable**
  The process is not sensitive to variations in concentration or changes in the composition of the exhaust air. High operating safety is provided by the low-maintenance plant technology and the simple operation (only an ON/OFF switch). In addition remote control and remote monitoring can also be provided.
- **No need to dispose of undesirable by-products**
  The pollutants in the exhaust air are converted to non-toxic, odourless substances, which can normally be discharged directly into the atmosphere or the sewage system.
- **Low maintenance and running costs**
  The plant requires only minimal expenditure on maintenance and the energy consumption is very low.
- **Tested**
  Several plants are already in operation in various fields. They prove the high efficiency and economic operation of the system.
- **Pilot plant testing possible**
  Mobile pilot plants are available for trials on site or in a testing laboratory.

PLASMACAT mounted in a container and positioned on a roof as a complete plant



PLASMACAT units with integrated fan

Advantages over competitive processes

In many cases thermal or catalytic incineration is not economic due to the low calorific value of the exhaust air - particularly if the heat energy cannot be reused. Moreover in the case of incineration additional contamination is discharged into the atmosphere from the fuel in the combustion gases which at least will contain large amounts of CO_2 plus CO and nitrogen depending on the process used.

The use of activated carbon or other adsorbents brings with it the problem of having to dispose of the adsorbent materials or significant costs for regeneration. In all adsorption processes there is the additional need to monitor the process for free capacity which is not an easy problem to solve.

Biofilters cannot be used universally. If there is a change in the composition and/or concentration of the exhaust air a relatively lengthy period of adaptation is necessary. Continuous feeding is also necessary for a successful operation and toxic substances (biocides) must be excluded. Formaldehyde or small molecular hydrocarbons (e.g. methane), amines and general solvents are all problematic in average to high concentrations. Apart from these disadvantages and restrictions, biofilters also require a large amount of space and are very heavy. The service life of the biomass is often very low and requires a lot of work as well as causing disposal problems when it is exchanged.

Oxidizing agents such as peroxide, permanganate, dichromate, chlorine or ozone are extremely expensive since large amounts are required for the treatment of the exhaust air. In addition certain oxidation products (e.g. manganese and chrome) have to be disposed of. Often the oxidizing agents can only be used in the liquid phase and/or require additional activation with UV or ultrasound.

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Awards received

- Environmental prize at the MUT (International Environmental Technology Exhibition) in Basle in 1995 (Pro Aqua-Pro Vita Foundation)
- Environmental prize from the Foundation for Nature and the Environment
- Prize winning entry in the competition «Switzerland - Technological Centre»

Applicational examples

- Odour elimination in the food industry through the oxidation of amines, aldehydes, fatty acids and hydrogen sulphide.
- Odour elimination in sewage treatment and composting plants.
- Odour elimination in the storage and processing of meat, fish and carcasses.
- Elimination of exhaust gases from the processing of water-based paints and dyes.
- Generation of pure air for buildings and special applications.
- Sterilization of air.
- Decomposition of small concentrations of solvents such as aldehydes, ketones, esters, ether etc. for example in the painting, dying and printing industries.

Please make contact with us - even if your application is not listed - and we will be happy to check out the applicability of the PLASMACAT process.

Technical data

Concentration range

Depending on the pollutant it is theoretically suitable for concentrations of hazardous substances up to the lower explosion limits. It is generally more economic for smaller to average concentrations.

Energy consumption

Depends on the pollutant and the concentration. We calculate an energy consumption for excitation purposes of 0.5 to 3 Wh per m^3 of treated air. To this must be added the power required by the fan.

Mobile PLASMACAT pilot plant

Services from Up-To-Date

Concept, design and installation of complete turnkey solutions for all the known processes in the exhaust air field.

- Consultation
- Engineering, planning, construction and commissioning (also as general contractor).
- Service and maintenance
- Special developments, laboratory trials
- Site trials

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