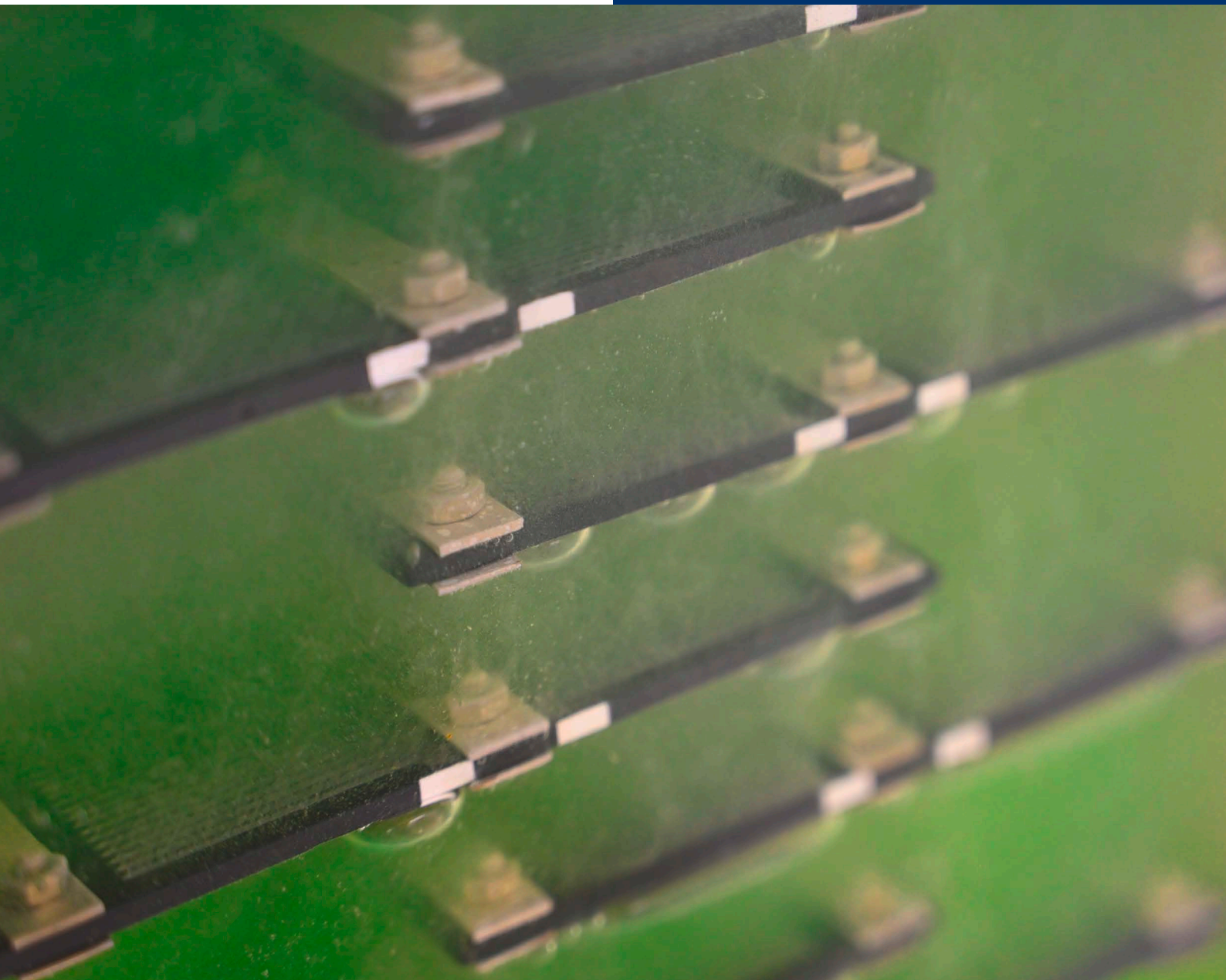


ClearFox® DiOx Advanced electrical Oxidation Process

Advanced technology for
wastewater treatment with boron-
doped diamond electrodes

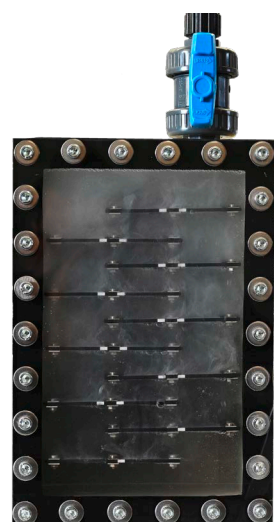
ClearFox® 
be clever

clearfox.com



The **ClearFox® DiOx** module is an advanced electrical oxidation process for treating complex wastewaters containing persistent substances, metals and organics. The core components of the DiOx module are boron doped diamond electrodes. These require only electrical energy to treat the wastewater, with no chemicals or other consumables required.

Wastewater treatment with an electrical oxidation process to remove persistent substances.



100%

COD-Removal. Complete oxidation of the COD present in the wastewater.



ClearFox® DiOx

The ideal solution for industrial and municipal wastewater treatment.

The applications

The ClearFox® DiOx is suitable for both industrial and municipal wastewater treatment.

Industrial wastewater treatment

The diamond electrode is particularly suitable for the oxidation of substances that are difficult to degrade. It is used where biological, chemical and physical wastewater treatment reaches its limits. After treatment, the wastewater is suitable for direct discharge. Industrial plants with heavily contaminated wastewater are:

- Landfills
- Dye works
- Oil and gas industry
- Mining
- Pharmaceutical industry
- Plastic recycling
- Printing companies
- Automotive industry
- Semiconductor industry
- Refineries

Municipal wastewater treatment

The ClearFox® DiOx is an ideal solution for the fourth purification stage in municipal wastewater treatment. This additional stage is particularly important for the removal of micropollutants such as

- Drug residues
- Hormones
- Pesticides
- PFAS

The advantages

Up to **100% COD reduction**

Suitable for highly **complex wastewater**

Treats wastewater **exclusively with electricity**

Modern technology

Installation in **containers** possible

Easily expandable

No chemicals required for operation

For **industrial and municipal wastewater**

No sludge accumulation

Fully automatic operation

Fast installation and commissioning

High efficiency in pollutant removal

No ozone storage required

Available as **containerised DiOx** or in **plastic tanks**

No odour development

Registered and protected

ClearFox® DiOx

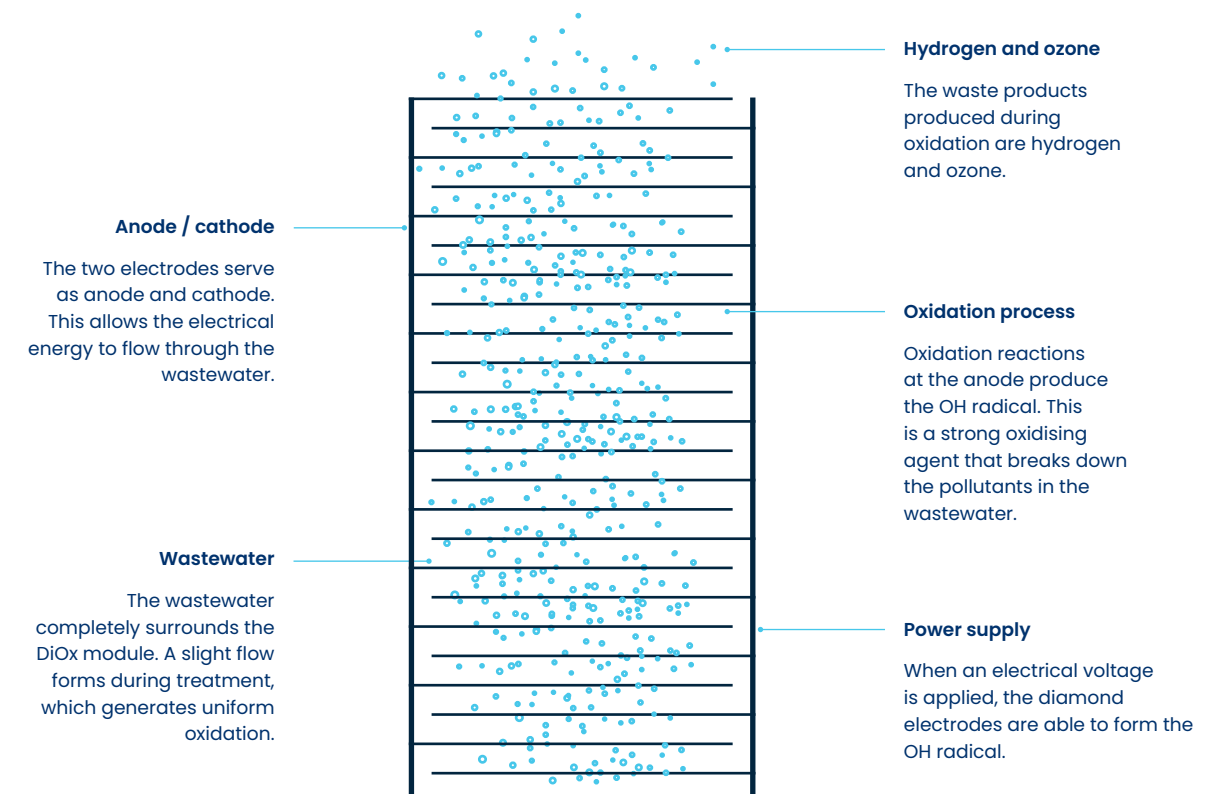
Advanced and powerful. Just clever.



ClearFox® DiOx Module
Advanced wastewater treatment with an electrical oxidation process

ClearFox® DiOx

The modern, highly efficient oxidation process.



Container-DiOx

The modular solution for large wastewater volumes

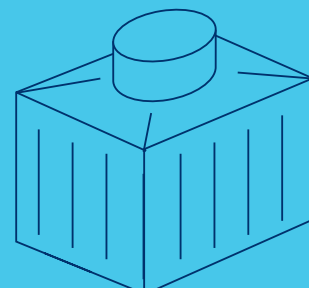
ClearFox® DiOx is available as a containerised module to treat large volumes of wastewater. A buffer tank equalises the inflow peaks and transfers the wastewater evenly to the DiOx modules. Any number of containers can be used for larger volumes.



DiOx in a small reactor

The individual solution

ClearFox® DiOx is available in smaller batch or continuous flow reactors. These can be customised for use in smaller applications or for pilot testing. Ideal for smaller industrial wastewater flows, or for the treatment of smaller flows of concentrate from membrane processes in municipal wastewater treatment.



The ClearFox® DiOx module is an **advanced oxidation process** for treating wastewater with a high organic load. The core components of the DiOx module are **diamond electrodes**, which are coated with diamond crystals just a few micrometres thick. Boron doping during the coating process converts the diamond into an electrode material. This enables high treatment efficiency, as only a small amount of electrical energy is required.

A module consists of two electrodes – with one electrode acting as the anode (positively charged) and the other electrode as the cathode (negatively charged). When **electrical voltage** is added, the oxidation reaction is triggered. The water molecule (H₂O) that touches the anode is converted into a **strong oxidising agent**, such as the hydroxyl radical. The efficiency of hydroxyl radical production depends heavily on the material of the anode. Boron-doped diamond is particularly effective in the production of hydroxyl radicals as it has a high potential for radical development.

Hydroxyl radicals are highly reactive molecules. These radicals are effective in breaking down organic and inorganic contaminants. When hydroxyl radicals encounter pollutant molecules, they either oxidise directly or break down into less harmful molecules. These reactions typically take place very quickly. As hydroxyl radicals react non-specifically, they break down a **wide range of pollutants**.



Pilot testing? No Problem!

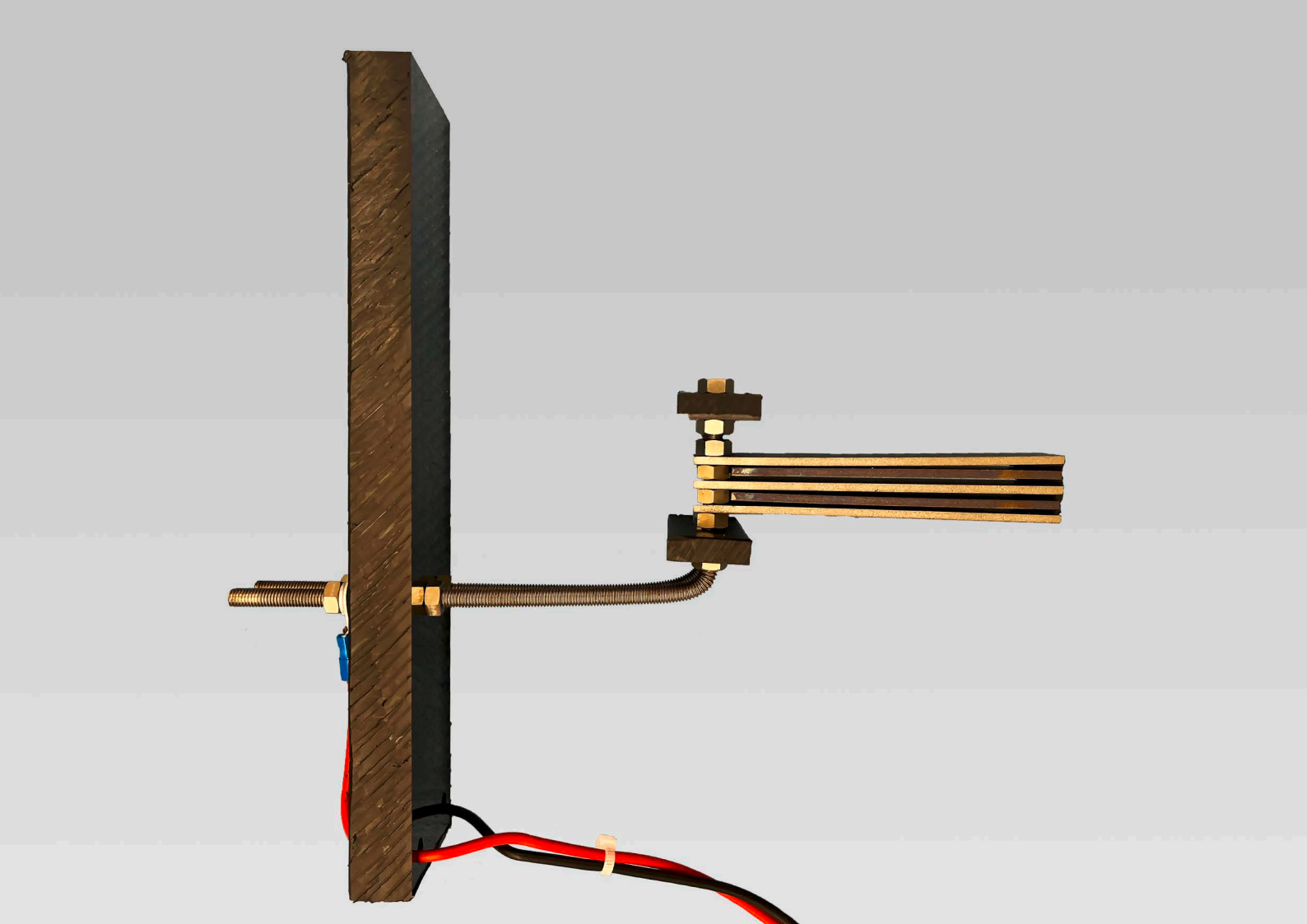
PPU provides a comprehensive range of flow reactors for laboratory and pilot scale applications. For wastewater testing, the lab-scale treatment plants provide a precise and efficient way to evaluate different methods under controlled conditions.

PPU Umwelttechnik GmbH places great emphasis on providing pilot-scale wastewater treatment plants that bridge the gap between laboratory research and full-scale implementation. These reactors make it possible to test the effectiveness and efficiency of wastewater treatment processes under real conditions, but in a controllable and scalable framework.

We are happy to advise you!

Specifications of the ClearFox® DiOx at a glance

	DiOx 1.0	DiOx 2.0	DiOx 3.0
Number of electrodes	5	10	15
Max. current	750 A	1500 A	2250 A
Surface	0.75 m²	1.5 m²	2.25 m²
COD removal (100% efficiency)	223,5 g/h	447 g/h	670,5 g/h
Voltage (due to electr. conductivity)	20 V	20 V	20 V
Power	15 kW	30 kW	45 kW
Maximum operating electrolytic temperature	67,6%	67,6%	67,6%



**Do you have any questions?
We are happy to advise you!**
+49 (0) 921 1511 020-0
info@clearfox.com



Further information
about our ClearFox® DiOx
can be found here



Innovation made in Germany

PPU Umwelttechnik GmbH provides wastewater treatment to the private, municipal, industrial and decentralised sectors. Under the brand name ClearFox®, the company sells wastewater treatment plants produced in Bayreuth all over the world. The focus is on biological, chemical-physical and oxidising processes for wastewater treatment. PPU Umwelttechnik GmbH offers selected processes in ISO sea containers. This makes them compact, mobile, modular and available anywhere in the world within a very short time. Each containerised wastewater treatment plant is tailored to individual requirements, making each project unique.

As a general contractor, PPU takes on the planning, production and commissioning of each individual wastewater treatment plant. Every customer can count on reliable co-operation with PPU Umwelttechnik GmbH.

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