ProMaqua®
a ProMinent Company

Powerful and yet environmentally-friendly

Innovative ozone technology – ecological and economical disinfection and oxidation

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Ozone
the most effective disinfectant

Unbeatably efficient and environmentally-friendly

Ozone is the strongest known oxidation agent and disinfectant currently used in water treatment.

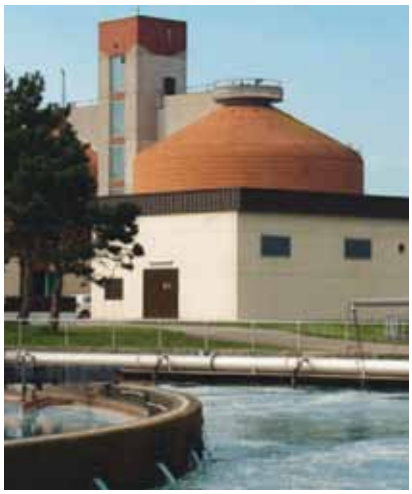
It reliably removes colouring, odours, bacteria and viruses without any harmful by-products. Ozone reacts quickly with a number of harmful substances, either by directly attacking the O_3 molecule or indirectly through the hydroxyl radicals produced.

When combined with other procedures (UV light or peroxide), even man-made trace substances such as the remains of hormones or antibiotics can be rendered harmless.

Moreover, the decisive advantage of ozone is that no environmentally harmful by-products result unlike the case with other comparable oxidation agents and disinfectants such as chlorine. It breaks back down into its original substance, i.e. oxygen, without the formation of undesirable by-products.

Benefits of ozone

- Environmentally-friendly operation as the operating gas used is either air or oxygen (no chemicals).
- On-site generation as required conserves resources.
- Efficient oxidation of inorganic and organic impurities.
- Crystal clear water thanks to microflocculation of colloids.
- Efficient disinfection without by-products.



Ozone generation water treatment with added value

Benefits of ozone generation systems

- High reliability – robustness – operational safety – high availability.
- Extremely easy to maintain and low operating and maintenance costs.
- High efficiency ensures low energy and cooling water consumption.
- ProMaqua has the right ozone technology (vacuum or overpressure procedure) for every application.
- High-quality materials for a virtually infinite service life.

Ozone impressively disinfects bacteria, viruses, fungi and parasites. Undesirable inorganic substances such as iron, manganese, arsenic, nitrite and sulphite are oxidised.

Ozone is also beneficial when oxidising undesirable organic substances in water. Strong smelling and strong tasting compounds, humic matter and dyes are reliably eliminated.

It is highly effective in the breakdown of cyclic hydrocarbons, trihalomethanes, chloramines and other chlorine compounds. After oxidation with ozone, the microflocculating effect of ozone causes substances and colloids dissolved in the water to become insoluble and they can then be filtered out.

Significantly less environmentally harmful by-products result from the generation and use of ozone, than other comparable oxidants and disinfectants.

As a highly reactive gas, ozone is generated on site from oxygen, and introduced to the water directly, without interim storage. Because of its high reactivity, ozone decomposes back into oxygen in the water, with a half life of several minutes. All the components of an ozone treatment system must be perfectly matched with each other and with the planned application to achieve an optimum ratio between ozone generation and effect.

Systems for every performance class

Ozone generation tailored to your needs

OZONFILT® OZVa ozone systems

The systems are best suited for small to medium ozone requirements of up to 105 g/h.

For enhanced safety and greater cost-effectiveness, the product range is equipped with an electronic power unit, which guarantees an accurately adjustable volume of ozone independent of fluctuations in mains voltage or pressure. The systems are operated with compressed air or oxygen.

OZONFILT® OZMa ozone systems

Maximum operational safety and minimised operating costs are guaranteed when using the zero-maintenance ozone generator for up to 735 g/h ozone from compressed air or oxygen.

Since air drying is controlled by demand and self-optimising, energy and cooling water consumption is minimised. Controlling the volume flow of gas results in reduced consumption of operating gas which requires huge amounts of energy to treat. The systems offer energy savings of up to 30%.

Ozone is increasingly being used as a universal disinfectant.

Ozone is the strongest known oxidation agent and disinfectant for water treatment. Generated in an environmentally friendly manner from oxygen or air, the ozone decomposes into oxygen again after use.

ProMaqua has more than 40 years of experience in the design and installation of ozone systems in a wide range of applications.

Bono Zon® BONa ozone systems

The systems are designed for an ozone requirement of up to 720 g/h.

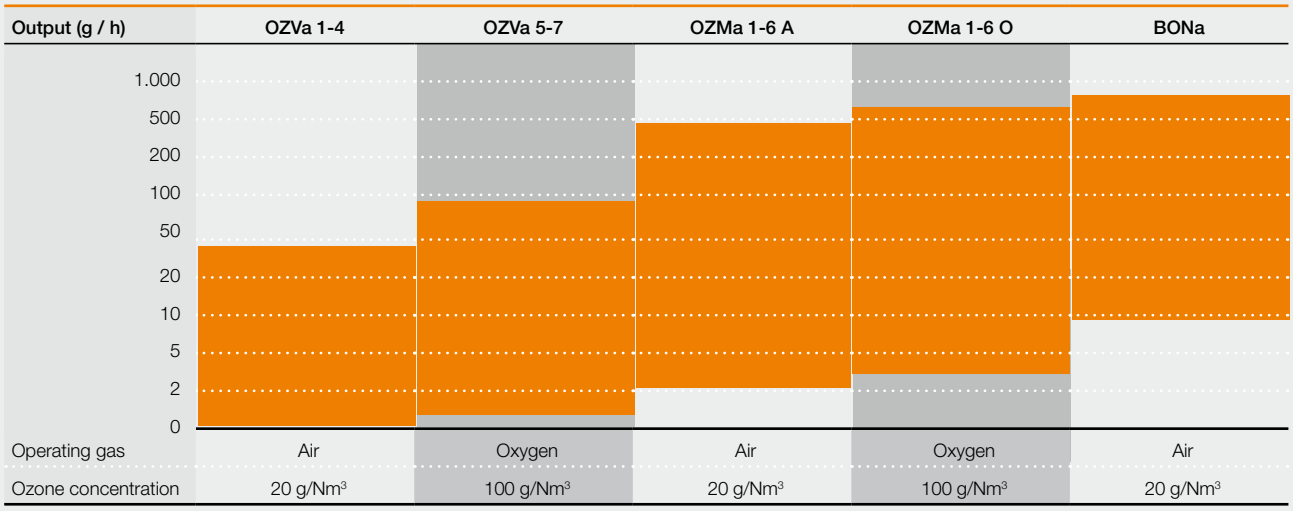
The vacuum systems are designed in accordance with the most stringent safety measures. All important operating parameters are monitored electronically and clearly shown on a display panel.

Complete systems

While they have a modular structure, the systems can also be individually adapted to the application in hand.

All the components needed for water treatment with ozone are matched in one system and fitted ready for use. Their modular structure makes solutions for particular applications and customers possible.

Overview of output from the various ozone systems



OZONFILT® OZVa

Ozone system

Ozone generation offering optimum operational safety coupled with maximum efficiency. The compact range complies with DIN standards and therefore the most stringent quality requirements.

- Simple operation.
- Ozone generated independent of pressure and voltage.
- Direct injection without injector system with up to 2 bar counterpressure.
- Maximum efficiency with low cooling water consumption.
- Digital display of ozone output in "grams/hour".
- Effective, independent of ambient conditions (air humidity, temperature).
- Infinitely variable output control between 3-100 %.
- Different versions for output ranges of 5 to 90 g/h with ozone concentrations of up to 100 g/Nm³.
- Compact form in painted standard control cabinet or stainless steel control cabinet.
- Available with and without mixing device. (Increases efficiency)
- Low maintenance and operating costs.

Technical data for OZVa 1-4 (operating gas: compressed air)

		OZVa 1	OZVa 2	OZVa 3	OZVa 4
Ozone output at 20 g/Nm³	g/h	5	15	35	40
Specific energy requirement for ozone generation	Wh/g	30	30	21	20
Air requirement (only ozone generation)	Nm³/h	0.37	1.00	2.25	2.5
Cooling water requirement (15 °C)	l/h	10 - 60	20 - 60	50 - 100	70 - 100
Weight approx.	kg	70	75	121	121
Electrical connection	V / Hz	230 / 50-60	230 / 50-60	230 / 50-60	230 / 50-60

Technical data for OZVa 5-7 (operating gas: oxygen)

		OZVa 5	OZVa 6	OZVa 7
Ozone generation output (at 100 g/Nm³)	g/h	30	60	90
Specific energy requirement for ozone generation	Wh/g	10	10	10
Cooling water requirement (15 °C)	l/h	30	70	100
Weight approx.	kg	75	109	114
Electrical connection	V / Hz	230 / 50-60	230 / 50-60	230 / 50-60

OZONFILT® OZMa

Ozone system

Zero-maintenance ozone generation which is both ecological and economical. Ozone generation with maximum operational safety and minimized operating costs.

- Economical:
  Zero-maintenance reactor with a virtually infinite service life.
- Automatic control of the operating gas depending on ozone output:
  - Reduced consumption of operating gas which requires huge amounts of energy to treat.
  - High ozone concentration ensures optimum addition of ozone.
- Air drying is controlled by demand and self-optimising which results in energy savings of up to 30%.
- Low investment costs for adding ozone to water using high ozone gas pressure.
- Automatic ozone generation, virtually independent of fluctuations in voltage and pressure.
- Ambient conditions (pressure/ temperature) have no impact.
- Infinitely variable adjustment of the required ozone quantity between 3 and 100 % of nominal capacity.
- 5.7" touch panel with data logger and screen plotter.
- Ozone output displayed in g/h.
- PLC with integrated ozone measurement and PID control.
- Multiple communication interfaces (e.g. LAN, Profibus DP).

Technical data for OZONFILT® OZMa 1A-6A (operating gas: compressed air)

		OZMa 1A	OZMa 2A	OZMa 3A	OZMa 4A	OZMa 5A	OZMa 6A
Ozone output at 20 g/Nm³	g/h	70	105	140	210	280	420
Specific energy requirement Ozone generation	Wh/g	16.5	16.5	16.5	16.5	16.5	16.5
Air requirement (only ozone generation)	Nm³/h	3.5	5.25	7.0	10.5	14.0	21.0
Cooling water requirement (15 °C)	l/h	90	135	180	270	360	540
Weight approx.	kg	270	280	300	420	445	598
Electrical connection	V / Hz	230 / 50-60	230 / 50-60	230 / 50-60	400 / 50-60	400 / 50-60	400 / 50-60

Technical data for OZONFILT® OZMa 1O-6O (operating gas: oxygen)

		OZMa 1O	OZMa 2O	OZMa 3O	OZMa 4O	OZMa 5O	OZMa 6O
Ozone output at 80 g/Nm³	g/h	123	184	245	370	490	735
Ozone output at 100 g/Nm³	g/h	105	158	210	320	420	630
Ozone output at 150 g/Nm³	g/h	60	90	120	180	240	360
Specific energy requirement Ozone generation	Wh/g	9	9	9	9	9	9
Cooling water requirement (15 °C)	l/h	120	180	240	200	280	420
Weight approx.	kg	220	230	230	320	345	415
Electrical connection	V / Hz	230 / 50-60	230 / 50-60	230 / 50-60	400 / 50-60	400 / 50-60	400 / 50-60

Bello Zon® BONa

Ozone system

The generation of ozone is very easy to operate and offers great operational safety.

- Vacuum system with low operating costs and wide field of application.
- Manual or automatic, infinitely variable control.
- Wide output range of 80 to 720 g/h.
- Complete systems available with addition of ozone, removal of remaining ozone, response and out-gassing system, ambient air monitoring etc.
- Clear, easy to understand display and operation panel.
- Information on operating status provided by LEDs.
- Air treatment using cost-effective adsorption drying plant.

Technical data for Bello Zon® BONa 1D-4D

		BONa 1D	BONa 2E	BONa 2D	BONa 3D	BONa 4D
Ozone output at 20 g/Nm³	g/h	80	120	160	240	320
Specific energy requirement for ozone generation	Wh/g	18.75	18.75	18.75	18.75	18.75
Air requirement (only ozone generation)	m³/h	4	6	8	12	16
Cooling water requirement (15 °C)	m³/h	0.1	0.2	0.2	0.3	0.4
Weight approx.	kg	360	700	720	820	1,200
Electrical connection	V / Hz	400 / 50-60	400 / 50-60	400 / 50-60	400 / 50-60	400 / 50-60

Technical data for Bello Zon® BONa 5D-9D

		BONa 5D	BONa 6D	BONa 7D	BONa 8D	BONa 9D
Ozone output at 20 g/Nm³	g/h	400	480	560	640	720
Specific energy requirement for ozone generation	Wh/g	18.75	18.75	18.75	18.75	18.75
Air requirement (only ozone generation)	m³/h	20	24	28	32	36
Cooling water requirement (15 °C)	m³/h	0.5	0.6	0.7	0.8	0.9
Weight approx.	kg	1,280	1,360	1,920	1,980	2,000
Electrical connection	V / Hz	400 / 50-60	400 / 50-60	400 / 50-60	400 / 50-60	400 / 50-60

OZONFILT® Compact OMVa

Ozone system

The OZONFILT® Compact OMVa is a complete, ready-to-use ozone system for treatment where 5 to 40 g/h of ozone is needed.

- High process safety thanks to pre-assembled, complete ozone treatment stage with perfectly coordinated components.
- Integrated OZVa ozone generation system.
- Well-thought-out assembly on stainless steel frame for plug and play connection.
- Good accessibility.
- Modular structure yet still customisable.
- Compact – requires very little space.

Main areas of use:
Process or product water in the beverage industry (rinser and table water), potable water, raw water.

- Pressure-resistant ozone generator built according to DIN 19627.
- Ozone point of injection for intensive mixing of ozone/air and the water to be treated.
- Stainless steel reaction tank.
- Destruction of residual ozone gas for complete removal.
- Ambient air monitoring for traces of ozone gas via gas detector with long-term stability sensor.
- Metering ozone in line with measurements ensures a constant concentration in the reaction tank.

Technical data for OZONFILT® Compact OMVa 1-3

		OMVa 1	OMVa 2	OMVa 3	OMVa 4	OMVa 1A
Ozone system type		OZVa 1	OZVa 2	OZVa 3	OZVa 4	OZMa 1A
Ozone output	g/h	5	15	35 g/h	40	70
Cooling water quantity	l/h	10-60	20-60	50-100	70-100	90
Electrical connection	V / Hz	230 /50-60	230 /50-60	230 /50-60	230 /50-60	230 /50-60
Enclosure rating	IP	43	43	43	43	43
Nominal throughput	m^3/h	1.5-5	5-15	15-30	30-45	45-60

Applications & industries

Applications for ozone

Swimming pools, production of potable water, beverage industry or industrial process water: ProMaqua has the right ozone-based water treatment solution tailored to your needs. ProMaqua provides its customers with an efficient and comprehensive range of products proven worldwide. Operationally safe and highly economical.

Public and private swimming pools

- Reduction of chloramines and trihalomethanes, avoiding that typical swimming pool smell.
- Crystal clear water thanks to microflocculating action.
- Reliable microbiological barriers in therapy pools.
- Reduction in investment and operating costs, potential reduction in circulating power and restriction of the supply of fresh water.
- Reduction in cost of chemicals: Avoidance of flocculant and significant reduction in chlorine consumption.

Local treatment of potable water

- Improved odour and taste.
- Removal of colouring.
- Breakdown of trace substances.
- Oxidation of metals such as iron, manganese, arsenic and organic impurities.
- Effective disinfection.

Local waste water treatment

- Breakdown of trace substances.
- Reduction of sewage sludge.
- COD reduction/breakdown.
- Removal of colouring.

Industry

- Removal of iron and manganese.
- Disinfection of process water.
- Removal of odorous substances in air scrubbers.

Cooling water

- Control of biological growth/biofilm.
- Avoidance of microbiological impurities/corrosion.
- No AOX formation.

Food and beverage industry

- Removal of iron and manganese from mineral and table water.
- Possible disinfection and microbiological protection when filling glass and PET bottles with table water.
- Treatment of raw water in the beverage industry.
- Disinfection for rinsers.
- Disinfection of production water.

Safe and efficient water treatment

"Investments that pay off."

The Bulgarian companies AUGUSTA 91 OOD, MALAKOV EOOD and VODA KLISURA and the Macedonian company KOYHUCHENKA have one thing in common: they guarantee a high level of hygiene when bottling their table water, mineral water and alcohol-free drinks with ozone systems from ProMaqua.

The existing water treatment systems were unable to prevent microbiological contamination during the bottling process. ProMaqua replaced these with its own ozone systems and germ-free potable water of the highest quality is now produced.

The precise-metering ozone systems of the OZONFILT® OZVa product range generate ozone from the oxygen in the ambient air. The air is treated using a pressure swing dryer ensuring that ozone can be generated with operational reliability even with a high level of ambient air humidity. Dimitar Peev, Managing Director of the Bulgarian subsidiary of the ProMinent Group, explains why the companies decided to invest in this product.

Mr Peev, how do the companies rate the ProMaqua systems?

Dimitar Peev: "Now that they have replaced their existing ozone systems with ProMaqua systems, they can be sure that they are bottling their water without any microbiological contamination."

Could you tell us some of the benefits of the ProMaqua ozone systems?

Dimitar Peev: "I would stress how easy they are to operate, how efficient they are and that they come fully equipped. Other positive features include complete protection for the electrical components and how the ozone quantity setting can be reproduced."

Do the five companies believe that their investment pay off?

Dimitar Peev: "Our customers were impressed with the quality of our ozone systems and our complete solutions from one source, including on-site installation. And satisfied end customers, happy with the quality of their beverages, guarantee sales. Which results in further investments."

Contact worldwide

Experts in Chem-Feed and Water Treatment

As a member of the ProMinent Group, ProMaqua is at home in 100 countries across the globe. This guarantees worldwide availability of our products and short distances to the customer.

We offer identically high quality standards for our products and services worldwide. Exactly where you need us. Experience, knowledge and expertise in water treatment and metering technology.

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