

## **PRESS RELEASE**

### **Fresh Air for Kiel: City of Kiel and Purevento GmbH to Start Test Phase with City Air Purifier at Theodor-Heuss-Ring**

**Kiel/Trittau, 6 February 2019: Starting today, the city of Kiel is testing the newly developed prototype of a city air purifier by Purevento GmbH at Theodor-Heuss-Ring, which is known for its high nitrogen oxide pollution. The purifier works based on a simple active principle: the air is absorbed directly at the roadside, where particulate matter and gaseous substances, such as nitrogen oxides, are emitted. The purified air is decelerated and released to the pedestrian side. The device's weight and functionality are optimised for easy relocation and smooth handling. The prototype will initially be in Kiel for up to two weeks. During this initial phase, its handling characteristics, optics, suction force, release power and sound volume will be tested. Depending on individual requirements, the city air purifier can clean up to 40,000 m<sup>3</sup> of air per hour, which is equivalent to the volume of 1,200 shipping containers. Six purifiers would be required for the particularly polluted corridor.**

“Air is a common good and should be clean and unlimited for everybody to use”, says inventor Robert Krueger, managing director of Purevento GmbH. In the scenic town of Trittau, Krueger has been developing, under the umbrella of trittec AG, innovative fabrics for air improvement in buildings since 2008. When he began dealing with the issue of urban air quality in spring 2017, he couldn't let go of the unresolved problem of city air pollution. He found enthusiastic like-minded pioneers and established Purevento GmbH. Krueger and his team of five, consisting of product designers and developers, soon found out: existing approaches to purifying city air were still too

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inefficient, too energy intensive, too complicated to use or too expensive to be economically and ecologically viable.

## **Clean Air Made in Schleswig Holstein**

Their solution was a device that would fit in any roadside parking bay, where it would directly absorb the outside air at the source and extract its pollutants. Their idea of the Purevento city air purifier followed a pragmatic approach: efficient operation and easy-to-use, affordable, real bridging technology for better air to breathe in cities. “We consider our technology a modular solution until cities’ electric mobility has considerably increased, public transport has improved, and pollution has been significantly reduced”, adds Krueger. “We created an intelligent combination of already proven conventional technologies. The result is a compact, energy-efficient city air purifier that can be easily set up without a lot of red tape and right at the source of the problem: road traffic.”

## **The Functional Principle: Clever but not Rocket Science**

The closed system absorbs the polluted air around the device and sucks it through the first level, where 80–90% of the particulate matter is extracted. This pre-cleaned air is pressed through the two filter levels, where up to 85% of gaseous pollutants (e.g. nitrogen oxides) are extracted, and to the outside. The suction system has a specially developed motor and is driven by energy reservoirs, which are powered by solar cells mounted on the top. If higher capacities are required, e.g. during rush hours, extra energy can be provided by an integrated fuel cell or external power supply, ideally CO<sub>2</sub>-neutral power from renewable sources. When the filter media reach their saturation limit, they are replaced locally and later burnt, together with the pollutants, (by waste disposal companies) at high temperatures without leaving residues. Purevento expects one to two filter changes a year, depending on the local level of pollution.

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## **Never Noisier than the Traffic**

The intelligent control system ensures optimum energy efficiency, as the air is only cleaned when the pollutant concentration exceeds a set level. The device is designed to not exceed the traffic noise level even at full capacity. In basic operation, the purifier is just about as noisy as a street café.

In basic operation, at 50% capacity and 20,000 cbm/h, its consumption is approx. 1 kWh, at full cleaning capacity, approx. 40,000 cbm/h, its consumption is up to 4.5 kWh. The aim is therefore to mainly operate the city air purifier in the medium speed range. The device is sensor-controlled, and its cleaning power varies with the air pollution level.

## **Fresh Air for Kiel: City Air Purifier at Theodor-Heuss-Ring**

In addition to the measures recommended to the region as part of its clean air programme, the city of Kiel is now also testing the city air purifier. In late November 2018, Purevento approached Kiel City Council to introduce the company's new product. The device measuring 4.80 metres in length and 2.50 in height, is to be set up at the side of the road, where it absorbs the ambient air, filters it, and releases the purified air into the environment. Purevento makes the prototype of its city air purifier available free of charge. It will initially be in Kiel for up to two weeks. During this initial phase, its handling characteristics, optics, suction force, release power and sound volume will be tested. During a second phase, the device's purification effect will be tested using complex measuring technology at multiple locations at Theodor-Heuss-Ring.

Krueger: "The city air purifier doesn't have to be placed right next to a measuring station. It should be placed at locations with high emission levels. Within the city of Kiel, legal emission limits are continuously exceeded only on a 200-metre stretch of

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road along Theodor-Heuss-Ring. Purevento currently has one fully functional technology carrier." For permanent local use, Purevento estimates the required air purification capacity to average 200,000 to 250,000 cbm/h, depending on daily traffic and the weather. Based on this estimate, about six city air purifiers of this generation would be required. For the city of Kiel, and for any other requirement, the devices' capacities are scalable. Robert Krueger explains: "Our objective for the city air purifier is to be a link in the improvement chain, i.e. in regard to Kiel, to reduce nitrogen oxides by at least 10%. This is achieved when the city air purifier thoroughly cleans large amounts of air, consequently causing the purified air to 'dilute' the ambient air." Krueger adds: "We have received multiple enquiries from other communities. We will take care of those right after the first test run in Kiel."

## **Two Models in Serial Production**

Two models of the city air purifier are planned for serial production. Model E is the energy self-sufficient model, which does not require any connections and is therefore ideal for locations without an energy infrastructure. Based on current plans, this model will purify 15,000 cbm of air with its own energy supply system, which equals the volume of 450 standard containers. The required power will be supplied by top-mounted solar panels. If required, an integrated fuel cell provides additional energy based on eco-friendly DMFC technology (direct methanol fuel cells). The device has a chassis for mobile use.

Model S is a high-performance city air purifier that uses an external power supply to purify up to 40,000 cbm/h of air. This is equivalent to 1,200 standard containers. The external power supply allows for the particularly compact design of this model and increases the cleaning power of the filter system. The required power can be obtained from nearby energy sources, such as street lighting or charging stations for electric vehicles, using an adaptor. Model S is a stationary device to be transported and set up by a truck.

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**For more information and technical specifications, please go to**

<https://www.purevento.com/en/purevento-city-air-cleaner/#technology>

**A video illustrating its functionality is available at**

<https://www.purevento.com/en/purevento-city-air-cleaner/>

## **About Purevento GmbH**

Purevento is a self-funded project of trittec AG, a company based in Trittau, Schleswig-Holstein, and founded in 2003. The city air purifier was designed to extract particulate matter and nitrogen oxides from air in urban traffic environments. The first serial products are expected to be ready for shipment within the next six months. However, to ensure large production numbers, the aim is to encourage investors to participate in Purevento. The inventions and developments for the air purifier have been registered for patent worldwide. The company currently consists of five persons.

More information is available at <https://www.purevento.com/en/>

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