GGSensors

# TAM

Tiny aerosol conditioner inside Air Monitor

## World's first high spatial-temporal resolution fine particulate matter($PM_{2.5}$) monitor with a built-in TAC

TAM will replace BAM for air and climate justice.

CERTIFICATE OF PATENT

Korean Intellectual Property Office Technical Patent
10-2368788

Ministry of Trade, Industry and Energy
- Certification of New Technology (No. 1387)
- High-tech Product Identification (No. 2022-62)

# The silent assassin, Fine dust

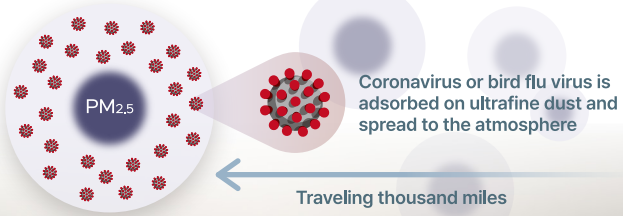
'Death by Air pollution'

In 2014, a nine-year-old girl died of an asthma attack without any other diseases such as respiratory tract in the UK.
The bereaved families have been recognized for living in a polluted environment after six years of litigation to determine the exact cause of her death, which is the first time in the world.

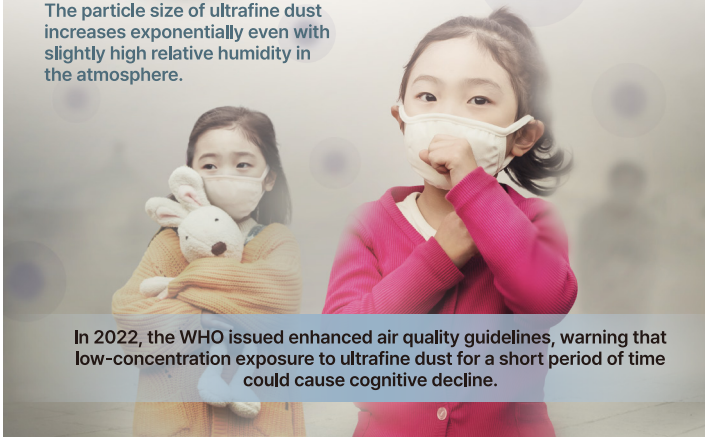
Source: Ella Kissi Debrah, Ella Roberta Family Foundation

## Acquiring accurate ultrafine dust information is essential for proper dust management.

Ultrafine dust, a first-class carcinogen, can penetrate blood vessels and increase the incidence of myocardial infarction or brain infarction and the early mortality rate of cancer patients. It is also deadly because ultrafine dust can travel thousands miles in the atmosphere, acting as a carrier for the virus.
Accurate information on how much of this ultrafine dust is in where I currently live is an important clue to avoid exposure to ultrafine dust.



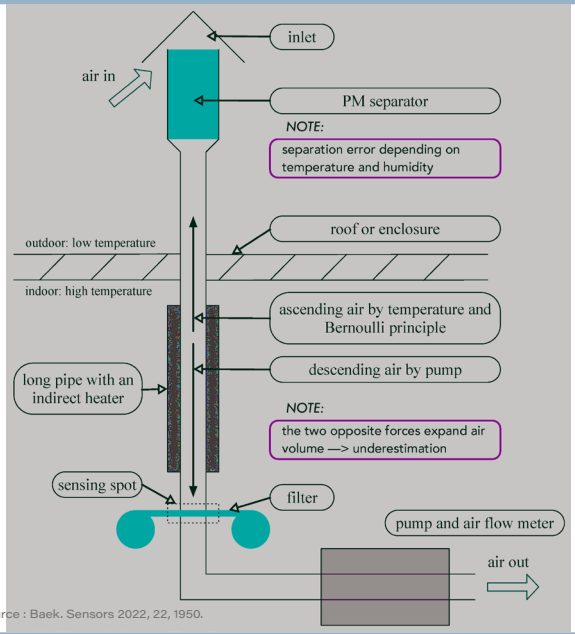

The particle size of ultrafine dust increases exponentially even with slightly high relative humidity in the atmosphere.



In 2022, the WHO issued enhanced air quality guidelines, warning that low-concentration exposure to ultrafine dust for a short period of time could cause cognitive decline.

## National air quality monitoring stations
# How reliable are you with the information?

### Problems with conventional beta-ray monitors




Source : Baek. Sensors 2022, 22, 1950.

### The National Monitoring Station cannot detect illegal incineration, pollution cars, and wildfires in real-time.

Source : Korea Environment Corporation

Is it really **real-time** air quality information in **our neighborhood**?

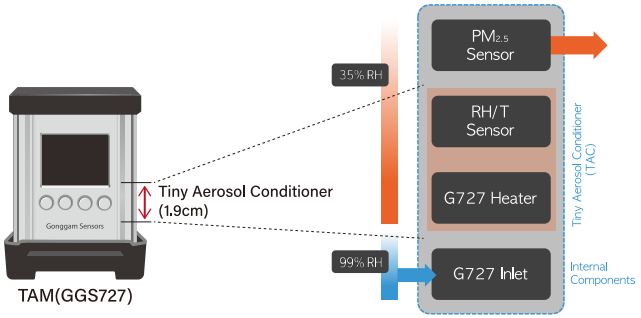
- Not real-time information as it presents 'one hour past' information.
- Not as precise as you want, it might be 'a few miles away'.
- National Monitoring Station provides an average value of one hour with a 20% loss.

## We reinvented the innovative $PM_{2.5}$ monitor
# for People and the Earth.

The reason why the structure of expensive imported equipment is complex and inaccurate is because of the hygroscopicity of ultrafine dust.
We succeeded in developing the world's first tiny aerosol conditioner technology capable of drying in real time. Ultrafine dust monitor with a built-in tiny aerosol conditioner can identify fog and smog the fastest in the world. It uses more than 100 times less energy than traditional beta-ray monitors and has 10,000 times smaller footprint, making it easy for anyone to install it anywhere.
The reinvented ultrafine dust monitor is called TAM. TAM's technical excellence was published online in March 2022 in the renowned journal "Sensors." If the TAM is available near you, your children will take off their masks with relief. And we can no longer worry about fatality due to air pollution.

### We have the world's first tiny aerosol conditioner technology.

- Patent registration in Korea/Taiwan/China
- Patent application in the United States/Europe/Japan/Australia




TAC dimension: (WDH) 30x24x20 mm

### TAM 917 Product Specifications

| | |
|---|---|
| Measurement method | Light scattering method |
| Operating System | TAM OS 1.5 |
| Heater | Built-in automatic controlled tiny aerosol conditioner |
| Monitoring range | 0.0~1000.0 μg/m³ |
| Measurement time | 5 seconds mean |
| Logging | 1 minute logging 28 years (1GB μSD),expandable |
| Maximum power consumption | 4.7 W |
| Temperature sensor | -20 ~ 80 °C |
| Humidity sensor | 0 ~ 100% RH |
| Barometric pressure sensor | 300 ~1100 hPa |
| Power | (Input) AC 100/240V, (Output) DC 12V 3A |
| Battery(optional) | 22 hours of use @ 11.1V(3cells) 5000 mAh |
| Size (WHD) | 220×224×165mm³ |

# Wildfires/House fires/Illegal incineration
# Real-time detection with TAM

A large amount of ultrafine dust from forest fires, house fires and illegal incineration is life-threatening.
At the AAAS Annual Meeting in November 2022, it was revealed that ultrafine dust, which accounts for 40% of wildfire smoke, attacks human lungs. In addition, according to the study published in the Environmental Journal by the Nevada Desert Research Institute (DRI), forest fire smoke significantly increases coronavirus infectivity.

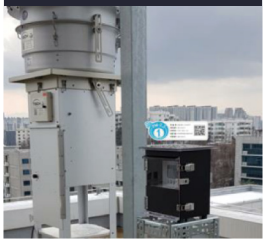
In September 2022, TAM, installed in a mile away from the National Monitoring Station (NMS) near the Daejeon Hyundai Outlet, confirmed the fire earlier than NMS in real-time.


KOREA UNIVERSITY

Professor Lee Meehye from
Korea University Department of Earth and Environmental Sciences

**"This is the ultrafine dust monitor that WMO was looking for."**
**"I've never seen light scattering in such a stable pattern"**

Korea University Mediheal Earth Environment Center



Measurement of Antarctic air quality with TAM

Araon, the first Korean Research Icebreaker

TAM14

## With market-creative innovation through problem-solving of existing technologies, we will work hard to provide the accurate and precise air quality monitoring information to the global community.

Innovation distinguishes between a leader and a follower.
- Steve Jobs, 2010

## Assuring our technology via on-site demonstrations in all seasons


January to April 2021, the Central Atmospheric Environment Research Institute @ Daejeon


March to April 2021, Korea Testing & Research Institute @ Gwacheon


July to November 2021, Korea Testing Laboratory @ Jinju


December 2021~, National Environmental Corporation Monitoring Station @Deokpyeong

**New Wine into New Wineskins** (Matthew's Gospel 9:17)

Gonggam Sensors Co., Ltd.
GGSensors The first innovative technology, TAC inside Air Monitor

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