

PHOTOCATALYST, MILESTONES

1968 Dr. Fujishima Akira of the University of Tokyo **discovered** the photocatalytic properties of titanium dioxide TiO₂.

1972 Dr. Fujishima publishes research known as the "Fujishima Effect" research that started the revolution in photocatalyst technology.

1990 The 1st International Conference on the Benefits and Uses of TiO₂ Technology is held in Toronto and Ontario, Canada Photocatalytic with special reference to the function "Purification and treatment of water and air".

2001 NASA scientists use TiO₂ Photocatalytic technology to neutralize the danger microbial contamination when the US was attacked by a carbon offensive.

2002 In 2002 the Taiwanese government used TiO₂ Photocatalytic technology to combat SARS epidemic.

2006 TiO₂ Photocatalytic technology has been used as a tool to prevent the SARS epidemic, Bird Flu in many countries around the world.

Global Presence

To date, the following countries use and apply TiO₂ Photocatalytic technology with great success

- a) Japan, USA / Canada
- b) China / Hong Kong / Taiwan / Korea
- c) Southeast Asia: Malaysia / Thailand / Singapore d) Europe: Germany / Italy/ Greece

Potential Applications

- a) Millions of cars / public transportation
- b) Thousands of hospitals, schools and medical buildings tunnels, etc.
- c) Casinos - Nightclubs - Theaters - Multipurpose
- d) Air purification - Purifies the air and reduces compounds such as VOCs, NOx, and others and at the same time improves air quality giving employees the feeling of being in the countryside. As a result, employees perform better and visitors feel the need to stay more in the building.

Antibacterial protection

- a) Destroy all viruses such as (H1N1, H5N1, SARS, MRSA, MS2, COVID19)
- b) For the prevention of diseases after earthquakes, floods, cyclones, etc.
- c) For hospitals, public places, home daily antibacterial protection
- d) For antibacterial treatment of surfaces such as computers, handles, toilets, etc.

Deodorization

- a) For the smell of garbage
- b) For the smell of pets
- c) To remove the smell from smoking
- d) To remove odor in new cars

WHAT IS TITANIUM DIOXIDE (TiO₂)?

Titanium is the 9th most common element on earth and titanium oxide is used as a whitening agent in paints and in cosmetics. Titanium dioxide is used as the lower pigment. For photocatalyst applications such as air purification, antibacterial use and self-cleaning use titanium dioxide TiO₂

ARE PRODUCTS WITH TITANIUM DIOXIDE (TiO₂) SAFE?

TiO₂ materials used as photocatalysts are physically and chemically safe, have been certified globally as food additive. It is now widely used for white chocolate, ice cream and for many cosmetics, including lipsticks.

WHAT ARE VOCs AND WHERE DO THEY COME FROM?

Formaldehyde is one of the most common VOCs. Formaldehyde is a colorless gas with an unpleasant odor. It is found in many building materials, such as plywood, and adhesives. Formaldehyde is also found in furniture (furniture, curtains and rugs) and in certain types of insulating foam. Other sources of formaldehyde are fuel: gas, wood, kerosene, and tobacco products. VOCs also come from personal care products, such as perfumes and hair sprays, dry or liquid cleansers, such as dyes, hairsprays and varnishes, and when copying and printing.

WHAT ARE THE SYMPTOMS FOR HUMANS FROM VOCs odors?

VOCs odor can cause eye, nose and throat irritation, nausea and dizziness, and skin rash problems. Higher amounts can cause lung irritation and wheezing. In even higher percentages can cause stress and memory problems.

HOW DO TiO₂ PRODUCTS PROTECT US FROM BACTERIA AND VIRUSES?

All microorganisms or the ones that create the odors or the ones who create the infections have a physical property to carry a negative charge while the surfaces coated with TiO₂ Photocatalytic technology have positive charge. This creates an "electromagnetic" attraction between the germs and the surface. So when the microorganisms found in proximity from the photocatalytic surface are attracted to it and as soon as they come to contact they die by oxidation. Even when airborne, they come into contact with hydroxyl free radicals and are oxidized to a point that they become inactivated.