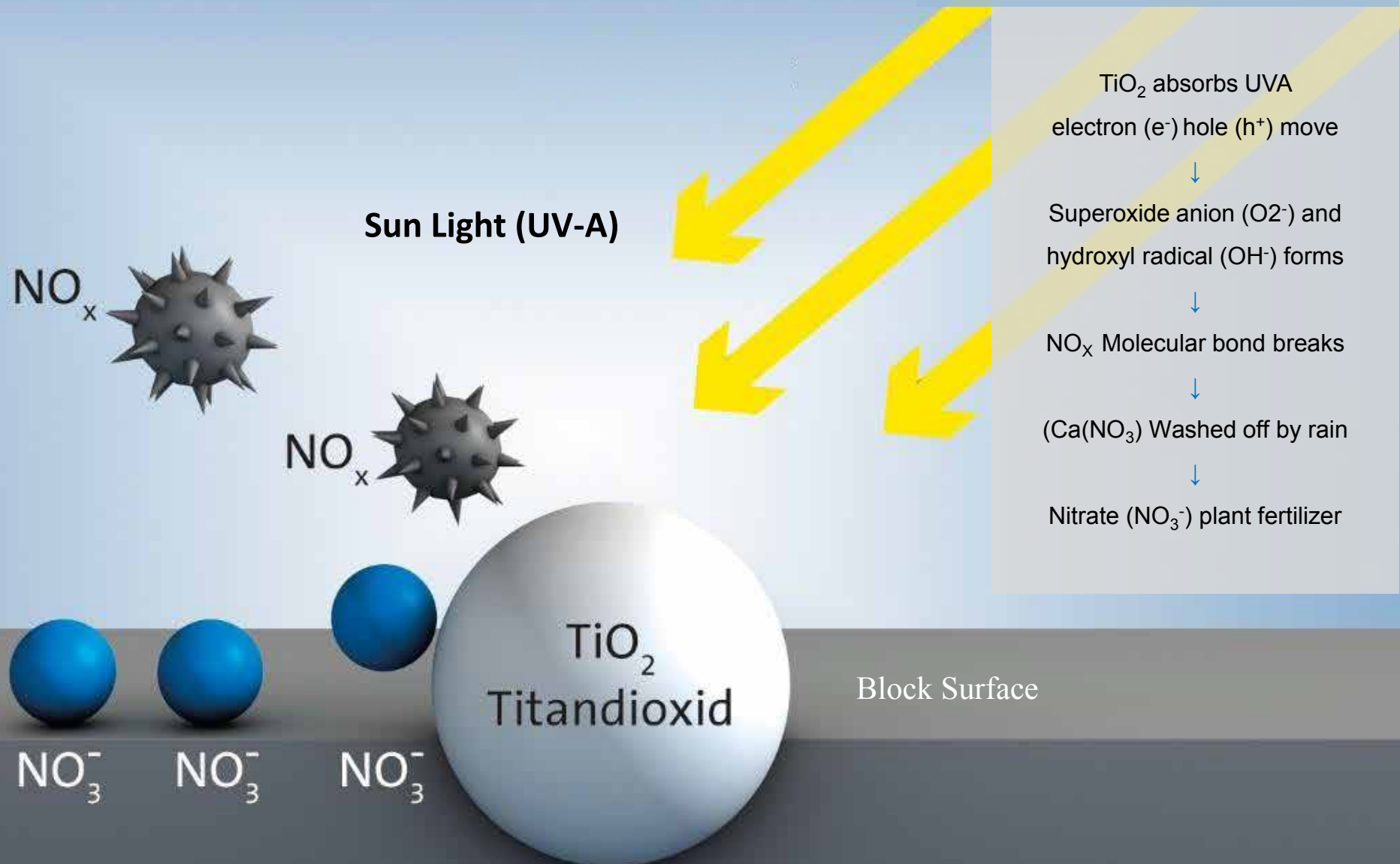


Eco-Friendly Pitcher Air Purification Interlocking Block Solution for Better Air Quality



Mechanism of photocatalysis

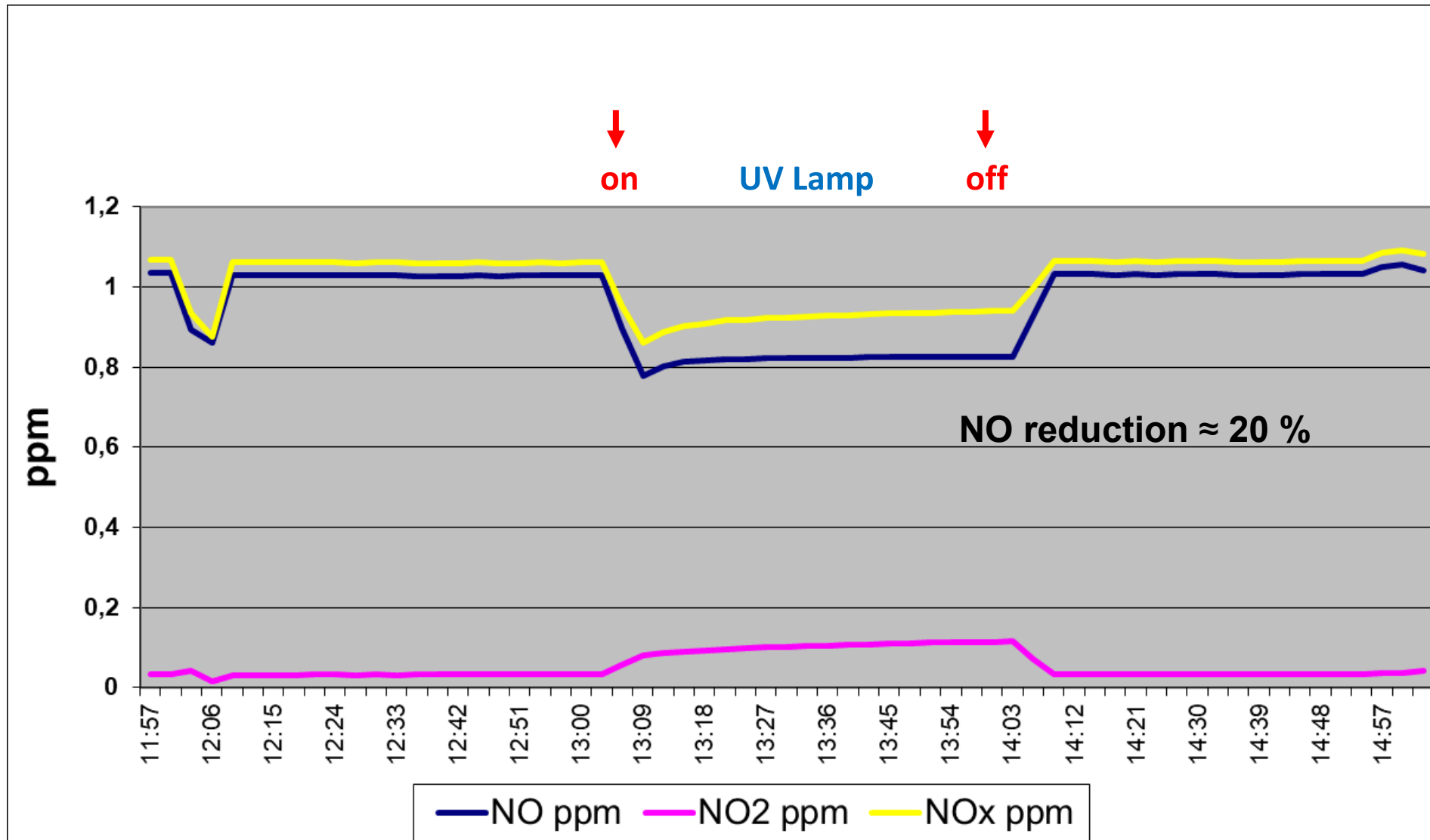


Photocatalyst absorbs light to provide higher energy and makes a chemical reaction faster but itself remains stable and unchanged.

Verification of photocatalytic activity

- Laboratory standard test (ISO 22197-1) - 3 hours

NOx Reduction - AirClean Block





When **1km²** blocks replaced with photocatalyst blocks...

Expected effects?

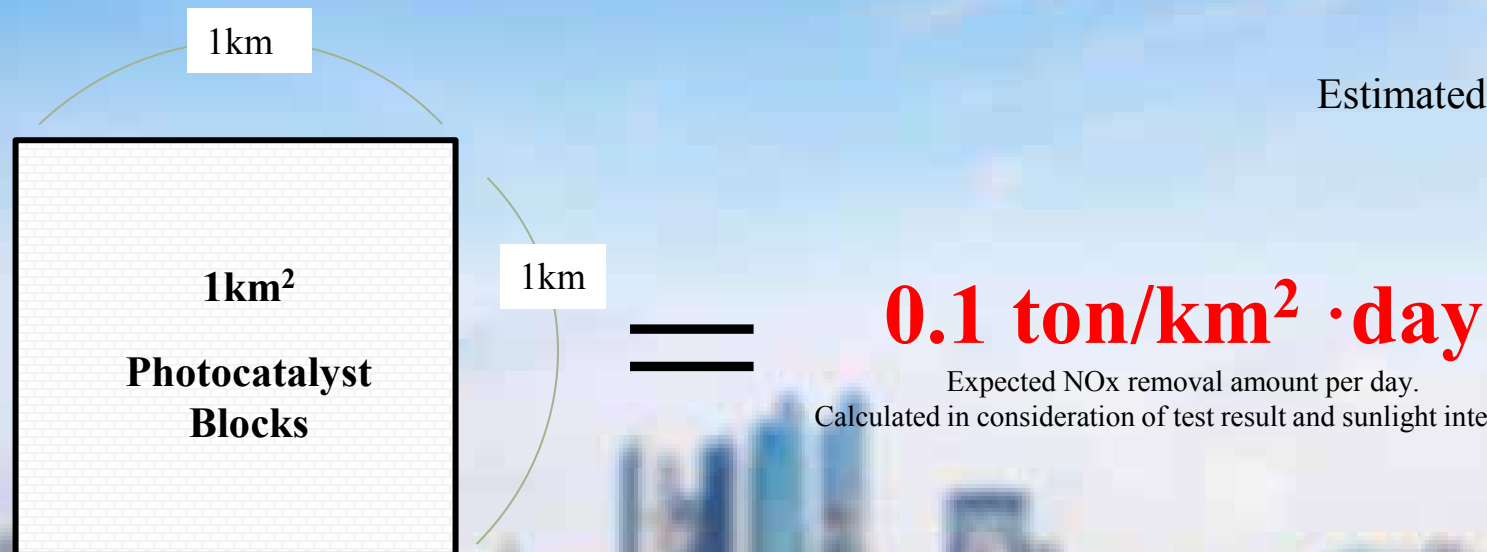
Replacing costs :

30 billion won

VS

Estimated fine dust social costs a year :

10.3 trillion won





Safety of titanium oxide?

Titanium is the 10th most abundant material in the earth and is added to cosmetics, papers, paint, toothpaste, chocolate and etc. It is used more than 7 million tons per year worldwide and is harmless to human body.



Type of titanium oxide?

For general industrial use, the rutile type with a particle size of 100-300nm is widely used, and the anatase type with a particle size of 10-30nm is used for photocatalysts.



Possibility to spread into the air?

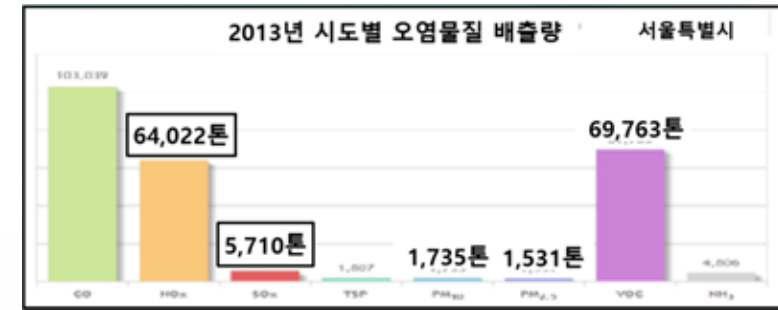
Nitrogen compounds such as nitric acid (HNO_3) and nitrate ions (NO_3^-) generated on the surface of photocatalyst exist in a neutralized (ion-bonded) NO_3^- state by the alkali component of concrete. So it may be considered as not spreading into the air.





Pollution by nitrate?

Nitrate on the surface is flushed away by rainwater and become plant fertilizer without affecting water quality.



Calculation basis (Prof. Dr. J.H.Kim / Chonnam National University)

- In 2013, if 30% of NO_x and SO_x emissions in Seoul were removed by photocatalyst, the amount corresponds to NO_x 53 tons/day and SO_x 4.7 tons/day.
- When nitrate nitrogen is discharged into the stream, the standard limit is NO₃-N 10 mg/L. It corresponds to NO₃- 44 mg/L.
- After NO_x and SO_x removal by photocatalysis, about 132 tons of water are required to discharge nitric acid or sulfuric acid generated within emission standards.
- The daily flow rate of the Han River is minimum of 4,069 thousand tons, and maximum of 664,263 thousand tons, even the minimum flow has more than 30,000 times the discharge standard, so it can be said 'no impact on the environment at all.'



Why it should be a photocatalyst block?

- Environment friendly technology using only sunlight and rainwater.
- Simultaneous removal of air pollutants (NO_x, SO_x, VOCs, NH₃, etc.) that are the cause of ultrafine dust.
- The photocatalysis lasts for the life span of the block.
- Antibacterial and deodorizing effect.

Photocatalyst blocks are very effective alternative to improving air quality.



Sandpaper Test

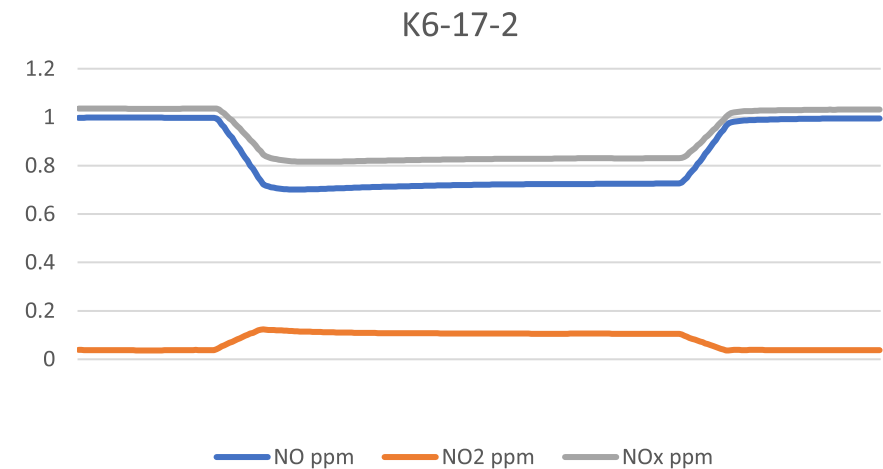
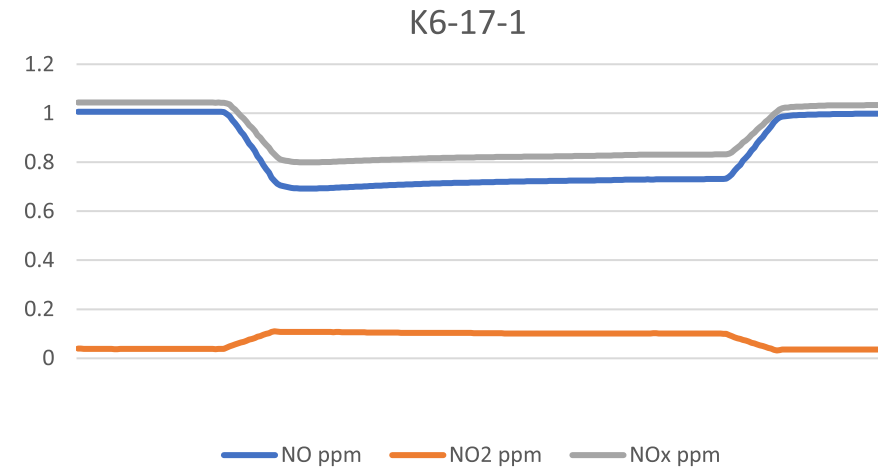


Sample K6-17 after sandpapering test

- Before 27.4%
- After 27.2%

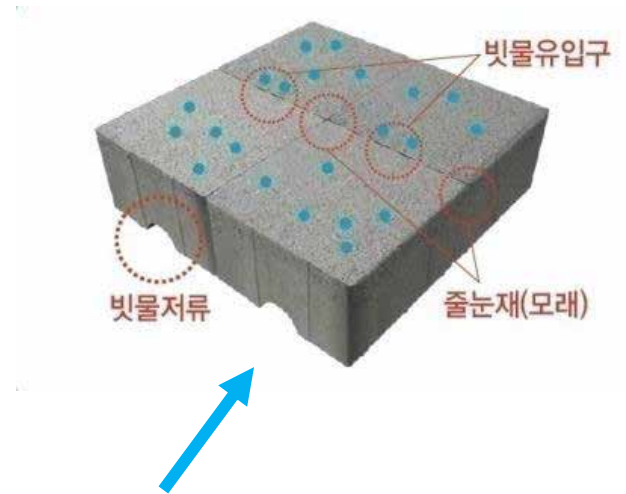
AirClean block is not surface - coating type

but concrete - mixture type that its photocatalysis lasts permanently and effects till the life span of blocks.



AirClean rainwater-inducing block

NOx removal + water storage, permeability



Rainwater-inducing function

- Waterway through block gaps.
- Secured space under block where contaminants can be flushed away.
- Continuing permeability. (Hydraulic conductivity after 7 months : 8.28mm/s)
- Reservoir and water storage function at the bottom of the pavement.
- Effectively reduce water pollution by permeating rainwater into the soil.

E.O.D
Thank You