

THE ENVIRONMENTAL ALTERNATIVE

Anti-Pollutant
Anti-Bacterial
Italian Made

OXYgena
PURIFICA L'ARIA

IMPORTED EXCLUSIVELY BY

COMPLETE Tiles & Stone

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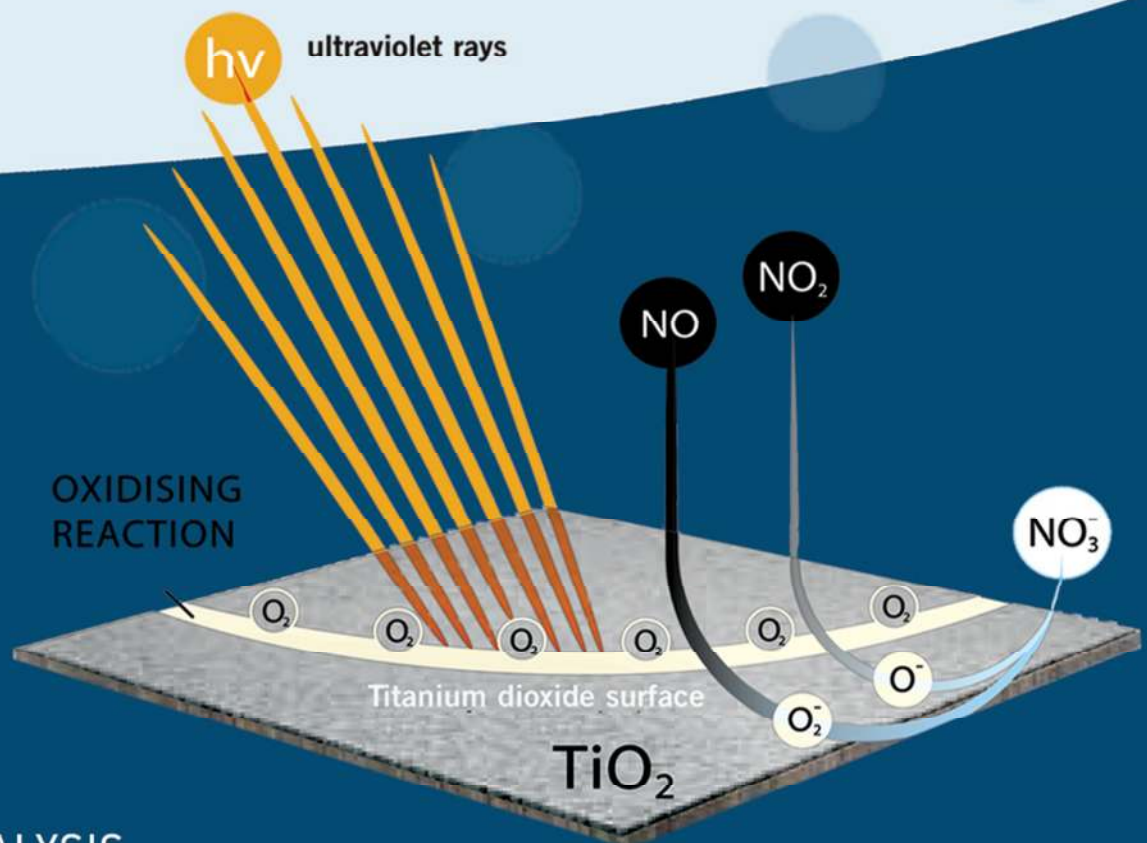
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Air-borne pollution is one of the most pressing and difficult problems to solve in our society. Combined with ever present bacteria such as *Escherichia coli* (E. coli) and *Staphylococcus Aureus*, our surrounding environments take an increasing toll on our day to day health. Reducing our pollution is a regular topic of conversation, however the reality of changing our lives to do so is much more challenging.

There are however steps that we can all take to improve our environments and counteract the detrimental effects of pollution. A partial solution is to transform the pollutants we create into harmless eco-compatible compounds.

This is where OXYGENA can make a difference. OXYGENA is a patented product with a titanium dioxide glazed surface. When it is exposed to light it reacts with pollutants and bacteria (organic and inorganic pollutants) leaving them totally innocuous. It is a true ecosystem that works exactly like the chlorophyll photosynthesis of plants.



PHOTOCATALYSIS

Photocatalysis is the combining of a photocatalyst (in this case titanium dioxide) with light to produce a chemical reaction or change in composition of a compound. In the presence of air and light active oxygen is produced. When the active oxygen comes into contact with organic and inorganic pollutants it activates a chemical reaction which decomposes the pollutant. This process is similar to chlorophyll photosynthesis, a naturally occurring chemical reaction turning harmful pollutants into innocuous compounds.

TITANIUM DIOXIDE

Titanium dioxide is the naturally occurring oxide of titanium (chemical formula TiO_2). The photocatalytic properties of titanium dioxide were discovered by Akira Fujishima in 1967 and published in 1972. The process on the surface of the titanium dioxide was called the Honda-Fujishima effect. In 1995 Fujishima and his group discovered the superhydrophilicity phenomenon for titanium dioxide coated glass exposed to sunlight. This resulted in the development of self-cleaning glass and anti-fogging coatings. This phenomenon also works for OXYGENA tiles used as facades.

Titanium dioxide acts as the photocatalyst, activating the chemical reaction by using the air, light and pollutants. However the titanium dioxide is not directly involved in the reaction and therefore is not consumed during the oxidation process.

This means there is no reduction in the process over time.

The tile's properties are timeless.

When titanium dioxide is incorporated into outdoor building materials such as tiles, this substantially reduces concentrations of airborne pollutants such as volatile organic compounds and nitrogen oxides.

A photocatalytic cement that uses titanium dioxide as a primary component, produced by Italcementi Group, was included in Time's Top 50 Inventions of 2008.

The challenge of manufacturing a tile that was both strong and durable had previously prevented the application of a titanium dioxide coating. This is because the titanium dioxide coating loses its photocatalytic properties when heated to 900 degrees celsius. However the OXYGENA product has risen to this challenge by utilising a unique firing system that enables the tile to be fired to 1130 degrees which enhances the mechanical durability of the tile whilst maintaining the photocatalytic properties.

This unique system is protected by international patents.



ANTI POLLUTION

OXYGENA will assist in the reduction of pollutants such as nitrogen oxides, PM10 particulate matter, volatile organic compounds, NH3 gas, polyaromatic compounds, formaldehyde and fine dust particles.



IN PUBLIC



AT HOME



AT THE OFFICE

Nitrogen oxide refers to NO_x (NO and NO₂), created by emissions from the burning of fossil fuels, as in cars, gas heaters, stoves and lightning. Nitrogen dioxide is toxic by inhalation.

Particulate Matter (PM₁₀) particles result from processes such as the burning of fossil fuels in vehicles and power plants. Various industrial processes also generate significant amounts of particulates. Increased levels of these fine particles in the air are linked to health hazards such as heart disease, altered lung function and lung cancer.

Volatile Organic Compounds are chemical compounds which have significant vapor pressures which can be dangerous to human health and have adverse effects on the environment over a long term period. A major source of man-made VOCs are solvents, especially paints and protective coatings. Since people today spend most of their time at home or in an office, long-term exposure to VOCs in the indoor environment can contribute to sick building syndrome. In offices, VOC results from new furnishings, wall coverings, and office equipment such as photocopy machines, which can release VOCs into the air.

Polyaromatic compounds (PAH)s are one of the most widespread organic pollutants. In addition to their presence in fossil fuels they are also formed by incomplete combustion of carbon-containing fuels such as wood, coal, diesel, fat, tobacco, and incense. As a pollutant, they are of concern because some compounds have been identified as carcinogenic.

Formaldehyde is a naturally occurring substance in the environment made of carbon, hydrogen and oxygen. Due to formaldehyde resins being used in many construction materials it is one of the more common indoor air pollutants. Formaldehyde is an intermediate in the combustion of methane as well as other carbon compounds, e.g. in forest fires, in automobile exhaust, and in tobacco smoke. Formaldehyde is highly toxic to humans, regardless of intake method. Formaldehyde can be toxic, allergenic, and carcinogenic.

Tests have shown that one square metre of OXYGENA tiles are capable of purifying up to 72 cubic metres of air during 8 hours of exposure to UV light.

ANTI-BACTERIAL

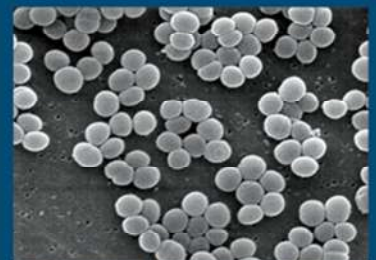
The photocatalytic properties of titanium dioxide have been well proven in their ability to quickly decompose bacteria. OXYGENA tiles have been tested and proven to reduce 99.99% of *Escherichia coli* (*E. coli*) bacteria after just 30 minutes of contact time. OXYGENA has also been proven to reduce 99.9% of *Staphylococcus Aureus* bacteria after 30 minutes of contact time.

E. coli can cause gastroenteritis, urinary tract infections, and neonatal meningitis. In rarer cases, it can also be responsible for haemolytic-uremic syndrome, peritonitis, mastitis, septicaemia and gram-negative pneumonia.

S. aureus can cause a range of illnesses from minor skin infections, such as pimples, impetigo, boils (furuncles), cellulitis folliculitis, carbuncles, scalded skin syndrome, and abscesses, to life-threatening diseases such as pneumonia, meningitis, osteomyelitis, endocarditis, toxic shock syndrome (TSS), bacteremia, and sepsis.



ESCHERICHIA COLI



STAPHYLOCOCCUS AUREUS

TECHNOLOGY

In 1995 Fujishima and his group discovered the superhydrophilicity phenomenon for titanium dioxide coated glass exposed to sun light. This resulted in the development of self-cleaning glass and anti-fogging coatings. This phenomenon also works for OXYGENA tiles used as facades on buildings.

The Gambarelli Group was the first to invent and patent the titanium dioxide tile in 2003. Today it is the only one with 8 years experience and numerous awards, patents and certification including but not limited to:

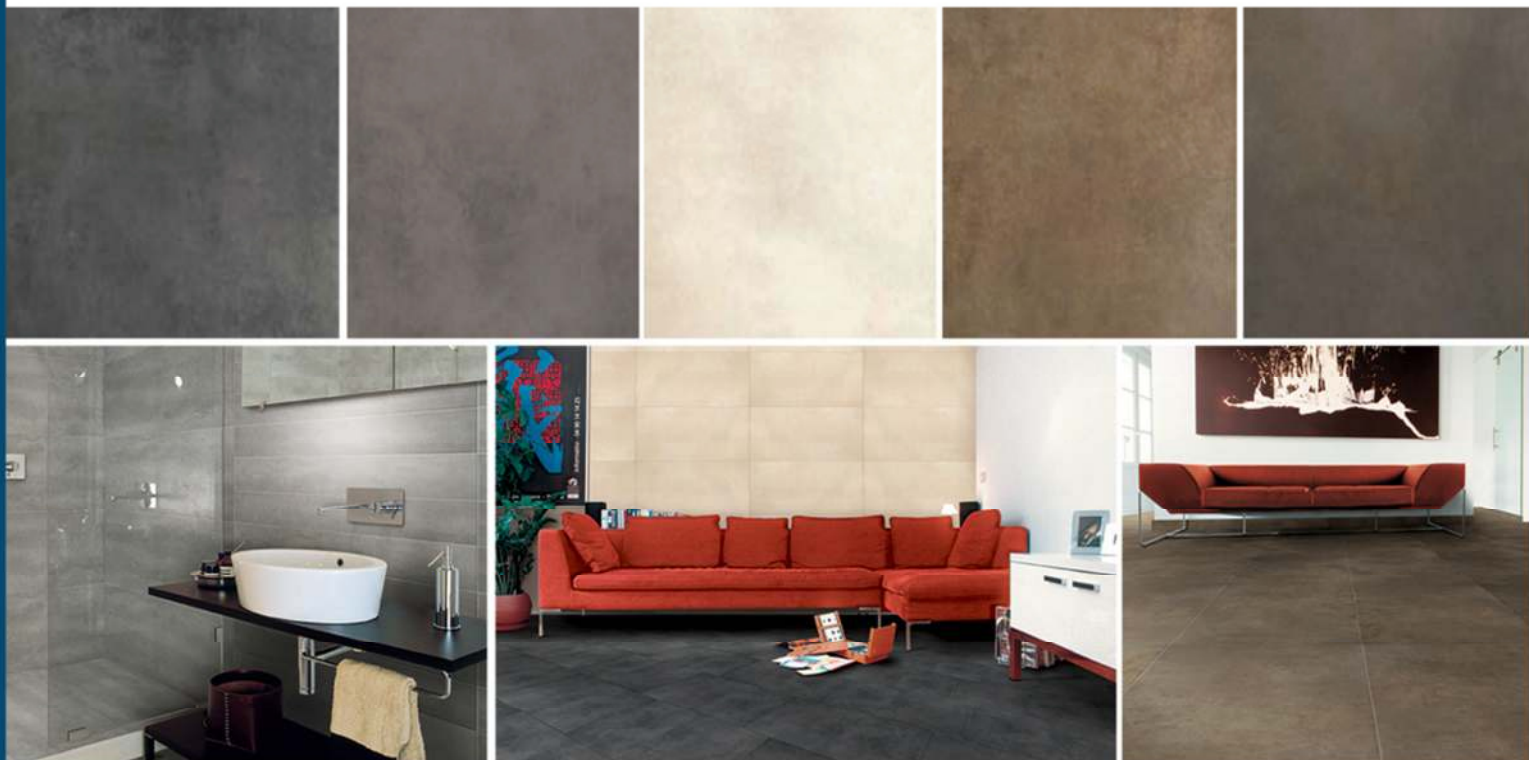
- Italian patent for invention
#0001341440
Approved September 24, 2009
- US patent for invention
#US7,608297B
Approved October 27, 2009
- Anti-pollutant efficacy's certifications
- Anti-bacterial efficacy's certifications



The OXYGENA product is porcelain stoneware, where the biscuit color typically matches the glaze color. Porcelain stoneware is a premium quality product at an affordable price.

The OXYGENA Concrete range combines a technological and biocompatible soul with the style and design of the modern era. Italian mastery of tile design has created a range with a color palette for the discerning eye. Various colors and formats are available with an R9 slip rating and Z wet pendulum test classification.

CONCRETE RANGE



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