

## Transparent Waterborne Photocatalytic Dispersion.

A **PHOTOACTIVA TB**® activated surface uses light energy (\*) to continuously produce active radicals on the surfaces:

**Hydroxyl Radical:** often referred to as the "detergent" of the atmosphere because it reacts with many pollutants, decomposing them through "cracking", often acting as the first step to their removal. It also has an important role in eliminating some greenhouse gases

**Peroxy Radicals:** as active as the ozone, they are the precursors of hydrogen peroxide, one of the most important disinfectants, capable of destroying both bacteria and viruses or fungi.

So, a **PHOTOACTIVA TB**® activated surface

- ELIMINATES the air POLLUTION
- MAINTAINS the surfaces CLEAN
- IMPEDES the development of VIRUSES, BACTERIA and FUNGI
- ELIMINATES ODOURS
- CONTRIBUTES TO PEOPLE'S HEALTH

**PHOTOACTIVA TB**® is used on surfaces submitted to polluted environments, mainly in urban or industrial areas where traffic and chemical pollutants are concentrated. **PHOTOACTIVA TB**® contributes to reduce pollution, to keep surfaces clean, and to reduce odours, also impedes the growth of viruses, moulds and bacteria

### - PHOTOCATALYSIS

Photocatalysis is a technology that works under the same principles than Photovoltaic Panels (Solar cells). It uses light energy (\*), to destroy elements that affect human health and dirt the air and the environment

- It is MAINTENANCE FREE, and its effect is PERMANENT.
- It is a CLEAN TECHNOLOGY
- It is a SURFACE CLEANER, and an AIR DEPOLLUTER
- DESTROYS the DIRT and DESTROYS VIRUSES, MOULDS and BACTERIA
- Is a NATURAL effect, as naturally reproduces the activity of the sun and plants.
- It doesn't contain harmful components

(\*) Photocatalysis requires light energy to be activated. Natural light, fluorescent, or incandescent bulbs are, in that order, suitable to activate the surfaces.

Black light, or LED lights emitting in the range of visible violet (380 nm) is optimal for a perfect activation. Even minimum power (0,01 Watt/ m<sup>2</sup>) of that light will eliminate up to 100 % of the biological load of the treated surfaces

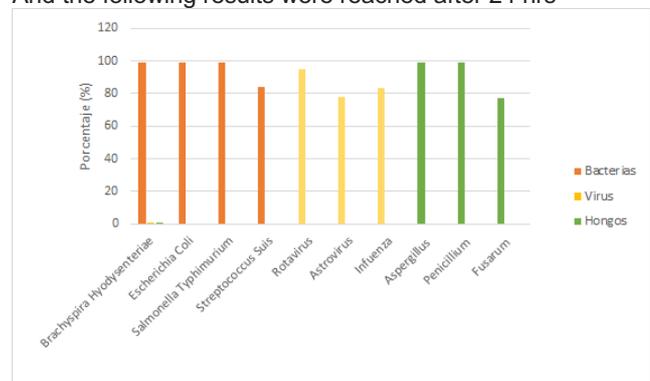
### -RESULTS

#### Tested under ISO 27447

After 3 months application, up to 100 % destruction of microorganisms when inoculated on the activated surfaces  
In test done with highly resistant Human Virus (adenovirus 5), the results after 3 months application were up to 100 % destruction

#### Other tests results

Up to 100 % reduction in ATP (1) measures can be obtained after 40-60 minutes in correctly illuminated surfaces  
And the following results were reached after 24 hrs



(1)Adenosine triphosphate (ATP) is a complex organic chemical that provides energy, often referred to as the "molecular unit of currency" of intracellular energy transfer. It is also a precursor to DNA and RNA.

### -APPLICATION

**PHOTOACTIVA TB**® is currently applied as a mist, by spray gun, with a 0, 3 mm nozzle and low pressure. Creation of drops, or product accumulation, should be avoided. Surfaces must be clean and dry. A single application of 100-150 gr /m<sup>2</sup> is recommended. **PHOTOACTIVA TB**® doesn't forms a film. **PHOTOACTIVA TB**® is applied on Coated Surfaces, Natural stone, Marble, Ceramics, Concrete, etc... Once applied, it develops adherence during the initial days.

**PHOTOACTIVA TB**® can have some whitening effect on dark coloured surfaces

### -TECHNICAL DATA

Waterborne photocatalytic dispersion for the reduction of pollutants and protection of surfaces in highly contaminated areas.

- No flammable. Waterborne
- Translucent/ invisible once applied
- Appearance: low viscosity milky liquid
- Density 1.1 kg/l
- Does not create a film
- Yield: around 10 m<sup>2</sup>/lt. once applied by spray gun
- Application temperature: between 5°C and 35°C
- Protect from frost.

updated 10/2020

# PhotoActiva TB **activa**

Protection against Bacteria Fungi and Viruses  
RESULTS CERTIFIED ISO-27447 and ISO -22197

Since the outbreak of severe acute respiratory syndrome (SARS) in southern China was recognized in late February 2003, a large number of chemical disinfectants have been used in the epidemic area, which has caused public concern about human health and the environment.

The use of light-reinforced semiconductor minerals is an alternative to conventional chemical disinfectants (Hong He a, 2004).

The minerals selected by our company have been studied over the years for their antibacterial properties ((Wei C, 1994); (Watts RJ, 1995); (Kikuchi, 1997); (Cho M, 2005); (Benabbou, 2007); (Page, 2007)) and are attributed to ROS generation, especially hydroxyl (HO) and hydrogen peroxide (H<sub>2</sub>O<sub>2</sub>) free radicals (Kikuchi, 1997), as well as several study-focused experiments. of the inactivation properties of viruses (Liga & Bryant, 2011).

A study to highlight apart from Hong He's performed with Coronavirus inactivation, is that of Mannekarn et al, in 2007, which showed that certain semiconductor minerals that had been radiated with visible light (VL) inactivate rotavirus, astrovirus, and feline calicivirus. (FCV).

Viral concentrations were drastically reduced after exposure for 24 hours. This finding implied that the catalyst products might somehow initially interact with viral proteins in the virus inactivation process. In addition, he shows in his article a partial degradation of the rotaviral dsRNA genome. He also observed that as with bacteria, reactive oxygen species such as superoxide (O<sub>2</sub><sup>-</sup>) anions and hydroxyl radicals (· OH) were generated in a significant amount after stimulation for 8, 16 and 24 hrs. In conclusion, it states that inactivation of viruses as well as microorganisms in general could occur through O<sub>2</sub> and OH generation, followed by damage to the viral protein and genome (Niwart Maneekarn, 2007).

After a thorough search for minerals with these capabilities, optimum concentrations and synergies, **PHOTOACTIVA TB**® is manufactured, a liquid treatment for all types of installations, based on non-degradable harmless semiconductor minerals, which in combination with a source light (natural or artificial) permanently eliminates any type of virus, bacteria or fungus.

**PHOTOACTIVA TB**® also contains components to ensure the adhesion of these minerals and provide treatment durability of about three years.

## Bibliography

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