updated 10/2020

PhotoActiva 130 activa

Protection against Bacteria Fungi and Viruses

Transparent Waterborne Photocatalytic Dispersion for non-porous indoor surfaces

A **PHOTOACTIVA 130®** 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

Peroxyl 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 130®** activated surface

- MAINTAINS the surfaces CLEAN
- DESTROYS VIRUSES, BACTERIA and FUNGI
- CONTRIBUTES TO PEOPLE'S HEALTH

PHOTOACTIVA 130® is used on non-porous surfaces.
PHOTOACTIVA 130® destroys viruses, moulds and bacteria, and also contributes to reduce pollution, to keep surfaces clean, and to reduce odours

- PHOTOCATALYSIS

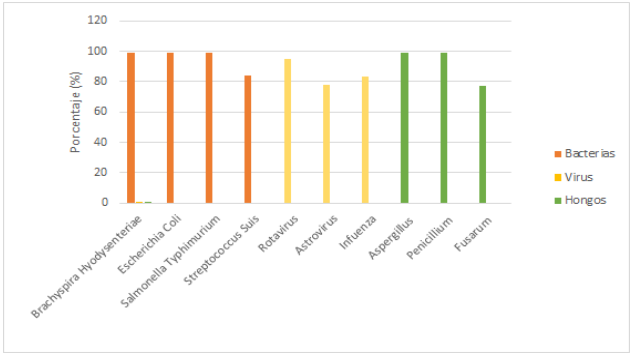
Photocatalysis is a technology that works under the same principles than Photovoltaic Panels (Solar cells). It uses light energy (*), to destroy elements that affect human health and dirt the air and the environment

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

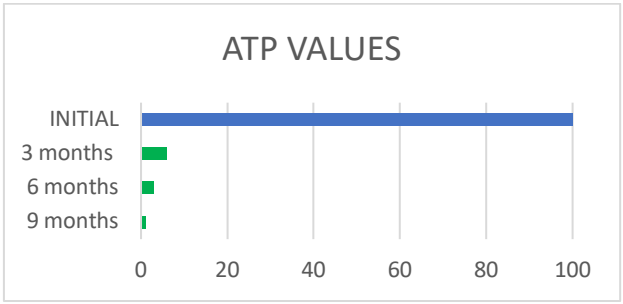
(*) Photocatalysis requires light energy to be activated. Natural light, fluorescent, or incandescent bulbs are, in that order, suitable to activate the surfaces.
Black light, or LED lights emitting in the range of visible violet (380 nm) is optimal for a perfect activation. Even minimum power (0,01 Watt/ m^2) of that light will eliminate up to 100 % of the biological load of the treated surfaces

-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.



Persistency of the treatment with time

-APPLICATION

PHOTOACTIVA 130® is currently applied as a mist, by spray gun, and low pressure. Creation of drops, or product accumulation, should be avoided. Surfaces must be clean and dry. A single application of 50-100 gr /m2 is recommended.
PHOTOACTIVA 130® doesn't form a film.
PHOTOACTIVA 130® is applied on glass, metal, and other indoor surfaces... Once applied, it develops adherence during the initial days.

-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 translucent liquid
- Density 1.01 kg/l
- Does not create a film
- Yield: around 20 m2/lt. once applied by spray gun
- Application temperature: between 5ºC and 35ºC
- Protect from frost.

Active Walls .S.L
Daoiz I Velarde 22-26 L1 08980 Sant Feliu Llob.
comercial @activacolors.com

updated 10/2020

PhotoActiva 130 activa

Protection against Bacteria Fungi and Viruses

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 (H2O2) 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 (O2-) 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 O2 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

Benabbou, A. D. (2007). Photocatalytic inactivation of Escherichia coli- effect of concentration of TiO2 and microorganism, nature and intensity of UV irradiation. Applied Catalysis B-Environmental 76 (3-4), 257-263.

Cho M, C. H. (2005). Different inactivation behaviors of ms-2 phage and Escherichia coli in TiO2 photocatalytic disinfection. . Appl Environ Microbiol 71(1), 270-275.

Hong He a, *. X. (2004). Catalytic inactivation of SARS coronavirus, Escherichia coli. Elsevier, 170-172.

Kikuchi, Y. S. (1997). Photocatalytic bactericidal effect of TiO2 thin films: dynamic view of the active oxygen species responsible for the effect. Journal of Photochemistry and Photobiology A: Chemistry 106, 51-56.

Liga, M. V., & Bryant, E. (2011). Virus inactivation by silver doped titanium dioxide nanoparticles for drinking water treatment. Elsevier, 535-544.

Niwart Maneekarn, W. E. (2007). Photocatalytic inactivation for diarrheal viruses by visible-light-catalytic titanium oxide. Clin. Lab., 413-421.

Page, K. P. (2007). Titania and silver Titania composite films on glass-potent antimicrobial coatings. Journal of Materials Chemistry 17 (1), 94-104.

Watts RJ, K. S. (1995). Photocatalytic inactivation of coliform bacteria and viruses in secondary wastewater effluent. Water Res 29(1), 95-100.

Wei C, L. W. (1994). Bactericidal activity of TiO2 photocatalyst in aqueous media: toward a solar-assisted water disinfection system. Environ Sci Technol 28, 934-938.

Active Walls .S.L
Daoiz I Velarde 22-26 L1 08980 Sant Feliu Llob.
comercial @activacolors.com