PhotoACTIVE
L&G Holding srl
L&G HOLDING SRL IS A FIRM OF PRODUCTION AND A CHEMICAL ENGINEERING PROVIDING INTEGRATED SOLUTIONS QUALIFIED AND COMPLETE TO COMPANIES. IT IS THE COMPANY THAT IS INTERESTED IN THE RESEARCH AND DEVELOPMENT OF MICRO AND NANOTECHNOLOGY APPLIED TO THE ENVIRONMENT, MATERIALS, PRODUCTS, BUT MOSTLY WE STUDY NEW MOLECULES SMART, FOR THE FOOD INDUSTRY, BUILDING, NAVAL, AGRICULTURE AND FOR MEDICAL AND PUBLIC HEALTH SECTOR. WE ARE THE LINK BETWEEN THE INDUSTRY AND THE TECHNOLOGY OF A MACRO OR MICRO STRUCTURE APPLIED TO A MATERIAL.
PhotoACTIVE performs an anti-microbial, anti-bacterial and anti-mold action, very effective, since instead of other anti-bacterial agents it does not kill bacteria or molds, but through oxidation-reduction reactions it decomposes them into gaseous substances that are dispersed in the surrounding environment not accumulating on the catalyst. The decomposition of the bacteria takes place by means of the hydroxide radicals (OH•) and the oxygen anions (O2-) generated by the photocatalytic process which attack the lipid membrane of the bacteria decomposing it and preventing the aerobic respiration phase of the bacteria. Therefore, the microorganisms die and are then gradually decomposed to obtain carbon dioxide and water which are released into the surrounding environment.

The destruction of molds, bacteria, viruses and other microorganisms allows the elimination of bad odors associated with their presence and allows the substrate to which the titanium dioxide is applied to be maintained at high hygienic conditions.

RELIABILITY
PhotoACTIVE has an average particle size of 5–7 nanometers, much smaller than a virus or bacterium. The drawing shows the dimensions we are talking about on a proportional scale. This nanostructure, thanks to its strong adhesion power, is able to cling to any substrate and, thanks to the photochemical action of the product, it is able to decompose any chemical element carbon-based or biological that settles on its surface. The PhotoACTIVE coating, after drying, is not toxic or harmful.
Hospital Acquired Infections are a $30 Billion annual problem in the US alone. Four areas that are not typically disinfected well:

1. Windows
2. Ceilings
3. Beds
4. Light fixtures
5. Air Condition
6. Wall

<table>
<thead>
<tr>
<th>Test Method</th>
<th>Test Parameters</th>
<th>Test Suspension (lg)</th>
<th>Final Count (lg)</th>
<th>Bactericidal Effect (log reduction)</th>
<th>Specification Limit (lg)</th>
<th>Bactericidal Efficiency (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Staphylococcus aureus ATCC 6538</td>
<td>7.26</td>
<td>0.92</td>
<td>5.18</td>
<td>5</td>
<td>0.1</td>
<td>0.05</td>
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<td>Escherichia coli ATCC 10536</td>
<td>7.23</td>
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<td>0.03</td>
<td>5</td>
<td>0.1</td>
<td>0.05</td>
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<tr>
<td>Pseudomonas aeruginosa ATCC33462</td>
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<td>6.27</td>
<td>5</td>
<td>0.1</td>
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<td>1.40</td>
<td>5.10</td>
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<td>0.05</td>
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</tbody>
</table>

Microbiology report conclusion:

- Test requested: Quantitative suspension test for the evaluation of bactericidal activity of chemical disinfectants and antibacterial
- Conclusion: COMPLIED
- Observation: Based on EN 1276 the tested product possesses bactericidal activity in 5 minutes at 20°C under clean condition
Infections in confined spaces on cruise ships are a problem. We show nine areas that are typically not disinfected well:

1. Windows
2. Ceiling
3. Beds
4. Lamps
5. Carpets and carpets
6. Walls
7. Curtains
8. Sofas and furnishings
9. Air conditioning
Infections in confined areas of hotels are a problem. We show six areas that are typically not disinfected well:

1. Windows
2. Ceiling
3. Beds
4. Lamps
5. Carpets
6. Walls
7. Curtains
8. Sofas and furnishings
PhotoACTIVE is the ideal industrial application for interior and facade cladding. The benefit achieved is unique, and we summarize it as follows:

1. Self-cleaning of surfaces
2. Antibacterial of the substrate
3. Hyper Hydrophilia
4. Reduction of volatile organic compounds
5. Low maintenance
6. Resistance to attack by acids and bases
7. Benefits in the environment
8. Long life of the coating
We certified PhotoACTIVE for use in medical clothing, we guarantee the durability of the product for 20 washes in the washing machine at 40 °C without losing the effectiveness of the antibacterial solution on the fabric.

1. Headwear
2. Masks
3. Clothing
4. Gloves

Biocide product in compliance with the BPR EU n. 528/2012 referred to in Annex V, dossier presented, present at the PT, to the type of product (PT) 1, 2, 4, 6, 7, 9, 10, and 11. Authorizations such as PMC must be requested.
OTHER APPLICATIONS

- PAINT
- AIRPORTS - STATIONS
- TRAINS – BUS - SHIPS
- MASKS
- SCHOOLS - KINDERGARTENS
- SHOPPING CENTERS
Analyses antibacterial on cloth

Staphylococcus aureus (ATCC 6538)
Klebsiella pneumoniae (ATCC 4532)

Results: Good Effect (best result)

Degradation of nitrogen oxides in air

Analysis of NOx, NO, NO2

Results: 97% of NOx destroyed in 15 minutes. Good photocatalytic activity.

Resistance to alkaline attack

From Class A2 to Class A1 until 75 mg/dm²

Results: 69.2 mg/dm²

Anti mold analysis

Rencillium purpurogenum
Rhodotorula mucilaginosa

Results: No mycelium on specimen after 21 days. (best result)

Antibacterial analysis on cloth

Staphylococcus aureus (ATCC 6538)
Klebsiella pneumoniae (ATCC 4532)

Results: Good Effect (best result)

Antibacterial analysis on paints

Staphylococcus aureus (ATCC 25923)
Escherichia coli (ATCC 25922)

Results: Good Effect (best result)

Antibacterial analysis on tile

Staphylococcus aureus (ATCC 6538)
Pseudomonas a. (ATCC 15442)

Results: Good Effect (best result)

Analysis of NOx, NO, NO2

Results: 97% of NOx destroyed in 15 minutes. Good photocatalytic activity.

Test Made in Japan*

Influenza virus A

Results:
1° test: 99.987% of virus destroyed
2° test: 99.998% of virus destroyed
3° test: 99.985% of virus destroyed

* Unregulated test. (There is no UNI-ISO test available)

All analysis files available on request
The duration depends on the materials, the state of the substrate and the climatic conditions.
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WE RECOMMEND

HPLV SPRAY SYSTEM
NOZZLE: 0.3 mm
AIR VOLUME: 2700 l/min.
PRESSURE: 0.31 bar (max.)
AIR: HOT

Application

Method

On the field PhotoACTIVE is usually applied in a 2 step process.

1. The surface is pre-cleaned
2. PhotoACTIVE is applied using HVLP spray guns, creating an incredibly thin layer only 40 nanometers thick.
3. Each liter of PhotoACTIVE covers up from 50 to 100 sqm.
4. Dries in seconds, cures in few minutes.

In Production PhotoACTIVE can be applied in a factory setting using a variety of spray techniques.

L&G provides all the information to apply the product.
THANKS FOR YOUR ATTENTION

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