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puretiTM 

SOLUCIONES SOSTENIBLES, PARA UN MUNDO LIMPIO

1- Fotocatálisis General

- Definición.
- Historia.
- Beneficios.
- Tendencias.
- Artículos Científicos y Patentes.

2- ¿Por Qué PURETI?

- Definición.
- Certificaciones.
- Testimonios.
- Premios y "Partnership Agreements".
- OEM.
- Logros.
- Media.
- Estructura en Europa.

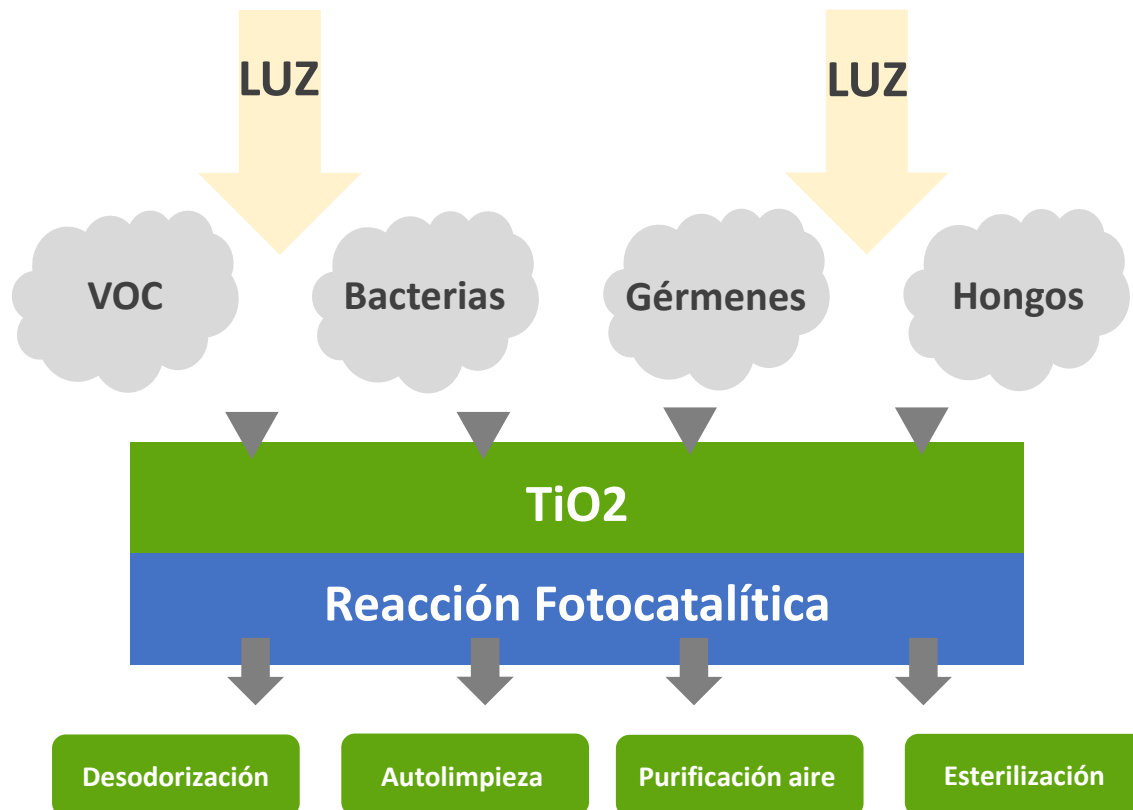
3- Repercusión en su Negocio

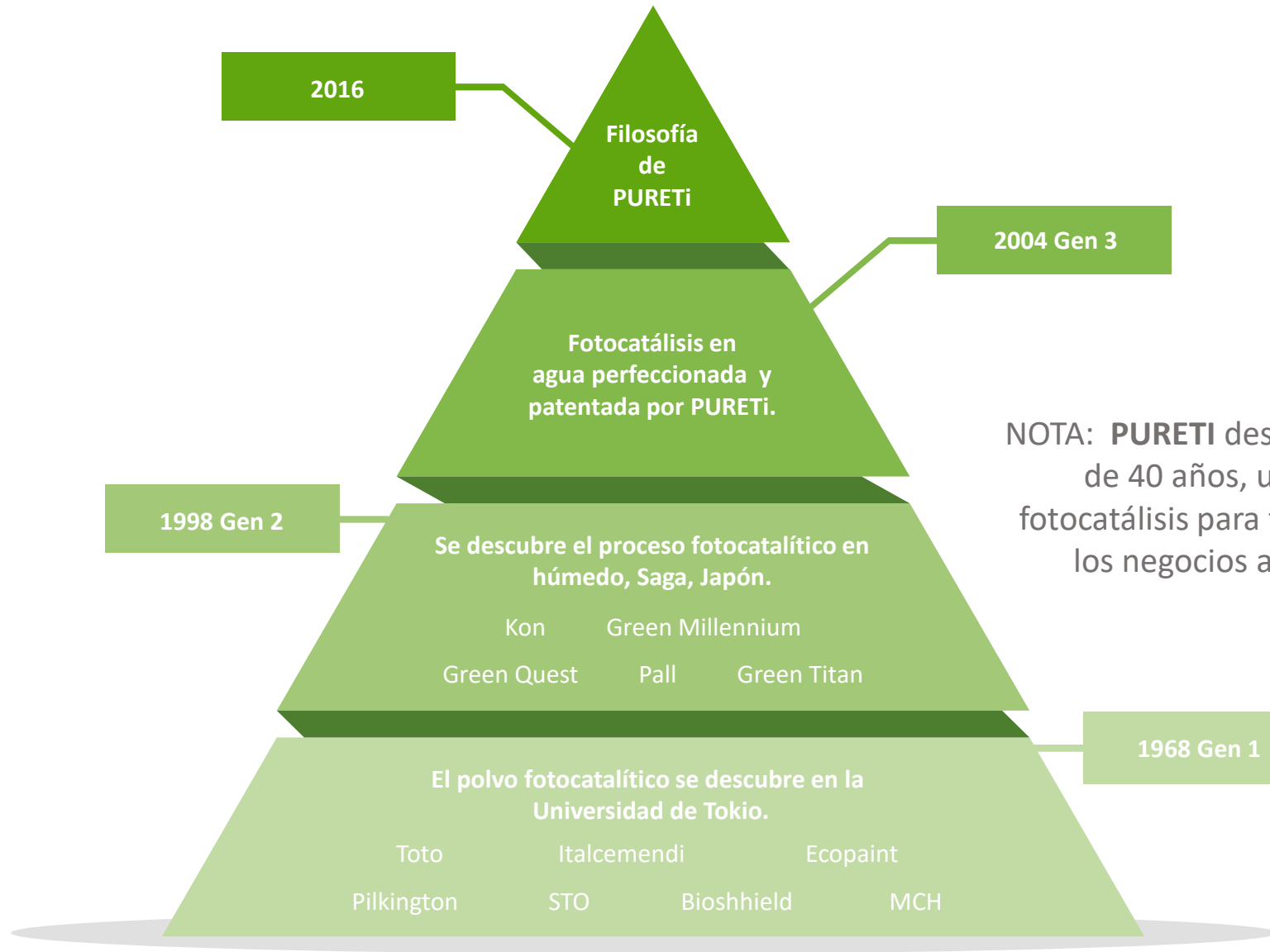
- Descomoditización / Exclusividad / "Cross-Fertilization" / Sustainable Brands.
- Apoyos.

4- Herramientas de apoyo

5- "Focus": Caso Particular

La **fotocatálisis** es una reacción química que elimina contaminantes habituales en la atmósfera, como son los NOx, SOx, COVs, mediante un proceso de oxidación activado por la energía de la luz. El fotocatalizador más comúnmente utilizado es el **dióxido de Titanio (TiO₂)**.





NOTA: **PURETi** después de más de 40 años, utiliza la fotocatalisis para transformar los negocios actuales.



ANTIBACTERIAS



ELIMINACIÓN DE
OLORES



AUTOLIMPIEZA



ELIMINACIÓN DE
MOHOS



ELIMINA LA
CONTAMINACIÓN
DEL AIRE



“La EIC considera los tratamientos fotocatalíticos como un de las 5 acciones que se introducirán en Europa para combatir la polución”. La Comisión de Industrias Medioambientales (EIC) existe para garantizar que el sector empresarial del Reino Unido pueda trabajar eficazmente para mejorar el medio ambiente en el que todos confiamos y disfrutamos como ciudadanos.



Towards Purer Air:

A review of the latest evidence of the effectiveness of photocatalytic materials and treatments in tackling local air pollution

Table 11 Net present value cost to 2020 of technologies per tonne of NO_x abated

Technology	€/t NO _x abated
Electric cars	2,196,676
Euro 6c diesel car	398,108
Photo-catalytic treatment	40,523
Renewable diesel generators	38,719
Bus retrofit	6,842

Annex 2: Economic assessment of photocatalytic treatment – A report by Temple Group

Introduction

Temple Group have been commissioned to undertake an update of the economic assessment previously carried out on the costs and benefits associated with a range of mitigation for large-scale pollution reduction in the UK.

The previous study¹ looked at the nitrogen oxides (NO_x) and particulate matter (PM₁₀) reductions which could be achieved for a range of mitigative measures, including:

- Electric vehicles: Replacement of 300,000 diesel cars by electric vehicles as envisioned by Low Carbon Vehicle Partnership (LCVP) roadmap.
- Liquefied Petroleum Gas (LPG): 75,000 diesel cars replaced with new LPG cars.
- Euro6c diesels: 90,000 old diesel cars replaced by new Euro6c diesel cars in 2018/19.
- Bus retrofit: 10,000 old buses in cities outside London retrofitted with DPF and SCR technology.
- Renewable diesel: 3,000 electricity generators on urban construction sites switch from using red diesel to renewable diesel.
- Photocatalytic treatment: 200 km of most polluted roads treated with photocatalytic treatment.

Ganadores del proyecto iSCAPE para reducir la contaminación de la Unión Europea



Este proyecto ha recibido fondos del programa de investigación e innovación Horizonte 2020 en acuerdo de subvención nº 689954

Trinity College Dublin (IRE), Università di Bologna (IT), University of Surrey (UK), Ilmatieteen Laitos (FIN), Universiteit Hasselt (BEL), Technische Universitat Dortmund (GER), JRC -Joint Research Centre- European Commission (BEL), Institut d'Arquitectura Avançada de Catalunya (ESP), T6 Ecosystems srl (ITA), **Pureti (ESP-USA)**.



El proyecto iSCAPE está diseñado para **combatir la polución** de las ciudades en los próximos 60 años.



What is iSCAPE?

Research and innovation action for improving air quality in European cities

What is iSCAPE aiming to achieve?

Advanced and integrated passive air pollution remediation strategies

Improving the Smart Control of Air Pollution in Europe



Existen más de 9.000 patentes y 44.000 artículos científicos que hablan de la fotocatalisis con TiO₂

Contents lists available at ScienceDirect
Applied Catalysis B: Environmental
 journal homepage: www.elsevier.com/locate/apcatab

Review
Self-cleaning applications of TiO₂ by photo-induced hydrophilicity and photocatalysis

Swagata Banerjee^a, Dionysios D. Dionysiou^b, Suresh C. Pillai^{c,d,e}

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Available online at www.sciencedirect.com
ScienceDirect
 Energy Procedia 119 (2017) 332–345

International Conference on Technologies and Materials for Renewable Energy, Environment and Sustainability, TMREES17, 21–24 April 2017, Beirut Lebanon
Exploring potential Environmental applications of TiO₂ Nanoparticles

Adawiya J. Haider^a, Riyad Hassan AL- Anbari^b, Ghadah Rasim Kadhim^b, Chafiq Touma Salame^c

^aApplied science department, University of Technology, Baghdad (10056), Iraq
^bDepartment of Building and Construction Engineering, University of Technology, Baghdad (10056), Iraq
^cLebanon University, Beirut, Lebanon

Contents lists available at ScienceDirect
Catalysis Today
 journal homepage: www.elsevier.com/locate/cattod

Review
Can the photocatalyst TiO₂ be incorporated into a wastewater treatment method? Background and prospects

Satoshi Horikoshi^{a,b,c}, Nick Serpone^d

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^cPhotochemical Laboratory, Department of Chemistry, University of Paris, 6th Terrasses 12, Paris 27196, Italy

Contents lists available at ScienceDirect
Journal of Materionics
 journal homepage: www.journals.elsevier.com/journal-of-materionics

Photocatalytic oxidation of gaseous benzene, toluene and xylene under UV and visible irradiation over Mn-doped TiO₂ nanoparticles

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^cCrete Center for Quantum Complexity and Nanotechnology, Department of Physics, 71003, Heraklion, Greece

Contents lists available at ScienceDirect
Chemical Engineering Journal
 journal homepage: www.elsevier.com/locate/cej

Evaluation of the photocatalytic activity of TiO₂ based catalysts for the degradation and mineralization of cyanobacterial toxins and water off-odor compounds under UV-A, solar and visible light

T. Fotiou^a, T.M. Triantaf^a, T. Kaloudis^b, A. Hiskia^{a,b}

^aLaboratory of Catalysis - Photochemical Process (Solar Energy - Biomass), Institute of Advanced Materials, Physicochemical Processes, Nanotechnology and Microsystems, National Center for Scientific Research "Demokritos", Petrasches Organon Trikoupias, 21209 Agia Paraskevi, Attika, Greece
^bQuality Control Department, Athens Water Supply and Sewerage Company (EDSDF SA), Oropos 156, 11146 Galati, Attika, Greece

Contents lists available at ScienceDirect
Superlattices and Microstructures
 journal homepage: www.elsevier.com/locate/superlattices

Ag/TiO₂ nanocomposite for visible light-driven photocatalysis

G. Sanzone^a, M. Zimbone^b, G. Cacciato^c, F. Ruffino^{a,b,c}, R. Carles^d, V. Privitera^a, M.G. Grimaldi^{b,d}

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Contents lists available at ScienceDirect
Chemosphere
 journal homepage: www.elsevier.com/locate/chemosphere

Removal of contaminants of emerging concern (CECs) and antibiotic resistant bacteria in urban wastewater using UVA/TiO₂/H₂O₂ photocatalysis

Margarita Jiménez-Tortiz^a, Izabel Fereira^a, Sheila da Silva Duque^a, Paulo Rubens Guimarães Barrocas^a, Enrico Mendes Saggioro^{a,b,c}

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Contents lists available at ScienceDirect
Advanced Powder Technology
 journal homepage: www.elsevier.com/locate/apt

Original Research Paper
Mesoporous Fe₃O₄@Ag@TiO₂ nanocomposite particles for magnetically recyclable photocatalysis and bactericide

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Department of Materials Science and Engineering, National Cheng Kung University, 209 Kua Kiang Road, Tainan 702, Taiwan

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ABSTRACT
 Bimetallic iron/silver (or Fe/Ag) core/shell nanoparticles were prepared with their surface being modified by adsorption of 2-mercaptosulfonate. The adsorption facilitated grafting of organic titanium-containing molecules on the Ag surface, and resulted a uniform deposition of amorphous TiO₂ layer after sol-gel treatment. The Fe₃O₄@Ag@TiO₂ particles presented a mesoporous TiO₂ shell of 10–20 nm in thickness. A Brunauer-Emmett-Teller surface area of ca. 340 m² g⁻¹ is reported. Iron-silver bimetallic

Contents lists available at ScienceDirect
Nano-Structures & Nano-Objects
 journal homepage: www.elsevier.com/locate/nano

Facile synthesis of plasmonic Ag/AgCl/polydopamine-TiO₂ fibers for efficient visible photocatalysis

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^aSchool of Environmental Science and Engineering, Shandong University, 27 Shandong Nanlu, Jinan, Shandong 250100, PR China

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4- Herramientas de apoyo

5- "Focus": Caso Particular



Compuesto por agua



Dióxido de titanio



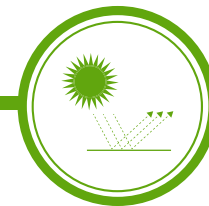
Aplicado con micronebulización



En cualquier superficie



Consigue sus efectos



Con el principio básico de la fotocatalisis

“ La **fotocatálisis** convierte la polución y la suciedad en vapor de agua y sal, y elimina las bacterias ”

PURETi es una solución que se puede aplicar por pulverización electrostática para formar una película mineral clara, duradera y fina de 40 nanómetros en prácticamente cualquier material de construcción: vidrio, metal, piedra, hormigón, pintura, plástico, etc. Recubrimiento transparente de TiO₂ que actúa como un catalizador en contacto con luz ultravioleta y disuelve las partículas incrustadas. El TiO₂ perdura en el tiempo manteniendo sus propiedades. Algunas de sus características es **destruir las partículas orgánicas contaminantes, matar las bacterias, produce un efecto superhidrofílico en las superficie y de autolimpieza.**

40 nanómetros
de espesor

Recubrimiento
invisible
TiO₂

A- Destruye
partículas
orgánicas
B- Súper
hidrofílico
C-Mata
bacterias

TiO₂ perdura
en años

ANTIBACTERIAS

Estudio de bacterias en superficies

ainia



Reducción de bacterias



99,99%

Resultados obtenidos

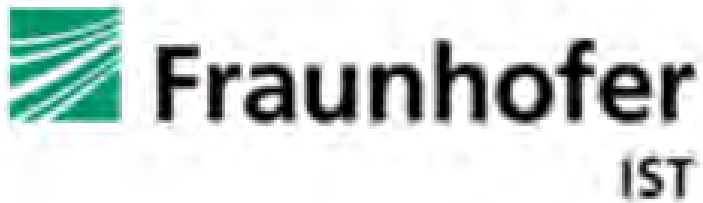
Material y tratamiento	<i>Escherichia coli</i> (log ufc/material)	<i>Staphylococ. aureus</i> (log ufc/ material)
Nº bacterias sobre material CONTROL tras 5h UV	4,81	3,18
Nº bacterias sobre PURETI COAT tras 5h UV	2,74	0
Nº bacterias sobre PURETI COAT PLATA tras 5h UV	0	0
Nº bacterias sobre material CONTROL tras 5h oscuridad	5,28	4,99
Nº bacterias sobre PURETI COAT tras 5h oscuridad	5,20	5,08
Nº bacterias sobre PURETI COAT PLATA tras 5h oscurid	5,39	4,99
Actividad antibacteriana fotocatalítica Material PURETI COAT	2,00	3,18
Actividad antibacteriana fotocatalítica Material PURETI COAT PLATA	4,81	3,18

Evaluación de resultados

- Los materiales cerámicos control no presentan ninguna actividad antimicrobiana.
- Los materiales cerámicos con agente PURETI COAT y agente PURETI COAT PLATA no presentan actividad antimicrobiana en condiciones de oscuridad.
- **Los materiales cerámicos con agente PURETI COAT y agente PURETI COAT PLATA presentan actividad antibacteriana** cuando son expuestos a una irradiación UV por debajo de 360nm, que simularía la luz solar o la luz artificial, produciendo la **reducción de entre 2-1,8 log de las bacterias presentes en su superficie (es decir entre el 99%-99,99% de las bacterias).**

POLUCIÓN

Estudio de polución en Tejidos



Reducción NO



55,88%

Determination of the photocatalytic air-cleaning performance of SAULEDA fabrics towards nitric oxide in a stirred tank reactor

Quotation-No.: Ne20190607-01

According to the test results above the tested sample

SAULEDA (coarse meshed)

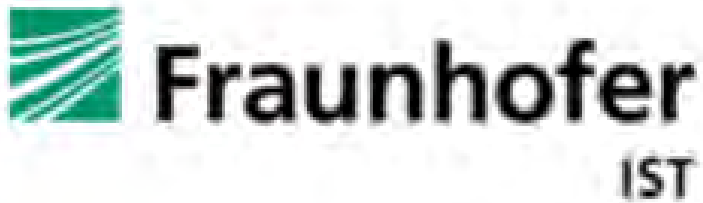
exhibits an intrinsic NO photocatalytic abatement rate k_R of 10,84 m/h with a total NO conversion of 55,88%.

Table of test results in accordance with ISO 31-0:

Sample	NO inlet concentration [ppmv] c_{NO}^{IN}	NO abatement rate [$\mu\text{g}/(\text{m}^2 \cdot \text{h})$] $r_{NO,i}^{photo}$	NO ₂ production rate [$\mu\text{g}/(\text{m}^2 \cdot \text{h})$] $r_{NO_2,i}^{photo}$	NO _x abatement rate [$\mu\text{g}/(\text{m}^2 \cdot \text{h})$] $r_{NO_x,i}^{photo}$	Overall conversion of NO [%] $\eta_{NO,i}^{total}$	NO photo-catalytic abatement rate [m/h] $k_R = \frac{r_{NO,i}^{photo}}{c_{NO}^{IN}}$
SAULEDA	1,0543	1384,53	1856,56	261,77	55,88	10,84

POLUCIÓN

Estudio de polución en
Césped Artificial



Reducción NO

48,68%

Determination of the photocatalytic air-cleaning performance of nitric oxide in a stirred tank reactor

Quotation-No.: Ne20190607-01

Turf no. 8_2

exhibits an intrinsic NO photocatalytic abatement rate k_R of 9,00 m/h with a total NO conversion of 48,68%.

Table of test results in accordance with ISO 31-0:

Sample	NO inlet concentration [ppmv] C_{NO}^{IN}	NO abatement rate [$\mu\text{g}/(\text{m}^2 \cdot \text{h})$] $r_{NO,i}^{photo}$	NO ₂ production rate [$\mu\text{g}/(\text{m}^2 \cdot \text{h})$] $r_{NO_2,i}^{photo}$	NO _x abatement rate [$\mu\text{g}/(\text{m}^2 \cdot \text{h})$] $r_{NO_x,i}^{photo}$	Overall conversion of NO [%] $\eta_{NO,i}^{total}$	NO photo-catalytic abatement rate [m/h] $k_R = \frac{r_{NO}^{photo}}{C_{NO}^{IN}}$
Turf no. 3_1	0,1075	793,72	551,89	662,49	42,67	6,07
Turf no. 8_2	0,0979	1092,73	871,20	800,68	48,68	9,00

POLUCIÓN

Estudio de polución en Cemento



Reducción NOx



70,0%



Fine ceramics - Test method for air-purification performance of semiconducting photocatalytic materials -

Removal of nitric oxide: Modified ISO 22197-1:2007

Prof. A Mills, Queen's University Belfast, David Keir Building, Stranmillis Road, Belfast, BT9 5AG, UK
 Tel: 02890974339 | Fax: 02890976524 | Email: enquiries@queensips.com
www.queensips.com

Customer name: Pureti
 Customer contact: bikash@pureti.com
 Sample name: **PURETi Coating**
 Sample description: Grey concrete panel

Testing conditions

Date (dd/mm/yy)	17/10/2013
T (°C)	25.7
RH (%)	52
STP flow (L/min)	1.4231
Irradiance (mW/cm ²)	2.00
NO supply conc. (ppm)	413.0

Results

- (i) NO supplied to the reactor
- (ii) NO removed by the test piece
- (iii) total NO unreacted
- (iv) amount of NO₂ generated by the test piece
- (v) net amount of NOx removed by the test piece = ((ii)-(iv))

Amount (mmol)	Area (%)
7.88	100.0
6.79	86.1
1.09	13.9
1.27	16.1
5.52	70.0

POLUCIÓN

Estudio de polución en Papel



Reducción NOx

38,76%



Fine ceramics - Test method for air-purification performance of semiconducting photocatalytic materials -

Removal of nitric oxide: Modified ISO 22197-1:2007

Prof. A Mills, Queen's University Belfast, David Keir Building, Stranmillis Road, Belfast, BT9 5AG, UK
 Tel: 02890974339 | Fax: 02890976524 | Email: enquiries@queensips.com
www.queensips.com

Customer Name: n/a
 Customer contact: n/a
Sample name: Example 2
 Sample description: Photocatalytic paper

Testing conditions

Date (dd/mm/yyyy)	05/09/2012
T (°C)	21.1
RH (%)	51
STP flow (L/min)	2.8676
Irradiance (mW/cm ²)	0.98
NO supply conc. (ppm)	0.977

Results

	Amount (μmol)	Area (%)
(i) NO supplied to the reactor	35.69	100.00
(ii) NO removed by the test piece	23.85	66.82
(iii) total NO unreacted	11.84	33.18
(iv) amount of NO ₂ generated by the test piece	10.02	28.07
(v) net amount of NO _x removed by the test piece = ((ii)-(iv))	13.83	38.76

AUTOLIMPIEZA

Estudio de Autolimpieza



Desaparición de Ácido Esteárico

80%

3.2 Self-cleaning properties

The photocatalytic activity of the PURETi coating was assessed by disappearance of stearic acid, which is commonly used to determine self-cleaning properties of various substrates. Figure 7 shows the stacked FTIR spectra of the stearic acid as a function of UV exposure. Based on this information we can conclude that stearic acid is substantially decomposed under UV radiation as indicated by significant reduction in intensity of absorbance over the course of UV exposure.

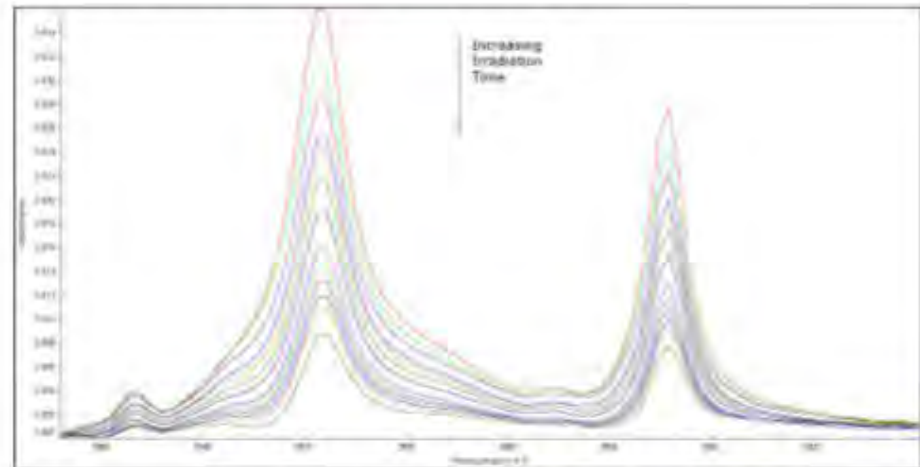


Figure 7: FTIR spectra of stearic acid for increasing UV-irradiation time.

The rates of stearic acid degradation were analyzed by integrating the area under the peaks (between 2800 and 2975 cm^{-1}). The results are shown in Fig 8. The y-axis represents the stearic acid concentration as a function of time normalized for initial concentration. The x-axis represents the time of exposure, or more specifically, a number of UV exposures, each lasting 8 minutes. The error bars are given for 90% confidence intervals. Figure 8 indicates that almost 80% of stearic acid disappeared within 104 minutes of exposure. It can be concluded that PURETi coating is very effective for decomposing the stearic acid, which can serve as a good approximation of self-cleaning properties of the samples tested.

“Very effective”

OLORES

Estudio de Mitigación de Olores de Ganado

IOWA STATE UNIVERSITY

Compound	10 µg/cm ² TiO ₂ in PureTi Coating
DMDS	33.89 ± 27.52%
DEDS	75.80 ± 18.74%
DMTS	69.76 ± 24.97%
butyric acid	82.81 ± 16.20%
guaiacol	100.00 ± 0.00%
p-cresol	93.85 ± 2.07%

Mitigación de olores



atmosphere



Article

Mitigation of Livestock Odors Using Black Light and a New Titanium Dioxide-Based Catalyst: Proof-of-Concept

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Table 9. Comparison of VOC removal rates using PureTi coating and Evonik coating.

Compound	10 µg/cm ² TiO ₂ in PureTi Coating	250 µg/cm ² TiO ₂ in Evonik Coating	p-Value
DMDS	33.89 ± 27.52%	42.88 ± 23.93%	0.6460
DEDS	75.80 ± 18.74%	88.03 ± 5.20%	0.3180
DMTS	69.76 ± 24.97%	93.99 ± 2.29%	0.4190
butyric acid	82.81 ± 16.20%	97.82 ± 2.27%	0.1660
guaiacol	100.00 ± 0.00%	94.09 ± 10.24%	0.1700
p-cresol	93.85 ± 2.07%	90.23 ± 9.56%	0.3750

DMDS: dimethyl disulfide; DEDS: diethyl disulfide; DMTS: dimethyl trisulfide. The content of TiO₂ in PureTi Clean coating is 1%.

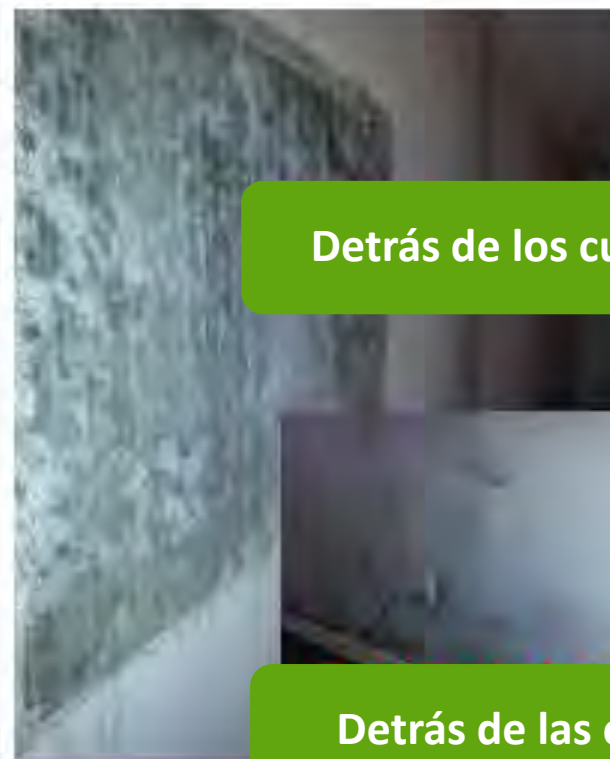
4. Conclusions

The PureTi coating at 10 µg/cm² yielded the highest reductions on selected odor compounds compared with lower catalyst loading densities. The reduction rates of butyric acid and p-cresol were 86.9 ± 14.2% and 93.8 ± 1.8%, respectively, with the 10-µg/cm² PureTi coating at a treatment time of 200 s, and 62.2 ± 7.5% and 27.4 ± 8.3%, respectively, at a treatment time of 40 s. The reduction of DMDS was 40.4 ± 24.8%; of DEDS 81.0 ± 16.7%; of DMTS 76.3 ± 22.1%; and of guaiacol 100.0 ± 0.0%, at a treatment time of 200 s. After a treatment time of 40 s, the reduction of DMDS was 35.0 ± 6.0%; of DEDS 27.7 ± 9.4%; of DMTS 37.1 ± 11.7%; and of guaiacol, 37.4 ± 11.3%. The photocatalysis efficiency of the 10-µg/cm² PureTi coating was comparable to the 250-µg/cm² Evonik coating according to the statistical analysis (*p* > 0.1). Significant influences were observed on the relative humidity and temperature (*p*-value ranging from 0.0023 to 0.9630), while the optimum conditions were inconsistent for the selected odor compounds. The dust layer on the wall of the swine barn was found to block

“Highest reductions”

Hotel español: desaparición de mohos y olores

Habitación N° 121	Junio 2013	Enero 2014
123 usado como control	Control	
Medición	TCOV's ppb	TCOV's ppb
Ubicación		
Exterior	0	0
Mesita de noche	257	58
Puertas correderas interiores	254	53
Cabecera cama	251	56
Lavabo	254	56
Notas en olores	Humo	Fresco
% Reducción		78%



Detrás de los cuadros

Detrás de las camas

Reducciones de COV después de 6 meses



TELSTAR: Armarios bacteriológicos



Estudio realizado por la
Universidad Autónoma de Barcelona

Nº Placa	Tratamiento	Condiciones ambientales	Días		
			0	2	12
1	<u>PuretiCoat</u>	Luz UV	4,06	0,00	0,00
2	<u>PuretiCoat</u>	Luz UV	3,68	0,00	0,00
3	<u>PuretiCoat</u>	Luz UV	4,44	0,00	0,00
4	<u>No Coating</u>	Luz UV	4,05	1,84	1,28
5	<u>No Coating</u>	Luz UV	3,78	2,16	0,51
6	<u>No Coating</u>	Luz UV	4,19	1,57	1,52
7	<u>PuretiCoat</u>	Luz LED	4,92	0,00	0,00
8	<u>PuretiCoat</u>	Luz LED	3,92	0,00	0,00
9	<u>PuretiCoat</u>	Luz LED	4,27	1,73	0,00*
10	<u>Control-no coating</u>	Cabina sin luz	3,58	2,35	2,33

Niveles de
Esterilización

CLÍNICA: Barcelona

Comparativa resultados Control Microbiológico en Quirófanos 2 y 4

Antes Después

QUIROFANO 2	Punto	Noviembre 2011 Ufc/m ³	Noviembre 2012 Ufc/m ³	Marzo 2013 Ufc/m ³
	1	4	36	0
2	6	40	0	
3	6	46	0	
4	4	10	0	
5	2	8	2	
6	2	14	4	

QUIROFANO 4	Punto	Noviembre 2011 Ufc/m ³	Noviembre 2012 Ufc/m ³	Marzo 2013 Ufc/m ³
	1	18	180	6
2	28	100	8	
3	16	110	6	
4	22	150	6	
5	6	94	2	
6	2	110	8	



Comparativa resultados Control Partículas en Quirófanos 2 y 4

QUIROFANO 2	Noviembre 2011 P/m ³	Noviembre 2012 Ufc/m ³	Marzo 2013 Ufc/m ³
	0,5 µm: 25586,7 5 µm: 873,6	0,5 µm: 637995,0 5 µm: 782,1	0,5 µm: 10893,6 5 µm: 566,2

QUIROFANO 4	Noviembre 2011 Ufc/m ³	Noviembre 2012 Ufc/m ³	Marzo 2013 Ufc/m ³
	0,5 µm: 103907,4 5 µm: 1807,7	0,5 µm: 139485,3 5 µm: 2613,4	0,5 µm: 6131,5 5 µm: 652,5

**INCREMENTA LA CALIDAD
DE AIRE INTERIOR**

Quirófano 2: 637.995,0 – 10.893,6

Quirófano 4: 139.485,3 – 6.131,5

- 2018 Gold Edison Award Winner
- Winners of the European Union's iSCAPE to decontaminate cities
- NASA Dual Use Technology Partner
- 2013 Architectural Products Innovation Award
- 2012 Edison Award in Materials Technology - Safety & Sustainability Category
- 2012 Material of the Year Award from Material ConneXion
- 2012 Katerva Award for Sustainability
- 2011 Popular Science Magazine Green Tech Innovative Product of the Year Award
- 2009 SCS certified PURETi Inc. under the Indoor Advantage Gold program
- 2005 NSF introduced PURETi to the world at the Smart Coating Conference of 2005
- Qualifies projects for LEED points under the U.S. Green Building Council standards



- 2018 - Neolith SKYLINE + PURETi - Gold Edison Award.
- November 2018 - Special IAQ (**Indoor Air Quality**) Edition D'A of Architecture FR.
- Architectural Record 2018 Products of the Year (Skyline + PURETi)
- Architectural Digest 2018 AD Great Design (Mirage)
- BUILDINGS Money-Saving Products 2018 (Skyline + PURETi)
- Architectural Products Product Innovation Awards 2018 (Skyline + PURETi)





Tecnología seleccionada por Nasa Spinoff



Technology Transfer

Among the technologies selected for Underwood's research were those developed by New York City's **PURETi Inc.**, a company that had created a new approach to titanium dioxide-based photocatalysis. (Titanium dioxide, a common compound found in everything from paint to suntan lotion to food coloring, acts as a photocatalyst when exposed to ultraviolet light.)

https://spinoff.nasa.gov/Spinoff2012/ee_5.html



Cristal is the world's second-largest producer of titanium dioxide and a leading producer of titanium chemicals. With nearly 4,000 employees on five continents, we are proud leaders in the innovation and manufacture of titanium products.

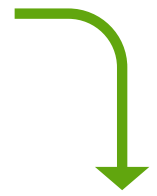


The screenshot shows the Cristal website's news archive. The navigation menu includes Home, About Us, Products & Services, Safety, Health & Environment, Careers, and News. The breadcrumb trail is Cristal > News Room > News Archive. The main heading is "Cristal and PURETi Partnership Press Release", which is circled in green. Below the heading, the following information is provided:

Date: 3/17/2016
Contact Name: Amy Drusano, Global Manager - Corporate Communications, Cristal, Karen Olszewski, PURETi Marketing Director
Contact Number: 410.229.8062, 513.290.3482

Hunt Valley, MD and New York, NY

Cristal and PURETi Announce Strategic Partnership to Promote New Applications of CristalACTIV™ Photocatalytic Materials



Cristal es el 2º mayor productor de TiO2

EIFFAGE



AUNDE



NEOLITH



Clear Channel



endutex



ezpeleta^e



Sauleda



Telstar



dormity.com



sports & leisure GROUP



SOLEEVA



ISRI^{IS}
ISRINGHAUSEN



imagic





Apple store



Century Link Field – Seattle, Washington



Baylor University – Waco, Texas
Library and Bookstore



Beckley Raleigh County
Convention Center – West Virginia



CEU Valencia



Palacio de Congresos,
Barcelona



Zurich Building, Barcelona



Monterrey Bay Aquarium



Fulton County Schools
Administration Building –
Atlanta, GA



Gala Building, Barcelona



Broome Street NY



Torre Cataluña, Barcelona

da
QUALITÉ DE L'AIR INTERIEUR
Capteurs, ventilation, maintenance et plus... les solutions de demain
Une offre unique pensée par les architectes du Maggiora d'Architectes

Mettez en œuvre vos solutions internes...
«
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atmosphere
Black UV light
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Reducing Swine Barn Odor — Using Light
MDPI

Newsweek
JAILING BANKERS THE AFFLUENZA EPIDEMIC
PURE PROFIT
THE MAKER OF A YANKEE STADIUM DISGRACE HOPS TO THE WORLD'S ONE SPRAY AT A TIME
BY BRUCE WOLFENBUTER

PURETi COULDN'T GET ANY TRACTION FOR ITS FAÇADE-BECAUSE POTENTIAL CLIENTS SAID IT WAS TOO GOOD TO BE TRUE
BY KATHERINE CROOK

The Economist
Topics Current edition More

Manure management
Smelly farms may succumb to subtle science
Titanium dioxide and ultraviolet light will clean them up

... "cubrió la superficie interior con una preparación comercial de dióxido de titanio, conocido como PURETi" ... Iowa University

THE WALL STREET JOURNAL
Europe Edition September 12, 2018 Today's Paper Video

THE FUTURE OF EVERYTHING
A Condo Façade That Cleans Itself—and the Air Around It
570 Broome in Manhattan incorporates an exterior treatment that fights grime and air pollution with NASA-approved technology

By Katherine Crook
May 29, 2018 10:00am ET

Could titanium dioxide—a common ingredient in sunscreen—help buildings act as air purifiers? That's the goal of Pureti, a Cincinnati-based manufacturer that offers a façade-cladding treatment in which titanium dioxide nanoparticles are sprayed onto the components of a building's exterior. When ultraviolet rays hit the treated surface, they set off chemical processes that burn away grime and convert contaminants such as nitrogen dioxide into nontoxic mineral dust that falls to the ground. The result: a building's exterior that cleans itself.

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- Why China and the U.S. Are Doing Big Damage to Pakistan

Buildings That Clear The Air

THE FUTURE OF EVERYTHING

COULD titanium dioxide—a common ingredient in sunscreen—help buildings act as air purifiers? That's the goal of Pureti, a Cincinnati-based manufacturer that offers a façade-cladding treatment in which titanium dioxide nanoparticles are sprayed onto the components of a building's exterior. When ultraviolet rays hit the treated surface, they set off chemical processes that burn away grime and convert contaminants such as nitrogen dioxide into nontoxic mineral dust that falls to the ground. The result: a building's exterior that cleans itself.

... "cubrió la superficie interior con una preparación comercial de dióxido de titanio, conocido como PURETi" ... Iowa University

Official Sponsor of The Wall Street Journal's The Future of Everything

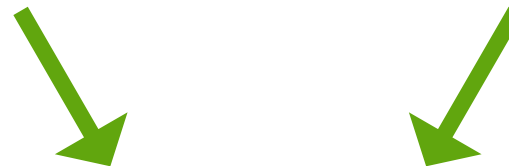
ezpeleta pureti MAHOU SAN MIGUEL

para que disfrutes de nuestras cervezas respirando aire más puro.

Fabricación local



I+D Local



360°

Productos

1- Fotocatálisis General

- Definición.
- Historia.
- Beneficios.
- Tendencias.
- Artículos Científicos y Patentes.

2- ¿Por Qué PURETI?

- Definición.
- Certificaciones.
- Testimonios.
- Premios y "Partnership Agreements".
- OEM.
- Logros.
- Media.
- Estructura en Europa.

3- Repercusión en su Negocio

- Descomoditización / Exclusividad / "Cross-Fertilization" / Sustainable Brands.
- Apoyos.

4- Herramientas de apoyo

5- "Focus": Caso Particular



01

Descomoditización del producto: sin necesidad de inversión en activos fijos ni en I+D, solamente aplicando PURETi sobre su producto final, esto adquirirá todas las propiedades que PURETi ofrece. Y todo ello de aplicación inmediata. “Time to market=Zero”.



02

Exclusividad: Firmamos acuerdos exclusivos con los “mejores players” de cada industria, dándoles la oportunidad de convertirse en únicos.



03

“Cross-Fertilization”: posibilidad de intercambiar experiencias entre industrias transversales para el enriquecimiento mutuo. Establecer el “PURETi Club”



04

Sustainable Brands: Estamos comenzando a darnos cuenta de que **el consumo excesivo tiene impactos negativos** no solo en **nuestra propia salud y la salud de nuestras comunidades**, sino también en **la salud de nuestro planeta.**

- Como resultado, empezamos a esperar más de las marcas que elegimos. Cada vez más queremos **saber** cómo nuestras compras **impactan** en **nuestra salud** y en la **salud de nuestra familia**, así como también en la **salud de nuestras comunidades.**
- Para que **las marcas** sigan siendo **competitivas**, **deben evolucionar** con esta nueva generación de consumidores, aquellos cuyas decisiones están orientadas a crear un mundo mejor para ellos y sus familias, sin afectar negativamente el mundo que los rodea.

PURETI te puede ayudar a enfocarte en esta visión cambiante que está surgiendo en el mercado global

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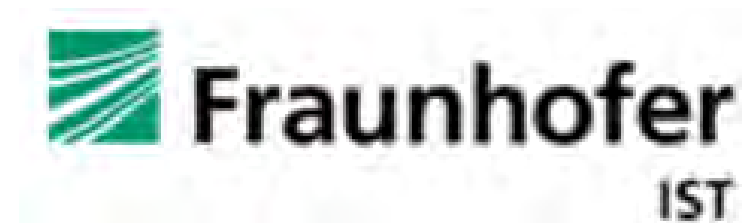
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FUENTE DE CONVERSIÓN

https://cfpub.epa.gov/ncer_abstracts/index.cfm/fuseaction/display.files/fileID/14285

Cantidad de Nox en contacto con 1 m2
(Kg/m2/año)

→ **0,29**



Cantidad de Nox producidos por año de coche (10k millas por año) Kg/Año

→ **0,5**



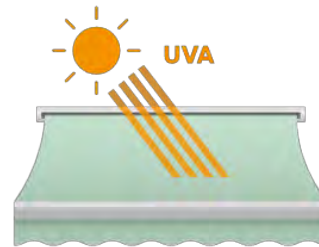
		Reducción de NOX	Superficie tratada con PURETI para eliminar 1 coche
AUNDE		22,2%	7,76 m2
		56,9%	3,09 m2
Sauleda		55,88%	3,11 m2

CASO DE EMPRESA QUE SE DEDICA A HACER TEJIDOS PARA TOLDOS

EL PRIMER TEJIDO QUE PURIFICA EL AIRE ¿Cómo funciona?



1 GREEN es un tejido recubierto de nanopartículas de dióxido de titanio (TiO₂).



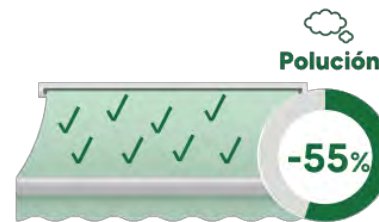
2 Cuando los rayos UVA golpean sobre el tejido GREEN comienza un proceso químico que convierte el oxígeno y vapor de agua de la atmósfera en **agentes limpiadores OH y O₂**.



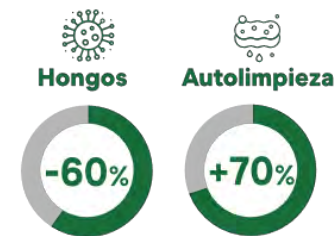
3 El OH convierte la suciedad orgánica y los compuestos orgánicos volátiles en mineral y gas y vuelve a H₂O.



4 El O₂ reduce el óxido de nitrógeno (NoX), uno de los gases más dañinos presente en la atmósfera, a nitratos relativamente inocuos.



5 Este proceso se repite millones de veces para limpiar la superficie y el aire que entra en contacto con ella **reduciendo los niveles de dióxido de nitrógeno en torno a un 55%** en pruebas de laboratorio.



6 También produce una reducción aproximada de los hongos en un 60% y tiene un efecto autolimpiante de en torno al 70%*.

*Estos porcentajes son orientativos y pueden variar en función de las condiciones del entorno.