FN Nano Inc
Breathe safe air

European Business Awards™ Sponsored by RSM — National Champion 2015/16

European Business Awards® ONE TO WATCH 2019

European Business Awards® NATIONAL WINNER 2019

FN NANO® photocatalytic coating technology for healthier and comfortable environments

prochazka@fnnanoinc.com

Jan Prochazka, Ph.D.

Advanced Materials JTJ

FN NANO

Bringing the future closer
HE3DA
High Energy 3D Accumulator

NANOPIN

AQUA-PULSE Pure Water Technology

NanoTio Advanced Photocatalytic Materials

4G-PHOTOCAT

NANOEMA

ECS The Electrochemical Society
Advancing solid state & electrochemical science & technology

EUROPEAN BATTERY ALLIANCE EBA250

SCHP ČR

ČSAF

Česko je nano

DECHEMA

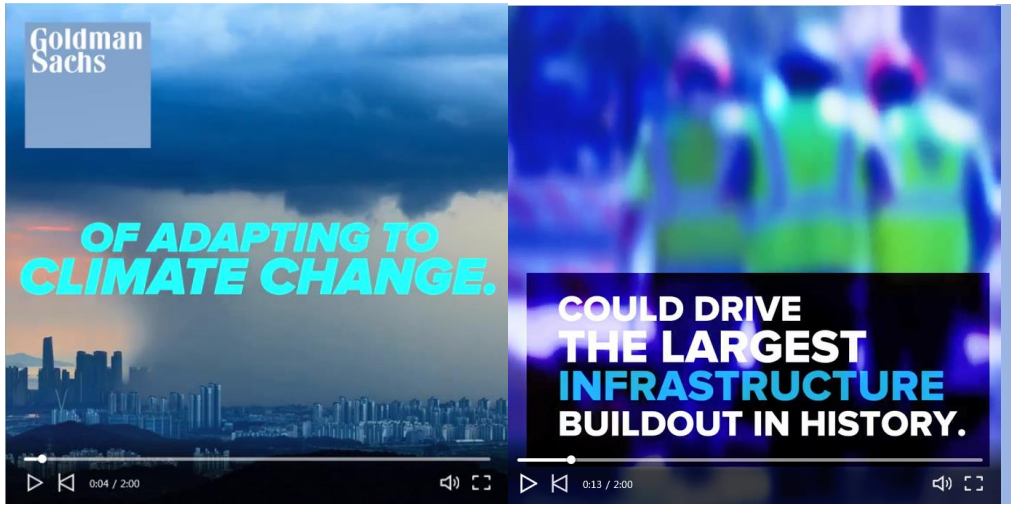
Greta is right saying:

"We can't just continue living as if there was no tomorrow, because there is a tomorrow,"

BUT SHE IS NOT RIGHT CLAIMING WE HAVE
NO ENVIRONMENTAL TECHNOLOGIES TO FIX THE PROBLEM

FN NANO® photocatalytic coating technology is one of them

- **Mature** and proven by years of applications
- Patented & **Certified**
- Increasing the **standard of life**
- **Accepted** by the industry and academia
- Ready to be implemented as **compensation of global warming effects**
- Ideal for **depollution of environment**
- Protects surfaces and **saves money** on their maintenance



SMART CITIES AND SMART BUILDINGS START WITH CLEAN AIR

FN NANO PHOTOCATALYSIS – the only feasible technology to eliminate dispersed pollutants of the air

PRINCIPLE of air depollution using photocatalysis of nano TiO_2

CONVERSION OF LIGHT ENERGY INTO AN ENVIRONMENTAL OXIDATION EFFECT ON TiO_2 SURFACE

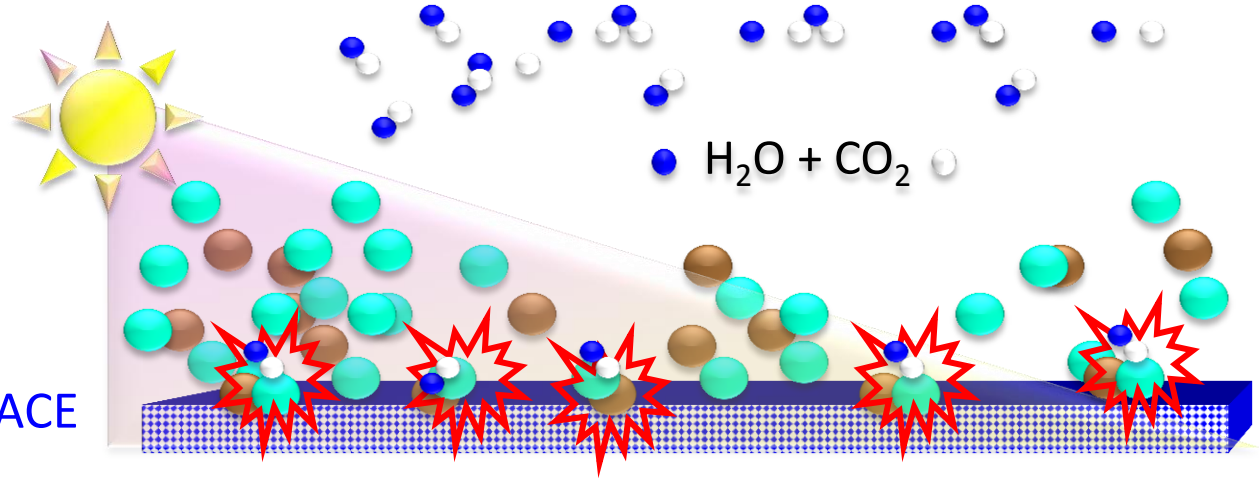
ORGANICS

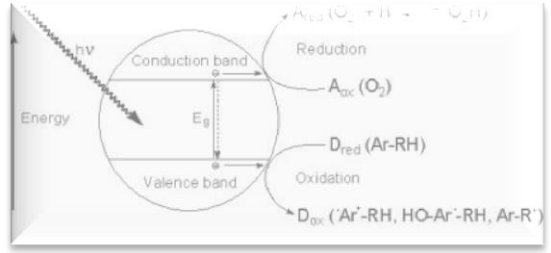
(SMOKE, MICROBES, VAPOUR, ETC)

+ AIR OXYGEN

+ LIGHT

+ TiO_2 SURFACE





Eg ~ 3.2eV *(higher oxidation potential than on chlorine, ozone or peroxide)*

ENVIRONMENTAL AND ECONOMICAL POTENTIAL OF FN NANO PHOTOCATALYSIS

COOL & CLEAN system

- Cool surface
- Clean air
- Self-cleaning effect

SCATTERED MILLIONS OF SMALL SOURCES OF POLLUTION – AUTOMOBILES

MILLIONS OF SMALL AREAS TO CLEAN AIR– PHOTOCATALYTIC SURFACES

COOL&CLEAN

- SURFACES 10-15°C COOLER - energy savings
- Self-cleaning – savings on maintenance
- Air cleaning – ecological function

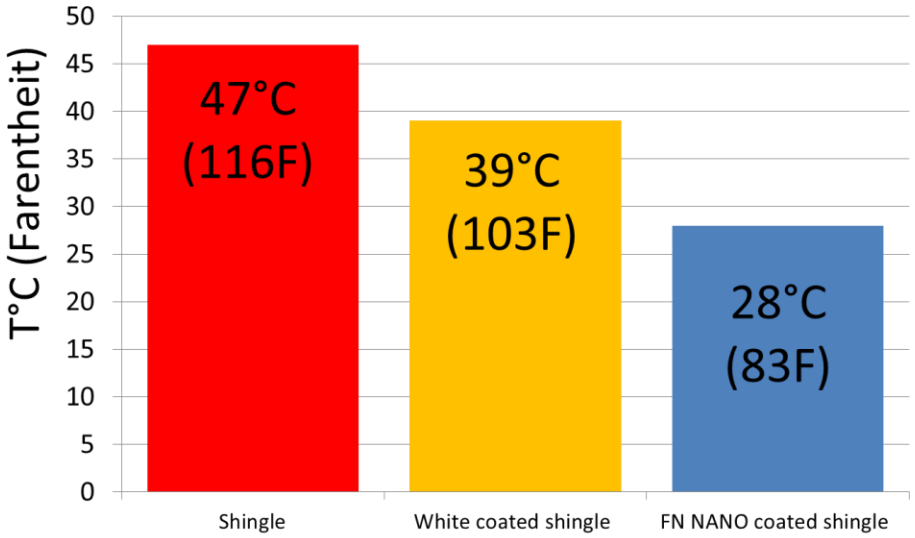
Regular

White painted

FN Nano TiO2 coating

ENORMOUS REFLECTION OF HEAT RADIATION (STRAIGHT BACK TO THE UNIVERSE) on nano TiO_2 coatings – <u>instant solution to global warming</u>

HEAT RADIATION REFLECTION

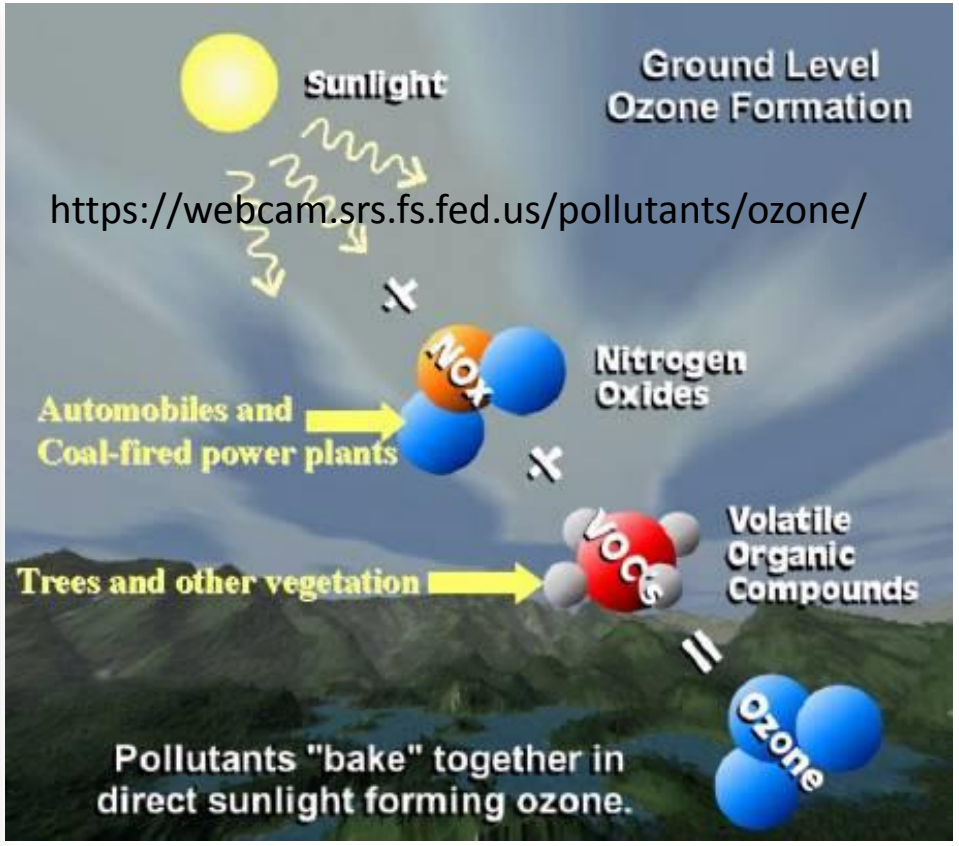


REGULAR SURFACE	47°C	(116F)
WHITE PAINT (WHITE ROOF SYSTEM)	39°C	(102F)
FN NANO TiO_2 COATING	**28°C**	(83F)

Cities can effectively ameliorate the "Heat Island Effect"

DECONTAMINATE AIR & PREVENT FORMING OF LOW OZONE

Removing NOx and VOCs on TiO2 surface stops formation and accumulation of low Ozone.



EXAMPLES

Kensington Palace Gardens London

Nanowall at the Czech Embassy in London compensates for emissions from at least 10 diesel cars

Embassy of the Czech Republic in London

Behave as good guests in a hosting country, act as a good guest on our planet

Embassy of the Czech Republic in Budapest

CZECH EMBASSY IN BUDAPEST COMPENSATES FOR EMISSIONS FROM ALL ITS CARS

Dedication of the demo COOL&CLEAN ecological building by the Ambassador of the Czech Republic to the USA

https://www.ktvn.com/story/41351137/macoma-environmental-technologies-introduces-instant-solution-to-global-warming

PROTECT & PRESERVE OUR HERITAGE

The highly oxidative semiconductor effect on **FN coating-painted facade creates a maintenance-free, self-cleaning surface, extending life of the façade and saving money on its maintenance.**

In addition, the TiO2 coating is removable in contrast to hydrophobic surface treatments.

SELF-CLEANING FEATURE SAVES EXPENSES ON MAINTENANCE OF POORLY ACCESSIBLE BUILDINGS AND SURFACES.

WE CAN EFFECTIVELY DEFEND OUR CULTURE AND OUR HERITAGE

FN NANO by its nature can be used only for peaceful applications

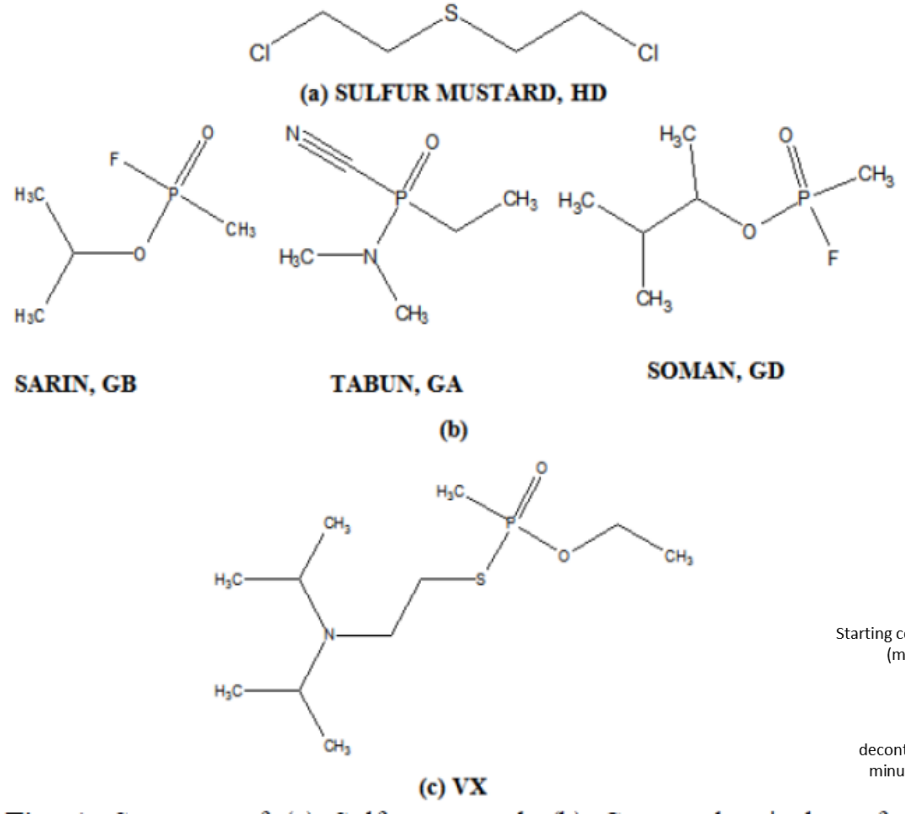
Mature, verified and certified technology, proven by years of applications can protect any other objects from exposure of biological or chemical terrorist attack without any special military equipment

Energy of light+FN NANO®
coating are only things needed!

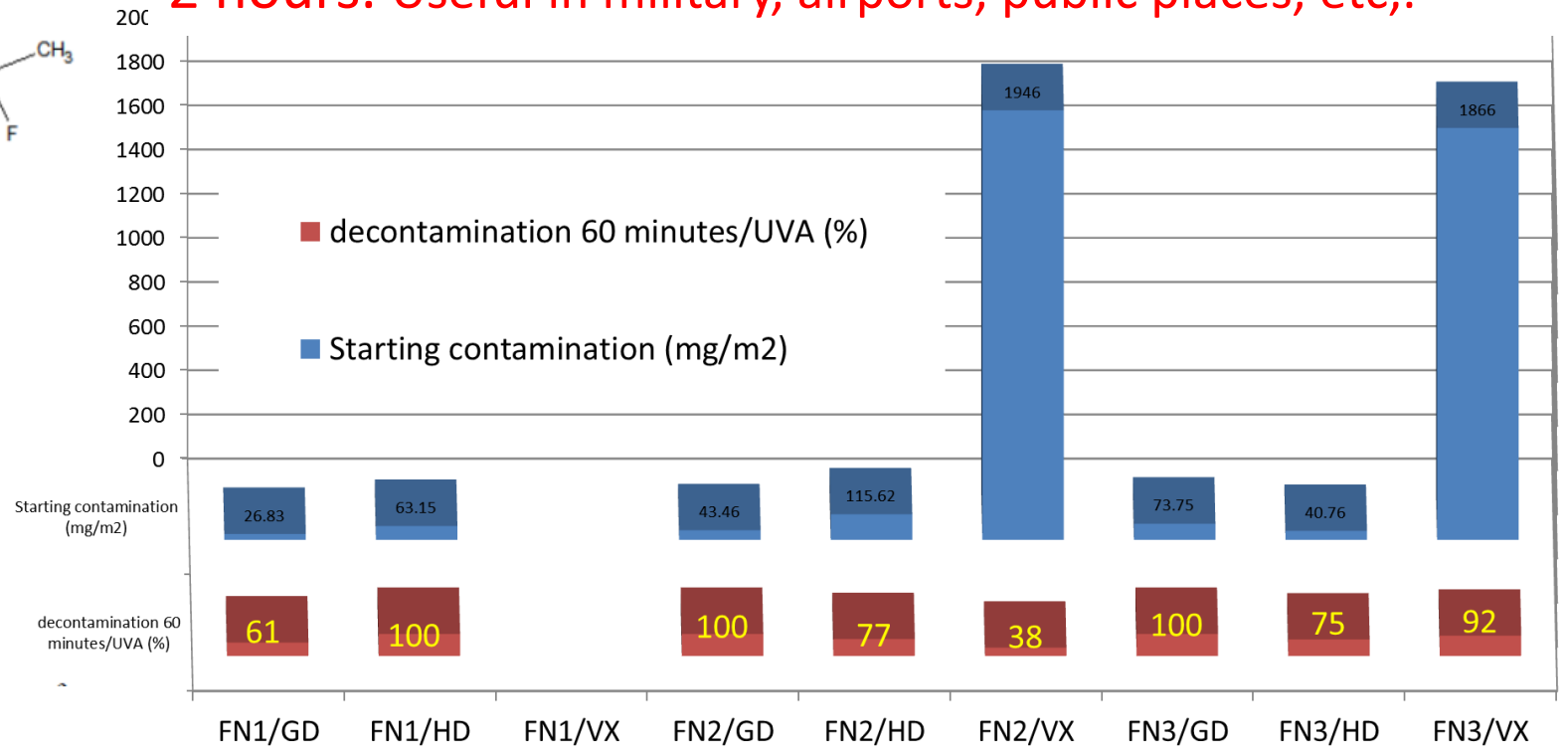
DEFEND & DECONTAMINATE

EFFECTIVELY LOWER RISKS OF CHEMICAL OR BIOLOGICAL ATTACK EXPOSURE

AUTOMATIC DECONTAMINATION OF POISONED SURFACES BY ENERGY OF SUN



Sarin, Soman, Yperite, VX, Tabun eliminated in less than 2 hours. Useful in military, airports, public places, etc,.



CHEMICAL WARFARE DECONTAMINATION SYSTEM

1 m² of FN® treated sound barrier cleans enough air per day, how much a person needs per year!!!

Fresh after application of color varietes of FN® coatings.

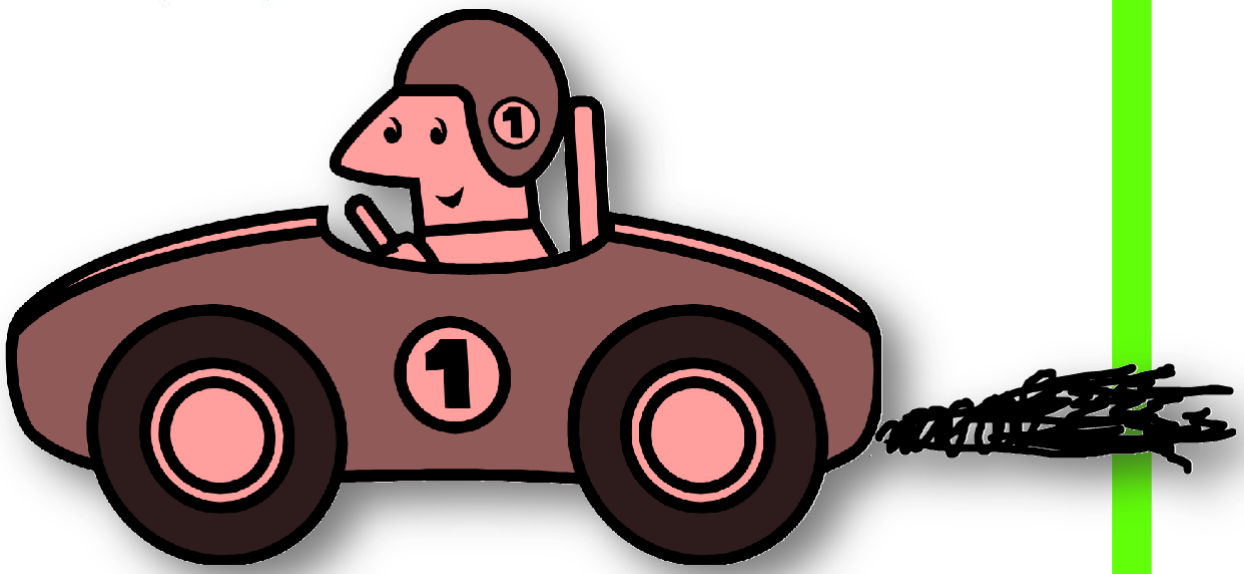
Economy & Ecology

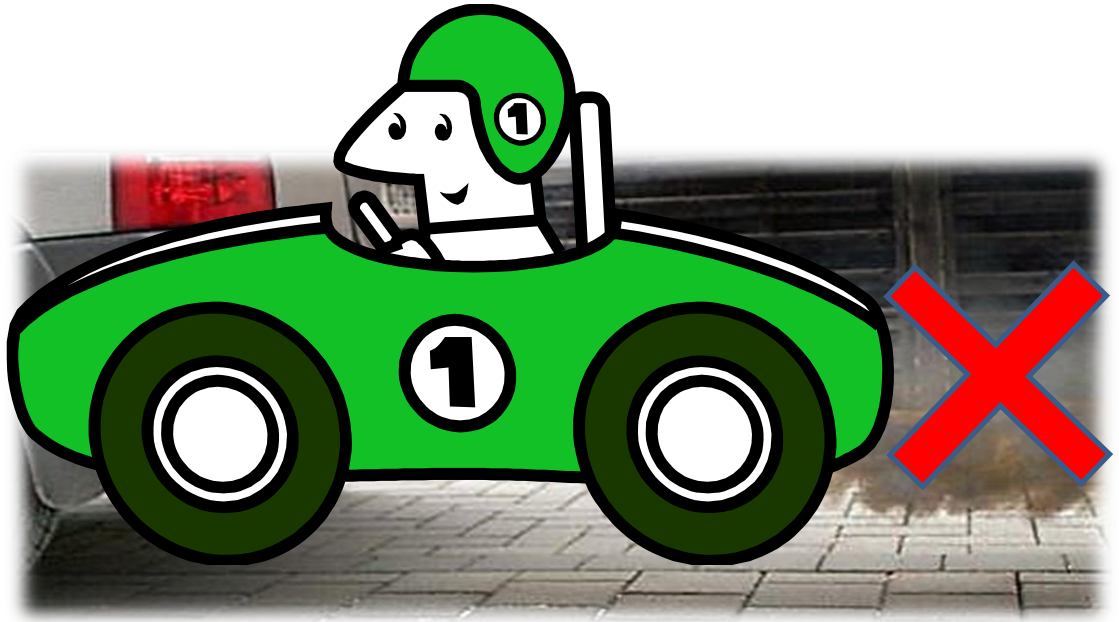
After 3 years –Darker areas were not painted with FN ®

using commercial functional coating with porous morphology

Radek Zouzelka [a, b], Jiri Rathousky [a]

<u>150ft²</u> of FN NANO® photocatalytic active surface in a polluted part of a city can **eliminate the emissions of one diesel car or three gasoline cars just like they were taken of the street**

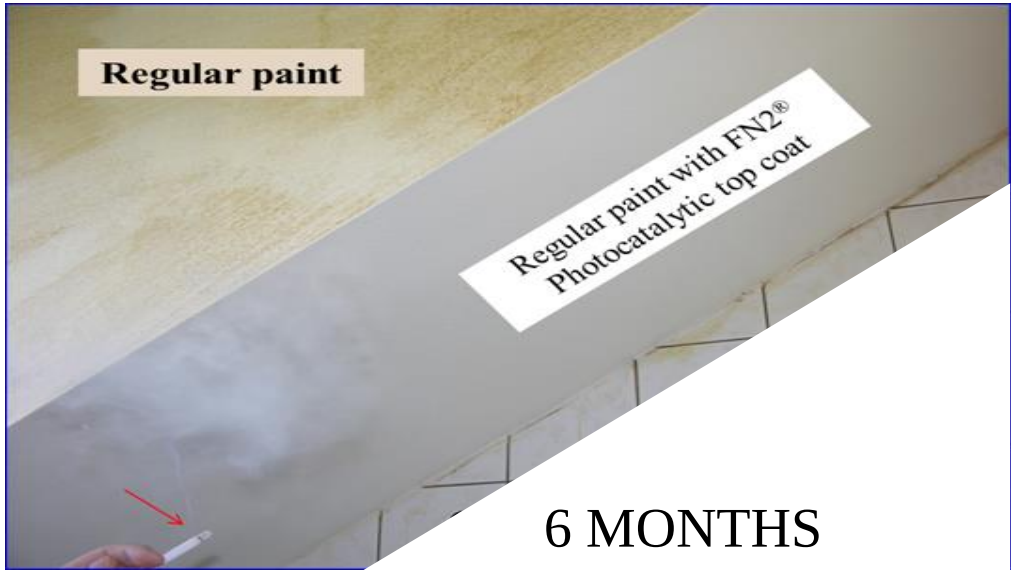




SMOKING ROOMS – ELIMINATES ODORS

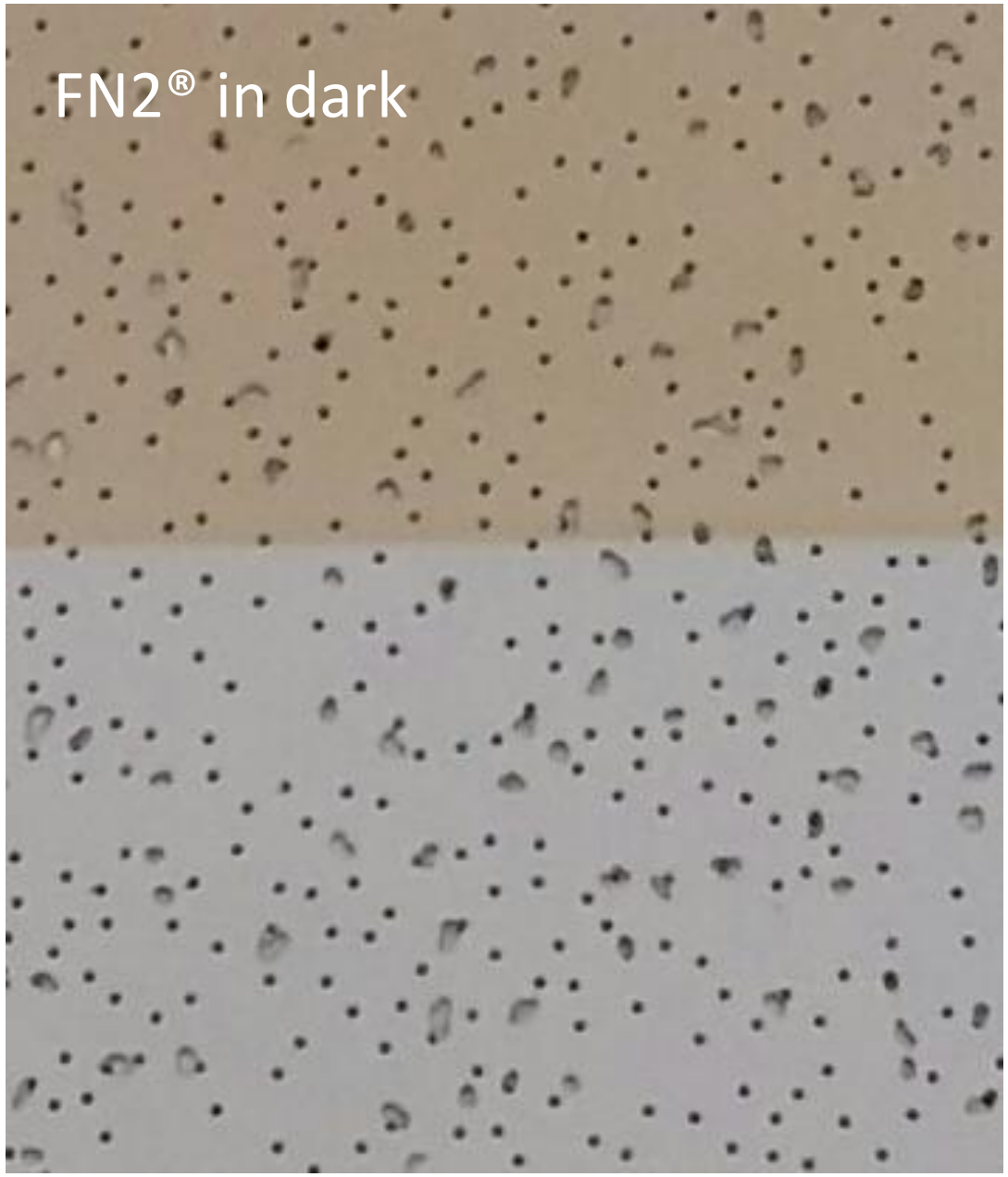
FN NANO® COATING:

- FAST SMOKE REMOVAL
- ODOR ELIMINATION
- NO MUSTY DEPOSITS



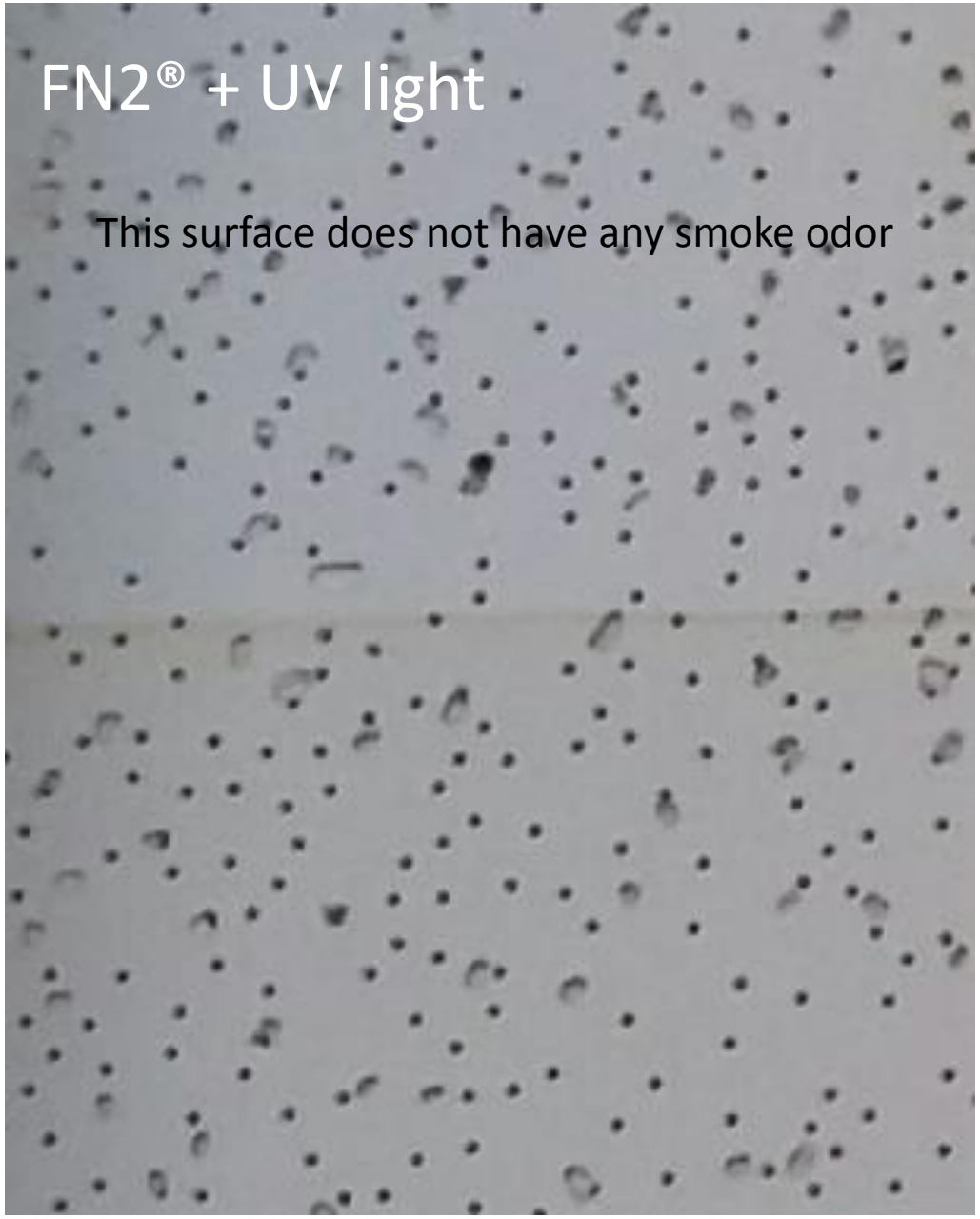
EXAMPLE: SMOKE IN THE AIR

When smoke comes into contact with the photocatalytic surface, it reacts with the oxygen **(burns)** creating molecules of water, CO_2 and other mineral compounds



Panels-
Smoking
room

Regular paint



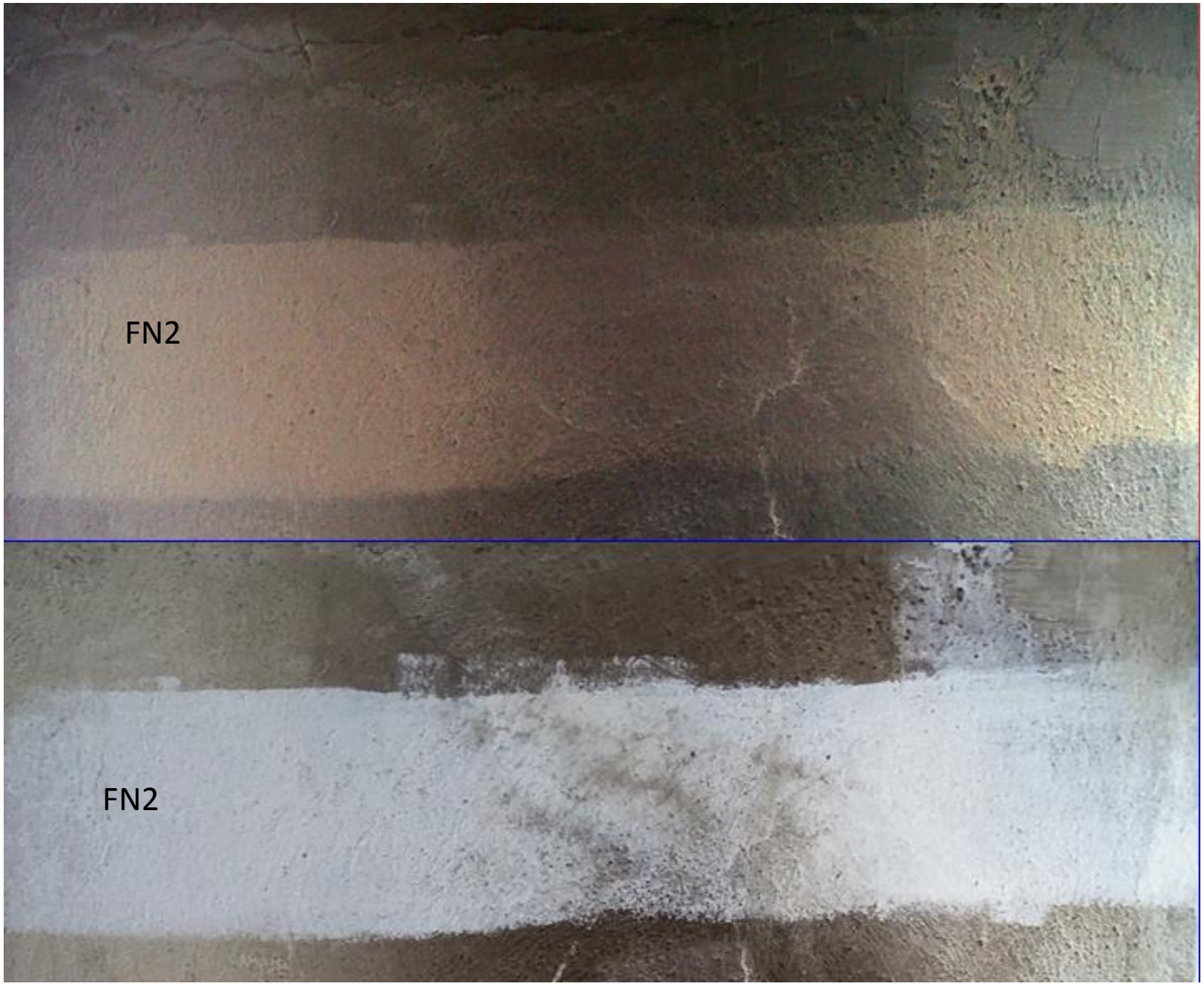
OUTSTANDING STRENGHT OF THE SELF-CLEANING EFFECT FROM SMOKE

12 HOURS OF EXPOSURE TO SMOKE

6 WEEKS LATER AFTER EXPOSURE TO THE DAY LIGHT

COMPLETELY CLEAN

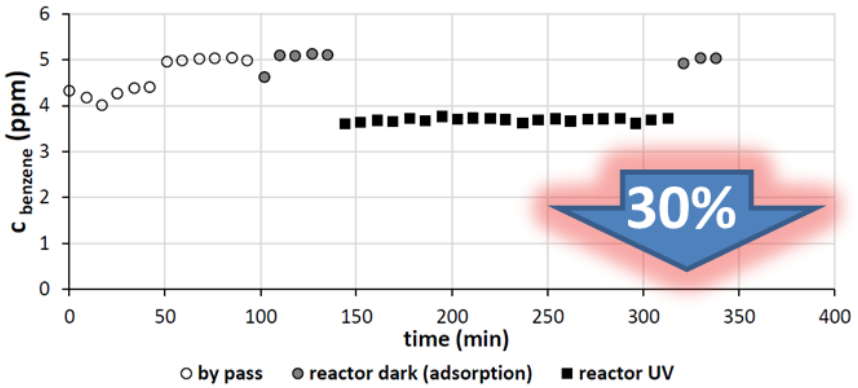
SMOKER



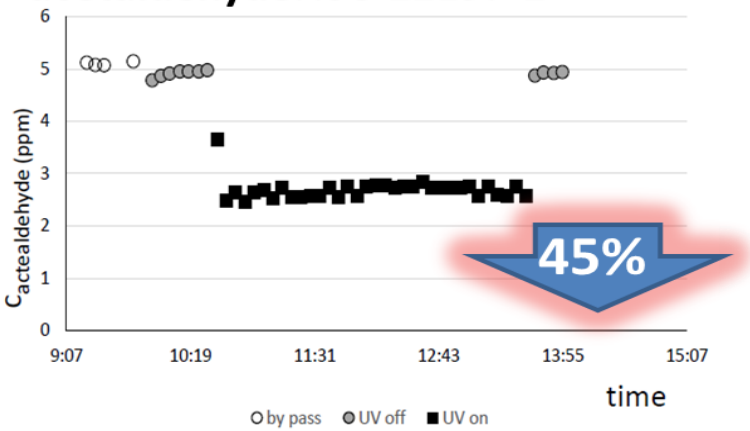
Mature technology - Innovative solution with long-term proven results

Cleans air of about 30-60% of pollutants per contact with FN Nano surface

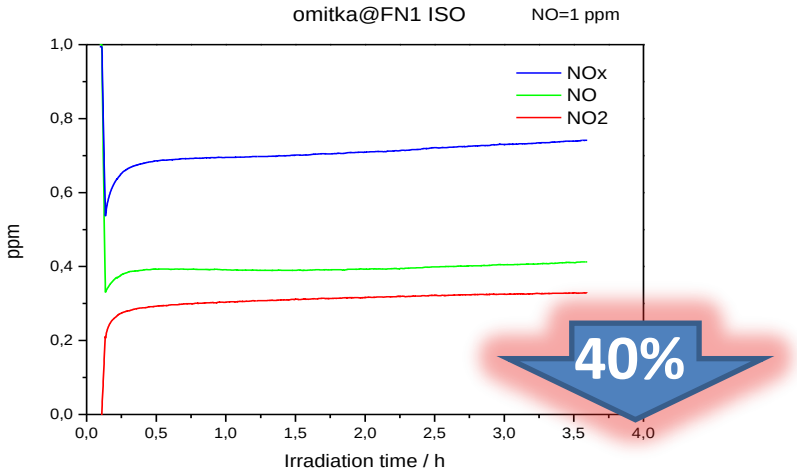
benzene: ISO 22197-3



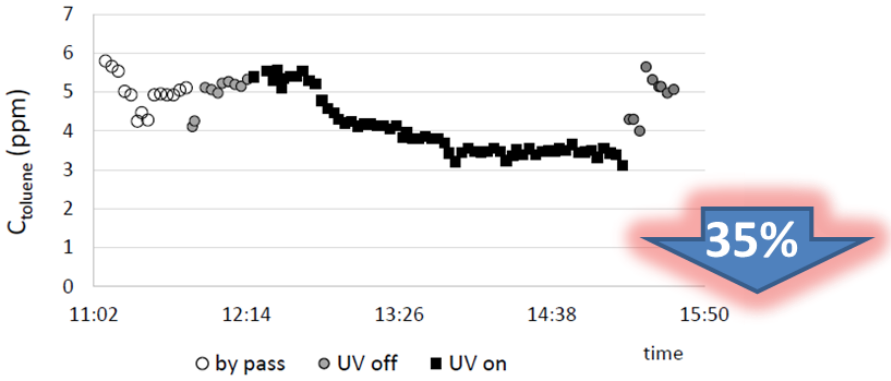
acetaldehyde: ISO 22197-2



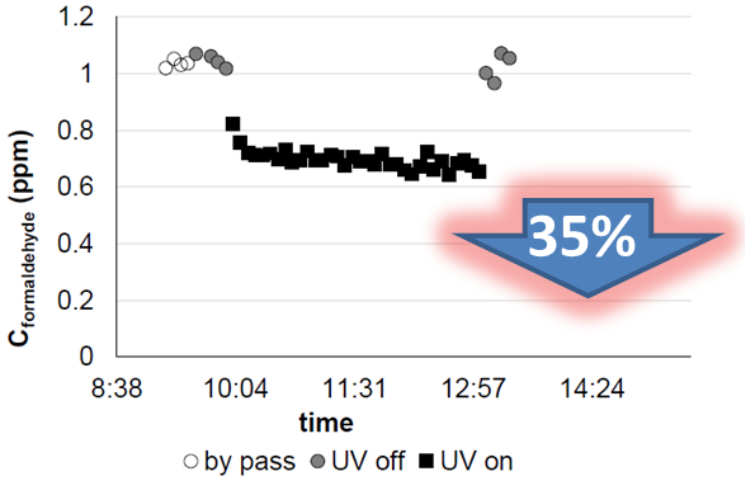
NOx: ISO 22197-1 sim



toluene: ISO 22197-3



formaldehyde: ISO 22197-4

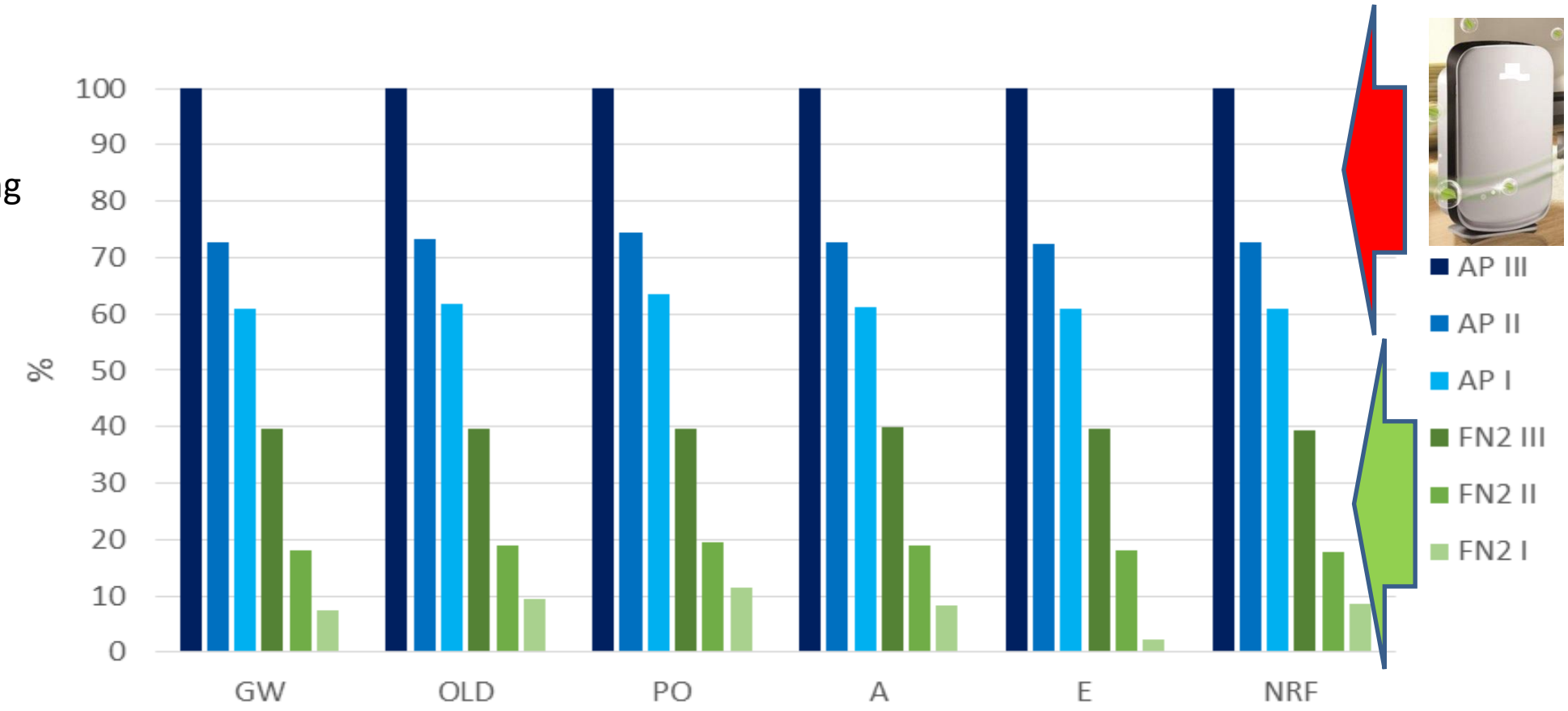


SAVE ENERGY & LOWER THE ENVIRONMENTAL IMPACT OF AIR PURIFICATION

LCA STUDY-ECOLOGICAL IMPACT OF **FN® COATING** (FN2) **VERSUS AIR PURIFIERS (AP)**

To clean the same amount of air, FN NANO® TiO_2 coating is up to 10x environmentally friendlier

AP = Air purifier
FN2 = Photocatalytic coating
I (light use)
II (medium use)
III (heavy duty use)



FN NANO® COATING CLEANS
1 000 000 cubic yards OF AIR FOR LESS THAN $1

Only by this way can 1 million cubic yards of contaminated air be cleaned of pollutants for only one dollar, and at the same time, these costs will be recovered many times in the form of savings for the maintenance of facades and constructions.

HER GENERATION CAN LIVE IN A CLEAN AND CONFORTABLE ENVIRONMENT,
IF THEY USE THE FN NANO® TECHNOLOGY FOR COMPENSATION OF THE ENVIRONMENTAL IMPACTS

<u>150ft²</u> of FN NANO® coating will compensate emissions from driving your automobile

EASY APPLICATION

https://www.youtube.com/watch?v=zQp9R1otu_g&feature=youtu.be


FN NANO® 150ft²
THINK GLOBALLY, ACT LOCALLY
YESTERDAY UNKNOWN
TODAY AN OPTION
TOMORROW A STANDARD
5 11 2012

Intelligent Coatings

FN NANO® Photocatalytic Coatings: A Real-World Environmental Solution

Economy & Ecology

Sustainable World

Practical Ecology in Action

Smart Cities Start With Clean Air

Smart Industries

Smart Buildings

Intelligent Coatings
FN NANO® Photocatalytic Applications
AIA

Intelligent Coatings
FN NANO® Photocatalytic Applications

Self-cleaning and air cleaning are great benefits

+

Air depollution - CO_2 EQUIVALENTS (OFFSETS) – benefits to the society

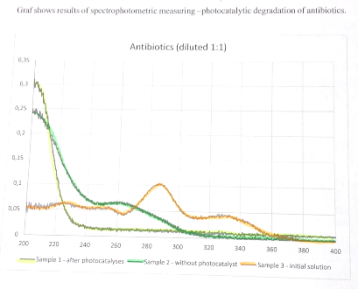
Eco-costs of emissions (Virtual Pollution Prevention Costs, VPPC)

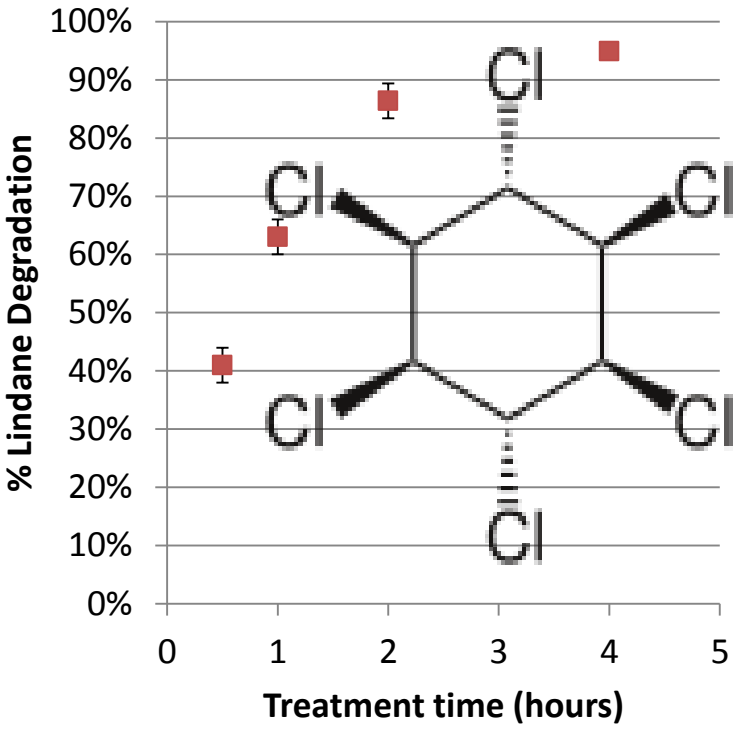
- **3754 Euro/ kg Benzo(a)pyrene equivalent** for **human toxicity, cancer** (Usetox 2)

The following marginal prevention costs have been calculated for 2017 (version 1.6):

- 116 Euro/ 1000 kg CO_2 equivalent for **global warming** (characterisation data IPCC 2007, **GWP 100**)
- 8.75 Euro/ kg SO_2 equivalent for **acidification** (ILCD)
- **6.0 Euro/ kg NOx equivalent for summer smog** (ILCD **photochem. oxidant formation**)
- 35 Euro/ kg fine dust PM 2,5 for **respiratory inorganics** (characterisation data RiskPol)

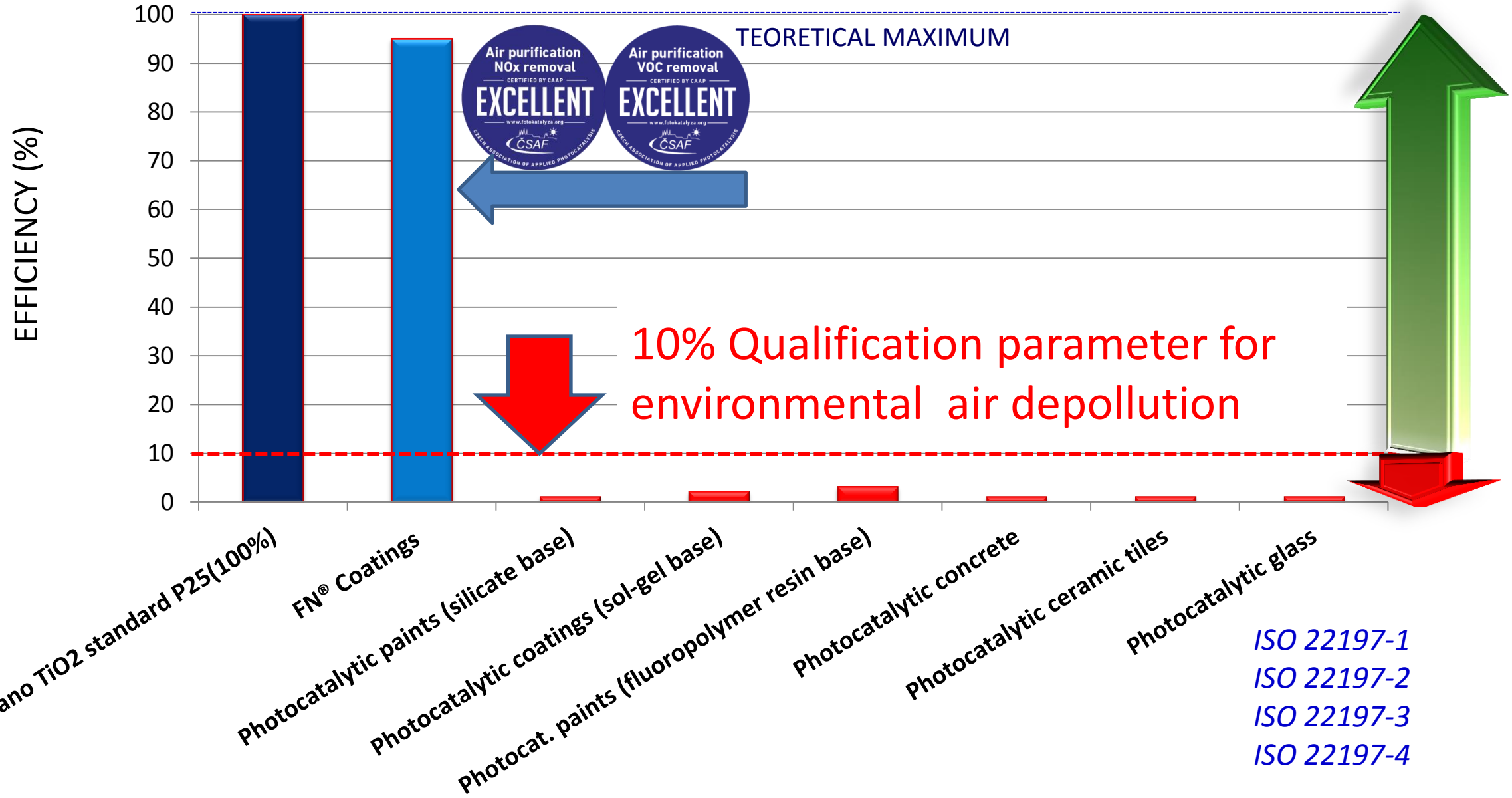
STEP AHEAD OF ELIMINATION OF EMERGING POLLUTANTS





Comparison – efficiency of photocatalytic products with pure photocatalyst (%)

FN NANO® efficiency – almost as high as a pure photocatalyst (100%)



ISO 22197-1
ISO 22197-2
ISO 22197-3
ISO 22197-4

•Economy and ecology synergies

Self-cleaning & AIR CLEANING = Economy & Ecology

before (6 years old building – marble tiles)

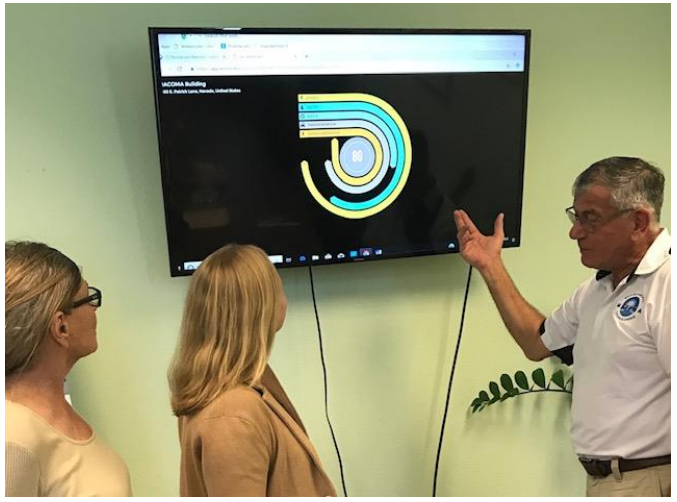
Villa Bianca complex 1

7 years after FN1® application

it would look like the previous picture without the coating

Cleans over one billion m^3/ year

FN NANO® can bring you valuable points in LEED certification evaluation process



Regional Director Patti Mason of the USGBC visited FN Nano treated building of Nevada Alliance Against Diabetes on E Patrick Lane in Las Vegas, which has been awarded with LEED Platinum certificate.

More on FN Nano technology at USGBC
https://www.usgbc.org/education/sessions/every-breath-you-take-innovative-air-quality-design-11882335

U.S. GREEN BUILDING COUNCIL USGBC

AIA

FN NANO® coatings – ideal technology for recovery and sustainable protection of historical objects in urban environment

Long term protection against:

- UV
- DIRT
- SOOT
- TARS
- DUST
- MICROORGANISMS
- CHEMICALS AND BIOAGENTS
- MUD DROPLETS AND SPLASHES
- OTHER CONTAMINATION

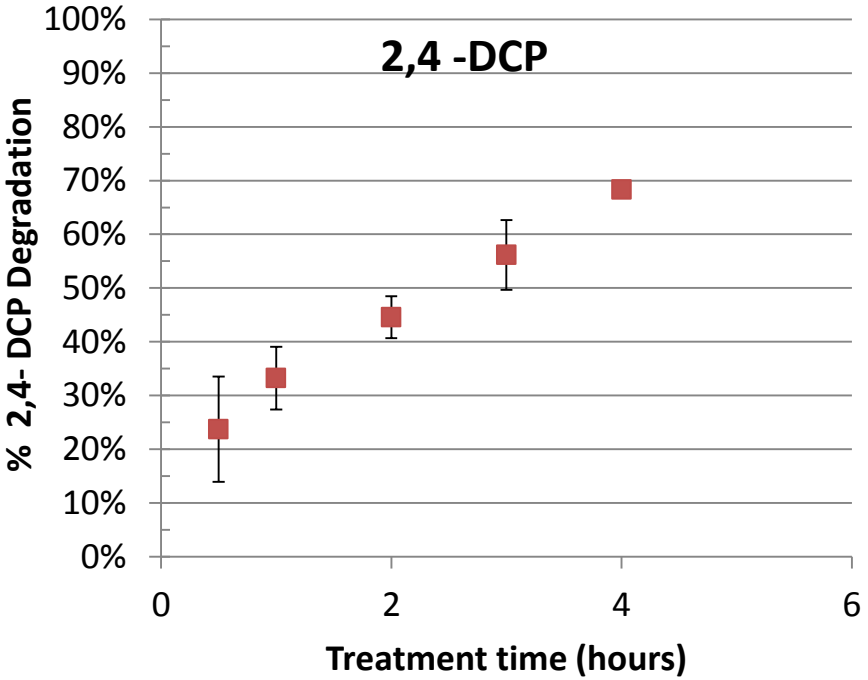
400 color varieties

Anti graffiti coating/ AIR CLEANING graffiti

A combination of several properties which protect the surface against graffiti:

1. **Hydrophilicity - spray solvent repealing effect doesn't allow graffiti penetrate through the FN layer,**
2. **High consumption of spray in comparison with regular surfaces,**
3. **Porous FN® layer can be easily removed by mechanical means without damaging the substrate,**
4. **Easy recovery of anti-graffiti surface by repainting**
5. **graffiti removal - soft brush and pressure water**

MOVE AWAY FROM PESTICIDES



IMPROVING STORAGE - REDUCE WASTING OF FOOD

Postharvest Biology and Technology 147 (2019) 68–77

Contents lists available at ScienceDirect

Postharvest Biology and Technology

journal homepage: www.elsevier.com/locate/postharvbio

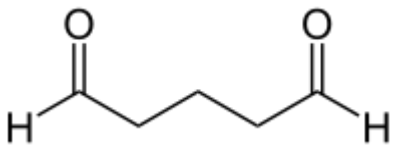
Efficacy of photocatalysis and photolysis systems for the removal of ethylene under different storage conditions

Namrata Pathak[a,*], Oluwafemi J. Caleb[a,b], Cornelia Rauh[c], Pramod V. Mahajan[a,*]

[a] Department of Horticultural Engineering, Leibniz Institute for Agricultural Engineering and Bioeconomy (ATB), Potsdam, Germany
[b] Post-harvest and Agro-processing Technologies, Agricultural Research Council (ARC) Infruitec-Nietvoorbij, Stellenbosch, South Africa
[c] Department of Food Biotechnology and Food Process Engineering, Technical University, Berlin, Germany

BETTER HEALTHCARE AND HOSPITALS

Glutaraldehyde



HYDROGEN PEROXIDE

Persteril