

PRESS RELEASE

## The Art of Cleaning The Air



Boysen Paints, the Philippines' leading paint brand, is sponsoring the first large scale public art project in the world that will use paints that can clean noxious air pollutants.

The project, called KNOxOUT Project: EDSA – Everyone Deserves Safe Air, will consist of eight artworks each measuring about 1,000 square meters, along the city's busiest roadway, which is also called EDSA (Epifanio de los Santos Ave.). In a unique mix of art and science, all of the artworks will use Boysen KNOxOUT, the first air cleaning paint in the world with CristalActiv photocatalytic technology whose ability to reduce noxious air pollutants has been proven in several scientifically verified trials around the world.

Like many Asian urban centers, Manila's air is a health threat to its population. Metro Manila was cited in a 2005 World Health Organization report as having the fourth most polluted air in the world. A study by the World Bank and the Dept. of Environment and Natural Resources (DENR) estimated that breathing dirty air is responsible for 5,000 premature deaths in the metropolis. A study from the University of the Philippines College of Medicine found that over half of all medications sold in the country last year were for respiratory illnesses.

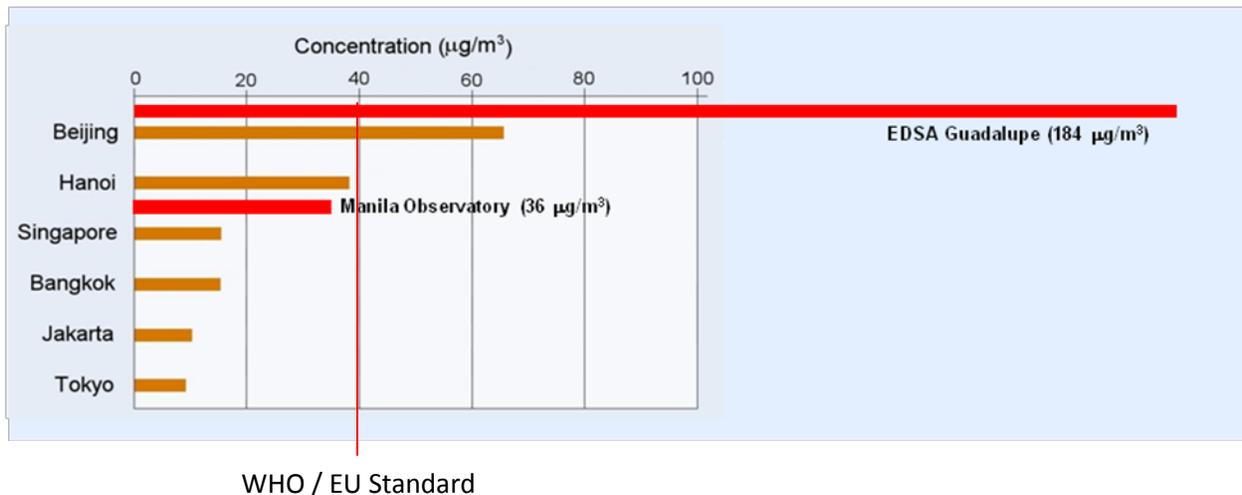
Roadside pollution poses the biggest threat to human health, because of its high concentration so close to where we live and work. One of the main contributors to roadside pollution is nitrogen dioxide (NO<sub>2</sub>), a reddish brown smog precursor produced from vehicle emissions with serious health and environmental effects.

"Air pollution in Metro Manila is dangerous, especially along major thoroughfares" said



Philippine Vice President Jejomar Binay putting his touch on the Ganap artwork along EDSA. Looking on are MMDA Chairman Francis Tolentino, Boysen VP Johnson Ongking, and artist Bogie Ruiz.

Dr. James Simpas, head of Urban Air Quality at the Manila Observatory, who presented data that showed that the average daily NO<sub>2</sub> level near the Guadalupe MRT Station in 2009 was over 4 ½ times the safe limit set by the World Health Organization (WHO) and the European Union. “There is little being done to mitigate this pollution and its health effects.”



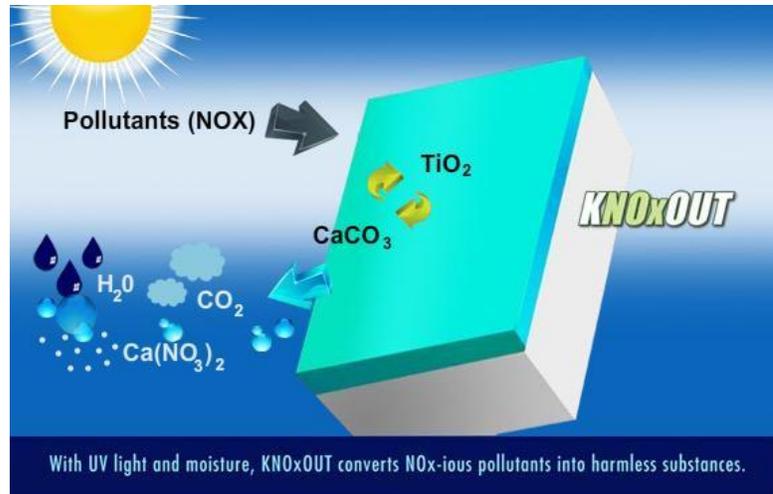
In a creative approach to addressing the air pollution problem, Boysen is putting up the country's public artworks that will simultaneously function as air purifiers. The key to transforming the artworks into air purifiers is the use of KNO<sub>x</sub>OUT, which uses a process called photocatalysis to convert air pollutants like nitrogen oxides (NO<sub>x</sub>) into benign substances in an environmentally friendly way.

The CristalActiv technology used in KNO<sub>x</sub>OUT was developed by Cristal Global, the world's second largest titanium dioxide (TiO<sub>2</sub>) producer and the global leader in using ultrafine TiO<sub>2</sub> for air quality improvement. Variants of the technology have been in use as DeNO<sub>x</sub> catalysts for over 30 years in lowering NO<sub>x</sub> emissions in gas as well as diesel exhaust systems.

On a KNO<sub>x</sub>OUT paint film, light energy activates the ultrafine TiO<sub>2</sub>, which then converts ordinary water vapor into free radicals that break down NO<sub>x</sub> that come into contact with the surface of the TiO<sub>2</sub> particles. Because of its small size – 6,500 of the TiO<sub>2</sub> particles can be laid end to end across the width of a human hair – a gram of the material has a surface area of a tennis court, and this large surface area promotes a high level of contact and activity with air pollutants.

The NO<sub>x</sub> gas is converted into nitric acid, which is rapidly neutralized by alkaline calcium carbonate particle in KNO<sub>x</sub>OUT, producing harmless quantities of calcium nitrate, water, and

negligible amounts of carbon dioxide and water. Calcium nitrate is water soluble and easily removed from the film, leaving a fresh surface ready to engage the next pollutant to come into contact with the film. Because the ultrafine TiO<sub>2</sub> is merely a catalyst in generating free radicals, it is not consumed in the reaction, allowing



KNOxOUT to continually clean the air as long as exposed to sufficient light.

The air cleaning properties of KNOxOUT and CristalActiv have been validated in several trials all over the world. A subsidiary of Cristal Global supplied the photocatalytic coatings used for an European Union funded project called **Photocatalytic Innovative Coatings Applications for De-Pollution Assessment (PICADA)**, which did several small scale trials that showed that the technology could reduce levels of NO<sub>x</sub>.

The world's largest air cleaning paint trial to date was done at a metro rail station along EDSA in 2009. The trial, which was monitored by the Manila Observatory and the Swedish environmental project management company Conexor, showed that the KNOxOUT painted on the walls of the station and surrounding area reduced NO<sub>2</sub> levels by up to 20% in the area, equivalent to the NO<sub>2</sub> emissions of over 30,000 cars passing by the station every day. A recently concluded trial in Camden, London verified by King's College, showed decreases in NO<sub>2</sub> levels similar to the Manila trial.

A study in Europe by APHEIS (Air Pollution and Health: A European Information System) found that even very small cuts in pollution can benefit health, while a Harvard University study found that people living in cities where air pollution decreased in recent decades saw their life expectancy increase an average of five months as a result of cleaner air.

"Every little bit counts in the fight against air pollution," says Johnson Ongking, Vice President of Boysen Paints. "People have always known that air pollution wasn't good for them, but they've felt hopeless in doing much about it."

“KNOxOUT is an empowering technology – it gives ordinary people the power to transform ordinary walls into air filters and actively fight air pollution,” added Ongking. “The artists for the EDSA project are creating some of the most beautiful air filters in the world, but for the rest of us we can do our share for clean air by painting plain air filters all over the city.”

The idea of empowering people to help clean the air was one of the major reasons the company chose to put up the artworks along EDSA, the site of the 1987 People Power Revolution where ordinary Filipinos gathered to oust the dictatorship of Ferdinand Marcos.

“This EDSA project is about rekindling the spirit of people power to fight the problem of air pollution,” says Ongking. “Everyone who uses a motor vehicle is part of the pollution problem, and KNOxOUT makes it possible for all of them to now be part of the



*Everyone Deserves Safe Air*

solution. After all, we all breathe the same air, and it’s our common responsibility to make sure it stops being harmful to us. At the very least, it’s now possible to take out the same amount of NOx that we put in the air.”

“If you about drive 20 kilometers daily on an average modern car that produces .15 grams of NOx per km, you’d be producing about 3 grams of NOx per day,” adds Ongking. “You could potentially erase that NOx footprint by painting 10 square meters of a wall with KNOxOUT on a busy street. It would take about 10 mature trees to take out the same amount of NOx.”



Each of the artworks for the project will be a lot bigger than that. In fact, at 1,000 square meters each, they will be the largest public artworks ever in the country. The project is being done in cooperation with the Metro Manila Development Authority (MMDA), a government agency responsible for the development of Metro Manila. It is also the first curated public art project in the country. Artists were chosen by curator TAO Inc. for their familiarity with communication through graphic means in outdoor spaces, and include the following:

- Social Realist painter, graphic designer, and political cartoonist Jose Tence “Bogie” Ruiz
- Asuncion “Baby” Imperial and Damien “Coco” Anne of the Manila-based graphic design studio B+C
- Brisbane-based partners Alfredo and Isabel Aquilizan
- Multi-awarded art department of the advertising agency TBWA
- France-trained painter and virtuoso printmaker Virgilio “Pandy” Aviado
- Highly-regarded Japanese-American Neal Oshima who has lived in the Philippines for more than 3 decades
- Dutch-Indonesian, London-based artist and curator Erika Tan, whose work is inspired by her interest in anthropology and the moving image
- London-based architects Tapio Snellman and Christian Grou, who own the practice named Neutral, founded in Tokyo.

