

Self-cleaning concrete - New weapon in fight against smog

Stockholm, Sweden.

From catalytic converters to alternative fuels, the fight against big-city smog has for many years been fought inside combustion engines and exhaust pipes. Now scientists are taking the fight to the streets by developing 'smart' building materials designed to clean the air with a little help from the elements.

Using technology already available for self-cleaning windows and bathroom tiles, scientists hope to paint up cities with materials that dissolve and wash away pollutants when exposed to sun and rain.

'Among other things, we want to construct concrete walls that break down vehicle exhausts in road tunnels' said Karen Patterson, a spokeswoman for the Swedish construction giant Skanska. 'It is also possible to make pavings that clean the air in cities'.

The Stockholm-based company is part of a \$1.7million Swedish-Finish project to develop catalytic cement and concrete products coated with titanium dioxide, a compound often used in white paint and toothpaste that can become highly reactive when exposed to ultra-violet light.

This is the idea: UV rays hitting the titanium dioxide trigger a catalytic reaction that destroys the molecules of pollutants, including nitrogen oxides, which are emitted in the burning of fossil fuels and create smog when combined with volatile organic compounds. Exposure to high levels of nitrogen oxides can trigger serious respiratory problems, including lung damage.

The catalytic reaction also prevents bacteria and dirt from sticking to a surface, making them easily removed by a splash of water or rain.

Bo-Erik Eriksson, head of research at Cementa, another company participating in the Swedish-Finish project, said the byproducts of the reaction, called photocatalysis, are benign, though it depends on what substances are involved: Organic compounds are broken down into carbon dioxide and water, while the nitrogen oxides yield nitrate salts.