Scientists at the University of Cambridge, working in collaboration with the Italcementi HeidelbergCement Group and other partners, have developed a substance that can absorb pollution. In the future, the substance could be used as a coating on pavements or buildings to eliminate many forms of air pollution.

The new substance is a composite made of graphene and titania nanoparticles. Titania is a photocatalyst, meaning that when it is exposed to sunlight, it alters harmful nitrogen oxides and other volatile organic compounds, changing them into inert or harmless products. The researchers discovered that adding graphene, a two-dimensional form of carbon, to titania, produces a material with more powerful ‘photodegradation’ properties than titania alone.

The researchers found that when the substance is mixed in with concrete pavement or applied to the walls of buildings, it converts airborne pollutants into harmless products which are then washed away by rain or wind. They can also be cleaned off the buildings manually.

According to researcher Marco Goisis, “Coupling graphene to titania gave us excellent results in powder form – and it could be applied to different materials, of which concrete is a good example for the widespread use, helping us to achieve a healthier environment. It is low-maintenance and environmentally friendly, as it just requires the sun’s energy and no other input.”

This is not the only product we have come across recently that uses graphene. We have recently covered several products that use graphene to improve thermal conductivity. These include a
thermal invisibility cloak and a highly-conductive graphene-based paint that can help lower electricity bills.

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**Takeaway:**

According to the World Health Organisation, more than 10 per cent of all deaths worldwide can be attributed to diseases caused by air pollution. The main components of this pollution are nitrogen oxides and other volatile compounds emitted by vehicle exhausts and industry. The new titania-graphene composite could help address this problem. First, the researchers will need to develop cheaper methods to mass-produce graphene and study the long-term stability of the new photocatalyst.