

Technology registry

Photo-active TiO₂ coatings for environmental purification and self cleaning applications.

1.	Name - Dr. K. K. Saini and Mr. Chander Kant
2.	<p>Designation Address : Dr. K. K. Saini - Senior principle Scientist</p> <p style="text-align: center;">Mr. Chander Kant - Senior Technical Officer</p> <p style="text-align: center;">National Physical Laboratory</p> <p style="text-align: center;">Dr. K. S. Krishanan Road</p> <p style="text-align: center;">New Delhi - 110012</p>
3.	Email Address: krishanksaini@gmail.com ; chanderkant162@gmail.com
4.	Area of Technology (e.g. materials, health care, etc.): Material & Technology for environmental Protection/ Purification
5.	Web link, if any:
6.	<p>Description in 500 words: We have developed a technology and equipment for coating thin photo-active TiO₂ films on large area glass substrates with sol-gel dip coating technique. Sol-gel technology relies on the the hydration and condensation of the material from suitable precursors under suitable conditions. Generally the coating precursors have very limited shelf life due to which the process is nor generally adopted for large scale production. We have designed a sol which has shelf life of ~ 3 months under controlled storage conditions. We have designed and got fabricated the coating equipment in a local workshop for coating high quality thin films of TiO₂ on glass substrates as large as one meter X one meter. The cost of equipment is less than Rs. 5.00 lacs as per today.</p> <p>Beauty of these coatings is that they become superhydrophillic on exposure to solar photons for considerable duration, this imparts the surface a self cleaning property and retains the visibility of glass for clear outside view, in high humidity conditions also. Such product is desired for modern high rise buildings where cleaning of glass windows and lotus coatings on them requires substantial budget in the form of labor and chemicals. The chemicals used also pollute or soil and water. This product is presently manufactured marketed by global players; PILKINGTON, Saint Gobain, PPG glass and cardinal glass. They manufacture this product either by sputtering - which requires high cost equipment or CVD - where toxic gases are pumped into the atmospheric air. Our technology is not only economic but environmental friendly also.</p> <p>Further TiO₂ is well known non-toxic photocatalytic material which degrades air pollutants like CO, NO_x, SO_x, VOC, BTEX etc. due to its photo-active property and and suitably placed band edge positions. Japan, Europe and USA are</p>

	adopting such product on large scale to control air pollution and keep the highway hoardings neat to look better. Nano-crystalline nature of the films improves the property further. This technology was validated under DST - Lockheed Martin India Innovation growth program - 2010 and was selected among top fifty technologies.
7.	Keywords: Photo-active, sol-gel, self cleaning, air purification.