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PHOTOCITYTEX – A LIFE project on the air pollution treatment in European urban environments by means of photocatalytic textiles

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In urban areas, air pollution from traffic is becoming a growing problem. In recent years the use of titanium dioxide (TiO_2) based photocatalytic self-cleaning and de-polluting materials has been considered to remove these pollutants. TiO_2 is now commercially available and used in construction material or paints for environmental purposes. Further work, however, is still required to clarify the potential impacts from wider TiO_2 use. Specific test conditions are required to provide objective and accurate knowledge.
Under the LIFE PHOTOCITYTEX project, the effectiveness of using TiO_2-based photocatalytic nanomaterials in building textiles as a way of improving the air quality in urban areas will be assessed. Moreover, information on secondary products formed during the tests will be obtained, yielding a better overall understanding of the whole process and its implications. For this purpose, a series of demonstrations are foreseen, comprising 1. lab-test and development of textile prototypes at lab scale, 2. larger scale demonstration of the use of photocatalytic textiles in the depollution of urban environments employing the EUPHORE chambers to simulate a number of environmental conditions of various European cities and 3. field demonstrations installing the photocatalytic textiles in two urban locations in Quart de Poblet, a tunnel and a school.
A one-year extensive passive dosimetric campaign has already being carried out to characterize the selected urban sites before the installation of the photocatalytic textile prototypes, and a similar campaign after their installation is ongoing. Also, more comprehensive intensive active measurement campaigns have been conducted to account for winter and summer conditions. In parallel, lab-tests have already been completed to determine optimal photocatalytic formulations on textiles, followed by experiments at EUPHORE.
Information on the deployment of the campaigns is given together with laboratory conclusions and first verification on the photocatalytic textile effectiveness as observed in the field campaigns and at EUPHORE. A discussion on the impact of this depolluting solution on the air quality of urban environments is given.