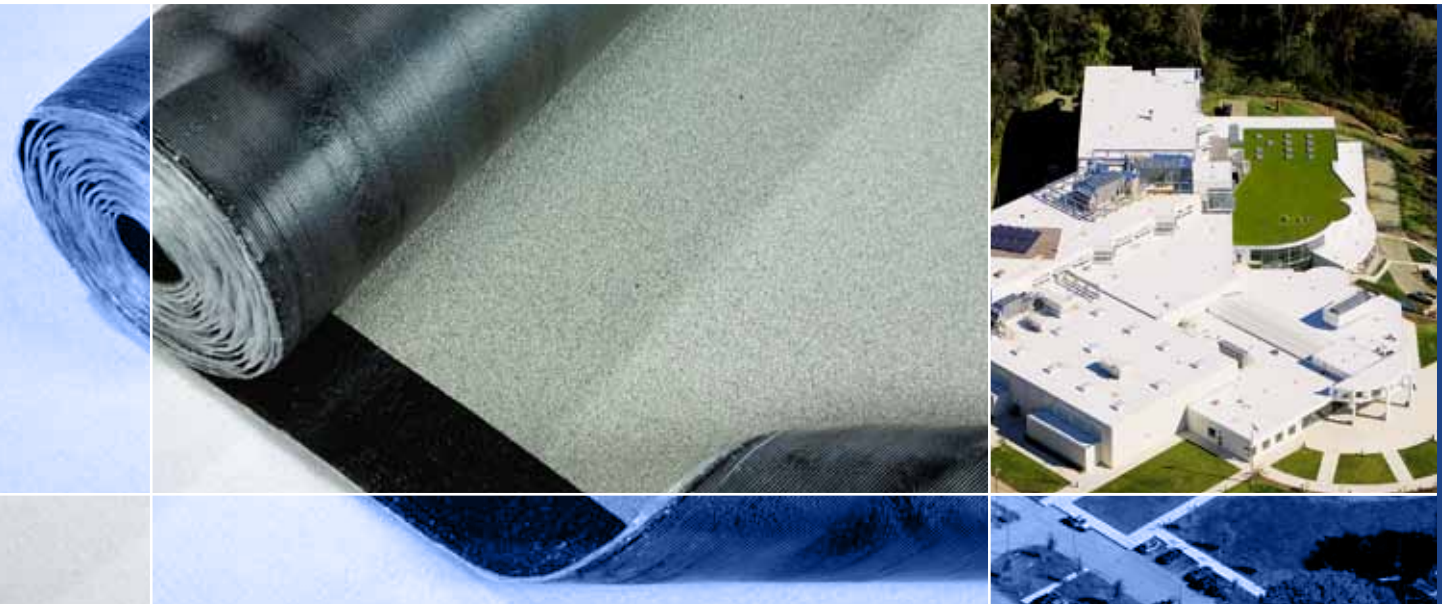


NOx-Activ Membranes



Depolluting waterproofing membranes
for non-accessible roofs



Green Building
High Quality Environmental
(HQE® French Standard)
Sanitary quality of the air

- ▶ **Depolluting effect:** destruction of nitrogen oxides (NOx).
- ▶ **Simple and safe installation:** traditional laying of membranes of Styrene Butadiene Styrene (SBS) bitumen.
- ▶ **Multipurpose solution:** welded or mechanically fixed laying, in single-ply or double-ply versions.
- ▶ **Proven solution:** patented protection and Pass Innovation of CSTB⁽¹⁾.

(1) CSTB: Building Scientific & Technical Center, French Institute member of UEAtc

Packaging

- **Paradiene 30.1 GS NOx Activ:** Roll: 1m x 10m – Pallet of 23 rolls.
- **Parafor Solo GFM NOx Activ:** Roll: 1m x 7m – Pallet of 23 rolls.

Main uses:

- In plains climate (altitude \leq 900m).
- Bearing elements: masonry (slope \geq 2%), steel (slope \geq 3%), timber (slope \geq 3%).
- Substrates: bearing element (masonry, steel, timber), heat insulation, old waterproofing.
- Flat roofs, non-accessible with visible roof waterproofing covering.

NOx-Activ Membranes



Atmospheric pollution, implications for the planet

Natural air, mainly composed of nitrogen and oxygen, is indispensable for life. Each human being breathes about 10 m³ of air per day.

Since the beginning of the industrial epoch, human activity has been modifying the atmosphere, disturbing the climate and degrading the quality of the air that we breathe by introducing more and more substances which are harmful to the health.

Among these harmful substances are the nitrogen oxides (NO_x), irritating gases that penetrate into the thinnest branches of the lungs, causing breathing difficulties for sensitive persons, bronchial hyperactivity and, for children, an increase in the sensitivity of the branches (bronchia) to infections, particularly due to nitrogen dioxide (NO₂), the atmospheric pollutant that is most harmful to the health.

The NO_x facilitate the formation of ozone in the atmosphere's lower layers.

In the summer, the thresholds established to protect health are often exceeded* in large conurbations (urban and suburban zones). The main sources of the emission of NO_x are road transportation, manufacturing industry and the power production sector.

Moreover, the heating power of NO₂ - 310 times that of CO₂ - accentuates climatic heating of the planet by increasing the greenhouse effect.

Fighting against pollution and its deleterious effects entails regulation of road traffic or reduction of gas emissions. But today, it is also possible to destroy the pollution generated. This is thanks to the depolluting elements introduced in building materials.

NOx-Activ: an aid to the protection of your environment

The contribution of NOx-Activ membranes to air depollution fits within the framework of an HQE® Standard (High Quality Environmental Standard for green building in France) but at a broader level, in all the projects that respect the principles of Sustainable Development. The NOx-Activ range corresponds to the wishes of the contracting authorities oriented, very practically, into « Activ » type eco-construction.

* Recommendation from the World Health Organisation (WHO): 40mg/m³ per year. European Directive, precaution threshold fixed at 200mg/m³ per hour, warning threshold set at 400mg/m³ per hour.

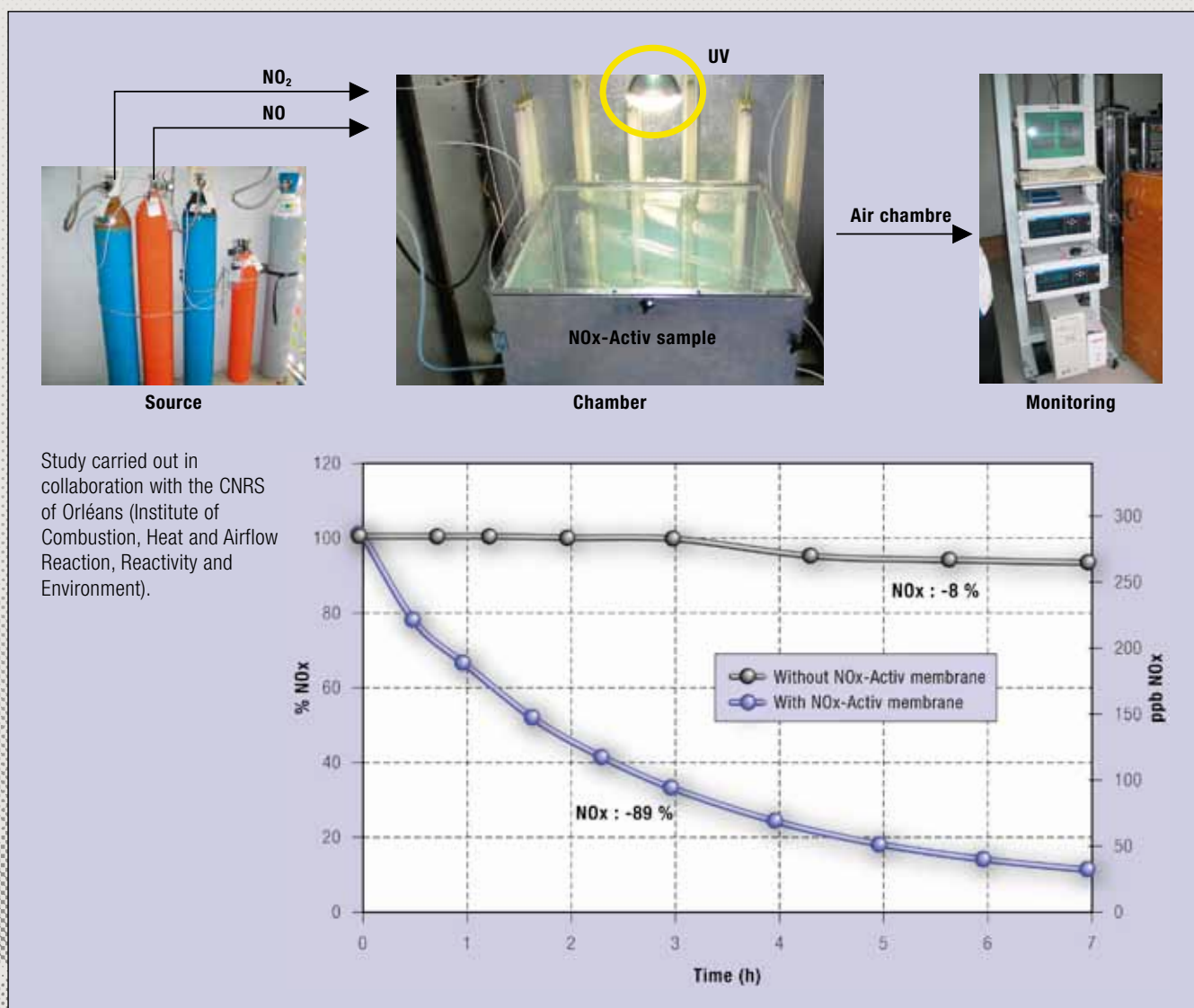
NOx-Activ line, Siplast's answer to depollution by the roof

Principle: The NOx-Activ membranes are self-protected by Noxite®, a material based on TiO₂ (titanium dioxide, in its anatase form), an element with depolluting properties by auto-catalysis (see Picada European study). So this is a depolluting system, actuated by the sun's light, and demonstrated in the

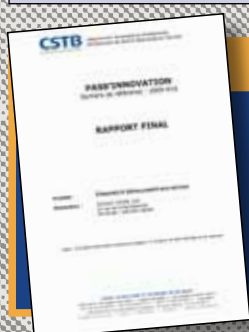
laboratory and by in situ tests as well as being validated by the "Centre National de la Recherche Scientifique" (CNRS) (French National Scientific Research Centre). The resulting depolluting effect is permanent, throughout the life of the waterproofing membrane.

Example: during one year, for 10,000m² of NOx-Activ roofing, the depollution of the NOx cancels the pollution generated by:

- ▶ 10 diesel vehicles rolling 20,000km/year;
- ▶ 32 petrol vehicle rolling 20,000km/year.



Study carried out in collaboration with the CNRS of Orléans (Institute of Combustion, Heat and Airflow Reaction, Reactivity and Environment).



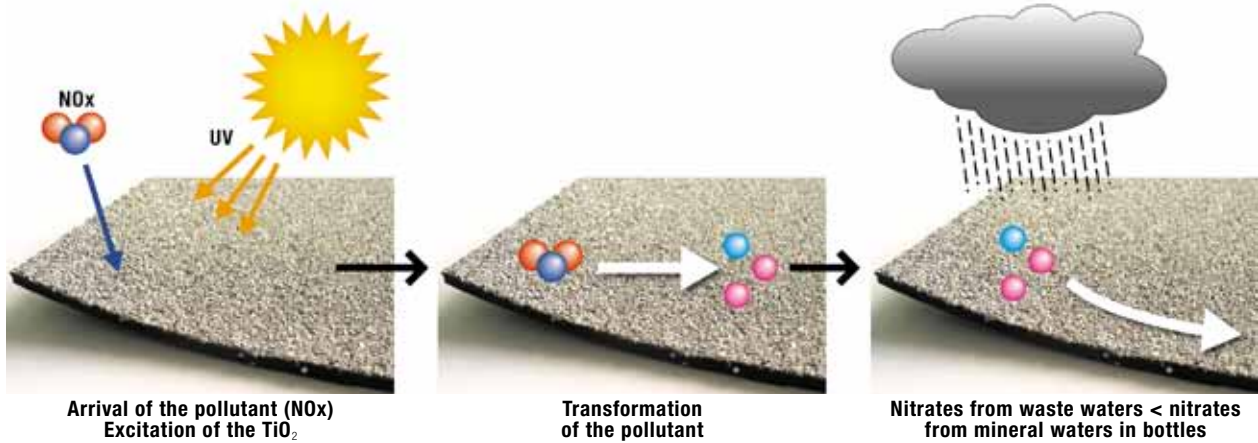
CSTB Pass'Innovation: NOx-Activ principle – Depolluting roof

The NOx-Activ principle is a genuine innovation in the field of roofs and of environment protection. NOx-Activ benefits, under Pass'Innovation no. 2009-016, from a conclusion by CSTB concerning the optimal « green fire level ».

The summary can be directly downloaded on the CSTB site under the « evaluation » heading. CSTB's final report as well as the Siplast technical file can be transmitted upon request as part of the analysis of your project.

Operation

Noxite[®], covering the NOx-Activ membrane, under the effect of daylight (UV radiation) causes the decomposition of the pollutants (NOx) into by-products carried away by washing (rainwater).



Note: the by-products from the decomposition of the NOxs have no measurable impact on the quality of the run-off water (see report from the analysis laboratory).

Complementary information

The principle of photocatalysis of titanium dioxide (TiO₂) was demonstrated in Japan in the 1970s.

Its use in various fields (health, interior ambience and well-being, automobile, urban civil engineering, materials for the interior and the exterior) have been multiplying during the last ten years.

For more information: www.efp-fep.com (European Photocatalysis Federation).

To build a depolluting roof with an NOx-Activ membrane

- Go to Internet site: www.siplast-international.fr.
- Go to heading « Green building/Depolluting roofs ».
- Click on « download on line ».
- Save as or print the standard description.

