

The effectiveness of Icopal membrane roof coating to improve air quality

At various places in The Netherlands the target values for air quality (NO_2 and PM_{10} in particular) are exceeded. National and local authorities, companies and research institutes investigate the potential of measures to improve air quality.

Icopal Ltd. manufacture roof coatings that remove part of the NO_2 concentrations in air. Icopal has commissioned TNO to study the ability of their products to remove NO_2 . TNO has carried out this study by means of tests in the laboratory and by sampling rainwater and water collected at a roof at Schiphol airport.

A small specimen of the waterproofing membrane ($30 \times 30 \text{ cm}^2$) was tested in a bell glass where it was exposed to concentrations NO_2 as they occur in ambient air. The specimen was irradiated by an UV bulb with an intensity and variation according to the diurnal course of the sun. The measured changes in concentrations are a measure of the amount of NO_2 that is removed by the material.

At a roof of about 400 m^2 at Schiphol airport close to a busy gate samples of rainwater and drainage water were collected during a couple of weeks in the summer and winter. The samples were analysed at the laboratory. The difference in concentrations of nitrogen components between the rainwater and drainage water is a measure of the amount of NO_2 absorbed by the waterproofing membrane.

The tests in the laboratory show that the waterproofing membrane removes and absorbs NO_2 . The results agree quite well with similar tests in French and German laboratories. The study also shows that establishing the removal rate of NO_2 in practice is hampered by the varying meteorological conditions that affect the accuracy of the results. Nevertheless, the results from the roof at the airport are, by and large, in line with the results from the laboratory.