



## FACTSHEET N° 8

### Indoor Air quality

#### **Low emissions to indoor air**

#### **Polyurethane insulation products contribute to comfortable and healthy indoor climate**

BING members in Europe produce some of the most efficient thermal insulation products in the world that contribute significantly to improving both temperature control in public and private buildings and “saving the planet” in terms of efficient retention of heat (or cold) and minimisation of energy input, thus saving millions of tonnes of carbon dioxide emissions per year.

Thermal insulation products manufactured by BING members cover buildings (walls, floorings, roof...), technical installations and other equipments.





It is important that as well as having a controlled, comfortable and economic environment, we have an agreeable and safe indoor climate in our houses, offices, shops, community areas, and factories. Producers of building materials have to ensure that their products cannot cause any hazard to the inhabitants of buildings.

To take the manufacturers' responsibility seriously BING commissioned a respected independent German scientific institute to conduct investigations on emissions from polyurethane products into indoor air. The Wilhelm-Klauditz-Institut (WKI), which is part of the reputable Fraunhofer Gesellschaft, performed standard air quality tests to assess emissions of volatile compounds and odours from BING Members' insulation products (both PUR and PIR<sup>1</sup>) under standard simulated 'in situ' conditions.

The investigations showed that polyurethane products emit only very small quantities of volatile organic compounds (VOC) in comparison to other building materials such as wood. Significant odours from sensory testing were not detected. The WKI came to the conclusion that all the tested products were 'suitable for indoor use'. Furthermore the testing confirmed conformity with the requirements of the "AgBB" evaluation scheme. This scheme established by the German authorities is intended to assess whether VOC emissions from building products are compatible with a healthy indoor air quality.

The European Commission is planning further legislation and testing standards under the Construction Products Directive to better define European wide criteria for emissions to indoor air. Consumers can rely on the low emissive polyurethane insulation products contributing to comfortable and healthy indoor climate now and in future.

**Summary of test results by Fraunhofer  
Wilhelm-Klauditz-Institut  
Material Analysis and Interior Chemistry**

**Test into the release of volatile organic compounds (VOCs) in  
thermal insulation materials made of rigid polyurethane foam <sup>2</sup>**

The Fraunhofer Wilhelm-Klauditz-Institut (WKI) conducted a test for demonstration purposes on the release of volatile organic compounds (VOCs) from rigid polyurethane foam used in thermal insulation products. The test was carried out in accordance with the emission test chamber method, which conforms to the European standard (ENV 13419-1) and is recognised by the Deutsche Institut für Bautechnik (DIBt; German institute for building technology). In addition, measurements were taken using a standard emission cell (FLEC) in accordance with ENV 13419-2.

<sup>1</sup> PUR is Polyurethane, PIR is Polyisocyanurate rigid foam in accordance with EN 13165

<sup>2</sup> These results are the summary of WKI Test Report N° : 2034/2004 of 12 November 2004

In order to simulate the worst case scenario, the facings of the thermal insulation product were removed in one test set-up. The product was also tested in two different test set-ups with factory-applied facings.



The emissions were evaluated according to the evaluation scheme proposed by the Committee for Health-related Evaluation of Building Products (AgBB - Ausschuss für die gesundheitliche Bewertung von Bauprodukten). Commissioned by the German Government, AgBB developed a method for the health-related assessment of building products (AgBB evaluation scheme, July 2004). Using this method, the compounds emitted from building products are evaluated to determine if they are a potential hazard to health. The intention to develop an evaluation grid for sensory testing corresponding to the AgBB method has not yet been realised. For this reason, the odour test was carried out in accordance with the DIN EN 13725 standard.

The tests conducted by WKI showed that the PUR/PIR rigid foam products examined under the purposely unfavourable test conditions released only very small quantities of organic substances into the air of the chamber. None of the emitted compounds revealed carcinogenic, mutagenic or reprotoxic potential.

As a rule, thermal insulation materials installed in buildings are not in direct contact with the indoor air. They are installed behind foil which is to a large extent gas-tight. Also PUR/PIR are isolated from the indoor environment by an internal cladding (masonry, plasterboards...). Nevertheless, the emissions from the PUR/PIR rigid foam products that were tested have no significant negative impact on the indoor air.

According to the AgBB assessment tool:

- Thermal insulation products made of rigid polyurethane foam emit only very small quantities of volatile organic compounds to the indoor air. They are odour-neutral.
- These substances are not harmful to health or the environment. They exhibit no carcinogenic, mutagenic or reprotoxic potential.
- The tested PUR/PIR rigid foam products are suitable for use in interior spaces

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