

## Low VOC emissions products - for creating healthy indoor air

**Most people spend 90% of their time indoors. It is therefore vital to design and provide good indoor air quality and a healthy working environment.**

In today's energy saving buildings, any volatile organic chemicals (VOC) emitted from floorings, paints and furniture are not readily dispersed as they might have been in the past. Elevated concentrations of VOC, formaldehyde, and other chemicals may occur, sometimes in combination with unpleasant odours. This may contribute to health problems such as headaches, abnormal tiredness, malaise, irritation of mucous membranes in the nose and the throat with added perception of dry air, eye irritation, and skin problems by the occupant.

Today, we see a growing awareness of the impact of building and furnishing materials on indoor air quality. Several consumer organisations have accused industry of poisoning the end-users and demand low emission products to ensure good indoor air.

Several member states of the European Union have established compulsory regu-

lation on maximum emissions from construction products (e.g. Germany and France), and other countries will follow.

Voluntary labels are also in use for characterising products with low VOC emissions. More than ten voluntary labels are used in Europe for marking low emission products, each one applying different limit values and testing protocols. And still different labels are used in the USA and in Asia.

Industry uses these labels for promoting high quality products at a better price. They may e.g. show that their products may qualify for earning points in LEED building certification projects. Car and aeroplane manufacturing industries also require low emissions from products used for interior finishes.

Emission testing of product samples is performed in test chambers that simulate actual living rooms, offices, schools etc. Temperature, humidity, room loading (area of product per room volume) and ventilation are defined, based on typical model rooms.



Photo: Nordfoto

*Offices of the past in leaky buildings of stone and wood have been replaced by modern offices constructed of modern materials which allow for only poor ventilation*

# Requirements and labelling systems

**In many countries legal or voluntary rating systems are operating for emission control of VOC, formaldehyde and other hazardous substances in carpets, floorings, adhesives, furniture, paints, etc.**

Germany, France and Japan have established maximum VOC emission values for several products. ISO, EPA, ASTM, ANSI, CEN, JIS and other organisations have also laid down standard test protocols and limit values.

Examples of labels for low emission products:

- EU flower - Europe
- Indoor Air Comfort - Europe
- AgBB/DIBt, Ü mark - Germany
- French VOC regulations
- AFSSET - France
- EMI CODE, adhesives and other construction products - Europe
- GUT, carpets - Europe
- M1 classification - Finland
- Blue Angel - Germany
- Ecolabel - Austria
- Nordic Swan - Scandinavia
- Indoor Climate Label - Denmark, Norway
- LEED IEQ credits - USA
- Section 01350 - California
- Indoor Advantage - USA
- BIFMA, system furniture - USA
- FloorScore, resilient floorings - USA
- CRI Green Label Plus, carpets/adhesives - USA
- Greenguard - USA
- Natureplus - Europe
- CertiPUR and CertiPUR US, PUR foam
- Several specifications in Gulf region, Japan, Korea, China, Australia

Eurofins Product Testing A/S is the world market leader for VOC emission chamber testing with more than 20 years experience in delivering reliable test results, but also in adapting any testing programme to the specific needs of each client, for optimizing the ratio of output and costs. Eurofins is ISO 17025 accredited and approved by many labels throughout the world. Combined simultaneous testing of a

product for several labels will provide you with maximum information at reduced cost. Eurofins' international recognition as a reliable test house supports the introduction of test results into several countries after the performance of just one chamber test.

All ranking systems handle each product separately. Experience shows that e.g. flooring adhesive changes its emission characteristics radically when in contact with concrete or wood and for this reason, laboratory simulation of whole systems should be seriously considered.



# VOC emission testing



*The emitted chemical vapours are sampled in adsorption tubes or in sampling bottles placed outside the chamber.*

**Emission from products is tested in stainless steel or glass chambers under controlled conditions. Both chemical and odour tests can be performed.**

The test chamber is simulating the conditions in an average Mid-European model room, as described in ISO 16000-9. A forthcoming European testing standard will modify that reference room. The chamber is flushed with clean, humidified and temperature controlled air. Outlet air passes through adsorption media in which released chemical vapours are sampled. Analyses for VOC, SVOC, formaldehyde, acetaldehyde, solvents, terpenes, glycols, amines, isocyanates, and many more are available. These test pro-

cedures are all quality accredited in accordance with ISO 17025.

Results may be re-calculated into predicted contribution to airborne concentrations in either real or model rooms, or show the decay of emissions with time. Odour thresholds may be determined in our accredited odour laboratory.

Eurofins is the leading test house offering accredited testing of pollutant emissions from all kinds of products and for various emission related labels. Each year several hundreds of carpets, resilient and hard floorings, paints, adhesives, furnishings, work stations, chairs, window frames, insulation materials, toys, textiles (to name but a few) are tested in our laboratories.

Eurofins operates a mobile emission cell "FLEC" for field measurements. We are therefore able to provide source control in buildings by testing emissions from walls, ceilings, floorings, doors, etc.

Eurofins uses Microchambers for comparative testing and for fast and inexpensive surveys, as well as for batch control testing. Eurofins uses mid-scale chambers for testing whole items of furniture, complete offices, or large machines in operation. During all testing, environmental conditions are strictly controlled for ensuring high reliability of test results.



*For a non-uniform test specimen such as a chair, Eurofins performs full object testing in large chambers.*

# Presentation of results

Having completed the emission test and the laboratory analyses, the results are evaluated by experienced chemists.

Test results are documented in a report, providing all necessary information and interpretation in a clear and comprehensible manner.

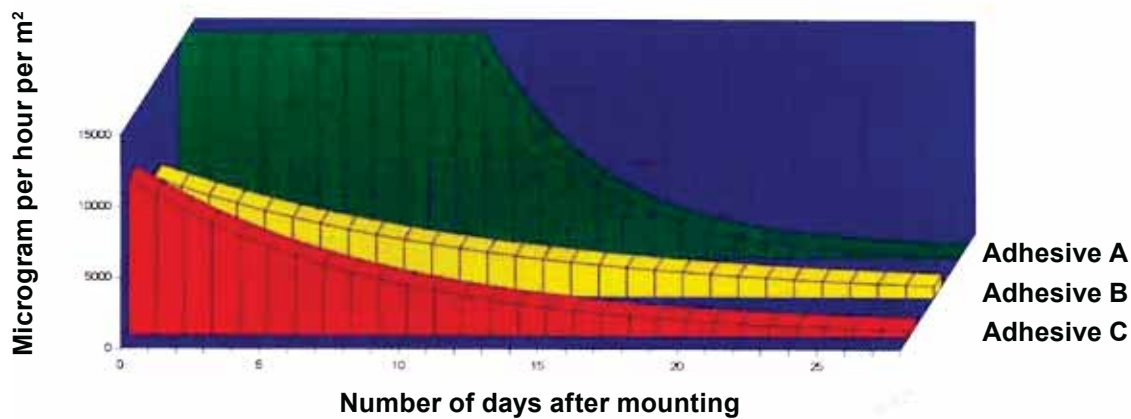
Reports can be presented in various formats and different degrees of detail. Low emission products will have a single-page attestation.

A simple test may consist of just the TVOC, reported as its toluene equivalent. More sophisticated reports may compare single VOC results with one or several limit values such as the LCI ("Lowest Concentration of interest") or

the German and the French versions - the NIK or CLI list. Similar lists are in use in the USA (CREL).

Microchamber tests are suitable for survey analyses and batch control. An emission test provides the manufacturer, supplier, and end-user with a uniform and impartial evaluation of the product's impact on the indoor air quality.

## Emission from a carpet with different adhesives



Emission test results are documented in a report showing how to read the test data. The report facilitates practical use of the results and helps you to decide which are preferred materials.

## Eurofins delivers

- Reliable emissions tests that are acknowledged by most quality labels in many different countries
- Low emissions attestation
- Indoor Air Comfort certificates and Ü mark certification services
- Simplified methods for comparative testing and batch control (Microchamber)
- Consulting on how to approach these items
- Services to clients mainly in industry but also to retailer chains, local or government authorities, and consumer organisations

### Testing laboratory:

#### Eurofins Product Testing A/S

- Smedskovvej 38, 8464 Galten, Denmark, Phone +45 7022 4276
- 2200 Rittenhouse St., Suite 150, Des Moines, IA 50321, USA Phone +1-515-362-5937

#### Contact our offices in

China (Shanghai, Shenzhen) - Denmark - France - Germany - Hong Kong - Italy - Netherlands - Thailand - UK - USA

via our common email address

[voc@eurofins.com](mailto:voc@eurofins.com)