



# The pursuit of wellness

fully biocompatible.



**FIEMME**  
3 0 0  
biocompatible wood floors



## **Green building and quality of life.**

The point of reference (point of departure) of the current evolution in the European building sector is the Directive 2002/91/EC of the European Parliament, a regulation about the energy performance of the buildings, part of the initiatives on climate change committed under the Kyoto Protocol. The Member States must apply minimum requirements as regards the energy performance of new and existing buildings, ensure the certification of their energy performance and require the regular inspection of boilers and air conditioning systems in buildings.

Evidently, the flooring isn't an as decisive factor as the features of the building envelope to influence the building performances. But it doesn't mean it is less important if you have close to your heart wellness of quality of life. To this end, FIEMME 3000 wants to play the main role in the evolution of our market by following the same tracks in the green building marked by the EU Directive - the target is to move up and encourage the laws and regulations which could specify the benchmarks for quality and healthiness of flooring and furniture. To raise the level, to go beyond the limits and to find new ones. Our Research & Development unit have closely worked on it and their efforts have been fully reflected in an important [independent research](#).





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## Indoor wellness - or discomfort.

Nowadays the market sells plentiful building and design products that, unfortunately, release chemical and potentially noxious substances that cannot be correctly set into rules as the current building regulations are meagre and shallow. Therefore, no surprise in realizing that most studies about the indoor pollution show how the air quality inside our houses is quite bad in many cases. In fact furniture, floors and building envelopes release the VOCs (Volatile Organic Compounds) - highly-volatile chemical compounds. Many of these VOCs lower the air quality and make the environments less comfortable. The so-called sick building syndrome (SBS), a well-defined combination of symptoms that takes effect after some hours spent in a specific building and, although generally it is solved after some hours or days (if the symptoms are cutaneous), after leaving the building it has a noteworthy impact both in economic and social terms. Some studies regarding offices and other public building carried out in several countries found out that the occupants had iterative ailments in the 15-50% of the cases.

The air turnover is not sufficient and the chemical compounds in the indoor air become stagnant and cause the following irritations and diseases: general discomfort, headache, nose, eye and mouth irritation, dry cough, itch, dizziness, nausea, tiredness. As said, nowadays in Italy there are no regulations regarding the indoor air quality. To help the designers to pinpoint the less harmful products, there are several frameworks of certification voluntarily (*the ARCAProtocol*, *the CasaClima guidelines with the ClimaHotelProtocol*, and *the Minergie-Eco certifications*, *Sentinel Haus* and *Bio-Safe*).

Sources: Italian Minister of Health, [www.salute.gov.it](http://www.salute.gov.it); Alpha-pinene Project, debriefing by CNR-IVALSA (National Research Council of Italy - Trees and Timber Institute).

FIEMME 3000 floors and DisegnoDilegno furniture don't pollute the air and they even enhance its features, as explained further on. In a world of conscientious producers and forward-looking administrators, the FIEMME 3000 benchmarks on healthiness should be stated as new requirements of environmental prevention, points of reference for more accurate legislator's actions.

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## SOME DATA

Even though nobody in the world carries out regular checks on the indoor pollution, where they analysed the indoor air quality the results were generally disturbing. In the United States, about the 20% of the population suffers from allergies caused by the environment and about the 75% of the urban dwellings contains allergens. In Italy, every year there are more than 150,000 illnesses connected to indoor pollutants. A study by the ISPRA (Italian Institution for the Environmental Protection and Research), carried out on a large sample in many Italian towns, discovered levels of indoor pollution much higher than the outdoor pollution: the ration between the generic quality of an indoor environment and the generic quality of an outdoor space is, in average, between 5 and 1, therefore, when we are indoor we are influenced by a number of pollutants which is five times higher than in the outdoors.

A study by the WHO shows that, in average, the 8% of the known diseases has environmental origins. Today there is a new branch in the molecular biology called "epigenetics" which studies how the environment can alter the human DNA according to where a person lives, grows up and develops.



OUTDOOR **1:5** INDOOR



According to these studies, many pathologies may be prevented by making men live in a healthy place since their conception, ergo by reducing their exposition to the pollutants, in particular during the pregnancy and throughout the first years of their life. ■

## WHAT DOES THE INDOOR AIR QUALITY DEPEND ON?

Source Bio-Safe

Why is the indoor air often unhealthy? Because it contains an excessive concentration of chemical, biological, bacterial and fungal compounds that adversely impact on our health. The indoor pollutants are numerous and have heterogeneous origin, features and effects on our health. Anyway, they can be divided into:

Chemical pollutants - Particulate - Allergenic pollutants - Heavy metals - Radioactivity



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## **CHEMICAL POLLUTANTS:**

The very large majority of these substances belong to the VOCs, molecules that vary a lot for their level of harmfulness and organoleptic impact. They easily evaporate from the building envelope or furniture surfaces and get dispersed in the air at a room temperature. As for every indoor pollutant, the environmental impact of these compounds is not only present in the air, but also in the domestic water and in the fine dust in the food sediments, furniture and furnishings.

## **PARTICULATE:**

The aerosol, commonly known as particulate material (PM), is an airborne mix of microscopic liquid and solid particles whose sedimentation speed is sufficiently low to let the indoor air streams transport them. Although the atmospheric particulate gets almost exclusively origin from outdoor environmental factors (mainly from the road dust and from the emissions derived from road traffic, industries, thermal-electrical power stations and domestic boilers), its indoor concentrations may be double than the outdoor ones.

## **ALLERGENIC POLLUTANTS:**

The polluting stress of an indoor environment is a complex mix of potential allergens, agents able to provoke specific human immune responses. They can be composed of different microorganisms (living or not living), fragments or faecal wastes, toxins and volatile compounds. The human allergens are biological contaminants secreted, produced or simply carried by carriers easily influenced by the environmental moisture like fungus, mites and, when there is stagnant water, even cockroaches or roaches that comfortably live inside the air conditioning plants, most of all inside the particulate filters, the cooling systems and condensers.

## **HEAVY METALS:**

An important indoor contaminating factor is the possible presence of heavy metals. They may represent the most damaging pollutants for the human beings, as they are able to connect themselves to the cellular structures and to gather inside the organism impeding the development of many metabolic functions. There are the potentially toxic metals that are fundamental for the living beings (iron, cobalt, chromium, copper, manganese, selenium, zinc) and the chiefly toxic and harmful ones (aluminium, arsenic, cadmium, mercury and lead. The elimination of heavy metals from our body can only be partial and occur through the salivation and transpiration.

## **RADIOACTIVITY:**

The radioactive sources can be different and belong to both artificial and natural origins. For example, all the emissions due to nuclear tests or incidents belong to the first group, along with the pollution due to the nuclear station wastes and/or due to the accidental leaks of radioactive material (Majak 1957, Chernobyl 1986, Fukushima 2011). The radioactive pollution belonging to limited places has only natural origins and can derive from the presence of radon underground, in the groundwater or in the building materials (lava rocks like tuffs, pozzolana and/or some granites).

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## From the promises to certain scientific data

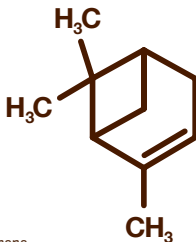
In FIEMME 3000 we are never afraid of checking and verifying our processes and products, sure about the quality of our production chain.

Anyway, some years ago we decided to remove all doubt. We asked the biggest Italian research institute on trees and timber, the CRN-IVALSA (The National Research Council of Italy - Trees and Timber Institute), to inspect in the deepest and impartial way possible our wood floors from the raw material to the surface treatments to the final product, also comparing them with other brands that declare themselves “fully natural”.

After 18 months (from July 2015 to December 2016), the outcomes were outstanding: only FIEMME 3000 are really good for our health. Now the evidences are undisputable: the scientific data declare their unconditional healthiness. Any material releases the VOCs (Volatile Organic Compounds) that can be harmful, inert or healthy..

The research pointed out that our woods release only natural and favourable VOCs, the alpha-pinene in particular. It is the most common terpene in nature, contained in pine needles, conifers, orange peel, rosemary, basil, dill and parsley, giving them their typical “pine” scent. It has anti-inflammatory, antibiotic and bronchodilatory properties, it is usually used to produce balsamic candies and fumigations to give relief to diseases like the asthma.

In a location finished with a FIEMME 3000 floor and DisegnoDilegno furniture not only you do not breathe noxious substances, but the living and healthy wood also releases “balsamic” wellness.



The alpha-pinene molecules



The National Research Council of Italy - Trees and Timber Institute, born in 2002, is the biggest Italian research institute on Trees and Timber. With a staff composed of about 80 people - in the offices of Florence, Trento, Grosseto and Catania - Ivalsa is a place of scientific and technical confrontation, the natural benchmark for the world of wood and wood-workers, wood-researchers, wood-designers and wood-entrepreneurs.



Name of research:

Alpha-pinene project: innovation of wood flooring production process for the maximization of the healthiness and the housing wellness.

**Scientific research by CRN-IVALSA**

**Researcher: Marco Fellin**

**Manager of reference: Martino Negri**

**Managers of reference for D.k.z.:**

**Marco Felicetti and Vittorio Monsorno**

The research project, after an initial analysis of the industrial process of the wood flooring manufacturing, the samples of floors and finishing products (oils, colours), went on with a deep bibliographic research on the regulatory and legislative levels governing the emission of volatile organic substances and on the positive and negative effects of the VOCs on the men's health.

The scientific core of the project are the analysis carried out on the finished products, inside the workplaces and their statistical evaluation. The analysis of the VOCs were carried out through to the gas-liquid chromatography (solid-phase micro extraction); the analysis of the heavy metals were carried out in X-ray fluorescence; to analyse the VOC emissions inside FIEMME 3000's production locations, they used a photoionization equipment.



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## The outcomes

- 1.** In no FIEMME 3000 floor they found out traces of heavy metals.
- 2.** In no FIEMME 3000 they found out radioactivity, just the ordinary radioactivity present in the wood in compliance with the harmless thresholds.
- 3.** No FIEMME 3000 floor contains or release oil-derivating substances.
- 4.** No FIEMME 3000 product releases harmful VOCs nor contains substances listed in the Red Lists of the various government bodies nor in other lists describing noxious substances.
- 5.** The VOCs released by FIEMME 3000 floors are the typical VOCs of plants and vegetables, that can commonly be detected in unpolluted forests.
- 6.** FIEMME 3000 floors release some VOCs that can be detected in some balsamic drugs used for the personal care, like the alpha-pinene.
- 7.** Along with the floor, also the floating laying system that FIEMME 3000 fosters can guarantee that no harmful substances will be release (any kind of glues do contain them).

***The same outcomes can be referred to DisegnoDilegno furniture, as it is made by assembling Flemme 3000 floor planks.***





## **INTERVIEW TO THE DESIGNER AND ENERGY COUNSELLOR LEOPOLDO BUSA, CHIEF OF BIOSAFE.**

***Architect, what is your opinion about the outcomes of the “Alpha-pinene project” carried out by CNR-IVALSA?***

We analysed the “Alpha-pinene project” by CNR-IVALSA with pleasure. It considered the content of VOCs of some wood species, examined both in their natural context and when treated with different products of saturation. This research represents the main technical-scientific document that convinced Bio-Safe® to validate all FIEMME 3000 products. Thanks to this research we could poke the nose in a real case, able to orient ourselves towards the new frontier of the environmental (and/or) product certifications bound to the indoor air quality.

***Explain yourself better.***

In Bio-Safe® we think we cannot carry on any certification path by following the only parameter about the low emissivity or light presence of VOCs. Instead, we believe it is important to mark the difference between the best environmental contexts and the most efficient low-emission products. A certification of quality like ours must reward all the entities able to distinguish themselves and propose new products and new knowledges that can positively influence the development of the certifying procedure. Among all the VOCs, for us it is essential to analyse, point out and give value to the qualitatively life-fostering ones by orienting the certifying steps towards an inclusive, complete and thorough model. This model must be correctly tared on a more and more complex organization.

***Hence, is it important to recognize the harmful VOCs and the potentially healthy ones?***

Of course. We need a certification able to divide the “good” compounds from the “bad” ones, to get the consumer to make his choices with more awareness. Up to now, he could only indiscriminately choose to avoid all the potentially detectable compounds. FIEMME 3000 wood and the CNR-IVALSA research show it is time to recognize the value of a new generation of products with positive homeopathic features, able to actively contribute to the men’s health.

FULLY BIOCOMPATIBLE. ALL LIFE LONG.

<sup>1</sup>National Research Council of Italy - "Trees and Timber" Institut

Plus<sup>1</sup> | Ph. Silvio Golia



IN LIFE, HEALTH COUNTS. PROTECT IT EVERY DAY IN EVERY CHOICE YOU MAKE

The quality of your life depends on the quality of the spaces you live, grow up and work in. Choose the natural wood of Fiemme 3000 floors and DisegnoDilegno furniture. It is fully scientific wellness. After a two-year research the CNR-IVALSA<sup>1</sup>, the greatest Italian Research Institute for Trees and Timber, declared that our woods release healthy VOCs - Volatile Organic Compounds - exclusively, like the alpha-pinene. Hence, they do not release harmful emissions but spread "balsamic" wellness. Healthy, wonderful, resistant, easy to be cleaned and maintained over the years.

**Fiemme 3000. The quality of your life begins at home**

[www.fiemme3000.it](http://www.fiemme3000.it)



**FIEMME**  
3 0 0 0  
biocompatible wood floors

**DISEGNO  
DILEGNO**  
biocompatible furniture