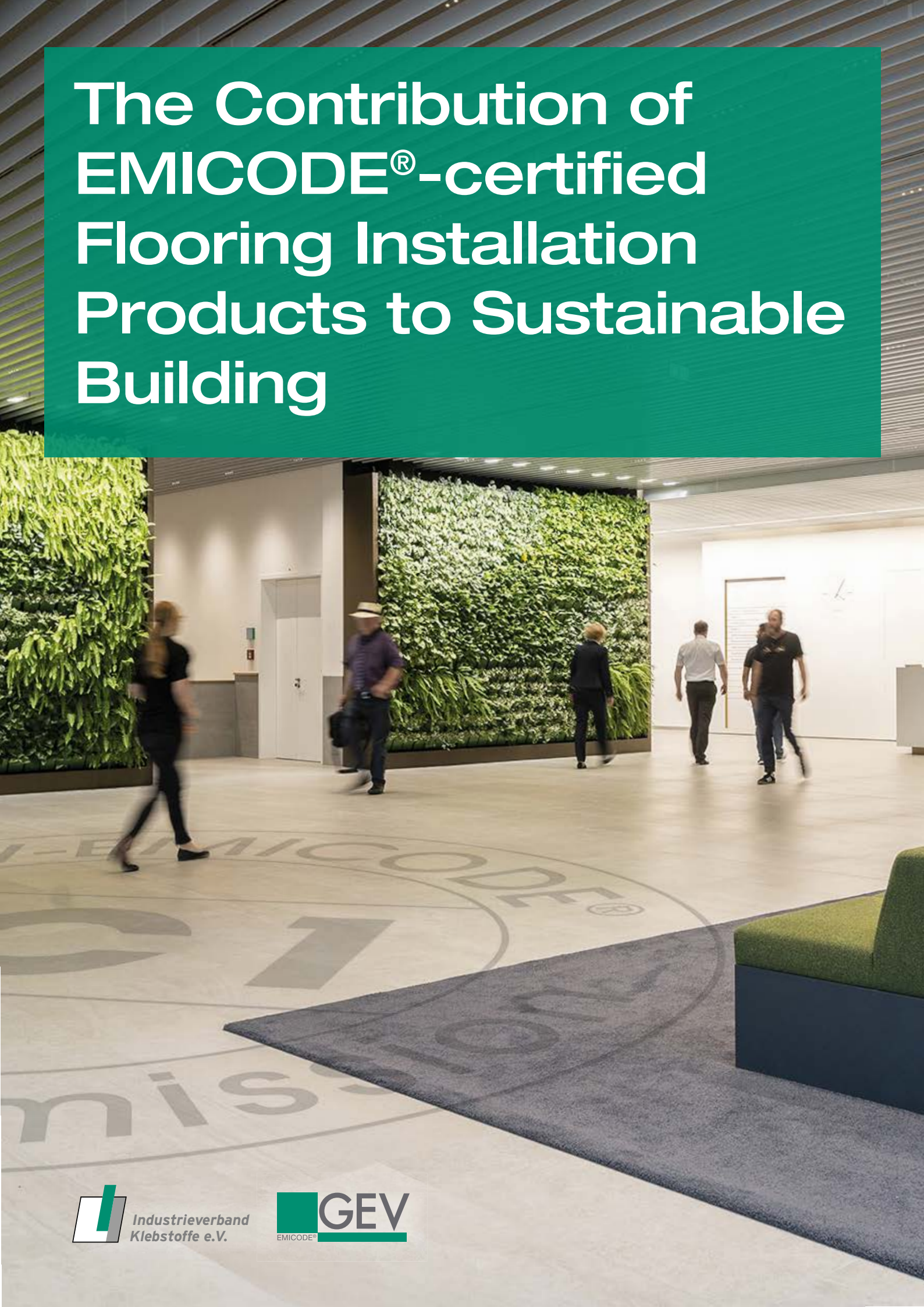
The Contribution of EMICODE®-certified Flooring Installation Products to Sustainable Building



Industrieverband Klebstoffe e.V.

GEV EMICODE®

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  DGNB – Deutsch Gesellschaft für nachhaltiges Bauen/German Sustainable Building Council
  QNG – Qualitätssiegel Nachhaltiges Gebäude/Quality Seal Sustainable Building
  LEED – Leadership in Energy and Environmental Design
  BREEAM – Building Research Establishment Environmental Assessment Method

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Introduction

For a long time now, the impact of human activity on the environment and on our natural resources has been the subject of scientific and social debate. There is broad consensus that the current patterns of consumption and production are not sustainable and exceed the ecological limits of planet Earth. They endanger, in particular, the livelihoods of future generations. These destructive tendencies are countered by sustainable activities that look to the future, are designed for durability, and whose footprint causes less damage to the earth and its inhabitants. As a result, they are better suited to preserve the livelihoods of future generations.

These destructive tendencies are countered by sustainable activities that look to the future, are designed for durability, and whose footprint causes less damage to the earth and its inhabitants. As a result, they are better suited to preserve the livelihoods of future generations.This discussion has also reached the building industry. Everyone involved in construction must ask themselves how sustainable their activities and products are.

The original goal of the GEV association and its EMICODE® label, launched more than 28 years ago, was to provide consumers with reliable guidance concerning emissions from flooring installation products. This goal is essential in the interest of sustainability. It does, however, not cover all aspects of sustainability. As a matter of fact, EMICODE®-certified installation products make other important contributions to the sustainability of buildings over and above the aforementioned emissions.

Sustainability today: The three dimensions of sustainability

Sustainable building means minimizing the negative impact of buildings on the environment, the society and the economy over their entire life cycle. The "Guideline for Sustainable Building", published by the BMI[1] in 2019, states:

"The overarching concept of a policy of sustainable and future-enabled development – based on the three dimensions of sustainability ecology, economy and socio-culture – is the starting point for developing principles and assessment criteria for sustainable building. This concept simultaneously addresses ecological, economic and socio-cultural requirements as equally important aspects and includes future generations in the analysis."

ECOLOGY

The primary goals of this dimension are the protection of natural resources, the reduction of emissions and waste and the minimization of energy and water consumption.

SOCIETY

This dimension refers to the needs and expectations of users and society such as comfort, safety, health, accessibility, integration, participation and cultural diversity.

ECONOMY

This dimension looks at the long-term economic viability of buildings. The follow-up costs of a building can exceed the erection costs several times over. The focus therefore is on building-related life cycle costs, economic efficiency and value stability.

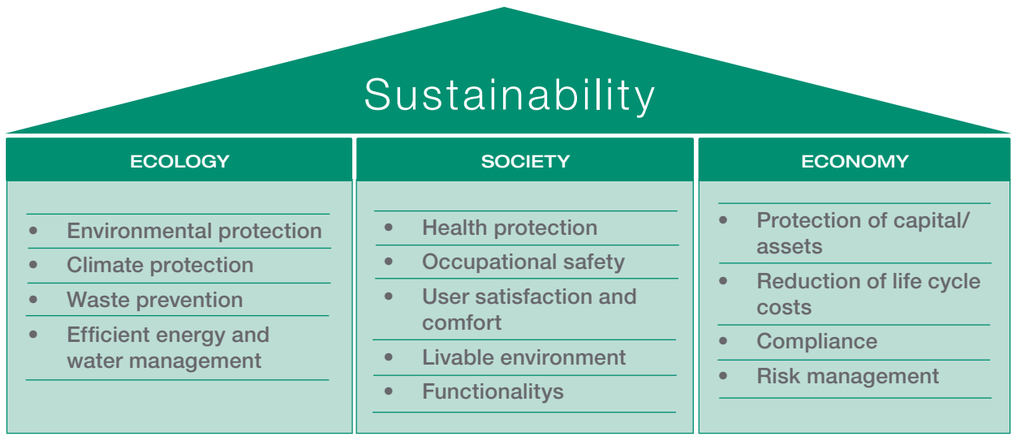


Figure 1: Goals of sustainable construction

[1] Leitfaden "Nachhaltiges Bauen"; German Federal Ministry of the Interior, Building and Community (2019)

The life cycle of a building

Sustainable construction requires a holistic view of a building's entire life cycle. All relevant stakeholders should be involved to establish the necessary balance between the three dimensions of sustainability.

The life cycle of a building covers all phases – from the planning and construction of the building to the use and later demolition, disposal or recycling of the building materials. Each phase generates certain environmental impacts, costs and benefits that need to be considered in a sustainable approach. In a simplified view, the life cycle of a building can be divided into four main phases:

The planning or design phase, in which architecture, functionality, energy efficiency and choice of materials are determined.
The construction phase, in which the building materials are manufactured, transported and installed, after which the building is put into operation.
The use phase, in which the building is inhabited, managed, maintained and, if necessary, refurbished or modernized.
The end-of-life phase, in which the building is demolished or partially dismantled and where the building materials are disposed of or recycled.

Figure 2: Simplified illustration of a building's life cycle

The life cycle of a building is an essential aspect of sustainable construction as it shows the entire ecological, economic and socio-cultural impacts of a building and identifies potentials for optimization.

The impact of installation materials over the entire life cycle

EN 15804 is a European standard that lays down the basic rules for creating environmental product declarations (EPDs) for building products and construction works. EPDs are an important tool for communicating the life cycle assessment results of products in the building industry and support the assessment of sustainable buildings. The standard defines the parameters to be declared, the phases of a product's life cycle to be included, and the rules for developing scenarios.

For this purpose, FEICA – the umbrella association of European adhesive and sealant manufacturers – has developed so-called "model EPDs" based on worst-case scenarios for a large number of flooring installation materials, adhesives and sealants.

PARAMETER	IMPACT OF INSTALLATION PRODUCTS	FEICA MODEL EPD
PRODUCTION PHASE		
A1 Raw material provision	■	●
A2 Transport to manufacturer	■	●
A3 Manufacture of the construction product	■	●
CONSTRUCTION PHASE		
A4 Transport to the building site	■	●
A5 Installation into the building	■	●
USE PHASE		
B1 Use	●	■
B3 Maintenance	●	■
B3 Repair	●	■
B4 Replacement	●	■
B5 Refurbishment	●	■
B6 Operational use of energy	●	■
B7 Operational use of water	■	■
END-OF-LIFE PHASE		
C1 Deconstruction/demolition	●	●
C2 Transport to waste processing facilities	●	●
C3 Waste processing	●	●
C4 Waste disposal	●	■
OUTSIDE THE SYSTEM BOUNDARIES		
D Reuse, recycling	●	●

Tabel 1 shows for which life cycle phase a FEICA model EPD (based on EN 15804) provides data for flooring installation products, and in which phases an installation product influences the sustainability of a building. ● = yes / ■ = no

What requirements are placed on flooring installation products by green building certification systems?

In the following, four nationally and internationally used green building certification systems are presented as examples, together with the requirements that flooring installation products need to fulfill according to these systems.

Deutsche Gesellschaft für nachhaltiges Bauen (DGNB) German Sustainable Building Council

The DGNB requirements for flooring installation products are part of the DGNB's criteria set "ecological quality" for the construction of new buildings. They apply to the emission properties of primers, undercoats, fillers, adhesives, barrier coats, screed resins and sealants used under floor coverings. The installation products must carry a recognized product label such as the EMICODE® in order to achieve the highest quality level in the DGNB system. This is meant to ensure the health and comfort of users as well as the conservation of resources.

Qualitätssiegel Nachhaltiges Gebäude (QNG) Quality Seal Sustainable Building

The Quality Seal Sustainable Building (QNG) is a state seal granted by the German Federal Ministry for Housing, Urban Development and Building. The seal is an award for buildings that meet high requirements with respect to environmental, health and social compatibility. One of the QNG criteria is the use of low-emission and pollutant-free flooring adhesives. These adhesives are expected to ensure better indoor air quality compared to other standard products, thus protecting the health of users and facilitating the disposal of floor coverings. To obtain the QNG seal, flooring adhesives must fulfill the following requirements:

- They must carry the EMICODE® EC 1 or EC 1PLUS label, which certifies very low emissions of volatile organic compounds (VOCs).
- They must be free of organohalogen compounds, formaldehyde, plasticizers and solvents.
- They must have high adhesive strength and good workability.
- They must be compatible with the most common floor coverings such as carpet, linoleum, PVC or parquet.

The use of flooring adhesives which meet these criteria contributes to a sustainable building that protects the environment and increases the comfort and well-being of its residents. The QNG is also a prerequisite for receiving federal funding for sustainable buildings under the Federal Subsidy for Efficient Buildings (BEG = Bundesförderung für effiziente Gebäude).

Leadership in Energy and Environmental Design (LEED)

LEED is an internationally recognized rating system for sustainable buildings developed by the U.S. Green Building Council. It evaluates the environmental performance of buildings in various categories such as energy efficiency, materials and resources, indoor air quality and site selection. For flooring adhesives, the criteria "low emissions" and "non-hazardous ingredients" are most important. These are evaluated in the category "Indoor environmental quality" under the credit "low-emitting materials". To meet the requirements of this credit, flooring adhesives must observe predefined limits for individual VOCs and for emissions as a whole. In addition, they must comply with the ingredient declarations according to recognized standards such as the EMICODE®.

Building Research Establishment Environmental Assessment Method (BREEAM)

BREEAM is a globally recognized certification system for sustainable building. It was developed in 1990 by the Building Research Establishment (BRE) in the UK and has since then been continuously refined and adapted to local conditions. One of BREEAM‘s assessment criteria is the choice of flooring adhesives that are not harmful to the environment or the health of users. To fulfil this requirement, flooring adhesives must observe certain limits concerning the content of volatile organic compounds (VOCs), formaldehyde and other pollutants. They must also have high bond strength and good resistance to moisture and temperature fluctuations. Flooring adhesives that meet these requirements contribute to better indoor air quality and lower energy consumption..

What all systems have in common is that they postulate low emissions of volatile organic compounds (VOCs) and the absence of substances of very high concern (SVHCs). They recognize the EMICODE® seal as evidence of compliance with these criteria. In addition to indoor air quality, QNG and BREEAM also consider the durability of the floor construction and therefore demand high bond strength between the adhesive and the floor covering.

EMICODE® and sustainable building

What is the EMICODE®?

The EMICODE® is an ecolabel for the classification of low-emission flooring installation materials and building products such as fillers, adhesives or parquet varnishes. It has been awarded since 1997 by the GEV (Gemeinschaft Emissionskontrollierte Verlegewerkstoffe, Klebstoffe und Bauprodukte e.V.) to products that undergo strict quality controls and regular unannounced spot checks. The EMICODE® label provides reliable guidance for planners, consumers and craftsmen who attach importance to healthy indoor air and environmentally friendly building materials. The EMICODE® classification system divides the products into three categories: EC 1PLUS (very low emissions plus), EC 1 (very low emissions) and EC 2 (low emissions).

Requirements to be met by EMICODE®-certified products?

Concerning VOC emissions, EMICODE®-certified products must observe the following maximum values:

	GEV-EMICODE EC 1 PLUS very low emission	GEV-EMICODE EC 1 very low emission	GEV-EMICODE EC 2 low emission
After 3 days TVOC [µg/m³]	≤ 750	≤ 1000	≤ 3000
After 28 days TVOC/TSVOC [µg/m³]	≤ 60 / ≤ 40	≤ 100 / ≤ 50	≤ 300 / ≤ 100

EMICODE®-certified products are products that meet high requirements for low emissions. In addition, stringent substance restrictions have been set by the EMICODE®, e.g. based on the European Chemicals Regulation REACH (so-called "candidate list") and others that go beyond. They all help improve indoor air quality and protect the health of residents.

The contribution of EMICODE®-certified flooring installation products to sustainable building

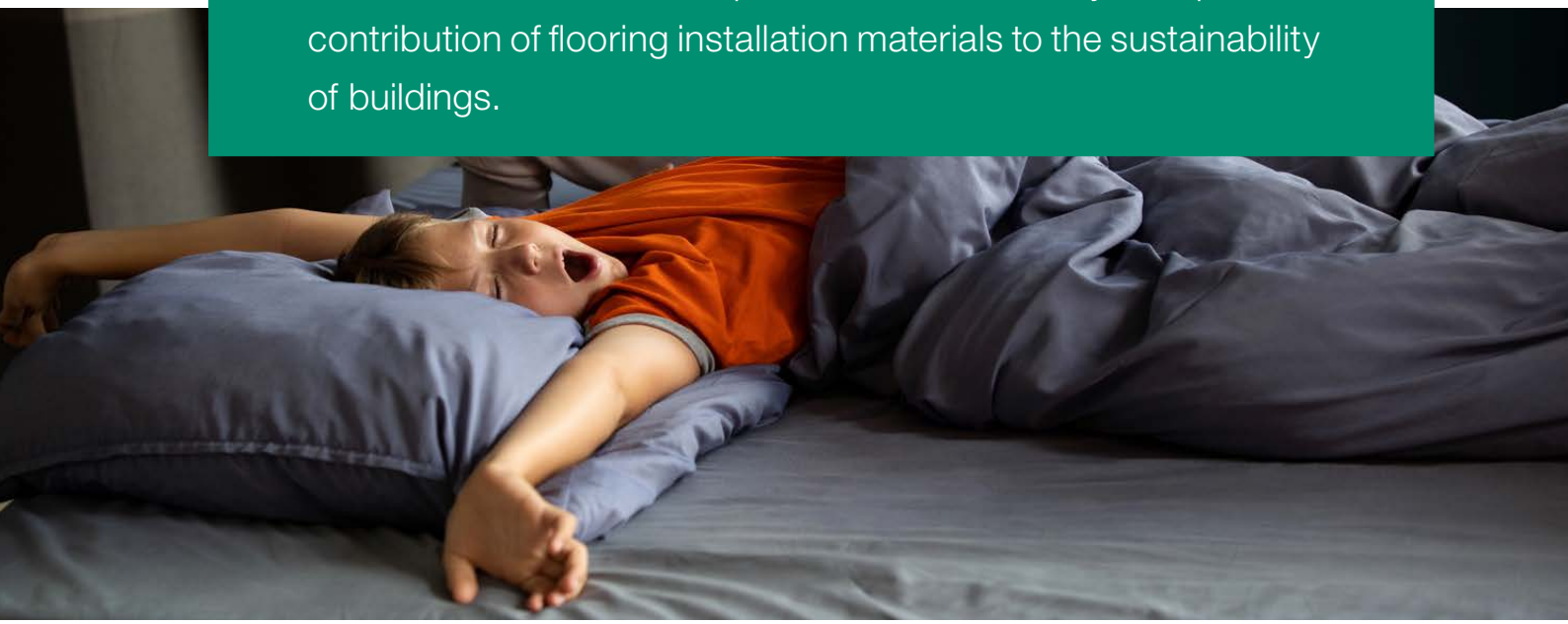
Sustainability means "meeting the needs of the present without compromising the ability of future generations to meet their own needs". EMICODE®-certified products make a positive contribution to all three dimensions of sustainability:

Ecology: EMICODE®-certified products reduce the emission of volatile organic compounds (VOCs), which are conducive to the formation of ozone. They thus support the goals of the European Green Deal and contribute to climate-friendly construction.

Society: EMICODE®-certified products promote the well-being and consequently the performance of room users. They help avoid health risks arising from pollutants in indoor air and ensure a pleasant indoor climate. They extend the service life of buildings and thus increase their attractiveness and value.

Economy: EMICODE®-certified products stand for transparency and trust, because the EMICODE® license is based on independent testing and strict quality management. Products that have been awarded the EMICODE® seal meet the requirements of national and international standards and certification systems for sustainability.

To conclude, EMICODE®-certified products make a positive contribution to sustainability at every stage of a building‘s life cycle. The EMICODE® label is a transparent and helpful tool that documents in a simple and verifiable way the positive contribution of flooring installation materials to the sustainability of buildings.



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