Glossary

Air barrier: A material that is applied in conjunction with a building component (such as a wall, ceiling, or sill plate) to prevent the movement of air through that component.

Air tightness: A building's ability to prevent uncontrolled air leakage through gaps, cracks or joints. It is a measure of how much air leaks in or out of a building, impacting energy efficiency, indoor air quality, and thermal comfort.

Blowing agent: Usually contained in the polyol blend, it causes the foam to expand upon the reaction between the polyol blend and MDI. The blowing agent can be physical or reactive in nature. The physical blowing agents (e.g., liquid fluorocarbon) vaporise with the heat of the polyurethane reaction. The reactive blowing agents (e.g., water) react with MDI to produce CO_2 – carbon dioxide during the reaction.

Building envelope: The exterior shell of the building, which provides structural integrity and control of heat, air, and moisture.

Closed-cell SPF: A type of SPF expanded with physical or reactive blowing agents to yield a rigid cellular structure. It is characterised by a predominance of closed cells (≥ 90%) and a density between 35-60 kg/m^3.

(For more information, see PU Europe Factsheet on *Differences between closed-cell and open-cell spray polyurethane PU foam*)

Compression strength: The stress or force applied parallel to the direction of the polyurethane foam rise at 10% deformation or at yield point.

Diisocyanates: Are a family of versatile chemical building blocks, having two reactive isocyanate (-NCO) groups and are used to make a wide range of polyurethane products i.e. rigid and flexible foams, coatings, adhesives, sealants, and elastomers. The most widely used aromatic diisocyanates are toluene diisocyanate (TDI) and methylene diphenyl diisocyanate (MDI).

(For more information, see the What are diisocyanates? section on the website www.isopa.org)

Energy efficiency: Greater energy efficiency means that it is easier to maintain a comfortable internal temperature, regardless of the weather conditions outside. This in turn leads to lower fuel consumption, lower bills for the consumer and fewer carbon emissions to damage the environment. Insulation is one of the simplest and most cost-effective ways to improve the energy efficiency of buildings, whether they are old or new.

(For more information, see the Increasing Energy Efficiency section on the website www.excellence-in-insulation.eu)

EPD – Environmental Product Declaration: A declaration containing quantified information about a given set of environmental impacts based on a life-cycle analysis.

(For more information, see the Environmental Product Declaration section on the website www.excellence-in-insulation.eu)

GHG – Greenhouse gases: A category of gases that absorb heat energy emitted from the planet's surface and they remain in Earth's atmosphere for a long time (from decades to centuries). By adding more GHGs, like CO_2 – carbon dioxide and methane – to the atmosphere, humans are causing average global temperature to rise at an unprecedented rate.

(For more information, see Greenhouse gas emissions by country and sector)

HFOs – **Hydrofluoroolefins:** Are mainly used as refrigerants, blowing agents, propellants and solvents. HFOs have zero ODP (Ozone Depletion Potential) and a very low GWP (Global Warming Potential).

LCA – Life Cycle Assessment: An Environmental Management tool which considers the environmental impacts of a product over its entire life cycle.

(For more information, see European Platform on LCA | EPLCA)

LEED – Leadership in Energy and Environmental Design: A green building rating system, developed by the United States Green Building Council (USGBC), that provides a suite of standards for environmentally sustainable construction. Energy efficiency, through proper application of insulation and air sealing technologies, plays an important role in the LEED evaluation process.

(For more information, see LEED rating system | U.S. Green Building Council)

Open-cell SPF: A type of SPF expanded with reactive blowing agents to yield a semi-rigid cellular structure. It is characterised by a low content of closed cells < 20% and a density between 8-15 kg/m^3.

(For more information, see PU Europe Factsheet on *Differences between closed-cell and open-cell spray polyurethane PU foam*)

Polymeric MDI, or pMDI: A liquid mixture containing monomeric MDI isomers and higher-molecular-weight oligomers, offering versatile reactivity for industrial applications, mainly used for producing rigid polyurethane foams.

Polyol: A high-weight molecule that contains hydroxyl groups (-OH). Polyol is a primary ingredient in the polyol blend.

Polyol blend: A mixture of one or more base polyols and additional ingredients (e.g., catalysts, surfactants, blowing agents and flame retardants).

PPE – Personal Protective Equipment: Includes all protective equipment and supplies designed to protect employees from serious workplace injuries or illnesses resulting from contact with chemical, radiological, physical, electrical, mechanical, or other workplace hazards. Besides face shields, safety glasses, hard hats, and safety shoes, PPE includes a variety of devices and garments, such as goggles, coveralls, gloves, vests, earplugs, and respirators.

(For more information, see the Personal Protective Equipment (PPE) section on the website https://www.spraypolyurethane.org)

PU – Polyurethane: A generic term, which covers a wide range of different formulations and applications derived from a reaction of diisocyanate/polymeric MDI with polyols.

Polyurethane insulation refers to a group of insulation materials based on PUR (polyurethane) or PIR (polyisocyanurate). The closed cell structure and high crosslinking density of PUR and PIR gives it the characteristics of good heat stability, high compressive strength and excellent insulation properties.

(For more information, see the What is polyurethane? section on the website www.excellence-in-insulation.eu)

REACH – Registration, Evaluation & Authorisation of Chemicals: An EU regulation, adopted to improve the protection of human health and the environment from the risks that can be posed by chemicals.

(For more information, see Understanding REACH - ECHA)

REACH restriction on diisocyanates: To ensure that workers across the EU can continue to handle diisocyanates safely, new training requirements are mandatory for professional and industrial users under the EU's REACH Regulation from 24 August 2023. The aim is to reduce the number of occupational asthma cases suspected to be caused by diisocyanates by ensuring that all diisocyanates users are informed and trained about potential hazards and how to handle products safely, taking into account the specific exposure prevention aspects.

(For more information, see Mandatory training section on the website www.isopa.org)

Respiratory sensitiser: A substance which, when inhaled, can trigger an irreversible allergic reaction in the respiratory system. Once this sensitisation reaction has taken place, further exposure to the substance, even to the tiniest trace, may produce symptoms. Breathing in the substances may irritate and cause damage to the nose, throat and lungs.

R-value: See Thermal resistance.

SDGs – Sustainable Development Goals: Adopted by all United Nations Member States in 2015, provides a shared blueprint for peace and prosperity for people and the planet, now and into the future.

(For more information, see THE 17 GOALS | Sustainable Development)

SDS – Safety Data Sheet: Provide users of chemicals with the necessary information to help them protect human health and the environment. A SDS contains important information about the properties of the substance or mixture, its hazards and instructions for safe handling, disposal and transport and also first-aid, fire-fighting and exposure control measures.

(For more information, see Extended safety data sheets - ECHA)

SPF – Spray PU foam: A highly effective and widely used insulation and air sealant material, used in renovation and new buildings.

Thermal barrier: A material or layer that prevents the passage of heat, often required to cover spray foam in occupied spaces to enhance fire safety.

Vapor barrier: A membrane, coating, or other material that has very low water vapor transmission rates. It's a component within a building assembly used to limit the transmission of water vapor by diffusion.

Thermal bridging: A thermal bridge is a localized area in a building's structure where heat transfer is significantly higher than in surrounding insulation materials.

(For more information, see Thermal bridging in buildings - Designing Buildings)

Thermal conductivity (λ): Represents the heat flow going through a material when there is a temperature difference between the two sides of that material. The lower the thermal conductivity of a material, the better the thermal performance.

Thermal resistance (R): A measure of how effectively a material or system resists the flow of heat. The higher the R-value, the more thermal resistance the material has and therefore the better its insulating properties.