

DOES SOLVENT-FREE ALSO MEAN FREE FROM SOLVENTS? (S05)

To answer this question, the first step is to define the term "solvent". In the case of chemical products for flooring technology, solvents are usually defined by their boiling point. The two most important Technical Rules for Hazardous Substances (German: TRGS) are TRGS 610 "Substitutes and substitution procedures for solvent-based primers and adhesives for flooring" and TRGS 617 "Substitutes for solvent-based surface treatment products for parquet and other wooden flooring".

- TRGS 610: Boiling point $\leq 200^{\circ}\text{C}$ (at $T=20^{\circ}\text{C}$ and $p=1013\text{ hPa}$), possible solvent content due to technical impurities: $\leq 0.5\%$.
- TRGS 617: Boiling point $\leq 250^{\circ}\text{C}$ (at $T=20^{\circ}\text{C}$ and $p=1013\text{ hPa}$), possible solvent content due to technical impurities: $\leq 0.1\%$.

Definition of solvents by use or property:

- Definition according to the Decopaint Directive (Directive 2004/42/EC) :
"Organic solvent" means a VOC used alone or in combination with other substances to dissolve or dilute raw materials, products, or waste materials, as a cleaning agent to dissolve contaminants, as a dispersant, as an agent to regulate viscosity or surface tension, or as a plasticiser or preservative.
- The Association for the Control of Emissions in Flooring Installation Products, Adhesives and Building Materials (German: GEV "Gemeinschaft Emissionskontrollierte Verlegewerkstoffe, Klebstoffe und Bauprodukte e.V." -Classification Criteria – for flooring installation products, adhesives and building materials:
Solvents are volatile organic compounds and their mixtures with a boiling point $\leq 200^{\circ}\text{C}$, which are liquid under normal conditions (20°C and 1013 hPa) and are used to dissolve or dilute other substances without altering them chemically. Emission-controlled products are manufactured without the addition of solvents. Solvent-free products may contain a minimum amount of solvent ($< 0.5\%$ by weight) which may result from impurities in the raw materials used.

Definition of VOC:

Strictly speaking, a differentiation must be made between solvent-free and VOC-free, with many substances matching the definitions of both terms. There are also different definitions for VOCs (volatile organic compounds), such as:

- Decopaint Directive (Directive 2004/42/EC):
VOCs are organic compounds with an initial boiling point not exceeding 250°C at a standard pressure of 101.3 kPa (1013 hPa)
- DIN/EN 16516:
VOCs (very volatile organic compounds) are volatile organic compounds which elute from n-hexane on a gas chromatography column at a certain level.
VOCs are volatile organic compounds which elute from a gas chromatography column at a certain level between n-hexane and n-hexadecane inclusive.
SVOCs (semi volatile organic compounds) elute from a gas chromatography column at a certain level between n-hexadecane (excluded) and n-docosane (included).
- GEV Classification Criteria:
VOCs are organic substances measured before n-hexane ($< n\text{-C}_6$) according to the analytical conditions specified in the GEV test method.
VOCs are organic substances measured in the range n-hexane ($n\text{-C}_6$) to n-hexadecane ($n\text{-C}_{16}$) according to the analytical conditions specified in the GEV test method in the range.
SVOCs are organic substances which are measured according to the analytical conditions specified in the GEV test method for n-hexadecane ($> n\text{-C}_6$) and up to n-docosane ($n\text{-C}_{22}$).
- Switzerland: Steering Tax on Volatile Organic Compounds:
Organic compounds with a vapour pressure of at least 0.1 mbar at 20°C or with a boiling point of at most 240°C at 1013.25 mbar (hPa).

TECHNICAL INFORMATION

- WHO Classification:

VVOC: Gas Chromatography Retention Range: <C6 (n-hexane) – boiling point: 50-100°C (at p=1013 hPa)

VOC: Gas Chromatography Retention Range: C7 (n-heptane) to C16 (n-hexadecane) – boiling point: 60-260°C (at p=1013 hPa)

SVOC: Gas Chromatography Retention Range: C16 (n-hexadecane) to D22 (n-docosane) – boiling point: 260-400°C (at p=1013 hPa)

Does the solvent-free product property also mean free of solvents?

The question of whether a product is solvent-free or free of solvents cannot be answered in general, as the answer depends on the necessary definition of "solvent".

In the field of flooring technology, the classification "solvent-free according to TRGS 610" or Emission (EC1^{plus} or EC1 or EC2) is most useful for primers, fillers and adhesives. Solvent-free products in these product groups can therefore still contain up to 0.5% solvent (boiling point <=200°C) as technical impurities.

TRGS 617 is relevant for surface treatment products for parquet flooring. Products which are "solvent-free according to TRGS 617" can therefore still contain up to 0.1% solvent (boiling point <= 250°C).

Solvent-free is particularly relevant from the point of view of occupational safety, as the rapid release of highly volatile substances during processing is to be reduced or avoided.

Products marked with GEV-Emission serve in particular as an additional consumer protection measure, as the emission of semi-volatile organic compounds (SVOCs) released indoors over a number of months is also taken into account.

The above information reflects the current state of development. It is to be regarded as non-binding insofar as we have no influence on the installation, and the conditions for installation are different depending on location. Claims based on this information are therefore excluded. The same applies to the commercial and technical consulting service provided free of charge and without obligation. We therefore recommend that you carry out sufficient tests of your own and determine for yourself whether the product is suitable for the intended purpose. 01072020