

REFURBISHING WOOD FLOORING CONTAMINATED WITH PAHS (SO 3)

WHAT ARE PAHS?

PAH = Polycyclic aromatic hydrocarbons

PAH is a collective term for several hundred chemically related compounds. Chemically, these are aromatic hydrocarbons whose structure consists of several condensed (clustered together and chemically connected) rings (therefore polycyclic). PAHs are solids or very hardly volatile compounds which are almost insoluble in water but soluble in aromatic hydrocarbons.

ORIGIN AND DISTRIBUTION OF PAHS

PAHs are formed when hydrocarbon compounds are heated or burned in the absence of oxygen. Examples:

- ✓ In coal refining (coking)
- ✓ In combustion processes for generating energy:
Automotive engines (in particular diesel vehicles), large combustion plants, heating systems
- ✓ For domestic combustion processes:
Candles, grilling sausages or fish, open fireplace

PAHs can be found in various technical products, such as: mineral oil, bitumen, pitch, tar, etc. PAHs are distributed to various places in the environment. For example: the fly ash and the exhaust gases produced during combustion processes are released into the atmosphere, so that the PAHs are subsequently distributed to soils, water and plants. PAHs are a cause of soil pollution at the site of refineries and coking plants.

PAHS IN PARQUET ADHESIVES

From the beginning of the 20th century until the Second World War, parquet was glued in hot asphalt based on bitumen or coal tar pitch. Installation of heavy-duty industrial-use wood block

flooring according to DIN 68 701 in bitumen/carbon tar pitch hot adhesive was still carried out right up to the 1990s.

Parallel to this use of hot adhesives, bitumen or tar pitch solutions were also used for parquet bonding. These "cold spreadable, dissolved, black" adhesives were used for bonding mosaic parquet until the beginning of the nineteen-sixties, for bonding strip parquet until the end of the sixties and occasionally until the late seventies.

PROPERTIES OF PAHS

Benz[a]pyrene was selected as the lead substance for PAHs. The following information is available on benz[a]pyrene:

- ✓ According to the maximum workplace concentration (MAK) list III A2, benz[a]pyrene is clearly classified as carcinogenic in animal experiments.
- ✓ According to the Technical Rules for Hazardous Substances (TRGS) 905, benz[a]pyrene is carcinogenic in humans, mutagenic, impairs fertility and is harmful to the unborn child.
- ✓ MAK value: 0.002 mg/m³ (based on total dust)
- ✓ PAHs are mainly inhaled as particles, bound to house dust, inhaled via the respiratory tract, and to a lesser extent as gases. They can also be absorbed in noticeable amounts through the skin.

EVALUATION OF PAH LEVELS IN PARQUET ADHESIVES

On 29.04.1998, the Federal Environment Agency defined limits for evaluating PAH levels and the measures to be taken.

Measures	Benz[a]pyrene level [mg/kg]		
	Wood flooring adhesive	House dust	Indoor air
not necessary	<10	no measurement necessary	no measurement necessary
Case-by-case decision, if necessary medium-term measures	10-3000	<10	no measurement necessary
short-term measures	10-3000	>10	no measurement necessary
	>3000	<10	twice as high as outdoor air concentration, but at least 3 ng/m ³ higher

TECHNICAL DATA SHEETS

CONDITIONS FOR REFURBISHING WOOD FLOORING CONTAMINATED WITH PAH

Before refurbishment of PAH-containing parquet floors can start, it is necessary to carry out a number of organisational measures which are described in detail in the "Instructions for removing PAH-containing adhesives for wood floors" of the Employers' Liability Insurance Associations for the building trade. The measures are mentioned in brief below:

- ✓ A certificate of competence must be kept.
- ✓ Various Technical Rules for Hazardous Substances (TRGS) must be observed: TRGS 524, 440, 150, 551
- ✓ There is a duty to notify: Employer's Liability Insurance Association, Factory Inspectorate, Office for Occupational Health and Safety
- ✓ Occupational medical check-ups: G 26, G 40
- ✓ Operating instructions must be drawn up in accordance with § 20 of the Hazardous Substances Ordinance (German abbreviation: GefStoffV).
- ✓ Technical and personal protective measures must be taken
- ✓ Removed parquet must be disposed of according to special waste code numbers.

Minor repair work (< 2 m²) can be carried out without the above-mentioned measures after only one single renovation notice by the company.

REFURBISHMENT PRINCIPLES

There are two refurbishment options:
Remove PAHs Encapsulate PAHs

The removal of PAHs is the most consistent and long-term logical solution to the problem. The disadvantage of the relatively high costs may be mitigated by high federal participation. Although the encapsulation of PAHs initially causes fewer costs and requires only straightforward occupational health and safety measures, the problem is merely postponed this way and sometimes requires complex and thus cost-intensive system set up.

STAUF'S REFURBISHMENT CONCEPTS

Three different refurbishment concepts are available:

- ✓ Encapsulate the parquet flooring
- ✓ Encapsulate the adhesive

- ✓ Complete refurbishment

ENCAPSULATION OF THE WOOD FLOORING

Principle: PAHs are encapsulated together with the parquet flooring

No release of PAHs No special occupational safety measures

Tests	Check the strength of the parquet bond
Preparatory measures	<ul style="list-style-type: none"> ✓ Fix hollow or loose areas (inject, reglue, screw) ✓ Sand the parquet flooring ✓ Close the edge joints with elastic sealing compound (acrylic, PU).
Seal dust/decouple mechanically/produce an overcoatable substrate	<ul style="list-style-type: none"> ✓ STAUF comfort pad
Wood flooring adhesive	<ul style="list-style-type: none"> ✓ PUK types
New parquet flooring	Tongue and groove material, for example (22 mm strip parquet, two-layer single strips)

ENCAPSULATION OF THE ADHESIVE

Principle:

Remove unstable old parquet - tar pitch adhesive encapsulated

PAHs are released, observe occupational health and safety etc.

Tests	Check the strength of the parquet bond
Preparatory measures	<ul style="list-style-type: none"> ✓ Remove parquet flooring ✓ Remove unstable adhesive residues ✓ Close the edge joints with elastic sealing compound (acrylic, PU).
Seal dust/Produce an even surface/produce an overcoatable substrate	<ul style="list-style-type: none"> ✓ STAUF VEP 195 ✓ Quartz sand ✓ STAUF XP-20
Wood flooring adhesive	<ul style="list-style-type: none"> ✓ SPU types ✓ M2A types ✓ SMP types ✓ PUK types
New parquet flooring	any

TECHNICAL DATA SHEETS

ENCAPSULATION OF THE ADHESIVE

Principle: Remove parquet flooring and adhesive

Take into account release of PAH, occupational health and safety, etc.

Tests	Check the strength of the parquet bond
Preparatory measures	<ul style="list-style-type: none"> ✓ Remove parquet flooring Mill off tar pitch adhesive together with top screed zone
Produce an even surface/ produce an overcoatable substrate	<ul style="list-style-type: none"> ✓ STAUF VEP 195 + Quartz sand ✓ VDP 130 / D 54 / VDP-160 / WEP 180 + STAUF Quartz sand ✓ STAUF XP-20
Wood flooring adhesive	<ul style="list-style-type: none"> ✓ SPU types ✓ M2A types ✓ SMP types ✓ PUK types
New parquet flooring	any

The information provided above corresponds to the current status of development. The information is purely indicative and non-binding, since we have no control over the laying process and because the actual laying conditions on site vary. Thus no claims can be made based on this information. The same is true for the commercial and technical advisory services that are provided without obligation and free of charge. We therefore recommend carrying out sufficient testing of your own in order to determine whether the result is suitable for the intended purpose. 26112018