ADHESIVES FOR SOLID FLOOR-BOARDS (PK 9)

GENERAL

When it comes to bonding parquet and planks, there is an almost bewildering number of different adhesives and products to choose from today. Faced with this, it's not easy to make the right choice since, apart from their capacity to fix the wooden floor more or less firmly, all the adhesives themselves can also influence the wooden floor that is stick. Due to their moisture content, their pronounced susceptibility to failure if subjected to premature use and the cavity problems that large-format solid wood elements are known for, dispersion adhesives can almost be ruled out. In the past, solvent-based synthetic resin adhesives were successfully used to bond large-format solid wood elements, even if the relatively slow strength development and the albeit minor swelling of the wood do not meet all the requirements for modern solid flooring installation. In addition, there is the problem of solvent emissions, which are nowadays no longer accepted either by consumers nor increasingly by installer.

SUITABLE ADHESIVES

For bonding solid wood planks or solid parquet strips with very large dimensions, reactive 1-component or 2-component parquet reactive adhesives would therefore appear to be ideal. These do not cause any swelling of the wood, can be used on almost all substrates and with almost all types of wood without any problems and usually harden completely within 24-48 hours. Without taking any other considerations into account, almost all SMP, PUK and SPU adhesives from the STAUF product portfolio could therefore be approved for bonding solid floorboards. This uncritical or even rash approval can be applied to a large number of rival products, when the sole focus is placed on a functional bond. No further information or restrictions on use are usually given. This can be explained not only by a lack of sufficient expertise, but often also by a product range that does not allow for further differentiation due to a lack of sensible alternatives.

APPROVAL FOR USE AND SELECTION CRITERIA

For bonding solid planks in particular, STAUF has therefore decided to take requirements for adhesives into account which go beyond the actual bonding function, and to give installers more certainty when it comes to avoiding later complaints by providing clearly graded approvals. In addition to the type of wood and the manufactured condition of the floorboard, i.e. raw or untreated, it is above all the width to thickness ratio that is decisive when selecting a suitable adhesive. An essential element of our technical data sheets is therefore providing information on possible deformations of elastically bonded solid planks, as well as specifying a reasonable width to thickness ratio.

TECHNICAL BACKGROUND

Even a very inexpensive elastic parquet adhesive can withstand the shear forces and shear stresses of a solid plank floor with proper bonding (if possible 100% wetting, sufficient application of adhesive). In contrast to dimensionally stable multi-layer parquet or multi-layer planks, however, large-format solid wood elements tend to show clearly noticeable deformations, cupping or even increased open joint formation under the influence of climate-induced moisture changes. Minimising these deformations to an inconspicuous, not optically conspicuous level is a requirement for the parquet adhesive that goes beyond the mere bonding itself. Not all solid wood floors are expected to undergo the same deformations. Apart from so-called "nervous" (e.g. beech, maple, olive) and "calm" (e.g. oak, most exotic woods) species, the shape and dimensions of the individual elements play an important role. Wide elements, for example, are more susceptible to deformation than narrow ones, and open joints are much more pronounced. Thin-layer solid wood reacts more strongly and above all faster to climate fluctuations than thicker wood, so that a direct correlation between the width and thickness of a solid plank and the extent of possible deformations can be derived from this.

BONDING RECOMMENDATION

In our experience, a width to thickness ratio of 7 to 1 is a good compromise with few noticeable changes under the usual annual climate fluctuations. Up to this range, bonding with elastic adhesives of a higher strength class (SMP 950, SPU 460) can be regarded as unproblematic. For a frequently requested extension of the width to thickness ratio from 7:1 to 10:1, for example, it is necessary to take certain additional deciding criteria into account:

- ✔ Are the planks on the long side sharp-edged or chamfered?
- ✔ Is the surface, or will it be, oiled or varnished?
- ✔ Does the intended type of wood tend to warp or does it tend to be "calm"?
- ✔ Is the total thickness of the plank more than or less than 20 mm?
- ✔ Is underfloor heating present?

STAUF KLEBSTOFFWERK GMBH . Oberhausener Str. 1 . 57234 Wilnsdorf . Germany
+492739301-0 . +492739301-200 . info@stauf.de . www.stauf.de

BACKGROUND:

- ✔ Bevelled board edges make slight deformations appear less conspicuous than sharp-edged boards.
- ✔ On finished surfaces, especially those sealed on site, deformations are more clearly visible than on oiled, rather dull matte surfaces.
- ✔ "Calm" wood species react more slowly and over a longer period of time to climatic fluctuations and their optical changes are therefore less conspicuous.
- ✔ Overall, thin solid planks, including currently found thicknesses of less than 14 mm, are more susceptible to deformation.
- ✔ On underfloor heating, wooden floors often become very dry from underneath, which in combination with elastic adhesives leads to significantly larger open joints and deformations.

SUMMARY

Taking all criteria into account, it is therefore also possible to approve the bonding of a solid board, e.g. 16 mm thick and 140 mm wide, with an elastic adhesive. Ultimately, the decisive factor is the consumer's or client's wishes concerning the visual appearance and their willingness to regard minor changes as a natural and welcome characteristic of a solid wooden floor.

ACCEPTABLE ADHESIVES

From a purely technical point of view, without considering occupational health criteria, hard or hard-elastic, (shear-resistant) 1-component or 2-component polyurethane parquet adhesives such as STAUF PUK 455 or PUK 446, as well as adhesives based on silane-terminated polyurethane such as SPU 570 are the first choice for bonding solid wood floorboards. Of all adhesive systems, they are the most effective in preventing both the formation of open joints and deformations. In the case of 1-component PU adhesives, an additional benefit is provided by the slight foaming of the adhesive during the curing phase. This significantly reduces the typical problems associated with the formation of cavities in the bonding of large-format elements, as the adhesive virtually fills cavities under the planks itself. This unintended but specific attribute of 1-component PU systems cannot be reproduced with SMP or SPU adhesives.

Disadvantages of PU adhesives are still their potential to trigger allergies and the poorer cleaning of tools, hands and finished parquet or plank surfaces compared to SMP or SPU adhesives.