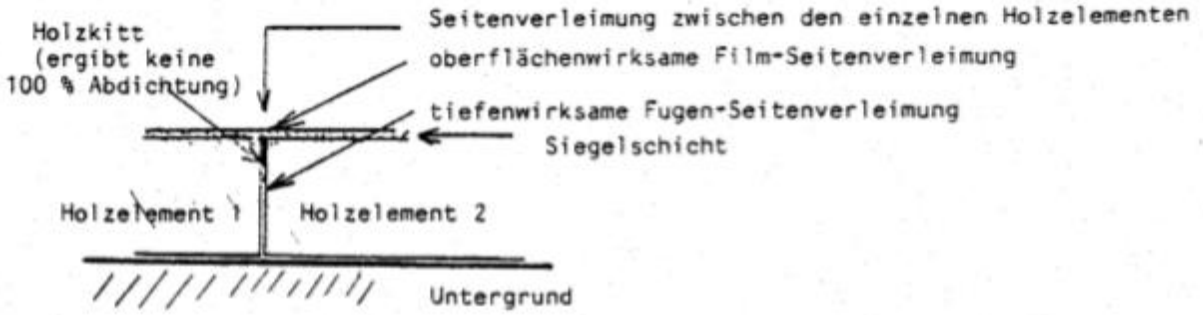
TECHNICAL SPECIAL INFORMATION 08

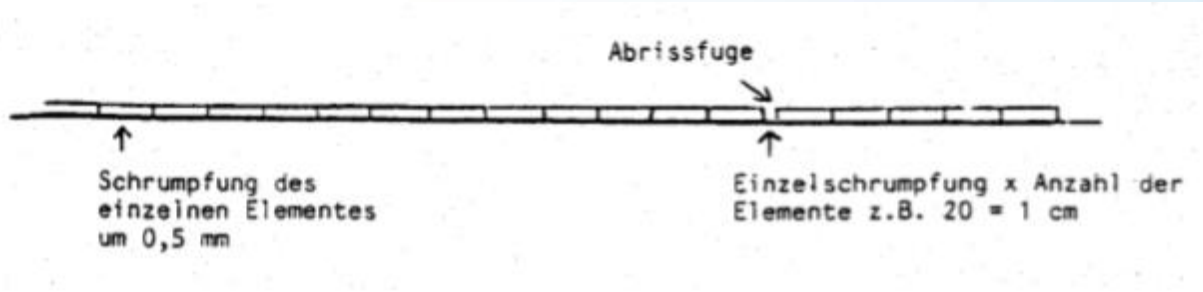
Side gluing of parquet seals

The quality of the so-called side gluing has a significant influence on the selection of seals in the modern and diverse sealing technology of today. In many cases, the side gluing tendency of a parquet seal determines whether a sealing system can be used or not. The problem of side gluing is given special attention not least because of the large variety of sealing products and the high quality standards in this country. In the practice of sealing technology, some knowledge and behaviours have developed which are of importance to every specialist.

What do we mean by side gluing?
It is the gluing or gluing together of individual wood elements by penetrating and coating parquet sealants. In principle, it is irrelevant which size connects these individual wood elements with each other. This gluing together of the individual wooden parts (lamellas, rods, boards, straps or planks) only becomes a problem when the wood shrinks and then so-called tear-off joints or delamination can occur in the adhesive bed.



What is a so-called tear-off joint?
According to the following sketch, the individual wooden elements stick together during the drying phase of the seal. By reducing the moisture content of the wood, e.g. during the heating period, all these wooden elements shrink individually. This results in an enormous surface tension which, similar to a chain, discharges at the weakest link, in this case at the weakest adhesive joint or along a grain (as already observed with floorboards). The floor thus tears at an unpredictable point and forms a more or less strong and conspicuous shrinkage joint. The moment of tearing off can be accompanied by a very loud bang. This makes it clear which enormous tension forces are effective and unload along a line. The width of the tear-off joint created in this way then also characteristically represents the sum of all individual shrinkage, or in other words, the actual shrinkage of an individual element adds up together with the other "individual shrinkage" to a cumulative shrinkage.



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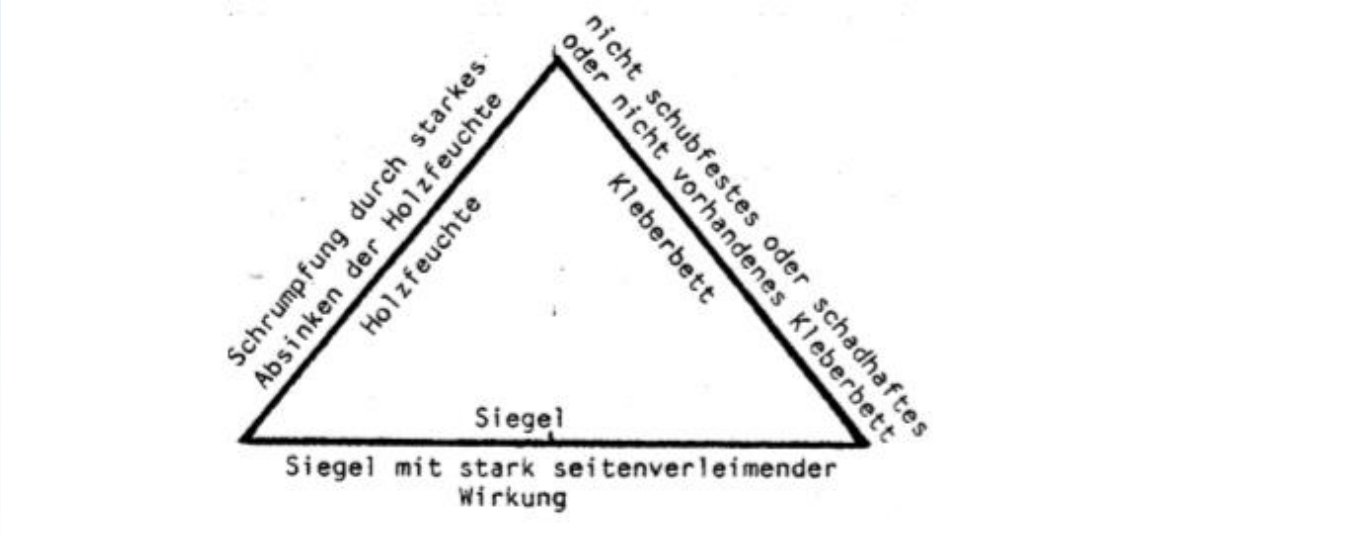
What causes can lead to the tear-off joint?
Three main factors work together to create the negative effect of the tear-off joint. The "magic triangle of the tear-off joint" could be represented as follows:



Shrinkage and expansion (also called shrinkage and swelling) of wood
is a natural, physical process, which must occur with corresponding fluctuations of the air humidity. If, for example, the wood moisture content of oak decreases by 4%, the wood volume is reduced by approx. 1% in width and 0.1% in length. The practical value is in the middle depending upon soil type, i.e. with approx. 0.5% a shrinkage of approx. 2 cm would result on 4 m width. DIN 280 stipulates that the moisture content of the finished parquet wood at the time of delivery must be 9 +/-2% (i.e. 7-11%) based on the kiln weight. The higher the actual moisture content of the wood at the time of installation, the stronger the actual re-drying and shrinkage potential. What this means becomes clear every now and then where these guideline values are strongly exceeded. It is not uncommon to find solid wood planks made of softwood that have a considerably higher moisture content and which naturally dry back and shrink to approx. 7-8% in the course of months in a normal climate. This leads to impressive "joint floors", especially in the do-it-yourself sector.

If, however, we assume the laying of material with the right wood moisture, the wood usually experiences a drop in its moisture content during the winter heating period. This is due to the fact that the air in winter is already relatively dry outside for longer periods of time and inevitably has to decrease considerably in relative humidity due to the heating inside the rooms. Expressed in numbers this means for example, an air with +/- 0°C and 40% air humidity sinks with warming on + 20°C on 10% air humidity. If such a dry air affects wood for days and weeks, shrinkage is unavoidable. Conversely, the humidity of the wood increases again when higher air humidity acts on the floor. So the wood works and this is easy to make plausible for the consumer. He has little pleasure, however, if the consequences of this change in volume become all too conspicuous and unattractive. Therefore each parquet layer is well advised to make the customer attentive to these natural processes with the product wood before placing an order and to recommend it urgently appropriate measures for the compensating air humidification. Also with it the shrinkage of the wood can be reduced to a minimum. The problem for the sealing technique and the parquet layer, however, is that it no longer has any influence on the actual climatic conditions in the room. Are humidification devices operated at all and if so, are they effective enough? Are they operated consistently and are their effectiveness regularly checked? These questions make it clear how difficult it is to estimate this factor.

To the question of bonding
the parquet layer has no influence on old floors, for example. For example, was a bituminous-based adhesive still used? How effective the adhesion of an old adhesive bed is after renovation must also be questioned. Critical caution is advisable. The decisive question in these cases (not shear-resistant or defective bonding) is whether the adhesion of the individual elements to the substrate is higher than the side gluing forces.

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Of course, it can also be a floating installation or special constructions such as sprung floors etc. Floating floors become a problem if the total area, which is free in principle, is weighed down from above by the "cupboard on the right and the sofa with the mother-in-law on the left" and the total shrinkage compensation cannot take place. The dead weight of the entire floor construction in combination with a particularly weakly bonded joint line can also lead to the tear-off joint.

Selection of the sealing system
appears at first glance to be the factor that can be most easily influenced by the parquet layer. And indeed, even in some problematic cases, only the control over this factor remains. Nevertheless, it is not always easy to convince the client or end user of the right seal if they have completely different ideas. Often there is also another strongly side gluing sealing system prescribed.

Summary of the critical bottoms
The following soil types have proven problematic in many years of practice:

1. Parquet floors and other wooden floors on a non-shear adhesive bed (bituminous base)

2. Parquet and other wooden floors on damaged adhesive bed
   This may be due to fatigue of the adhesive or to incorrect setting of the adhesive during the drying process.

3. Parquet and other wooden floors on underfloor heating systems
   By heating up the substrate during the heating period, in addition to the low air humidity, the moisture is increasingly expelled from the wood, as the heat flows from bottom to top through the wood. Increased fluctuations in wood moisture must be expected in this case. After detailed investigations, elastic seals with low side gluing have proven to be optimal on underfloor heating systems and result in the highest technical safety.

4. Upright lamella parquet flooring
   In practice, cases of block gluing with relatively wide joints have arisen here.

5. Wood paving floors
   For all wood paving floors, there is an increased risk of tear-off joints due to higher swelling and shrinkage movements due to climatic fluctuations (above all for new floors, somewhat less for old floors). Therefore, systems with little or no side gluing tendency are recommended. This does not apply in principle to the wood paving elements newly introduced to the market some time ago.

6. Planks without wide joints
   Mainly with newly laid plank floors, practically minimal joints are present. In contrast to old floors with wide joints, there is a risk that the boards will be glued together. In practice, there are known cases in which the weakest plank is torn apart in the middle along the grain due to re-drying.

7. Gymnasium and multipurpose hall
   These are mostly laid floating or consist of a so-called sprung floor construction. Here the danger of tear-off joints is particularly great.

In all these cases, we recommend the use of a sealing or impregnation system with low side gluing. The following paragraph classifies today's sealing systems according to the degree of their side gluing tendency.

The side gluing tendency of the different sealing systems

a) Low side gluing systems
   Oil synthetic resin seal, SolvSeal LT Export Extra or impregnate with Classic BaseOil, Classic HardOil and Classic 100ProOil. In principle, all these systems can be used on all types of floors. Based on the other product and system properties, a decision will have to be made together with the client regarding the future use of the floor. Please also note individual instructions for use in the individual technical data sheets.

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b) Medium side gluing systems
AquaSeal® FlexPrimer or AquaSeal® Exobloc in combination with AquaSeal® Seal. These systems are higher than group a) in their side gluing, but much closer to group a) than to group c). As the coating properties are comparable with group a), group a) systems are preferred for the corresponding problem.

c) Strongly side gluing systems
AquaSeal® seal in full build-up without primer. These types of seal are not recommended for the problem floors listed under points 1-7, or only recommended to a very limited extent. In any case we recommend the use of AquaSeal® FlexPrimer or AquaSeal® Exobloc when using water-based AquaSeal® seals (reduction of the side gluing effect).

For all seal-coated systems, the use of roller and trowel primers reduces the side gluing effect. Nevertheless, it can be said that the extent and addition effect of deep-acting side gluing and superficial film side gluing have not yet been fully investigated. Final statements, for example, on the side-gluing tendency of a rapid build-up (2x filler base + 1 x single-layer thick-film seal) cannot be represented at this point in time. Until this is the case, extreme caution is required.

Advice on how to deal with this problem in practice

1. Avoid the risk of side gluing by adhering to our recommendations. This special technical information as well as our seal System Consultant and the individual technical application data sheets provide sufficiently precise information to identify the problem cases in good time.

2. In the case of existing relevant types of floor, you should immediately arrange a clarifying discussion with your client or architect. Make your concerns known with reference to the practical experience and try to convince your customers of the low side gluing seal even if another seal was originally intended. If this does not succeed, then you should assert your reservations in writing, i.e. verifiably, and have the assumption of the risk confirmed by the client.

3. Make all your decision-makers familiar with the problem. Let your key employees read this special technical information from time to time.

4. Inform your end users that wood is alive and naturally subject to shrinkage and expansion. As a rule, it cannot do any harm if the end user is made aware of the occurrence of shrinkage joints beforehand. If the customer expects joints to occur temporarily, he will not think that this is an abnormal appearance or a reason for complaint. Always recommend appropriate measures, such as humidifiers, which, if they work properly, will help to alleviate the problem and create a healthy living environment.

This special technical information is intended to advise you to the best of our knowledge and belief and in accordance with the state of the art, thus helping to avoid unpleasant complaints and to achieve our common goal of high-quality sealed parquet.

In case of doubt or if additional information is required, we offer our customers a comprehensive telephone consultation service. Our expert team is at your disposal for further information.

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