

Dear Sir or Madam

You have decided on purchasing a raised floor of the Lindner AG. We ask you to observe the following instructions in order to guarantee an acceptable functioning of this system floor for the long term after its installation in a professional fashion. This user guideline refers to raised floor panels made of calcium sulphate and chipboard.

1 Climatic conditions

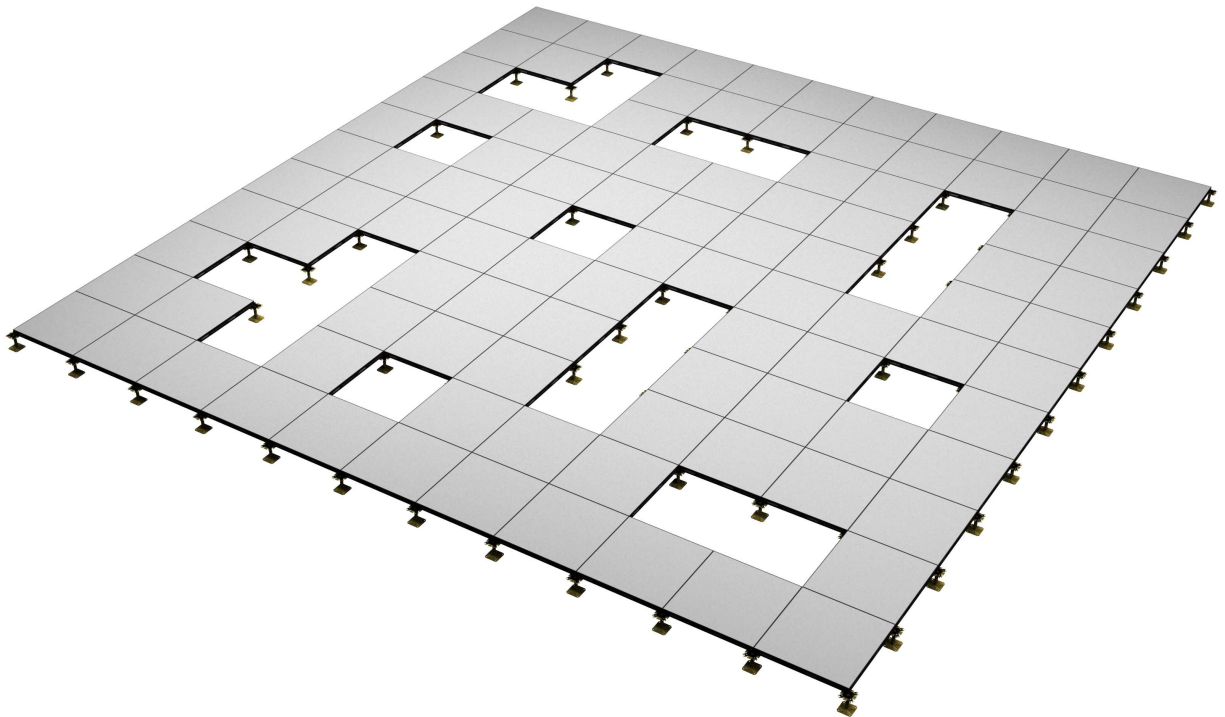
The room temperature should range between 15°C and 25°C. The relative air humidity should range between 40 und 65 %.

Changes in dimension of the floor panels due to climatic changes (temperature, air humidity) within the above mentioned temperature and air humidity values can be taken up by the system.

Climatic conditions beyond the tolerances specified can cause dimensional changes (a swelling or shrinking of the floor system according to the material used) which make additional measures necessary for the integration of movement joints.

2 Opening and closing of the floor system

If panels are taken out of the floor area or channels for later installation works or similar, it has to be paid attention to that this is done like it is shown on the following illustration. Free-standing pedestal which are not supporting at least one panel have to be avoided.



Exemplary proposal for opening the raised floor:

The forming of islands has to be avoided. Do not take out more than 3 panels out of one row.

Taken out panels shall be stacked in a way that visible side is applied to visible side and reverse side to reverse side so as to avoid any eventual smearing of the batch identification on the covering side.

Horizontal forces are only permissible as partial forces of the allowed load. The loading specifications refer to the closed raised floor. So do not carry out any transports towards an open row of panels.

The raised floor panels may only be lifted with a vacuum respectively a spike lifting device.

The system may only be opened or closed by qualified personnel.

2.1 Taking out of a panel

- I. Place the lifting device in the centre of the panel edge with a short distance of approximately 5 cm to the edge and lift the panel slightly to loosen it.
- II. Then place the lifting device in the middle of the panel and lift it vertically (Illustration A).

With parquet coverings it is recommended to lay the taken out revision panel on a soft pad (e.g. a cloth) in order to prevent the surface from scratching.

With raised floor panels with stone or ceramic coverings (due to the high weight) it is recommended to lay the taken out panel directly on a soft pad in order to prevent damages of the surface.

The panel shall not be transported with a suction lifter if possible.

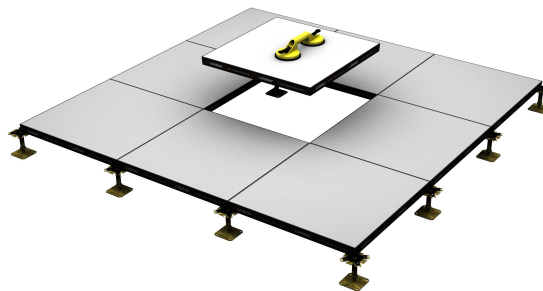


Illustration A

2.2 Inserting of panel

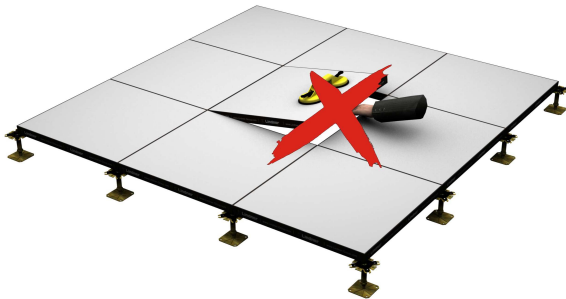
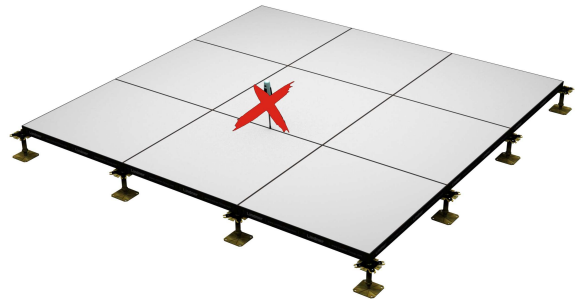
Place the lifting device on one side, hold the panel with your hands, lay it with one side on two pedestals, push it to the neighbouring panel and lower the panel with the lifting device.

If with the use of a velour covering, the first row of the piles of the adjacent panel is pinched in, the proper, original state can be restored by “lifting” the inserted panel a bit.

Attention:

- Do not put your fingers in the gap between the panels with the opening and closing of the system – danger of injury! (Illustration B)
- Do not try to take up panels with unsuited tools like a screwdriver or a chisel (Illustration C).

- Detach the lifting device immediately after the use (a vacuum causes the detachment of the covering)
- Do not put taken-out panels down on the panel edge.

**Illustration B****Illustration C**

- Basically:
- Remove dirt of pedestal head.
 - Test if the gasket and eventually the stringers rest on the pedestal head properly.
 - Check the installation direction of the covering.

Taken-out panels shall be put back in their original positions and shall not be turned around into a different position. In addition, it has to be checked whether they fit well and only then the next panel can be inserted.

3 Cut-outs

Subsequent cut outs within a floor panel have to be made with a minimum distance of 100 mm to the edge. The edges of cuts have to be sealed. Depending on the loading requirement and the shape of the cut out, additional pedestals and/or supporting stringers should be installed.

4 Substructure

Pedestals, stringers as well as bridgings or other substructures may not be altered. The raised floor system may not be loaded if in exceptional circumstances, such as for subsequent installations, it becomes necessary to dismantle any components. Non-compliance might result in the danger of a collapse of the system!

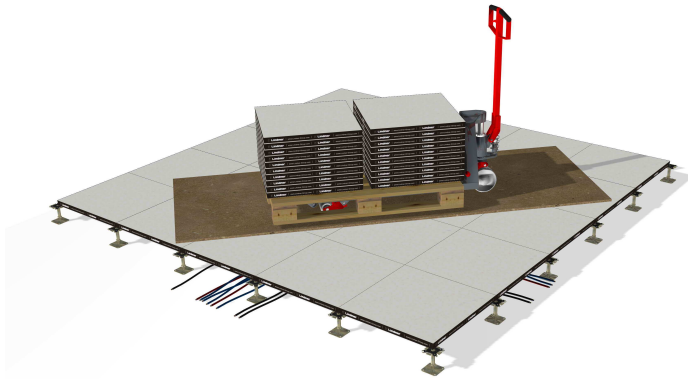
System components which have been dismantled have to be remounted when the work is completed so that the vertical load removal and the horizontal rigidity are again assured.

5 Cable installation

Do not draw in cables over the edge of the floor system or a panel. Do not pull off or damage pedestals through overstraining with the installation of cables in the cavity. We recommend to lay cables in from the roll.

6 Protective measures

6.1 Extraordinary loading



With the transport of heavy loads the floor has to be covered with chipboard, steel plates or planks. In this way the floor covering and the gluing is protected and the loads are distributed to a larger area on the floor system.

Dynamic loads from lifting carts, forklifts etc. may not be included in calculations by simply transferring the wheel loads to static loads. In such cases the DIN 1055 as well as the maximum admissible loads of our raised flooring systems have to be observed.

The tests and the classification are made according to current standards. The admissible load indentation points are defined in the application guideline to the DIN EN 12 825.

6.2 Continuous contact with water

Continuous contact with water has absolutely to be avoided as this inevitably leads to a damaging of the floor system.

7 Floor coverings

7.1 Parquet surfaces

An important quality for the installation and use of parquet as a covering for raised floors is the „working“ of the parquet. Under the term “working“, the swelling and shrinking is summarized which is caused by the absorption respectively evaporation of water (but also of organic solvents). Depending on the wood species and growing direction there will appear different swelling and shrinking dimensions. The wood humidity has to be adjusted during the production process to the corresponding usage climate.

We adjust our raised floor system to a standard room climate of 40 % relative air humidity. This corresponds to a wood humidity for central European wood of 7.5 %.

When keeping an appropriate climate for wood of 18 – 22°C and a relative air humidity of 35 – 55 % during installation and usage we guarantee a perfect condition of our parquet raised floor. This corresponds to the climate which is also necessary for the human well-being.

For deliveries to Scandinavia, the wood is adjusted to the expected lower relative air humidity of 35 %. This corresponds to a wood humidity for normal central European woods of 6.5 %. A usage climate of 25 – 45 % relative air humidity applies.

Deviations of the above mentioned climate terms will lead to a swelling or shrinking of the parquet upper layer which is a material induced appearance. In addition to the form change of the parquet / the panel, tensions in the adhesive joint may occur due to the different “working” of the panel and the parquet lamella.

When the air humidity is too low, joints may occur between the raised floor panels respectively the parquet upper layer, in an extreme case splits may occur and the protective edge trim can detach from the parquet. When the air humidity is too high, this can lead to a swelling of the parquet upper layer. This can lead to a more or less intense deformation of the surface of the panel (according to the design of the parquet), but most important it can lead to a jamming of the whole raised floor which reduces the function of the floor system. The panels can only be opened and closed with an extreme effort.

The “working” respectively the change of the wood humidity caused by the climate can be influenced positively by a lacquer coating of the surface. The varnish coating delays the moisture absorption and evaporation of the wood and compensates in this way the short-term changes of the climate. A parquet surface which is treated with floor oil reacts very fast on changing climate conditions, just like an untreated surface. The humidity exchange respectively the shrinking and swelling is not delayed compared to a untreated surface and takes place within a short time. A treatment with oil is used for an improvement of the look and is useful for the protection of the parquet upper layer from contamination.

Referring to the usage conditions, lengthwise and across glued parquet designs like for example lacquered oak cubes are therefore significantly less sensitive and more robust than oiled beech in the large baton 2 design.

In the scope of a normal usage climate, we also propose to generally plan an edge joint of approximately 8 – 10 mm at arising building parts. The installation should be permanently supervised through a thermohydrograph which immediately shows any change respectively an overstepping of the climate.

At larger areas it is recommended to discuss this topic with the project manager or the product management.

With expected differing climate conditions, the Product Management has also to be consulted and if necessary, it has to be set a wood humidity which is adjusted to the using conditions.

7.2 Loosely laid tiles

With loosely laid tiles, it has to be paid attention to that a penetration of the fixation paint into the joints of the raised floor respectively of the transition of raised to hollow floor is avoided. The penetration of the fixation paint can lead to creaking sounds of the raised floor.

7.3 Shading

Regarding velour coverings which can be used with our system floors, we would also like to mention the phenomenon called “shading”, which has been discussed repeatedly in the technical literature.

Shading effects can develop on all velour merchandises irrespective of its qualities. The material in such cases is of no consequence, because studies have shown that this phenomenon can occur in the same way both on natural fibres such as wool, silk or coconut fibre and on synthetic fibres such as polyamide or polypropylene.

Shading effects develop entirely irrespective of the support or foundation on which a covering is installed.

Shading effects do not only occur on raised flooring. Studies have shown that carpeting installed next to each other on different foundations have the same shading effect all the way through.

The cause for this has not yet been clarified in detail. Tests, however, have shown that even different velour coverings installed next to one another, or coverings laid next to one another in layers lying one on top of the other will have the respective phenomenon and so today, researchers tend to see local influences originating in the building or location of the building as the cause for this phenomenon.

More detailed information about the shading phenomenon will be provided to you by the *Deutsche Teppich-Forschungsinstitut e.V.*, Charlottenburger Allee 41, 52068 Aachen, which also keeps relevant brochures available.

8 Cleaning and maintenance instructions

Basic principles conditional to the system have to be considered for the cleaning and maintenance of the floor coverings on system floors. You are provided with information on that topic by our as well as the covering manufacturer’s cleaning and maintenance guideline.

Especially with parquet floor coverings the cleaning and maintenance should exclusively be done with the products which are proven and recommended by us. Other maintenance products could have negative effects on the surface coatings which were applied by us. It can lead to the destruction respectively discolouring of the upper layer. Please notice our cleaning and maintenance instructions.

Should you have any further questions, we are gladly available to provide you with any information. Telephone 0 87 23 / 20-26 51 Product Management Floor Systems