

screws), sub layers, vapor barriers, filling material, etc. All of them shall comply with the required technical specifications for the design (i.e. thickness of sub layers and of the parquet). Specific installation elements shall likewise be used such as hammer, jigsaw or electric saw, drill, folding ruler, pencil, wedges (spacer wedges), tie rod, and set-squares. Below we add some particularities for floating, bonded, and radiant floor heating installations.

3.3.2 Specifications for installation of floating parquet

3.3.2.1. Design

Whenever possible, the parquet shall be installed parallel to the larger dimension of the room. However, usually the installation direction is given by the space's light source, e.g., the terrace window. The elements shall be installed parallel to the incoming light.

The space proportions can also be emphasized by suitably choosing the installation direction. For instance, a longitudinal direction installation is required in areas such as hallways. In long and narrow rooms the installation direction shall be adapted to the room proportions. To make narrow rooms look wider, place boards perpendicular to the smaller dimension. The use of light-colored wood expands small spaces visually.

3.3.2.2. Insulating sheet

We recommend the use of insulation sheet with cement slabs, and when installing on an under floor heating. Likewise, the drying period for new slabs is set approximately for at least 6 to 8 weeks.

The functions of this insulation sheet can be widely varied, while the most important ones are to provide thermal and acoustic insulation as well as improve the overall comfort of the parquet system plus the insulation sheet. Sometimes it can act as a vapor barrier and other times it presents an improved thermal conductivity for installing on under floor heating. We recommend to place the boards perpendicular to the boards. It shall be installed overlapping the sheets at least 20 cm. It shall be raised around the perimeter at least half way up the baseboard.

3.3.2.3. Joints

3.3.2.3.1. General information

Both perimeter joints and expansion joints specified below are designed for absorbing dimensional swelling and shrinkage movements experienced by parquet surfaces as a result of the normal hygrothermal variations that take place in rooms. For instance, variation in relative humidity between the winter and summer periods, or those due to the start-up and shut-off of climate control devices (heating, air conditioning). These joints are not in any case intended to absorb abnormal dimensional variations such as those which arise from the inadequate conditioning of the premises, or those that can take place for instance as a result of an incident with entry of water, condensation, or other similar circumstances.

3.3.2.3.2. Perimeter joint

In floating installations, a perimeter joint with a minimum width of 1.5 % of the larger room dimension, and of at least 10 mm if they are multi-layer products and 12 mm and they are solid products. The maximum standard thickness of baseboards is 17 mm, so that for unobstructed room dimensions equal or larger than 12 meters, the use of special baseboards shall be provided for, or expansion joints shall be carried out in the installation. This joint shall also be carried out in all the elements that cross the parquet (pipes for different types of installations) and in the areas of contact with carpet elements (door frames).

3.3.2.3.3. Expansion joints

If the dimensions of the premises exceed 8 unobstructed meters, expansion joints shall compulsorily be installed in the proper places (not to be confused with perimeter joint) so that they can absorb the swelling and shrinkage movements that this type of floor undergoes.

The most suitable places to have expansion joints are: starts of hallways; doorway areas; narrowings between partitions that separate different spaces of one room. In the case of houses in which the partitioning creates evident narrowing, carrying out expansion joints in critical points must be provided for (even when the dimensional specifications established in this section are not met). Heavy furniture can create a discontinuity in the floor's floating behavior.

3.3.2.4. Offset

Place the board so that the ends of each board are separated from the next one at least twice the width of the board or at least 30 cm (taking the smallest measure.)

3.3.2.5. Trims and intermediate segments

To trim the end of each row, pieces of any length can be used, however, in intermediate segments, measures shorter than the minimum provided are not allowed.

3.3.2.6. Gluing the boards

When using products to be tongued and grooved, apply glue all around the perimeter. The glue should always be applied on the top of the groove.

Wood adhesives for the installation of floating laminated floors should be minimum of D3 class, according to UNE EN 204. Other conventional adhesives for solid products are not to be used here.

3.3.2.7. Installation steps

1-Lay the damp proofing sheet and the foam board. The damp proofing sheet needs to be placed over the insulation foam board, by overlapping the joints of the foam. At the perimeter joint, the base must have the height of the skirting.

2-The 1st row is aligned on the right side with the female part facing the wall. It is firmly fixed to the wedge, keeping a perimeter expansion gap.

3-Assembly using a tapping block and a hammer. Never hit the board directly with the hammer, for it can damage the connecting system.

4-Use the tapping crowbar for the last row and remember to leave the recommended expansion joint. Start a new row with the pieces sawn from the last row.

5-Make sure that the minimum distance of 30 cm between the row joints is kept and the rows are parallel. Then continue installation.

Warning: Rotate the joints accordingly while tapping in order to avoid the expansion joints to become separated. Use an adapted tapping block to gently tap the panels lengthwise once the piece has been installed in order to attach it.

6-End the installation of the last row by using the tapping crowbar, keeping the expansion joint.

7-Remove spaces from the expansion joints to place the skirting boards, screw and nail them with a pneumatic pistol.

8-For floating installations, expansion joints need to be placed every 12 meters lengthwise to the panels and 8 meters breadth wise, by using the right edgings in any case. For the edging at least a 5 mm expansion joint in relation to the wood must be kept.

9-For corridors where installation may have a T, L or U shape, it is recommended to use dilation edgings. To register installation data, a form needs to be used.

3.3.3. Specifications for the installation of glued parquet

3.3.3.1. Perimeter joints

Leave a joint perimeter of between 4 and 10 mm to the walls or any other vertical elements. This joint can be filled with flexible materials. For glued flooring, the perimeter joint is to prevent Wall surface moisture and a soundproof barrier. It is not intended to absorb thickness swelling movements of the installation.

3.3.3.2. Adhesives

It is advisable to use a two component epoxide, polyurethane or sylane adhesive. This adhesive is adequate for applying on cement mortars, anhydrite mortars, wood boards, previous ceramic tiles, marble floors and like, cast asphalt mortars for commercial or civil use, including those with screed placed over under floor heating systems. Do not use outdoors or on surfaces where moisture may emerge. Generally, in order to use adhesives, the manufacturer's instructions are to be followed regarding reaction time, open-air period, duration, doses, application, products, forms, and adequate parquet thickness.

3.3.3.3. Gluing the pieces

It is quite important to observe the maintenance conditions and room recommendations regarding cleaning, size and shape of the room, leveling, environmental humidity, etc. that have been described in this document.

IMPORTANT

Let the boards acclimate in the unopened packages at the normal room temperature. The parquet elements moisture should be between 7 and 11%. Before installation, measure the environmental humidity with a carbon hygrometer. Before installation, make sure to measure surface temperature and environmental humidity and temperature. If necessary, warm the room or ventilate it in order to avoid a high relative environmental humidity (it should be always less than 70%).

Supporting elements must be thick, solid, flat and not too coarse. They must be stable regarding dimensions, without warping and dryness and must not have emerging moisture. They should not have cracks or resistant dust substances.

Floor must be clean and even.

-Place 4 or 5 panel rows to check dimensions. Saw imperfections and place them in less visible areas.

-Use a notch trowel and apply glue in 45° angles.

-Apply glue to the first row and fit the pieces. Then spread the glue all over the surface, at least, for the installation of the three first rows or use as much glue as materials can be installed for the next 10 minutes after application.

-Install the first wood board with the tongue to the exterior and the groove to the wall, and repeat this procedure with the other boards, keeping them align to the wall. Additional gluing in H on the tongue and groove joint with D3 adhesives, according to UNE EN 204.

Intsa recommends the glue of its catalogue.

-Do not press edges when putting elements together, but fit them easily by using the assembly joint. Add additional pressure to ensure a good joint at door entrances or on places close to the wall.

-Start by the left wall when installing the panels.

-Start a new row with the pieces sawn from the last row, keeping a minimum of 40 cm length to guarantee a fine looking installation.

-Proceed by installing only a few panels to make sure that the glue does not dry before placing the boards.

-Use and adapted tapping block and remove the tapping crowbar to fit the joint.

-After gluing, wait a minimum of two hours before walking on the flooring, although waiting 72 h is advisable. There is a form in the Annex to register installation data. More information about installation at: <http://industriadeltahero.com/instrucciones-instalacion-sueltos-parquet>

3.3.4. Specifications for the installation of parquet on water under floor heating systems

This point applies to water under floor heating systems that include pipes of different materials (usually plastic materials) and are found in mosaics of diverse nature which force warm liquids or coolants out. Their other under floor heating systems like "radiant wire", "radiant panels", "radiant sheets" and the like.

3.3.4.1. Recommended installation systems

It can be glued or floating.

3.3.4.2. General recommendations

We recommend making the installation glued to the floor, provided that the thickness of the parquet flooring is higher than 15 mm or that the wood has a density higher or equal to 550 kg/m³. It is interesting to mention that the parquet boards must be glued directly to the floor and also between them (groove and tongue), not only to gain stability but also to improve heat conductivity. This is due to the fact that Wood is a more insulating material than others, so it offers resistance to heat transfer, obviously both, to increase and to heat loose.

Besides, on air chamber will multiply this effect.

3.3.4.3. Screed thickness

The screed thickness will be the necessary one to ensure its adequate functioning. In any case, a minimum of 30 mm is recommended, counted as the conduction pipes of the system.

3.3.4.4. Parquet heat resistance and sub layers

The heat resistance of the parquet and sub layers altogether, that is, of all the covering and supporting materials situated over the under floor heating, should be at least of 0.17 m²·K/W (square meters centigrade degree/Watt).

-Flooring installation: heat diffusing layer + bituminous board reel. -Glued installation: polyurethane, epoxy and silane based glue.

3.3.4.5. Working temperature

The system power must be regulated so that the temperature of the parquet surface never exceeds 27 °C.

3.3.4.6. Screed humidity. Drying protocol

Do not turn on the heating abruptly. It is advisable to increase temperature gradually. Sharp change in temperature may dry up the wood, producing cracks or warping.

For cement-bound screeds, moisture content must be less than 2 %. For anhydrite-bound screed moisture content must be less than 0.5 %.

As for new buildings as for refurbished houses, a progressive heating protocol to be done is a must before placing the pavement. This is done in order to prevent subfloor moisture to raise to the screed.

You may use the water under floor heating system to dry screed. For doing so, it is necessary to follow a heat-up phase to turn it on, keep it and turn it off, according to the manufacturer instructions. Proceed as follows:

-Functional heating

-Heating for the installation -Installation of the pavement. You must to keep in mind and follow these considerations, apart from those specified by the manufacturer: For cement-bound screeds, the heat-up phase will not take less than 21 days. Pavement cannot be installed if moisture content exceeds 1.8 M/C%. For anhydrite-bound screed, this phase will take no less than 7 days. Placement of the pavement is not allowed if moisture content exceeds 0.3 M/C%.

-Turn the heating system on and gradually increase temperature by intervals of 2 or 3°C a day over a week until reaching the regular temperature of the system.

-Keep this temperature over daily week until the screed is completely dry.

-Reduce temperature by intervals of 2 or 3°C until the heating system is off.

Once the wood flooring has been installed, the use of a heating system at low temperature is recommended in the first week, gradually increasing temperature over the next week until reaching the usual temperature that better fits your necessities.

It is recommended to combine the heating-up phase with regular ventilation of rooms. Some "in situ" moisture measurement systems for screeds may damage the pipes of the under floor heating system. This is why humidity should be measured in points where indications of riskless places have been left. These measures must be taken with a carbon hygrometer.

It is not recommended to keep rooms with relative environmental humidity between 50 and 70 %, especially in winter.

It is not advisable to use screeds because the distance generated between the screed and the wood creates an air chamber that may damage. As isolates temperature and delays the spread of it across the floor, the heating system is not enough, and air chambers would raise the wood temperature and produce floor reductions, warping, etc.

See Annex for a form to register data in case of installation with under floor heating system.

3.3.5. Specifications for plating skirting boards

Intsa recommends skirting boards to be perfect adaptation to the wall with a pneumatic pistol for a correct installation, thus guaranteeing a perfect adhesion to the wall and a tight seal.

3.3.6. Specifications for the installation in areas with under floor heating system pipes

For installations with this kind of heating system, 5 mm expansion joint between Wood and pipes are necessary. Please follow these instructions:

4. PROTECTION, MAINTENANCE, AND PARQUET INSPECTION

4.1. Provisional protection

Placement must be planned in advance, so it should start with the last phases of the finishing and, if possible, after the painting. While finishing Works are done, hygrometry conditions in rooms, state in previous clauses of this instructions manual, should be ensured. For parquets finished in site, it may happen that the staining of working elements must be thick, solid, flat and not too coarse. They must be stable regarding dimensions, without warping and dryness and must not have emerging moisture. They should not have cracks or resistant dust substances.

4.2. Conditioning rooms

Wood and its derivative materials are hygroscopic, that is, they absorb or release humidity from or to the environment according to hygrothermal conditions (humidity and temperature) in the environment.

The parquets finishing (varnish, oil, wax, dye, stain, etc.) is only a relative protection from hygroscopic imbalances. High relative environmental humidity (above 65 % for more than 15 days), may cause the wood flooring to absorb and excess of moisture. Low relative environmental humidity in rooms (less than 35%) for the same period of time, may cause an excessive loss of moisture in wood.

It is necessary to plan in advance the conditions of the room (ventilation, heating, protection against direct sunlight, etc.) so the parquet is not under undesirable moisture imbalances, and their subsequent changes in dimension. It is recommended to keep rooms with relative environmental humidity between 50 and 70 % for coast areas and between 45 and 60 % for inland areas. Once installation is concluded, maintenance conditions are the construction owner's responsibility.

4.3. Inspection with the customer

Once the installation is completed, inspection with the customer will be carried out and s/he will be given a copy of the Maintenance and Care Instructions Manual. Inspect the parquet by standing up with natural light behind the observer. Do not use corner lamps nor backlighting to inspect and locate defects on the surface flooring.

Flooring last inspection will be done no later than seven days after the installation is completed and a report upon construction reception will be issued to be signed by the installer and the customer, adding any necessary note.

4.4. Maintenance and Care Instructions

Upon completion of the installation, the company in charge of it will provide the contractor or customer a manual or instruction for flooring use and maintenance.

5. CLEANING AND MAINTENANCE MANUAL

5.1. Protection, maintenance, and parquet inspection

For the flooring production, Intsa has used state-of-the-art technology in order to make the most of this wood exclusive product special features. Parquet is the flooring par excellence. Parquet flooring improves with time but requires constant care in order to keep looking new and scratch-free. Parquet is always a good investment because of its resistance over time. Indeed, it is always trendy, admits a wide range of finishes and makes your house look warmer than with any other parquet.

2-Avoid feet pads under furniture legs to avoid scratching the floor, mainly if it is a heavy furniture. Be careful when changing the place of a furniture: lift it, do not drag it over the floor.

3-Clean and dry liquid spills immediately to avoid moisture penetrating into the joints.

4-Changes in environmental humidity can cause contraction (when diminishing humidity) and expansion (when increasing humidity). These changes may damage the floor if some precautions are not taken. Keep humidity at a constant level to avoid them, as these changes may cause black stains, cracks, thickness swelling and warping. To prolong the beauty of the flooring, we recommend to keep environmental humidity conditions as indicated below.

5-In rooms where the parquet is laid, keep temperature at 20 – 23 °C.

6-To ensure healthy atmospheric conditions, make sure that relative humidity is kept between 40 and 65%, as recommended by the World Health Organization.

7-For doing so, keep rooms ventilated, control abrupt changes in the heating, and protect the floor against sunlight direct exposure.

8-Avoid ultraviolet light direct exposure. Sunlight direct exposure or intense artificial light may affect the flooring top layer. This exposure can produce oxidation and, as a result, pale Woods get darker while dark Woods get fade. This is a Wood feature, it is NOT a defect.

9-For second homes and apartments