

## INTERIOR CONDITIONS AND SUBFLOOR CHECK

### INTERIOR CONDITIONS

Before the installation, make sure that all work on site (decoration, installation of sanitary fixtures, etc.) has been completed. Maintain the humidity level between 40% and 65%; the air temperature has never be lower than 15°C in the coldest season and has never exceed 30°C in the hottest one: outside of these ranges, the boards may suffer deformation and adhesives and other products used for the installation may not work correctly.

### SUBFLOOR CHECK

The subfloor on which the hardwood flooring is to be installed must be smooth, level, and have a compact surface so as to guarantee the best possible strength of the adhesion between the underside of the planks and the subfloor itself.

### CONCRETE SCREEDS, CONCRETE LEVELLING SCREEDS

Carry out the following checks before installation:

- **Smoothness/Flatness of the subfloor:** place a 2-metre long straight edge on the subfloor: the maximum allowable tolerance is 3 mm.
- **Subfloor structural strength:** when hammering the surface no marks or deep cracking should appear.
- **Subfloor superficial compactness control:** it should not be possible to create deep scratches or excessive dust when scraping the surface of the subfloor with a nail.
- **Fissuring:** fissures created in the middle of the rooms and that do not start from the base of the walls are allowable. Other kind of fissures, in particular those which start from the base of the walls or that permeate throughout the complete thickness of the subfloor, must be properly consolidated by suitable and permanent means.
- **Cleaning of the surface:** before the installation begins, it is very important to carefully clean and check the surface of the subfloor.
- **Moisture content:** the moisture content of the subfloor has to be within the recommended limits. The subfloor residual moisture control has to be executed only using calcium carbide hygrometer (other tools could give wrong measurements in certain conditions).  
In case of concrete screeds and concrete levelling screeds the maximum value allowed for the installation is 2,0% CM with a maximum thickness 80 mm.

In case of subfloor with a thickness more than 80 mm, this control has to be done on the total thickness (not only on the surface) and the maximum value allowed for the installation has to be reduced proportionally to the increased thickness (so for instance with a screed 120 mm thick the maximum value allowed will be 1,4% CM).

In case of evaluation of installation on underfloor heating system see paragraph "Installation on underfloor radiating system" below.

Should these requirements not be fulfilled, implement proper operation before installation.

### ANHYDRIDE SCREED (CALCIUM SULPHATE)

Carry out the following checks before installation:

- **Smoothness/Flatness of the subfloor:** place a 2-metre long straight edge on the subfloor: the maximum allowable tolerance is 3 mm.
- **Subfloor structural strength:** when hammering the surface no marks or deep cracking should appear.
- **Cleaning of the surface:** before the installation begins, it is very important to carefully clean and check the surface of the subfloor.
- **Moisture content:** the moisture content of the subfloor has to be within the recommended limits. The subfloor residual moisture control has to be executed only using calcium carbide hygrometer (other tools could give wrong measurements in certain conditions).

In case of anhydrite screeds the maximum value allowed for the installation is 0,4% CM.

Should these requirements not be fulfilled, implement proper operation before installation.

### WOODEN PANELS SUBFLOORS

Carry out the following checks before installation:

- **Smoothness/Flatness of the subfloor:** place a 2-metre long straight edge on the subfloor: the maximum allowable tolerance is 3 mm.
- **Wooden panels thickness:** at least 15 mm.
- **Pattern:** the pattern has to be chosen avoiding that the joints between the boards coincide with the joints between the wooden panels.
- **Moisture content:** check always the moisture content of the wooden panels: it has never exceed 10% because a higher value could damage the floor.

Should these requirements not be fulfilled, implement proper operation before installation.

### PRE-EXISTING FLOORS

The laying of Listone Giordano® can also be carried out on pre-existing flooring, provided that they are checked all the conditions of flatness, solidity (it means perfect adhesion to their subfloor), compactness, cleaning of the surface, absence of cracks and of residual moisture or lift necessary to ensure proper contact at every point of the surface and the protection from external side.

For installation over existing hard flooring (ceramic, stone, etc.), should in particular ensure that the surface is likely to ensure proper bonding: action must be taken with preliminary treatments of deep cleaning, degreasing, sanding of the surface by mechanical means and/or suitable chemicals.

The glued installation is not compatible with pre-existing type textile floor coverings (i.e carpets) or resilient (linoleum, pvc, etc.) and with ceramic floors not perfectly adhered to their subfloor.

In these cases, the old floors must therefore necessarily be removed.

### INSTALLATION ON UNDERFLOOR RADIATING SYSTEM

When the glue down installation is over an underfloor radiating system, it is necessary first of all check that:

- the heating system is one that functions at a low temperature;
- the system is provided of proper regulation tools in order to avoid that **the contact temperature of the hardwood floor surface will exceed 27°C during the heating time and that condensation appear in every part, either of the system and of the subfloor, during the cooling time.**

Should these indications not be fully complied the floor could suffer not only dimensional deformations and gapping between the boards but also permanent damages.

Listone Giordano® products featuring birch plywood support may also be used in particularly severe winter conditions of temperature and humidity, i.e. with relative air humidity down to 30% and with floor surface temperature up to 29°C. Under these extreme conditions, not optimal for people's health and well-being, the product retains its integrity and functionality; however, it may be subject to phenomena typically connected to wood shrinking, such as warped board section (concave cupping), the formation of gaps between boards, or even the formation of cracks within the single board.

The construction characteristics of the subfloor have a greater importance in case of installation on underfloor heating system; particularly **the maximum residual humidity that cannot be more than 1.7% CM for concrete screed and 0,2% for anhydrite screed.**

The glue down installation on an area with an underfloor radiating system is strongly advisable to reach best performances both regarding the best conduction of heat into the rooms and because it confers greater dimensional stability to the planks (the variation of interior conditions creates minor deformations).

The main thermal resistance values (the lower the thermal resistance, the better is the heating conduction) are reported in the table below:

| PRODUCT  | TOTAL THICKNESS | THERMAL RESISTANCE R [m <sup>2</sup> K / W]* |
|--|-----------------|--|
| Plank 140 , 190 and 230, Ancien/Quattrocento Italiano, Conte   | 14,0 mm         | 0,086  |
| Slide and Foxtrot (13 mm thick)  | 13,0 mm         | 0,083  |
| Perigal  | 13,0 mm         | 0,074  |
| Fabrique   | 12,5 mm         | 0,078  |
| Listone 190 and 140, Heritage 140 and 190, Desir, Undici, Decò, Medoc, Slide and Foxtrot (12,5 mm thick), Biscuit, Between | 12,5 mm         | 0,077  |
| Prima 140, 140 smart and 190 (B)   | 10,0 mm         | 0,062  |
| Prima 140, 140 smart and 190 (P)   | 11,5 mm         | 0,084  |
| Listone 90 and 70  | 11,0 mm         | 0,067  |
| Corona 70  | 9,0 mm          | 0,055  |
| Listone flottante 140 and 190  | 15,0 mm         | 0,110  |
| Prima flottante 140 and 190  | 14,0 mm         | 0,104  |
| Réserve  | 18,0 mm         | 0,125  |

\*approximate values related to the Oak top layer version.

With a floating installation it would be necessary to add the thermal resistance of the sound insulation foam underlay and particularly that of the air in any empty spaces that might remain under the flooring, particularly in case of not perfectly smooth subfloor.

In this case thermal resistance can increase so much.

## INSTALLATION SYSTEMS

For each product only proper installation systems are allowed.

Please follow directions below according to the installation system.

### GLUE DOWN INSTALLATION

Choose an adhesive that is compatible with the characteristics of the sub-floor and that won't transmit humidity to the wood (do not to use adhesives that contain water).

Ecolfit® Listone Giordano® is the single component, isocyanate and solvent free, sililated polymer-based adhesive with a very low emission of volatile organic compound recommended for all the range of our hardwood floors.

**Do not use two-component adhesives as they can damage significantly and irreversibly the appearance of all the applied finishes, particularly those oil based.**

Spread the adhesive on the subfloor only using a suitably notched trowel and lay the boards on top by interlocking them, if possible, using only a little pressure.

The glue has to be applied homogeneously onto the whole subfloor surface; do not apply it on individual strip/board or discontinuously. Do not apply the glue directly underneath the boards.

Open the boxes only as the boards will be installed; keep the boards in their original boxes until the moment of their laying.

The boards have to be joined only by hands avoiding the use of other tools (for instance the mallets) that can create damages on the surface and the corners of the boards.

During this operation take care not to allow adhesive into the joints or on the surface.

**It's forbidden the use of Pulplus® Listone Giordano or aggressive solvents to remove adhesive residues on oil based finished hardwood floor especially if stained.**

Around the entire perimeter of the interiors, including the point of junction with thresholds of other flooring materials, it is compulsory to form an expansion joint to be filled with appropriate skirting along the vertical walls and thresholds in connection with other joints in the floors.

Anyway the expansion joint cannot ever be lower than 8 mm and the intermediary dilatation gap cannot ever be lower than 4 mm.

### FLOATING INSTALLATION

In case of floating installation, if there is any evidence of, or even doubt about, the possibility of moisture intrusion (for example on ground floors or on subfloors recently built or containing high humidity lightening materials, etc.) it is necessary to lay a double polyethylene sheet over the subfloor and extend it a few centimetres up the walls to form an effective moisture barrier.

Before starting the actual installation of the planks, it is essential to lay foam underlay that will provide sound insulation.

The installation of the boards is carried out by inserting a continuous bead of glue (suitable for floating hardwood floors) on the lower part of the groove.

It is necessary to take care, when laying the floor, that end joints in one row are not lined up with end joints in adjacent rows; the correct staggering can be obtained by choosing an appropriate length for the first plank in a row.

All around the perimeter of the room, including where the hardwood floor meets other flooring materials, it is essential to leave an expansion gap between 8 and 10 mm (more if the room is particularly large) that will be covered by a suitable skirting board along the walls or by a threshold where the wood floor meets a different floor surface or a door.

It is necessary to allow for intermediary dilatation gaps every 6-8 metres, both width-wise and length-wise.

During installation, any adhesive that accidentally remains on the top surface of the planks has to be wiped away quickly.

If the adhesive dries on the surface, its removal will require considerable effort risking to alter the shining of the hardwood floor.

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The information contained on this sheet are based on the Company's research and experience.  
However it is intended for general purposes only since it is impossible to predict every environmental and installation variable.